

INITIAL STUDY/MITIGATED NEGATIVE DECLARATION
CLEARLAKE OAKS COUNTY WATER DISTRICT

WASTEWATER INFRASTRUCTURE AND REHABILITATION PROJECT

January 2026

Prepared For:

Clearlake Oaks Water District
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Appendix C	Biological Resources Assessment

List of Abbreviations and Acronyms

AB	Assembly Bill
ARPA	Archaeological Resources Protection Act
ASTM	American Society for Testing and Materials
BMP	Best Management Practice
CCR	California Code of Regulations
CalTrans	California Department of Transportation
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAPS	Criteria Air Pollutants
CARB	California Air Resources Board
CAO	Cleanup and Abatement Order
CBC	California Building Code
CBSC	California Building Standards Code
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CDFW	California Department of Fish and Wildlife
CFG	California Fish and Game
CGS	California Geological Survey
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CLOCWD	Clearlake Oaks County Water District
CRHR	California Register of Historical Resources
CRWQCB	California Regional Water Quality Control Board
CWA	Clean Water Act
CWPP	Community Wildfire Protection Plan
dB	Decibel
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHSZ	Fire Hazard Severity Zone
FHWA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Authority
GHG	Greenhouse Gas
HAPs	Hazardous Air Pollutants
HMP	Hazard Mitigation Plan
IS/MND	Initial Study/Mitigated Negative Declaration
KUSD	Konocti Unified School District
LCAB	Lake County Air Basin
LCAQMD	Lake County Air Quality Management District
LCFPD	Lake County Fire Protection District
LOS	Level of Service

LRA	Local Responsibility Area
LSs	Lift Stations
LTA	Lake Transit Authority
MRZ	Mineral Resources Zone
MUTCD	Manual on Uniform Traffic Control Devices
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
No.	Number
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
PG&E	Pacific Gas and Electric
PRC	Public Resources Code
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SR	State Route
SRA	State Responsibility Areas
SCADA	Supervisory Control and Data Acquisition
SCH	State Clearing House
SLF	Sacred Lands File
SWRCB	State Water Resources Control Board
TCP	Traditional Cultural Property
TCR	Tribal Cultural Resources
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Section 1 | Introduction

1.1 PROJECT SUMMARY

Table 1.1-1: Project Summary

Project Title:	Clearlake Oaks County Water District Wastewater Infrastructure and Rehabilitation Project
Lead Agency Name and Address:	Clearlake Oaks County Water District 12952 East Highway 20 Clearlake Oaks, CA 95423
Contact Person and Phone Number:	Dianna Mann, General Manger, 707-998-3322
Project Location:	Sections 5 and 6 of Township 13 North, Range 7 West; Sections 29, 31, and 32 of Township 14 North, Range 7 West; and Section 36 of Township 14 North, Range 8 West
General Plan Designation:	The General Plan Land Use Designations for the Proposed Project's improvement areas include: Community Commercial, Low Density Residential (LDR), Medium Density Residential (MDR), High Density Residential (HDR), Rural Residential (RR), Rural Lands (RL), Community Commercial (CC) and Public Facilities (PF)
Zoning:	The Zoning Designations for the Proposed Project's improvement areas include: Rural Residential (RR), Single-Family Residential (R1), Multi-Family Residential (R3), Open Space O), Resort Commercial (CR), and Rural Lands (RL).
Description of the Proposed Project:	The Proposed Project involves improvements, repairs, and upgrades to facilities at the wastewater treatment plant and within the collection system to improve system performance.
Surrounding Land Uses and Setting:	Adjacent properties to the Proposed Project include open space, residential, agriculture, and commercial uses.
Other Public Agencies Whose Approval is Required:	State of California Regional Water Quality Control Board, California Air Resources Board, and California Department of Transportation.
Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance impacts to tribal cultural resources, procedures regarding confidentiality, etc.?	Tribal consultation letters were sent to all affected Native American tribes on December 6, 2025.

1.2 BACKGROUND AND PURPOSE OF STUDY

The Clearlake Oaks County Water District (CLOCWD or District) provides water and wastewater treatment to its customers in the approximately 2.1-square mile service area. The District's mission is to provide the best quality water and the safest, most efficient treatment and disposal of wastewater at a reasonable cost to its customers.

As described in detail within the Wastewater Infrastructure and Rehabilitation Projects Phase 4-DFA SRF Grant Request Technical Memo No. 1 (**Appendix A**) and summarized in **Section 2.0** of this Initial Study, the Proposed Project consists of several infrastructure improvement projects needed to address issues raised in Cleanup and Abatement Order (CAO) No. R5-2014-0707 (**Appendix B**) issued in November 2014 by the California Regional Water Quality Control Board (CRWQCB).

The purpose of this Initial Study is to evaluate potential environmental impacts associated with the Proposed Project in accordance with California Code of Regulations (CCR) Title 14 (Chapter 3, Section 15000, et seq.), also known as the California Environmental Quality Act (CEQA) Guidelines. Additionally, because the District intends to apply for the California Clean Water State Revolving Fund Program, partially funded by the U.S. Environmental Protection Agency (USEPA), this addendum has been prepared to address certain federal environmental regulations, including regulations guiding the General Conformity Rule for the Clean Air Act (CAA), the Federal Endangered Species Act (FESA), and the National Historic Preservation Act (NHPA). USEPA has allowed a modified CEQA document, called CEQA-Plus, to be the compliance base for projects applying for federal grant monies. These additional regulatory components in compliance with CEQA-Plus requirements are addressed in Sections 4.2, Agriculture and Forest Resources; 4.3, Air Quality; 4.4, Biological Resources; 4.5, Cultural Resources; 4.8, Greenhouse Gases; 4.10, Hydrology and Water Quality; 4.13, Noise; and 4.14, Population and Housing (and Environmental Justice).

1.3 INCORPORATION BY REFERENCE

In compliance with CEQA Guidelines Section 15150, this Initial Study has incorporated by reference the following CEQA compliance documents that were prepared for similar improvements to the CLOCWD wastewater treatment infrastructure:

- Initial Study: Clearlake Oaks County Water District, Wastewater Infrastructure Rehabilitation; April 2014: State Clearing House (SCH) Number 2014042073
- Addendum to Mitigated Negative Declaration, Clearlake Oaks County Water District, Wastewater Infrastructure Rehabilitation; January 2016: SCH Number 2014042073
- Addendum to Mitigated Negative Declaration, Clearlake Oaks County Water District, Wastewater Infrastructure Rehabilitation; July 2017: SCH Number 2014042073
- Initial Study: Clearlake Oaks County Water District, Water Reclamation Project; November 2018: SCH Number 2018122011

1.4 SUMMARY OF FINDINGS

Section 4 of this document contains the analysis and discussion of potential environmental impacts resulting from construction and implementation of the Proposed Project. Based on the resources evaluated, it was determined that the Proposed Project would have no impact on the following resources:

- Mineral Resources
- Population/Housing
- Public Services
- Recreation

Impacts of the Proposed Project were determined to be less than significant for the following resources:

- Aesthetics
- Agriculture and Forestry Resources
- Energy
- Land Use and Planning
- Utilities and Service Systems

Impacts of the Proposed Project to the following resources would be less than significant with the incorporation of mitigation measures:

- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Transportation
- Tribal Cultural Resources
- Wildfire

1.5 DOCUMENT ORGANIZATION

This Initial Study/Mitigated Negative Declaration (IS/MND) contains the following six sections plus appendices:

- **Section 1**, Introduction, provides a project summary/environmental checklist form, and an overview of the Proposed Project and the CEQA process.
- **Section 2**, Project Description, provides a detailed description of Proposed Project components.
- **Section 3**, Determination, identifies the environmental factors potentially affected based on the analyses contained in this IS and includes the Lead Agency's determination based upon those analyses.
- **Section 4**, Evaluation of Environmental Impacts, presents the CEQA checklist and environmental analyses for all impact areas and the mandatory findings of significance. A brief discussion of the

reasons why the project impact is anticipated to be less than significant or why no impacts are expected is included.

- **Section 5,** References, contains the bibliography of resources cited within this document.
- **Section 6,** Preparers, includes the list of preparers.

Section 2 | Project Description

This section provides a description of the Proposed Project that serves as the basis for the assessment of potential environmental impacts in **Section 4.0**.

2.1 PROJECT LOCATION

The CLOCWD Wastewater Infrastructure and Rehabilitation Project (Proposed Project) involves improvements, repairs, and upgrades to facilities at the Clearlake Oaks Sewage Treatment Plant, located at 13705 Jensen Road, Clearlake Oaks, CA 95423 and within the wastewater collection system (i.e. lift stations (LSs), manholes, pipelines) in and around the community of Clearlake Oaks in Lake County, California adjacent to Clear Lake. The improvement areas are located in Sections 5 and 6 of Township 13 North, Range 7 West; Sections 29, 31, and 32 of Township 14 North, Range 7 West; and Section 36 of Township 14 North, Range 8 West as depicted on the Mount Diablo Principal Meridian U.S. Geological Survey (USGS) 7.5' Clearlake Oaks quadrangle map. **Figure 1** and **Figure 2** show the location of the various improvements included within the Proposed Project .

2.2 PROJECT OBJECTIVES

The District has identified the following objectives for the Proposed Project, which seeks to upgrade or replace existing wastewater infrastructure in order to:

- Comply with the CRWQCB Cleanup and Abatement Order No. R5-2014-0707;
- Ensure that all wastewater flows are properly treated, especially during peak flow periods;
- Ensure that the CLOCWD WWTP meets the requirements of its Central Valley RWQCB Discharge Requirement Order No. 98-211;
- Ensure that the CLOCWD LSs and collection systems comply with California State Water Resources Control Board (SWRCB) Order No.'s 2006-0003 and 2013-0058 and the System Evaluation and Capacity Assurance Plan;
- Improve overall operation cost efficiency;
- Improve safety and reliability of the WWTP to avoid operational failure and non-compliance with regulatory requirements; and
- Provide real-time data monitoring to improve operational flexibility.

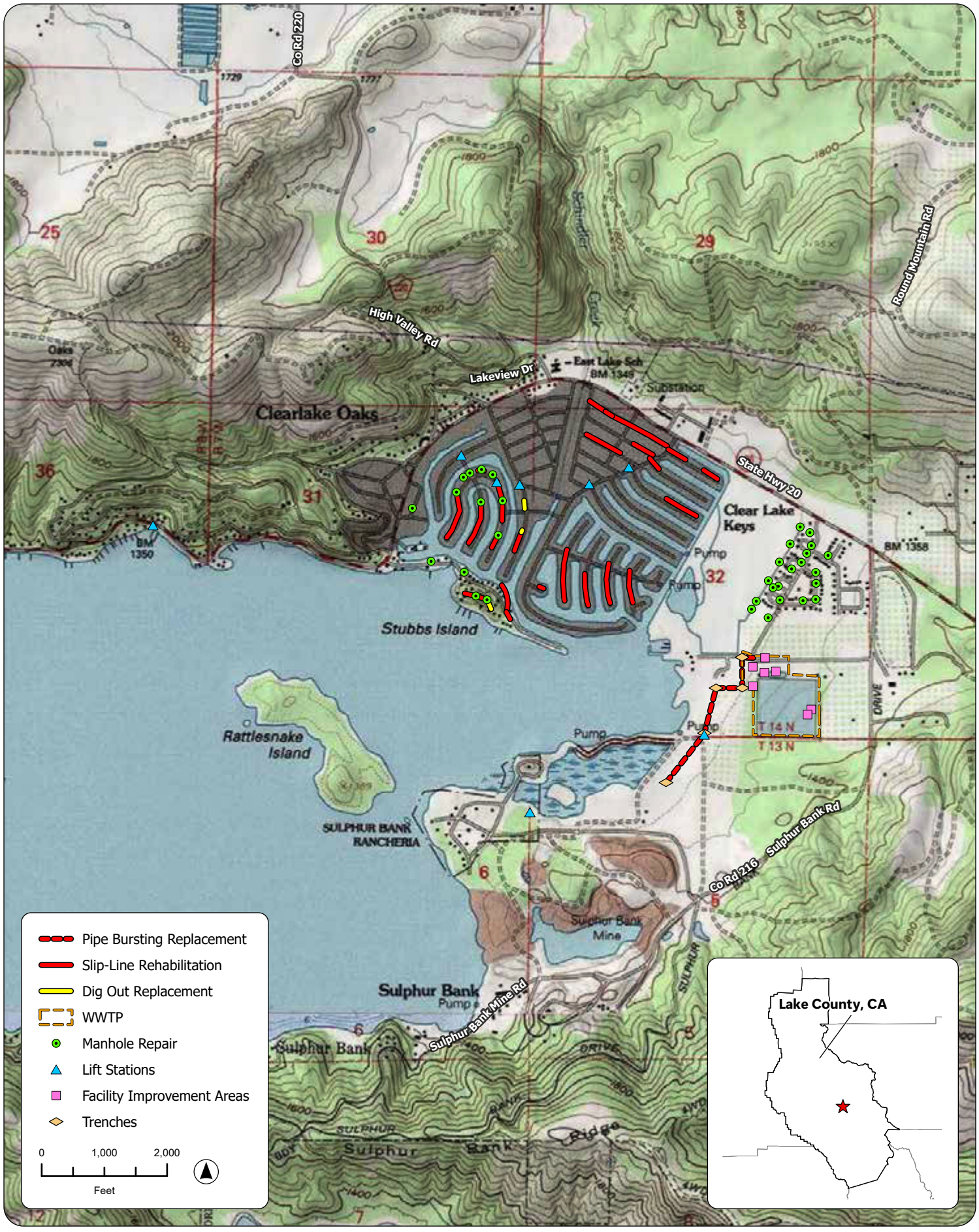
2.3 PROJECT DESCRIPTION

The following components of the Proposed Project are described in detail within the Wastewater Infrastructure and Rehabilitation Projects Phase 4-DFA SRF Grant Request Technical Memo No. 1, included as **Appendix A**, and are shown on **Figure 3**.



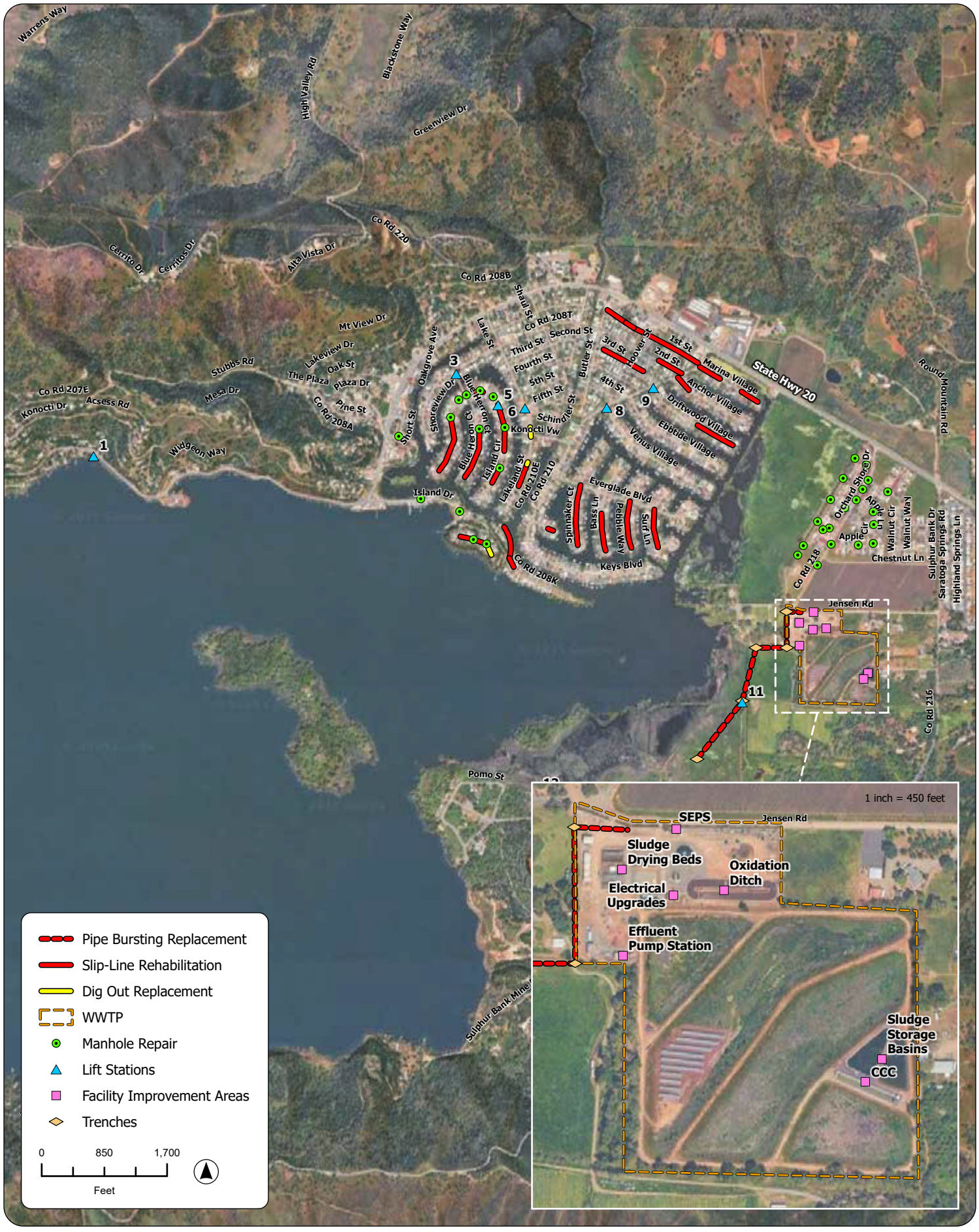
SOURCE: ESRI, 2025; Acorn Environmental, 11/6/2025

Figure 1
Regional Location



SOURCE: "Clearlake Oaks, CA" USGS 7.5 Minute Topographic Quadrangle, T13N R07W, T14N R07W, T14N R08W, Sections 5, 6, 29, 31, 32, & 36, Mt. Diablo Baseline & Meridian; ESRI, 2025; Acorn Environmental, 12/4/2025

Figure 2
Site and Vicinity



SOURCE: ESRI, 2025; Google Earth Aerial Photograph, 5/2024; Acorn Environmental, 12/4/2025

Figure 3
Aerial Overview

2.3.1 Project Components

Wastewater Treatment Plant Improvements

Oxidation Ditch

The Proposed Project includes upgrades and replacement of two 10 Hp brush aerators with new 15 Hp aerators and special attachments and modifications to the oxidation ditch and rotor brushes (wider design). Currently the existing aerators do not provide enough oxygen to the existing oxidation ditch for adequate treatment of raw sewage and the rotor brushes short circuit.

Sludge Drying Beds

The Proposed Project includes upgrading three of the existing sludge drying beds (No. 2, 3, and 4) with new underdrain piping and 6 to 12 inches of sub-base and 4 to 6 inches of concrete. The existing sludge drying beds have deteriorated AC surfaces with varying thicknesses and have been cracking and unraveling causing contaminated sludge being missed with the dried sludge. In addition, the underdrain system does not allow for the removal of the built up leachate.

Groundwater Monitoring Well

The Proposed Project includes the installation of a new groundwater monitoring well at the WWTP. The well will be approximately 50 to 60 feet deep. A 20-foot by 20-foot area would be required for the equipment but would not require any ground disturbance beyond the well. This groundwater monitoring well is a current requirement by the CRWQCB and is part of the current CAO No. R5-2014-0700 issued by the Central Valley RWQCB.

Electrical Panel

The Proposed Project includes upgrades to the electrical panel to the WWTP to accommodate the additional demands of the other WWTP upgrades. The upgrades include a new transformer and electrical drop from the nearest power pole and E(3) Phase power supply (overhead) and underground electrical wiring to portions of the WWTP and main control room panel.

Sludge Pond

The Proposed Project includes replacing the poly lining on Sludge Pond No. 2. The existing Sludge Pond No. 2 aerated lagoons poly lining is ripped and deteriorating and leakage from this Sludge Pond will impair the groundwater.

CL2 Basin

The Proposed Project includes removing a temporary poly lined CL2 contact basin and replacing it with a new concrete contact basin, along with a mixing chamber, vertical shaft aerators, pumps, analyzers, chlorinators, controllers and panels. This will improve the overall needed chlorine contact time and efficiency. The existing chlorine contact basin was constructed as a temporary basin in 2000 with a poly lining. This poly lining is problematic due to its deterioration and the contact floor within the basin is uneven, which causes an accumulation of sludge, algae, and other bypassed effluent particles. In addition, the basin has a tendency to short circuit.

WWTP Facility/Building

The Proposed Project includes remodeling over 380 square feet of office space, electrical wiring, restroom facilities and demolishing old and deteriorated facilities located in the WWTP and surrounding buildings. The existing laboratory and control building was constructed over 45 years ago and is in need of repairs and upgrades for safety and efficiency purposes, this includes roof replacements and improvements to restroom facilities, and an addition of a conference room.

Filter Press

The Proposed Project includes installation of a filter press at the Water Treatment Plant (WTP) to remove up to 80 percent of the algae that is impacting the WWTP. Currently excessive lake algae produced during the WTP clarifier and filter backwash cycles is being discharged into the sewer collection system which is then transported by the interceptor/collection system to the WWTP. The excessive algae places a burden on both the oxidation ditch and impacts the secondary clarifier, which bulks during high algae influent especially during the peak of summer.

Lift Station Improvements

Lift Station No. 1

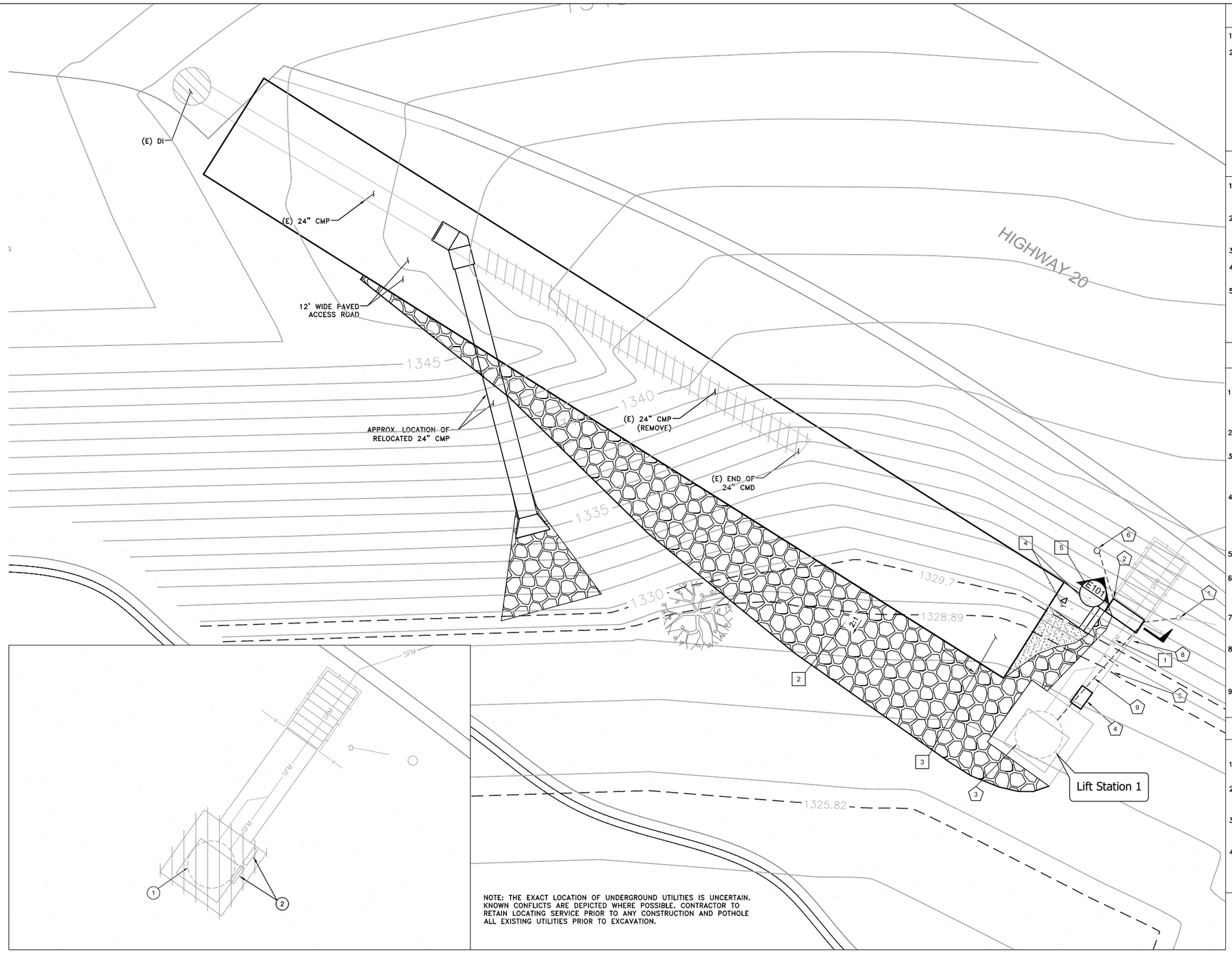
The Proposed Project includes a new access driveway for emergency and general operational access to LS 1; refer to **Figure 4** for the specific site plan. The driveway will be approximately 100 feet in length and approximately 10 feet wide. This includes a new access stairway and gate, with the existing access along Highway 20 locked since it currently poses as an unsafe access and entry point to the LS and requires parking on north -side of Highway 20. Rip rap will be applied to the southern exposed embankment for slope protection, with a total amount of fill of approximately 100 cubic yards. Approximately 35 linear feet of the existing 24-inch corrugated metal pipe used to convey stormwater from Highway 20 will be abandoned in place, and 35 linear feet will be constructed under the access road towards Clear Lake. Rip rap will be applied to the end of the pipeline for slope protection. The Proposed Project also includes the cutting-in of a 6-inch bypass quick connect valve (located above ground) to provide operators with an emergency inter-tie to bypass raw sewage in the event of a failure at LS 1. Additionally, a new control and Supervisory Control and Data Acquisition (SCADA) panel, including new wiring, would be installed. A Caltrans Encroachment Permit will be needed for construction within the right-of-way along Highway 20.

Lift Station No. 3

The Proposed Project includes installation of new electrical wiring and controls, valve box, quick connect assembly and the extension of the perimeter fence around the LS to by approximately 40 linear feet to encompass the new bypass structure and valve box. The new components will be installed within existing paved or disturbed areas in the public right of way. Refer to Section 4A.2 and Drawing Number CE103 of **Appendix A** for the specific site plan of LS 3.

Lift Station No.'s 5, 6, 8, and 9

The Proposed Project includes installation of a new wet-well, pumps, rails, valves, valve boxes, and a quick connect assembly with valve box for catastrophic failures at each of these LSs. All improvements will be made within paved or disturbed areas in the public right of way. Refer to Sections 4A.3 through 4A.6 and Drawing Numbers CE105, CE106, CE108, and CE109 of **Appendix A** for the specific site plans of LS 5, LS 6, LS 8, and LS 9.



(E) SITE PLAN (DEMO)
SCALE: 1"=5'

(N) SITE PLAN
SCALE: 1"=5'

0 5 10
Feet

DEMOLITION KEYNOTES

1. PUMPS NOT INCLUDED.
2. REMOVE (E) PANEL AND CONTROLS. SALVAGE PANEL COMPONENTS PER ELECTRICAL DESIGN. SEE SHEET C301.

IMPROVEMENT KEYNOTES

1. (N) FLOW METER AND SEWAGE BYPASS CONNECTION. SEE DETAIL 4 ON SHEET C201.
2. (N) AC ACCESS ROAD SEE SHEET C301 AND C311 FOR PROFILE AND SECTION.
3. (N) 10' BY 14' LANDING THIS LOCATION.
4. (N) CONCRETE LANDING & ALUMINUM STAIRS. SEE SHEET C403.
5. CUT, BAND, AND MODIFY EXISTING RAILING AND TOE KICK. INSTALL (N) MANGATE. PROVIDE SHOP DRAWING FOR DISTRICT APPROVAL PIOR TO FABRICATING.

ELECTRICAL KEYNOTES

1. EXISTING MAIN CIRCUIT BREAKER AND PG&E METER PANEL. REMOVE EXISTING CONDUCTORS, INSTALL 2'c, 3#2, 1#6(G) TO MTS.
2. SEE DETAIL DWG E101 FOR ELEVATION OF ELECTRICAL PANELS.
3. REPLACE PUMPS 1 AND 2, INSTALL LEVEL TRANSMITTER, LSHH AND LSLL. INSTALL PUMP CABLE AND LIT/LSH/LSL CABLES IN EXISTING CONDUIT TO PULLBOX.
4. INSTALL A 2'X2' NEW 4SS PULLBOX 18" ABOVE EXISTING CONDUITS. SPLICE PUMP CABLES IN PULLBOX TO CONDUCTORS. MOUNT PULLBOX TO RAILING AT 24" ABOVE GRADING WITH UNISTRUT MOUNTING EXTEND CONDUITS AS REQUIRED.
5. 1"c, FE CABLE. MOUNT TO EXISTING STRUCTURE WITH CLAMPS.
6. INSTALL BARE #2 TO GROUND ROD. BOND TO CONTROL PANEL, MTS, GENERATOR CIRCUIT BREAKER AND PUMP TERMINATION PANEL.
7. GENERAL – SEE TYPICAL PUMP STATION CONDUIT AND CABLE DIAGRAM FOR CONNECTIONS.
8. INSTALL CONDUITS SURFACE MOUNTED FROM PULLBOX TO CONTROL PANEL. 1–1"c, 3#10, K_0 (a), 4#14 (PUMP 2), 1–2"c, 4 #14, 1–TSP (LSHL, LIT).
9. INSTALL 2"c, TSP, 4#14 FROM PULLBOX TO WETWELL.

NOTES

1. ZERO RUMSEY IS EQUAL TO 1318.26–FEET ABOVE MEAN SEA LEVEL.
2. A "FULL LAKE" IS MEASURED AT 1325.82–FEET ABOVE MEAN SEA LEVEL ON THE RUMSEY GAUGE.
3. MAXIMUM RUMSEY GAUGE WAS MEASURED AT 1329.7–FEET AND OCCURRED ON FEBRUARY 24, 1998.
4. THE RUMSEY GAUGE WAS MEASURED AT 1328.89–FEET ON FEBRUARY 22, 2017.

SOURCE: MC Engineering, 4/10/2017; Acorn Environmental, 12/5/2025

Figure 4
Lift Station 1 Site Plan

Collection System Rehabilitation (Pipelines and Manholes)

The proposed improvements for the collection system within roadways and/or shoulder areas include a combination of various types of pipeline and manhole improvements. These pipeline and manhole improvements include trenchless pipeline rehabilitation with polyethylene slip lining; trenching for spot repairs and replacement of pipeline segments; crack sealing with gout and/or epoxy of pipelines; removing roots and grouting of pipelines; and replacing and/or grouting manholes.

Trenchless slip lining will be used in cases where there are multiple defects found in pipeline segments between manholes. The material used for the slip lining is made of polyester, fiberglass cloth and is introduced in the upstream manhole or at cleanouts where house service connections require repair. Once installed the material is cured in place with hot water, ultraviolet light, or steam. Polyethylene slip lining meets American Society for Testing and Materials (ASTM) Standard F2561. **Figure 3** shows the segments of pipeline where slip-lining will be installed.

In situations where the pipeline sags are considered significant or a slip line cannot be properly installed, a backhoe or trencher will be used to dig out those deteriorated and sagging pipeline segments. **Figure 3** shows the two segments of pipelines that will be dug out and replaced and one dig out for spot repair. The new pipe sections will have flexible transition couplings made of elastomeric materials conforming to ASTM C 1173 and will be banded with series 300 premium grade stainless steel. Excavation associated with the two pipeline replacements would be approximately 3 feet by 10 feet with an average depth of 6 feet, with approximately 540 cubic feet of cut or 20 cubic yards. Dewatering may be required to complete the pipeline replacements.

Root intrusion will be eliminated by in-line cutters and foaming and re-examined for possible in-line repair.

Lift Station No. 11 (Ejector) Bypass and Pipeline Replacements

LS 12 currently pumps waste flows from the Elem Indian Colony Tribal Grounds through a 5-Hp LS to a gravity manhole located approximately 2,925 linear feet from LS 11 Pneumatic Ejector Station, it is then pumped approximately 2,161 linear feet to a point of connection at the WWTP.

The Proposed Project includes replacing pumps and updating the control system at LS 12 and the replacement of approximately 2,161 linear feet of 6-inch asbestos-concrete pressurized pipe (force main) from LS 11 to the point of connection at the WWTP. Due to high ground water conditions, the pipe will be replaced with new 6-inch DR 18 PVC pipe via the pipe bursting method. In addition, 885 linear feet of pipe will be installed via the pipe bursting method to replace the gravity main that is connected to LS 11. The pipeline segments to be replaced are shown on **Figure 3.** No ground disturbance will occur at LS 12 as the pump replacement and control system is within the existing LS facility.

Five boring trenches would be required to accommodate the pipe bursting/installation equipment used for the pipeline replacement. Each trench would be approximately 10 feet by 4 feet with an average depth of 4 feet, with approximately 160 CF of cut or 6 CY.

2.3.2 Construction and Timing

Energy efficient construction equipment would be used to the extent feasible. Construction of the Proposed Project would last approximately 18 months, with a tentative start date of June 1, 2026,

assuming no delays. Some of the work will be completed simultaneously, but the majority of the construction would be staggered. The following equipment may be used during construction:

- Backhoes and excavators
- Trenchers and loaders
- Dump trucks
- Pavers and rollers
- Trash/waste storage
- Small crane
- Welding equipment
- Material stockpiles/supply yards
- Generators and compressors
- Hand tools
- Boring and trenching equipment
- Service trucks with crane attachments
- Jack/bore and scaffolding
- Water and pump trucks
- Compactors

The majority of the Proposed Project will take place within existing treatment components and will not require new ground disturbance. Due to the uncertainty of the exact locations of underground utilities, a locating service will be utilized to locate all existing utilities prior to any disturbance. The following components of the Proposed Project will require ground disturbance:

- LS 1: New 100-foot access drive installed with an average depth of 6 feet and width of 10 feet, with approximately 6,000 cubic feet of excavated material or 222 cubic yards of cut.
- Collection system pipeline replacements: Two pipelines would be dug out via an approximately 3-foot by 10-foot trench with an average depth of 6 feet, with approximately 360 cubic feet of cut or 13 cubic yards.
- Bypass and pipeline replacements at LS 11 Ejector: Five boring trenches would be 10 feet by 4 feet with an average depth of 4 feet, with approximately 800 cubic feet of cut or 30 cubic yards.

There will be a total of approximately 265 cubic yards of cut, of which 43 cubic yards will be used as fill and the excess 222 cubic yards will be hauled off-site.

Section 3 | Determination

3.1 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

As indicated by the discussions of existing and baseline conditions, and impact analyses that follow in this Section, environmental factors not checked below would have no impacts or less than significant impacts resulting from the project. Environmental factors that are checked below would have potentially significant impacts resulting from the project. Mitigation measures are recommended for each of the potentially significant impacts that would reduce the impact to less than significant.

☐ Aesthetics	☐ Agricultural/Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☐ Energy
☒ Geology/Soils	☒ Greenhouse Gas Emissions	☒ Hazards and Hazardous Materials
☒ Hydrology/Water Quality	☐ Land Use/Planning	☐ Mineral Resources
☒ Noise	☐ Population/Housing	☐ Public Services
☐ Recreation	☒ Transportation	☒ Tribal Cultural Resources
☐ Utilities/Service Systems	☒ Wildfire	☒ Mandatory Findings of Significance

The analyses of environmental impacts in **Section 4**, **Impact Analysis**, result in an impact statement, which shall have the following meanings.

Potentially Significant Impact: This category is applicable if there is substantial evidence that an effect may be significant, and no feasible mitigation measures can be identified to reduce impacts to a less than significant level. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

Less than Significant with Mitigation Incorporated: This category applies where the incorporation of mitigation measures would reduce an effect from a "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measure(s) and briefly explain how they would reduce the effect to a less than significant level (mitigation measures from earlier analyses may be cross-referenced).

Less Than Significant Impact: This category is identified when the proposed project would result in impacts below the threshold of significance, and no mitigation measures are required.

No Impact: This category applies when a project would not create an impact in the specific environmental issue area. "No Impact" answers do not require a detailed explanation if they are adequately supported by the information sources cited by the lead agency, which show that the impact does not apply to the

specific project (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

3.2 DETERMINATION

On the basis of this initial evaluation (to be completed by the Lead Agency):

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Diana Mann
Signature

1-12-26
Date

Section 4 | Evaluation of Environmental Impacts

4.1 AESTHETICS

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

4.1.1 Regulatory Setting

State

California Department of Transportation (CalTrans)

CalTrans administers the Scenic Highway Program which selects certain highway corridors in the State for their scenic qualities. For designated highways, CalTrans works to preserve and protect their scenic values through planning and design of highway projects. The Scenic Highway system includes a list of highways that have been designated and those that are eligible for designation as scenic highways.

Local

Lake County General Plan

The Lake County General Plan aims to protect and enhance aesthetics and scenic values as a part of the broader vision for land use and community development.

Policy LU-7.9 – Integrate Natural Features: The County shall emphasize each community's natural features as the visual framework for new development and redevelopment.

Policy LU-7.10 – Visual Access: The County shall maintain visual access to views of Clear Lake, hillsides, creeks, and other distinctive natural areas by regulating building orientation, height, and bulk.

Policy OSC-2.8 – Scenic Viewpoints Along Roadways, Bikeways, and Pedestrian Trails: Scenic viewpoints along roadways and multi-use trails should be provided where there are major views of specific features, such as Clear Lake, Mt. Konocti, or panoramic views of the countryside. Interpretative information should be provided at these points to help inform visitors and residents of the natural and cultural history of the County.

Policy OSC-7a.5 – Preservation of Lake Views: Development regulations and review procedures should prevent further blockage of lake views from shoreline roadways and where feasible, restore visual contact with the lake from these roadways.

County of Lake General Performance Standards

Article 41 of the County of Lake General Performance Standards outlines standards for lighting and glare as follows:

41.8 Glare and heat: All exterior lighting accessory to any use shall be hooded, shielded or opaque. No unobstructed beam of light shall be directed beyond any exterior lot line. Buildings and structures under construction are exempt from this provision.

4.1.2 Environmental Setting

The Proposed Project improvement areas are partially visible from State Route (SR)-20, as well as from Orchard Shore Drive and several residential houses that surround the components of the Project.

Designated scenic highways, roadways, and resources do not occur within viewing range of the Proposed Project improvement areas (Caltrans, 2025a). SR-20 is listed as an "Eligible State Scenic Highway" (Caltrans, 2025). The nearest Officially Designated Scenic Highway is SR-116 approximately 40 miles southwest of the Proposed Project (Caltrans, 2025a).

Views of the Proposed Project improvement areas from the surrounding vicinity are typical of residential wastewater infrastructure, and a majority of the Proposed Project will occur below ground. Eight LSs would be part of the Proposed Project and visible from the surrounding residences. Site Photographs 1 and 2 below provide example views of the pipeline replacement areas and WWTP.

The land surrounding the points of pipeline repair/replacement and manhole repair is largely developed, residential land with typical residential limited light emitting sources. The improvements areas in and around the WWTP have surrounding land uses that are more undeveloped with scattered residences nearby. The manhole repairs north of the facility improvement area would also be located in a residential neighborhood along SR-20. The wastewater infrastructure throughout the neighborhoods does not directly emit any light. Some light emission occurs at the WWTP.



Site Photograph 1: View from Blue Heron Court looking south at region of manhole and pipeline repair



Site Photograph 2: View from Jensen Road looking south at the WWTP

4.1.3 Impact Assessment

a) Would the project have a substantial adverse effect on a scenic vista?

No Impact. The Proposed Project would not erect any structure that could impact scenic vistas. The Proposed Project is located near a Clear Lake, although the Project would not provide a vantage point to a scenic vista and is not visible from any known scenic vista. The Proposed Project will not result in the obstruction of federal, state, or locally classified scenic areas, historic properties, community landmarks, or formally classified scenic resources, such as a scenic highway, national or state scenic area, or scenic vista. Therefore, there would be no impact.

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. The Proposed Project is not located along a State-designated Scenic Highway (CalTrans, 2025). While there are "Eligible State Scenic Highways" in the vicinity, the Proposed Project does not occur directly adjacent to officially designated scenic highways. All Project-related disturbance would occur in developed areas and would occur mostly below ground, minimizing any potential damage to resources such as trees, rock outcroppings, and historic buildings, although the Proposed Project is not within a state scenic highway. Therefore, there would be no impact.

c) In nonurbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

No Impact. The Proposed Project improvement areas are located in an area zoned by the County for single family residential, open space, rural residential, and rural lands (Lake County, 2025a). The improvements of the Proposed Project would not conflict with any applicable zoning and would not alter the scenic quality of the Proposed Project. All views from publicly accessible vantage points, such as sidewalks and parking lots, will not be degraded. Therefore, the Proposed Project would have no impact on visual character.

d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less than Significant. The Proposed Project would not introduce new sources of light to the Proposed Project improvement areas with the exception of security lighting at the booster pump station near LS 11. Lighting would be similar to the sources of light from the existing WWTP. The Proposed Project will be consistent with Article 41 of the County of Lake General Performance Standards which require all exterior lighting accessory to any use be hooded, shielded or opaque and no unobstructed beam of light be directed beyond any exterior lot line. Day and nighttime views in the area would not be significantly adversely impacted. Therefore, the Proposed Project would have a less-than-significant impact.

4.2 AGRICULTURE AND FORESTRY

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

4.2.1 Regulatory Setting

Federal

Farmland Protection Policy Act (FPPA)

The FPPA is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that federal programs are administered in a matter that is compatible with state and local units of government, and private programs and policies to protect farmland (7 U.S. Code [USC] Section 4201). The Natural Resources Conservation Service (NRCS), responsible for the implementation of the FPPA, categorizes farmland in a number of ways. These categories include: prime farmland, farmland of statewide importance, and unique farmland. Prime farmland is considered to have the best possible features to sustain long-term productivity. Farmland of statewide importance includes farmland similar to prime farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Unique farmland is characterized by inferior soils and generally needs irrigation depending on climate. The Land Evaluation and Site Assessment is a numeric rating system used by the NRCS to evaluate the relative agricultural importance of farmlands.

State

California Farmland Mapping and Monitoring Program (FMMP)

The California FMMP, which monitors the conversion of the State's farmland to and from agricultural use, was established by the California Department of Conservation, under the Division of Land Resource Protection. The program maintains an inventory of state agricultural land and updates its "Important Farmland Series Maps" every two years. The FMMP is an informational service only and does not constitute state regulation of local land use decisions. The four categories of farmland, which include Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance, are considered valuable and any conversion of land within these categories is typically considered to be an adverse impact.

Williamson Act

The Williamson Act is a State program that was implemented to preserve agricultural land. Under the provisions of the Williamson Act (California Land Conservation Act 1965, Section 51200), landowners contract (Williamson Act Contract) with the county to maintain agricultural or open space use of their lands in return for reduced property tax assessments. The contract is self-renewing; however, the landowner may notify the county at any time of intent to withdraw the land from its preserve status. Withdrawal from a Williamson Act contract involves a ten-year period of tax adjustment to full market value before protected agricultural/open space land can be converted to urban uses.

Public Resources Code (PRC)

The California PRC compiles statewide laws related to the conservation, utilization, and supervision of natural resources, along with mines and mining, oil and gas, and forestry. Under the PRC, Section 12220 (g) defines Forest Land as land that can support 10-percent native tree cover for any species and that allows for management of one or more forest resources. The PRC Section 4526 defines Timberland as land available for and capable of growing a crop of tress of a commercial species used to produce lumber and other forest products. The PCR Section 51104 (g) defines Timberland Production Zone as an area which has been zoned for and is devoted to growing and harvesting timber, or for growing and harvesting timber and compatible uses.

4.2.2 Environmental Setting

The Proposed Project improvement areas is located within an area that was residentially developed in the 1960’s (Lake County News, 2022). This area was previously marsh wetland, now known as the Clearlake Keys. The improvement areas mostly follows paved roadways, and some segments of pipeline repair would travel through open fields. Historical imagery does not show evidence of agriculture or forestry use in the path of the Proposed Project. The FMMP identified the Proposed Project as mostly Urban and Built-up Land, with some pipelines going through Grazing Land and Farmland of Local Importance (California Department of Conservation, 2025a). Urban and Built-up Land is commonly residential, commercial, and industrial, and is occupied by structures with a building density of 1 unit to 1.5 acres or 6 structures to 10 acres, approximately. The NRCS prepared a custom soil resource report for the Proposed Project (NRCS, 2025).

4.2.3 Impact Assessment

a) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact. The Proposed Project improvement areas are not currently used for agriculture, nor identified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance per the FMMP (California Department of Conservation, 2025a). Additionally, the rehabilitation of the wastewater infrastructure would not cause the conversion of any land. Therefore, the Proposed Project would have no impact on farmland.

b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

Less than Significant. The Proposed Project improvement areas are not zoned as agricultural land, although a pipeline briefly passes through land zoned as Agricultural Preserve for approximately 98 feet. This land is subject to a Williamson Act contract. Although construction may involve unearthing relevant pipelines and some ground disturbance to make replacements or improvements, the land would be returned to its previous state following the infrastructure rehabilitation and the Project would not preclude the site from further agricultural uses. The rehabilitation would not convert the land under a Williamson Act contract to urban uses. Therefore, the Proposed Project would have a less-than-significant impact.

c) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

No Impact. The Proposed Project improvement areas and surrounding land uses are not zoned as forest land (as defined in PRC Section 12220 (g)), timberland (as defined by PRC section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g)). Therefore, there would be no impact to the existing zoning or cause rezoning for these land types.

d) Would the project result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. The Proposed Project improvement areas do not contain any forest land and would not result in the loss or conversion of any forest land. Therefore, the Proposed Project would have no impact on timberland or forest land.

e) Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

No Impact. The Proposed Project will not involve changes to the existing environment which could result in the conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use. Therefore, no impact would occur.

4.2.4 Compliance with Federal Environmental Laws and Regulations

As discussed above, the Proposed Project is not in areas designated as protected farmland by the NRCS under the FPPA. The Proposed Project will not involve changes to the existing environment which could result in the conversion of farmland to non-agricultural use. Therefore, the Proposed Project would not result in direct or indirect impacts to federally protected farmland. The Proposed Project would comply with all federal regulations relating to agricultural resources, including the FPPA.

4.3 AIR QUALITY

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

4.3.1 Regulatory Setting

Federal

Clean Air Act of 1970

The CAA; 42 USC Chapter 85 is the federal legislation for the protection of air quality. The CAA gives the USEPA authority to regulate air quality by promulgating standards and levels for air quality and enforcing those standards and levels on federal, state, and tribal land. The CAA requires the USEPA to regulate Hazardous Air Pollutants (HAPs), which are those pollutants that are known or suspected of causing cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects.

The Federal CAA of 1970, as amended, establishes air quality standards for several Criteria Air Pollutants (CAPs): ozone (O_3), carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). These pollutants are termed "criteria" pollutants because the USEPA has established specific concentration threshold criteria based upon specific medical evidence of health effects or visibility reduction, soiling, nuisance, and other forms of damage. These National Ambient Air Quality Standards (NAAQS) are divided into primary and secondary standards. Primary standards are designed to protect public health, and secondary standards are intended to protect public welfare from effects such as visibility reduction, soiling, nuisance, and other forms of damage. NAAQS and California Ambient air quality standards (CAAQS) are presented in **Table 4.3-1.**

Areas are designated attainment, nonattainment, or maintenance by the USEPA depending on whether the area is below or exceeds the established NAAQS. Nonattainment areas must take steps towards attainment within a specific period of time. Once an area reaches attainment for a particular criteria pollutant, then the area is re-designated to attainment. The CAA places most of the responsibility on states to achieve compliance with the NAAQS. States, municipal statistical areas, and counties that contain areas of nonattainment are required to develop a State Implementation Plan, which outlines policies and procedures designed to bring the state into compliance with the NAAQS.

Table 4.3-1: Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards Concentration	National Standards Primary	National Standards Secondary
Ozone (O_3)	1 hour	0.09 ppm (180 µg/m^3)	–	Same as primary standard
Ozone (O_3)	8 hours	0.070 ppm (137 µg/m^3)	0.070 ppm (147 µg/m^3)	
Respirable particulate matter (PM_{10})	24 hours	50 µg/m^3	150 µg/m^3	Same as primary standard
Respirable particulate matter (PM_{10})	Annual arithmetic mean	20 µg/m^3	–	
Fine particulate matter ($PM_{2.5}$)	24 hours	–	35 µg/m^3	Same as primary standard
Fine particulate matter ($PM_{2.5}$)	Annual arithmetic mean	12 µg/m^3	9.0 µg/m^3	15 µg/m
Carbon monoxide (CO)	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	–
Carbon monoxide (CO)	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	–
Carbon monoxide (CO)	8 hours (Lake Tahoe)	6 ppm (7 mg/m^3)	–	–
Nitrogen Dioxide (NO_2)	Annual arithmetic mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary standard
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	0.030 ppm (for certain areas) [h]	–
Sulfur Dioxide (SO_2) [9]	24 hours	0.04 ppm	0.14 ppm	–

Pollutant	Averaging Time	California Standards Concentration	National Standards Primary	National Standards Secondary
		(105 µg/m^3)	(for certain areas)	
Sulfur dioxide (SO_2)	3 hours	–	–	0.5 ppm (1,300 µg/m^3)
Sulfur dioxide (SO_2)	1 hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	–
Lead (Pb)	30-day average	1.5 µg/m^3	–	–
Lead (Pb)	Calendar quarter	–	1.5 µg/m^3 (for certain areas)	Same as primary standard
Lead (Pb)	Rolling 3- month average	–	0.15 µg/m3	
Visibility-reducing particles	8 hours	See footnote [1]	No national standards	No national standards
Sulfates	24 hours	25 µg/m3	No national standards	No national standards
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m^3)	No National Standards	No National Standards
Vinyl Chloride	24 hours	0.01 ppm (26 µg/m^3)	No National Standards	No national standards

Notes: µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; ppb = parts per billion; ppm = parts per million

[1] In 1989, the Air Resources Board converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively

Source: CARB, 2024

State

California Clean Air Act of 1988

The California Air Resources Board (CARB) oversees air quality planning and control throughout California. CARB is primarily responsible for ensuring implementation of the California CAA, responding to the CAA requirements, and regulating emissions from motor vehicles and consumer products in the State. CARB has established emissions standards for vehicles sold in California and for various types of equipment available commercially. It also sets fuel specifications to further reduce vehicular emissions.

The CCAA establishes ambient air quality standards for the state and a legal mandate to achieve these standards by the earliest practical date. These standards apply to the same six criteria pollutants as the CAA and also include sulfate, visibility, hydrogen sulfide, and vinyl chloride. They are generally more stringent than the NAAQS and, in the case of PM_{10} and NO_2, are far more stringent. CAAQS are health-based to protect the health and welfare of the populace with a reasonable margin of safety. These pollutants include ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, sulfates, Pb, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. **Table 4.3-1** provides the federal and state ambient air quality standards.

Local

Lake County Air Quality Management District

Lake County Air Quality Management District (LCAQMD) is a regional agency that regulates stationary sources of air pollution within the Lake County Air Basin (LCAB). Its primary purpose is to enforce local, state, and federal air quality law, rules, and regulations in order to satisfy ambient air quality standards and protect the public from harm due to poor air health.

All projects in Lake County and in the community of Clearlake Oaks are subject to applicable LCAQMD rules and regulations in effect at the time of construction. Descriptions of specific rules applicable to the Proposed Project may include, but are not limited to:

- Visible emissions shall meet the standards in accordance with Chapter II, Article I Visible Emissions.
- Particulate matter emissions from combustible sources shall meet the standards in accordance with Chapter II, Article II Particulate Matter Emissions (LCAQMD, 2001).

The LCAQMD has not adopted air quality thresholds for the determination of impact significance for projects subject to CEQA review.

Lake County General Plan

The Lake County General Plan contains the following policies and implementation measures related to air quality that are relevant to the Proposed Project:

Goal HS-3: To reduce the generation of air pollutants and promote non-polluting activities to minimize impacts to human health and the economy of the County.

> **Policy HS-3.2.** Best Available Air Pollution Control Technologies. The County shall require the use of the best available air pollution control technologies to maintain healthful air quality and high visibility standards, along with continuing compliance with State and Federal Ambient Air Quality Standards.
>
> **Policy HS-3.9.** Air Quality Analysis. The County may require an analysis of potential air quality impacts associated with significant new developments through the environmental review process, and identification of appropriate mitigation measures prior to approval of any major development project.

Policy HS-3.10. Dust Suppression During Construction. The County shall require dust-suppression measures for grading activities, and asbestos dust hazard mitigation plans for projects located in Naturally Occurring Asbestos Areas.

4.3.2 Environmental Setting

Climate and Topography

The Proposed Project is located in Lake County, California, within the LCAB. The LCAB is situated between northwest–southeast-trending mountain ridges at the southern end of the northern Coast Range. Synoptic weather patterns typical of the northern California intermountain coastal climate dominate the LCAB. During summer, the interaction between the Pacific high-pressure system and thermal low-pressure conditions over the Great Basin creates predominantly westerly winds. Winter conditions are

generally influenced by northwesterly winds associated with passing storm systems. The LCAB frequently experiences temperature inversions that trap pollutants near the ground surface, especially during early morning hours. Upper-air subsidence during the summer further restricts vertical dispersion. As a result, the highest pollutant concentrations typically occur under stagnant weather conditions and are most often attributed to locally generated pollutants, poorly managed control burns, or wildfire events. The summer-season burn ban, combined with the region's low population density and limited industrial activity, has contributed to the LCAB being in attainment for all state ambient air quality standards (LCAB, 2002).

Attainment Status

Lake County is currently designated as being in attainment for all state and federal ambient air quality standards (CARB, 2023; USEPA, 2025).

Sensitive Receptors

The nearest sensitive receptors to the Proposed Project include single-family homes located adjacent to the proposed pipeline alignments. East Lake Elementary School is located approximately 0.17 mile north of the northernmost project components.

4.3.3 Impact Assessment

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

No Impact. In areas within the state where air quality standards are not met, CARB collaborates with local air districts to develop and implement plans to achieve compliance with federal and state standards. As discussed above, Lake County is designated attainment for all criteria air pollutants under both state and federal standards; therefore, no applicable air quality plan has been adopted for the region. As such, the Proposed Project would have no potential to conflict with or obstruct implementation of one.

b) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Less than Significant Impact. Construction of the Proposed Project would involve minor demolition, grading and/or trenching associated with pipeline replacements and pipe bursting, and cement work for the construction of access drives. These activities would result in the temporary generation of emissions from the use of heavy-duty diesel construction equipment and vehicle trips, and the generation of fugitive dust. However, the LCAB is designated attainment for all CAPs under both state and federal standards; therefore, construction would not have the potential to violate air quality standards or result in a cumulatively considerable net increase in criteria pollutants for non-attainment areas. Furthermore, **Mitigation Measure AQ-1** discussed below under Question C would further reduce the fugitive dust during construction. Operation of the Proposed Project would require ongoing maintenance of the new infrastructure; however, these activities would be comparable to existing operations and would not generate significant emissions.

c) Would the project expose sensitive receptors to substantial pollutant concentrations?

Less than Significant Impact with Mitigation. During construction, sensitive receptors may be affected by the temporary generation of emissions and fugitive dust from construction activities, the nearest of which include single-family homes located adjacent to portions of the proposed pipeline alignments. Heavy-duty diesel-powered equipment would be the primary source of localized pollutants; however, not all construction activities require such equipment (e.g., electrical panel upgrades), and usage would be intermittent. Most construction work would occur within previously disturbed areas and would not require extensive ground disturbance, thereby limiting fugitive dust generation. While some activities may overlap, the majority of construction work would be staggered and progress sequentially along each alignment, preventing concentrated or prolonged emissions. **Mitigation Measure AQ-1**, which includes measures to reduce equipment idling, would further reduce potential exposure to emissions and fugitive dust. Operation of the Proposed Project would require ongoing maintenance of the new infrastructure; however, these activities would be comparable to existing conditions and would not generate significant pollutant emissions. Therefore, construction and operation of the Proposed Project would not expose sensitive receptors to substantial pollutant concentrations and impacts would be less than significant with mitigation.

d) Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less than Significant Impact. Exhaust from construction equipment and the use of asphalt and other materials may generate temporary odors during construction. Because equipment would operate intermittently and work would progress along each alignment, odor-generating activities would be short-lived at any given location and would not affect a substantial number of people. Operation of the Proposed Project would not introduce new odor sources beyond those already associated with the existing wastewater infrastructure. Therefore, construction and operation of the Proposed Project would result in a less-than-significant impact related to odors.

4.3.4 Mitigation Measures

AQ-1: The following best management practices (BMPs) shall be implemented by the project applicant to minimize short-term air quality impacts during construction.

- Water exposed surfaces twice a day.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Cover all exposed stockpiles.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent streets.
- Limit traffic speeds on unpaved roads to 15 miles per hour (mph).
- Suspend grading activity when winds (instantaneous gusts) exceed 25 mph.
- Minimize idling times either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of CCR) and provide clear signage for construction workers at all access points.
- Maintain and properly tune all construction equipment in accordance with manufacturers specifications, and have a certified visible emissions evaluator check all equipment.

4.3.5 Compliance with Federal Environmental Laws and Regulations

As discussed above, the Proposed Project is located in an attainment area for all CAPs, therefore, no conformity determination is required for this project. Due to the limited duration of construction activities, the infrequent use of heavy equipment, and no increase in long-term operational activities, the Proposed Project would not emit a significant among of CAPs or HAPs. Therefore, the Proposed Project would not constitute a major source of CAP emissions. The Proposed Project would not be a major source of CAP emissions and would not impact a Federal Class I area. The Proposed Project would not exceed the USEPA's general conformity *de minimus* threshold or hinder the attainment of air quality objectives in the local air basin. The Proposed Project would comply with all federal regulations relating to air quality, including the CAA.

4.4 BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

4.4.1 Regulatory Setting

Federal

Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) implement the FESA of 1973 (16 USC Section 531 et seq.). Threatened and endangered species on the federal list (50 Code of Federal Regulations [CFR] Section 17.11, 17.12) are protected from "take" (direct or indirect harm), unless a FESA Section 10 Permit is granted or a FESA Section 7 Biological Opinion with incidental take provisions is rendered. Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present in the project area and determine whether the proposed project will have a potentially significant impact upon such species. Under FESA, habitat loss is considered to be an impact to the species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC Section 1536[3], [4]). Therefore, project-related impacts to these species or their habitats would be considered significant and would require mitigation. Species that are candidates for listing are not protected under FESA; however, USFWS advises that a candidate species could be elevated to listed status at any time, and therefore, applicants should regard these species with special consideration.

Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

Many bird species, especially those that are breeding, migratory, or of limited distribution, are protected under federal and state regulations. Under the Migratory Bird Treaty Act of 1918 (16 USC Section 703-711), migratory bird species and their nests and eggs that are on the federal list (50 CFR Section 10.13) are protected from injury or death, and project-related disturbances must be reduced or eliminated during the nesting cycle. The Bald and Golden Eagle Protection Act (16 USC Section 668) specifically protects bald and golden eagles from harm or trade in parts of these species.

Clean Water Act

The U.S. Army Corps of Engineers (USACE) has primary federal responsibility for administering regulations that concern waters of the U.S. (including wetlands), under Section 404 of the Clean Water Act (CWA). Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the U.S. The USACE requires that a permit be obtained if a project proposes the placement of structures within, over, or under navigable waters and/or discharges dredged or fill material into waters below the ordinary high water mark. A Section 401 Water Quality Certification is required in order to comply with CWA Sections 301, 302, 303, 306, and 307 and has been delegated by USEPA to the RWQCB.

State

California Endangered Species Act

The California Endangered Species Act of 1970 (CESA) (California Fish and Game [CFG] Code Section 2050 et seq., and CCR Title 14, Section 670.2, 670.51) prohibits "take" (defined as hunt, pursue, catch, capture, or kill) of species listed under CESA. A CESA permit must be obtained if a project will result in take of listed species, either during construction or over the life of the project. Section 2081 establishes an incidental take permit program for state-listed species. Under CESA, California Department of Fish and Wildlife

(CDFW) has the responsibility for maintaining a list of threatened and endangered species designated under state law (CFG Code 2070). CDFW also maintains lists of species of special concern, which serve as "watch lists." Pursuant to requirements of CESA, an agency reviewing proposed projects within its jurisdiction must determine whether any state-listed species may be present in the Project area and determine whether the proposed project will have a potentially significant impact upon such species. Project-related impacts to species on the CESA list would be considered significant and would require mitigation.

California Fish and Game Code

CFG Code (Section 3503, 3503.5, and 3800) prohibits the possession, incidental take, or needless destruction of any bird nests or eggs. Fish and Game Code Section 3511 designates certain bird species "fully protected", making it unlawful to take, possess, or destroy these species except under issuance of a specific permit. CFG Code Sections 4700, 5050, and 5515 designates certain mammal, amphibian, and reptile species "fully protected", making it unlawful to take, possess, or destroy these species except under issuance of a specific permit. The California Native Plant Protection Act of 1977 (CFG Code Section 1900 et seq.) requires CDFW to establish criteria for determining if a species or variety of native plant is endangered or rare. Section 19131 of the code requires that landowners notify CDFW at least 10 days prior to initiating activities that will destroy a listed plant to allow the salvage of plant material.

CFG Code (§1601 - 1607) protects fishery resources by regulating "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." The limit of CDFW jurisdiction is subject to the judgment of the Department; currently, this jurisdiction is interpreted to be the "stream zone," defined as "that portion of the stream channel that restricts lateral movement of water" and delineated at "the top of the bank or the outer edge of any riparian vegetation, whichever is more landward." CDFW reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by the CDFW and the applicant is the Lake or Streambed Alteration Agreement.

CEQA

CEQA (PRC Section 15380) defines "rare" in a broader sense than the definitions of threatened, endangered, or fully protected. Under the CEQA definition, CDFW can request additional consideration of species not otherwise protected. CEQA requires that the impacts of a project upon environmental resources must be analyzed and assessed using criteria determined by the lead agency. Sensitive species that would qualify for listing but are not currently listed may be afforded protection under CEQA. The CEQA Guidelines (Section 15065) require that a substantial reduction in numbers of a rare or endangered species be considered a significant effect. CEQA Guidelines (Section 15380) provide for assessment of unlisted species as rare or endangered under CEQA if the species can be shown to meet the criteria for listing. Plant species on the California Native Plant Society (CNPS) Lists 1A, 1B, or 2 are typically considered rare under CEQA. California "Species of Special Concern" is a category conferred by CDFW on those species that are indicators of regional habitat changes or are considered potential future protected species. While they do not have statutory protection, Species of Special Concern are typically considered rare under CEQA and thereby warrant specific protection measures.

California Water Code

Waste Discharge Requirements are required pursuant to California Water Code Section 13260 for any persons discharging or proposing to discharge waste, including dredge/fill, which could affect the quality of the waters of the state.

Local

Lake County General Plan

The Lake County General Plan aims to protect and enhance the natural resources that make Lake County unique. The following goals and policies are designed to address biological resources:

Goal OSC-1: To preserve and protect environmentally sensitive significant habitats, enhance biodiversity, and promote healthy ecosystems throughout the County.

Policy OSC-1.1 – Protection of Rate and Endangered Species: The County should ensure the protection of environmentally sensitive wildlife and plant life, including those species designated as rare, threatened, and/or endangered by State and/or Federal government.

Policy OSC-1.13 – Management of Oak Woodland Communities: The County shall support the conservation and management of oak woodland communities and their habitats.

Policy OSC-1.14 – Visual Access: Prior to approving a specific plan or project, the County shall require a biological study to be prepared by a qualified biologist for proposed development within areas containing a moderate to high potential for sensitive habitat, sensitive wildlife species, and/or sensitive plant species. As appropriate, the study shall include the following activities: (1) inventory species listed in the CNPS Manual of California Vegetation; (2) inventory species identified by USFWS, Department of Fish and Game, and NMFS; (3) inventory special-status species listed in the California Natural Diversity Database (CNDDB); and (4) conduct field surveys of the Project site by a qualified biologist.

Policy OSC-1.15 – Protect Natural Resources: The County shall strive to protect natural resource areas, fish and wildlife habitat areas, scenic areas, open space areas, and parks from encroachment or destruction by incompatible development and invasive species.

Resolution #95-211 – Oak Woodland Management Policy

Lake County adopted Resolution #95-211, the Oak Woodland Management Policy, which requires monitoring of oak woodland resources and supporting educational materials to address the conservation of oak woodlands.

4.4.2 Environmental Setting

Methodology

A Biological Resources Assessment was prepared by Acorn Environmental for the Proposed Project in December 2025 and is included as **Appendix C**. Biologist Geo Graening, PhD, conducted a biological field assessment on October 31, 2025, and collected data on wildlife and plant species present, as well as habitat types and jurisdictional waters. The following sources and materials were reviewed:

- Previous biological resource studies pertaining to the Project Area or vicinity
- USGS 7.5 degree-minute topographic quadrangles of the Project Area and vicinity
- Aerial photography of the Project Area
- CNDDB, electronically updated monthly by subscription
- A query of the CNPS's database *Inventory of Rare and Endangered Plants of California* (online edition)
- USFWS National Wetlands Inventory (NWI) mapper
- USFWS species list (IPaC Trust Resources Report)

Habitat types occurring in the Proposed Project improvement areas were mapped on aerial photographs and information on habitat conditions and the suitability of habitats to support listed species was also recorded. The Proposed Project was also assessed for the presence of potentially-jurisdictional aquatic habitat.

Habitats

The NWI reported no water features specifically within the Proposed Project improvement areas, but there are water resources very nearby as shown in **Figure 5**. The CNDDB reported no special-status habitats, and no critical habitat for federally-listed species were determined to occur within the Proposed Project improvement areas (**Appendix C**). No designated wildlife corridors or fishery resources exist within the Proposed Project improvement areas, however, wildlife corridors exist nearby in the marshlands of Clear Lake and Clear Lake contains important fishery resources (**Appendix C**).

Habitats occurring within the Proposed Project improvement areas were mapped (see **Figure 6a** and **6b**) and are discussed below.

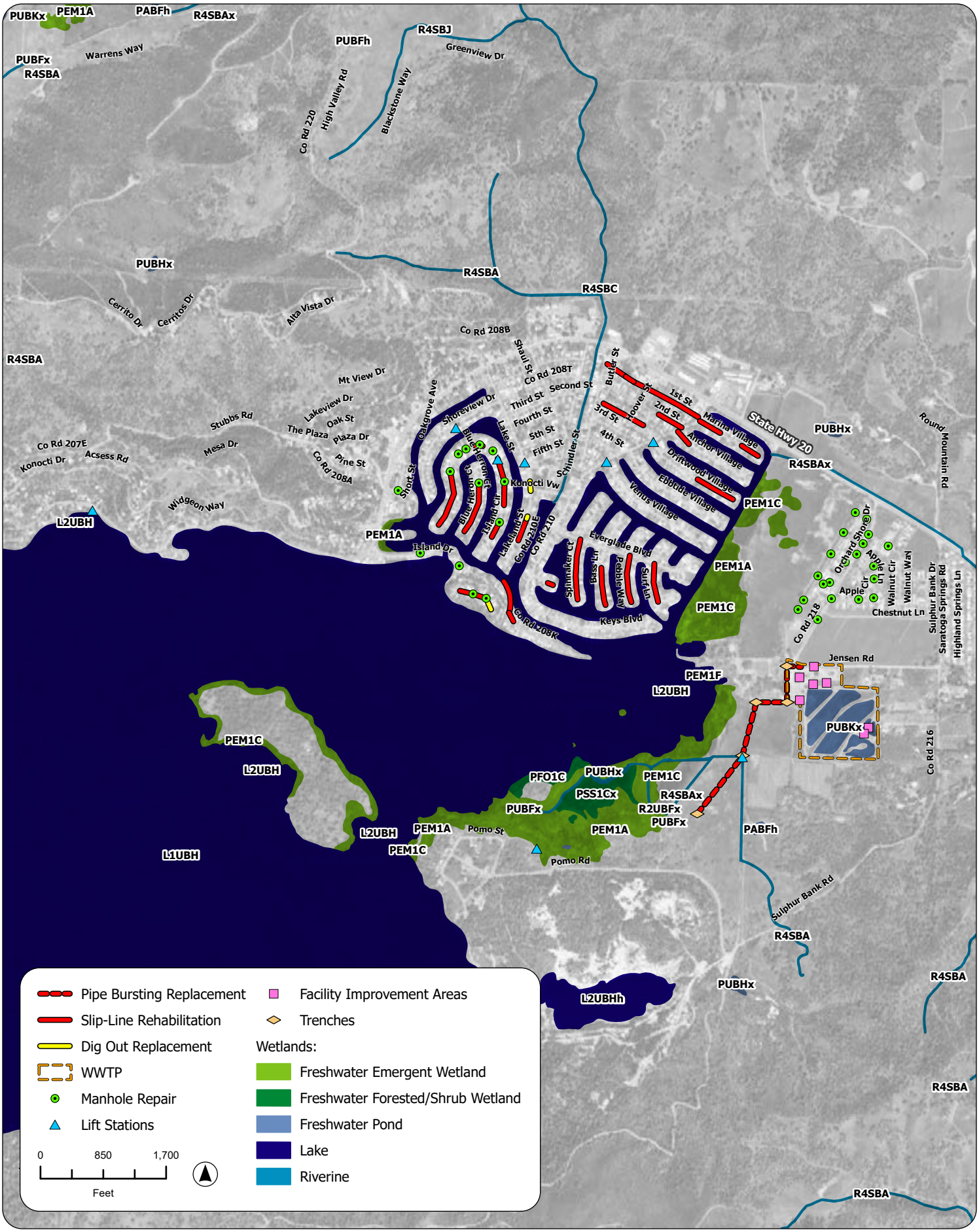
WWTP

Most of the WWTP compound is devoid of vegetation; it consists primarily of roads, buildings, and bare ground that is maintained free of weeds. There are landscaped areas with ornamental trees and shrubs, primarily oleander and cypress, in the northern portion of the property. Several stands of native oaks (Quercus lobata, Q. agrifolia and Q. wislizeni) are mixed in with ornamental plants near the aeration pond and office. Patches of ruderal vegetation occur in the sludge drying beds and ponds. This vegetation consists of nonnative annual grasses, Himalayan blackberry (Rubus armeniacus), yellow star-thistle (Centaurea solstitialis), coyote brush (Baccharis pilularis), long-beaked filaree (Erodium botrys), and other weedy forbs.

The industrial nature of the WWTP discourages most wildlife occupation, but urbanized animals do occur, such as American robin (Turdus migratorius), killdeer (Charadrius vociferus), and American crow (Corvus brachyrhynchos). Sheep (Ovis aries) are periodically allowed to graze the grass in the sludge ponds for weed control.

Lift Station No. 11 and Pipelines

LS 11 and its associated pipelines are situated in agricultural lands that are used primarily for grazing animals and hay production. This habitat is highly managed and has simplified diversity and structure, dominated by European annual grasses and weedy forbs. The primary grasses observed during the survey were bromes (Bromus), slender wild oat (Avena barbata), mouse barley (Hordeum murinum), Italian wild ryegrass (Lolium perenne), wild rye (Leymus triticoides), and medusa head rye (Taeniatherum caput-



SOURCE: USFS, 5/7/2025; ESRI, 2025; Google Earth Aerial Photograph, 5/2024; Acorn Environmental, 12/4/2025

Figure 5

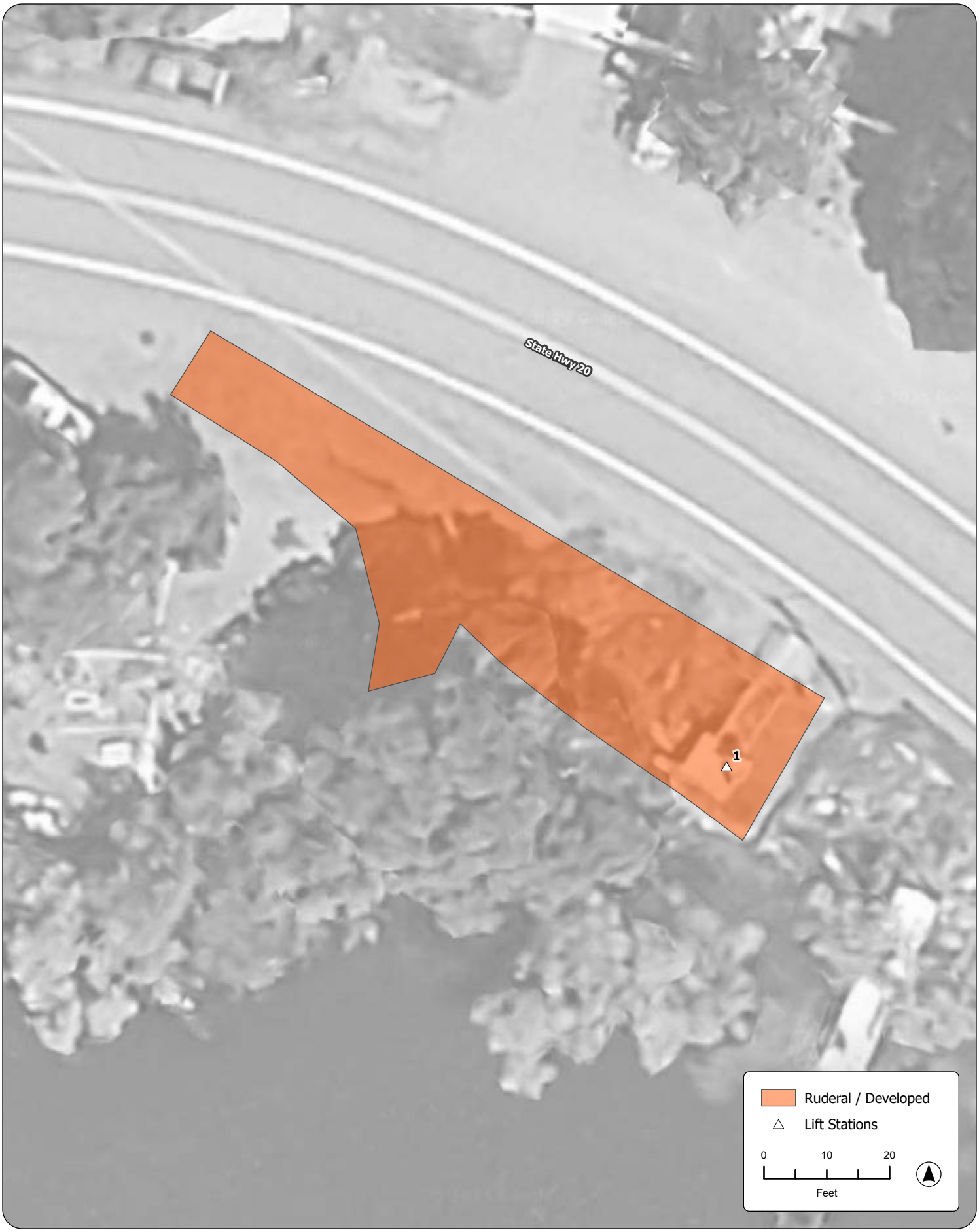
National Wetland Inventory



SOURCE: ESRI, 2025; Google Earth Aerial Photograph, 5/2024; Acorn Environmental, 12/4/2025

Figure 6A

Habitat Types (Page 1 of 2)



SOURCE: ESRI, 2025; Google Earth Aerial Photograph, 5/2024; Acorn Environmental, 12/4/2025

Figure 6B

Habitat Types (Page 2 of 2)

medusae). The most common weedy forbs were doveweed (Croton setiger,) shortpod mustard (Hirschfeldia incana), fleabane (Dittrichia sp.), horehound (Marrubium vulgare), and yellow starthistle (Centaurea solstitialis). There were a few native species visible, such as coffeeberry (Frangula californica) and valley oak (Quercus lobata) on the field edges. No vernal pool plant indicator plants are present (such as Navarretia, Eryngium, or Eleocharis). This vegetation community provides some forage and shelter for wildlife. The wildlife that were detected were: blacktail deer (Odocoileus hemionus columbianus); coyote (scat; Canis latrans); American crow (Corvus brachyrhynchos); and common songbirds. The nearby marshlands hosted a flock of red winged blackbirds (Agelaius phoeniceus) and there is an Osprey stand that was erected near the powerlines to the northwest of LS 11.

Residential Areas (Clearlake Oaks and Clearlake Keys)

The residential subdivisions that require sewage collection system upgrades consist of paved roads, residences, and landscaping. Some alleys are dredged canals (keys) that have private docks and boat traffic. The vegetation is all ornamental or ruderal, and the most common trees were palms, conifers, fruit trees, maples, and some native oaks (primarily Q. lobata). Pets and disturbance-tolerant wildlife are present, primarily mockingbird (Mimus polyglottos) and other common songbirds.

Lift Station No. 1

The proposed upgrades to LS 1, including the access road, are primarily located in a ruderal/developed area that was filled and raised with dirt and riprap for road construction (Highway 20 and private driveways) and maintained around the lift station. Vegetation includes western buttonwillow (Cephalanthus occidentalis), poison oak (Toxicodendron diversilobum), curly dock (Rumex crispus), cherry (Prunus) and California wild grape (Vitis californica). While no animals were present in this portion of the Proposed Project improvement areas during the survey, the adjacent lakeside area contained wading birds such as white pelican.

Listed Species and Other Special-Status Species

The CNDDB reported no special status species as occurring within the Proposed Project improvement areas, although it did report occurrences of the following species in the vicinity:

- Eel grass pondweed (*Potamogeton zosteriformis*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- Pallid bat (*Antrozous pallidus*)
- Osprey (*Pandion haliaetus*)
- Konocti manzanita (*Arctostaphylos manzanita ssp. elegans*)
- Watershield (*Brasenia schreberi*)
- Clear Lake hitch (*Lavinia exilicauda chi*)
- Brownish dubiraphian riffle beetle (*Dubiraphia brunnescens*)
- Clear Lake tule perch (*Hysterocarpus traskii lagunae*)
- Western ridged mussel (*Gonidea angulata*)

Using the USFWS' IPaC Trust Resource Report System, a species list was generated for the Proposed Project improvement areas. However, the list is generated using a regional and/or watershed approach and does not indicate whether the Proposed Project improvement areas provide suitable habitat. The following species were identified by the IPaC:

- California Condor (*Gymnogyps californianus*) Experimental Population, Non-Essential
- Northern Spotted Owl (*Strix occidentalis caurina*) Threatened
- Northwestern Pond Turtle (*Actinemys marmorata*) Proposed Threatened
- Clear Lake Hitch (*Lavinia exilicauda chi*) Proposed Threatened
- Monarch Butterfly (*Danaus plexippus*) Candidate
- Burke's Goldfields (*Lasthenia burkei*) Endangered

During the field survey, no special-status species were observed within the Proposed Project improvement areas. The following discusses the potential for special-status species to occur within Proposed Project improvement areas:

Plants

No special-status plants are expected to occur within the Proposed Project improvement areas because the requisite habitats are not present. Konocti manzanita (Arctostaphylos manzanita ssp. elegans), is a conspicuous shrub that requires volcanic soils, and there are no manzanita plants at all in the Proposed Project improvement areas. Watershield (Brasenia schreberi) and eel-grass pondweed (Potamogeton zosteriformis) are found in freshwater marshes and swamps and Burke's goldfields (Lasthenia burkei) require vernal pools and wet meadows. The Proposed Project improvement areas are devoid of water resources such as marshes or standing water. Mendocino tarplant (Hemizonia congesta ssp. elegans) requires clay / serpentine soils that do not occur in the Proposed Project improvement areas.

Birds And Bats

The CNDDB reports the following special-status species in the vicinity: osprey (Pandion haliaetus), northern spotted owl (Strix occidentalis caurina), pallid bat (Antrozous pallidus), and Townsend's big-eared bat (Corynorhinus townsendii). Trees adjacent to the Proposed Project improvement areas could serve as bat roosting habitat and there is an osprey stand that was erected near the powerlines to the northwest of LS 11. Northern spotted owl requires mature forest habitat, and has no potential to occur in, or near, the Proposed Project improvement areas.

Aquatic Species

Special-status species occur in Clear Lake and its adjacent marshes; the species reported closest to the Proposed Project improvement areas are Clear Lake hitch, Sacramento perch (Archoplites interruptus), Clear Lake prickly sculpin (Cottus asper), Clear Lake tule perch (Hysterocarpus traskii lagunae), and northwestern pond turtle (Actinemys marmorata). However, the Proposed Project improvement areas contain no water resources and will not directly interact with Clear Lake or its tributary waters. It is possible that northwestern pond turtles could migrate from aquatic habitats into the Proposed Project improvement areas, primarily the LS 1 project site and the LS 11/pipeline project site.

Other Species

Monarch butterfly (Danaus plexippus) could use the agricultural fields in the LS 11/pipeline project site for nectar foraging habitat, although the biological survey did not detect any host plants, such as milkweeds (Asclepias spp.). The other project sites have no nectar resources. The Proposed Project improvement areas do not contain overwintering habitat and are not near an overwintering population.

Critical Habitat and Habitat Conservation Plans

No critical habitat for any federally-listed species occurs within the Proposed Project improvement areas. The Proposed Project is not located within any adopted Habitat Conservation Plan or Natural Community Conservation Plan.

4.4.3 Impact Assessment

a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less-than-Significant Impact with Mitigation. Operation of the infrastructure upgrades at the WWTP and the rehabilitation and replacement of LSs and pipe infrastructure throughout Clear Lake Oaks would not impact biological resources, either directly or through habitat modification. Construction impacts are addressed below by improvement area.

WWTP Upgrades

Most of the WWTP compound is devoid of vegetation; it consists primarily of roads, buildings, and bare ground. Vegetation that is present is ornamental or ruderal and does not contain special-status species or potential habitat for special-status species. The industrial nature of the WWTP discourages most wildlife occupation. There would be no impacts to special-status species from project implementation in this area.

Lift Station No. 11 and Pipeline

Lift Station No. 11 and its associated pipelines are situated in agricultural lands that are used primarily for grazing animals and hay production. This habitat is highly managed and has simplified diversity and structure. Project implementation would not impact any known population of special-status species; however, the nearby marshlands to the west (outside of the Proposed Project improvement areas) host special-status species, and individuals could migrate into Proposed Project improvement areas between the time that the field survey was completed and the start of construction. Northwestern pond turtle is the primary concern, and this is a potentially significant impact before mitigation. **Mitigation Measure BIO-1** below recommends a pre-construction clearance survey and placement of high visibility/wildlife exclusion fencing to prevent impacts to riparian/aquatic species. Mitigation would reduce this impact to a less-than-significant level through avoidance measures.

Noise, vibration, and other construction-related disturbance, could indirectly impact special-status nesting birds and roosting bats in trees near the Proposed Project improvement areas, which is considered a potentially significant impact. **Mitigation Measure BIO-2** below recommends a pre-construction nesting bird and roosting bat survey and avoidance measures if found. Mitigation would reduce this impact to a less-than-significant level through avoidance measures.

Monarch butterfly could use the agricultural fields in the Lift Station 11 pipeline alignment for nectar foraging habitat. Project implementation would not significantly reduce any nectar habitat for monarch butterfly, as there are ample grasslands surrounding the development area. The project would not impact overwintering habitat or host plants. This impact is considered less than significant.

Residential Collection System Upgrades (Clearlake Oaks and Clearlake Keys)

The residential subdivisions that require sewage collection system upgrades consist of paved roads, residences, and landscaping. Some alleys are dredged canals (keys) that have private docks and boat traffic. The vegetation is all ornamental or ruderal, and wildlife are unlikely to occupy these residential areas. Construction activities would have a less that significant impact upon special-status species in these areas.

Lift Station No. 1

The proposed upgrades to LS 1, including the access road, are primarily located in an area that was filled and raised with dirt and riprap for road construction. This project site does not contain suitable habitat for special status species, but suitable habitat exists in the adjacent riparian habitat, and the wetlands and shoreline of Clear Lake. It is possible that aquatic species, especially northwestern pond turtles could migrate, from aquatic habitats into this project site, and this is a potentially significant impact before mitigation. **Mitigation Measure BIO-1** below recommends a pre-construction clearance survey and placement of high visibility/wildlife exclusion fencing to prevent impacts to riparian/aquatic species. Mitigation would reduce this impact to a less-than-significant level through avoidance measures.

Noise, vibration, and other construction-related disturbance, could indirectly impact special-status nesting birds and roosting bats in trees near the Proposed Project improvement areas, which is considered a potentially significant impact. **Mitigation Measure BIO-2** below recommends a pre-construction nesting bird and roosting bat survey and avoidance measures if found. Mitigation would reduce this impact to a less-than-significant level through avoidance measures.

b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less-than-Significant Impact with Mitigation. The Proposed Project improvement areas do not contain any riparian habitat, aquatic resources, or other sensitive natural habitat; however, riparian habitat associated with Clear Lake occurs in close proximity of LS 1 improvements. To prevent potentially significant impacts to this riparian habitat, **Mitigation Measure BIO-1** would be implemented, which includes fencing off riparian habitat to avoid accidental impacts from large construction vehicles. With **Mitigation Measure BIO-1**, impacts would be reduced to a less-than-significant level.

c) Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less-than-Significant Impact with Mitigation. There are no aquatic resources within the Proposed Project improvement areas; however, the shoreline of Clear Lake is adjacent to LS 1, and the canals (keys) are adjacent to some LSs or pipeline segments. Although no work is proposed in open water or the adjacent lacustrine wetlands, construction activities have the potential to introduce pollutants (sediment, petroleum products, concrete waste, etc.) into adjacent aquatic resources, which is considered a potentially significant impact. **Mitigation Measure GEO-1** includes erosion control measures to prevent

pollutants from entering adjacent aquatic resources, which would reduce these indirect impacts to a less-than-significant level.

d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less than Significant. No wildlife corridors or fishery resources exist within the Proposed Project improvement areas. However, wildlife corridors exist nearby in the marshlands of Clear Lake, and Clear Lake contains important fishery resources. The Proposed Project would either replace existing structures or introduce new, small structures to existing developed areas, without creating large barriers to wildlife movement. No structures would be built that would impede wildlife access or wildlife corridors. The proposed project would therefore have a less-than significant impact to wildlife movement.

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The Proposed Project is not located in an area covered by an adopted Habitat Conservation Plan or Natural Community Conservation Plan. Lake County has policies protecting oak woodlands; however, the Proposed Project would not involve the removal of oak trees. As such, there would be no impact.

4.4.4 Mitigation Measures

BIO-1: A pre-construction survey for special-status species shall be performed by a qualified biologist for improvements related to LS 1 and LS 11 and its associated pipeline. If any listed species are detected, the appropriate wildlife agency (CDFW and/or USFWS) shall be contacted and construction shall be delayed until the species have voluntarily left the area. Following the clearance survey, high-visibility wildlife exclusion fencing shall be erected between construction areas and adjacent aquatic resources (marshes and lake shoreline) to prevent animals from migrating into work areas and prevent construction vehicles from entering sensitive riparian habitat. This fencing may be combined with erosion control fencing.

BIO-2: A pre-construction survey for roosting bat shall be conducted by a qualified biologist within 500 feet of improvements related to LS 1 and LS 11 and its associated pipeline. If construction activities occur during the nesting bird season (typically February through August), a pre-construction survey for the presence of special-status bird species or any nesting bird species should be conducted by a qualified biologist within 500 feet of improvements related to LS 1 and LS 11 and its associated pipeline. If active nests or roosting bats are identified in these areas, CDFW and/or USFWS shall be consulted to develop measures to avoid “take” prior to the initiation of any construction activities. Avoidance measures may include establishment of a buffer zone using construction fencing or postponement of construction activities until a qualified biologist has determined that the nest/roost are no longer active.

4.4.5 Compliance with Federal Environmental Laws and Regulations

As discussed above, no federally-listed wildlife or plant species are likely to occur within the Proposed Project improvement areas due to the lack of suitable habitat. There are no waters of the U.S. or wetland features within the Proposed Project improvement areas. **Mitigation Measure BIO-1** and **BIO-2** have been identified to reduce impacts to sensitive wildlife species, such as special-status bats, northwestern pond turtle, and Monarch butterfly, although no trees would be removed as part of the Proposed Project. With the implementation of **Mitigation Measure BIO-1** and **BIO-2**, the Proposed Project would have a less-than-significant impact on federally listed species. The Proposed Project would comply with all federal regulations relating to biological resources, including the FESA, Migratory Bird Treaty Act, Wild and Scenic Rivers Act of 1968, and Executive Order 11990, Protection of Wetlands.

4.5 CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

4.5.1 Regulatory Setting

Federal

National Historic Preservation Act

Section 106 of the NHPA, as amended, and its implementing regulations found at 36 CFR Part 800, require federal agencies to identify cultural resources that may be affected by actions involving federal lands, funds, or permitting actions. The significance of the resources must be evaluated using established criteria outlined at 36 CFR 60.4, as described below. If a resource is determined to be a historic property, Section 106 of the NHPA requires that effects of the undertaking on the resource be determined. A historic property is:

> …any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in the National Register of Historic Place (NRHP), including artifacts, records, and material remains related to such a property… (NHPA Section 301[5]).

If it is determined that a historic property will be adversely affects by implementation of a proposed action, prudent and feasible measures to avoid or reduce impacts must be taken. The State Historic

Preservation Officer must provide an opportunity to review and comment of these measures prior to implementation of the proposed action.

National Register of Historic Places

The eligibility of a resource for listing in the NRHP is determined by evaluating the resource using criteria defined in 36 Code of Federal Regulations 60.4 as follows.

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, association, and:

> A. That are associated with events that have made a significant contribution to the broad patterns of our history;
> B. That are associated with the lives of persons significant in our past;
> C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
> D. That has yielded, or may be likely to yield, information important to prehistory or history.

Archaeological Resources Protection Act

The Archaeological Resources Protection Act (ARPA) of 1979 (Public Law 96-95; 16 USC 470aa-mm), provides for the protection of archaeological resources and sites which are on public and Indian lands, and fosters increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources and data which were obtained before October 31, 1979. ARPA also provides for penalties for noncompliance and illegal trafficking.

Native American Graves Protection and Repatriation Act

Native American Graves Protection and Repatriation Act (NAGPRA) is a federal law passed in 1990. NAGPRA provides a process for museums and federal agencies to return certain Native American cultural items—human remains, funerary objects, sacred objects, or objects of cultural patrimony—to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations. NAGPRA includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American burials and cultural items on federal and tribal lands, and penalties for noncompliance and illegal trafficking.

State

California Environmental Quality Act

CEQA requires that, for projects financed by or requiring the discretionary approval of public agencies in California, the effects that a project has on historical and unique archaeological resources be considered (PRC Section 21083.2). Historical resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance (PRC Section 50201). The CEQA Guidelines (Section 15064.5) define three cases in which a property may qualify as a historical resource for the purpose of CEQA review:

- The resource is listed in or determined eligible for listing in the California Register of Historical Resources (CRHR).
- The resource is included in a local register of historic resources, as defined in section 5020.1(k) of the PRC, or is identified as significant in a historical resources survey that meets the requirements of section 5024.1(g) of the PRC (unless the preponderance of evidence demonstrates that the resource is not historically or culturally significant).
- The lead agency determines that the resource may be a historical resource as defined in PRC §§ 5020.1(j), 5024.1, or significant as supported by substantial evidence in light of the whole record. Section 5024.1 defines eligibility requirements and states that a resource may be eligible for inclusion in the CRHR if it:
    1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
    2. Is associated with the lives of persons important in our past;
    3. Embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
    4. 4. Has yielded, or may be likely to yield, information important in prehistory or history.

Resources must retain integrity to be eligible for listing on the CRHR. Resources that are listed in or eligible for listing in the NRHP are considered eligible for listing in the CRHR and thus are significant historical resources for the purposes of CEQA (PRC Section 5024.1(d)(1)).

PRC Section 21083.2 governs the treatment of a unique archaeological resource, which is defined as "an archaeological artifact, object, or site about which it can be clearly demonstrated" that it meets any of the following criteria:

- It contains information needed to answer important scientific research questions, and there is a demonstrable public interest in that information.
- It has a special and particular quality such as being the oldest of its type or the best example of its type
- It is directly associated with a scientifically recognized important prehistoric or historic event or person.

Assembly Bill 52

Signed into law in September of 2014, Assembly Bill 52 (AB 52) established Tribal Cultural Resources (TCRs) as a new category under CEQA and mandated a more rigorous process for consultation among California Native American Tribes and CEQA lead agencies. The law also requires noticing and consultation with affected Native American tribes for projects filing a Notice of Preparation, Notice of Mitigated Negative Declaration or Notice of Negative Declaration on or after July 1, 2015 (Stats. 2114, chapter 532, § 11 (c)).

TCRs are defined in PRC 21074 as sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

> Included or determined to be eligible for inclusion in the CRHR or is listed in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
>
> A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1 [of the PRC]. In

applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

A project that has potential to impact a TCR such that it would cause a substantial adverse change constitutes a significant effect on the environment unless mitigation reduces such effects to a less than significant level.

Local

Lake County General Plan

The Lake County General Plan aims to protect and enhance the natural and cultural resources that make Lake County unique. The goals and policies designed to address cultural resources are as follows:

Goal OSC-8: To manage and project sites of cultural and archaeological importance for the benefit of present and future generations.

Policy OSC-8.1 – Evaluation of Cultural and Archaeological Resources: The County should participate in and support efforts to identify its significant cultural and archaeological resources using appropriate State and Federal standards.

Policy OSC-8.2 – Protection of Resources with Potential State or Federal Designations: The County should encourage the protection of cultural and archaeological sites with potential for placement on the NRHP and/or inclusion in the California State Office of Historic Preservation's California Points of Interest and California Inventory of Historic Resources. Such sites may be of statewide or local significance and have anthropological, cultural, military, political, architectural, economic, scientific, religious, or other values.

4.5.2 Environmental Setting

Cultural resource databases were searched for the Proposed Project in October of 2025.

Prehistoric Setting

Post Pattern (11,000 – 8,000 Before Present [B.P.])

The time period for this pattern is the Pleistocene/Holocene transition. Fluted points similar to Clovis points found in the Great Plains, occasionally in association with extinct megafauna, and flaked stone crescents from the Borax site near Clear Lake are characteristic of this pattern, but little is known about other artifacts used or the adaptive system represented.

Borax Lake Pattern (8,000 – 6,500 B.P.)

The Borax Lake Pattern assemblage is characterized by large wide-stemmed points, oval shaped flake tools, and long thin flakes (bladelets). It is uncertain whether this assemblage represents a hunting focus or an incomplete assemblage. Milling stones have been reported at one site with a radiocarbon date within the temporal range of this pattern, but it is not clear whether the milling artifacts are contemporaneous with the Borax Lake Pattern or are artifacts from a later time period.

Early Berkeley Pattern: Mostin Phase (6,500 – 2,500 B.P.)

The first evidence of stable, long-term settlements is found at Clear Lake at this time. Early evidence of this pattern includes Houx contracting-stemmed and square-stemmed points, formalized burial patterns, and the use of pestles, with abundant acorn macro-fossils implying that acorns were being processed at this early time.

Mendocino Pattern (3,000 B.P. – 500 Common Era [C.E.])

This pattern is characterized by side-notched, corner-notched, and concave-based dart points of the Mendocino series. Hand stones and milling slabs, flake and cobble tools, and a limited number of cobble mortars and pestles are also present. A high degree of resident mobility, with hunting camps and seasonal encampments represented, is associated with this period.

Berkeley Pattern (1,200 B.P. – 800 C.E.)

This pattern overlaps the timeframe of the Mendocino Pattern. Elaborate artifact assemblages include leaf-shaped and stemmed projectile points, a highly developed bone tool industry, fishing implements, baked clay objects, and a high frequency of mortars and pestles. Basketry impressions left in baked clay and changes in bone awl technology indicate that both loose-weave and tightly woven baskets were constructed. Well-defined house floors, artifact assemblages, and black midden soils at sites indicate a high degree of sedentism focused on intensive use of acorns, large game, and fish in the Clear Lake region. The Berkeley Pattern and Mendocino Pattern occupied the lakeshore at the same time, but with different adaptive poses: sedentary for the former and mobile/seasonal for the latter. A greater reliance on exchange is evidence for the Berkeley Pattern by obsidian biface production from the Borax Lake obsidian source and by the presence of marine shell beads imported from the Pacific coast. At about 500 B.P., it appears that people migrated out from the Clear Lake region; most researchers interpret this as Pomoan-speaking populations expanding out from their homeland at Clear Lake and replacing earlier Yukian-speaking people. The Berkeley Patter is seen along the coast, and it co-occurs in time with the Mendocino Pattern at Warm Springs in the mountainous area of north central Sonoma County. At Warm Springs, the Berkeley pattern dominates the river valleys, while the Mendocino Pattern is widely dispersed in the uplands.

Augustine Pattern (post 500 C.E.)

The homeland of this pattern is in the Sacramento-San Joaquin Delta region, where a large-sclare ceremonial complex has been described. This is not seen in northwest California. Rattlesnake corner-notched projectile points are a hallmark of the Augustine Pattern, and both sedentary systems and more mobile adaptations have been identified along the coast and in the Warm Springs area. This time period may be characterized by limited numbers of centralized villages and smaller short-term occupation sites in a variety of habitats that were not previously used. Both mortar-pestle and handstone-milling slab technology and present.

Ethnographic Setting

The Proposed Project lies within the traditional territory of the Southeastern Pomo. Pomo speakers have been sub-divided into seven distinct language groups: Kashaya, Southern, Central, Northern, Northeastern, Eastern, and Southeastern, and can be linked to the larger family of Hokan speakers (Acorn Environmental, 2025). Southeastern Pomo speakers occupied the area around East Lake and Lower Lake, on the eastern margin of Clear Lake.

The Pomo peoples organized themselves into small tribelets or village communities, and the social and political organization of these individual groups showed considerable variation. The Pomo economy was based on a seasonal round of fishing, hunting, and the collection of a variety of plants for food, tools, structures and trade (Acorn Environmental, 2025). Beads (also called *po* or *pol*), made from magnesite, were also an important part of the Pomo economy. These beads were of such high value that they were traded individually rather than in a necklace like the Pomo did with the clam shell coins they made. The Pomo were also known for their expertise in basket making. The types of houses used by the Pomo varied depending on the climate and vegetation of each district. In the Kashaya Pomo region, single-family dwellings were typically made of redwood bark slabs erected in conical fashion to create a structure 8 to 15 feet in diameter and 6 to 8 feet high (Acorn Environmental, 2025).

Typical weapons used in hunting were the bow and arrow for larger game, club for bear, and spears for sea lions and seals. Smaller animals were captured by bola, low brush fences, nets, snares, and basketry traps. Lake, stream, and ocean fish were caught in traps, with lines or weirs. The traditional mortar and pestle were used for processing of acorns, Buckeye nuts and other seeds, grasses, and roots. Knives were made from obsidian or chert and could be attached to handles and used as axes (Acorn Environmental, 2025).

Historic Setting

The first non-native people to enter Lake County may have been Spanish soldiers led by Luis Argüello on their expedition through the North Coast Ranges in 1821, but the route of the expedition is not known (Acorn Environmental, 2025). A more sustained presence in the region was initiated with the entry of trappers and hunters from Oregon traveling to Russian settlements like Fort Ross and Bodega. In 1832 or 1833, American trappers led by Ewing Young of the Hudson's Bay Company passed through the Clear Lake region.

In 1844, Salvador Vallejo obtained a land grant for Rancho Lupyomi, which included all of Clear Lake and its surrounding areas. Vallejo raised cattle there until 1847, when he sold his land rights and 800 cattle to Charles Stone, Andy Kelsey, and others. Stone and Kelsey's harsh treatment of native laborers led to their murder in 1849. In retaliation, U.S. troops killed over 100 native people, with many dying on what is now called Bloody Island (Acorn Environmental, 2025).

In 1848, Walter Anderson and his wife, the first recorded female settler, moved to Clear Lake. Like many early settlers, they made their living by herding cattle. The population of Clear Lake expanded rapidly in the mid-19th century, reaching 1,000 by 1861. This period saw the establishment of businesses and mills. A dam built on Cache Creek in 1866 caused flooding by raising lake levels, prompting locals to destroy it in 1868. A second dam was constructed in 1914 and remains today (Acorn Environmental, 2025).

Lake County is composed of lands that were once parts of Mendocino and Napa counties. The County was formed in 1861 with Lakeport as the seat of government. The wooden courthouse where the County's business was conducted burned in 1867 and the county seat temporarily relocated to Lower Lake until a new stone building was completed in 1871 in Lakeport (Acorn Environmental, 2025).

The California Borax Company mined Sulphur Bank between 1865 – 1869, resulting in the complete removal of a large mound of sulphur said to measure 40 feet high and 300 feet long. Mercury was then mined there beginning in 1873 until after World War II. At its peak, the Sulphur Bank Mine employed more

than 1,000 people, a majority of whom were Chinese immigrants. The mine was designated California Historical Landmark No. 428 in 1949 (Acorn Environmental, 2025).

The land that would eventually become Clearlake Oaks was settled by Charles "Uncle Jack" Stubbs, who's family went on to become prominent figures in the county. Stubbs, a sailor hailing from England, settled in Lake County in 1859 and began raising livestock. He sold butchered meat of the Sulphur Bank Mine, located adjacent to his ranch, which eventually grew to roughly 3,000 acres (Acorn Environmental, 2025). A small town took shape in the 1920s on the north side of East Lake and in 1926 a post office was established there and designated Stubbs. In 1935 the name was changed to Clear Lake Oaks (Acorn Environmental, 2025).

By the late 19th century, the key industries around Clear Lake were livestock, dairy farming, milling, and mining minerals like borax, sulfur, and mercury. The area also became known for its resorts built around the mineral springs, although interest in these waned in the early 1900s with the rise of automobile travel. Clear Lake saw a temporary revival as a vacation destination in the 1920s with the completion of Highway 20 and the construction of vacation homes. However, the local economy shifted to agriculture, focusing on fruit and walnut cultivation. Lake County became renowned for its pears, grapes, and wineries, particularly after the Bartlett pear, developed locally, was showcased at the 1855 World's Fair. Since the 1940s, Lake County has produced a significant share of California's pear crop, and vineyards have also become increasingly important to the region (Acorn Environmental, 2025).

Post-World War II growth reshaped the shoreline east of the original settlement of Stubbs with the creation of the Clearlake Oaks Keys. In the 1960s developers dredged extensive wetlands and marshes to cut a grid of canals into the delta at the mouth of Cache Creek, generating about 6.5 miles of navigable channels (Acorn Environmental, 2025).

4.5.3 Methodology

Native American Outreach

The California Native American Heritage Commission (NAHC) was contacted on October 27, 2025, to request a search of the Sacred Lands File (SLF) and a list of local Native American contacts that may have information regarding the Project area. Ms. Melina Carlos of the NAHC responded via email on October 28, 2025, and stated that the SLF search for the Project area was positive and that the Elem Indian Colony Pomo Tribe should be contacted for more information. The NAHC also provided a list of an additional 34 representatives from 20 another Native American tribes that are traditionally and culturally affiliated with the Project area. In accordance with AB 52, letters were sent to the following Tribes on December 6, 2025 requesting consultation in compliance with the CEQA review process:

> Elem Indian Colony Pomo Tribe, Big Valley Band of Pomo Indians of the Big Valley Rancheria, Cahto Tribe, Cloverdale Rancheria of Pomo Indians, Coyote Valley Band of Pomo Indians, Dry Creek Rancheria of Pomo Indians, Estom Yumeka Maidu Tribe of the Enterprise Rancheria, Guidiville Rancheria of California, Habematolel Pomo of Upper Lake, Hopland Band of Pomo Indians, Koi Nation of Northern California, Manchester Band of Pomo Indians of the Manchester Rancheria, Middletown Rancheria of Pomo Indians of California, Noyo River Indian Community, Pinoleville Pomo Nation, Potter Valley Tribe, Redwood Valley or Little River Band of Pomo Indians, Robinson Rancheria of Pomo Indians, Round Valley Reservation/ Covelo Indian Community, Scotts Valley Band of Pomo, and Yokayo Tribe.

The communication included an introduction to the Proposed Project, maps of the area, and disclosed the methodology of the records search and pedestrian survey. After two weeks with no response to the initial hardcopy communication, follow up emails were sent or phone calls were made to all contacts who had not yet responded. One response was received from the Habematolel Pomo of Upper Lake THPO declining to comment.

Literature Review

A review of historical sources, including archaeological, ethnographic, and historical sources in the public domain and the author's library, as well as historical maps and aerial photographs, identified past land uses within and adjacent to the Project area. No significant cultural features of interest were identified in the sources consulted, although precontact archaeological sites have a moderate to high potential to occur at or near the surface within the Project area. Given the identified landforms around the Project area, archaeological deposits are expected to occur at the surface and shallow contexts where prior land uses may have affected integrity.

Records Search

A record search was completed on November 5, 2025, by the Northwest Information Center of the California Historical Resources Information System at Sonoma State University. The cultural resource site map and records, survey reports, and other relevant material, which included the California Office of Historic Preservation's Build Environment Resources Directory, the Archaeological Determinations of Eligibility and the California Inventory of Historic Resources (1976), were reviewed. Additionally, survey plats and other maps were consulted as a part of the literature review (Acorn Environmental, 2025).

Field Survey

A pedestrian survey for the Proposed Project was conducted on October 31, 2025, by qualified archaeologist, Mike Taggart, RPA. The fieldwork included an intensive survey along the alignment of the proposed force main upgrade south of the WWTP and work locations within the WWTP. A 30-meter corridor, centered on the force main pipeline alignment was surveyed with transects spaced less than 15 meters. All areas of proposed ground disturbance at and around the proposed new access to LS1 was intensively surveyed. Reconnaissance-level survey was conducted for existing manholes, LSs, and collection pipe in developed residential areas. The survey did not identify any new archaeological or historic resources but did confirm the location of one resource where a small amount of ground disturbance is proposed.

Results

The literature review, historic maps, aerial photographs, and field survey identified two cultural resources that are intersected by the Project area, and six others that lie within 150 feet. However, no ground disturbance is proposed within the boundaries of the cultural resource sites with the exception of one where a small pit over the existing pipe is required. The records search and GIS processing identified 15 prior studies intersecting the Project area. These studies cover the collection pipe slated for trenchless replacement from the WWTP to LS 11, as well as LSs 1, 6, and 12. The sewer pipe slated for dig replacement on Stubbs Island (Oak Knoll Avenue) and the western portion of 1st Street was covered by prior studies. Three upgrade locations within the WWTP may lack prior survey, but with refurbishment occurring above ground on existing infrastructure in a highly developed area.

Resources in the immediate vicinity are dominated by obsidian lithic scatters, with the large occupation site of Elem just to the south. All of the resources are considered eligible to the CRHR.

4.5.4 Impact Assessment

a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?

Less-than-Significant with Mitigation. Two previously documented cultural resources are intersected by project components, and six resources lie within 150 feet of the Project. All of the resources are considered eligible for the CRHR. Resources located in and around the Keys and north of the WWTP would not be affected due to the noninvasive methods of the refurbishments and safe distance from proposed ground disturbance. Moreover, the ground under the Keys is highly disturbed from excavation of the channels and construction of the uplands in the 1960s. Resources on Stubbs Island are likewise not at risk given their distance to locations of proposed ground disturbance. No resources were identified in proximity to LS 1.

The assessment identified three resources located south of the WWTP which intersect or are located in proximity to ground disturbance associated the pipe bursting work. However, implementation of **Mitigation Measures CUL-1** and **CUL-3** would avoid a substantial adverse change. Therefore, the Proposed Project would result in a less than significant impact with mitigation.

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Less-than-Significant Impact with Mitigation. Precontact archaeological sites were found to have a moderate to high potential to occur at or near the surface within the Project area considering landscape positioning, depositional environment, proximity to ethnographic villages, and previously documented archaeological sites nearby. In contrast, the landforms around the site have been mapped as Older Pleistocene in age, and too old to harbor buried archaeological deposits. Thus, archaeological deposits were expected to occur at the surface and shallow contexts where prior land uses could allow preservation. As discussed in **Section 4.5.3** and **Question a)** two previously documented cultural resources are intersected by project components and six resources lie within 150 feet of the Project, all of which are eligible for the CRHP.

The existing collection pipe between the WWTP and LS 11 is bisected by an identified resource site. The existing pipe makes a near 90-degree turn inside the site boundary, necessitating a small excavation over the existing pipe. The site is characterized as a sparse obsidian lithic scatter, and the small excavation will occur in an area of prior ground disturbance. While the sparse nature of the lithic scatter, prior ground disturbance, and small volume of excavation would not result in a substantial adverse change to the resource, ground disturbance monitoring would be utilized nonetheless and would be on hand in the event of an inadvertent discovery.

Should buried artifacts or features be inadvertently discovered during construction, work should stop in the vicinity until an archaeologist can make an assessment. Therefore, if such resources were discovered, implementation of **Mitigation Measure CUL-1** would ensure that work is halted until resources eligible for NHRP and CRHR can be identified and important information is recovered. For areas of high archaeological sensitivity (425 feet west of WWTP where the pipe turns sharply south; and at LS 11) tribal

monitoring of excavation and related ground disturbance would be implemented. This would reduce the impact of the Proposed Project to less-than-significant impact with mitigation incorporated.

c) Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Less-than-Significant Impact with Mitigation. The Proposed Project would not disturb any known human remains, including those interred outside of formal cemeteries, because there are no known human remains located on or in the vicinity of the Proposed Project. If human remains are inadvertently uncovered, **Mitigation Measure CUL-2** would ensure that work is halted, the Lake County coroner is contacted, and compliance with Section 15064.5 I (1) of the CEQA Guidelines and Health and Safety Code Section 7050.5 is required. Project-related ground disturbance in the vicinity of the find should not resume until the process detailed in CEQA Guidelines Section 15064.5 (c) has been completed. Therefore, the Proposed Project will have a less-than-significant impact with mitigation incorporated.

4.5.5 Mitigation Measures

CUL-1: In the event archaeological resources are discovered during site excavation, grading, or construction, work on the site will be suspended until the significance of the features can be determined by a qualified archaeologist. If significant resources are determined to exist, the archaeologist shall make recommendations for protection or recovery of the resource. If archaeological resources are inadvertently discovered, all finds would be subject to CEQA guidelines 15064.5 and PRC 21083.2. Procedures for inadvertent discovery include the following:

- All work within 50-feet of the find shall be halted until the significance of the find can be evaluated in accordance with NRHP and CRHR criteria by an archaeologist or a paleontologist if the find is of paleontological nature.
- If any find is determined to be significant, then representatives of the County of Lake shall meet with the archaeologist, or paleontologist, to determine the appropriate course of action. If necessary, a Treatment Plan shall be prepared by an archaeologist, or paleontologist, which outlines the recovery of the resource, analysis and reporting of the find. The Treatment Plan shall be submitted to the County for review and approval prior to resuming construction.
- All significant cultural or paleontological materials recovered shall be subject to scientific analysis, professional curation, and a report prepared by the professional archaeologist, or paleontologist, according to the current professional standards.

CUL-2: If human remains are encountered during construction activities, Lake County shall comply with Section 15064.5 (e) (1) of the CEQA Guidelines and PRC Section 7050.5. All project-related ground disturbance within 100-feet of the find shall be halted until the county coroner has been notified. If the coroner determines that the remains are Native American, the coroner will notify the NAHC to identify the most likely descendants of the deceased Native Americans. Project-related ground disturbance in the vicinity of the find shall not resume until the process detailed in Section 15064.5 (e) has been completed.

CUL-3: Tribal monitoring of excavation and related ground disturbance shall occur in areas of high resource sensitivity, including 425 feet west of the WWTP where the pipe turns sharply south, and at LS 11. Ground disturbance in these areas of high resource sensitivity will be limited to the greatest extent feasible and matting or plywood would be used when moving equipment in these areas.

4.6 ENERGY

Would the project	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

4.6.1 Regulatory Setting

Local

Lake County General Plan

The Lake County General Plan contains the following policies and implementation measures related to energy that are relevant to the Proposed Project:

Goal PFS-6: To ensure that adequate and efficient public utilities are provided to meet the needs of residents and businesses in the County.

> **Policy PFS-6.1.** Electric Service. The County shall coordinate with electricity providers in planning for the timely expansion of electrical facilities to meet future demand, and for projects affecting public health, schools, or for significant air emissions reductions.

Policy PFS-6.4. Energy Conservation. The County shall support the use of energy conservation devices and renewable energy sources in residential, commercial, and industrial developments, and shall continue to develop renewable energy sources for County facilities when practical.

4.6.2 Environmental Setting

Pacific Gas & Electric (PG&E) provides electricity service to Lake County and to the areas where the Proposed Project improvements would occur. No natural gas service is available in Lake County; instead, propane is supplied by private companies (Lake County, 2019). PG&E provides natural gas and electric service to approximately 16 million customers across a 70,000-square-mile area in northern and central California.

4.6.3 Impact Assessment

a) Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less-than-Significant Impact.

Construction:

Construction of the Proposed Project is anticipated to last 18 months and would require on-site energy use and fuel consumption (e.g., gasoline and diesel) for worker, hauling, and vendor vehicle trips, as well as for the operation of construction equipment and machinery. The use of this energy is necessary for Proposed Project development and would be utilized only when needed for construction progress. Construction equipment would be energy efficient to the extent feasible required to comply with CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation, which limits idling and mandates the phase-out of older, high-emitting diesel vehicles, thereby improving overall fuel efficiency and reducing unnecessary energy consumption.

Operation:

During operation, energy usage associated with the upgraded wastewater facilities would generally remain comparable to existing conditions; however, certain components would enhance energy efficiency and system durability. The installation of new electrical wiring and controls at LS 3, along with upgrades to the WWTP electrical panel, would improve operational reliability and efficiency. Additionally, bypassing LS. 11 and replacing its pipeline would eliminate an outdated, energy-intensive pneumatic ejector system, reducing long-term energy consumption and operational costs. Overall, operation of the Proposed Project would not result in a significant impact on energy resources.

4.7 GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer	☐	☐	☒	☐

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
to Division of Mines and Geology Special Publication 42.				
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

4.7.1 Regulatory Setting

Federal

Clean Water Act

The CWA prohibits the discharge of sediment and erosion into navigable waters of the United States to protect water quality. It establishes regulatory measures to control soil erosion and sediment runoff, ensuring that construction and land development activities implement BMPs to prevent sediment pollution. The goal is to maintain the integrity of the nation's waters by minimizing the impact of soil disturbance and erosion on water quality.

National Earthquake Hazards Reduction Act

The National Earthquake Hazards Reduction Act was passed in 1977 to reduce the risks to life and property from future earthquakes in the United States. The Act established the National Earthquake Hazards

Reduction Program, which was most recently amended in 2004. The Federal Emergency Management Agency (FEMA) is designated as the lead agency of the program.

State

California Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (PRC Section 2621 et seq.) was passed in 1972 to reduce the risk to life and property from surface faulting in California. The Act prohibits the siting of most structures intended for human occupancy on the surface trace of active faults. For projects proposed in an active Fault Zone, a geologic investigation must be prepared to demonstrate that proposed buildings would not be constructed across active faults. According to the California Geological Survey, an "active" fault is defined as one that has shown evidence of movement within the last 11,000 years.

California Seismic Hazards Mapping Act (SHMA)

The California SHMA of 1990 (PRC Section 2690–2699.6) addresses nonsurface fault rupture earthquake hazards, including strong ground shaking, liquefaction, and seismically induced landslides. The SHMA also addresses expansive soils, settlement, and slope stability. Under the SHMA, cities and counties may withhold development permits for sites within seismic hazard areas until geologic/geotechnical investigations have been completed and measures to reduce potential damage have been incorporated into development plans.

California Building Standards Code

The California Building Standards Code (CBSC) consists of 13 parts, including the California Building Code (CBC), Energy Code, Fire Code, and Green Building Standards Code. Part 2 of the CBSC is the CBC that includes standards for structural design, excavation, grading, seismic design, drainage, and erosion control. CBC Chapter 18 (Soils and Foundations) and Appendix J (Grading) include requirements for geotechnical investigations and soil reports.

Local

Lake County General Plan

The Lake County General Plan, Health and Safety Element and Land Use Element, includes goals and policies related to geology and soils. The goals and policies generally focus on minimizing risks associated with geological and soil conditions and protecting valuable resources. The Plan address geological hazards to ensure public safety and property protection, which includes addressing hazards such as earthquakes and seismic hazards and landslides and unstable slopes. In addition, the plan addresses erosion control standards for construction and grading, and to protect soil health and water quality. It also aims to protect valuable agricultural resources and has separate policies addressing geothermal resources and aggregate resources management (Lake County, 2008).

Lake County Code of Ordinances

The Lake County Code of Ordinances contains multiple ordinances that directly pertain to geology and soils, mainly through regulations designed to mitigate hazards and control development. The grading ordinance is the primary regulatory tool for managing earth disturbance and addresses soils and geological stability. The goals of the ordinance are to minimize hazards to life and property, protect against soil erosion, protect waterways , fish, wildlife, and sensitive vegetation, protect air quality from dust and

asbestos, and maintain consistency with the General Plans goals. Key requirements related to geology and soils include permit requirements, engineered plans and reports, erosion control and sediment detention with implementation of erosion control and sediment detention plans and BMPs to prevent loss of soil and protect water quality during and after grading, seismic/geologic hazard zones, and winter grading restrictions.

Lake County Multi-Jurisdictional Hazard Mitigation Plan (HMP)

The Lake County Multi-Jurisdictional Hazard Mitigation Plan (HMP) 2025 is prepared by multiple organizations including the auditor-controller's office, Lake County sheriff, and the cities of Lakeport and Clearlake amongst others. The plans mission is to enhance the County's resilience in disasters by focusing on mitigation, preparation, response and recovery. It identifies and prioritizes a list of fourteen major natural hazards of concern including wildfire, drought and water shortage, earthquake, severe weather from storms, severe weather from heat, aquatic biologic hazards, flood, tree mortality, climate change, levee failure, agriculture hazards, dam failure, volcano and geothermal gases, and subsidence. The plan analyzes the risk associated with known active and potentially active fault zones and addresses hazards like ground shaking, liquefaction, and surface rupture. The plan also identifies areas of high landslide susceptibility based on slope steepness and soil types and proposes mitigation strategies for development in these areas. Lake County has regions where serpentine and ultramafic rocks are common, where the weathering of these rocks creates soil containing naturally occurring asbestos, which when disturbed by grading or construction can cause a significant health hazard. The plan contains specific protocols, like those outlined in the grading ordinance, to minimize soil disturbance and protect air quality. Chapter 9 Flood specifically evaluates the County's flood hazard profile, location and extent, previous occurrences, probability of future events, and exposure and vulnerability. The HMP outlines strategies to minimize flood hazards, including regulating development within flood-prone areas, preserving natural floodplain functions, and implementing infrastructure improvements to manage stormwater and reduce flood risk (Lake County, 2025b).

4.7.2 Environmental Setting

Lake County is located in the north central part of the Coast Range Geomorphic Province, which is characterized by northwest-southeast trending valleys and ridges. These are controlled by folds and faults that resulted from the collision of the Farallon and North American plates and subsequent shearing along the San Andreas Fault. The bedrock in the site vicinity is mapped as Mesozoic-era rocks of the Franciscan Formation, overlaid by alluvium and recent volcanic rocks, including pyroclastic rocks (USGS, 1960).

Seismic Conditions

The Proposed Project is not located in a designated Fault-Rupture Hazard Zone, as identified under the Alquist-Priolo Earthquake Fault Zoning Act (USGS, 2025). There are a number of inactive faults in the vicinity of the Proposed Project. An active fault is one that shows displacement within the last 11,000 years (Holocene epoch) and is considered more likely to generate a future earthquake than a fault that has not shown signs of recent activity. The nearest faults to the Proposed Project are the Clover Valley Fault Zone and the Cross Spring Fault Zone, both of which are mapped as a quaternary fault of undifferentiated age (USGS, 2025). The nearest active faults are the Big Valley Fault and the Bartlett Springs Fault System and are located approximately 8 miles southwest, and 6 miles southeast of the Proposed Project, respectively.

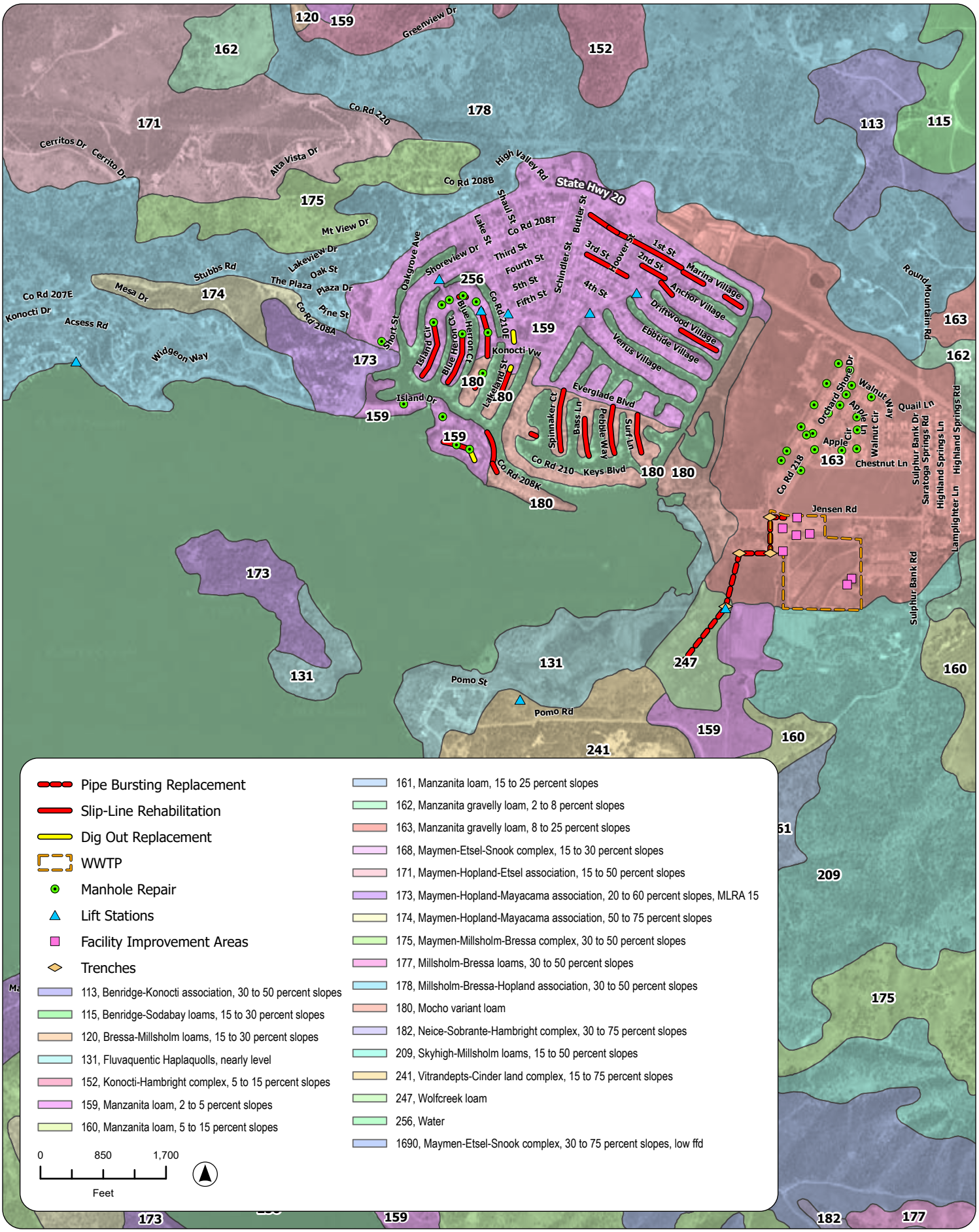
Soil Types and Characteristics

The Proposed Project improvement areas contain five soil types: Manzanita loam, 2 to 5 percent slopes, Mocho variant loam, Manzanita gravelly loam, 8 to 25 percent slopes, Wolfcreek loam, and Vitrandepts-Cinder land complex, 15 to 75 percent slopes (NRCS, 2025) as shown in **Figure 7**. Manzanita and Wolfcreek series consists of very deep, well drained soils formed in alluvium from mixed rock sources; Mocho series consists of very deep, well drained soils formed in alluvium derived mostly from sandstone and shale rock sources; and Vitrandepts-Cinder land complex soils refer to soils from vitrandic, and cinder land are intermixed and often found in volcanic areas. (California Resources Soil Lab, 2025). **Table 4.7-1** details the characteristics of each soil type.

Table 4.7-1: Soil Types

Soils	Hydrologic Soil Group	Drainage Class	Ksat (µm/s)	Runoff Class	Linear Extensibility
Manzanita loam, 2 to 5 percent slopes	C	Well drained	Moderately low to moderately high	Low	Moderate
Mocho variant loam	C	Well drained	Moderately high	Low	Moderate
Manzanita gravelly loam, 8 to 25 percent slopes	C	Well drained	Moderately low to moderately high	High	Moderate
Wolfcreek loam	C	Well drained	Moderately high	Low	Moderate
Vitrandepts-Cinder land complex. 15 to 75 percent slopes	No rating	Excessively drained	N/A	N/A	Low

Source: NRCS, 2025



SOURCE: NRCS Soils, 2025; ESRI, 2025; Google Earth Aerial Photograph, 5/2024; Acorn Environmental, 12/4/2025

Figure 7
Soil Types

Soil Hazards

The hydrologic soil group is a classification based on the runoff potential of the soils when thoroughly saturated by a long duration storm. Soils are grouped into four classes that grade from A to D, with A being coarse-grained soils with high infiltration and low runoff potential and D being mostly fine-grained clays with extremely slow infiltration and high runoff potential. The majority of the soils within the Proposed Project improvement areas have a hydrologic rating of C, indicating they have a slow infiltration rate when thoroughly wetted (NRCS, 2025).

Drainage class is a measure of the frequency and duration of wet periods under conditions similar to those in which the soil developed. The soil types within the Proposed Project improvement areas are well-drained to excessively drained (NCRS, 2025).

Expansive soils may increase in volume when water is absorbed and shrink when dried. This property is measured using linear extensibility. Expansive soils are of concern because they can cause foundations to rise during the rainy season and fall during the dry season, causing structural distortion. The soils within the Proposed Project have low to moderate linear extensibility ratings, indicating they have low shrink-swell potential (NRCS, 2025).

Paleontological Resources

A search of the University of California Museum of Paleontology (UCMP) specimen records cited no listings for unique paleontological resources or geological features in the immediate project area and did cite a few invertebrates within Clear Lake, but not within the immediate project area. However, the database search listed 249 specimens within Lake County. All specimen records were located at least 5.5 miles northwest of the Proposed Project (UCMP, 2025).

4.7.3 Impact Assessment

a) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Less-than-Significant Impact. The Proposed Project is not within a designated Alquist-Priolo Earthquake Fault Zone. No known faults with evidence of historic activity cut through the valley soils in the vicinity of the Proposed Project, and the nearest active fault is approximately 6 miles from the Proposed Project. Due to the geology of the County and its distance from active faults, the potential for loss of life, property damage, ground settlement, or liquefaction to occur in the vicinity of the Proposed Project are considered minimal. In addition, all replacement pipelines will be installed in accordance with the CBC. Therefore, the Proposed Project would not cause potential substantial adverse effects, including the risk of loss, injury, or death involving a rupture of a known earthquake fault.

ii. Strong seismic ground shaking?

Less-than-Significant Impact. The nearest active fault is approximately 6 miles from the Proposed Project. Ground shaking generally decreases with distance and increases with the depth of unconsolidated alluvial deposits. Considering the distance to the causative faults, the potential for ground motion in the vicinity of the Proposed Project is minimal. In addition, all replacement pipelines will be installed in accordance with the CBC. Therefore, the Proposed Project would not cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong ground shaking.

iii. Seismic-related ground failure, including liquefaction?

Less-than-Significant Impact. There are no geologic hazards or unstable soil conditions known to exist on within the Proposed Project Improvement Areas. Additionally, neither liquefaction nor lateral spreading has been observed in the project vicinity from any historic earthquake (California Department of Conservation, 2025b). The Proposed Project improvement areas are mapped as having low liquefaction potential (USGS, 2025). Due to the nature of the underlying soils and the history of low ground shaking potential, liquefaction and lateral spreading potential in the project area are considered very low. In addition, all replacement pipelines will be installed in accordance with the CBC. Therefore, the Proposed Project would not cause potential substantial adverse effects, including the risk of loss, injury, or death involving liquefaction.

iv. Landslides?

Less-than-Significant Impact. There have been three recorded landslide events in the vicinity of LS-1 as mapped by the USGS. These landslides covered portions of I-20, and only the paved road was impacted. The remainder of the Proposed Project improvement areas do not have any recorded landslide events but are found in the area (USGS, 2025b). Improvements to LS-1 would not increase the landslide potential of this area, as the installation and rehabilitation would occur within the existing disturbed area of the roadway and wastewater treatment infrastructure. The remainder of the improvement areas are not in areas with previously recorded landslides or in areas at risk. In addition, all replacement pipelines will be installed in accordance with the CBC. The Proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

b) Would the project result in substantial soil erosion or the loss of topsoil?

Less-than-Significant Impact with Mitigation. The Proposed Project includes installation and upgrades of WWTP components, pipeline repairs, and pump station repairs amongst others. There is some potential for erosion to occur during grading and stabilization activities at the Proposed Project improvement areas. With implementation of Mitigation Measure GEO-1, which requires various erosion control measures and BMPs, impacts would be reduced to a less-than-significant level.

c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Less-than-Significant Impact. The Proposed Project improvement areas have a relatively stable soils and no apparent unique or significant landforms. Furthermore, the project area has a relatively low potential for frequent and strong seismic shaking (California Department of Conservation, 2025b). Such factors

minimize the potential for other geologic hazards such as landslides, lateral spreading, subsidence, liquefaction, or collapse. Additionally, portions of the Proposed Project improvement areas will be conducted in previously disturbed areas that contains engineered fill and will be installed in accordance with the CBC. Therefore, the Proposed Project is unlikely to become unstable and result in geologic hazards. As a result, the Proposed Project would have a less-than-significant impact.

d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Less-than-Significant Impact. The soils within the Proposed Project have low to moderate linear extensibility ratings and are not considered expansive soils (NRCS, 2025). The Proposed Project would not be located on expansive soil or create substantial direct or indirect risks to life or property. There would be a less-than-significant impact.

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?

No Impact. The Proposed Projects do not require wastewater disposal or the use of septic systems. There would be no impact.

f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less-than-Significant Impact with Mitigation. The UCMP database cited no listings for unique paleontological resources or geological features in the immediate project area. However, the database search listed 249 specimens within Lake County (UCMP, 2025). Accordingly, there is a reasonable basis for concluding that paleontological impacts may be encountered at the Proposed Project as a result of construction-related excavation activities, which is a potentially significant impact. Mitigation Measure GEO-2 has been identified to reduce impacts to paleontological resources. Implementation of Mitigation Measure GEO-2 would ensure that impacts would be less-than-significant.

4.7.4 Mitigation Measures

GEO-1: The following erosion control measures and BMPs shall be required during construction:

- Temporary erosion control measures (such as silt fences, staked straw bales, and temporary revegetation) shall be employed for disturbed areas.
- Construction activities shall be scheduled to minimize land disturbances during peak runoff periods and to the immediate area required for construction. Soil conservation practices shall be completed during the fall or late winter to reduce erosion during spring runoff. Existing vegetation would be retained where possible. To the extent feasible, grading activities shall be limited to the immediate area required for construction.
- Topsoil removed during construction shall be carefully stored and treated as an important resource. Berms shall be placed around topsoil stockpiles to prevent runoff during storm events.
- Establish fuel and vehicle maintenance areas away from all drainage courses and design these areas to control runoff. To the degree needed, these areas would be established before construction begins and would be clearly marked.

- Disturbed areas would be re-vegetated after completion of construction activities.

GEO-2: If paleontological resources (fossils) are discovered during project activities, all work shall cease within a 100-feet of the find until a qualified professional paleontologist as defined by the Society of Vertebrate Paleontology's Conformable Impact Mitigation Guidelines Committee can assess the nature and importance of the find and recommended appropriate treatment. The Clearlake Oaks Water District will also be notified of the discovery and the qualified professional paleontologist's opinion within 48 hours of the initial finding. Treatment may include preparation and recovery of fossil materials, so that they can be housed in an appropriate museum or university collection and also may include preparation of a report for publication describing the finds. Project activities shall not resume until after the qualified professional paleontologist has given clearance and evidence of such clearance has been submitted to the Clearlake Oaks Water District.

4.8 GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☒	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☒	☐	☐

4.8.1 Regulatory Setting

Federal

Massachusetts v. EPA, 549 U.S. 497 (2007)

In Massachusetts v. EPA, 549 U.S. 497 (2007), the Supreme Court found that greenhouse gas emissions (GHGs) are air pollutants covered by the CAA. The Court also acknowledged that climate change is caused, in part, by human activities. The Supreme Court's ruling paved the way for the regulation of GHG emissions by the USEPA under the CAA. The USEPA has enacted regulations that address GHG emissions, including, but not limited to, mandatory GHG reporting requirements, carbon pollution standards for power plants, and air pollution standards for oil and natural gas.

State

Assembly Bill 32

California's major initiative for reducing GHG emissions is outlined in Assembly Bill 32 (AB 32), the "California Global Warming Solutions Act of 2006," signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32

requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. Based on this guidance, CARB approved a 1990 statewide GHG level and 2020 limit of 427 MT CO_2e. The Scoping Plan was approved by CARB on December 11, 2008, and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since approval of the Scoping Plan.

In May 2014, CARB approved the first update to the AB 32 Scoping Plan. The 2013 Scoping Plan update defined CARB's climate change priorities for the next five years and set the groundwork to reach post-2020 statewide goals. Senate Bill 32 (SB 32) was signed by the governor on September 8, 2016, to extend AB 32 by requiring the State to further reduce GHGs to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). To ensure consistency with SB 32 CARB adopted another update the Scoping Plan in December 2017. The 2017 Scoping Plan update highlights California's progress toward meeting the "near-term" 2030 GHG emission reduction goals defined in the original Scoping Plan. The strategy includes extending the Cap-and-Trade program post-2020, implementation of the Short-Lived Climate Pollutant Plan and Mobile Source Strategy and increasing renewable energy generation and improving energy efficiency. In 2016, the Legislature passed SB 32. This established a benchmark for California to reduce GHG emissions to 40 percent below 1990 levels by 2030. Under the 2022 Scoping Plan, seven key areas were identified: transportation sustainability, clean electricity grid, sustainable manufacturing and buildings, carbon dioxide removal and capture, short-lived climate pollutants (non-combustion gases), and natural and working lands.

Local

Lake County Air Quality Management District

The LCAQMD has not adopted GHG thresholds for the determination of impact significance for projects subject to CEQA review. Lake County is currently in the process of developing a Climate Action Plan (CAP); however, it has not yet been finalized and therefore cannot be used for evaluating GHG emissions.

4.8.2 Environmental Setting

Gases that absorb and re-emit infrared radiation in the atmosphere are called GHGs. The GHGs that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are primarily determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2, CH_4, and N_2O are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing are associated with agricultural practices and landfills. N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizers that contain nitrogen, fossil fuel combustion, and other chemical processes. In addition to natural sources, human activities are exerting a substantial and growing influence on climate by changing the composition of the atmosphere and the ocean, and by modifying the land surface through deforestation and urbanization that reduces carbon capture and decreases albedo. GHGs are typically quantified in terms of "carbon dioxide equivalent" (CO_2e), a common measure used to compare the

emissions of various GHGs based on their global warming potential. This measure is usually presented in metric tons (MT) and is expressed as MT CO_2e.

4.8.3 Impact Assessment

a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less-than-Significant Impact with Mitigation.

Construction:

The Proposed Project would generate GHG emissions during construction from the use of heavy-duty diesel-powered construction equipment and vehicle trips. The LCAQMD has not adopted formal thresholds of significance for GHG emissions, and although it is in the process of developing a CAP, the plan is not finalized and therefore cannot be used to evaluate the Proposed Project's GHG emissions. LCAQMD has determined that the Bay Area Air District) thresholds of significance may be used to evaluate GHG emissions for projects in Lake County; however, the Bay Area Air District has not established quantitative thresholds for construction-related GHG emissions, noting that such emissions are temporary and variable and therefore would not significantly contribute to long-term GHG emissions impacts in the LCAB. Since there are no thresholds to compare construction emissions against, this analysis relies on the implementation of BMPs to reduce GHG emissions, as recommended by the California Air Pollution Control Officers Association (CAPCOA) (CAPCOA, 2010). **Mitigation Measure GHG-1** requires measures such as using alternative-fueled equipment, sourcing local building materials, recycling construction and demolition waste, and minimizing vehicle idling. With the implementation of these measures, construction-related GHG emissions would be minimized, and the Proposed Project would have a less-than-significant impact on GHG emissions.

Operation:

The Proposed Project involves rehabilitation and upgrades to existing wastewater infrastructure, including improvements at the WWTP, LSs, manholes, pipelines, and associated electrical and operational equipment. These improvements would increase the energy efficiency and system durability of the wastewater facilities and reduce corresponding operational GHG emissions from energy use and transportation for maintenance activities (see **Section 4.6**). Therefore, the Proposed Project would not increase GHG emissions over baseline conditions and there would be a less-than-significant impact.

4.8.4 Mitigation Measures

GHG-1: CLOCWD shall ensure through contractual obligations that the following measures are implemented during construction to minimize GHG emissions:

- The contractor shall operate at least 15 percent of construction vehicles/equipment using alternative fuels (e.g., biodiesel, electric).
- The contractor shall source at least 10 percent of construction materials locally.

- The contractor shall recycle at least 50 percent of construction and demolition waste.
- Idling times shall be minimized either by shutting off equipment when not in use or reducing the maximum idling time to five minutes (as required by the California Airborne Toxics Control Measure (Title 13, Section 2485 of the CCR).

4.9 HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☒	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☒	☐	☐

4.9.1 Regulatory Setting

Federal

USEPA

The USEPA administers numerous statutes pertaining to human health and the environment. The USEPA regulates toxic air contaminants through its implementation of the CAA. Although the CAA covers a range of air pollutants, Section 112(r) specifically covers "extremely hazardous materials" which include acutely toxic, extremely flammable, and highly explosive substances. Section 112(r) (referred to as the USEPA's Risk Management Plan (RMP)) requires facilities involved in the use or storage of extremely hazardous materials to implement a RMP. A RMP requires a detailed analysis of potential accident factors present at a facility and requires the implementation of mitigation measures designed to reduce the identified accident potential.

The USEPA also regulates the land disposal of hazardous materials through the Resource Conservation and Recovery Act (RCRA). Under RCRA, the USEPA regulates the activities of waste generators, transporters, and handlers (any individual who treats, stores, and/or disposes of a designated hazardous waste). RCRA further requires the tracking of hazardous waste from its generation to its final disposal through a process often referred to as the "cradle-to-grave" regulation. The "cradle-to-grave" regulation requires detailed documentation and record keeping for hazardous materials generators, transporters, and/or handlers in order to ensure proper accountability for violations.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The CERCLA provides a Federal fund to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through various enforcement mechanisms, the USEPA obtains private party cleanup orders and recovers costs from financially viable individuals and companies once a response action has been completed. Uncontrolled or abandoned hazardous-waste site identification, monitoring, and response activities in states are coordinated though the state environmental protection or waste management agencies.

Federal Occupational Safety and Health Administration (OSHA)

OSHA regulates the preparation and enforcement of occupational health and safety regulations with the goal of providing employees a safe working environment. OSHA regulations apply to the workplace and cover activities ranging from confined space entry to toxic chemical exposure. OSHA regulates workplace exposure to hazardous chemicals and activities through regulations governing workplace procedures and equipment.

State

Department of Toxic Substances Control (DTSC)

The California DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste under the RCRA and the State Hazardous Waste Control Law. Both laws impose "cradle-to-grave" regulatory systems for handling hazardous waste in a manner that protects human health and the environment.

California Occupational Safety and Health Administration (Cal/OSHA)

Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations in the State. Cal/OSHA regulations concerning the use of hazardous materials in the workplace, as detailed in Title 8 of the CCR, include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation.

Cal/OSHA enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees at hazardous waste sites. The hazard communication program requires that Safety Data Sheets be available to employees and that employee information and training programs be documented.

State Water Quality Control Board (SWQCB) Underground Storage Tank (UST) Program

The SWRCB UST Program is a state-level regulation managed by the SWRCB in California. The program is designed to prevent releases of hazardous substances from USTs, protect groundwater quality, and ensure compliance with federal and state UST regulations.

Regional Water Quality Control Board (RWQCB)

The SWRCB and RWQCBs regulate hazardous substances, materials, and wastes through a variety of State statutes including, for example, the Porter-Cologne Water Quality Control Act, Cal. Water Code Section 13000 et seq., and the UST cleanup laws (Cal. Health and Safety Code Section 25280- 25299.8). RWQCBs regulate all pollutant or nuisance discharges that may affect either surface water or groundwater. Any person proposing to discharge waste within any region must file a report of waste discharge with the appropriate regional board.

Cortese List – Government Code Section 65962.5

The provisions in California Government Code § 65962.5 require CalEPA to compile a database listing of hazardous waste facilities and other permitted activities within their jurisdiction. This database is collectively referred to as the "Cortese list." The sites for the list are designated by the SWRCB, the Integrated Waste Board, and the DTSC. The Cortese list is updated quarterly.

California Building Code and California Fire Code

Prior to issuance of building permits and during occupancy of the Proposed Project, the Lake County Building Division and Fire Department would be responsible for reviewing plans for facilities proposing to use hazardous materials to ensure that applicable CBC and California Fire Code standards are included in project design. These standards address, among other elements, proper storage and secondary containment for hazardous materials and fire-safe construction and materials. Use of appropriate design features would help reduce the potential for accidental releases of hazardous materials that could affect occupants or require emergency response services.

2023 State Hazard Mitigation Plan

The 2023 California State Hazard Mitigation Plan (SHMP) is the State's primary guidance document for reducing long-term risks from natural and human-caused hazards and provides a framework that local governments must consider when preparing their own hazard mitigation plans. The SHMP outlines

historical and current hazards affecting California, identifies statewide mitigation strategies and actions, and offers guidance to local jurisdictions on hazard planning. The 2023 update expands analysis of climate change and equity-priority communities and reorganizes hazards according to impact ratings rather than by hazard type. The SHMP is divided into two volumes—the Core Plan and Technical Appendices—and is supported by additional resources, including the Adaptation Planning Guide, MyPlan 2.0, and a statewide webinar series. The update was developed with input from Statewide Hazard and Working Groups composed of subject-matter experts from multiple levels of government; a new Climatic Hazards Group now focuses on drought, extreme heat, freeze events, and severe storms. These groups continue to advise on emerging hazard data and statewide mitigation efforts during the plan's implementation phase. The 2023 SHMP is effective through August 29, 2028.

California Department of Toxic Substances Control (DTSC)

The DTSC is a sub-agency of the CalEPA that regulates the generation, transportation, treatment, storage, and disposal of hazardous waste under the federal RCRA and the State Hazardous Waste Control Law. Both laws impose "cradle-to-grave" regulatory systems for handling hazardous waste in a manner that protects human health and the environment.

California Occupational Safety and Health Administration (Cal/OSHA)

Cal/OSHA assumes primary responsibility for developing and enforcing State workplace safety regulations. Cal/OSHA regulations concerning the use of hazardous materials in the workplace, as detailed in Title 8 of the CCR, include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees at hazardous waste sites. The hazard communication program requires that Material Safety Data Sheets be available to employees and that employee information and training programs be documented.

Local

2025 Lake County Multi-Jurisdictional Hazard Mitigation Plan

The Lake County Multi-Jurisdictional Hazard Mitigation Plan (HMP) (2025) was prepared by Lake County in coordination with the Lake County Sheriff's Office of Emergency Services, County departments, and the Cities of Clearlake and Lakeport. The Plan establishes a countywide framework to reduce risks to life, property, infrastructure, and the environment through hazard identification, risk assessment, and long-term mitigation strategies. The HMP evaluates a broad range of hazards affecting Lake County, including wildfire, flood, earthquake, drought and water shortage, severe weather, aquatic hazards, levee and dam failure, tree mortality, subsidence, and volcanic or geothermal gas release, among others. For each hazard, the Plan assesses historical occurrences, location and extent, probability of future events, and exposure and vulnerability of the built environment, natural resources, and critical facilities. The Plan also addresses secondary and cascading hazards, such as erosion, debris flows, infrastructure damage, and potential releases of hazardous materials that may occur during major hazard events. Climate change is integrated throughout the HMP as a factor that can intensify hazard frequency and severity, particularly for wildfire, flooding, drought, and extreme heat. A countywide Mitigation Strategy identifies goals, objectives, and actions to improve community resilience, guide infrastructure planning, protect water resources, and support coordinated emergency response across jurisdictions.

Lake County General Plan

The General Plan, Health and Safety Element addresses the hazardous materials and emergency response planning for the County. Applicable general plan policies related to the Proposed Project are listed below. Appendix GPCT analyzes the Proposed Project's consistency with the General Plan pursuant to the CEQA Guidelines Section 15125(d); however, the determination of the Proposed Projects consistency with the General Plan ultimately rests with the Lake County Board of Supervisors.

Goal HS-1. To ensure the County is protected from injury and damage resulting from natural catastrophes, man-made events, and hazardous conditions.

Policy HS-1.1: The County shall permit development only in areas where the potential danger to the health and safety of people can be mitigated to an acceptable level.

Policy HS-1.3: The County shall ensure all buildings for human habitation are designed in compliance with the Uniform Building Code and other requirements based on risk (e.g., seismic hazards, flooding), type of occupancy, and location (e.g., floodplain, fault).

Goal HS-5. To protect residents, visitors, and property from hazardous materials through their safe use, transport, and disposal.

Policy HS-5.1: The County shall strive to ensure that hazardous materials are used, transported, and disposed within the County in a safe manner and in compliance with local, state, and federal safety standards. Investigations and enforcement action shall be taken as necessary for any illegal hazardous waste disposal or other violations of federal, state, or local hazardous materials laws and regulations.

Policy HS-5.2: The County shall work with Caltrans and the Highway Patrol to ensure that hazardous materials transported within the County are restricted to routes that have been designated for such transport.

Policy HS-5.5: The County shall prevent incompatible land uses within close proximity to hazardous waste properties.

Policy HS-5.11: The County shall require that developers have Phase I or Phase II environmental site assessments performed during the design phase on sites known to contain hazardous materials or which had previously been utilized for the handling or storage of hazardous materials.

Goal PFS-5. To ensure the safe and efficient disposal or recycling of solid and hazardous waste generated in the County.

Policy PFS-5.4: The County shall require the proper disposal and recycling of hazardous materials and should investigate hazardous waste disposal needs for anticipated geothermal and agricultural toxic wastes.

Goal T-3. To enhance airports in the County to meet the County's changing needs and demands while minimizing adverse airport-related environmental impacts and safety hazards.

Policy T-3.2: The County shall promote compatible land use planning in areas surrounding airports. Land uses involving the concentration of people and/or hazardous materials should not be developed

in the approach pattern. Federal and state regulations governing operations and land use restrictions related to airports shall be supported by the County.

4.9.2 Environmental Setting

For the purposes of this section, the term "hazardous materials" as defined by the CCR are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous materials are grouped into the following four categories based on their properties:

- Toxic: causes human health effect
- Ignitable: has the ability to burn
- Corrosive: causes severe burns or damage to materials
- Reactive: causes explosions or generates toxic gases

Hazardous waste is any hazardous material that is discarded, abandoned, or slated to be recycled. The criteria that define a material as hazardous also define a waste as hazardous. If improperly handled, hazardous materials and hazardous waste can result in public health hazards if released into the soil or groundwater or through airborne releases in vapors, fumes, or dust. Soil and groundwater having concentrations of hazardous constituents higher than specific regulatory levels must be handled and disposed of as hazardous waste when excavated or pumped from an aquifer. The CCR, Title 22, Sections 66261.20-24 contains technical descriptions of toxic characteristics that could cause soil or groundwater to be classified as hazardous waste.

Hazardous materials are routinely used, stored, and transported within the community of Clearlake Oaks and the broader Lake County region. Hazardous waste generators include commercial businesses, automotive and marine service stations, public agencies, and residential uses. Federal, State, and local agencies maintain comprehensive databases that identify facilities that use hazardous materials, generate hazardous waste, contain leaking underground storage tanks (LUSTs), or require cleanup oversight. These include DTSC's EnviroStor database, the SWRCB GeoTracker system, and California Department of Conservation - California Geologic Energy Management Division's (CalGEM) WellSTAR.

A review of the SWRCB GeoTracker database identified five historical LUST cleanup cases within Clearlake Oaks, all of which are listed as Completed – Case Closed:

- Clearlake Oaks Chevron (12585 Highway 20; Case Closed 6/17/2004): Gasoline release with groundwater impacts; cleanup completed under Central Valley RWQCB oversight.
- Oaks Boathouse (12700 Island Drive; Case Closed 11/7/1994): Gasoline release with potential surface water impacts; cleanup completed.
- Former Snow's Automotive (12617–12621 Highway 20; Case Closed 2/21/2017): Gasoline constituents (benzene, toluene, ethylbenzene, xylene, naphthalene) affecting drinking water supply wells; cleanup completed and land use controls recorded.
- Exxon (12609 Highway 20; Case Closed 3/12/1993): Gasoline-contaminated soil; cleanup completed.
- M&M Auto / Oak's Union 76 (12622 Highway 20; Case Closed 12/4/1991): Gasoline-contaminated soil; cleanup completed.

All five sites have been closed by regulatory agencies, indicating that any remaining contamination is not expected to pose a significant risk under current land use conditions. No open cleanup cases or active hazardous materials release sites are located within or immediately adjacent to the project work areas (California State Water Resources Control Board, 2025).

DTSC's EnviroStor database (California Department of Toxic Substances Control, 2025a) and the Cortese List (pursuant to Government Code § 65962.5) (California Department of Toxic Substances, 2025b) identify one active cleanup site in the project vicinity: the Sulphur Bank Mercury Mine, a 150-acre State Response/NPL (Superfund) site located along Sulphur Bank Road on the eastern shore of the Oaks Arm of Clear Lake. The former sulfur and mercury mine contains approximately 3 million cubic yards of waste rock with elevated mercury and arsenic in soil, sediment, and surface water. The site is jointly managed by DTSC and the USEPA and consists of multiple Operable Units addressing mine waste, impacted residential areas, lake sediments, and adjacent wetlands. USEPA has completed several removal actions and continues to advance long-term remediation planning, including release of a Proposed Cleanup Plan in 2023. Mercury levels in Clear Lake fish have resulted in a State fish consumption advisory. Although the Sulphur Bank Mercury Mine appears on the Cortese List, no portion of the Proposed Project is located within the Superfund site boundary (California Department of Toxic Substances Control, 2025a).

A search of the CalGEM's WellSTAR geothermal well system identified 18 historical geothermal wells in the vicinity of the Sulphur Bank Mercury Mine and Herman Impoundment. These wells were drilled for exploratory steam or temperature-gradient investigations by operators such as Freeport-McMoRan Resource Partners, Earth Energy, Inc., and Bradley Mining. Representative wells include SBM-1 (API 03390580), SBM-3 (API 03390582), SBM-14 (API 03390593), and Bradley Mining Well 1 (API 03390006). All identified wells are documented as Plugged and Abandoned, and no active or idle geothermal wells occur on or adjacent to the project construction locations. No wells requiring additional regulatory coordination are present within the project work areas (California Department of Conservation, 2025c).

4.9.3 Impact Assessment

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less than Significant Impact with Mitigation. Construction of the Proposed Project would involve the routine transport, use, and short-term storage of limited quantities of hazardous materials such as fuels, lubricants, hydraulic fluids, solvents, concrete additives, paints, welding gases, and cleaning agents. These materials are typical for construction involving excavation, trenching, pipeline replacement, mechanical and electrical upgrades, structural improvements, and concrete work. Hazardous materials would be used in small quantities and would not require bulk storage. Potential accidental releases during construction could occur from equipment leaks, refueling operations, or improper handling. However, all contractors would be required to comply with applicable federal and State regulations, Cal/OSHA requirements, and construction BMPs, including Standard Operating Procedures for fueling. These construction BMPs have been incorporated as **Mitigation Measures HM-1** and **HM-2** to reduce potential adverse effects.

During operation, the rehabilitated wastewater facilities would continue to use chemicals already employed at the WWTP for treatment and disinfection (e.g., chlorine compounds, treatment additives). The Proposed Project does not introduce new types or substantially greater quantities of hazardous materials than are currently used. Instead, the project improves operational safety by upgrading multiple components of the wastewater system that strengthens the entire wastewater system by improving structural integrity, containment, reliability, and monitoring, such as:

- Collection system repairs reduce infiltration and overflow risks.
- LS upgrades add modern pumps, controls, backup power, and bypass connections to prevent uncontrolled discharges.
- Treatment process improvements—including new aerators, valves, and wet-well upgrades—enhance stability and reduce chemical-handling issues.
- Solids handling upgrades and a new sludge pond liner improve containment and minimize leachate.
- A new concrete chlorine contact basin increases disinfection reliability and prevents accidental releases.
- Modern electrical and SCADA systems improve monitoring, reduce equipment failures, and enable faster detection of anomalies.
- A new groundwater monitoring well provides early detection of subsurface issues and supports long-term environmental protection.

Collectively, these improvements increase reliability, containment, and monitoring throughout the wastewater system, thereby reducing the potential for accidental releases of hazardous materials compared to existing conditions. The project would remain subject to hazardous materials regulations administered by CalEPA, DTSC, SWRCB/RWQCB, and Lake County Environmental Health, as well as any applicable Hazardous Materials Business Plan requirements.

Accordingly, the Proposed Project would not create a significant hazard to the public or environment through routine hazardous materials use or through reasonably foreseeable upset and accident conditions. This impact would be less than significant with mitigation.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less than Significant Impact with Mitigation. East Lake School, part of the Konocti Unified School District, is located approximately 0.17 miles from the northern-most component of the Proposed Project. As described in **Questions (a) and (b)**, construction activities would involve only limited quantities of typical construction-related hazardous materials that would be used in small amounts, stored temporarily, and handled in accordance with existing federal and State regulations and spill-prevention procedures. These materials would not generate hazardous emissions, nor would construction activities involve acutely hazardous substances. Similarly, project operation would not introduce new chemical types or hazardous emission sources. Instead, operational upgrades would further reduce the potential for accidental releases relative to existing conditions. Because the Proposed Project would not emit hazardous substances or handle acutely hazardous materials capable of affecting nearby receptors, and because all construction and operational activities are governed by stringent hazardous materials regulations, the presence of East Lake School within 0.17 miles would not result in a significant hazard. This impact would be less than significant with mitigation.

d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Less than Significant Impact. A review of the Cortese List identified one active Cortese-listed site in the broader vicinity of the Proposed Project: the Sulphur Bank Mercury Mine, a State Response/NPL (Superfund) site located along Sulphur Bank Road. As described in **Section 4.9.2**, the site contains historic sulfur and mercury waste materials and remains under long-term cleanup oversight. However, no portion of the Proposed Project is located on, within, or immediately adjacent to the Sulphur Bank Mercury Mine Superfund site boundary. Because the improvement areas are not situated on a Cortese-listed property, and because the nearest listed site is geographically separate and unrelated to project activities, the Proposed Project would not pose a significant hazard to the public or the environment related to listed contamination. This impact would be less than significant.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

No Impact. The Proposed Project is not located within an airport land use plan and there are no public airports located within two miles of the Improvement areas. The nearest airport is Hoberg Airport, located approximately 10 miles south of the Improvement areas. The Proposed Project will have no impact.

f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less-than-Significant Impact. The Proposed Project involves rehabilitation and upgrades to existing wastewater infrastructure, including improvements at the WWTP, LSs, manholes, pipelines, and associated electrical and operational equipment. These activities would occur within previously developed sites, public rights-of-way, and utility corridors that already support wastewater facilities and municipal infrastructure. Construction may require intermittent lane closures or temporary traffic controls near LSs or within roadways; however, all work within public streets would be subject to Lake County encroachment permits, traffic control requirements, and coordination with emergency service providers to maintain access at all times. These measures ensure that construction activities would not impede emergency vehicle circulation. For these reasons, the Proposed Project would not impair or physically interfere with an adopted emergency response plan or emergency evacuation plan. This impact would be less than significant.

g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Less-than-Significant Impact with Mitigation. As described in **Section 4.20.2**, the improvement areas are primarily located within a Local Responsibility Area with varying Fire Hazard Severity Zone classifications. Construction activities would involve temporary equipment with limited ignition potential. Contractors would be required to comply with federal, state, and local regulations, such as California Building/Fire Code and Lake County fire-safe regulations, and implement standard construction BMPs to minimize fire risk, included as **Mitigation Measure HM-3** and **HM-4**. These requirements ensure that the likelihood of

accidental ignition during construction remains low. During operation, the improved wastewater facilities would not involve the handling or storage of new flammable materials and would instead the decrease the chances of igniting a fire wildfire, such as reducing the chance of fire ignition due to faulty electrical equipment. This impact is less than significant with mitigation.

4.9.4 Mitigation Measures

HM-1

Personnel shall follow written Standard Operating Procedures (SOPs) for filling and servicing construction equipment and vehicles. The SOPs, which are designed to reduce the potential for incidents involving hazardous materials, shall include the following:

- Refueling shall be conducted only with approved pumps, hoses, and nozzles;
- Catch pans shall be placed under equipment to catch potential spills during servicing;
- All disconnected hoses shall be placed in containers to collect residual fuel from the hose;
- Vehicle engines shall be shut down during refueling;
- No smoking, open flames, or welding shall be allowed in refueling or service areas;
- Refueling shall be performed away from bodies of water to prevent contamination of water in the event of a leak or spill;
- Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents;
- Should a spill contaminate soil, the soil shall be put into containers and disposed of in accordance with local, State, and federal regulations;
- All containers used to store hazardous materials shall be inspected at least once per week for signs of leaking or failure. All maintenance and refueling areas shall be inspected monthly. Results of inspections shall be recorded in a logbook that would be maintained on site; and
- The amount of hazardous materials used in project construction and operation shall be consistently kept at the lowest volumes needed.

HM-2

If suspected soil contamination is encountered during grading activities, all work shall be halted and a qualified individual, in consultation with the RWQCB, shall determine the appropriate course of action.

HM-3

During construction, staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a firebreak.

HM-4

Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles and heavy equipment.

4.10 HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. result in a substantial erosion or siltation on- or off-site;	☐	☒	☐	☐
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv. impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

4.10.1 Regulatory Setting

Federal

Clean Water Act

The CWA, as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality and establishes the national water quality goals. The pertinent sections of the CWA include:

- Section 303 and Section 304: Provide water quality standards, criteria, and guidelines.

- Section 401: Water Quality Certification. Requires an application for any federal permit that proposed an activity which may result in the discharge to Waters of the U.S. to obtain certification from the state that the discharge will comply with other prevision of the CWA.
- Section 402: Established the National Pollution Discharge Elimination System (NPDES) for the discharge of any pollutant (except for dredge of fill material) into Waters of the U.S. This permit system is administered by the SWRCB and is discussed in further detail below.
- Section 404: Establishes a permit program for the discharge of dredge or fill material into Waters of the U.S. This permit program is administered jointly by the USACE and the USEPA.

Safe Drinking Water Act (SDWA)

Under the SDWA, the USEPA regulates contaminants of concern to domestic water supply. Contaminants of concern are those defined to pose a threat to public health or alter the aesthetic acceptability of the water. These types of contaminants are classified as either primary or secondary Maximum Contaminant Levels (MCLs).

Federal Emergency Management Agency

FEMA is responsible for mapping flood prone areas under the National Flood Insurance Program (NFIP). Communities that participate in the NFIP are required to adopt and enforce a floodplain management ordinance to reduce future flood risks related to new construction in a flood hazard area.

National Pollution Discharge Elimination System (NPDES)

Under Section 402(p) of the CWA, the USEPA established the NPDES to enforce the discharge standards for both point-source and non-point source pollution, such as construction activities. Construction activities include clearing, grading, excavation, stockpiling, and reconstructing existing facilities involving removal and replacement of existing foundations or other hardscapes. Construction projects disturbing one or more acres of soil must be covered under the NPDES Construction General Permit process. The responsibility for issuing NPDES programs is delegated to the SWRCB and the nine RWQCBs. Additional discussion for NPDES as it relates to State specific regulations are discussed below.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) provides the basis for water quality regulation within California. The Act requires a “Report of Waste Discharge” for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. The RWQCB implements waste discharge requirements identified in the Report.

CCR - Title 22, Division 4, Chapter 3 – Water Recycling Criteria

This section of the CCR, commonly referred to as Title 22, establishes the recycled water quality criteria, acceptable uses of recycled water, wastewater treatment requirements for each use, use area requirements, engineering report requirements, reporting and record keeping requirements, and design requirements for operational reliability of treatment.

The regulations establish acceptable levels of constituents in recycled water for a range of uses and prescribe means for assurance of reliability in the production of recycled water. Criteria for the production of recycled water include water quality standards, treatment process requirements, operational

requirements, and treatment reliability requirements. The intent of the regulations is to ensure the protection of public health associated with the use of recycled water. Title 22 recycled water regulations for a specific reuse category are based on the expected degree of contact with the recycled water.

State Non-degradation Policy

In 1968, as required under the Federal Anti-degradation Policy described previously, the SWRCB adopted a Non-degradation Policy aimed at maintaining high quality for waters in California. The Non-degradation Policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety, and welfare of the people of the state. The policy provides as follows:

Regional Water Quality Control Boards

The SWRCB and RWQCBs also regulate hazardous substances, materials, and wastes through a variety of State statutes, including the Porter Cologne Water Quality Control Act, California Water Code Section 13000 et seq., and the underground storage tank cleanup laws, California Health and Safety Code Subsection 25280–25299.8. RWQCBs regulate all pollutant or nuisance discharges that may affect either surface water or groundwater. Any person proposing to discharge waste within any region must file a report of waste discharge with the appropriate regional board. The Proposed Project is located within the jurisdiction of the Central Valley RWQCB.

Sustainable Groundwater Management Act (SGMA)

The SGMA, enacted in September 2014, established a framework for groundwater resources to be managed by local agencies in areas designated by the Department of Water Resources as “medium” or “high” priority basins. Basins were prioritized based, in part, on groundwater elevation monitoring conducted under the California Statewide Groundwater Elevation Monitoring (CASGEM) program. The SGMA requires local agencies in overdrafted, medium and high-priority basins to form Groundwater Sustainability Agencies and be managed in accordance with locally-developed Groundwater Sustainability Plans.

Local

Lake County Code of Ordinances

Water resources and safety in Lake County are regulated by the Lake County Code of Ordinances (Code). Chapter 9 of the Code - Health and Sanitation, Article VIII, contains regulations for wells and the preservation of groundwater. Per the Code, a well permit must first be obtained from the Health Officer and filed with the Lake County Health Department prior to construction. Chapter 9 of the Code also outlines regulations for the sanitary disposal of sewage. Approval of a new wastewater system must be obtained from the County Health Officer demonstrating that the system would comply with local permitting requirements. Chapter 25 of the Code - Floodplain Management, outlines floodplain management regulations to minimize flood losses, including regulation of erosion, alteration of floodplains, control of grading and dredging, and regulation of the construction of flood barriers. Chapter 28 of the Code – Groundwater, regulates the extraction and exportation of groundwater from Lake County. Chapter 29 of the Code – Stormwater Management Ordinance, regulates stormwater for the purpose of reducing pollutants in stormwater discharges and by prohibiting non-stormwater discharges

Lake County General Plan

The General Plan contains goals and policies related to water resources. Applicable General Plan Water Resources Element and Health and Safety Element policies related to the Proposed Project are listed below:

Goal HS-6. To minimize the possibility of the loss of life, injury, or damage to property as a result of flood hazards.

Policy HS-6.1: All development within the designated floodway or floodplain zones shall conform to Federal Emergency Management Administration regulations and the Lake County Flood Plain Management Plan.

Policy HS-6.2: The 100-year floodplain zones should be protected and maintained through strict limitation on land use. To carry out this policy, the following guidelines on development should be observed:

- Critical facilities (those facilities which should be open and accessible during emergencies) should not be permitted.
- Passive recreational activities (those requiring non-intensive development, such as hiking, horseback riding, picnicking) are permissible.
- New development and divisions of land, especially residential subdivisions, shall be developed to minimize flood risk to structures, risk to infrastructure, and ensure safe access during flood conditions.
- The County shall impose stringent controls on approvals of septic systems where there is a substantial likelihood of infiltration of floodwater into the systems, and/or the discharge from the systems into floodwaters.

Policy HS-6.6: Prior to the approval of urban development project sites and projects within floodplain areas, the project applicant shall demonstrate that such development will not adversely impact downstream properties or contribute to flooding hazards.

Goal WR-2: To protect the quality of surface and groundwater resources to meet the needs of all beneficial users.

Policy WR-2.1: Protect Surface & Ground Water Quality. All proposed land use and development plans should be evaluated as to their potential to create surface and groundwater contamination hazards from point and non-point sources. Effects include but are not limited to: soil erosion; direct discharge of potentially harmful substances; ground leaching from storage of raw materials, petroleum products, or wastes; floating debris by runoff from the site.

Policy WR-2.4: BMPs. The County shall continue to require the use of feasible and practical BMPs to protect surface water and groundwater from the adverse effects of construction activities and urban runoff.

Goal WR-5: Encourage efficient use of water for new and existing land uses.

Policy WR-5.1: Water Use Efficiency for New Development. The County shall require the use of water conservation techniques appropriate for new development. Such techniques include but are not limited to; requiring low flow plumbing fixtures on new construction, the use of high

efficiency irrigation systems, use of gray-water for landscaping, the integration of storm water runoff into passive groundwater recharge, the use (when feasible) of reclaimed water resources for reasonable and beneficial use and the use of drought-tolerant vegetation.

Policy WR-5.2: Water Use Efficiency for Existing Development. The County shall encourage the retrofitting of existing development with water-conserving devices.

Policy WR-5.5: Water-Conserving Appliances. The County shall require the use of water-conserving appliances and fixtures in all new development, as mandated by State law (California Health and Safety Code, Section 17921.3; Title 20, CCR, Section 1601(b); and other applicable sections of Title 24 of the CCR).

Goal PFS-3: To ensure the provision of adequate wastewater collection and treatment within the County.

Policy PFS-3.4: Developer Requirements. The County shall require that developers meet all County wastewater requirements for adequate collection, treatment, and disposal prior to breaking ground for construction.

Policy PFS-3.5: Water Conservation. The County shall minimize wastewater flows through water conservation efforts. Consideration should be given to allow use of gray water for landscape irrigation.

Goal PFS-4: To ensure the management of stormwater in a safe and environmentally sensitive manner through the provision of adequate storm drainage facilities to protect people and property and maintain the quality of receiving waters.

Policy PFS-4.2: Development Requirements. The County shall encourage project designs that minimize drainage concentrations and impervious coverage, compliment groundwater recharge, avoid floodplain areas, and where feasible, be designed to provide a natural watercourse appearance and that maintain natural watershed functions.

Policy PFS-4.3: Stormwater Detention Basins. The County shall require stormwater detention basins that are designed to ensure public safety, be visually unobtrusive, provide temporary or permanent wildlife habitat values, and where feasible provide recreational uses.

Lake County Rules and Regulations for On-Site Sewage Disposal

The Lake County Rules and Regulations for On-Site Sewage Disposal (County of Lake, 2010) are rules adopted in per the County Code to prescribe requirements for on-site sewage disposal systems. This document provides design criteria for standard on-site sewage disposal subsurface systems (LCR 1-130) as well as alternative systems that maybe used in the Project area including subsurface drip disposal systems (LCR 1-155), pressurized distribution systems (LCR 1-160), aerobic systems (LCR 1-195), sand filter systems (LCR 1-190 & LCR 1-200), other media filter (LCR 1-210-215) systems, steep slope systems (LCR 1-220), holding tanks (LCR 1-270), and experimental systems (LCR 1-290).

4.10.2 Environmental Setting

Regional Hydrology

The improvement areas are located in the Sacramento River Hydrologic Region, Cache Creek hydrologic unit, Upper Cache Creek hydrologic area (Caltrans, 2025b). Schindler Creek is the nearest stream to the project components, which drains from the hillsides north of the Improvement areas and discharges into Clear Lake. Schindler Creek is not listed on the 303(d) list of impaired water bodies, although Clear Lake is listed for lead, microcystins, oxygen (dissolved), pH, mercury, boron, and nutrients. TMDLs were approved for mercury and nutrients on October 20, 2003, and September 21, 2007, respectively, but are in development for microcystins, oxygen (dissolved), pH, boron, and lead (State Water Resources Control Board, 2024).

FEMA establishes flood hazard designations through the National Flood Insurance Program and publishes Flood Insurance Rate Maps (FIRMs) identifying areas subject to flooding during the 1-percent annual chance (100-year) and 0.2-percent annual chance (500-year) flood events. The improvement areas are covered by FIRM Panels 06033C0544D and 06033C0543D. According to the effective FIRMs, the westernmost Proposed Project improvement areas are primarily located within Zone AE, a Special Flood Hazard Area subject to inundation by the 1-percent annual chance flood with established Base Flood Elevations. A small northern segment of the same western area is mapped as Zone A, representing 1-percent annual chance flood areas where BFEs have not been determined. These mapped SFHAs are associated with Schindler Creek, which flows along and through the westernmost improvement areas. In addition, narrow portions of Zone X occur along the northern boundary of the Zone AE floodplain, representing areas outside the 0.2-percent annual chance flood hazard. The remainder of the improvement areas are located entirely within Zone X, indicating minimal flood risk under FEMA criteria (FEMA, 2025).

Groundwater

Lake County lies over the southwest portion of the Sacramento Valley Groundwater Basin. The primary groundwater basin in the Improvement areas vicinity is the Clear Lake Cache Formation Basin, High Valley Basin, Long Velley Basin, and Burns Valley Basin (California Department of Water Resources, 2025). Groundwater is utilized for irrigation and domestic supply and is generally of good quality. Groundwater in these basins is used extensively for irrigation, municipal, and domestic supply. Groundwater is one of Lake County's most important natural resources. On average, groundwater supplies approximately 60 percent of the County's combined urban and agricultural water demand (Lake County, 2025c). Countywide demand for groundwater is expected to increase substantially over the coming decades. Urban water demand is projected to rise from an average of 10,900 acre-feet per year to 19,738 acre-feet per year by 2040, an 81 percent increase. Agricultural demand, depending on future crop types and expansion, may rise from the current average of 39,817 acre-feet per year to as much as 48,387 acre-feet per year by 2040, representing a 21 percent increase. With the exception of areas adjacent to Clear Lake, nearly all of this additional demand is anticipated to be met through increased groundwater extraction (Lake County, 2025c).

4.10.3 Impact Assessment

a) Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Construction

Less-than-Significant Impact with Mitigation. Construction activities have the potential to impact water quality through soil erosion and increased silt and debris discharged into runoff. Additionally, the use of construction materials such as fuels, solvents, and paints may present a risk to surface water quality. Temporary storage of construction material and equipment in work areas or staging areas could create the potential for a release of hazardous materials, trash, or sediment to the storm drain system. Furthermore, construction-related erosion and discharges could occur. The Proposed Project would involve limited and localized ground disturbance, consisting primarily of small excavation areas (e.g., approximately 10-foot by 4-foot pits) for pipeline and manhole repairs that would be backfilled shortly after installation. With the exception of the access road installation at LS 1, ground disturbance would not occur over large contiguous areas, and the total disturbed area would be less than one acre. To minimize the potential for erosion and sediment transport during construction along with other forms of pollution runoff, standard erosion and sediment control BMPs and refueling practices would be implemented as **Mitigation Measures GEO-1**, **HM-1**, and **HM-2**, including surface re-vegetation after construction and utilizing Standard Fueling Practices. With implementation of these BMPs included as mitigation measures, impacts due to construction activities would be less than significant.

During operation, the upgraded wastewater system, manholes, gravity mains, force mains, LSs, and associated improvements would improve the reliability and integrity of wastewater conveyance. These upgrades would reduce the likelihood of leaks, overflows, or accidental discharges to Schindler Creek, Clear Lake, or groundwater compared to existing conditions. This impact is less than significant with mitigation.

b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less-than-Significant Impact. The Proposed Project would only add minor new water-demands uses due to the wastewater infrastructure related upgrades and would not significantly increase groundwater withdrawals during operation. Construction would use only small, short-term amounts of water (e.g., for dust control) that would not measurably affect groundwater supplies. Furthermore, it would also not significantly alter infiltration or recharge, as soils would be restored after construction and the Proposed Project does not add meaningful impervious area. Therefore, the Proposed Project would not interfere with groundwater recharge or conflict with local or State groundwater plans. This impact is less than significant.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i. Result in a substantial erosion or siltation on- or off-site?

Less-than-Significant Impact with Mitigation. Construction activities (trenching, grading, vehicle movement) could increase erosion and sediment transport, particularly near Schindler Creek and Clear Lake. However, implementation of **Mitigation Measures GEO-1, HM-1,** and **HM-2** would require the use of standard erosion and sediment control measures during ground-disturbing activities, including installation of straw wattles or similar sediment capture devices where appropriate, proper management of excavated materials, spill prevention practices, and immediate backfilling and surface restoration following construction. Upon completion, the site would return to pre-project drainage conditions, and no long-term erosion impacts are anticipated. This impact is less than significant with mitigation.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?

Less-than-Significant Impact. The Proposed Project consists primarily of wastewater infrastructure improvements, most of which are underground (pipelines, manholes) or aboveground elements (LSs). These facilities introduce minimal new impervious surfaces and would not increase runoff volumes or alter hydrology in a way that increases flood risk. This impact is less than significant.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less-than-Significant Impact. The Proposed Project does not include substantial new impervious surfaces or new drainage infrastructure that would increase stormwater flows beyond existing system capacity. Construction BMPs would control potential pollutants during construction, and long-term wastewater system improvements would not generate substantial new stormwater discharges during operations. This impact is less than significant.

iv. Impede or redirect flood flows?

Less-than-Significant Impact. The westernmost Proposed Project improvement areas lie within FEMA Flood Zone AE, with a small northern portion in Zone A. Project components within these areas include underground pipelines and manholes, which do not obstruct flood flows. No structures, grading, or embankments would be introduced that could alter flood conveyance or redirect floodwaters associated with Schindler Creek or Clear Lake. The remaining project areas lie in Zone X, outside the 0.2% floodplain. Therefore, the Proposed Project would not impede or redirect flood flows.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Less-than-Significant Impact. Portions of the western Improvement areas lie within FEMA Zone AE and Zone A associated with the 1-percent annual chance floodplain of Schindler Creek. Project components

located in these areas consist of underground pipelines and manholes, which are designed to be watertight and not leak during flooding. The Proposed Project does not introduce significant new sources of pollution, such as chemical storage, fuel facilities, or other above-ground pollutant sources that could be mobilized by floodwaters. Therefore, inundation would not result in the release of pollutants. This impact is less than significant.

e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less-than-Significant Impact. The Proposed Project consists of upgrades to existing wastewater collection infrastructure and would not introduce new discharges or land uses that conflict with local surface or groundwater plans. Instead, by reducing the potential for leaks and overflows from aging infrastructure, the Proposed Project supports rather than conflicts with applicable water quality and groundwater management plans. Furthermore, the Proposed Project does not involve groundwater pumping for consumptive use, only groundwater quality testing, and would not affect groundwater management actions under the Sustainable Groundwater Management Act (SGMA). This impact is less than significant.

4.10.4 Compliance with Federal Environmental Laws and Regulations

As discussed above, preventative measures shall be taken to avoid surface water contamination (see **Mitigation Measures GEO-1, HM-1**, and **HM-2**) and there are no waters of the U.S. located within the Proposed Project improvement areas. Therefore, permits under the CWA and Porter-Cologne Water Quality Act are not required. Additionally, no nearby waters are classified as wild and scenic. All LSs are located with Zones AE, A, or X. No new structures or grades would be introduced that could impact flood flows or result in significant impacts to the drainage patterns of the sites. The Proposed Project would comply with all federal regulations relating to hydrology and water quality.

4.11 LAND USE AND PLANNING

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐

4.11.1 Regulatory Setting

Local

Lake County General Plan

The Lake County General Plan, Land Use Element establishes the land use diagram and density/intensity standards that dictate the distribution of different uses and their allowed development capacity. It guides the future development pattern of unincorporated Lake County, which links to infrastructure. The Land Use Element focuses on where and how land can be developed, but its policies have direct implications for necessary infrastructure improvements and rehabilitation (Lake County, 2008).

The Public Facilities and Services Element specifically establishes goals and policies that address the vital infrastructure and public services needed. It works with the Land Use Element to ensure infrastructure is planned to support the designated land uses (Lake County, 2008).

Lake County Code of Ordinances

The Lake County Code of Ordinances Title 18 is the primary tool used by the County to regulate the use and development of land in unincorporated areas. The purpose is to implement the goals and policies of the Lake County General Plan by promoting public health, safety, and general welfare. The ordinance establishes a comprehensive system of zoning districts, development standards, and permitting procedures that dictate what activities are allowed on a particular piece of property. The ordinance has two main types of zoning designations including Base Zoning Districts and Combining Zoning Districts. Base Zoning districts include agricultural zones, residential zones, commercial zones, industrial zones, and other zones like open space.

Lake County Multi-Jurisdictional Hazard Mitigation Plan

The Lake County Multi-Jurisdictional Hazard Mitigation Plan (HMP) 2025 is prepared by multiple organizations including the auditor-controller's office, Lake County sheriff, and the cities of Lakeport and Clearlake amongst others. The plans mission is to enhance the County's resilience in disasters by focusing on mitigation, preparation, response and recovery. It identifies and prioritizes a list of fourteen major natural hazards of concern including wildfire, drought and water shortage, earthquake, severe weather from storms, severe weather from heat, aquatic biologic hazards, flood, tree mortality, climate change, levee failure, agriculture hazards, dam failure, volcano and geothermal gases, and subsidence. Chapter 9 Flood specifically evaluates the County's flood hazard profile, location and extent, previous occurrences, probability of future events, and exposure and vulnerability. The HMP outlines strategies to minimize flood hazards, including regulating development within flood-prone areas, preserving natural floodplain functions, and implementing infrastructure improvements to manage stormwater and reduce flood risk (Lake County, 2025b).

4.11.2 Environmental Setting

The Proposed Project is located in the vicinity of Clearlake Oaks in Lake County, California, and is predominantly within disturbed and developed areas. The General Plan Land Use Designations for lands in the vicinity of the improvement areas include: Community Commercial, Low Density Residential (LDR), Medium Density Residential (MDR), High Density Residential (HDR), Rural Residential (RR), Rural Lands (RL), Community Commercial (CC) and Public Facilities (PF) (Lake County, 2008). The Proposed Project improvement areas have the following zoning designations as determined by Lake County: Rural

Residential (RR), Single-Family Residential (R1), Multi-Family Residential (R3), Open Space (O), Resort Commercial (CR), and Rural Lands (RL).

Surrounding land uses include local commercial (Cl), Rural Lands (RL), Suburban Residential Reserve (SRe), Medium Density Residential (MDR), Public Facilities (PF), High Density Residential (HDR), Resort Commercial (Cr), Low Density Residential (LDR), Resource Conservation (RC), Community Commercial (Cc), and Agriculture (A). Surrounding zoning and land use designations are illustrated in **Figures 8** and **9**.

Portions of the Proposed Project are located within a 100-year floodplain, with Schindler Creek flowing through the western portion of the Proposed Project and draining into Clear Lake. Regional access to the Proposed Project is provided by State Highway 20, adjacent to the site's northern boundary.

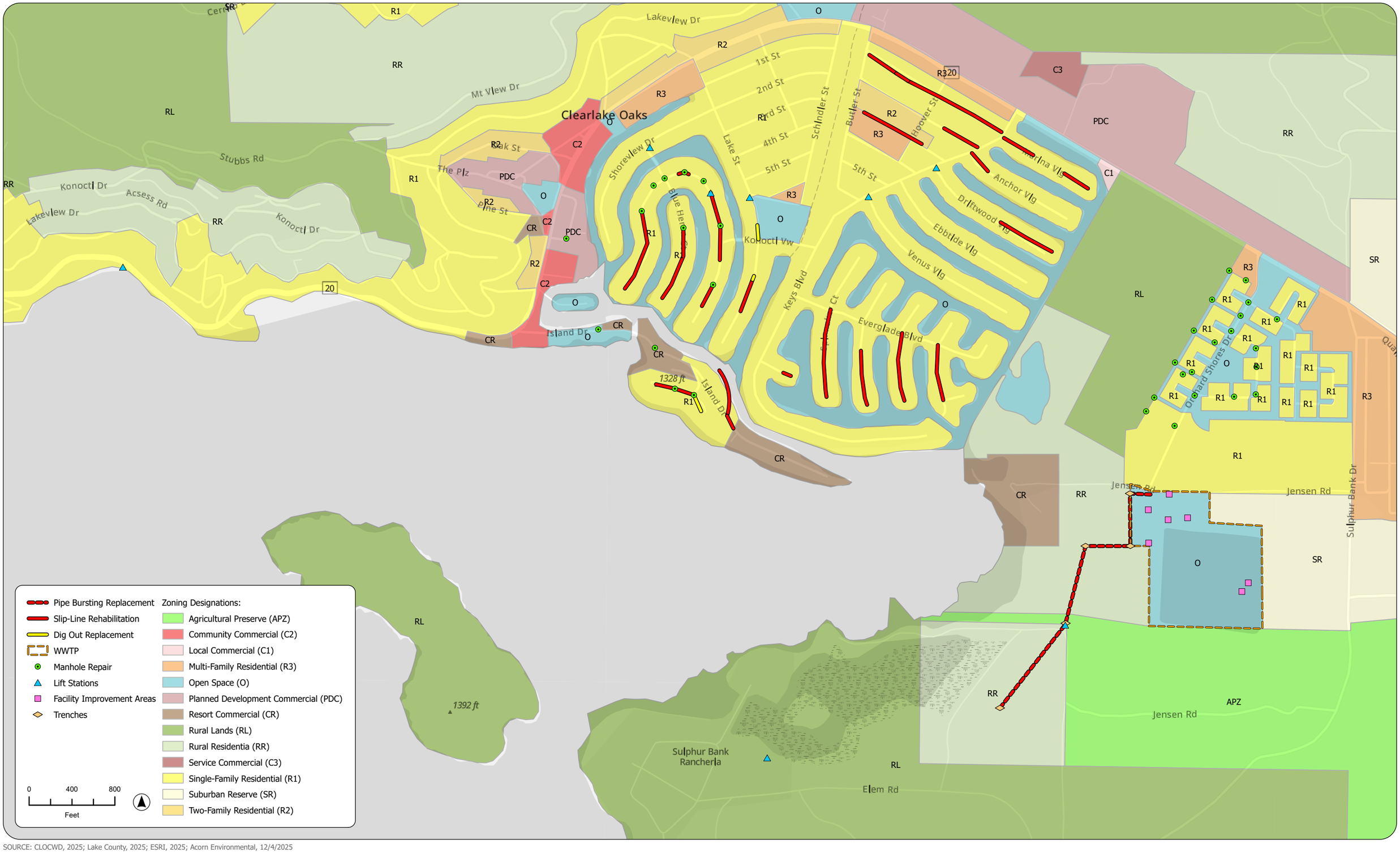
4.11.3 Impact Assessment

a) Would the project physically divide an established community?

No Impact. Some of the improvement and rehabilitation components of the Proposed Project could involve temporary closures of small residential roadways but would not divide an established community. There would be no impact.

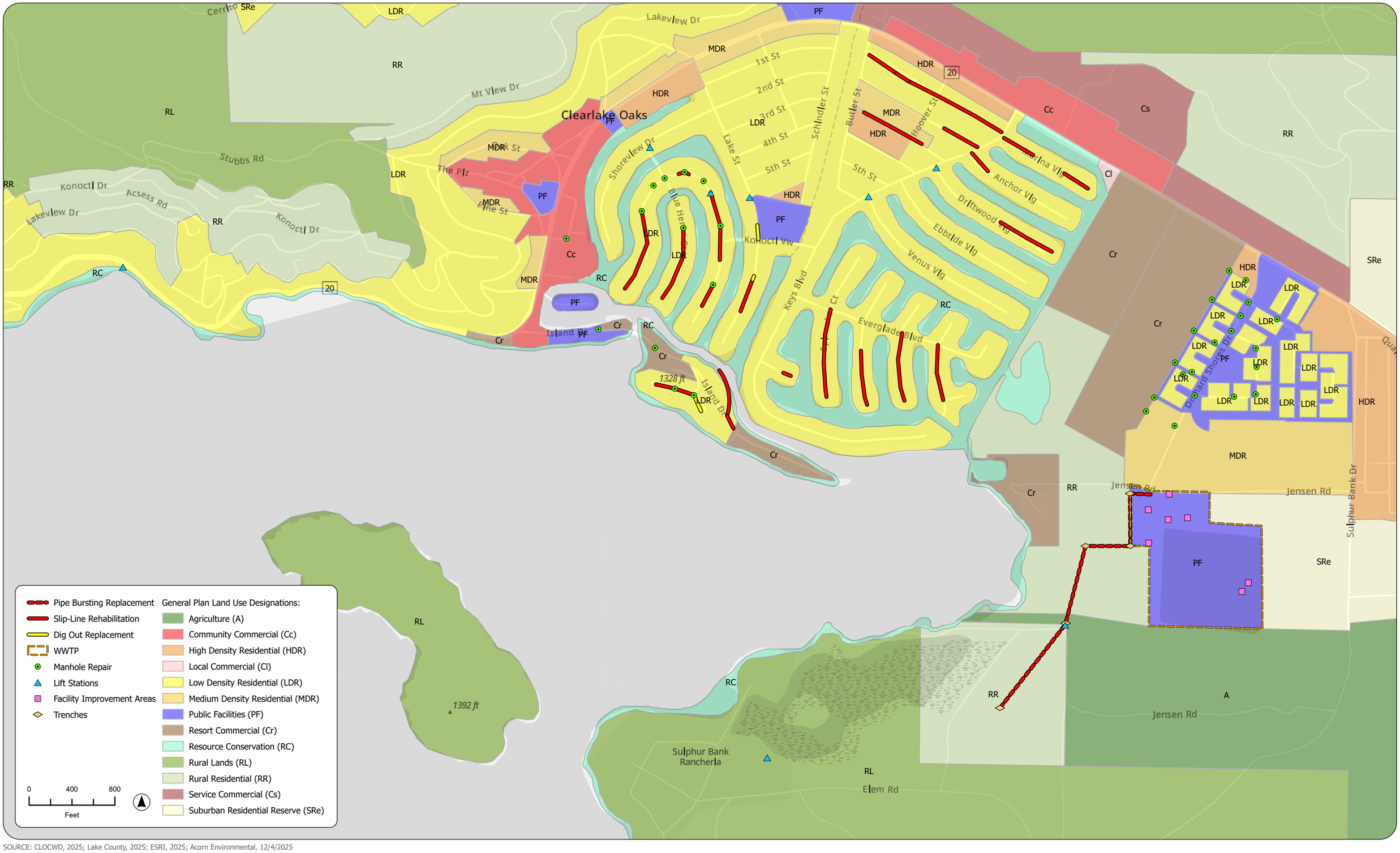
b) Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Less than Significant Impact. As discussed in **Section 4.10.3**, the Proposed Project does include some development components within the floodplain; however, the proposed earthwork was designed to avoid fill within Clear Lake, which demonstrates that the Proposed Project will not have any significant impact to the base flood elevation during the 100 year storm event. The Proposed Project is consistent with the underlying land use and zoning designations, and historical use of the area and the proposed infrastructure upgrades would not conflict with any applicable land use plan or policy. There are no habitat conservation plans or natural community conservation plans that are applicable to the Proposed Project. There would be less than significant impact.



SOURCE: CLOCWD, 2025; Lake County, 2025; ESRI, 2025; Acorn Environmental, 12/4/2025

Figure 8
Zoning Designations



SOURCE: CLOCWD, 2025; Lake County, 2025; ESRI, 2025; Acorn Environmental, 12/4/2025

Figure 9
General Plan Land Use Designations

4.12 MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

4.12.1 Regulatory Setting

State

Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act (PRC Chapter 9, Division 2) provides a comprehensive surface mining and reclamation policy to ensure that adverse environmental impacts are minimized and mined lands are reclaimed to a usable condition. Mineral Resources Zones (MRZs) are applied to sites determined by the California Geological Survey (CGS) as being a resource of regional significance and are intended to help maintain mining operations and protect them from encroachment of incompatible uses.

Local

Lake County General Plan

The Lake County General Plan aims to protect and enhance the natural and cultural resources that make Lake County unique. The goals and policies designed to address mineral resources are as follows:

Goal OSC-4: Protect the current and future extraction of mineral resources that are important to the County's economy while minimizing impacts of this use on the public and the environment.

Policy OSC-4.3 – Minimize Land Conflicts: The County shall require that new development adjacent to existing mining operations be designed to provide a buffer between the proposed use and mining operations. Similarly, new mining operations shall be designed to provide a buffer between existing or likely adjacent uses to minimize incompatibility with nearby uses and adequately mitigate their environmental and aesthetic impacts. The buffer distance will be based upon an evaluation of noise, aesthetics, drainage, operating conditions, topography, lighting, traffic, operating hours, and air quality.

4.12.2 Environmental Setting

The California Geological Survey is responsible for the classification and designation of areas within California containing or potentially containing significant mineral resources. The CGS classifies lands into

Aggregate and MRZs based on guidelines adopted by the California State Mining and Geologic Board, as mandated by the Surface Mining and Reclamation Act of 1975. The CGS has not classified Lake County as within any designated MRZs, although Lake County Adopted an Aggregate Resource Management Plan in 1992 as an element of its General Plan (Lake County, 1992).

Gold and mercury mining activities have historically occurred in Lake County, however, there are currently no mercury mines within the County. Today, the major mineral operations in the County are sand and gravel extractions for aggregate, both in terms of quantity of materials produced and value of extracted resources. These aggregate operations occur near the major creeks in the County.

While the Proposed Project improvement areas are not within a designated Quarry Resource Area, there are quarries within the vicinity of the Proposed Project. The Bailey Quarry, Clearlake Lava Quarry, and Clearlake Quarry are located just south (Bailey) and north (Clearlake Lava and Clearlake) of Highway 20 between Clearlake Oaks and the intersection of Highways 20 and 53. The Bailey Quarry, which operated as a hard rock quarry, is idle, whereas the Clearlake Lava Quarry and Clearlake Quarry are operating facilities. These active quarries also operate as hard rock quarries, producing red, light weight, scoria cinders.

4.12.3 Impact Assessment

a) Would the project result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?

No Impact. There are no known mineral resources located in the vicinity of the Proposed Project improvement areas and the areas proposed for infrastructure rehabilitation have already been developed. Therefore, the Proposed Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. As such, there would be no impact.

b) Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. No mineral resources of significant value have been identified within the Proposed Project improvement areas. Although there is aggregate extraction within the vicinity of the Proposed Project, the improvement areas are not under consideration for use for mineral resource extraction by the County General Plan. Therefore, the Proposed Project would not result in the loss of availability of a locally important mineral resource recovery site as delineated on a local general plan, specific plan, or other land use plan. As such, there would be no impact.

4.13 NOISE

Would the project result in:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

4.13.1 Regulatory Setting

Federal

Federal Noise Abatement Criteria

Operational noise standards used in this study are Federal Highway Administration (FHWA) Noise Abatement Criteria (NAC) for the assessment of noise consequences related to surface traffic and other project-related noise sources. These standards are discussed below. The FHWA establishes NAC for various land uses that have been categorized based upon activity. Land uses are categorized on the basis of their sensitivity to noise as indicated in **Table 4.13-1**. The FHWA NAC is based on peak traffic hour noise levels. Sensitive receptors with the potential to be impacted by the project alternatives primarily consist of residential land uses; thus, the Category B noise standard (67 dBA Leq) would apply to those uses.

Table 4.13-1: Federal Noise Abatement Criteria Hourly A-Weighted Sound Level Decibels

Activity Category	Activity Criteria Leq (h), dBA	Evaluation Location	Activity Category Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67	Exterior	Residential.
C	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D	52	Interior	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or non-profit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, shipyards, utilities (water resources, water treatment, electricity), and warehousing.
G	--	--	Undeveloped lands that are not permitted.

Source: Title 23 CFR Part 772, Table 1 to Part 772 – Noise Abatement Criteria

Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (2018)

The Federal Transit Authority (FTA) has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. The vibration damage criteria adopted by the FTA are shown in **Table 4.13 2**. The FTA has also adopted standards associated with human annoyance for groundborne vibration impacts for three land use categories: (1) High Sensitivity; (2) Residential; and (3) Institutional. **Table 4.13 3** describes these three categories as well the associated vibration thresholds associated with human annoyance for these categories.

Table 4.13-2: Construction Vibration Damage Criteria

Building Category	Peak Particle Velocity (inches/second)
Reinforced concrete, steel or timber (no plaster)	0.5
Engineered concrete and masonry (no plaster)	0.3
Non-engineered timber and masonry buildings	0.2
Buildings extremely susceptible to vibration damage	0.12

Source: FTA, 2018

Table 4.13-3: Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB	65 VdB	65 VdB
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB

Source: FTA, 2018
[1] More than 70 events per day
[2] 30-70 events per day
[3] Fewer than 30 events per day
VdB = Vibration decibels

Local

Lake County General Plan

The Lake County General Plan contains the following policies and implementation measures related to noise that are relevant to the Proposed Project:

Goal N-1: To protect County residents from the harmful exposure of excessive noise and prevent incompatible land uses from encroaching upon existing and planned land uses.

Policy N-1.3: Indoor noise levels for residential uses shall not exceed 45 dBA CNEL.

Policy N-1.4: The County should encourage proper site planning, architectural layout, and use of building materials as methods of noise attenuation. The following techniques should be considered to reduce noise impacts.

- Increase the distance between noise source and receiver through the use of building setbacks and/or dedication of noise easements.
- Place noise tolerant land uses such as parking lots, maintenance facilities, and utility areas between noise source and receiver.
- Use noise tolerant structures, such as garages or carports, to shield noise sensitive areas. Orient buildings to shield outdoor spaces from a noise source.
- Use berming and heavy landscaping to reduce noise levels.
- Cluster office, commercial, or multiple family residential structures to reduce interior open-space noise levels.
- Locate automobile and delivery access to commercial or industrial uses abutting residential parcels at the maximum practical distance from residential uses.
- Use multi-glazed or multi-pane windows, tight-fitting doors, and dense building materials where feasible.

Policy N-1.7: The County shall require contractors to implement noise-reducing mitigation measures during construction when residential uses or other sensitive receptors are located within 500 feet.

Policy N-1.10: The County shall enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code.

Lake County Code

The Lake County Code establishes performance standards intended to ensure compatibility among land uses and to protect public health, safety, welfare, and the County's rural-resort character. Chapter 21, Article 41 (Performance Standards) provides countywide operational noise requirements applicable to all land uses unless otherwise exempted. The purpose of these standards is to control noise, vibration, dust, odor, smoke, and other nuisance conditions that may adversely affect surrounding properties. The ordinance includes several exemptions from local noise limits when standard, reasonable practices are followed. These exemptions include:

- Emergency equipment operated on an irregular or unscheduled basis.
- Warning devices (e.g., alarms and sirens) operated continuously for no more than five minutes.
- Bells, chimes, or carillons.
- Non-electronically amplified sounds at sporting, amusement, and entertainment events.
- Construction site noise generated between 7:00 a.m. and 7:00 p.m.
- Lawn and plant care equipment with functioning sound-suppression devices operated between 7:00 a.m. and 8:00 p.m.
- Aircraft subject to federal or state regulation.
- Agricultural equipment used on property zoned for agricultural activities.

The ordinance also provides a process for exceptions. Upon written application by an industrial or commercial noise source, the Zoning Administrator or Planning Commission may authorize conditional exceptions to local noise emission standards under the following circumstances:

- The noise is infrequent;
- Noise levels beyond the property line are already exceeded by an exempt noise source in the same location; or
- A legally existing use predating the ordinance cannot comply with noise standards even after implementing Best Available Control Technology.

4.13.2 Environmental Setting

Acoustical Background and Terminology

Fundamentals of Sound

Sound is defined as any pressure variation in air that the human ear can detect and is technically described in terms of loudness (amplitude) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The dB scale uses the hearing threshold (20 micropascals of pressure), as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighing network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the dBA

sound level has become the standard tool of environmental noise assessment. Noise levels reported in this section are in terms of A-weighted levels in dB.

Community noise is commonly described in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent sound level (L_{eq}) over a given time period (usually one hour). The L_{eq} is the foundation of the Day-Night Average Level (L_{dn}) noise descriptor and shows very good correlation with community response to noise. The L_{dn} is based upon the average noise level over a 24-hour day, with a +10 dB weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were louder than daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. L_{dn}-based noise standards are commonly used to assess noise effects associated with traffic, railroad, and aircraft noise sources.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the ambient noise level.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness and can cause an adverse response.

Generally, most noise is generated by transportation systems, principally motor vehicle noise, but also including aircraft noise and rail noise. The level of traffic noise depends on three things: l) the volume of the traffic, 2) the speed of the traffic, and 3) the number of trucks in the flow of the traffic. Because noise is measured on a logarithmic scale, 70 dBA plus 70 dBA does not equal 140 dBA. Instead, two sources of equal noise added together have been found to result in an increase of 3 dBA. That is, if a certain volume of traffic results in a noise level of 70 dBA the addition of the same volume of traffic, or doubling, would result in a noise level of 73 dBA. As stated above, 3 dBA is just audible; therefore, if a project doubles the traffic volume there would be an audible increase in the ambient noise level.

Noise attenuates (lessens) at a rate of 6 to 9 dBA per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and noise barriers, vegetative or manufactured, etc.). Widely distributed noises, such as a large industrial facility or a street with moving vehicles would typically attenuate at a lower rate, approximately 4 to 6 dBA per doubling of distance.

Ambient Noise and Sensitive Receptors

The Improvement areas are located within the community of Clearlake Oaks and surrounded primarily by low-density residential uses, roadway corridors, and utility infrastructure. Ambient noise in the area is dominated by vehicular traffic along SR-20, which runs east–west through Clearlake Oaks and passes near several LSs and collection system segments. Local traffic along Sulphur Bank Drive, Keys Boulevard, Lakeland Street, and other neighborhood streets also contributes to baseline noise levels, though at substantially lower volumes. No industrial noise sources are present near the Improvement areas. Based on this, the ambient noise level was estimated to be 55 dBA based on the U.S. Department of Transportation National Transportation Noise Map since SR-20 is the dominant source of noise (U.S. Department of Transportation, 2025).

Noise sensitive receptors are land uses that are considered to be more sensitive to noise impacts. Examples of noise sensitive receptors include schools, residences, and hospitals. Sensitive receptors near project components include adjacent single-family homes and East Lake Elementary School, located approximately 0.17 mile north of the nearest northern project component.

4.13.3 Impact Assessment

a) Would the project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

Less than Significant Impact with Mitigation. Construction activities associated with the Proposed Project would include grading, excavation, filling, and the installation of sewer pipelines, LSs, and associated infrastructure. This would require the use of work trucks, graders, earthmovers, backhoes, excavators, water trucks, and welding equipment along with other supporting equipment. The majority of construction activities would be brief and temporary in any given location, and the proposed facilities will be located within mostly public rights-of-way or areas already developed. Furthermore, for example, manhole rehabilitation, collection system repairs, pipe bursting, and minor pipeline replacements would progress continuously along each alignment, meaning crews would not remain in one location for extended periods. As a result, construction noise near any individual residence would be temporary and short-lived, typically occurring over only a brief period before work shifts farther along the roadway or utility corridor. When construction is occurring, activities could generate noise levels that could reach 74 to 90 dBA L_{max} at a distance of 50 feet (**Table 4.13-4**).

Table 4.13-4: Construction Equipment Noise Levels

Construction Equipment	Typical Maximum Noise Levels (dBA) at 50 feet	Typical Maximum Noise Levels (dBA) at 25 feet with 6 dBA Attenuation
Backhoe	80	86
Compactor	82	88
Concrete Mixer	85	91
Pavement Saw	90	96
Excavator	81	87
Generator Set	82	88
Grader	85	91
Paver	85	91
Truck	84	90
Dozer	85	91
Roller	85	91
Scraper	85	91
Tractors/Loaders	80	86
Welders	74	80

Sources: FTA, 2018; FHWA, 2006

For the sensitive receptors adjacent to the project components, construction could be as close as 25 feet to construction activities, exposing them to noise levels ranging from 80 to 96 dBA L_{max} from construction activities, raising the ambient noise environment significantly from the current levels of 55 dBA while high noise generating equipment is being used. However, with implementation of **Mitigation Measure NOI-1**, construction activities associated with the Proposed Project would comply with Lake County's noise regulations, which exempt construction site noise occurring between 7:00 a.m. and 7:00 p.m. under Article 41 of the County Code. All project construction—including LS rehabilitation, manhole and collection system repairs, pipeline replacement, pipe bursting, and WWTP improvements—would be restricted to these allowed daytime hours. Furthermore, **Mitigation Measure NOI-1** has other measures to reduce noise, such as equipping construction equipment with properly fitting mufflers if applicable. Finally, because work along the would move continuously near the sensitive receptors and would not remain at any single location for an extended period, exposure for nearby sensitive receptors would be temporary and of short duration. With implementation of **Mitigation Measure NOI-1** to reduce potential noise levels and restrict construction hours, construction noise impacts would be less than significant.

Operation

Less than Significant. Operational noise generated by the upgraded wastewater facilities would be comparable to existing conditions. The rehabilitated LSs would continue to result in low-level mechanical noise that is consistent with current operations. Manholes, force mains, and gravity pipelines would not generate noise during normal use, similar to existing conditions. Routine WWTP and lift-station operation and monitoring would also be similar to existing maintenance and operation practices. Because the Proposed Project would not introduce new noise-producing equipment or increase operating hours,

overall operational noise levels would remain essentially unchanged and would not exceed applicable County standards. Therefore, operational noise impacts would be less than significant.

b) Would the project generate excessive groundborne vibration or groundborne noise levels?

Less than Significant with Mitigation. The Proposed Project involves construction activities that could generate ground-borne vibration, including excavation, use of heavy machinery such as pavement saw cutters and jackhammers, and compactors. Several project components—particularly collection system repairs and LS work—are located adjacent to existing single-family residences and other sensitive receptors. Therefore, nearby receptors could temporarily experience minor levels of construction-related vibration. The County does not establish specific quantitative vibration limits; therefore, the FTA Transit Noise and Vibration Impact Assessment Manual provides the appropriate reference thresholds. Humans typically perceive vibration at approximately 65 VdB, with the threshold for annoyance occurring at roughly 80 VdB, and the potential for building damage beginning around 0.2 inch/sec ppv. **Table 4.13-5** presents typical vibration levels for standard construction equipment at a reference distance of 25 feet.

All construction vibrations would be below the structural damage threshold (100 VdB) at this distance or greater. However, the majority of the equipment listed exceeds the human annoyance threshold (80 VdB) at 25 feet (FTA, 2018). Given that sensitive receptors are adjacent to the Proposed Project improvement areas, construction activities within 100 feet of sensitive receptors could cause potential annoyance. However, construction activities would not remain in one location for extended periods because rehabilitation of manholes, LSs, and collection system segments would advance continuously along each alignment. As a result, any perceptible vibration at adjacent receptors would be of very short duration. In addition, construction would comply with Lake County Code Article 41 due to **Mitigation Measure NOI-1**, which exempts construction noise occurring between 7:00 a.m. and 7:00 p.m., thereby limiting vibration-generating activities to acceptable daytime hours.

Given the temporary nature of the work at each location, the mobile progression of construction crews, and compliance with the County's permitted construction hours by implementing **Mitigation Measure NOI-1**, vibration generated by the Proposed Project would not result in structural damage and any short-term annoyance would be minimal. Therefore, this impact would be less than significant with mitigation.

Table 4.13-5: Vibration Source Levels for Construction Equipment

Equipment	Maximum Vibration Level at 25 feet [VdB (rms)]
Hoe Ram	87
Large bulldozer	87
Loaded trucks	86
Jackhammer	79
Small bulldozer	58

Source: FTA, 2018
rms: root mean square

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The Improvement areas are not located within two miles the vicinity of a private airstrip or public airport, or within an airport land use plan. The nearest airport is Hoberg Airport, located approximately 10 miles south of the Improvement areas. As the Proposed Project is primarily focused on upgrading sewer infrastructure and would not introduce new noise sources that would exacerbate existing airport noise, there would be no impact.

4.13.4 Mitigation Measures

NOI-1

- All construction hours would take place between the hours of 7:00 a.m. and 7:00 p.m.
- All construction vehicles or equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and acoustical shields or shrouds in accordance with manufacturers' specifications.
- Loud stationary construction equipment shall be located as far away from sensitive receptor areas as feasible. To the extent feasible, existing barrier features (structures) shall be used to block sound transmission between noise sources and noise sensitive land uses.
- Maintenance of construction equipment and machinery, including noise reducing components such as mufflers, silencers, covers, guards, vibration isolators, etc., shall be performed regularly to reduce excess noise.
- Construction equipment and machinery that produce reduced noise and vibration levels shall be utilized to the extent feasible.
- Construction equipment and machinery shall only be operated by trained and qualified personnel.
- Haul trucks shall be operated in accordance with posted speed limits.
- The contractor shall monitor construction noise and vibration and designate a disturbance coordinator, post the coordinator's contact telephone number conspicuously around the improvement areas, and provide the number to nearby sensitive receptors. The disturbance coordinator shall receive all public complaints, be responsible for determining the cause of the complaints, and implement any feasible measures to alleviate the problem.

4.13.5 Compliance with Federal Environmental Laws and Regulations

Since the Proposed Project would integrate **Mitigation Measure NOI-1** to reduce construction-generated noise, the Proposed Project would not raise the ambient noise level beyond the FHWA construction noise threshold at sensitive receptors. The Proposed Project would comply with all federal regulations relating to noise, including the FHWA.

4.14 POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

4.14.1 Environmental Setting

Clearlake Oaks, a census-designated place in Lake County, had an estimated population of 2,174 in 2023 (Census Reporter, 2023). The estimated population of Lake County was 68,163 in the 2020 Decennial Census (US Census, 2025). A majority of the proposed infrastructure rehabilitation are located within the Clearlake Oaks Community Growth Boundary as outlined in the 2008 General Plan (Lake County, 2008).

4.14.2 Impact Assessment

a) Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. All growth and development regulations within the vicinity of the Proposed Project are controlled through the Lake County General Plan. Implementation of the Proposed Project would not result in a direct increase in population or housing. The Proposed Project would not increase the capacity of the WWTP. No additional indirect impacts to population and housing are anticipated as a result of the Proposed Project beyond those identified in the General Plan. As such, the Proposed Project would have no impact on population growth.

b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact. The Proposed Project does not include land uses that would displace the existing residences or otherwise necessitate the displacement or construction of replacement housing elsewhere. Therefore, the Proposed Project would have no impact.

4.15 PUBLIC SERVICES

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

4.15.1 Environmental Setting

Fire protection and emergency medical services within the vicinity of the Proposed Project are provided by the Lake County Fire Protection District (LCFPD). Additionally, the Northshore Fire Protection District Station 75 is adjacent to portions of the Proposed Project. CAL FIRE also has a seasonal fire station located approximately 3.2 miles west of the WWTP. The nearest hospital to the Proposed Project is Adventist Health Clear Lake, which is located at 15630 18th Avenue, Clearlake, approximately 5.6 miles southeast of the Proposed Project. Adventist Health Clear Lake is a general acute care hospital with a standby emergency room that provides a comprehensive range of inpatient and outpatient medical services to the local population as well as numerous specialized services (California Department of Health Care Access and Information, 2025).

Lake County, including unincorporated Clearlake Oaks, receives law enforcement provisions from the County Sheriff's Office to protect citizens and property within the County. The Lake County Sheriff's Department has of 10 sworn command officers, with the Sheriff's office nearest to the Proposed Project being in Lucerne, approximately 8.25 miles northwest (Lake County Sheriff, 2025). This office responds to calls in the region of the Proposed Project.

The Konocti Unified School District (KUSD) serves the community through seven separate schools, with a total of 4,014 enrolled students (KUSD, 2025). East Lake Elementary School is the nearest school , located less than 0.25 miles from the Proposed Project.

Lake County offers numerous parks and recreational areas. The nearest located parks to the Proposed Project are Clark's Island and Nylander County Park, located approximately 0.08 and 0.17 miles west of

the Proposed Project, respectively (Lake County Parks, Recreation, & Trails, 2025). These parks are managed by the Lake County Parks, Recreation, & Trails Department.

4.15.2 Impact Assessment

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

Fire protection?

No Impact. The vicinity of the Proposed Project is served by the LCFPD and the Northshore Fire Protection District Station 75. The nearest fire station is approximately 1.2 miles northwest of the WWTP and adjacent to some of the Proposed Project improvement areas. The Proposed Project would be required to comply with standard requirements including the current California Fire Code which Lake County Fire Protection District has adopted. The implementation of the Proposed Project would not require additional fire facilities or necessitate new or altered facilities, resulting in no impact.

Police protection?

No Impact. The vicinity of the Proposed Project is served by the County Sherrif's Office. The nearest Sheriff's Office is located approximately 8.25 miles northwest of the Proposed Project. The Proposed Project would not result in the need for new or altered services, or alteration to the patrol requirements from the Sheriff's Office. Impacts related to emergency vehicle access along roadways during construction is discussed in **Section 4.17**. Therefore, the Proposed Project would have no impact.

Schools?

No Impact. No new employment would be created by the Proposed Project, and the Proposed Project is not anticipated to otherwise induce unplanned population growth. Accordingly, the Proposed Project would not result in adverse physical impacts associated with the provision of new or physically altered school facilities. Therefore, the Proposed Project would have no impact on school facilities.

Parks?

No Impact. The Proposed Project would not result in the construction of new residences or the addition of employees to operate and maintain the Proposed Project. Thus, it is not anticipated that increases in population would occur and that would result in increased use of existing parks. Therefore, the Proposed Project would have no impact on parks.

Other public facilities?

No Impact. The Proposed Project would not result in a need for additional or other public facilities. Therefore, the Proposed Project would have no impact.

4.16 RECREATION

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

4.16.1 Environmental Setting

Lake County operates and maintains a number of recreational activities. The nearest recreational facility to the Proposed Project is Clark's Island, located approximately 0.08 miles west of the Proposed Project improvement areas. In addition to County-maintained parks, regional recreational opportunities include the Anderson Marsh State Historic Park and Mount Konocti. Clear Lake and surrounding terrain support a large variety of recreation opportunities. The southernmost region of the Mendocino National Forest begins approximately 4 miles northwest of the Proposed Project.

4.16.2 Impact Assessment

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No Impact. Increased demand for existing parks or other recreational facilities is typically driven by an increase in population. The Proposed Project would not result in an increase of residents. Therefore, the Proposed Project would not contribute to the substantial deterioration of existing facilities or require the construction of new facilities or expansion of existing facilities. Therefore, there would be no impact.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. As discussed above, the Proposed Project would not include or result in the construction or expansion of recreational facilities that might have adverse physical effect in the environment. Therefore, the Proposed Project would have no impact.

4.17 TRANSPORTATION

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☒	☐	☐
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	☐	☒	☐	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☒	☐	☐

4.17.1 Regulatory Setting

Federal

Federal Highway Administration

The FHWA regulates the construction, maintenance, and operation of the nation's roadways. FHWA guidelines ensure that transportation projects funded or overseen by the federal government comply with safety standards, minimize environmental impacts, and enhance mobility. Compliance with FHWA standards is required for any project impacting federal highways or receiving federal transportation funds.

Manual on Uniform Traffic Control Devices

The Manual on Uniform Traffic Control Devices (MUTCD), administered by the FHWA, sets forth standards for traffic signs, signals, and pavement markings in the United States. These guidelines ensure uniformity in traffic control devices, enhancing road safety and efficiency. Adherence to MUTCD standards is mandatory for all public roads.

State

California Department of Transportation

Caltrans is responsible for the design, construction, maintenance, and operation of the California state highway system. Caltrans regulations and guidelines govern traffic management, road safety, and environmental protection for projects affecting state highways. Any roadwork or infrastructure improvements within state highway right-of-way must comply with Caltrans standards.

Senate Bill 743

Senate Bill 743 was signed into law in 2013, with the intent to better align CEQA practices with statewide sustainability goals related to efficient land use, greater multimodal choices, and GHG reductions. The

provisions of SB 743 became effective on July 1, 2020. Under SB 743, automobile delay, traditionally measured as level of service (LOS), is no longer used to establish the significance of a transportation impact under CEQA. Instead, impacts are determined by evaluating how VMT would change with implementation of a project.

Local

2022 Lake County Final Regional Transportation Plan/ Active Transportation Plan

The Regional Transportation Plan (RTP) is Lake County's long-range, 20-year strategy for developing and managing a safe, efficient, multimodal transportation system. Prepared by the Lake County/City Area Planning Council in coordination with federal, state, local, and tribal partners, the RTP guides improvements that support regional mobility and goods movement while aligning transportation planning with land use goals. The 2022 RTP update reflects changes since 2017, including new laws, policies, and emerging issues. It evaluates these developments and identifies related challenges and opportunities for maintaining and improving the region's transportation network. The Plan is organized into elements covering the State highway system, local streets and roads, public transit, active transportation, tribal transportation, and aviation, as well as an overarching issues element that addresses cross-cutting regional topics. Each element describes current conditions and issues, defines performance measures, outlines both constrained and unconstrained project lists, identifies potential funding sources, and provides goals, objectives, policies, and estimated costs relative to expected funding availability. Key topics include the five SRs in the region; city and county road systems; bicycle and pedestrian infrastructure guided by the Active Transportation Plan; fixed-route and specialized transit services; transportation needs on tribal lands; and aviation issues centered on Lampson Field, the region's public airport.

Lake County General Plan

The Transportation and Circulation Element included in the Lake County General Plan was prepared pursuant to Section 65302(b) of the California Government Code. The Transportation and Circulation Element addresses the location and extent of existing and planned transportation routes, terminals, and other local public utilities and facilities. The General Plan identifies roadway and transit goals and policies that have been adopted to ensure that the transportation system of the County will have adequate capacity to serve planned growth. These goals and policies are intended to provide a plan and implementation measures for an integrated, multi-modal transportation system that will safely and efficiently meet the transportation needs of all economic and social segments of the County. Applicable goals and policies are as follows:

Goal T-1: Roads and Highways. To provide and plan for a unified, coordinated, cost efficient countywide road and highway system that ensures safety, maintains adequate levels of service, and the efficient movement of people and goods.

> **Policy T-1.2:** Roads should be improved and constructed to the design standards recommended by the County Department of Public Works, as shown in Table 6-1 (reproduced as **Table 4.17-1**), Lake County Road Design and Construction Standards. Road design standards shall be based on the American Association of State Highway and Transportation Officials (AASHTO) standards and supplemented by Caltrans and County standards.

Table 4.17-1: Lake County Road Standards

Category	Minor Arterial	Major Collector	Minor Collector	Local	Category
Design Speed	60 mph	50 mph	40 mph	30 mph	Design Speed
Number of Lanes	2-4	2-4	2	2	Number of Lanes
Lane Width	12 ft	12 ft	11 ft	11 ft	Lane Width
Right-of-Way Width	60 ft	50 ft (min)	50 ft	50 ft	Right-of-Way Width

Source: Lake County, 2008

Policy T-1.7: Impact of New Development on Roadways. Facilities constructed or utilized for new development shall comply with County standards in order to minimize initial and subsequent maintenance costs.

Policy T-1.8: Level of Service. County maintained roadways should be improved and maintained to provide an adequate peak period LOS of "C" or better for existing and anticipated traffic volumes if roadway upgrades are feasible, such as roadway widening, addition of lanes via re-striping, and other safety and operational improvements. The County shall allow a limited number of County roadway segments to operate at a level of service of "E" or better where improving the segment to LOS C are deemed infeasible due to cost, negative community and/or environmental impacts, and constructability issues. This "E" level of service for certain roadways shall not include any State Highway unless approved by Caltrans.

4.17.2 Environmental Setting

Roadway Network

SR-20, a major east–west state highway, is located north of the residential area and serves as the primary regional travel corridor through Clearlake Oaks.

The WWTP is located in the southwestern portion of the Clearlake Oaks community and is accessed primarily from Jensen Road, a two-lane local roadway running east–west. Local access to the WWTP is provided via Orchard Shore Drive, which connects Jensen Road to residential areas north of the plant. Sulphur Bank Drive provides an additional north–south connection between Jensen Road and SR-20.

North of the WWTP, the Proposed Project includes manhole replacements and pipeline rehabilitation within established residential neighborhoods. These neighborhoods are accessed from SR-20 via different roadways, including Keys Boulevard, Butler Street, Schindler Street, and Lakeland Street. Furthermore, local circulation is provided by a network of narrow residential streets, including 1st through 6th Streets, Venus Village, Ebbtide Village, and Anchor Village.

Bicycle and Pedestrian Facilities, and Public Transportation

Local roads in the Improvement areas area primarily serve low-speed residential traffic and do not include striped bicycle lanes. Pedestrian facilities are limited with many roads not including formal pedestrian infrastructure.

Public transit service in the area is provided by the Lake Transit Authority (LTA). While no bus stops are located directly adjacent to the WWTP or within the interior residential neighborhoods, LTA operates transit routes along SR-20, including stops near the northern project components. These stops provide east–west regional transit connections within the Clearlake Oaks area and beyond.

4.17.3 Impact Assessment

a) Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less than Significant with Mitigation. The Proposed Project would involve rehabilitation of existing sewer pipelines and force mains, replacement of manholes, and upgrades at the Clearlake Oaks WWTP. Construction would occur primarily within existing public roadways—examples being 1st Street, Marian Village, Spinnaker Court, Orchard Shore Drive, Apple Court, Island Circle, and Blue Heron Court—and within previously disturbed areas at the WWTP or LSs. Construction activity would generate temporary increases in vehicle trips related to worker commutes, delivery of equipment and materials, and movement of construction vehicles such as excavators, trucks, and compactors. For residential areas that would be impacted by the sewer line and manhole improvements, work areas would shift continuously along the alignment, and hence construction traffic demands would be dispersed over time and location. Short-term lane closures and temporary traffic controls would be required in some segments. However, these closures would be localized, brief, and managed using standard traffic control measures included in **Mitigation Measure T-1**, minimizing disruption to the circulation system. Staging areas would be located at or near the WWTP and other suitable areas so that equipment can be parked and materials delivered efficiently, reducing the need for additional haul trips along local roads. Construction vehicles would access the Improvement areas via SR-20, which is designed to accommodate regional travel, and then via local roadways depending on the location of the project component. Because operational activity would not expand system capacity or introduce new traffic-generating land uses, long-term traffic would be limited to periodic maintenance trips, similar to existing conditions. The Proposed Project would therefore not result in long-term increases in traffic. Traffic-related impacts would be less than significant with mitigation.

b) Would the project conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?

Less than Significant with Mitigation. CEQA Guidelines section 15064.3(b) relates to evaluating the transportation impacts of land use and transportation project based on VMT. The Proposed Project does not include any changes in land use that would significantly increase VMT nor significant new facilities but the replacement of mostly existing facilities. Instead, the goal of the Proposed Project is to upgrade existing sewer infrastructure instead of substantial expansion of it, consequently it will not lead to increased development or a significant increase in traffic volumes. Temporary increases in traffic due to construction activities will be managed through traffic control measures included as **Mitigation Measure T-1**, minimizing any potential impact. Therefore, the project would not conflict with CEQA Guidelines section 15064.3(b), and the impact is less than significant with mitigation.

c) Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less than Significant. Construction of the Proposed Project—including rehabilitation of the pipelines and replacement of existing manholes—would require temporary trenching and excavation within existing public roadways. All disturbed pavement and shoulders would be restored to pre-project conditions following installation. The Project does not include any changes to roadway alignment, lane configurations, intersection controls, or traffic circulation patterns. Construction zones would be managed through standard traffic control measures to maintain safe speeds, sight distance, and travel paths for motorists, bicyclists, and pedestrians. As a result, the Proposed Project would not create or exacerbate hazards due to a geometric design feature or incompatible use. This impact would be less than significant.

d) Result in inadequate emergency access?

Less than Significant with Mitigation. Construction of the Proposed Project—including pipeline rehabilitation, manhole replacement within residential neighborhoods, and WWTP upgrades—would require temporary, localized lane closures on streets such as Anchor Village, Marian Village, Blue Heron Court, Island Circle, Orchard Shore Drive, and others. These closures would be short in duration and would shift as work progresses, minimizing the amount of time any single roadway segment is impacted. **Mitigation Measure T-1** would ensure that CLOCWD complies with all rules and regulations contained in encroachment permits issued by Lake County and Caltrans. This includes but is not limited to providing advance notice to the designated Permit Inspector prior to initiating work, obtaining approval for any work that would interrupt the normal flow of public traffic, and maintaining a minimum of one paved traffic lane not less than 12 feet wide with a contiguous 4-foot shoulder open to public traffic at all times.

Because construction activities would be temporary, localized, and **Mitigation Measure T-1** would ensure access throughout construction, the Proposed Project would not result in inadequate emergency access. Impacts would be less than significant with mitigation.

4.17.4 Mitigation Measures

Mitigation Measure T-1

CLOCWD shall follow all rules and regulations within the encroachment permits issued by Lake County and Caltrans. These measures may include, but are not limited to:

- At least 48 hours before starting any work, or 5 working days if any lane closures or traffic control will be necessary, the CLOCWD shall notify the designated Permit Inspector;
- Work that will interrupt the normal flow of public traffic is not authorized without prior approval from the State's Representative;
- A minimum of one paved traffic lane not less than 12 feet wide and a contiguous 4 foot shoulder shall be open for use by public traffic at all times, and when construction operations are not actively in progress, all lanes shall be open to public traffic;
- Whenever vehicles or equipment are parked on the shoulder outside of the traveled way between 6 feet to 15 feet of a traffic lane, the shoulder area shall be closed with fluorescent traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment;
- Excavation of any trench 5 feet or more in depth shall not begin until the contractor has submitted and received written approval of the contractor's Trench Excavation Safety Plan; and

- The District shall provide and maintain through the work area at all times ADA compliant safe walk way for pedestrians and bicycles, which shall be: a minimum of four feet wide, clearly defined, and maintained in a smooth unobstructed condition free of tripping hazard, unless a pedestrian detour is in place.

4.18 TRIBAL CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☒	☐	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

4.18.1 Regulatory Setting

Federal

NHPA Section 106

Section 106 of the NHPA of 1966 requires tribal consultation in all steps of the process when a federal agency project or effort may affect historic properties that are either located on tribal lands, or when any Native American tribe or Native Hawaiian organization attaches religious or cultural significance to the historic property (traditional cultural property [TCP]), regardless of the property's location. When such an undertaking occurs on tribal land, the federal agency must notify appropriate Native American tribes of the undertaking and give those tribal groups the opportunity to consult, should they wish to do so.

State

AB 52

AB 52, enacted in 2014, introduced a new category of resources in CEQA known as TCRs, which incorporates tribal cultural values alongside scientific and archaeological considerations when assessing impacts and mitigation. According to PRC, Division 13, Section 21074, TCRs are defined as either:

1. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either: a. Included or determined to be eligible for inclusion in the CRHR, or b. Included in a local register of historical resources as defined in subdivision (k) of PRC Section 5020.1.
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.

Native American tribes with cultural ties to a geographic area may have specialized knowledge about their TCRs. Therefore, AB 52 mandates that within 14 days of deciding to move forward with a project or deeming a project application complete, the lead agency must notify California Native American tribes that have requested to be on the agency's notification list. The notice must include a brief description of the project, its location, contact information for the lead agency, and inform the tribe that they have 30 days to request a consultation. The lead agency is required to initiate the consultation process within 30 days of receiving such a request.

Local

Lake County General Plan

The Lake County General Plan aims to protect and enhance the natural and cultural resources that make Lake County unique. The goals and policies designed to address cultural resources are as follows:

Goal OSC-8: To manage and project sites of cultural and archaeological importance for the benefit of present and future generations.

Policy OSC-8.1 – Evaluation of Cultural and Archaeological Resources: The County should participate in and support efforts to identify its significant cultural and archaeological resources using appropriate State and Federal standards.

Policy OSC-8.2 – Protection of Resources with Potential State or Federal Designations: The County should encourage the protection of cultural and archaeological sites with potential for placement on the NRHP and/or inclusion in the California State Office of Historic Preservation's California Points of Interest and California Inventory of Historic Resources. Such sites may be of statewide or local significance and have anthropological, cultural, military, political, architectural, economic, scientific, religious, or other values.

4.18.2 Environmental Setting

The Proposed Project lies within the traditional territory of the Southeastern Pomo. Pomo speakers have been sub-divided into seven distinct language groups: Kashaya, Southern, Central, Northern, Northeastern, Eastern, and Southeastern, and can be linked to the larger family of Hokan speakers (Acorn Environmental, 2025). Southeastern Pomo speakers occupied the area around East Lake and Lower Lake, on the eastern margin of Clear Lake.

The Pomo peoples organized themselves into small tribelets or village communities, and the social and political organization of these individual groups showed considerable variation. The Pomo economy was based on a seasonal round of fishing, hunting, and the collection of a variety of plants for food, tools, structures and trade (Acorn Environmental, 2025). Beads (also called *po* or *pol*), made from magnesite, were also an important part of the Pomo economy. These beads were of such high value that they were traded individually rather than in a necklace like the Pomo did with the clam shell coins they made. The Pomo were also known for their expertise in basket making. The types of houses used by the Pomo varied depending on the climate and vegetation of each district. In the Kashaya Pomo region, single-family dwellings were typically made of redwood bark slabs erected in conical fashion to create a structure 8 to 15 feet in diameter and 6 to 8 feet high (Acorn Environmental, 2025).

Typical weapons used in hunting were the bow and arrow for larger game, club for bear, and spears for sea lions and seals. Smaller animals were captured by bola, low brush fences, nets, snares, and basketry traps. Lake, stream, and ocean fish were caught in traps, with lines or weirs. The traditional mortar and pestle were used for processing of acorns, Buckeye nuts and other seeds, grasses, and roots. Knives were made from obsidian or chert and could be attached to handles and used as axes (Acorn Environmental, 2025).

In accordance with AB 52, letters were sent to the following Tribes on December 6, 2025 requesting consultation in compliance with the CEQA review process: Big Valley Band of Pomo Indians of the Big Valley Rancheria, Cahto Tribe, Cloverdale Rancheria of Pomo Indians, Coyote Valley Band of Pomo Indians, Dry Creek Rancheria of Pomo Indians, Elem Indian Colony Pomo Tribe, Estom Yumeka Maidu Tribe of the Enterprise Rancheria, Guidiville Rancheria of California, Habematolel Pomo of Upper Lake, Hopland Band of Pomo Indians, Koi Nation of Northern California, Manchester Band of Pomo Indians of the Manchester Rancheria, Middletown Rancheria of Pomo Indians of California, Noyo River Indian Community, Pinoleville Pomo Nation, Potter Valley Tribe, Redwood Valley or Little River Band of Pomo Indians, Robinson Rancheria of Pomo Indians, Round Valley Reservation/Covelo Indian Community, Scotts Valley Band of Pomo, and Yokayo Tribe. As of January 9, 2026, the CLOCWD has received one response in regards to request for consultation from the Habematolel Pomo of upper Lake THPO who declined to comment.

4.18.3 Impact Assessment

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

Less-than-Significant Impact with Mitigation. As outlined in the Cultural Resources Inventory (Acorn Environmental, 2025) and discussed in **Section 4.5**, the Proposed Project was found to contain two previously documented cultural resources that are intersected by project components and six resources that lie within 150 feet of the Project area, all of which were considered eligible for the CRHR for the purposes of the cultural assessment. As described in **Section 3.5**, known tribal cultural resources as defined in PRC Section 21074 have been identified on the Proposed Project through background research. Resources in the immediate vicinity are dominated by obsidian lithic scatters, with the large occupation site of Elem just to the south. The existing collection pipe between the WWTP and LS 11 is bisected by cultural resources. The ground disturbance in this area of the Project boundary is minimal; thus, the sparse nature of the lithic scatter, prior ground disturbance to the location, and the small volume of excavation would not result in a substantial adverse change to the cultural resource. Consultation with Native American tribes under AB 52 has not resulted in the identification of new TCRs. However, because construction of the Proposed Project would require ground-disturbing activities, there is the potential of unanticipated discoveries of subsurface archaeological deposits or human remains, which would be a potentially significant impact. The conclusion of consultation under AB 52 and the application of **Mitigation Measures CUL-1**, **CUL-2**, and **CUL-3** would reduce impacts to TCPs or TCRs to a less-than-significant level.

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Less-than-Significant Impact with Mitigation. The Proposed Project improvement areas area not listed as a historical resource in the CRHR, although there are resources that have been identified as eligible for the CRHR. As described above, tribal cultural resources have been identified in the vicinity of the Proposed Project and mitigation has been provided to resolve potentially significant impacts. Consultation with Native American tribes under AB 52 has not resulted in the identification of new TCRs. It is possible that unknown buried archaeological materials could be found during ground disturbing activities at the development site, including unrecorded Native American materials. If human remains are uncovered, compliance with Section 15064.5 I (1) of the CEQA Guidelines and Health and Safety Code Section 7050.5 is required. The application of **Mitigation Measures CUL-1**, **CUL-2**, and **CUL-3** would reduce impacts to TCPs or TCRs to a less-than-significant level. Therefore, the Proposed Project will have a less than significant impact with mitigation.

4.19 UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

4.19.1 Regulatory Setting

Local

Lake County General Plan

The Lake County General Plan aims to establish the framework for the provision of public facilities and services to meet the needs of the County's future development. The following are the goals and policies related to utilities and service systems that apply to the Proposed Project:

Goal PFS-3: To ensure the provision of adequate wastewater collection and treatment within the County.

> **Policy PSF-3.5 – Water Conservation**: The County shall minimize wastewater flows through water conservation efforts. Consideration should be given to allow use of gray water for landscape irritation.

Goal PFS-5: To ensure the safe and efficient disposal or recycling of solid and hazardous waste generated in the County.

Policy PSF-5.1 – Solid Waste Reduction: The County shall promote the maximum feasible use of solid waste reduction, recycling, and composting of wastes, strive to reduce commercial and industrial waste on an annual basis, and pursue a financing mechanism for solid waste reduction programs in order to meet the requirements of Public Resources Code 41780 and 41780.1.

Policy PSF-5.3 – Provisions for Solid Waste Storage, Handling, and Collection: The County shall ensure that all new facilities have the necessary provisions for solid waste storage, handling, and collection prior to using building permits.

Goal PFS-6: To ensure that adequate and efficient public utilities are provided to meet the needs of residents and businesses in the County.

Policy PSF-6.1 – Electric Service: The County shall coordinate with electricity providers in planning for the timely expansion of electrical facilities to meet future demand, and for projects affecting public health, schools, or for significant air emissions reductions.

Policy PFS-6.6 – Watershed Protection During New Public Facilities Expansion: Extension of public facilities shall be designed to minimize or avoid potential adverse impacts to the watersheds within the County.

4.19.2 Environmental Setting

Water and Wastewater Services

The CLOCWD is the only supplier of potable water in the community of Clearlake Oaks. The District provides water and wastewater treatment to approximately 2,359 people within its 2.1-square mile service area as of 2018. The WWTP has a maximum daily flow of 2.1 million gallons per day.

Solid Waste Collection and Disposal

Solid waste collection and recycling services for Clearlake Oaks are provided by Lake County Waste Solutions through C&S Waste Solutions. Solid waste is collected and taken to the Lake County Transfer Station and Recycling Center (C&S Waste Solutions, 2025).

Natural Gas, Electricity, and Communication Services

Pacific Gas & Electric (PG&E) provides electrical and natural gas services in the vicinity of the Proposed Project. PG&E provides service to approximately 16 million customers. There are existing electrical lines throughout the Proposed Project. Telecommunication service in the area is provided by Mediacom, while multiple carriers provide mobile service.

4.19.3 Impact Assessment

a) Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less-than-Significant Impact.

Water and Wastewater Services. The Project Proposed includes the rehabilitation of wastewater infrastructure across the CLOCWD service area. The Proposed Project would not require new or expanded water or wastewater treatment as the project components support an improved wastewater treatment system and would not require additional infrastructure construction. The District has sufficient capacity to serve the community with water and wastewater treatment. The water demands of the Proposed Project would be minimal and temporary, relating only to construction needs for dust abatement. Therefore, the Proposed Project would not result in the construction or relocation of water or wastewater utilities which could cause significant environmental effects. This is a less-than-significant impact.

Stormwater. The Proposed Project would cause minimal ground disturbance, and any disturbance would be returned to the original condition of the site. An access road would be paved for LS 1 which would cause an increase in impervious surface and the potential for stormwater runoff. The effects of stormwater runoff are addressed in **Section 4.10**. The Proposed Project would not warrant stormwater collection infrastructure as the project would mostly return the surface of the improvement areas to their original condition. Therefore, the impacts related to stormwater would be less-than-significant impact.

Natural Gas, Electricity, and Communication Services. The Proposed Project would not require additional natural gas, electricity, or communication service connections. There would be no relocation or construction of new or expanded electric power, natural gas, or telecommunications facilities which could cause significant environmental effects and therefore no impact.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Less-than-Significant Impact. The water demands for the Proposed Project would be limited to the construction period. Operation of the infrastructure improvements would not require additional water demand. There is sufficient water supplies available from the District to meet these minimal needs. The increase in water demand would be temporary and therefore the impact would be less than significant.

c) Would the project result in a determination by the waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. The District provides wastewater treatment services and maintains a WWTP for the community. The Proposed Project would rehabilitate and improve the collection system and WWTP, creating a more efficient wastewater system to serve the community. The Proposed Project would not cause an increase in wastewater treatment demands and the WWTP has adequate capacity to continue serving the community. Therefore, there would be no impact.

d) Would the project generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less-than-Significant Impact. Lake County Waste Solutions provides solid waste collection services to the vicinity of the Proposed Project. The Proposed Project would generate solid waste during construction. Construction has the potential to generate solid waste related to the replacement of pipelining and pipes. Construction waste would be contained in designated bins and picked up by the waste hauler for disposal. Operation of the Proposed Project would not generate solid waste. Lake County Waste Solutions, operated by C&S Waste Solutions, has adequate capacity to accept the minimal waste produced through construction of the Proposed Project. The Proposed Project would not generate solid waste in excess of any standards or in excess of the capacity of local infrastructure. Therefore, the impact would be less than significant.

e) Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Less-than-Significant Impact. Proposed Project construction and operation would not generate substantial amounts of solid waste and thus, the Proposed Project would not conflict with any federal, State, and local management and reduction statutes and regulations related to solid waste. Further, the Proposed Project would be subject to compliance with existing statutes and regulations by the County, State, or federal law. Therefore, the Proposed Project would have a less-than-significant impact.

4.20 WILDFIRE

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☒	☐	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☒	☐	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

4.20.1 Regulatory Setting

State

California Department Forestry and Fire Protection

State Responsibility Areas (SRAs) are lands in California where CAL FIRE holds legal and financial responsibility for wildfire protection and administers fire hazard classifications and building standards. Local Responsibility Areas (LRAs), on the other hand, include city lands, cultivated agricultural areas, unincorporated non-flammable regions, and lands not meeting the criteria for SRAs or Federal Responsible Areas. CAL FIRE is directed by California PRC Section 4201 through 4204 and California Government Code Section 51175-51189 to map fire hazard zones within both SRAs and LRAs based on factors such as fuels, terrain, and weather. These Fire Hazard Severity Zones (FHSZs) reflect the likelihood of an area burning over a 30- to 50-year period without considering fuel reduction efforts, and they also influence building code requirements aimed at reducing ignition risks in wildland-urban interface areas. Additionally, these maps rate wildlife hazards as "moderate," "high," or "very high" based on factors such as fuel loading, slope, and fire weather.

Local

Lake County General Plan

The Lake County General Plan aims to maintain a high quality of life for Lake County Residents through minimizing natural hazard risks. The following goals and policies are designed to address urban and wildland fire hazards:

Goal HS-7: To minimize the possibility of the loss of life, injury, or damage to property as a result of urban wildland fire hazards.

Policy HS-7.1 – Consultation with Fire Service District: The County shall consult with the appropriate fire service district or California Division of Forestry in areas designated as high and extreme fire hazard, for particular regulations or design requirements prior to issuance of a building permit or approval of subdivisions.

Policy HS-7.4 – Wildland Fire Management Plans: The County shall require the development of wildland fire management plans for projects adjoining significant areas of open space that may have high fuel loads..

Lake County Community Wildfire Protection Plan

The Lake County Community Wildfire Protection Plan (CWPP) is a collaborative strategy developed by local citizens, state, and federal agencies to address wildfire risks. The plan helps the community identify their specific wildfire protection needs and priorities, such as hazard mitigation, community preparedness, and structure protection. The CWPP reflects community input on actions and projects that will assist not only local residents, but also first responders in their efforts to protect lives, property, and the environment. The plan's purpose is to streamline the previous CWPP in accordance with newer guidelines, provide fire safety information to residents, provide information to homeowners to reduce ignitability of their homes, identify recommended fuel reduction projects throughout Lake County, identify Fire Safety resources and groups throughout Lake County, and to promote comprehensive and community-based adaptation to living in a fire adapted ecosystem.

4.20.2 Environmental Setting

The Proposed Project is located on relatively flat land. The Proposed Project improvement areas are identified by CAL FIRE as being within an LRA, except for LS 12, which is in a Federal Responsibility Area given the land's trust status. The FHSZ for the Proposed Project, as recommended by the State Fire Marshal, ranges from a no FHSZ to a Very High FHSZ as shown in **Figure 10** (CAL FIRE, 2025).

4.20.3 Impact Assessment

a) Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

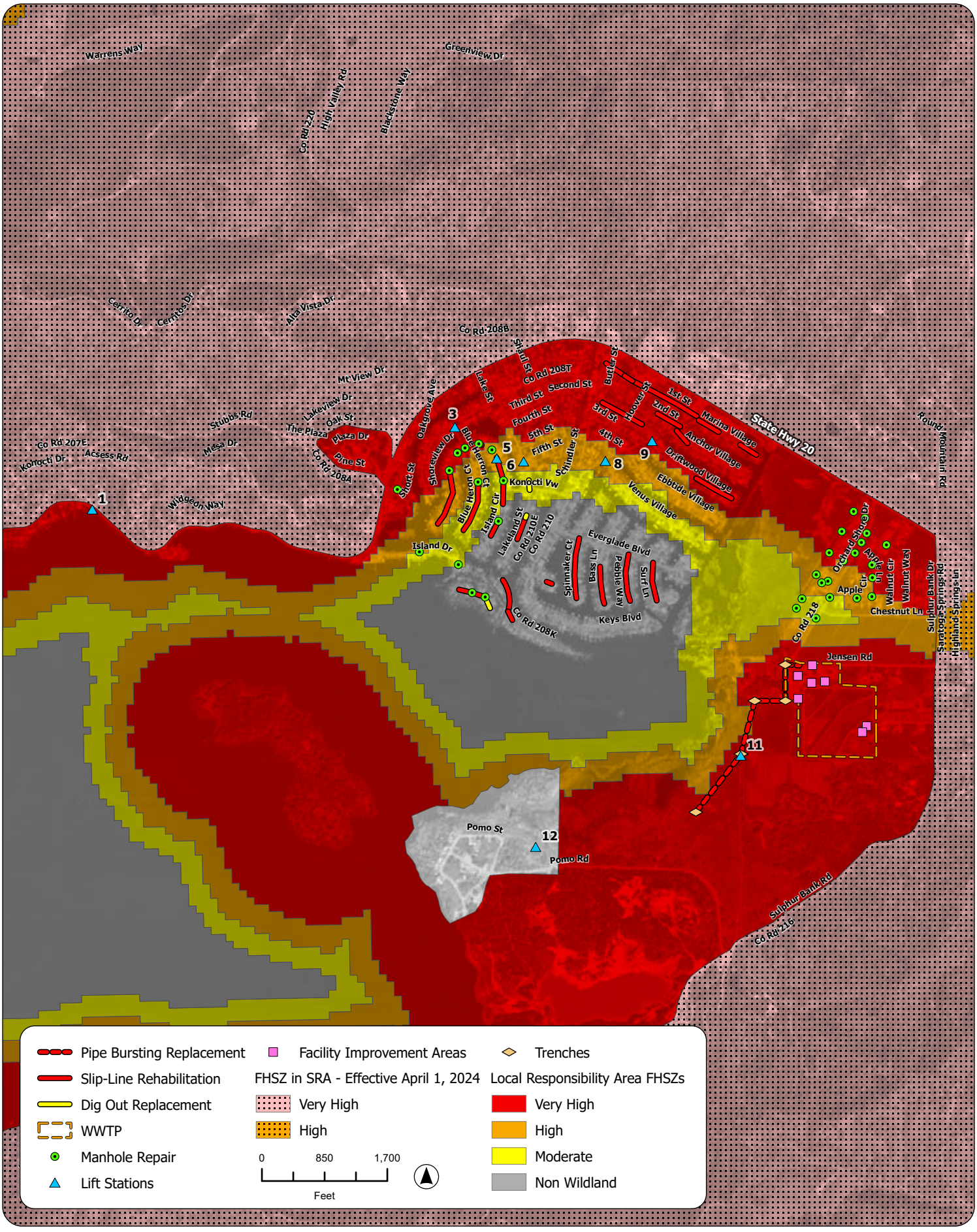
Less-than-Significant Impact. Implementation of the Proposed Project would not alter the existing land use in the improvement areas. Additional vehicles would be required during construction, which would increase evacuation traffic in case of an emergency, but operation of the Proposed Project would not impact any adopted emergency response plan or emergency evacuation plan. Impacts related to construction traffic are discussed in **Section 4.17**. As such, the Proposed Project would have less-than-significant impact.

b) Due to slope, prevailing winds, and other factors, would the project exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Less-than-Significant Impact with Mitigation. The Proposed Project is located on relatively flat land with minimal slope and is not subject to strong prevailing winds or other factors that would exacerbate wildfire risks. Additionally, a large portion of the Proposed Project is bordered by Clear Lake. However, the Proposed Project was identified by the State Fire Marshal as a Very High FHSZ in some areas (CAL FIRE, 2025). While there are no strong prevailing winds, in order to reduce the potential risk of wildfire, **Mitigation Measure WILD-1** mandates actions to reduce fire risk during construction. Furthermore, the Proposed Project would be developed and operated in compliance with all current California Fire Code regulations Therefore, the Proposed Project would have a less-than-significant impact with mitigation incorporated.

c) Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Less-than-Significant Impact with Mitigation. The Proposed Project includes the installation of a roadway along Clear Lake at LS 1. As discussed above, construction of the Proposed Project could increase the risk of a wildfire, although **Mitigation Measure WILD-1** would be incorporated to reduce these impacts. The nature of the Proposed Project would not require maintenance that would exacerbate fire risk or result in impacts to the environment. Therefore, the Proposed Project would have a less-than-significant impact with mitigation.



SOURCE: ESRI, 2025; Google Earth Aerial Photograph, 5/2024; CalFire, 2024/2025; Acorn Environmental, 12/4/2025

Figure 10

Fire Hazard Severity Zones

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

No Impact. The Proposed Project is located on relatively flat terrain and would not involve significant ground disturbance that would alter the existing conditions of the site. The existing conditions of the Proposed Project do not expose people or structures to significant risks, including downslope, downstream flooding, or landslides as a result of fire impacts. The Proposed Project would also not result in drainage changes. Therefore, the Proposed Project would have no impact.

4.20.4 Mitigation Measures

WILD-1: During construction, staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a fire break. Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles, heavy equipment, and chainsaws.

4.21 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

4.21.1 Impact Assessment

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less-than-Significant Impact with Mitigation. The potential project-related impacts to the habitats of plant and wildlife species is addressed in **Section 4.4** of this document. **Mitigation Measure BIO-1** and **BIO-2** have been identified to address potential impacts to biological resources and reduce these impacts to a less-than-significant level. The Proposed Project would not substantially restrict the range or number of endangered plants or animals, nor would it impact historical resources.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Less-than-Significant Impact with Mitigation. CEQA Guidelines Section 15064(i) states that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of a project are cumulatively considerable. The Proposed Project would have the potential to result in impacts to the environment, but these impacts, in addition to being fully mitigated, are primarily related to construction and are therefore short-term and temporary. Long-term operation impacts of the Proposed Project are minimal and existing ordinances and regulations exist to ensure that compliance with statutory and regulatory standards is maintained throughout the operational life of the Project. Where applicable, the Initial Study identifies mitigation measures to potential environmental impacts resulting from implementation of the Proposed Project. Potential impacts resulting from Project are therefore considered less than significant with incorporation of mitigation measures.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less-than-Significant Impact with Mitigation. The analyses of environmental issues contained in this Initial Study indicate that the Proposed Project is not expected to have substantial impact on human beings, either directly or indirectly. Mitigation Measures listed above will be enacted to reduce potential impacts to less than significant. Standard requirements and conditions of approval have been incorporated in the Proposed Project to reduce all potentially significant impacts to less than significant. Therefore, the Proposed Project would have a less-than-significant impact.

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Appendices

Appendix A

Wastewater Infrastructure and Rehabilitation Projects Phase 4-DFA SRF Grant Request Technical Memo No. 1

CLOCWD
Technical Memo No. 1
WASTEWATER INFRASTRUCTURE AND REHABILITATION PROJECTS
PHASE 4- DFA SRF GRANT REQUEST

Project No. C-06-8056-210 (Original)
April 2025

SECTION 1 - Supporting Documents for Phase 4 Grant Request

1) CLOCWD/USDA RD Wastewater Preliminary Engineering Report, dated 3/2014 (Refer to FAAST)
2) CLOCWD/SWRCB Wastewater Collection System Infiltration/Inflow Analysis and Mapping Program Project Report, dated 12/2015 (Refer to FAAST)
3) CLOCWD/SWRCB Wastewater Collection System Infiltration/Inflow Analysis and Mapping Program Project Report (Revised/Updated - 2017) (Refer to FAAST)
4) CLOCWD Recycled Water Feasibility Study, Date 1/2018 (Refr to FAAST)
5) CLOCWD WWTP Groundwater Monitoring Well Disinfection and Re-Development Workplan, May 2022 – CRWQCB (Refer to FAAST)
6) Report Of 20 October 2021 Inspection, Clearlake Oaks County Water District Wastewater Treatment Facility, Lake County – Guy Childs RWQCB - 2021/2022 (**Refer to Exhibit 1A)**
6) RWQCB Cleanup and Abatement Order (**CRWQCB CAO R5-2014-0700)** (Refer to FAAST)
7) Supporting Environmental Documents (Initial Study, ISMNDs and Amended ISMNDs) Refer to FAAST)
8) Completed Plans and Specifications for CLOCWD Lift Stations (1, 3, 5, 6, 8, and 9) – Phase 2 Project (Refer to FAAST)
9) Completed Plans and Specification for I/I Rehabilitation Projects (Various Locations) – Phase 3
10) Completed Plans and Specifications for Oxidation Ditch (WWTP), LS Nos. 1, 3, 5, 6, 8, and 9, and specifications prepared for sewer collection system rehabilitation (CIPP and manhole). Improvements (Refer to FAAST)
11) **Approved Grant Agreement No. D17-04010 (Project No. C-06-8056-210)** that included various projects that were pre-approved for construction. Also refer to **Attachment A** for projects 1-10**. (Refer to Exhibit 1B, attached)**
12) CLOCWD/SWRCB Wastewater Collection System Infiltration/Inflow Analysis and Mapping Program Project Report – Appendices (2017/18) **(Refer to Exhibit 1C)**
13) CLOCWD USDA Wastewater System Improvements – Lift Station Upgrades/Improvements Tech Memo No. 2. **(Refer to Exhibit 1D)**
14) CLOCWD USDA Wastewater - Technical Memo No. 1 (USDA PER**) (Refer to Exhibit 1E)**

SECTION 2 - Objective

The overall objective of this Phase 4 Technical Memorandum No. 1, for the submitted Phase 4 Grant Request, is to provide the staff of the SWRCB SRF DAC Program with additional and existing detailed pre-design information for current projects that were cost-effectively recommended by the Engineering Team and have been included under the regulatory umbrella of the **RWQCB CAO No. R5-2014-0700.** This Tech Memo will provide the necessary backup information, costs, alternative evaluations (updated), and final funding request under the SWRCB DFA SRF Program.

The various listed projects are shown within **Phase 4 -Revised Project List and Cost Table Matrix for SWRCB DFA SRF Grant Submittal (Attachment A)** and are considered a part of the CRWQCB CAO and include two phases for which construction grant funding is being requested:

1) **Phase 4A** (Critical)- Current approved construction grant projects that were approved under **SWRCB Grant Agreement No. D17-04010 (Project No. C-06-8056-210)**. with typically are at a 95% design completion phase and have had environmental clearance (NOD) under CEQA and NEPA.
2) **Phase 4B** (Important)- Most of the projects were cost-effectively evaluated within past project reports and have environmental clearance but haven't started design. All projects as shown within the Project Cost Table and Matrix **(Attachment A)** were thoroughly evaluated within various project reports and documents, as noted above.

All listed projects and, as shown by **Attachment A,** are described and detailed within existing approved project reports with figures and tables that were prepared with funding from the SWRCB and USDA and closely adhered to SWRCB project report guidelines. These reports have been reviewed by the staff of the SWRCB. CLOCWD staff and the Engineering Team (Team) have respectively included all listed projects as a part of the required CEQA and NEPA environmental review process with hearings, approvals, and accompanying NODs. Protocols and processes were closely followed, as they relate to communication(s) and consultations (Senate Bill 35) with the local native American tribes on past projects (Phases 1, 2, 3, and 4). The environmental process also included the preparation and approvals of Initial Studies, ISMNDs, NODs, and other environmental certifications. These environmental documents have been updated and have been submitted into the FAAST application for this Phase 4 funding request.

The Team has closely followed all SWRCB guidelines and conditions as provided for in the existing grant agreements and associated FBA's. It is important to note that to date, three (3) phases of design and construction work have been completed and as recommended and approved as per **SWRCB Grant Agreement No. D17-04010 (Project No. C-06-8056-210)**. These projects were either part of the past bidding process or were never included for construction due to a maximum SWRCB grant limitation of $8,000,000 (5-year requirement) and were ultimately eliminated through the FBA process.

All **Phase 4A and 4B** projects are still highly recommended for completion due to deficiencies and needs, as outlined within the attached reports and characterized within the CAO. Over the last 5 years these deficiencies have created on-going and serious potential water quality violations. A very important and critical part of this current SWRCB Phase 4 Construction Grant request are those specific projects relating to the old and deteriorating collection system and the associated I/I rehabilitation projects. These rehabilitation projects were identified within the CLOCWD/SWRCB Wastewater Collection System Infiltration/Inflow Analysis and Mapping Program Project Report (Revised/Updated - 2017). Again, **only a small portion** of the identified and recommended collection system pipeline rehabilitation projects were funded under **Phase 3** SWRCB Grant funding program, due to the grant funding cap. There are over 700 pipeline and manhole deficiencies remaining that are currently contributing to the CLOCWD's high I/I wet-weather flows. It should be assumed that the collection system pipelines comprised primarily of VCP and ACP pipe have contributed to both excessive I/I that affects the existing lift stations and the WWTP, along with exfiltrating raw sewage into Clear Lake being caused, in part, by frequent high groundwater conditions, since the pipelines are within the keys and peninsulas' of eastern Clear Lake.

SECTION 3 - General Description of Projects as Requesting Grant Funding (Phase 4)

PHASE 4A ***– Identified Projects with Completed Plans and Specifications Requesting Grant Funding*** : The following are those recommended projects that have completed plans and specifications that were identified as recommended projects, but were not completed due to SWRCB funding limitations (refer to **Attachment A**).

4A.1) Lift Station No. 1 Rehabilitation
4A.2) Lift Station No. 3 Rehabilitation
4A.3) Lift Station No. 5 Rehabilitation
4A.4) Lift Station No. 6 Rehabilitation
4A.5) Lift Station No. 8 Rehabilitation
4A.6) Lift Station No. 9 Rehabilitation
4A.7) Collection System Rehabilitation (Pipelines and Manholes)
4A.8) Project Report/Grant Application Updates (Planning Updates and Application Costs)
4A.9) Oxidation Ditch Upgrades (WWTP)
4A.10) Lift Station 11 (Ejector) Bypass and Pipeline Replacements
4A.11) Sludge Drying Bed Improvements

The above-mentioned projects will still require minor modifications to specifications. Our Team will supply copies of the completed plans and specs. and include in the 2025 FAAST update for CLOCWD Phase 4 Project.

PHASE 4B ***– Identified Projects w/out Plans and Specifications Requesting Grant Funding:*** The following are those recommended projects But Were included within the Planning Level Project Documents and Environmental Reports and corresponding certifications (Attachment A):

4B.12) Groundwater Monitoring Well (WWTP)
4B.13) Electrical Panel Upgrades at WWTP
4B.14) Sludge Pond No. 2 Poly Lining
4B.15) Upgrade CL2 Basin with concrete Structures and Appurtenances
4B.16) WWTP Facility/Building Improvements
4B.17) New Filter Press for WTP Backwash Sludge/Algae (Pending Further Review)

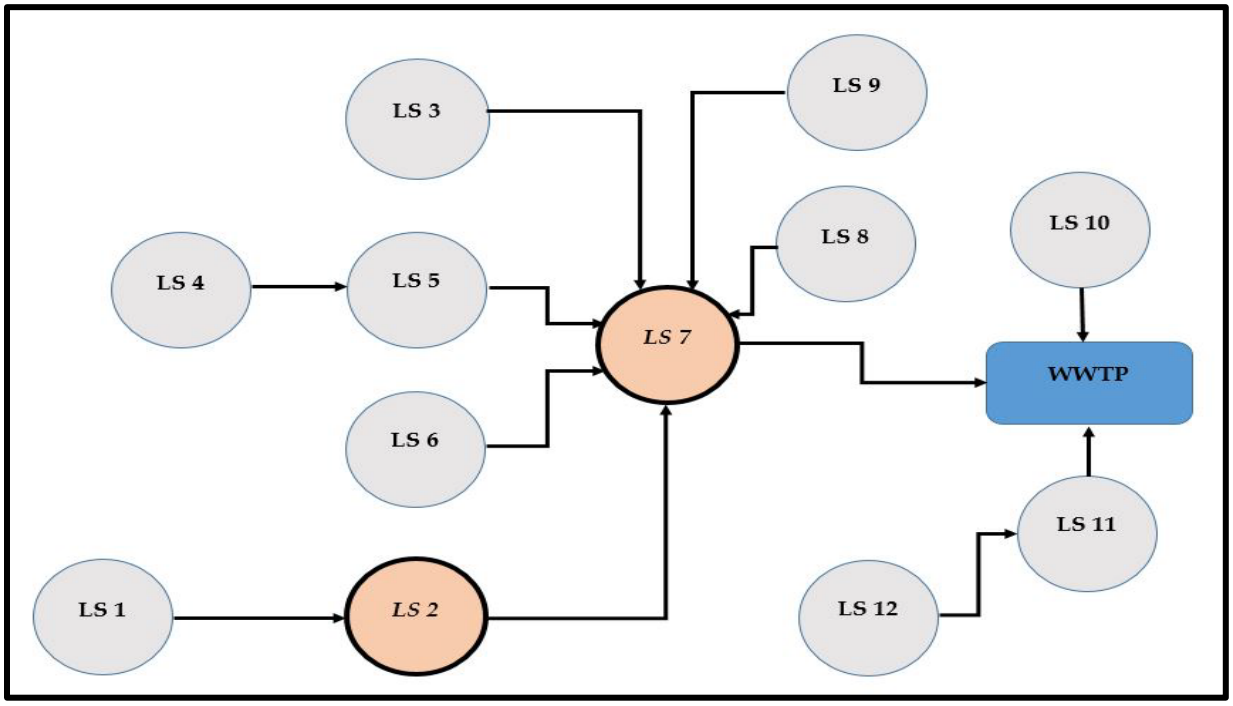
SECTION 4 - Project Descriptions and Needs Analysis

This section of the Tech Memo will provide references from past reports along with a revised project description that will illustrate the wastewater facility location and current needs, as associated with the **RWQCB CAO No. R5-2014-0700.** Since the preparation of the past reports there have been ongoing operational issues stemming from existing facility conditions. The District continues to make repairs to portions of the collection and treatment facilities on an emergency basis and as funds become available during the annual budgeting process, serious system-wide deficiencies still exist, including those that are identified within CAO **No. R5-2014-0700. The completed Phase 3 SWRCB construction grant also provided funding for the installation of electrical control panels to most of the lift stations, with the limited and capped SWRCB funding per Agency.**

PHASE 4A PROJECTS (REFER TO ATTACHMENT A – PROJECT COST TABLE)

The Phase 4A projects have been problematic for the last 11 years and include both facilities at WWTP and within the collection system. Other project costs and associated grant requests include those soft cost expenditures related to updates to project costs and other construction grant application preparation costs (FAAST).

Projects 4A.1 – 4A.6 (LS Nos. 1,3,5,6,8, and 9), and 4A.10 (LS No. 11) are for rehabilitation of existing lift stations as depicted below. It is important to note that Lift Stations No. 2 and Lift Station No. 4 have been fully rehabilitated under the Phase 3 portion of this grant project, which included the construction of a new Lift Station No. 7 and upgrading both Lift Stations 2 and 4.

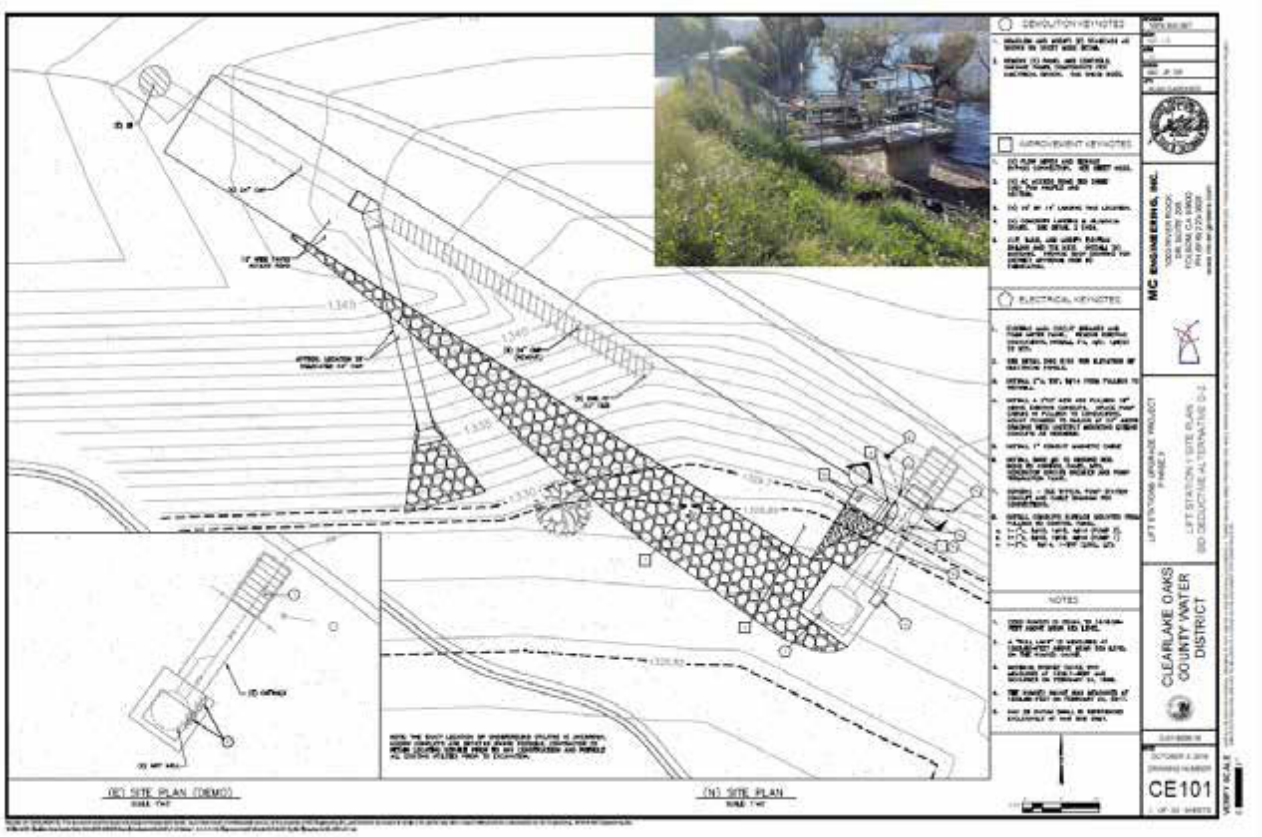


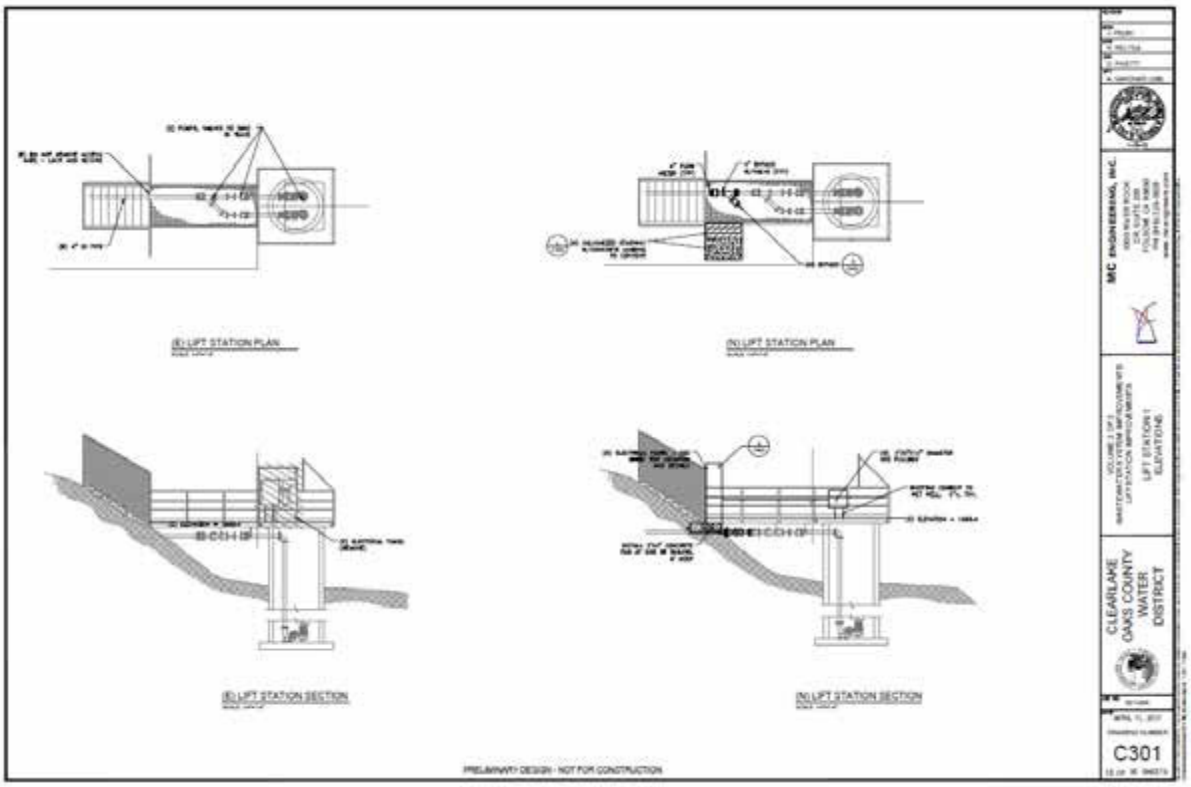
4A.1) <u>Lift Station No. 1 Rehabilitation - Description</u>

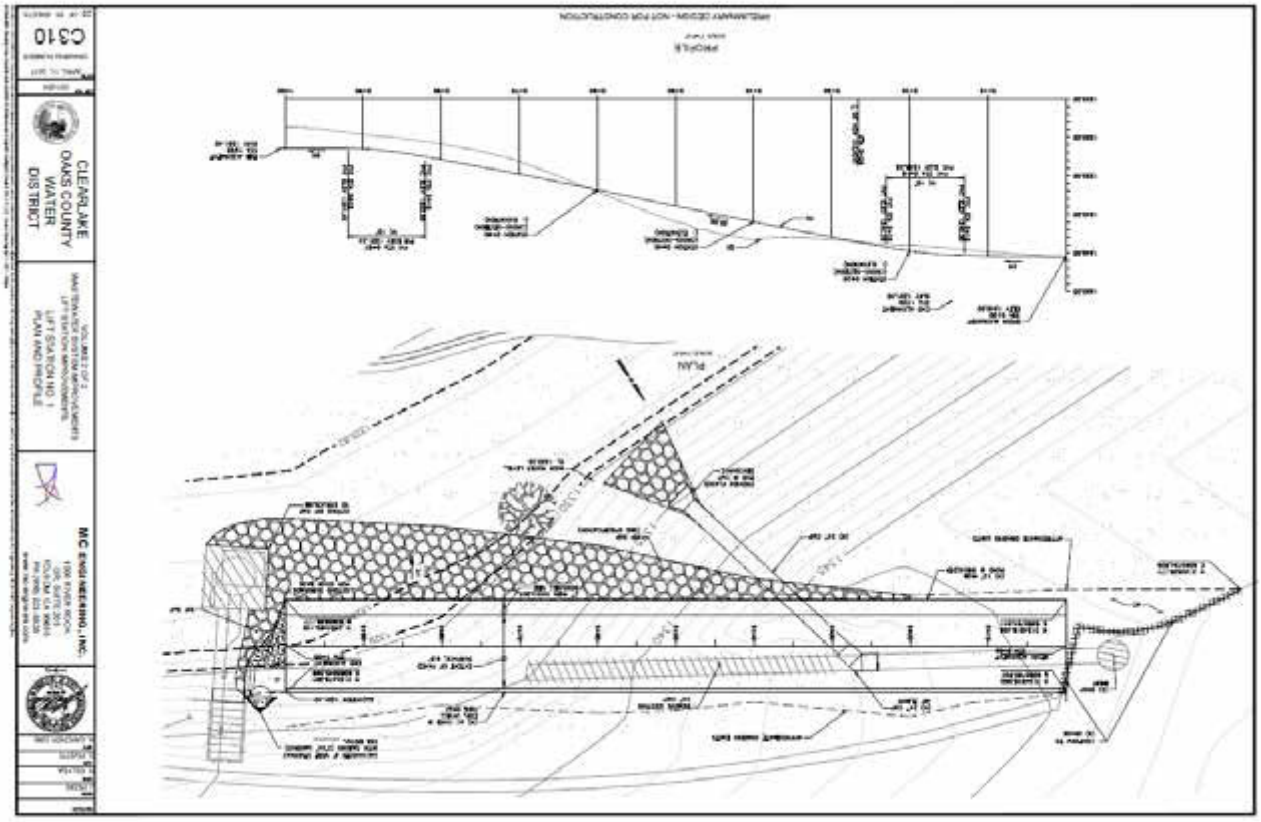
<u>Project Description:</u> Lift Station No. 1 is located adjacent to Hwy 20 and is within the 100-year flood plain of Clearlake. Please refer to portions of the USDA PER Report for additional project descriptions. This project includes the addition and installation of emergency-related appurtenances since it is located on the Clear Lake. The appurtenance

includes the construction of an access road for safe access and to allow for the emergency installation of portable generators and trash pumps in the event of failures to the station. **The project cost $469,686.**

Photos and Plans: Refer to **Attachment B1 – Photos and construction drawings.**







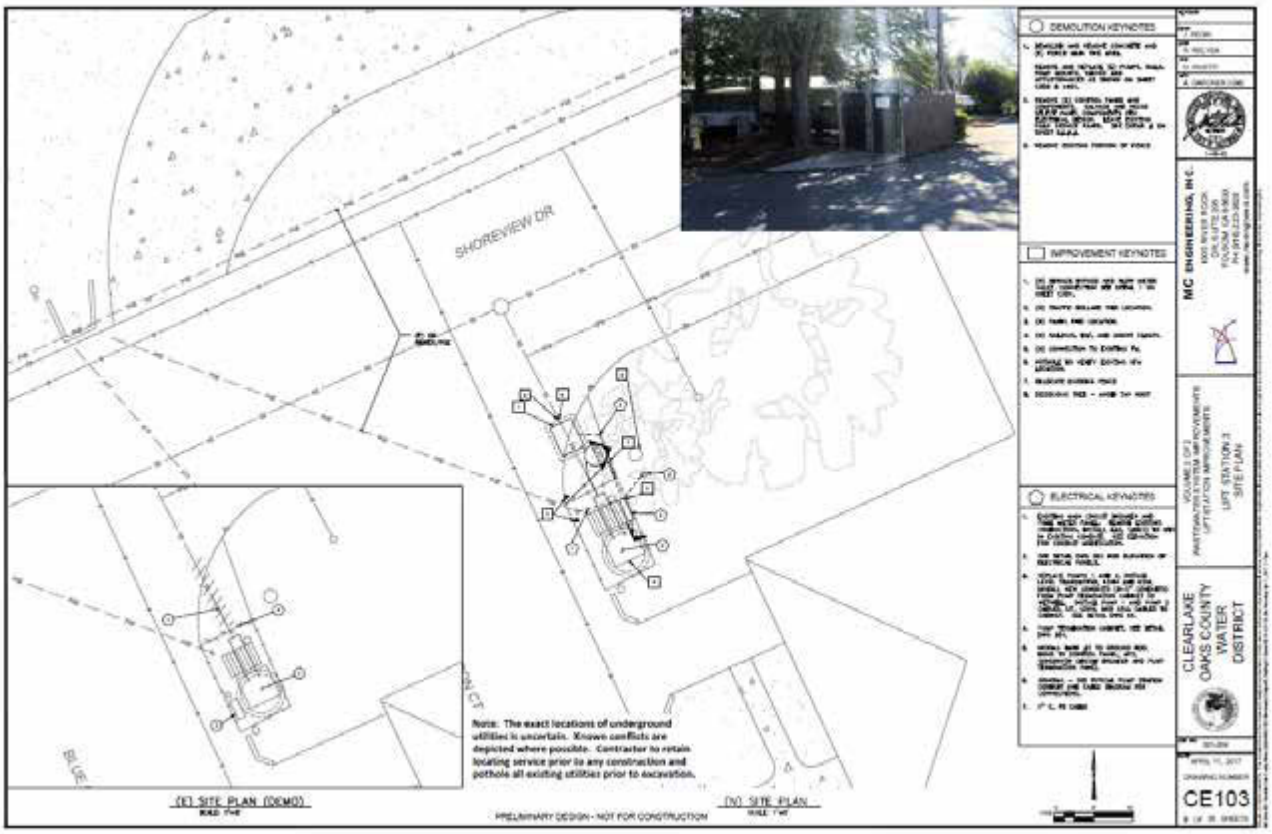
Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

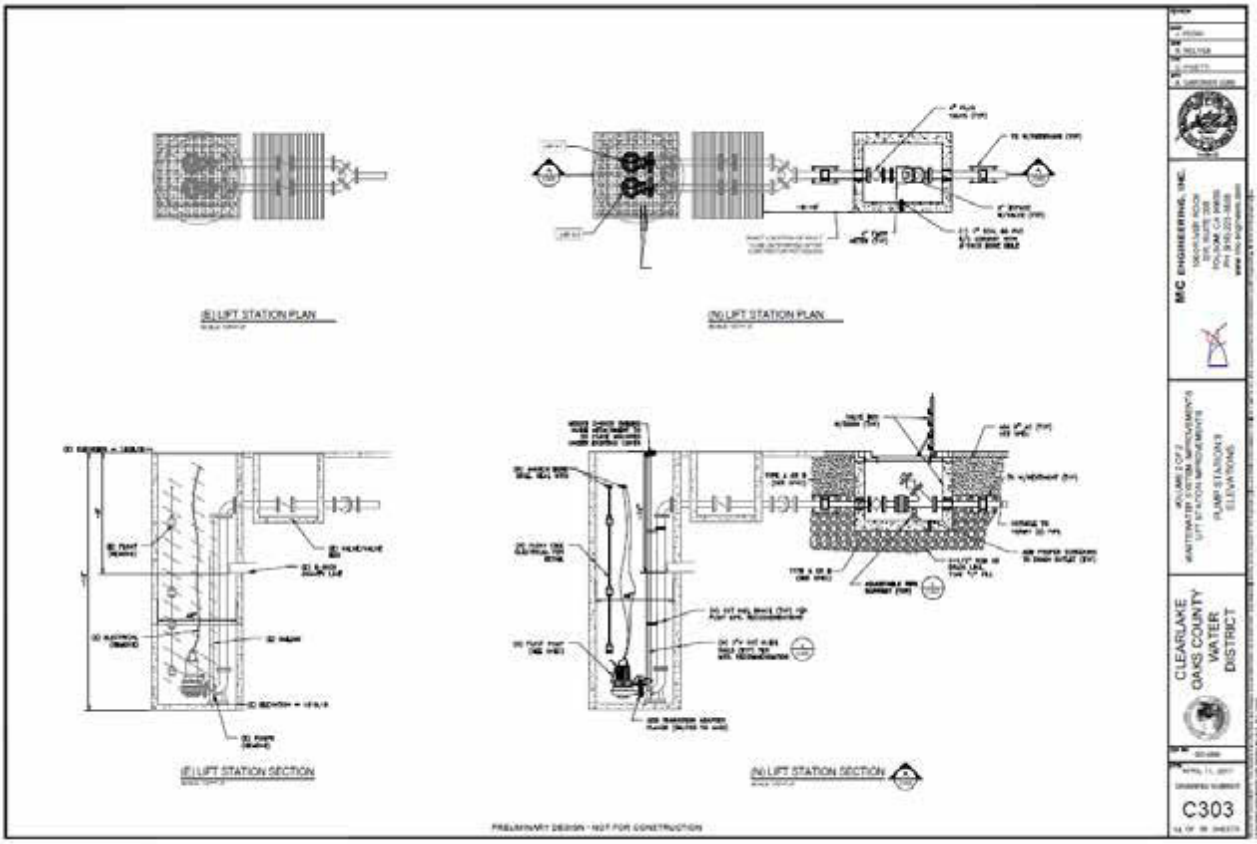
Project Needs and Deficiencies: There is no vehicle and truck access to the wet well and pumps. Access is only acquired by parking on the north side of Hwy 20 and crossing the highway on a dangerous curve. If the LS was to fail, there is no quick connect bypass or method to handle emergency LS overflows. This project includes adding a new control and SCADA panel, including new wiring, due to age and deterioration. A very important recommendation includes (1) the addition of an access driveway to perform maintenance and remove pumps from time to time and to deliver and operate emergency generators and/or pumps and trucks during outages. And this cannot be done due to the current access on the north side of Hwy 20, and (2) the need for a quick connect assembly to handle overflows from the wet well.

4A.2) Lift Station No. 3 Rehabilitation- Description

Project Description: Lift Station No. 3 is located adjacent to Blue Heron Street and has limited access. LS No. 3 requires new electrical wiring and controls, new valve box, and addition of quick connect assembly. **The project cost $ 308,880.**

Photos**:** Refer to **Attachment B2 - Photos and construction drawings.**


SHOREVIEW DR
DEMOLITION KEYNOTES
IMPROVEMENT KEYNOTES
ELECTRICAL KEYNOTES
Note: The exact locations of underground utilities is uncertain. Known conflicts are depicted where possible. Contractor to retain locating service prior to any construction and potholes all existing utilities prior to excavation.
(E) SITE PLAN (DEMO)
(N) SITE PLAN
PRELIMINARY DESIGN - NOT FOR CONSTRUCTION
MC ENGINEERING, INC.
CLEARLAKE OAKS COUNTY WATER DISTRICT
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION #3
SITE PLAN
CE103


(E) LIFT STATION PLAN
(N) LIFT STATION PLAN
(E) LIFT STATION SECTION
(N) LIFT STATION SECTION
PRELIMINARY DESIGN - NOT FOR CONSTRUCTION
MC ENGINEERING, INC.
CLEARLAKE OAKS COUNTY WATER DISTRICT
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION #3
PUMP STATION 3 ELEVATIONS
C303

Corrosion and Guide Rails Failing (2016 Pic)



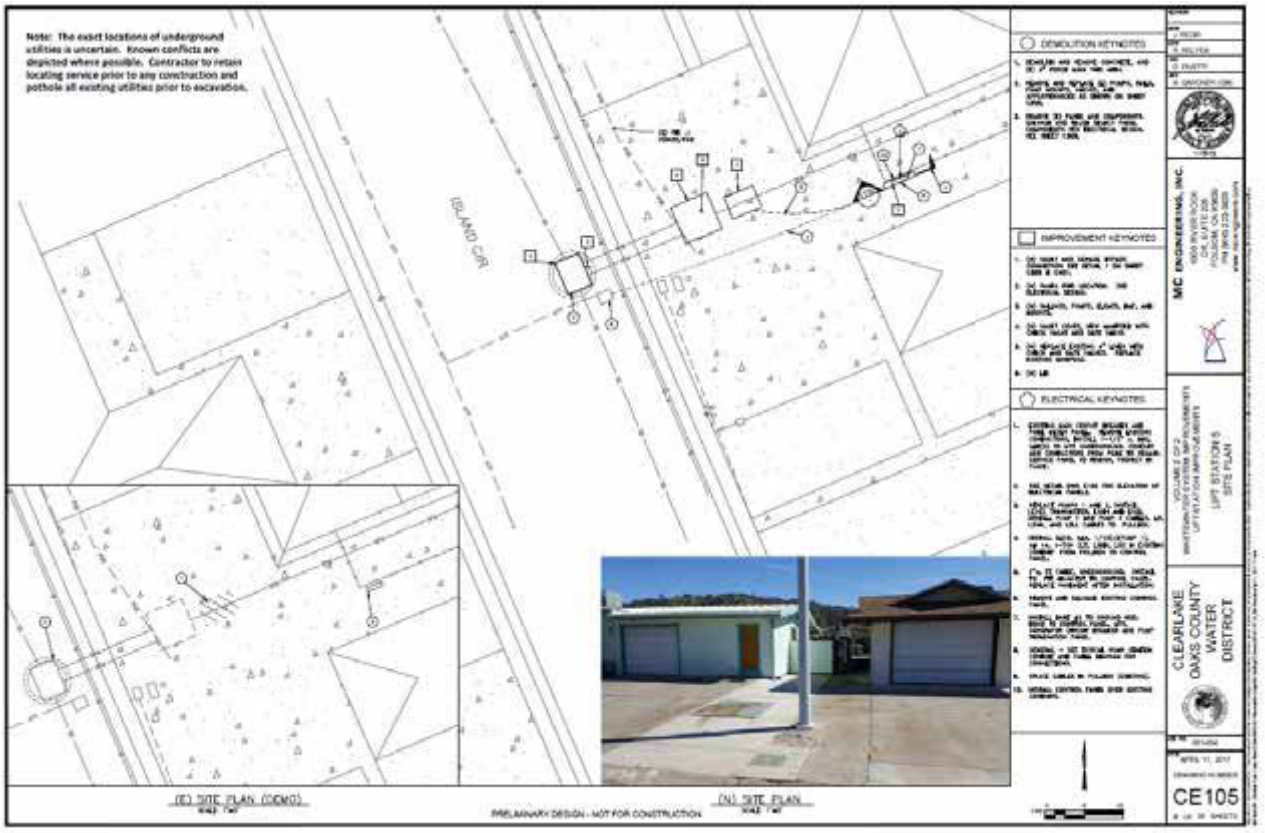
Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

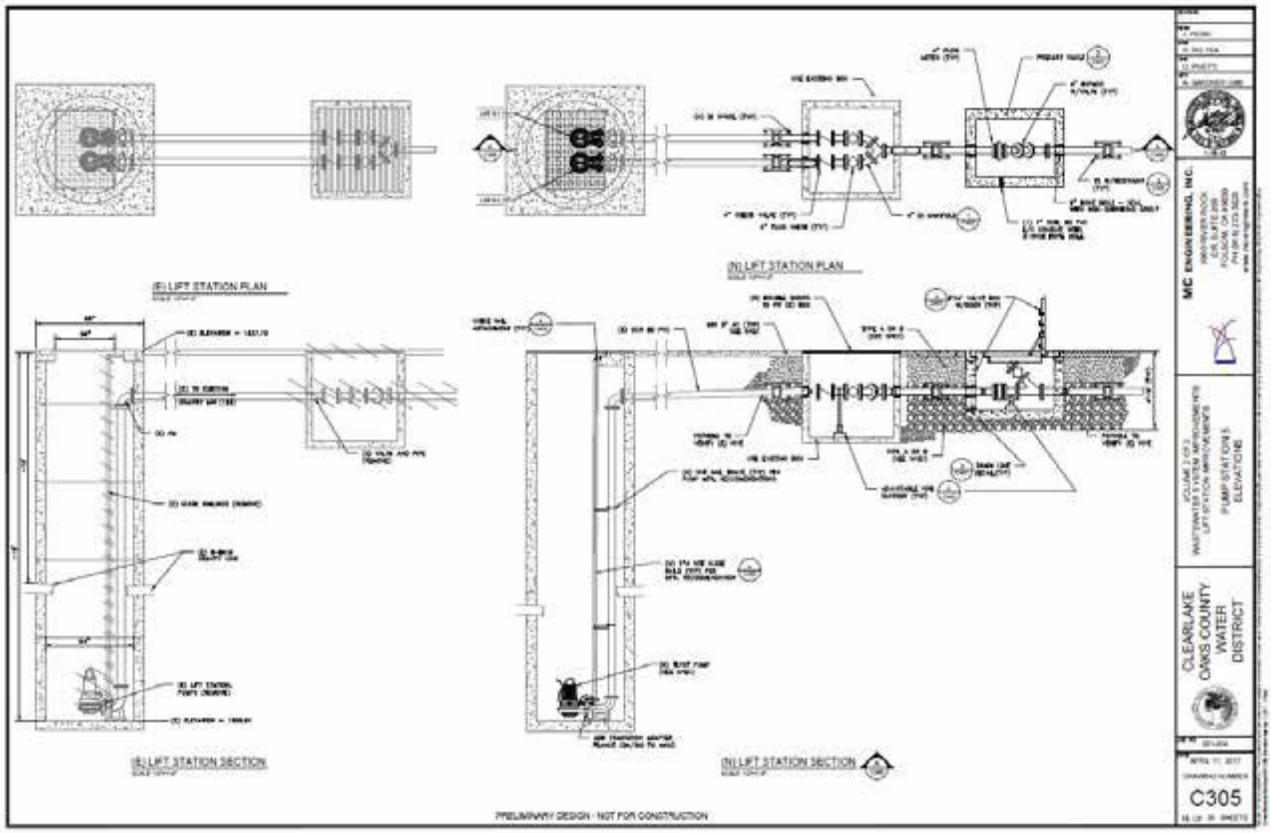
Project Needs and Deficiencies: This lift station is over 40 years old and has no emergency related appurtenances, including an emergency quick connect assembly. The valving and valve box does not have a quick connect bypass assembly in the event of a pump station outage. A portion of the electrical wiring needs to be replaced. The surrounding chain link fence may need to extend with the addition of the new bypass structure and valve box. The current E/C panel was replaced as a construction project under the Phase 3 Grant.

4A.3) Lift Station No. 5 Rehabilitation- Description

Project Description: Lift Station No. 5 is located on Island Circle and is located within the roadway with access from a small manhole style wet well and entry access. The control E/C panel is located off-site on public R/W. **The project cost $385,482.**

Photos: Refer to **Attachment B - Photos and design construction drawings below:**





Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

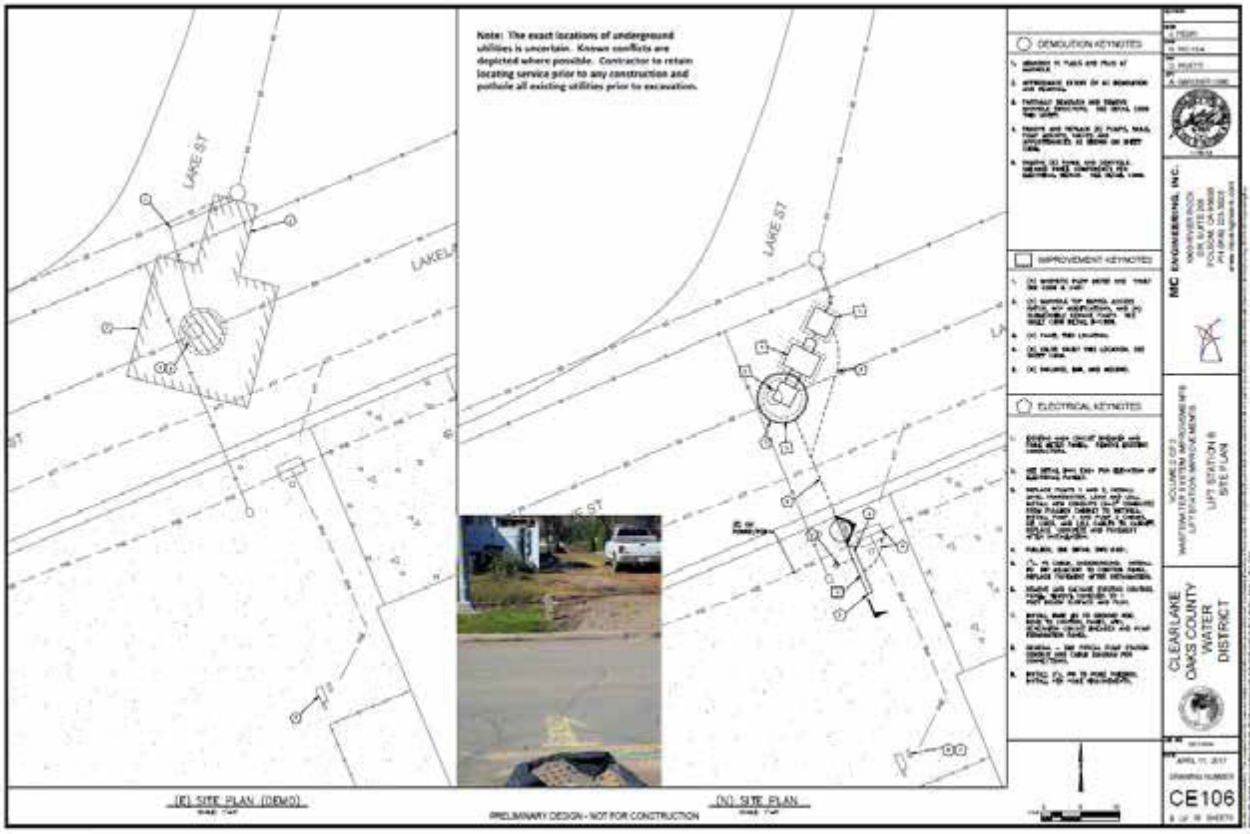
Project Needs and Deficiencies: This lift station is over 40 years old and is similar in style to LS Nos. 4 (Rehabilitated under the Phase 3 SWRCB Grant), LS no. 6, LS no. 8, and LS No. 9. All referenced lift stations are problematic and have failed over the last 10 years. In

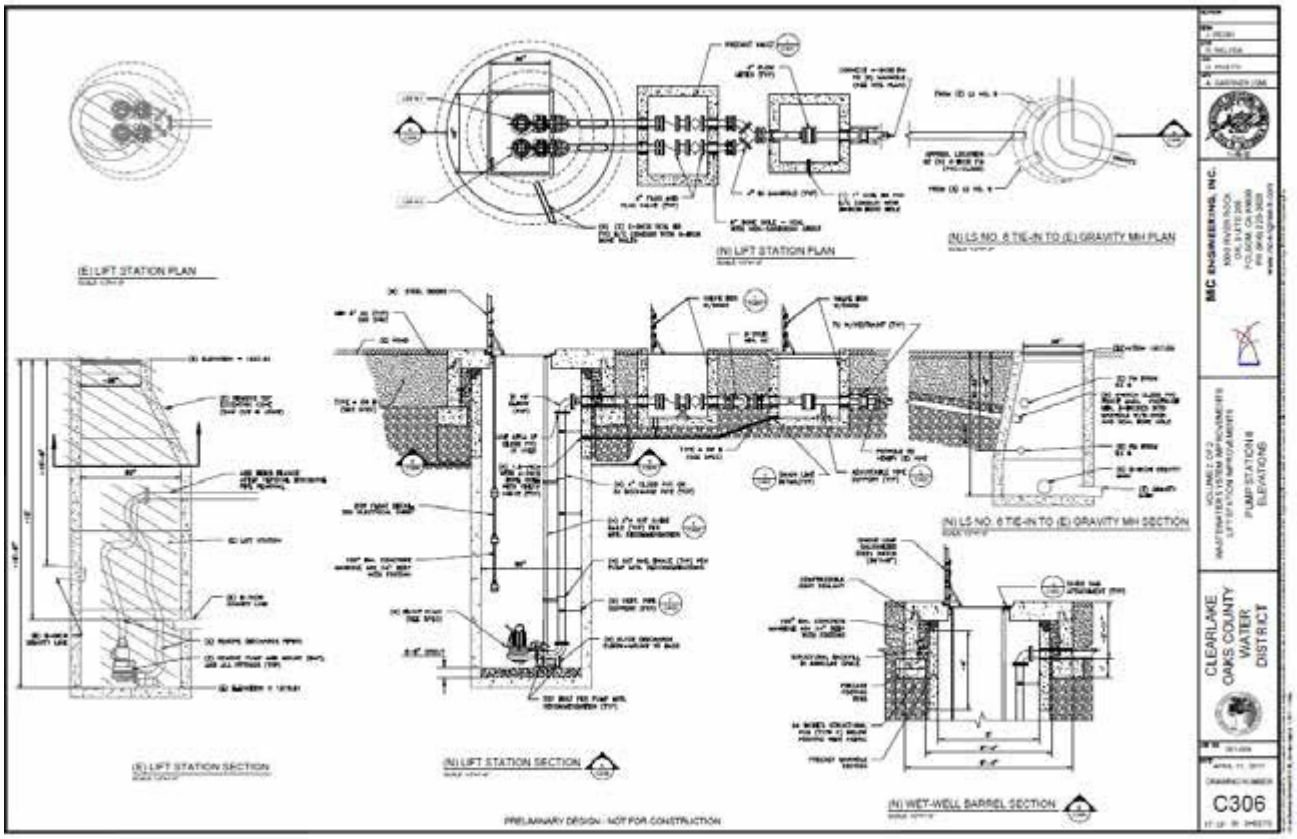
some cases, the slide/guide rails are non-existent, and the pumps are difficult to access and pull which is compounded by the manhole style wet wells. The District has no ability to address a catastrophic failure due to lift station outage, which would typically include the addition of a quick connect emergency bypass structure, along with provisions to install an emergency standby generator.

4A.4) <u>Lift Station No. 6 Rehabilitation- Description</u>

<u>Project Description:</u> Lift Station No. 6 is located on Lake Street and is located within the roadway with access from a manhole style wet well. The control panel is located off-site on public R/W. The new construction will consist of a new wet-well, pumps, rails, valves, valve boxes, and a quick connect assembly with valve box for catastrophic failures. **The project cost $385,482.**

<u>Photos:</u> Refer to **Attachment B - Photos and design construction drawings below:**





Visual of Confined Space and Corrosion (Typical LS 8 and 9)



Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

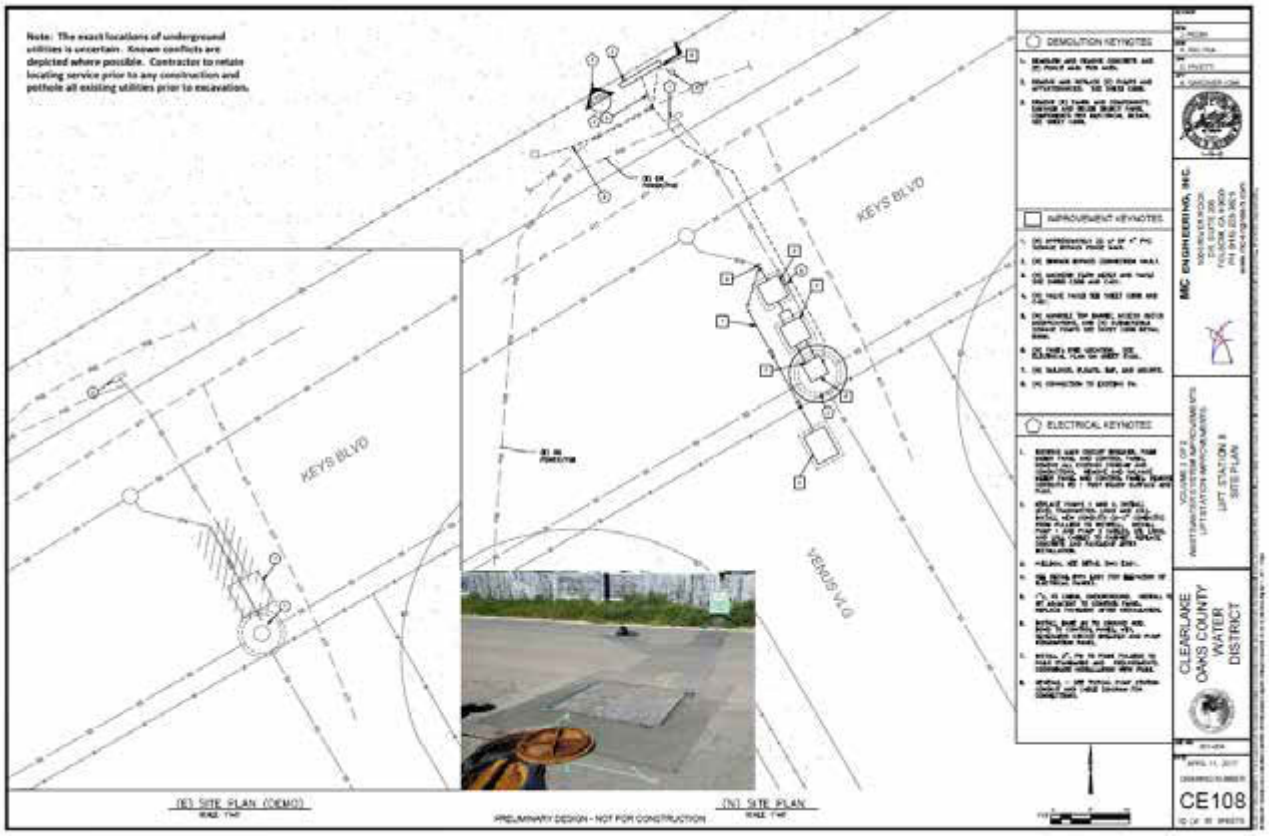
Project Needs and Deficiencies: This lift station is over 40 years old and is similar in style to LS Nos. 4 (Rehabilitated under the Phase 3 SWRCB Grant), LS no. 5, LS no. 8, and LS No.

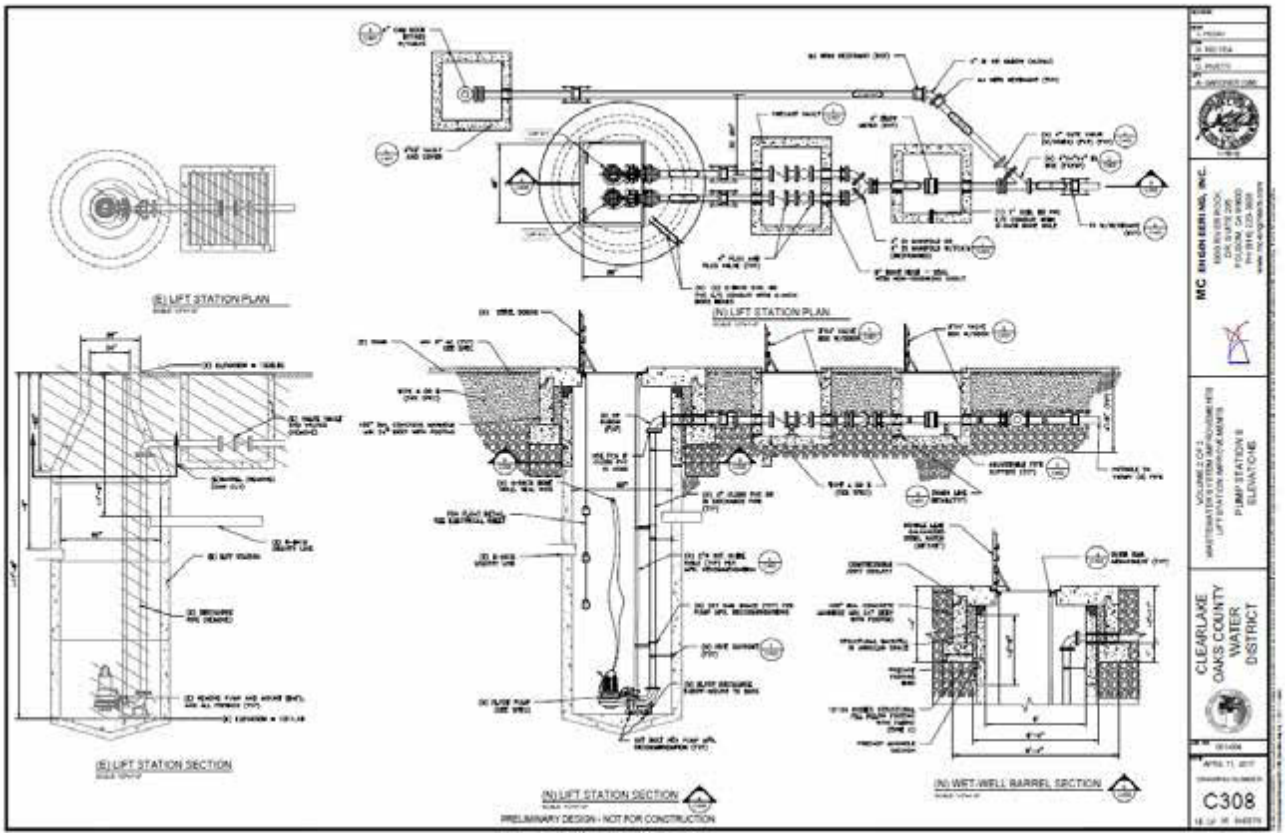
9. All referenced lift stations are problematic and have failed over the last 10 years. In some cases, the slide/guide rails are non-existent, and the pumps are difficult to access and remove which is compounded by the manhole style wet wells that fail to meet Cal OSHA standards, due to narrow entrance. There are no required appurtenances, including a quick connect assembly to allow for emergency pumping from wet-well during lift station catastrophic failure(s). The existing gate valves need to be replaced along with old and deteriorated electrical wiring. The E/C panel was replaced as part of the Phase 3 Project.

4A.5) <u>Lift Station No. 8 Rehabilitation- Description</u>

<u>Project Description:</u> Lift Station No. 8 is located at the intersection of Venus Village and Keys Blvd. and is located within the roadway with access from a small manhole style wet well, limiting access to pumps and floats. The control panel is located off-site on public R/W. The new construction will consist of a new wet-well, pumps, rails, valves, valve boxes, and a quick connect assembly with valve box for catastrophic failures. This lift station requires a new emergency quick connection assembly and possible relocation of electric and control panel and wiring. The existing panel is located adjacent to a customer's garage. **The project cost $365,405.**

<u>Photos:</u> Refer to **Attachment B - Photos and construction drawings.**





Corrosion with Exposed Wiring and Lack of Access



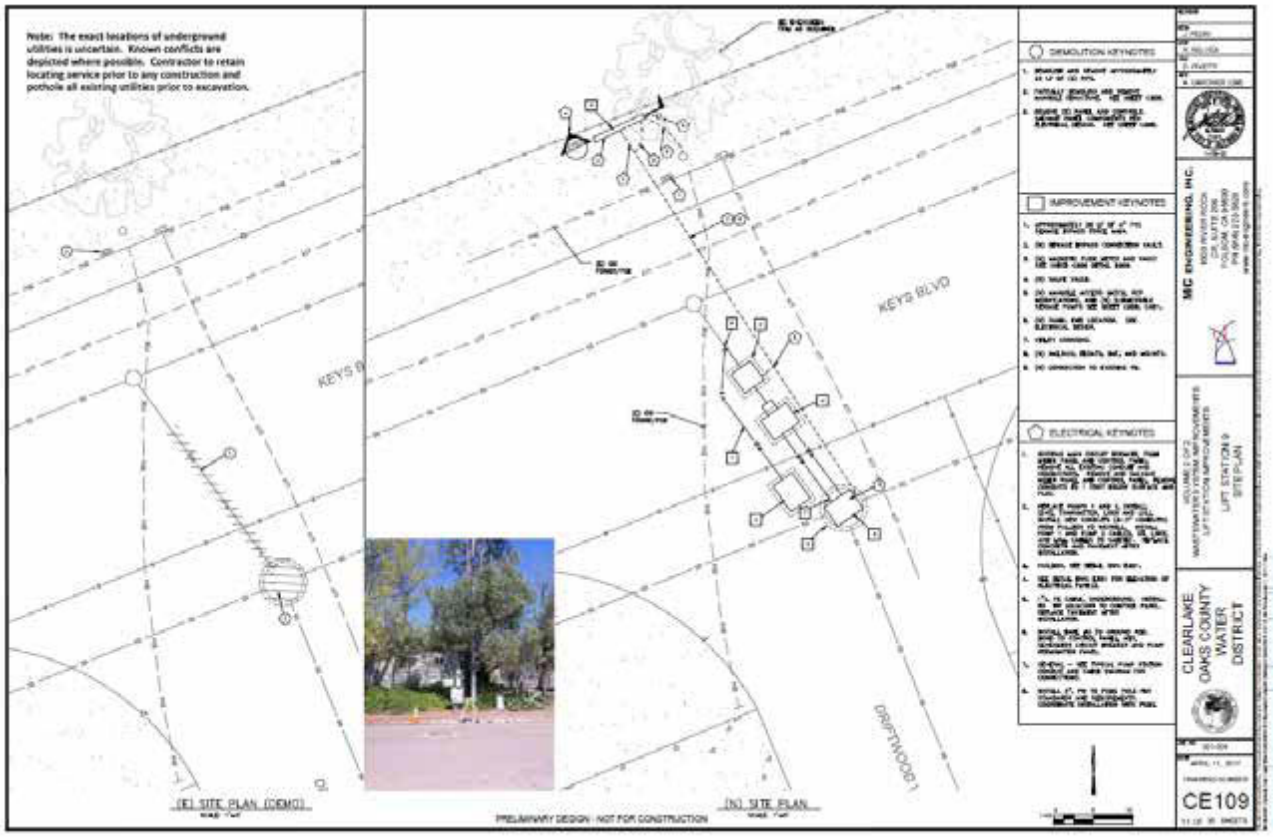
Reference Report and Corresponding Section(s): **Refer to Tech Memo No. 2 – Lift Stations** and reference material as found **in Section 1**, above, for related documents along with references as listed within **Attachment A**.

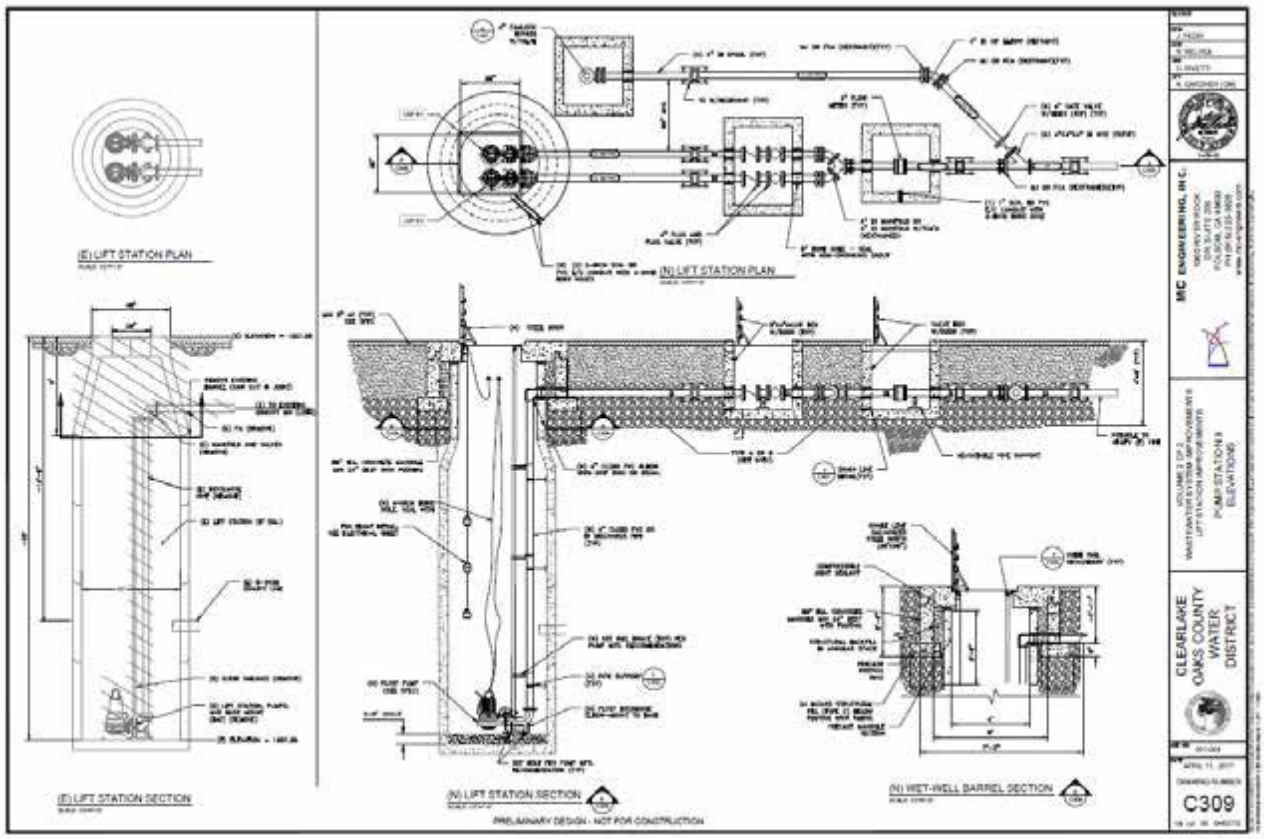
Project Needs and Deficiencies: This lift station is over 40 years old and is similar in style to LS Nos. 4 (Rehabilitated under the Phase 3 SWRCB Grant), LS no. 5, LS no. 8, and LS No. 9. All referenced lift stations are problematic and have failed over the last 10 years. In some cases, the slide/guide rails are non-existent, and the pumps are difficult to access and pull which is compounded by the manhole style wet wells with no safe way to access fails to meet Cal OSHA standards, due to narrow entrance. There are no required appurtenances, including a quick connect assembly to allow for emergency pumping from wet-well during lift station catastrophic failure(s). The existing gate valves need to be replaced along with old and deteriorated electrical wiring. The E/C panel was replaced as a part of the Phase 3 Project.

4A.6) Lift Station No. 9 Rehabilitation- Description

Project Description: Lift Station No. 9 is located on 3rd Street and is located within the roadway with access from a manhole style wet well, with very limited access. The control panel is located off-site on public R/W. The new construction will consist of a new wet-well, pumps, rails, valves, valve boxes, and a quick connect assembly with valve box for catastrophic failures. This lift station requires a new emergency quick connection assembly and possible relocation of electrical and control panel and wiring. **The project cost $385,482.**

Photos: Refer to **Attachment B - Photo and construction drawings.**





Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

Project Needs and Deficiencies: This lift station is over 40 years old and is similar in style to LS Nos. 4 (Rehabilitated under the Phase 3 SWRCB Grant), LS no. 5, LS no. 6, and LS No. 8. All referenced lift stations are problematic and have failed over the last 10 years. In some cases, the slide/guide rails are non-existent, and the pumps are difficult to access and pull which is compounded by the manhole style wet wells that fail to meet Cal OSHA standards. There is no quick connect assembly for portable pumps in the event of a catastrophic lift station failure. The existing valves are old and deteriorated and need immediate replacement, along with the existing wiring. The E/C panel was replaced as a part of the Phase 3 project.

4A.7) Collection System Rehabilitation (Pipelines and Manholes) - Description

Project Description: The location and condition of sewer collection system pipelines have been well documented over the last 20 years. The current amount of I/I is still significant during the winter months and is measured daily at the WWTP. The pipeline is comprised primarily of vitrified clay pipe (VCP) and Asbestos Concrete Pipe (ACP)and is prone to cracking and joint separation as evident within CCTV logs. A detailed rating system was prepared as a part of the I/I Analysis (2017 Project Report). Only a portion of the system was approved for rehabilitation under the Phase SWRCB DFA SRF Grant, due to funding limitations. Smoke testing for direct in-flow sources was competed as per the recommendations within the 2017 Project Report leading to spot repairs conducted by the CLOCWD staff. The proposed project will consist of CIPP with service line socks, possible tee-liners, manhole rehabilitations, main-line dig outs, and other possible

rehabilitation procedures. It is recommended by the engineering team that both CCTV inspections and smoke testing be performed prior to identifying exact locations and methods of rehabilitation. **The project cost $3,137,737.**

Reference Report and Corresponding Section(s): Refer to **Attachment A** and Section I above, for related documents.

Project Needs and Deficiencies: This Phase 4 grant funding request will include some of the collection system deficiencies that were not included within the Phase 3 construction project, which included CIPP (cured-in-place) rehabilitation and slip lining of certain identified service laterals. The staff has reviewed the condition assessment as provided by our Team in 2017 and has requested a few additional manholes that are leaking for spot repairs. The existing CCTV logs as both performed and reviewed in 2017-2018 indicated a significant amount of delamination of prior CIPP work performed in the early 2000's.

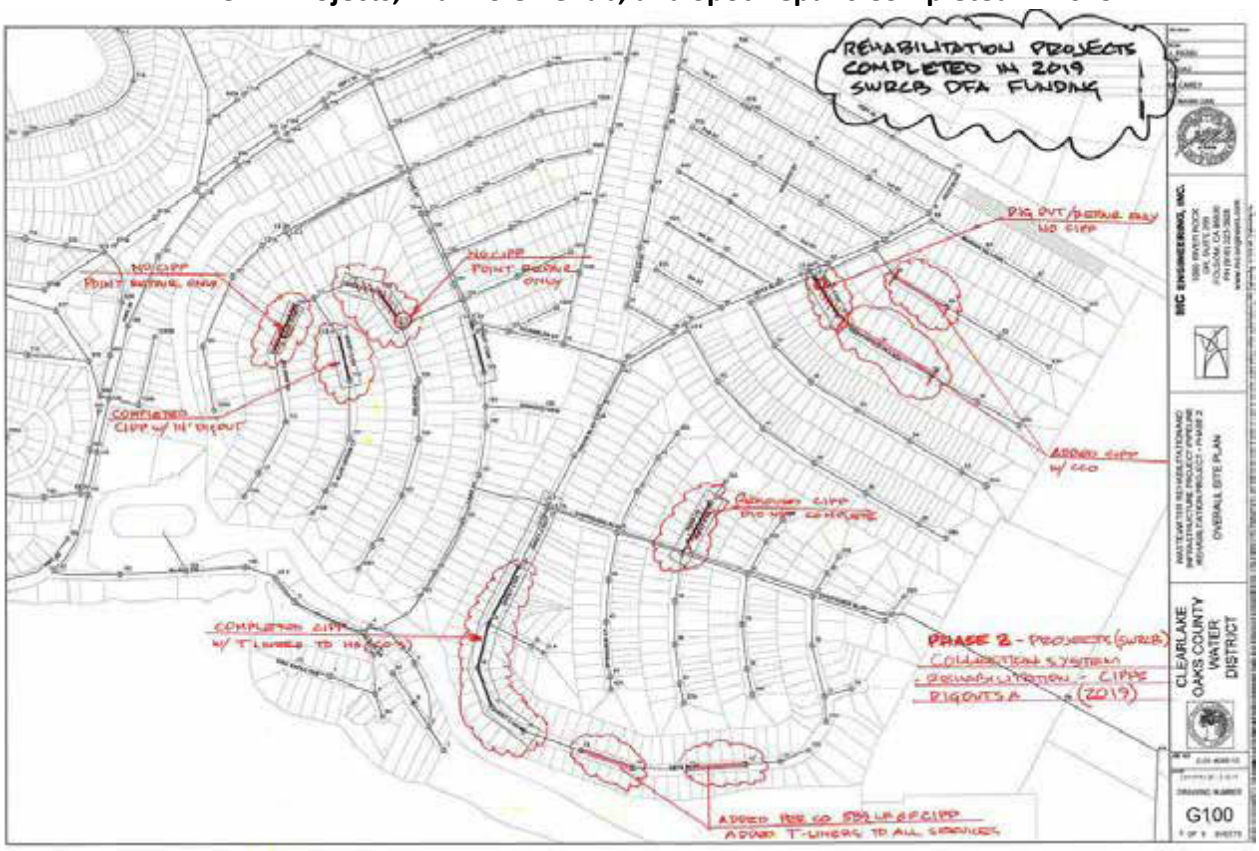
Map/Figure of Recommended Rehabilitation Projects:

Calculation of Sewer Collection System Manhole and Pipeline Rehabilitation Recommendations [1]

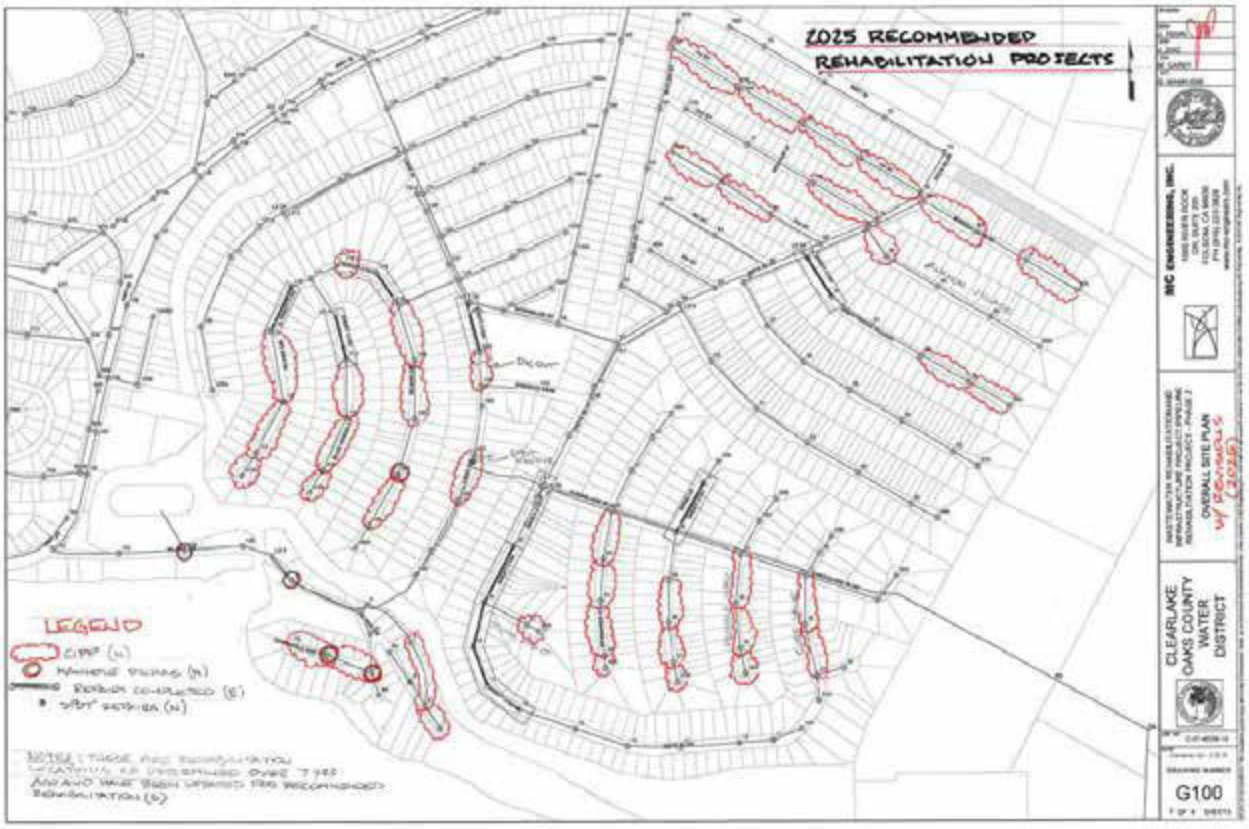
Rehabilitaion Locations		Rehabiliatation Type		CIPP			House Service Retro			Digouts/Spot Repairs		T-Liners (House Services)			Manhole Rehabilitation		
Street	Manhole	Manholes	Pipelines	Pipe Size	Pipe Type	Distance (ft)	# of Services	Top Hats	Digouts	Length	Depth	No.	Pipe Type	Size	Depth (ft)	Internal	External
Marina Village	67A - 67X		X	6"	ACP	220									4.5		
Marina Village	68-69		X	6"	ACP	305									8.1		
1st St	76-75		X	6"	VCP	310									3.3		
1st St	75-74		X	6"	VCP	344									5.1		
1st St	74-74A		X	6"	VCP	369									2		
1st St	87B-87		X	6"	VCP	157									3.5		
2nd St	78-79		X	6"	VCP	367									3.1		
Anchor Village	65-66		X	6"	ACP	188									9.8		
3rd St.	80A-80		X	6"	VCP	197									2.8		
3rd St.	80-81		X	6"	VCP	301									4.4		
Driftwood Village	59A (LS 9)-59		X	6"	ACP	243									5.7		
Driftwood Village	59-60		X	6"	ACP	272									10.3		
Surf Lane	31-32		X	6"	ACP	266									4.6		
Surf Lane	32-23		X	6"	ACP	173									5.3		
Pebble Way	34A-34		X	6"	ACP	139									6.4		
Pebble Way	34-35		X	6"	ACP	233									7		
Pebble Way	35-24		X	6"	ACP	253									7.16		
Bass Lane	37A-37		X	6"	ACP	113									5.5		
Bass Lane	37-38		X	6"	ACP	205									6.1		
Bass Lane	38-39		X	6"	ACP	218									6.2		
Spinnaker Ct	42A-42		X	6"	ACP	87									7.4		
Spinnaker Ct	42-43		X	6"	ACP	282									7.5		
Spinnaker Ct	43-44		X	6"	ACP	216									8.4		
Spinnaker Ct	44-26		X	6"	ACP	250									9.6		
Flying Jib Ct	21A-21		X	6"	ACP	86									13		
Island Drive	144	X		15"	VCP										11.4		
Island Drive	9	X		8"	VCP										7.8		
Island Drive	1-2		X	8'	VCP	140									5.06		
Island Drive	2-3		X	8"	VCP	350									8.7		
Oak Knoll Ave.	7	X		6"	VCP										5		
Oak Knoll Ave.	8	X		6"	VCP										6.3		
Oak Knoll Ave.	8-8A		X Dig-out)	6"	VCP	30				10	6.3				6.3		Sp
Oak Knoll Ave.	8-9		X	6"	VCP	175									6.1		
Oak Knoll Ave.	7-8		X	6"	VCP	211									5		
Lake St.	104-105		X (Dig-out)	6"	VCP	174				15	11.3				11.3		
Lake St.	101		X (Dig-out)	6"	VCP	10				15	7.4				7.4		
Lake St.	100-101		X	6"	VCP	252									7.3		
Island Circle	106-107		X	6"	VCP	305									5.1		
Island Circle	107	X		6"	VCP										5		
Island Circle	108-109		X	6"	VCP	303									8.9		
Island Circle	109-LS 5		X	6"	VCP	300									10.3		
Island Circle	118-119		X	6"	VCP	Dig-out									10.4		
Island Circle	114-115		X	6"	VCP	374									4.8		
Island Circle	113-114		X	6"	VCP	300									3.8		
Island Circle	113A-113		X	6"	VCP	160									3.8		
Blue Heron Ct	110A-110		X	6"	VCP	150									11.2		
Blue Heron Ct	110-111		X	6"	VCP	300									11.2		
Blue Heron Ct	111-112		X	6"	VCP	301									10		
Walnut Way	672	X		6"	ACP										4		
Apple Lane	640	X		6"	ACP										4.5		
Apple Lane	641	X		6"	ACP										5		
Apple Lane	643	X		6"	ACP										5.5		
Apple Lane	644	X		6"	ACP										5.5		
Orchard Shores Dr.	637	X		6"	ACP										4		
Orchard Shores Dr.	638	X		6"	ACP										4.5		
Orchard Shores Dr.	639	X		6"	ACP										5		
Orchard Shores Dr.	645	X		6"	ACP										5.5		
Orchard Shores Dr.	646	X		6"	ACP										6		
Peach Ct. Back Lot	630	X		6"	ACP										6.5		
Peach Ct. Back Lot	631	X		8"	ACP										4		
Lemon Circle Back Lot	632	X		8"	ACP										4.5		
Lemon Circle Back Lot	638	X		6"	ACP										5.5		
Plum Circle Back Lot	633	X		8"	ACP										6		
Plum Circle Back Lot	634	X		6"	ACP										6		
Grape Cirlcle Back Lot	635	X		8"	ACP										6		
Grape Cirlcle Back Lot	636	X		6"	ACP										6.5		
Grape Cirlcle Back Lot	629	X		8"	ACP										7		
Grape Cirlcle (LS 10)	629A	X		8"	ACP										7		
TOTALS		25				9629											
CCTV Inspection (Pre)						9629									30 MH Inspections @ $2000		

Notes: (1) Refer to Pipeline Assessment Logs as prepared in 2017/18

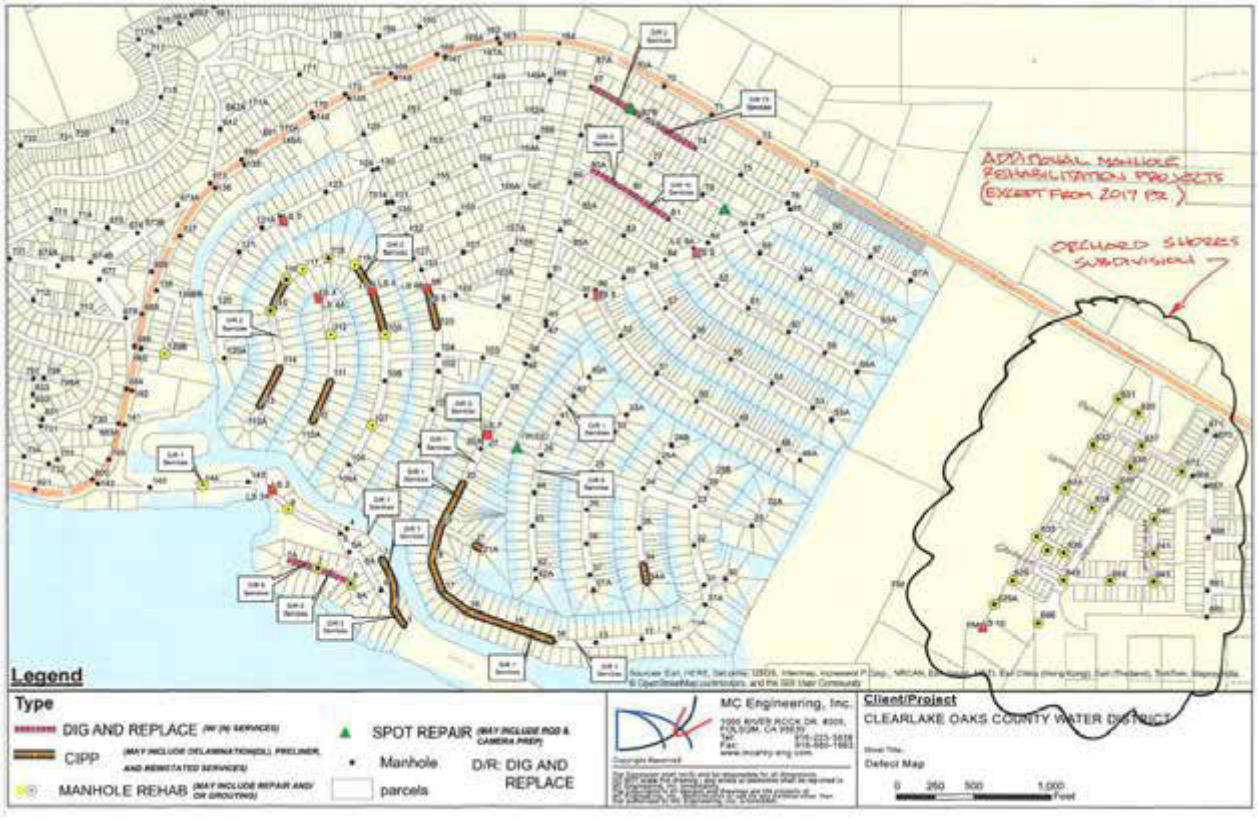
CIPP Projects, Manhole Rehab, and Spot Repairs Completed in 2019



Phase 4 – 2025 Recommended CIPP, Spot Repairs, and Other Rehabilitation Projects



Phase 4 – 2025 Manhole Locations for Manhole Rehabilitation Projects



4A.8) Project Report and Grant Application Updates- Description

Project Description: This Phase 4 SWRCB DFA SRF Grant request included updates and revisions to the existing 2014/15 USDA PER and I/I Analysis (2017 Project Report). The updates included project cost revisions and an updated Alternative Cost Comparison of recommended projects. Again, a majority of the Phase 4A projects have already been designed but were not funded due to SWRCB funding limitations. This project cost also includes the submittal of a Construction Grant application through the FAAST Program. **The project cost is $65,000, which may include Environmental amendments.** Some of the engineering services have already been provided and the District will be requesting eligible planning cost(s) reimbursements.

Reference Report and Corresponding Section(s): 2014/2015 USDA Rural Development PER and the Wastewater Collection System Infiltration/Inflow Analysis and Mapping Program Project Report (Revised/Updated - 2017)

Project Needs and Deficiencies: Planning and design work required to address the RWQCB CAO as reference above, along with existing and continuing deteriorated conditions.

4A.9) Oxidation Ditch Upgrades (WWTP) - Description

Project Description: Provide for adequate treatment of raw sewage by providing adequate O2 to the existing oxidation ditch. This includes upgrading and replacing existing two (2) 10 Hp brush aerators with new 15 Hp aerators, including special attachments and modifications to ditch. Calculation of required O2 transfer was calculated and it was found that the existing aerators did not provide for the required amount of O2. **The project cost $461,776.**

Photos: **Various pictures of existing Ox Ditch**:

Existing Oxidation Ditch



Existing 10Hp Rotor Brush with Short Circuiting Evident





Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

Project Needs and Deficiencies: A detailed engineering analysis was provided and can be found within Technical Memo No. 1, that recommends that the current oxidation ditch be upgraded with two (2) new 15 Hp rotor brush aerators to provide for the adequate O2 transfer to meet DO requirements. Other improvements to includes wider design of rotor brush to prevent existing short circuiting. This project was recommended for funding under **Approved Grant Agreement No. D17-04010 (Project No. C-06-8056-210.**

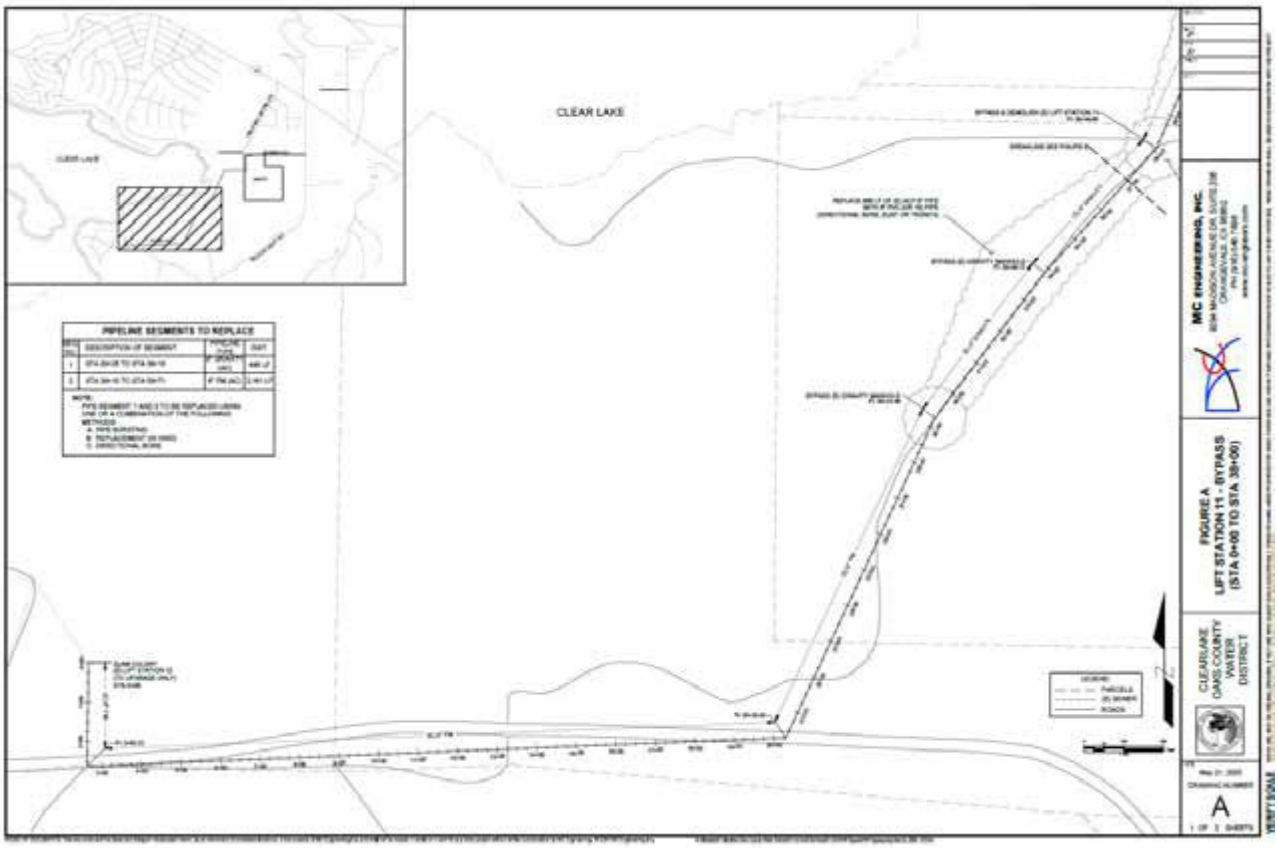
4A.10) Lift Station No. 11 Bypass and Pipeline Replacements- Description

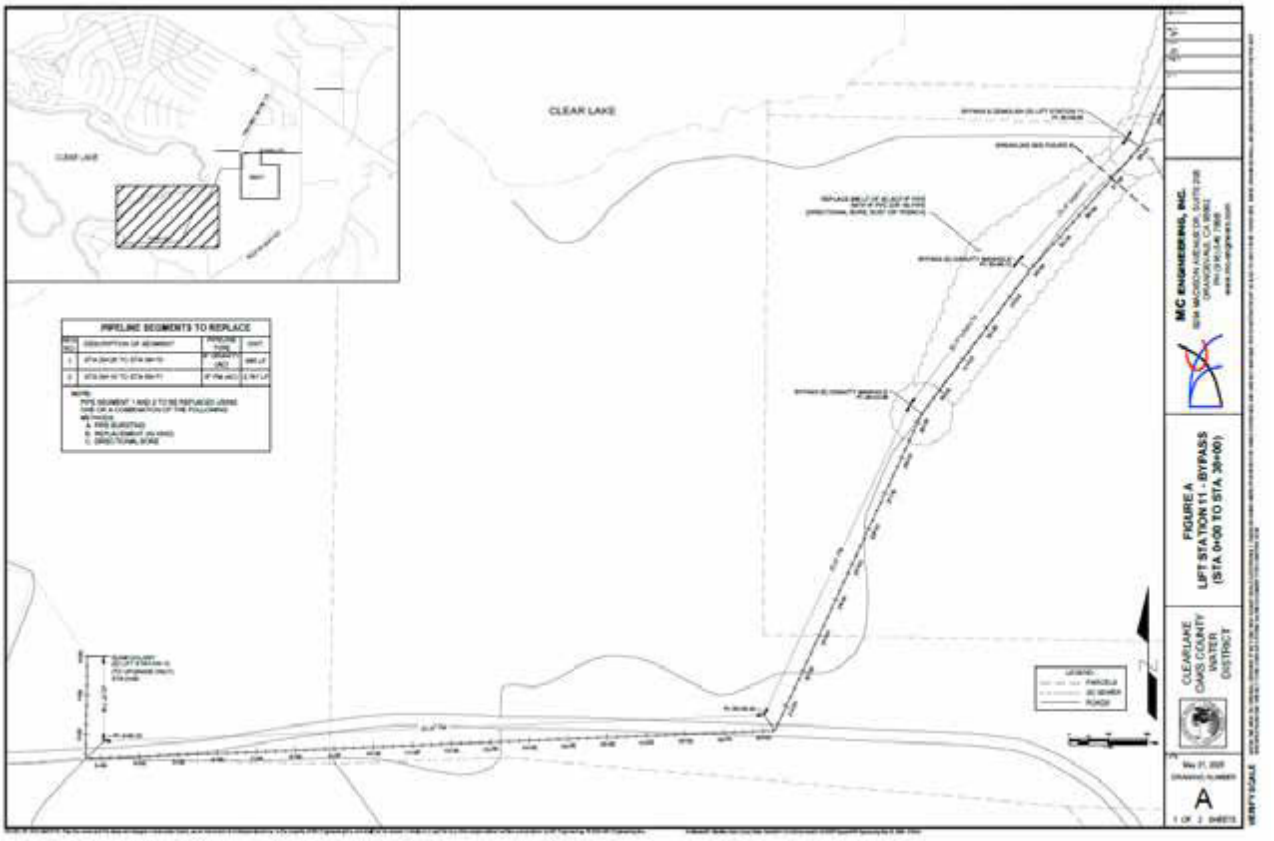
Project Description: This project includes the bypassing of old and deteriorated LS No. 11 (Pneumatic Ejector Station). This will require minor upgrades to the existing LS No. 12, which currently pumps waste flows from the Elam Colony Tribal Grounds through a 5Hp lift station (LS No. 12) to a gravity manhole located approximately 2925 linear feet (LF) from the LS No. 11 where it is then pumped (pneumatically) approximately 2161 LF to a point of connection at the WWTP. This project also includes the elimination/replacement of approximately 2161 LF of problematic old and deteriorated 6-inch asbestos-concrete (AC) pipe (pressurized) from LS No. 11 to the Point of Connection at the WWTP, which was constructed over 45 years ago in very wet-saturated soil.

Approximately 2161 LF of AC pipeline is highly recommended to be replaced (bursting) with new 6-inch DR 18 PVC pipe, along with the 885 LF of gravity main that is connected to the LS No. 11. Please refer to preliminary design drawing as attached. **The project cost $1,508,261.**

Photos: Also refer to **Attachment B – Photos and (N) Preliminary Engineering Drawing.**

Preliminary Civil Drawings of (N) Pipelines and Bypass of LS 11





Photos of Old and Deteriorated LS 11 (Pneumatic Ejector Station)

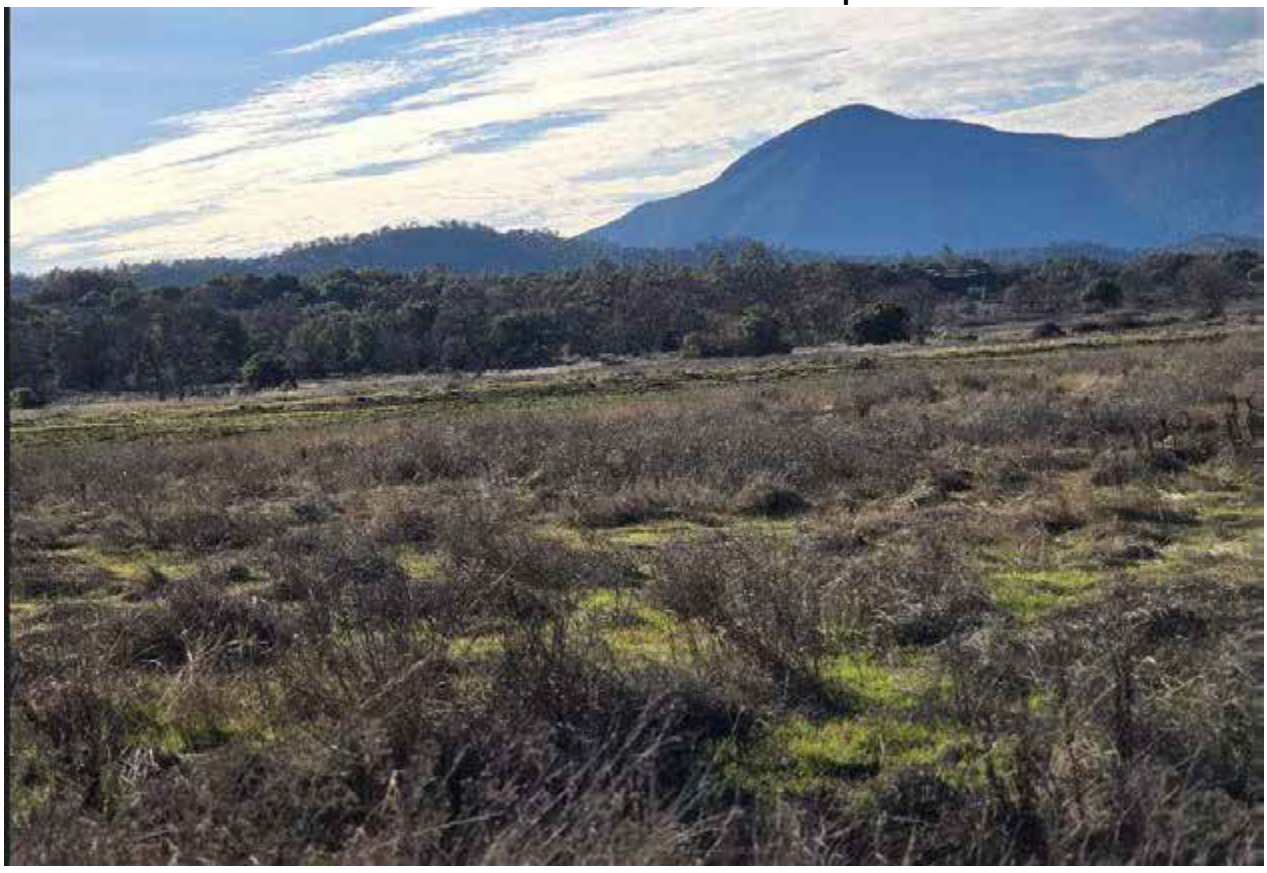




Photos of Force Main Route Through Marsh Areas (Cause of ACP Failures)
Looking South with LS 11 in Background



Looking South from LS 11 Ejector Sta. Towards LS 12
Problematic Conditions for ACP Pipe



Existing Lift Station No. 12 (Smith and Loveless) to be Modified with Pump Improvements



Smith Loveless Lift Station with Two 5 Hp Pumps and Wet Well



Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

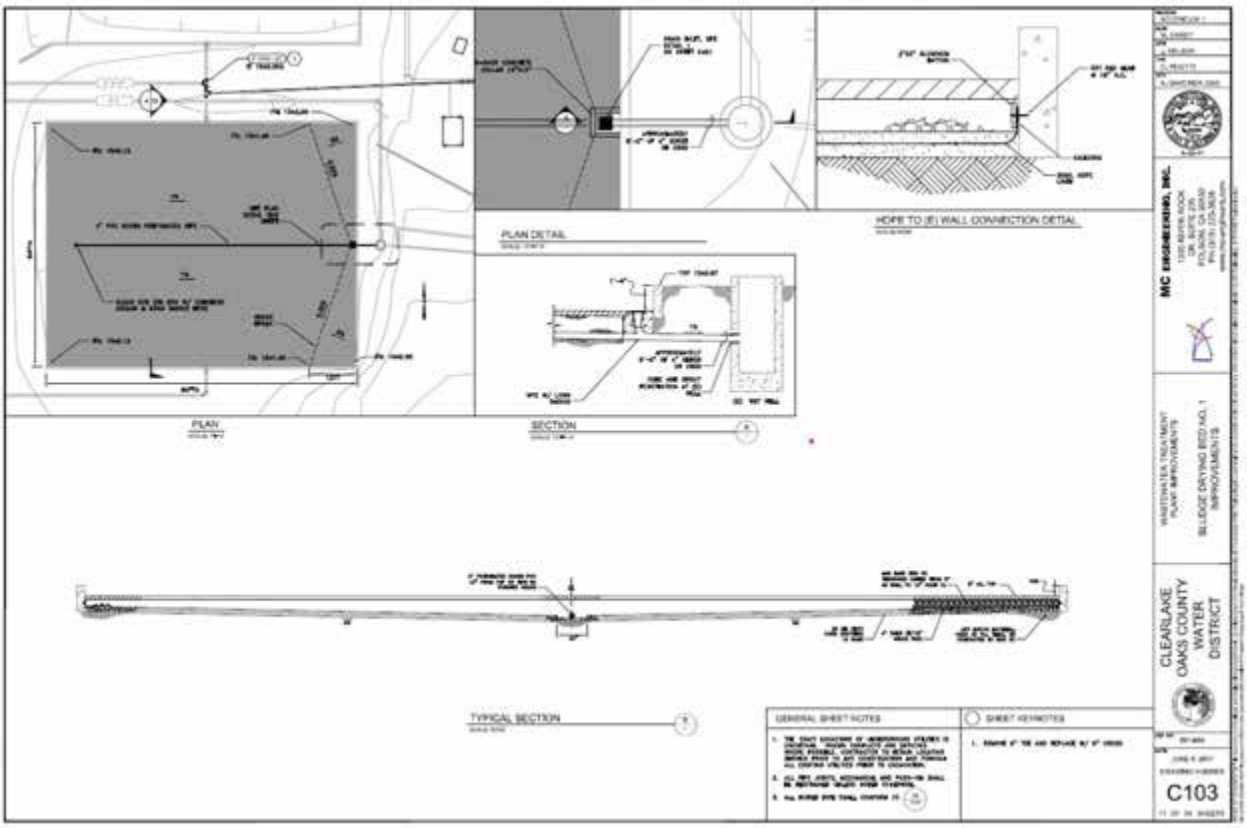
Project Needs and Deficiencies: The existing LS No. 11 is over 45 years old and is on the verge of a catastrophic failure. Certain components have been replaced over the past years. This ejector lift station (pneumatic) is not required and due to its energy and operational costs it is recommended to be bypassed/eliminated. Please refer to **Alternative Analysis Figures 4A-10a1 and 4A-10b1.** The alternative analysis clearly shows that replacing LS No. 11 on an annual cost-recovery basis is the most cost-effective recommendation. The annual cost difference is **$58,267/year** for bypassing LS No. 11 and **$66,980/year** for lift station upgrade. The 6-inch AC pipeline replacements are a critical component of this project. Access is a serious problem during the winter months when the pipeline fails due to high and surface groundwater. Approximately 2161 LF of old and deteriorated 6-inch AC pipe was not the correct pipeline to use as a force main when it was constructed over 45 years ago and continues to deteriorate causing serious O and M replacements and cost to the CLOWD Staff. The recommended method for replacement is pipe bursting, due to high ground water conditions.

4A.11) Sludge Drying Bed Improvements- Description

Project Description: Upgrade three (3) of the existing deteriorated sludge drying beds by replacing old and deteriorated AC surfaces (thickness varies) with new underdrain piping and 6-12-inches of sub-base and 4-6-inhes of concrete. **The project cost $653,339.**

Photos and Drawings: **Photos and (N) Preliminary Engineering Drawing.**

Typical Sludge Drying Bed Design Layout for Three (E) Sludge Beds

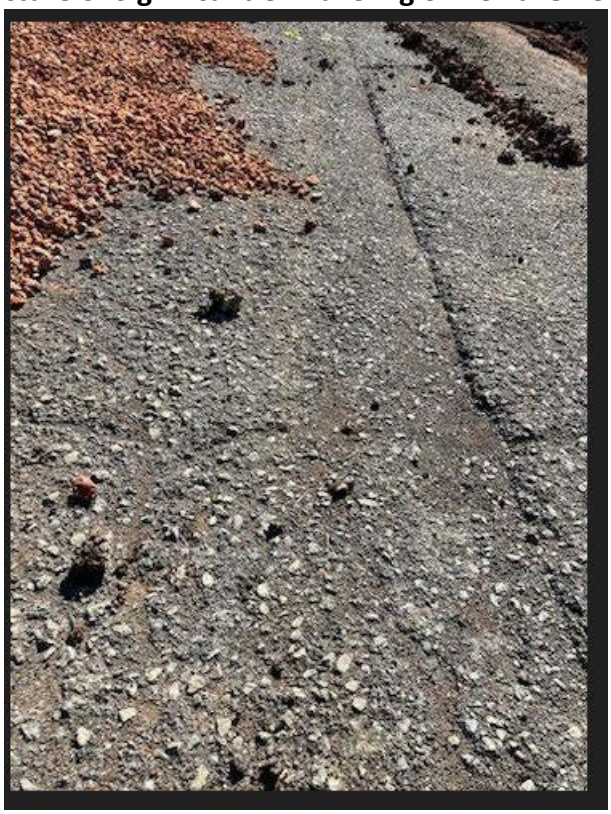


Various Photos of Sludge Drying Beds Cracking/Deterioration

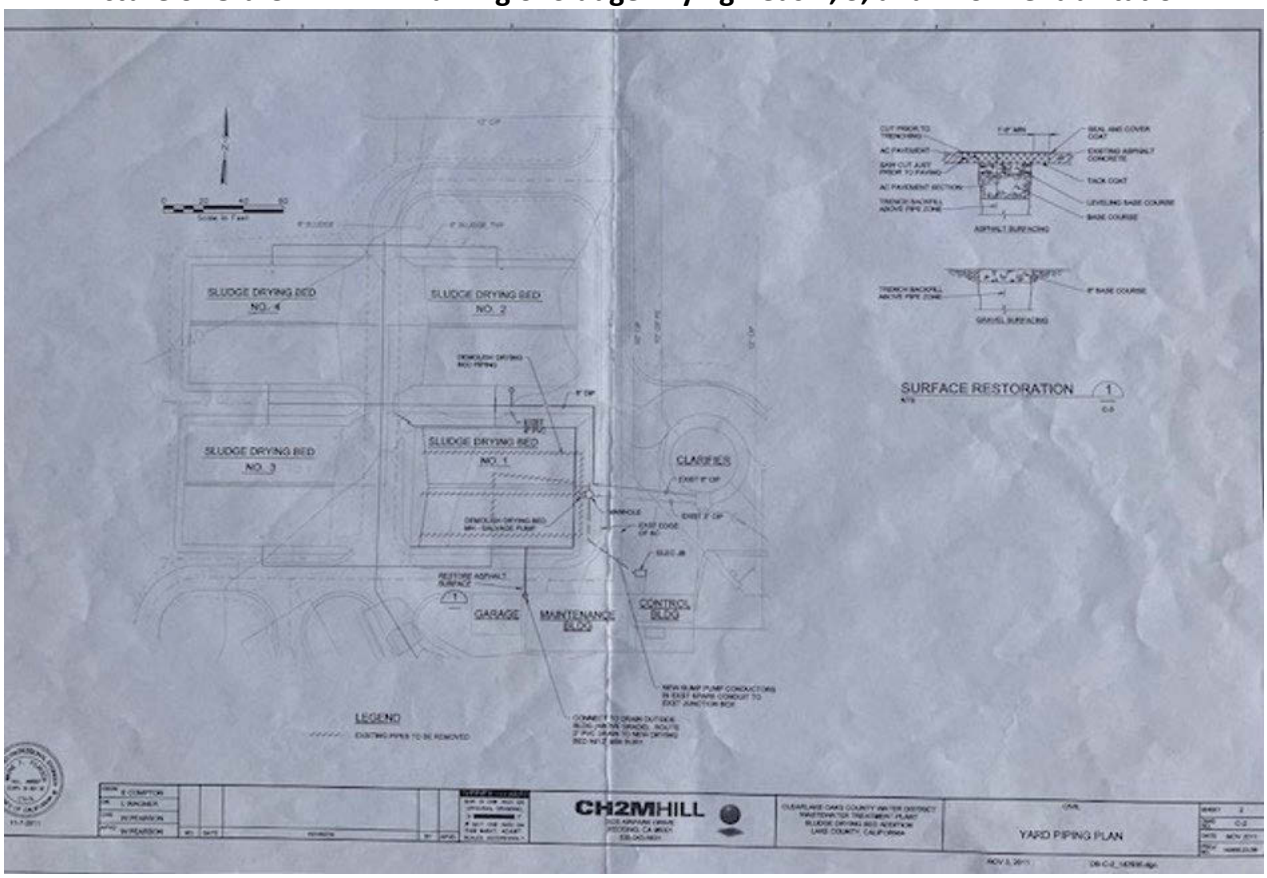




Picture of Significant Un-raveling of AC Pavement



Picture of Old CH2MHill Drawing of Sludge Drying Beds 2, 3, and 4 for Rehabilitation



Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

Project Needs and Deficiencies: The existing sludge drying beds are old and deteriorated and have been cracking and seriously unraveling causing contaminated sludge during the removal process due to portions of the AC aggregate being missed with the dried sludge. Also, the **underdrain system doesn't allow for the removal of the built-up leachate**. Also refer to the photos above.

PHASE 4B PROJECTS

4B.12) Groundwater Monitoring Well (WWTP) - Description

Project Description: Install new groundwater approximately 50-60-foot-deep monitoring well at WWTP. **The project cost $49,858.**

Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

Project Needs and Deficiencies: This is the current requirement as required by the CRWQCB and is a part of the current **CAO No. R5-2014-0700.**

4B.13) Electrical Panel Upgrades at WWTP

Project Description: To upgrade the electrical power to WWTP due to the required WWTP upgrades. This will include a new transformer and electrical drop from the nearest PG and E (3) Phase power supply (overhead) with a new transformer and underground to portions of the WWTP and to the main control room and panel. **Project cost $ 327,928.**

Photos: **Photos and Drawings (No Photos or Drawings)**

Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

Project Needs and Deficiencies: The new 15 Hp oxidation ditch aerators (rotor brushes) along with the recent addition of the new clarifier (2018 USD Project) and actuated effluent valve (Phase 3 - SWRCB Project). This project was removed for funding in 2017 due to the $ 8.0 million funding cap by the SWRCB.

4B.14) Sludge Pond No. 2 Poly Lining- Description

Project Description: Existing Pond No. 2 aerated lagoon poly lining is ripped and deteriorated and must be replaced. It was identified in past reports as problematic. **Project cost $137,529.**

Photos: Refer to **Attachment B - Photos and construction drawings (No Drawings Available)**

Existing Repairs and Patching Shown (Other tears not visible due to sludge)





Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

Project Needs and Deficiencies: The existing pond lining is ripped and must be replaced. Any leakage from this lagoon will impair the groundwater. It was identified as problematic in past reports, over 10 years ago.

4B.15) Upgrade CL2 Basin with Concrete Structures and Appurtenances- Description

Project Description: This project includes removing a temporary poly lined chlorine contact basin constructed in 2000. The existing CL2 basin is to be replaced with a new concrete contact basin, along with a mixing chamber, vertical shaft aerators, pumps, analyzers, chlorinators, controllers and panels. **Project cost $1,736,247.**

Photos: Refer to **Attachment B - Photos and construction drawings (No drawings available)**

Photo Depicting Poly lined CL 2 Basin Also Accumulated Algae Due to Lack of Baffling



Serious Issues Present with CL 2 Basin (Need Baffling and Better Flow Control Systems)



Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

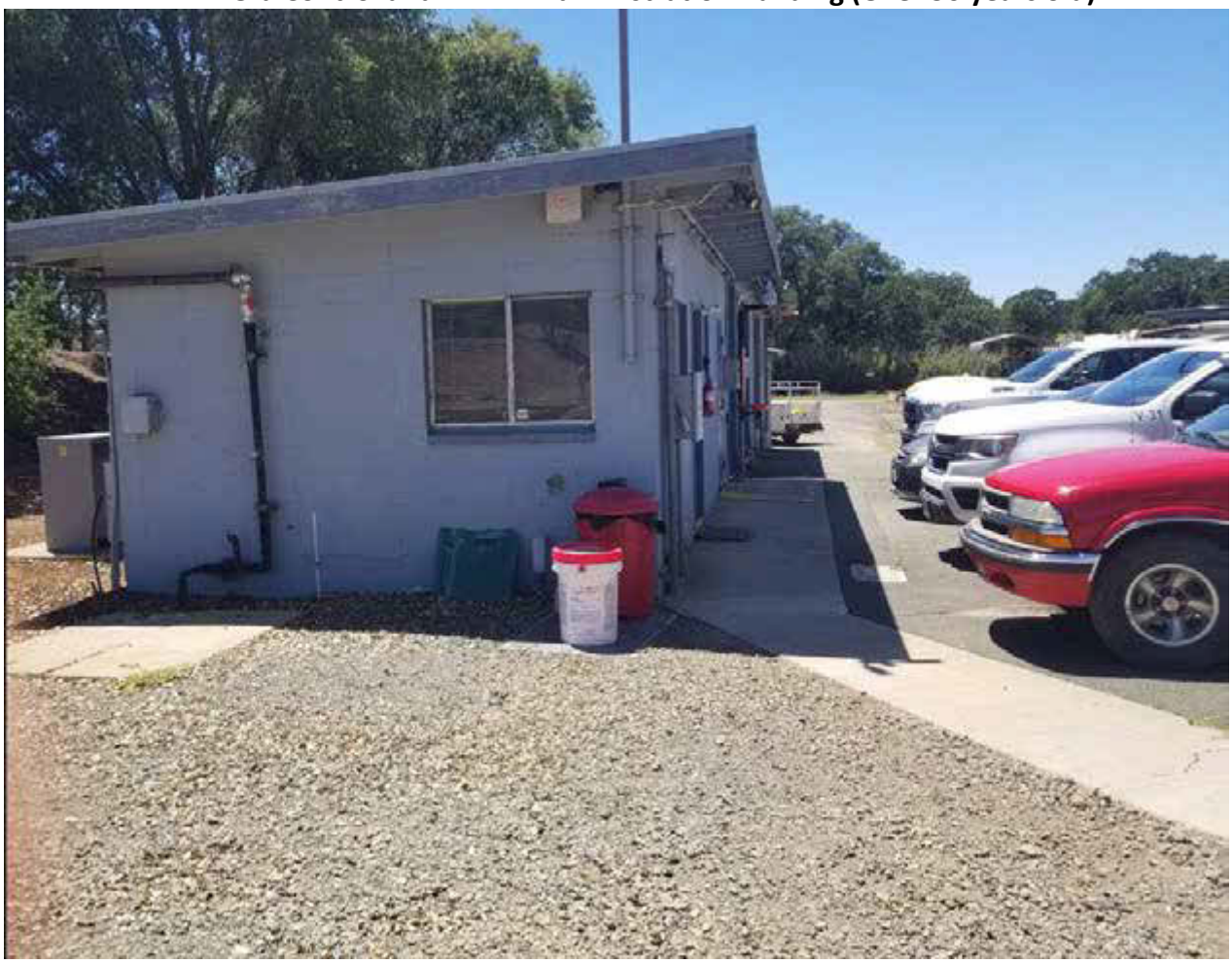
Project Needs and Deficiencies: The existing chlorine contact basin was constructed to be temporary in early 2000s and is poly lined which is extremely problematic due to deterioration along with an uneven contact floor within the basin that accumulates sludge, algae, and other bypassed effluent particles. It has a tendency of short circuiting. Please refer to past documentation found within past reports. This improvement will improve the overall needed chlorine contact time and efficiency. Need to increase CT times, especially during wet-weather conditions.

4B.16) WWTP Facility/Building Improvements- Description

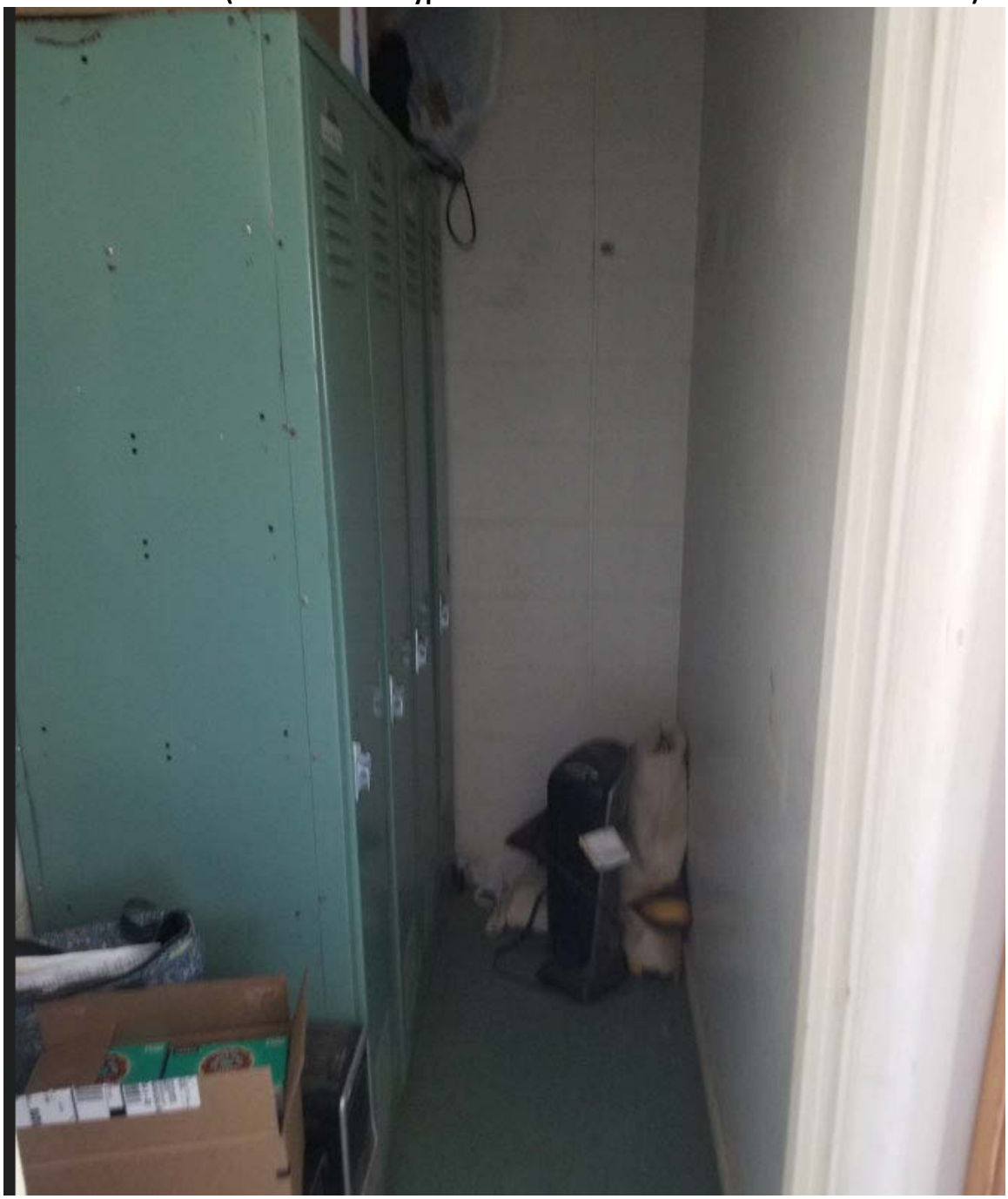
Project Description: This project includes the remolding of over 380 SF of new office space, new electrical wiring, remolding of restroom facility, including the demolition of old and deteriorated facilities. **Project cost $251,874.**

Photos: Refer to **Attachment B - Photos and construction drawings**

Old Control and WWTP Administration Building (Over 50 years old)



Internal View of the Locker Room of Admin Building
(Locker Access Typical of Internal Control Room and Office Areas)



Work Area Also Lacking Adequate Storage of Equipment
(Also Note Lack of Insulation and Open Rafters)



Reference Report and Corresponding Section(s): Refer to **Section 1**, above for related documents along with references as listed within **Attachment A**.

Project Needs and Deficiencies: The existing laboratory and control building were constructed over 45 years ago and need to be upgraded and improved for operational efficiency. The electrical wiring needs to be updated for safety and efficiency purposes. Many of the rooms need to be improved included a new restroom facility for both men and women. The is currently no conference room for meetings with staff. The roof and other portions of the facility need replacement or serious upgrades.

4B.17) New Filter Press for WTP Backwash Sludge/Algae- Description

Project Description: Still under further review. The staff of the CLOCWD Water and Wastewater Departments are requesting some type of mitigation for excessive algae being discharged from Water Treatment Plant WTP backwashing processes which are then discharged into the sewer collection system and transported by the interceptor/collection system to the WWTP. A filter press at WTP is recommended to remove up to 80% of the algae that is impacting primarily the wastewater treatment plant operations. The cost for a filter press could run for $300,000 to as much as $550,000 and would include piping and appurtenance, with the caked sludge from the WTP being delivered to the WWTP pond for further drying.

Reference Report and Corresponding Section(s): This proposed project is a current and serious system deficiency and was recently (2022) recognized as an important project recommendation by District operating staff. The District has written up a description of the current problem relating to high concentrated algae entering the process stream both within the lift stations and more importantly at WWTP.

Project Needs and Deficiencies: The current Water Treatment Facility produces a significant amount of lake algae during the clarifier and filter backwash cycles which is then discharged to the wastewater collection system impacting pump station and WWTP operations. The high organic (algae) concentrations place a significant burden on both the oxidation ditch (DO) and impacts the secondary clarifier, which bulks during high algae influent especially during the peak of summer. At times the WWTP has exceeded its BOD and SS requirements as a direct result of the high influent concentrations. This continues to be very problematic and the only real and cost-effective solution is to process the excessive algae at WTP through a filter press.

SECTION 5 - Project Updated Cost and Alternative Evaluation

All 4A and 4B project costs and alternative evaluations have been prepared and updated to reflect current dollars and other conditions. The Team has provided both visual (photos) of the specific projects along with corresponding cost and project alternative evaluations, as noted below. It is important to note that some of the wastewater treatment plant recommended projects will only have two alternatives with one of the alternatives being a “no-project.” Rehabilitation projects typically require a repair to a certain operating component and not a complete replacement, which is obviously not the most cost-effective means for continued operation.

Figure 4A.1, below are the recent 2024 energy usage calculations for all lift stations as an annual cost within the alternative analysis:

Figure 4A.1 Lift Stations (1-1) 2024 Energy Usage Energy Usage

	2025 PG and E Energy Yearly Usage for All CLOCWD Lift Stations (LS 1-12)								
	Lift Station 1	Lift Station 3	Lift Station 4	Lift Station 5	Lift Station 6	Lift Station 8	Lift Station 9	Lift Station 11	Lift Station 12
Januray	$31.68	$82.78	$90.95	$305.05	$101.42	$125.62	$119.65	$155.94	$254.98
February	$57.63	$96.49	$107.61	$623.32	$157.18	$140.36	$88.52	$233.07	$317.96
March	$99.27	$121.70	$519.70	$825.61	$175.72	$149.25	$125.32	$118.07	$171.64
April	$73.57	$136.58	$123.25	$751.01	$160.92	$132.69	$110.25	$101.31	$104.13
May	$45.70	$100.17	$90.70	$543.72	$132.07	$115.19	$92.52	$113.00	$89.34
June	$32.63	$96.72	$67.90	$439.21	$131.12	$121.71	$111.36	$99.64	$92.88
July	$27.33	$80.99	$56.33	$270.38	$106.88	$133.56	$116.52	$106.07	$98.80
August	$28.12	$78.60	$59.13	$230.87	$76.74	$124.62	$128.16	$116.90	$109.40
September	$26.69	$71.81	$55.61	$171.02	$62.65	$113.15	$101.12	$117.10	$106.21
October	$25.64	$63.88	$51.93	$142.65	$63.88	$119.26	$106.15	$131.50	$111.68
November	$28.11	$70.60	$68.44	$142.66	$62.24	$127.84	$115.37	$112.54	$104.37
December	$34.44	$85.29	$84.08	$319.56	$112.90	$117.65	$111.34	$106.89	$128.15
Total:	$510.81	$1,075.61	$1,375.63	$4,785.06	$1,343.72	$1,520.90	$1,326.28	$1,512.03	$1,689.54
Average:	$42.57	$89.63	$114.64	$397.09	$111.98	$126.74	$110.52	$126.00	$140.80

The following are both the revised project cost estimates along with the corresponding alternative evaluation (Annual Cost Recovery Method):

PHASE 4A - PROJECTS COSTS AND ALTERNATIVE EVALUATION (REFER TO ATTACHMENT A – PROJECT COST TABLE)

This revised cost estimate includes 2024/25 dollars and also includes the addition of soft costs. The project soft costs are estimated at 17%, which include revisions and updates to specifications and some minor mods. to the plans.

4A.1) Lift Station No. 1 Rehabilitation (Recommended)

Revised Project Cost Estimate: Table 4A.1a and Table 4A.1b are the revised project costs estimate.

Table 4A.1a Revised Cost Estimate

ALTN. NO. 4A.1a - UPDATED COST ESTIMATE FOR LIFT STATION NO. 1 UPGRADE							
Project Description	Item	Description	Quantity	Unit	Unit Price	Total Construction Cost	Notes
Upgrade Existing Pump Station No. 1	1	Bonds and Insurance (1%)	1	LS	NA	$3,509	
	2	Mobilization (3%)	1	LS	NA	$10,527	
	3	Storm Water Pollution Control Plan/EP	1	LS	NA	$25,000	
	4	Add New Quick Connect Bypass Valve and Fittings	1	LS	$15,000	$15,000	
	5	Purchase and Install New Pumps	2	EA	$38,000	$76,000	
	6	Install New Valving and Foot Access w/ Gate	1	LS	$48,000	$48,000	
	7	Install New Wiring, Panel, and Controls	1	LS	$135,000	$135,000	
	8	Install (N) Access Rd. w/ 6" of AB & 3" AC w/6" Dike/Curb	1400	SF	$14	$19,600	Requires Caltrans EP
	9	Import Fill for Access Road	137	YDS	$90	$12,330	Requires Caltrans EP
	10	38 LF of New CMP - 24-inch Culver w/ Fittings	38	LF	210	$7,980	Requires Caltrans EP
	11	Cleanup, Finish Grading and Paving	1	LS	$12,000	$12,000	Requires Caltrans EP
					Sub-Total Construction Costs	$364,946	
					Soft Costs 17%	$62,041	
					Sub-total Construction and Soft Costs	$426,987	
					Contingencies 10%	$42,699	
					Total Alternatve Cost Estimate	**$469,686**	

Table 4A.1b Revised Cost Estimate

ALTN. NO. 4A.1b - UPDATED COST ESTIMATE FOR NEW LIFT STATION LS NO. 1							
Project Description	Item	Description		Unit	Unit Price	Total Construction Cost	Notes
Construct New Lift Station No. 1	1	Bonds and Insurance (1%)	1	LS		$6,906	
	2	Mobilization (3%)	1	LS		$20,717	
	3	Storm Water Pollution Control Plan/EP	1	LS	$35,000	$35,000	
	4	Site preparation and Demolition of Old Facilities	1	LS	$85,000	$85,000	
	5	Upgrade Wet Well with Piping and Railing	1	EA	$125,000	$125,000	Package Lift Station - Smith and Loveless - Non submersibles
	6	Install Valve Box with Valves	1	LS	$65,000	$65,000	
	7	Pumps and Pump Installation with and floats	2	EA	$95,000	$190,000	
	8	Electrical and Controls and Wiring (Panel)	1	LS	$145,000	$145,000	
	9	Quick Connect Assembly - Bypass	1	EA	$15,000	$15,000	
	10	Install (N) Access Road w/ 6-inches of AB & 3-inches AC	1235	SF	$12	$14,820	Requires Caltrans EP
	11	Import Fill for Access Road	137	YDS	$65	$8,905	Requires Caltrans EP
	12	38 LF of New CMP - 24-inch Culver w/ Fittings	38	LF	180	$6,840	Requires Caltrans EP
					Sub-total Construction Costs	$718,188	
					Soft Costs (30%)	$215,456	
					Sub-total Construction and Soft Costs	$933,644	
					Contingencies	$93,364	
					Total Alternatve Cost Estimate	**$1,027,008**	

Project Alternative Evaluation (Cost Comparison): Table 4A.1a1, and Table 4A.1a2 project alternative cost comparisons using the Annual Cost Recovery Methods.

Table 4A.1a1 Rehabilitation

Annual Cost Comparison Alternative LS No. 1					
Alternative 4A -1a1 Lift Station Rehabilitation					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$469,686	35	2.5	0.0432	$20,290
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$511	35	NA		$511
Repairs/Maint. [2]	$6,500	35	2.5	0.0432	$280.80
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$31,157**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

Table 4A.1a2 New Lift Station

Annual Cost Comparison Alternative LS No. 1					
Alternative 4A-1b1 New Lift Station					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$1,027,008	35	2.5	0.0432	$44,367
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$1,076	35	NA		$1,076
Repairs/Maint. [2]	$511	35	2.5	0.0432	$22.07
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$55,540**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

No Project Alternative Cost (NA)

4A.2) Lift Station No. 3 Rehabilitation (Recommended)

Revised Project Cost Estimate: **Table 4A.2a and b** are the revised project costs estimate.

Table 4A.2a Revised Cost Estimate

ALTN. NO. 4A.2a - UPDATED COST ESTIMATE FOR LIFT STATION NO. 3 UPGRADE							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Upgrade Existing Pump Station No. 3	1	Bonds and Insurance (1%)	1	LS	NA	$0	
	2	Mobilization (3%)	1	LS	NA	$0	
	3	Storm Water Pollution Control Plan/EP	1	LS	NA	$25,000	
	4	Demolition of Old Wet Well Internal Wiring and Guide Rails	1	LS	$22,000	$22,000	
	5	Purchase and Install New Pumps	2	EA	$38,000	$76,000	
	6	Install New Valving	1	LS	$35,000	$35,000	
	7	Install New Quick Connect Assembly	1	EA	$35,000	$35,000	
	8	Install New Wet Well Guide Railings	1	LS	$20,000	$20,000	
	9	Install New Wiring to Controls	1	LS	$15,000	$15,000	
	10	Cleanup, Finish Grading and Paving	1	LS	$12,000	$12,000	
					Sub-total Construction Costs	$240,000	
					Soft Costs 17%	$40,800	
					Sub-total Construction and Soft Costs	$280,800	
					Contingencies 10%	$28,080	
					Total Alternatve Cost Estimate	**$308,880**	

Table 4A.2b Revised Cost Estimate

ALTN. NO. 4A.2b - UPDATED COST ESTIMATE FOR NEW LIFT STATION LS NO. 3							
Project Description	Item	Description		Unit	Unit Price	**Total Construction Cost**	Notes
Construct New Lift Station No.3	1	Bonds and Insurance (1%)	1	LS	$7,260	$7,260	
	2	Mobilization (3%)	1	LS	$21,780	$21,780	
	3	Storm Water Pollution Control Plan/EP	1	LS	$35,000	$35,000	
	4	Site preparation and Demolition of Old Facilities	1	LS	$55,000	$55,000	
	5	Install Wet Well with Piping and Railing	1	EA	$275,000	$275,000	Package Lift
	6	Install Valve Box with Valves	1	LS	$65,000	$65,000	Station - Smith
	7	Pumps and Pump Installation with SST Failings and floats	2	EA	$30,000	$60,000	and Loveless -
	8	Electrical and Controls and Wiring	1	LS	$145,000	$145,000	Non submersibles
	9	Quick Connect Assembly - Bypass	1	EA	$15,000	$15,000	
	10	Misc. Piping and valves	1	LS	$58,000	$58,000	
	11	Cleanup, Finish Grading, and Paving	1	LS	$18,000	$18,000	
					Sub-total Construction Costs	$755,040	
					Soft Costs (30%)	$226,512	
					Sub-total Construction and Soft Costs	$981,552	
					Contingencies	$98,155	
					Total Alternatve Cost Estimate	**$1,079,707**	

Project Alternative Evaluation (Cost Comparison): Table 4A.2a1, and Table 4A.2a2 project alternative cost comparisons using the Annual Cost Recovery Methods.

Table 4A.2a1 Rehabilitation

Annual Cost Comparison Alternative LS No.3					
Alternative 4A -2a1 Lift Station Rehabilitation					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$308,880	35	2.5	0.0432	$13,344
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$1,076	35	NA		$1,076
Repairs/Maint. [2]	$6,500	35	2.5	0.0432	$280.80
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$24,775**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

Table 4A.2a2 New Lift Station

Annual Cost Comparison Alternative LS No. 3					
Alternative 4B-2b1 New Lift Station					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$1,079,707	35	2.5	0.0432	$46,643
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$1,076	35	NA		$1,076
Repairs/Maint. [2]	$3,500	35	2.5	0.0432	$151.20
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$57,946**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

No Project Alternative Cost (NA)

4A.3) Lift Station No. 5 Rehabilitation (Recommended)

Revised Project Cost Estimate: **Table 4A.3a and Table 4A.3b** are the revised project costs estimate.

Table 4A.3a Revised Cost Estimate (Recommended)

ALTN. NO. 4A.3a - UPDATED COST ESTIMATE FOR LIFT STATION NO. 5 UPGRADE							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Upgrade Existing Pump Station No. 5	1	Bonds and Insurance (1%)	1	LS	NA	$2,880	
	2	Mobilization (3%)	1	LS	NA	$8,640	
	3	Storm Water Pollution Control Plan/EP	1	LS	$25,000	$25,000	
	4	Demolition of Old Wet Well and Piping	1	LS	$22,000	$22,000	
	5	Purchase and Install New Pumps	2	EA	$38,000	$76,000	
	6	Install New Valving	1	LS	$35,000	$35,000	
	7	Install New Quick Connect Assembly	1	EA	$15,000	$15,000	
	8	Install New Wet Well/Retrofit Manhole with New Railings	1	LS	$68,000	$68,000	
	9	Install New Wiring to Controls	1	LS	$35,000	$35,000	
	10	Cleanup, Finish Grading and Paving	1	LS	$12,000	$12,000	
	11						
					Sub-total Construction Costs	$299,520	
					Soft Costs 17%	$50,918	
					Sub-total Construction and Soft Costs	$350,438	
					Contingencies 10%	$35,043.84	
					Total Alternatve Cost Estimate	**$385,482.24**	

Table 4A.3.b Revised Cost Estimate

ALTN. NO. 4A.3b - UPDATED COST ESTIMATE FOR NEW LIFT STATION LS NO. 5							
Project Description	Item	Description		Unit	Unit Price	**Total Construction Cost**	Notes
Construct New Lift Station No. 5	1	Bonds and Insurance (1%)	1	LS	NA	$7,260	
	2	Mobilization (3%)	1	LS	NA	$21,780	
	3	Storm Water Pollution Control Plan/EP	1	LS	$35,000	$35,000	
	4	Site preparation and Demolition of Old Facilities	1	LS	$55,000	$55,000	
	5	Install Wet Well with Piping and Railing	1	EA	$275,000	$275,000	Package Lift Station - Smith and Loveless - Non submersibles
	6	Install Valve Box with Valves	1	LS	$65,000	$65,000	
	7	Pumps and Pump Installation with SST Failings and floats	2	EA	$30,000	$60,000	
	8	Electrical and Controls and Wiring	1	LS	$145,000	$145,000	
	9	Quick Connect Assembly - Bypass	1	EA	$15,000	$15,000	
	10	Misc. Piping and valves	1	LS	$58,000	$58,000	
	11	Cleanup, Finish Grading, and Paving	1	LS	$18,000	$18,000	
					Sub-total Construction Costs	$755,040	
					Soft Costs (30%)	$226,512	
					Sub-total Construction and Soft Costs	$981,552	
					Contingencies	$98,155	
					Total Alternatve Cost Estimate	**$1,079,707**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.3a1, and Table 4A.3a2** project alternative cost comparisons using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements.

Table 4A.3a1 Rehabilitation

Annual Cost Comparison Alternative LS No. 5					
Alternative 4A -3a1 Lift Station Rehabilitation					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$385,482	35	2.5	0.0432	$16,653
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$4,765	35	NA		$4,765
Repairs/Maint. [2]	$6,500	35	2.5	0.0432	$280.80
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$31,774**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

Table 4A.2a2 New Lift Station

Annual Cost Comparison Alternative LS No. 5					
Alternative 4A-3b1 New Lift Station					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$1,079,707	35	2.5	0.0432	$46,643
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$4,765	35	NA		$4,765
Repairs/Maint. [2]	$3,500	35	2.5	0.0432	$151.20
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$61,635**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

4A.4) Lift Station No. 6 Rehabilitation (Recommended)

Revised Project Cost Estimate: **Table 4A.4a and 4B.4b** are the revised project cost estimates.

Table 4A.4a Revised Cost Estimate

ALTN. NO. 4A.4a - UPDATED COST ESTIMATE FOR LIFT STATION NO. 6 UPGRADE							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Upgrade Existing Pump Station No. 6	1	Bonds and Insurance (1%)	1	LS	$2,880	$2,880	
	2	Mobilization (3%)	1	LS	$8,640	$8,640	
	3	Storm Water Pollution Control Plan/EP	1	LS	$25,000	$25,000	
	4	Demolition of Old Wet Well and Piping	1	LS	$22,000	$22,000	
	5	Purchase and Install New Pumps	2	EA	$38,000	$76,000	
	6	Install New Valving	1	LS	$35,000	$35,000	
	7	Install New Quick Connect Assembly	1	EA	$15,000	$15,000	
	8	Install New Wet Well/Retrofit Manhole with New Railings	1	LS	$68,000	$68,000	
	9	Install New Wiring to Controls	1	LS	$35,000	$35,000	
	10	Cleanup, Finish Grading and Paving	1	SF	$12,000	$12,000	
					Sub-total Construction Costs	$299,520	
					Soft Costs 17%	$50,918	
					Sub-total Construction and Soft Costs	$350,438	
					Contingencies 10%	$35,043.84	
					Total Alternatve Cost Estimate	**$385,482.24**	

Table 4A.4b Revised Cost Estimate

ALTN. NO. 4A.4b - UPDATED COST ESTIMATE FOR NEW LIFT STATION LS NO. 6							
Project Description	Item	Description		Unit	Unit Price	Total Construction Cost	Notes
Construct New Lift Station No. 6	1	Bonds and Insurance (1%)	1	LS	$7,260	$7,260	
	2	Mobilization (3%)	1	LS	$21,780	$21,780	
	3	Storm Water Pollution Control Plan/EP	1	LS	$35,000	$35,000	
	4	Site preparation and Demolition of Old Facilities	1	LS	$55,000	$55,000	
	5	Install Wet Well with Piping and Railing	1	EA	$275,000	$275,000	Package Lift Station - Smith and Loveless - Non submersibles
	6	Install Valve Box with Valves	1	LS	$65,000	$65,000	
	7	Pumps and Pump Installation with SST Failings and floats	2	EA	$30,000	$60,000	
	8	Electrical and Controls and Wiring	1	LS	$145,000	$145,000	
	9	Quick Connect Assembly - Bypass	1	EA	$15,000	$15,000	
	10	Misc. Piping and valves	1	LS	$58,000	$58,000	
	11	Cleanup, Finish Grading, and Paving	1	LS	$18,000	$18,000	
					Sub-total Construction Costs	$755,040	
					Soft Costs (30%)	$226,512	
					Sub-total Construction and Soft Costs	$981,552	
					Contingencies	$98,155	
					Total Alternatve Cost Estimate	**$1,079,707**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.4a1, and Table 4A.4a2** project alternative cost comparisons using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements.

Table 4A.4a1 Rehabilitation

Annual Cost Comparison Alternative LS No. 6					
Alternativ 4A -4a1 Lift Station Rehabilitation					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$385,482	35	2.5	0.0432	$16,653
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$1,344	35	NA		$1,344
Repairs/Maint. [2]	$6,500	35	2.5	0.0432	$280.80
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$28,353**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

Table 4A.4b1 New Lift Station

Annual Cost Comparison Alternative LS No. 6					
Alternative 4A-4b1 New Lift Station					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$1,079,707	35	2.5	0.0432	$46,643
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$1,344	35	NA		$1,344
Repairs/Maint. [2]	$3,500	35	2.5	0.0432	$151.20
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$58,214**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

4A.5) Lift Station No. 8 Rehabilitation

Revised Project Cost Estimate: **Table 4A.5a and 4A.5b** is the revised project costs estimate.

Table 4A.5a Revised Cost Estimate

ALTN. NO. 4A.5a - UPDATED COST ESTIMATE FOR LIFT STATION NO. 8 UPGRADE							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Upgrade Existing Pump Station No. 8	1	Bonds and Insurance (1%)	1	LS	$2,730	$2,730	
	2	Mobilization (3%)	1	LS	$8,190	$8,190	
	3	Storm Water Pollution Control Plan/EP	1	LS	$25,000	$25,000	
	4	Demolition of Old Wet Well and Piping	1	LS	$22,000	$22,000	
	5	Purchase and Install New Pumps	2	EA	$38,000	$76,000	
	6	Install New Valving	1	LS	$35,000	$35,000	
	7	Install New Quick Connect Assembly	1	EA	NA	$0	Gravity Overflow In-place
	8	Install New Wet Well/Retrofit Manhole with New Railings	1	LS	$68,000	$68,000	
	9	Install New Wiring to Controls	1	LS	$35,000	$35,000	
	10	Cleanup, Finish Grading and Paving	1	LS	$12,000	$12,000	
					Sub-total Construction Costs	$283,920	
					Soft Costs 17%	$48,266	
					Sub-total Construction and Soft Costs	$332,186	
					Contingencies 10%	$33,218.64	
					Total Alternatve Cost Estimate	**$365,405.04**	

Table 4A.5b Revised Cost Estimate

ALTN. NO. 4A.5b - UPDATED COST ESTIMATE FOR NEW LIFT STATION LS NO. 8							
Project Description	Item	Description		Unit	Unit Price	**Total Construction Cost**	Notes
Construct New Lift Station No. 8	1	Bonds and Insurance (1%)	1	LS	$7,260	$7,260	
	2	Mobilization (3%)	1	LS	$21,780	$21,780	
	3	Storm Water Pollution Control Plan/EP	1	LS	$35,000	$35,000	
	4	Site preparation and Demolition of Old Facilities	1	LS	$55,000	$55,000	
	5	Install Wet Well with Piping and Railing	1	EA	$275,000	$275,000	Package Lift Station - Smith and Loveless - Non submersibles
	6	Install Valve Box with Valves	1	LS	$65,000	$65,000	
	7	Pumps and Pump Installation with SST Failings and floats	2	EA	$30,000	$60,000	
	8	Electrical and Controls and Wiring	1	LS	$145,000	$145,000	
	9	Quick Connect Assembly - Bypass	1	EA	$15,000	$15,000	
	10	Misc. Piping and valves	1	LS	$58,000	$58,000	
	11	Cleanup, Finish Grading, and Paving	1	LS	$18,000	$18,000	
					Sub-total Construction Costs	$755,040	
					Soft Costs (30%)	$226,512.0	
					Sub-total Construction and Soft Costs	$981,552	
					Contingencies	$98,155	
					Total Alternatve Cost Estimate	**$1,079,707**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.5a1, and Table 4A.5a2** project alternative cost comparisons using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements.

Table 4A.5a1 Rehabilitation

Annual Cost Comparison Alternative LS No. 8					
Alternative 4A -5a1 Lift Station Rehabilitation					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$365,405	35	2.5	0.0432	$15,785
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$1,521	35	NA		$1,521
Repairs/Maint. [2]	$6,500	35	2.5	0.0432	$280.80
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$27,662**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

Table 4A.5a2 New Lift Station

Annual Cost Comparison Alternative LS No. 8					
Alternative 4A-5b1 New Lift Station					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$1,079,707	35	2.5	0.0432	$46,643
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$1,521	35	NA		$1,521
Repairs/Maint. [2]	$3,500	35	2.5	0.0432	$151.20
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$58,391**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

4A.6) Lift Station No. 9 Rehabilitation

Revised Project Cost Estimate: **Table 4A.6a and 4A.6b** is the revised project costs estimate.

Table 4A.6a Revised Cost Estimate

ALTN. NO. 4A.6a - UPDATED COST ESTIMATE FOR LIFT STATION NO. 9 UPGRADE							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Upgrade Existing Pump Station No. 9	1	Bonds and Insurance (1%)	1	LS	$2,880	$2,880	
	2	Mobilization (3%)	1	LS	$8,640	$8,640	
	3	Storm Water Pollution Control Plan/EP	1	LS	$25,000	$25,000	
	4	Demolition of Old Wet Well and Piping	1	LS	$22,000	$22,000	
	5	Purchase and Install New Pumps	2	EA	$38,000	$76,000	
	6	Install New Valving	1	LS	$35,000	$35,000	
	7	Install New Quick Connect Assembly	1	EA	$15,000	$15,000	
	8	Install New Wet Well/Retrofit Manhole with New Railings	1	LS	$68,000	$68,000	
	9	Install New Wiring to Controls	1	LS	$35,000	$35,000	
	10	Cleanup, Finish Grading and Paving	1	LS	$12,000	$12,000	
	11						
					Sub-total Construction Costs	$299,520	
					Soft Costs 17%	$50,918	
					Sub-total Construction and Soft Costs	$350,438	
					Contingencies 10%	$35,043.84	
					Total Alternatve Cost Estimate	**$385,482.24**	

Table 4A.6b Revised Cost Estimate

ALTN. NO. 4A.6b - UPDATED COST ESTIMATE FOR NEW LIFT STATION LS NO. 9							
Project Description	Item	Description		Unit	Unit Price	**Total Construction Cost**	Notes
Construct New Lift Station No. 9	1	Bonds and Insurance (1%)	1	LS	$7,562	$7,562	
	2	Mobilization (3%)	1	LS	$22,686	$22,686	
	3	Storm Water Pollution Control Plan/EP	1	LS	$35,000	$35,000	
	4	Site preparation and Demolition of Old Facilities	1	LS	$55,000	$55,000	
	5	Install Wet Well with Piping and Railing	1	EA	$275,000	$275,000	Package Lift Station - Smith and Loveless - Non submersibles
	6	Install Valve Box with Valves	1	LS	$65,000	$65,000	
	7	Pumps and Pump Installation with SST Failings and floats	2	EA	$30,000	$60,000	
	8	Electrical and Controls and Wiring	1	LS	$145,000	$145,000	
	9	Quick Connect Assembly - Bypass	1	EA	$15,000	$15,000	
	10	Misc. Piping and valves	1	LS	$58,000	$58,000	
	11	Cleanup, Finish Grading, and Paving	1	LS	$18,000	$18,000	
					Sub-total Construction Costs	$756,202	
					Soft Costs (30%)	$226,861	
					Sub-total Construction and Soft Costs	$983,063	
					Contingencies	$98,306	
					Total Alternatve Cost Estimate	**$1,081,369**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.6a1, and Table 4A.6a2** project alternative cost comparisons using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements.

Table 4A.6a1 Rehabilitation

Annual Cost Comparison Alternative LS No. 9					
Alternative 4A- 6a1 Lift Station Rehabilitation					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$385,482	35	2.5	0.0432	$16,653
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$1,326	35	NA		$1,326
Repairs/Maint. [2]	$6,500	35	2.5	0.0432	$280.80
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$28,335**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

Table 4A.6a2 New Lift Station

Annual Cost Comparison Alternative LS No. 9					
Alternative 4A - 6b1 New Lift Station					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$1,081,369	35	2.5	0.0432	$46,715
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$1,326	35	NA		$1,326
Repairs/Maint. [2]	$3,500	35	2.5	0.0432	$151.20
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$58,267**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

4A.7) Collection System Rehabilitation (Pipelines and Manholes)

Revised Project Cost Estimate: **Table 4A.7a** is the revised project costs estimate. This revised estimate was based on additional field evaluations and current operational deficiencies as determined by District field staff over the last 5 years.

Table 4A.7a Revised Cost Estimate

ALTN. 4A.7 COLLECTION SYSTEM REHABILITATION (PIPELINES AND MANHOLES)							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Collection System Rehabiitation (MHs, Pipelines, and Services)	1	Bonds and Insurance (1%)	1	LS	$22,299	$22,299	
	2	Mobilization (3%)	1	LS	$66,897	$66,897	
	3	Traffic Control Plan	1	LS	$25,000	$25,000	
	4	Sorm Water Pollution Plan	1	LS	$20,000	$20,000	
	5	Manhole Rehabilitation	10	EA	$6,800	$68,000	Repair cracks, grade rings, and other
	6	Sewer Line Dig and Replace	10	EA	$55,000	$550,000	Avg. Cost for 5LF to 20Lf
	7	Mainline CIPP	7500	LF	$175	$1,312,500	12 Blocks @450LF/Block (6"&8")
	8	Service Line Lining (Sock)	35	EA	$5,500	$192,500	CIPP Tee liner (4" Service)
	9	CCTV (Prepatory) and Smoke Testing (Inflow)	1	LS	$41,900	$41,900	8-days@ $4800/day with Mob. @ $3500/Day
	10	Cleanup, Finish Grading and Paving	1	LS	$20,000	$20,000	
					Sub-total Construction Costs	$2,319,096	
					Soft Costs (23%)	$533,392.08	
					Sub-total Construction and Soft Costs	$2,852,488.08	
					Contingencies (10%)	$285,248.81	
					Total Alternatve Cost Estimate	$3,137,736.89	

Project Alternative Evaluation (Cost Comparison): **Table 4A.7a1, and Table 4A.7a2** project alternative cost comparisons using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements.

Table 4A.7a1 Rehabilitation

Annual Cost Comparison Alternative Collection System Rehabilitation					
Alternative 4A-7a1 New Sewer Pipelines					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$3,137,737	35	2.5	0.0432	$135,550
Annual Cost [1]	$3,500	35	NA		$3,500
Energy/Electrical	NA	35	NA		NA
Repairs/Maint. [2]	$2,500	35	2.5	0.0432	$108.00
Salvage Value	NA	35	NA		NA
				Total	**$139,158**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.
(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs
(3) Total Capital includes soft costs

4A.8) Project Report and Grant Application Updates

Revised Project Cost Estimate: **Table 4A.8a** is the revised project costs estimate.

Table 4A.8a Revised Cost Estimate

ALTN. NO. 4A.8 - UPDATED COST ESTIMATES, ENVIRONMETAL CLEARANCE, FAAST APPLICATIONS, MISC. COMMUNICATIONS				
Project Description	Item	General Description of Required Project Report, Environmental Documents, and FAAST Submittals for Phase 4 (Engineering Soft Cost Allowances)	**Total Construction Cost**	**Notes**
Preliminary Engineering Project Report and Environmental Documents Updates	1	Project Report Updates and Revisions	$18,000	Engineering Prepared by Work Order
	2	FAAST Submittals	$8,000	Engineering Prepared by Work Order
	3	Environmental Report Updates	$35,000	NEPA/CEQA Prepared by Agreement
	4	Misc. Administration and Communications	$4,000	Invoices/backup Submitted Per SWRCB Grant Agreement
		Total Estimated Grant Allowance for Prior Work	**$65,000**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.8a1, and Table 4A.8a2** project alternative cost comparisons using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements.

4A.9) Oxidation Ditch Upgrades (WWTP)

Revised Project Cost Estimate: **Table 4A.9a** is the revised project costs estimate. Requires no Alternative Analysis. This is a rehabilitation Project of an (E) oxidation ditch requiring new brush aerators and repairs to existing gunite.

Table 4A.9a Revised Cost Estimate

ALTN. NO. 4a.9a - UPDATED COST ESTIMATE FOR OXIDATION DITCH UPGRADES							
Project Description	Item	Description	Quantity	Unit	Unit Price	Total Construction Cost	Notes
Install (N) 15 HP Brush Aerators, Controls, and Rewiring for Controls	1	Bonds and Insurance (1%)	1	LS	$2,880	$3,450	
	2	Mobilization (3%)	1	LS	$8,640	$10,350	
	3	Storm Water Pollution Control Plan/EP	1	LS	$25,000	$15,000	
	4	Demolition of Old Brush Aerators and Appurtenances	1	LS	$35,000	$35,000	Old 10 HP Brush Aerators
	5	Installation of new 15 Hp Brush Aerators	2	EA	$105,000	$210,000	
	6	Install New Wiring and Controls and DO Probes	2	EA	$25,000	$50,000	
	7	Rental Bypass AS Unit During Ditch Upgrades	1	LS	$30,000	$30,000	3 Week Rental
	8	Cleanup, Finish Grading and Paving	1	LS	$5,000	$5,000	
					Sub-total Construction Costs	$358,800	
					Soft Costs 17%	$60,996	
					Sub-total Construction and Soft Costs	$419,796	
					Contingencies 10%	$41,980	
					Total Alternatve Cost Estimate	**$461,776**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.9a1, and Table 4A.9a2** project alternative cost comparisons using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements. This is also a rehabilitation project, and a new oxidation ditch will cost between $ 1.3 to $1.7 million to construct. Energy costs will be about equal. Additional O and M are minimal, except for periodic replacement of rotor brushes, motor, and bearings. The project is required and is based on 2016 Tech Memo requiring 15 HP rotor brushes for movement and O2 transfer.

Table 4A.9a1 Rehabilitation

Annual Cost Comparison Alternative Oxidation Ditch Upgrade Rehabilitation					
Alternative 4A-9b1 Oxidation Ditch Upgrades					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$461,776	35	2.5	0.0432	$19,949
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical [4]	$225,000	35	NA		$225,000
Repairs/Maint. [2]	$2,500	35	2.5	0.0432	$108.00
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$255,132**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.
(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs
(3) Total Capital includes soft costs
(4) Assume Electrical for 10HP motors (2) at 32 hrs per yr. using $ .20/kwh or $1.50/hr – Assume 15,000 hrs per yr

4A.10) Lift Station No. 11 Bypass and Pipeline Replacements

Revised Project Cost Estimate: **Table 4A.10a and 4A.10b** are the revised project costs estimate.

Table 4A.10a Revised Cost Estimate

ALTN. NO. 4a.10a - UPDATED COST ESTIMATE FOR UPGRADING LIFT STATION NO. 11 AND (N) FORCE MAIN PIPELINES)							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Upgrade Existing Pump Station No. 11 w/2161 lf of (N) Pipeline	1	Bonds and Insurance (1%)	1	LS	$2,880	$2,880	
	2	Mobilization (3%)	1	LS	$8,640	$8,640	
	3	Storm Water Pollution Control Plan/EP	1	LS	$25,000	$25,000	
	4	Demolition of Old Wet Well and Piping	1	LS	$22,000	$8,000	
	5	Purchase and Install New Cmpressor and Fittings	1	EA	$38,000	$32,560	
	6	Install New Valving w/ (2) ARV	1	LS	$55,000	$55,000	
	7	Install New Quick Connect Assembly	1	EA	$15,000	$15,000	
	8	Install Ejector Station Wet Well	1	LS	$90,000	$90,000	
	9	Install New Wiring to Controls	1	LS	$35,000	$35,000	
	10	Install new PVC DR 14 PVC Pipe - Bursting	2161	LF	$240	$518,640	Replace Old Failing ACP Pipe
	11	Points of Connection to Force Main to WWTP	3	LS	$20,000	$60,000	
	12	Rehab. Old Ejector Sta. Building	90	SF	$350	$31,500	
	13	Cleanup, Finish Grading and Paving	1	LS	$12,000	$12,000	
					Sub-total Construction Costs	$894,220	
					Soft Costs 30%	$268,266	
					Sub-total Construction and Soft Costs	$1,162,486	
					Contingencies 10%	$116,249	
					Total Alternatve Cost Estimate	**$1,278,735**	

Table 4A.10b Revised Cost Estimate

ALTN. NO. 4A.10b - UPDATED COST ESTIMATE FOR ELIMINATING EJECTOR STATION NO. 11 (Upgrade LS 12 - and New Pipeline)							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Eliminate LS No. 11 w/ Upgrade to LS 12 w/3046 LF of (N) Pipeline	1	Bonds and Insurance (1%)	1	LS	$9,882	$9,882	
	2	Mobilization (3%)	1	LS	$29,646	$29,646	
	3	Storm Water Pollution Control Plan/EP	1	LS	$35,000	$36,000	
	4	Site preparation and Demolition of Old Facilities (Ejector Sta.)	1	LS	$55,000	$50,160	
	5	Upgrade Existing Smith Loveless Lift Station No. 12 (Pumps)	2	EA	$25,000	$50,000	Upgrade (E) Lift Station - Smith and Loveless - Pumps/Empellers
	6	Install Valve Box with Valves - ARV 2	2	EA	$20,000	$40,000	
	8	Electrical and Controls and Wiring	1	LS	$15,000	$15,000	
	9	Install New PVC DR 18 PVC Pipe - Bursting	2161	LF	$240	$518,640	
	10	Replace (E) Gravity 4-Inch ACP w/ 6-Inch PVC Dr18 Pipe	885	LF	$240	$212,400	
	11	Points of Connection to Force Main to WWTP	3	LS	$20,000	$60,000	
	12	Quick Connect Assembly - Bypass	1	EA	$15,000	$15,000	
	13	Cleanup, Finish Grading, and Paving	1	LS	$18,000	$18,000	
					Sub-total Construction Costs	$1,054,728	
					Soft Costs (30%)	$316,418	
					Sub-total Construction and Soft Costs	$1,371,146	
					Contingencies	$137,115	
					Total Alternatve Cost Estimate	**$1,508,261**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.10a1, and Table 4A.10a2** project alternative cost comparisons using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements.

Table 4A.10a1 Rehabilitation

Annual Cost Comparison Alternative LS No. 11					
Alternative 4A.10a1 Upgrade LS 11 w/ New Force Main Pipeline Replacement					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$1,278,735	35	2.5	0.0432	$55,241
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$1,512	35	NA		$1,512
Repairs/Maint. [2]	$3,500	35	2.5	0.0432	$151.20
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$66,980**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

Table 4A.10a2 New Lift Station

Annual Cost Comparison Alternative LS No. 11					
Alternative 4A-10b1 Bypass LS 11					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$1,508,261	35	2.5	0.0432	$65,157
Annual Cost [1]	$20,075	35	NA		$20,075
Annual Cost [4]	($20,075)	35	NA		($20,075)
Energy/Electrical	$1,690	35	NA		$1,690
Energy/Electrical [4]	($1,512)	35	NA		($1,512)
Repairs/Maint. [2]	$3,500	35	2.5	0.0432	$151.20
Repair Maint. [4]	($3,500)	35	NA		($3,500.00)
Salvage Value	$10,000	35	NA		($10,000.00)
				Total	**$51,986**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

(4) Eliminate LS 11

4A.11) Sludge Drying Bed Improvements

Revised Project Cost Estimate: **Table 4A.11b** is the revised project costs estimate.

Table 4A.11b Revised Cost Estimate

ALTN. NO. 4A.11 - UPDATED COST ESTIMATE FOR SLUDGE DRYING BED IMPROVEMENTS (CONCRETE LINING)							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Replace Sludge Bed Surface w/ Concrete (3 Beds)	1	Bonds and Insurance (1%)	1	LS	$5,315	$4,881	
	2	Mobilization (3%)	1	LS	$15,946	$14,644	
	3	Storm Water Pollution Control Plan/EP	1	LS	$10,000	$10,000	
	4	Demolition of Old AC Drying Bed	3	LS	$15,000	$45,000	Three (3) Beds (64'x80")
	5	Install (N) Underdrain w/ Piping	290	LF	$65	$18,850	Three (3) Beds (80'LF EA)
	6	Concrete Resurface w/AB Sub-base	180	YDS	$50	$9,000	Three (3) Beds (64'x80")
	7	6-inches Reinforced Concrete Bed	15360	SF	$18	$276,480	Three (3) Beds (64'x80")
	8	Sand - 3/8" minus with Poly Lining	62	YDS	$45	$2,790	With 30 m HDPE liner
	9	Misc. Repairs	1	LS	$18,000	$18,000	
	10	Drainage Inlet Box with Removable Grate	3	EA	$30,000	$90,000	Three (3) Beds (64'x80")
	11	Cleanup, Finish Grading and Paving	1	LS	$15,000	$18,000	
					Sub-total Construction Costs	$507,645	
					Soft Costs 17%	$86,300	
					Sub-total Construction and Soft Costs	$593,944	
					Contingencies 10%	$59,394	
					Total Alternatve Cost Estimate	**$653,339**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.11a1, and Table 4A.11a2** project alternative cost comparisons using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements. Current beds are paved with asphalt concrete which doesn't hold up. The recommended alternative is to use concrete in place of AC which only has a life of 10 years where concrete will provide a life expectancy of over 50 years.

Table 4A.11a1 New Facility (NO ALTERNATIVE REQUIRED)

PHASE 4B - PROJECTS COSTS AND ALTERNATIVE EVALUATION (REFER TO ATTACHMENT A – PROJECT COST TABLE)

This revised cost estimate includes 2024/25 dollars and also includes the addition of soft costs. The project soft costs are estimated at 17%, which include revisions and updates to specifications and some minor mods. to the plans. These upgrades and improvements projects like the 4A projects above have been identified within past project engineering reports and through communications and orders from the CRWQCB as necessary to be within compliance with all regulatory requirements and orders.

4B.12) Groundwater Monitoring Well (WWTP)

Revised Project Cost Estimate: **Table 4A.12ba** is the revised project costs estimate.

Table 4A.12ba Revised Cost Estimate

ALTN. NO. 4B.12 - UPDATED COST ESTIMATE FOR INSTALLING NEW GROUNDWATER MONITORING WELL							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Construct New Groundwater Monitoring Well	1	Bonds and Insurance (1%)	1	LS	$250	$373	
	2	Mobilization (3%)	1	LS	$750	$1,118	
	3	Storm Water Pollution Control Plan/EP	1	LS	$25,000	$1,000	
	4	Insatll (N) Grorundwater Monitoring Well (50)' Depth	70	LF	$475	$33,250	Cost varies based on subsurface conditions
	13	Cleanup, Finish Grading and Paving	1	LS	$3,000	$3,000	
					Sub-total Construction Costs	$38,740	
					Soft Costs 17%	$6,586	
					Sub-total Construction and Soft Costs	$45,326	
					Contingencies 10%	$4,533	

Project Alternative Evaluation (Cost Comparison): **Table 4A.12a1,** is a project alternative evaluation based on Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements. There are **NO** comparable projects per CRWQCB monitoring well design requirements.

Table 4A.12a1 (NO ALTERNATIVE REQUIRED)

4B.13) Electrical Panel Upgrades at WWTP

Revised Project Cost Estimate: **Table 4A.13a** is the revised project costs estimate.

Table 4A.13a Revised Cost Estimate

ALTN. NO. 4B.13 - UPDATED COST ESTIMATE FOR UPGRADING POWER TO WWTP							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Upgrade Electrical Panel and Power Feed to WTP	1	Bonds and Insurance (1%)	1	LS	$2,450	$2,450	
	2	Mobilization (3%)	1	LS	$7,350	$7,350	
	3	Storm Water Pollution Control Plan/EP	1	LS	NA	$0	
	4	Rewire Main Electrical System @ WWTP	1	LS	$65,000	$65,000	Transformer,wiring, appurtenances
	5	Provide (N) Electric Panel/Upgrade SCADA	1	EA	$175,000	$175,000	
	6	Cleanup, Finish Grading and Paving	1	LS	$5,000	$5,000	
					Sub-total Construction Costs	$254,800	
					Soft Costs 17%	$43,316	
					Sub-total Construction and Soft Costs	$298,116	
					Contingencies 10%	$29,812	
					Total Alternatve Cost Estimate	**$327,928**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.13a1** project alternative cost comparison using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements. There are no alternatives required for the electrical upgrades.

Table 4A.13a1 NO ALTERANTIVE REQUIRED

4B.14) Sludge Pond No. 2 Poly Lining

Revised Project Cost Estimate: **Table 4B.14a** is the revised project costs estimate.

Table 4A.14a Revised Cost Estimate

ALTN. NO. 4B.14 - UPDATED COST ESTIMATE FOR RELINING SLUDGE POND NO. 2, W/ HYPOLON POLY LINING, ANCHORS, AND RIM RING							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Install (N) Hypalon Lining for Sludge Pond	1	Bonds and Insurance (1%)	1	LS	$1,028	$1,028	
	2	Mobilization (3%)	1	LS	$3,083	$3,083	
	3	Storm Water Pollution Control Plan/EP	1	LS	$8,000	$8,000	
	4	Demolition and Removal of Old Poly Lining	1	LS	$28,000	$28,000	
	5	Grade and Re-surface pond	1500	SF	$10	$15,000	
	6	Install (N) Hypalon Lining	1500	SF	$4	$6,000	
	7	Anchors/Tie Downs and Perimeter Ring	150	LF	$105	$15,750	
	8	Re-wiring and Re-installing (E) Aerators	1	LS	$18,000	$18,000	
	9	Cleanup and Finish Grading	1	LS	$12,000	$12,000	
					Sub-total Construction Costs	$106,860	
					Soft Costs 17%	$18,166	
					Sub-total Construction and Soft Costs	$125,026	
					Contingencies 10%	$12,503	
					Total Alternatve Cost Estimate	**$137,529**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.14a1** is project alternative analysis using the Annual Cost Recovery Methods. A **no project alternative** is not compatible with CRWQCB CAO requirements. This is a rehabilitation project requiring the replacement of the existing poly lining. No alternatives are required.

Table 4A.14a1 New Facility (NOT COST-EFFECTIVE)

4B.15) Upgrade CL2 Basin with Concrete Structures and Appurtenances

Revised Project Cost Estimate: **Table 4A.15a** is the revised project costs estimate.

Table 4A.15a Revised Cost Estimate

ALTN. NO. 4B.15a - Construct In-Place (N) Cl2 Contact Basin (Remove Poly Lined Existing Basin- Replace with Concrete Structures							
Project Description	Item	Description		Unit	Unit Price	**Total Construction Cost**	Notes
Install (N) CL2 Contact Chamber with Equipment	1	Bonds and Insurance (1%)	1	LS	$11,675	$11,675	
	2	Mobilization (3%)	1	LS	$35,024	$35,024	
	3	Storm Water Pollution Control Plan/EP	1	LS	$35,000	$35,000	
	4	Demolition of (E) Cl 2 structure	1	LS	$60,000	$60,000	
	5	Site grading/Earthwork	177	CY	$180	$31,860	
	6	Cast-in-pace CL2 Basin w/ Mixing Chamber and (2) Vertical Shaft Mixers	350	CY	$1,400	$490,000	
	8	Inlet/Outlet Structures	24	CY	$1,400	$33,600	
	9	Sampling/Analyzer Structures and Equipment/Panels	1	LS	$135,000	$135,000	
	10	Sample Pumps (3)	3	EA	$20,000	$60,000	
	11	Sample Piping and Analyzer (2)	1	EA	$20,000	$20,000	
	12	Electrical and SCADA Upgrades	1	LS	$145,000	$145,000	
	13	Replace Clorinators/Sodium Hypochlorite Feed Pumps. Piping and Controllers	1	LS	$65,000	$65,000	
	14	Miscellaneous Piping, Connections, Outlet Structures, Flow Meter	1	LS	$52,000	$52,000	
	15	Handrails and Misc Grating Steps..etc	1	LS	$25,000	$25,000	
	16	Cleanup, Finish Grading, and Paving	1	LS	$18,000	$15,000	
					Sub-total Construction Costs	$1,214,158	
					Soft Costs (30%)	$364,248	
					Sub-total Construction and Soft Costs	$1,578,406	
					Contingencies	$157,841	
					Total Alternatve Cost Estimate	**$1,736,247**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.15ab1,** is a project annual cost evaluation using the Annual Cost Recovery Methods. ***No Alternative*** required. Rehabilitation of existing Cl2 basin for better contact time and removing poly lining that cracks and is uneven on basin bottom.

Table 4A.15a1 Rehabilitation

Annual Cost Comparison Alternative (N) CL 2 Basin with Appurtanences					
Alternative 4B-15a1 Upgrade (E) Cl2 Basin					
Item	Cost Values ($)	Annual Cost Recovery		Amortization Factor	Annual Cost Value
		Years (Life)	Interest %		
Capital Cost [3]	$1,736,247	35	2.5	0.0432	$75,006
Annual Cost [1]	$20,075	35	NA		$20,075
Energy/Electrical	$8,500	35	NA		$8,500
Repairs/Maint. [2]	$9,000	35	2.5	0.0432	$388.80
Salvage Value	$15,000	35	NA		($15,000.00)
				Total	**$88,970**

Notes: (1) Required annual cost based on pumps station maintenance 1 man (@ 30 mins/day or 182.5 hrs/year @ Burdened rate of $110/hr.

(2) Assumes for budgeting purposes ongoing maintenance and repairs, including cap. replacement costs

(3) Total Capital includes soft costs

Table 4A.15b1 New Facility (REHABILITATION – NO ALTERNATIVE)

4B.16) WWTP Facility/Building Improvements

Revised Project Cost Estimate: **Table 4A.16a** is the revised project costs estimate.

Table 4A.16a Revised Cost Estimate

ALTN. NO. 4B.16a - UPDATED COST ESTIMATE FOR LAB AND CONTROL BUILDING IMPROVEMENTS AT WWTP							
Project Description	Item	Description	Quantity	Unit	Unit Price	**Total Construction Cost**	Notes
Upgrade Grade Lab and Control Building @ WWTP	1	Bonds and Insurance (1%)	1	LS	$2,880	$1,790	
	2	Mobilization (3%)	1	LS	$8,640	$5,370	
	3	Storm Water Pollution Control Plan/EP	1	LS	$0	$0	
	4	Demolition of Portions of the Lab, Offices, & Control Room	1	LS	$30,000	$30,000	
	5	Construct (2) New Offices with Conference Room	380	SF	$300	$114,000	
	11	Add New Appurtenances (Sink, Lab, Restroom Facilities)	100	LS	$350	$35,000	
	13	Cleanup, Finish Grading and Paving	NA	LS	NA	$0	
					Sub-total Construction Costs	$186,160	
					Soft Costs 23%	$42,817	
					Sub-total Construction and Soft Costs	$228,977	
					Contingencies 10%	$22,898	
					Total Alternatve Cost Estimate	**$251,874**	

Project Alternative Evaluation (Cost Comparison): **Table 4A.16a1,** is an annual cost evaluation using the Annual Cost Recovery Methods. New control building with offices and storage would cost well over $1.5 million. The current facility is structurally sound and only requires offices and some internal and external remodeling, with a new restroom.

Table 4A.16a1 New Facility Cost >$1.5 million (NA)

4B.17) New Filter Press for WTP Backwash Sludge/Algae

Revised Project Cost Estimate: **Table 4A.17b** is currently under review as an addition to the project recommendations.

Table 4A.17b Revised Cost Estimate

Project Alternative Evaluation (Cost Comparison): **Table 4A.17b1, and Table 4A.17b2** project alternative cost comparisons using the Annual Cost Recovery Methods**. (PENDING)**

Table 4A.17a1 New Filter Press w/No Alternative

SECTION 6 - Project Recommendations for SWRCB DFA SRF Grant Funding

The recommended projects for SWRCB DFA SRF funding that have been described above and through past reports and CAO are as shown below within **Table 6A.** The total funding request for **4A Projects is $8,526,961 and** the funding request for **4B Projects is $3,000,986 with the total combined 4A and 4B projects totaling $11,527,947.**

Table 6A – Project Recommendations and Cost Summary Table

Project Descriptions	Fundable	Total Costs
PHASE 4A PROJECTS		
4A.1) Lift Station No. 1 Rehabilitation	Yes	$469,686
4A.2) Lift Station No. 3 Rehabilitation	Yes	$308,880
4A.3) Lift Station No. 5 Rehabilitation	Yes	$385,482
4A.4) Lift Station No. 6 Rehabilitation	Yes	$385,482
4A.5) Lift Station No. 8 Rehabilitation	Yes	$365,405
4A.6) Lift Station No. 9 Rehabilitation	Yes	$385,482
4A.7) Collection System Rehabilitation (Pipelines and Manholes)	Yes	$3,538,168
4A.8) Project Report and Grant Application Updates	Yes	$65,000
4A.9) Oxidation Ditch Upgrades (WWTP)	Yes	$461,776
4A.10) Lift Station 11 (Ejector) Bypass and Pipeline Replacements	Yes	$1,508,261
4B.12) Sludge Drying Bed Improvements	YES	$653,339
PHASE 4A PROJECT TOTALS		**$8,526,961**
PHASE 4B PROJECTS		
4B.11) Groundwater Monitoring Well (WWTP)	YES	$49,858
4B.13) Electrical Panel Upgrades at WWTP	YES	$327,928
4B.14) Sludge Pond No. 2 Poly Lining	YES	$137,529
4B.15) Upgrade CL2 Basin with concrete Structures and Appurtenances	YES	$1,736,247
4B.16) WWTP Facility/Building Improvements	YES	$251,874
4B.17) New Filter Press for WTP Backwash Sludge/Algae	YES	$497,550
PHASE 4B PROJECT TOTALS		**$3,000,986**
GRAND TOTAL OF PROJECTS 4A AND 4B		**$11,527,947**

Our Team is also requesting that the project be funded in two separate bid packages **(Segment I Bid Package and Segment II Bid Package).** This would allow for the **Segment I** to complete minor design and specification revisions and then proceed with bidding and construction, while the second segment include the completion of the required design (plans and specs) and update the environmental documents that relate to the **Segment II** projects and once completed **Segment II** will proceed to bidding and construction all under and as specified within one grant agreement.

SEGMENT I – PROJECTS

- **Project No. 4A.1 – 4A.6 - Lift Stations 1, 3, 5, 6, 8, and 9 –** Design completed with minor modifications.
- **Project No. 4A.7** - **Collection System Rehabilitation** (Specs completed w/ minor plan sheet modifications required).

- **Project No. 4A.9** - **Oxidation Ditch Aeration Upgrades**. Only minor modifications are required for attaching and connecting new 15 Hp rotor brushes.
- **Project No. 4A.12** - **Sludge Drying Beds (3) Upgrades**. Minor modifications to specifications with completed plan set.
- **Project No. 4B.13** – **Electrical Upgrades**. Partially completed but requires specification modifications and amendment to existing electrical drawings. No environmental analysis is required.
- **Project No. 4B. 14** – **Sludge Pond No. 2 Relining**. Requires modifications with new Hypalon lining to both plan view and specifications.

The following **PHASE II** Projects will require the preparation and completion of plans and specifications, with Project 4A.10 requiring an amendment to the existing environmental documents and they are:

SEGMENT II PROJECTS

- **Project No. 4A.10 – LS No. 11 Bypass and Pipeline Replacement -**Needs both plans and specifications and possible amendment to the existing environmental documents. The environmental impact footprint will be minimal since we are requesting a pipe bursting project to minimize impacts to open space.
- **Project No. 4B. 11 – Groundwater Monitoring Well Installation** – This will require new plans and specifications using CRWQCB guidelines and direction. Monitoring well be to be located within existing WWTP. This project may take minor environmental modifications and analysis.
- **Project No. 4B.16 – WWTP Facility/Buildings Improvements.** This will require some architectural and civil design modifications with the building footprint and size not increasing. All work to be conducted within existing structures. This project may take minor environmental modifications and analysis.

ATTACHMENT A

Phase 4 -Revised Project List and Cost Table Matrix
for
SWRCB DFA SRF Grant Submittal

ATTACHMENT A - REVISED PROJECT LIST, JUSTIFICATIONS, ENVIRONMENTAL COVERAGE, AND COST TABLE MATRIX

Project Phases	ITEM NO.	HIGH PRIORITY	PROJECT REFERENCES DESRIPTIONS [1]						PRIORITIZED PROJECTS	PLANS AND SPECIFICATIONS COMPLETE		REPORTS PREPARED DESCRIBING PROJECTS AND COSTS AND ASSOCIATED ENVIRONMENATL IMPACTS							PROJECT COST ESTIMATES UPDATED			Under a Cleanup and Abatement Order No. R5-2014-0707	REQUESTING SWRCB SRF DFA GRANT FUNDING		NOTES/JUSTIFICATIONS	Miscellaneous Notes
			Wastewater Collection System Infiltration/Inflow Aanalysis (2015 and Updared 2017)/18)			USDA PER (2014)		SWRCB Reclamation Report (2019)	Project Titles	Plan and Spec Reference and General Descriptions with Needs	P & S % Complete (3)	Projects as Described in Technical Reports by the USDA and SWRCB [1]		Requires Project Report Update as Part of 10% Design (Tech Memo)		Environmental CEQA/NEPA Coverage [2]			2018	2024 (Bid)	2026 (Bid) (7%)				
			Sections	Alternative Analysis	SWRCB Grant Funded Design Competed	Sections	Alternative Analysis	Sections				Yes	No	Yes	No	Yes	No	Description of Environmental Coverage					Yes	No		
PHASE 4A	1	X	Chapters 1, 2, 3, 4, 5, 6 & 7		YES (SWRCB Project No. C-01-8056-10)	Sect 2.3.5 (Table 6), Sect 4 (Table 21) Sect 6.1 (Table 24) & Sect 6.1.10	YES (Chapter 4 and Table 6)		Lift Station No. 1 Rehabilitation	Wastewater System Improvements Volume 2 of 2 (Sheet CE 101/201/301) - PHASE 3	95%	X			X	X		Projects for LS No.s 1, 3, 4, 5, 6, 8, and 9 were included with the environmental documents (MND), as prepared by Analytical Environmental Services (AES) for the USDA Rural Development Project Report.		$470,000	$469,686	X	X		*Old and deteriorated w/ NO access off of Hwy 20. Projects were designed under theSWRCB grant agreements but were never constructed due to grant funding cao. Projects are 100% designed. Cleanup and Abatement Order (R5-2014-0707) - Refer to Sections 12-17 of the Order for Specific Issues as Identified.*	*Projects with completed plans and specifications - Some modifications and changes required prior to bidding*
	2	X	Chapters 1, 2, 3, 4, 5, 6 & 7		YES (SWRCB Project No. C-01-8056-10)	Sect 2.3.5 (Table 6), Sect 4 (Table 21) Sect 6.1 (Table 24) & Sect 6.1.10	YES (Chapter 4 and Table 6)		Lift Station No. 3 Rehabilitation	Wastewater System Improvements Volume 2 of 2 (Sheet CE 103/203/303) - PHASE 3	95%	X			X	X		Projects for LS No.s 1, 3, 4, 5, 6, 8, and 9 were included with the environmental documents (MND), as prepared by Analytical Environmental Services (AES) for the USDA Rural Development Project Report.		$375,000	$308,880	X	X		*Projects were designed under theSWRCB grant agreements but were never constructed due to grant funding cao. Projects are 100% designed. Old and deteriorated - needs emergency components- Cleanup and Abatement Order (R5-2014-0707) - Refer to Sections 12-17 of the Order for Specific Issues as Identified*	
	3	X	Chapters 1, 2, 3, 4, 5, 6 & 7		YES (SWRCB Project No. C-01-8056-10)	Sect 2.3.5 (Table 6), Sect 4 (Table 21) Sect 6.1 (Table 24) & Sect 6.1.10	YES (Chapter 4 and Table 6)		Lift Station No. 5 Rehabilitation	Wastewater System Improvements Volume 2 of 2 (Sheet CE 105/205/305) - PHASE 3	95%	X			X	X		Projects for LS No.s 1, 3, 4, 5, 6, 8, and 9 were included with the environmental documents (MND), as prepared by Analytical Environmental Services (AES) for the USDA Rural Development Project Report.		$380,000	$385,482	X	X		*Projects were designed under theSWRCB grant agreements but were never constructed due to grant funding cao. Projects are 100% designed. Old and deteriorated - needs emergency components- Cleanup and Abatement Order (R5-2014-0707) - Refer to Sections 12-17 of the Order for Specific Issues as Identified*	
	4	X	Chapters 1, 2, 3, 4, 5, 6 & 7		YES (SWRCB Project No. C-01-8056-10)	Sect 2.3.5 (Table 6), Sect 4 (Table 21) Sect 6.1 (Table 24) & Sect 6.1.10	YES (Chapter 4 and Table 6)		Lift Station No. 6 Rehabilitation	Wastewater System Improvements Volume 2 of 2 (Sheet CE 106/206/306) - PHASE 3	95%	X			X	X		Projects for LS No.s 1, 3, 4, 5, 6, 8, and 9 were included with the environmental documents (MND), as prepared by Analytical Environmental Services (AES) for the USDA Rural Development Project Report.		$450,000	$385,482	X	X		*Projects were designed under theSWRCB grant agreements but were never constructed due to grant funding cao. Projects are 100% designed. Old and deteriorated - needs emergency components- Cleanup and Abatement Order (R5-2014-0707) - Refer to Sections 12-17 of the Order for Specific Issues as Identified*	
	5	X	Chapters 1, 2, 3, 4, 5, 6 & 7		YES (SWRCB Project No. C-01-8056-10)	Sect 2.3.5 (Table 6), Sect 4 (Table 21) Sect 6.1 (Table 24) & Sect 6.1.10	YES (Chapter 4 and Table 6)		Lift Station No. 8 Rehabilitation	Wastewater System Improvements Volume 2 of 2 (Sheet CE 108/208/308) - PHASE 3	95%	X			X	X		Projects for LS No.s 1, 3, 4, 5, 6, 8, and 9 were included with the environmental documents (MND), as prepared by Analytical Environmental Services (AES) for the USDA Rural Development Project Report.		$345,000	$365,405	X	X		*Projects were designed under theSWRCB grant agreements but were never constructed due to grant funding cao. Projects are 100% designed. Old and deteriorated - needs emergency components- Cleanup and Abatement Order (R5-2014-0707) - Refer to Sections 12-17 of the Order for Specific Issues as Identified*	
	6	X	Chapters 1, 2, 3, 4, 5, 6 & 7		YES (SWRCB Project No. C-01-8056-10)	Sect 2.3.5 (Table 6), Sect 4 (Table 21) Sect 6.1 (Table 24) & Sect 6.1.10	YES (Chapter 4 and Table 6)		Lift Station No. 9 Rehabilitation	Wastewater System Improvements Volume 2 of 2 (Sheet CE 109/209/309) - PHASE 3	95%	X			X	X		Projects for LS No.s 1, 3, 4, 5, 6, 8, and 9 were included with the environmental documents (MND), as prepared by Analytical Environmental Services (AES) for the USDA Rural Development Project Report.		$325,000	$385,482	X	X		*Projects were designed under theSWRCB grant agreements but were never constructed due to grant funding cao. Projects are 100% designed. Old and deteriorated - needs emergency components- Cleanup and Abatement Order (R5-2014-0707) - Refer to Sections 12-17 of the Order for Specific Issues as Identified*	
	7	X	Chapters 4, 5, 6 & 7	Chapters 5, 6 & 7	YES (SWRCB Project No. C-01-8056-10) Limited the amount of pipeline rehabilitation due to grant cap.	Sect 6.1 (Table 24)			Collection System Rehabilitation (Pipelines, Manholes, and COs)	75% Complete - requires Spec and Plan mods - PHASE 2	75%	X			X	X		Projects for LS No.s 1, 3, 4, 5, 6, 8, and 9 were included with the environmental documents (MND), as prepared by Analytical Environmental Services (AES) for the USDA Rural Development Project Report.		$4,750,000	$3,538,168	X	X		*Projects were designed under theSWRCB grant agreements but were never constructed due to grant funding cao. Projects are 100% designed. Old and deteriorated - needs emergency components- Cleanup and Abatement Order (R5-2014-0707) - Refer to Sections 12-17 of the Order for Specific Issues as Identified*	
	8	X	Update						Updated Project Report Facilities Plan (2017) and construction application submittal for Phase 4	Udpdate Cchapter 7 and other costs and descriptions, including environmental updates (amendment, if required by SWRCB)	90%	X		X		X				$65,000	$65,000	X	X		*Projects were designed under theSWRCB grant agreements but were never constructed due to grant funding cao. Projects are 100% designed. Old and deteriorated - needs emergency components- Cleanup and Abatement Order (R5-2014-0707) - Refer to Sections 12-17 of the Order for Specific Issues as Identified*	
	9	X	Chapters 1, 2, 3, 4, 5, 6 & 7		YES (SWRCB Project No. C-01-8056-10)	Sect 4 Table 20) & 6.1 (Table 24)			New 20 HP Rotor Brushes at Oxidation Ditch	Wastewater System Improvements Volume 1 of 2 (Specs) - Phase 2	95%	X			X	X		Sewer collection system rehabilitation projects were were included with the environmental documents (MND), as prepared by Analytical Environmental Services (AES) for the USDA Rural Development Project Report.		$350,000	$461,776	X	X		*Projects were designed under theSWRCB grant agreements but were never constructed due to grant funding cao. Projects are 100% designed. Old and deteriorated - needs emergency components- Cleanup and Abatement Order (R5-2014-0707) - Refer to Sections 12-17 of the Order for Specific Issues as Identified*	
	10	X				Sect 2.3.5 (Table 6) Sect 6.1 (Table 24) & Sect 6.1.10			Lift Station No. 11 (Eliminate Ejector System) Bypass and Pipeline Replacements (Old Ac Failing Pipe)	Eliminate Old Compressor Ejector Pumps with Submersibles- Refer to Wastewater Facilities Report 2017 - Bypass old ejector station, upgrade pumps and panel @ LS No. 12. Replace old deteriorated AC pipelines from LS 11 to WWTP	10%	X		X		X (Partial)	X			$1,099,800	$1,508,261	X	X		Old/Deteriorated- Remote location not cost efficient and requires 100% replacement	*Refer to Recycled Water Feasibility Study 2017 & CEQA- Late Addition*
	11	X	Chapters 1, 2, 3, 4, 5, 6 & 7			Sect 4 & 6.1 (Tables 20 & 24) & Sect 6.1.10	YES (Chapter 4 and Table 16)		Sludge Drying Beds improvements and Modifications **(2)**	Subbase, pavement restoration, and drainage (2-Beds) - Contaminating ground water	0%	X			X	X				$675,000	$653,339	X	X		Based on Project Report and RWQCB Cleanup and Abatement Order (R5-2014-0707) - Deterioration	*Refer to Recycled Water Feasibility Study 2017 & CEQA*	**Sub4-total Phase 4A (Items 1-10)**
																		PHASE 4A TOTALS			**$8,609,800**	**$8,526,961**					**$8,526,961**
PHASE 4B	12	X				**Refer to CRWQCB 2022 Inspection**			Groundwater Monitoring Well at WWTP **(1)**	Install new groundwater monitoring well per CRWQCB	0%	X		X		X				$85,000	$49,858	X	X		Required by the CRWQCB- Cleanup and Abatement Order (R5-2014-0707) - Refer to Sections 12-17 of the Order for Specific Issues as Identified		
	13	X	Chapters 1, 2, 3, 4, 5, 6 & 7			Sect 4 & 6.1 (Tables 20 & 24) & Sect 6.1.11	YES (Chapter 4 and Table 16)		Electrical Upgrades for WWTP Improvements	Reeavluate power feed and transformer, and panel electrical capacity- No available capacity for (N) rotor brushes (Ox ditch)	0%	X			X					$285,000	$327,928	X	X		Need updated and improved power supply w/ needed and required upgrades - - Refer to Sections 12-17 of the Order for Specific Issues as Identified	Refer to Recycled Water Feasibility Study 2017 & CEQA	
	14	X				Sect 4 & 6.1 (Tables 20 & 24) & Sect 6.1.12	YES (Chapter 4 and Table 16)		New/Replace Sludge Storage Pond Lining	Add new poly lining to pond no. 2 - Aerated Lagoons (40-60 mil)- Existing lining ripped and failing	0%	X			X					$458,000	$137,529	X	X		Existing old and deteriorated with multiple repairs See cost estimate - - Refer to Sections 12-17 of the Order for Specific Issues as Identified	Refer to Recycled Water Feasibility Study 2017 & CEQA	
	15	X				Sect 4 & 6.1 (Tables 20 & 24) & Sect 6.1.11	YES (Chapter 4 and Table 16)		New Upgraded Chlorine Contact Basin w/ Pumps/Mixing/Baffling	Add (new concrete CXL2 basin with feed, mixing, pumps, monitoring (pre-post Cl2)-Lack mixing and detention	0%	X			X	X				$1,391,880	$1,736,247	X	X		*Based on Project Report and RWQCB Cleanup and Abatement Order (R5-2014-0707) - Poly-lining failing and improper mixing*	Refer to Recycled Water Feasibility Study 2017 & CEQA	**Added from 4C below**
	16	X				Sect 4 & 6.1 (Tables 20 & 24) & Sect 6.1.11	YES (Chapter 4 and Table 16)		WWTP Facility Improvements	Rehab office building and provide updated lab and equipment, and outside lighting	0%	X			X				0	400,000	$251,874	X	X		Required per new ELAP Regs and old and deteriorated - - Refer to Sections 12-17 of the Order for Specific Issues as Identified	Refer to Recycled Water Feasibility Study 2017 & CEQA	
	17	X						X	New Filter Press for WTP Backwash	Provide (N) filter press- pre-treat algae from WTP	0%		X	X						$465,000	$497,550	X	X		Provide means to eliminate liquid alge flow as discharged form the WTP - DO problems and handling issues - Ra	New problem due to drought and high algae concentrations	**Sub4-total Phase 4B (Items 12-18)** / **Sub-total Phase 4A (items 12-19)** / **Total 4A and 4B Projects**
																		PHASE 4B TOTALS			**$3,084,880**	**$3,000,986**					**$3,000,986** / **$8,526,961** / **$11,527,947**
										PENDONG WASTEWTARE PROJECTS NOT INCLUDED WITHIN THIS SUBMITTAL																
	18					Sect. 4 (Table 20) Sect. 6.1.9			Improve Sludge Bed Drainage	Provide (N) bubbler type drainage along the so. End of sludge beds to prevent flooding of beds	0%	X			X					$60,000	$64,200	X	X		Current no drainage system and lower sludge bed floods during winter	New serious deficiency	
	19					Sect 4 & 6.1 (Tables 20 & 24)			Provide Reliability and Emergency Backup at Sludge Ponds 1 and 2	Provide (1) new portable sludge pump for Ponds 1 and 2 -required emergency backup	0%	X			X					$90,000	$96,300	X	X		Currently no way of properly removing sludge form ponds 1 and 2	New serious deficiency	
	20					Sect 4 & 6.1 (Tables 20 & 24)			Rehab or Replace Portions of Headworks	Replace moving bar screen and upgrade parshall flume and bypass at headworks	0%		X		X					$125,000	$133,750	X	X		Headworks over 40 years old (old and deteriorated)	Refer to Recycled Water Feasibility Study 2017 & CEQA	
	21					Sect 4 & 6.1 (Tables 20 & 24)			Rehabilitate (E) Oxidation Ditch	Resurface (E) oxidation sloped walls to avoid sewage contact w/ soil and repair cracks. Add concrete floor/base to (E) Structure to replace deteriorated sand bottom	0%	X			X					$300,000	$321,000	X	X		Current Oxidation ditch has earthen floor and suseptable to groundwater contamination, the current gunited walls are over 50 yrs old and have various deep cracks	Refer to Recycled Water Feasibility Study 2017 & CEQA	
PHASE 4C	22								New Upgraded Chlorine Contact Basin w/ Pumps/Mixing/Baffling	Add (new concrete CXL2 basin with feed, mixing, pumps, monitoring (pre-post Cl2)-Lack mixing and detention	0%	X			X	X				$1,391,880	$1,489,312	X	X		*Based on Project Report and RWQCB Cleanup and Abatement Order (R5-2014-0707) - Poly-lining failing and improper mixing*	Refer to Recycled Water Feasibility Study 2017 & CEQA	Moved to Item 16
	23								Miscellaneous WWTP Replacement Old and Deriotrated (Pumps/Motors/Lab Equipment)	Replacement of old and deteriorated WWTP (primary/secondary) pumps, motors, piping and fittings	0%	X			X	X				$175,000	$187,250	X	X		*Based on Project Report and RWQCB Additional standby pump for effluent outfall*	Refer to Recycled Water Feasibility Study 2017 & CEQA	
	24								Effluent Pump ststion HVAC Upgrades	Provide reliable heating ventilation and cooling for effluent pump station	0%		X	X						325,000	$347,750	X	X		Control temperatures of effluent pump station builsding	Refer to Recycled Water Feasibility Study 2017 & CEQA	
	25								Upgrade SCADA System	Provide new and upgraded SCADA facilities for controlling DO testing monitoring/other- outdated unreliable	0%		X	X						$65,000	$69,550	X	X		See above, Upgrade and replace old and deteriorated SCADA system(s) various system components	Refer to Recycled Water Feasibility Study 2017 & CEQA	
	26								New Backup Generator	Provide new backup generator w/ auto start- Do not have areliable and dependable backup power source at WWTP	0%	X			X					$260,000	$278,200	X	X		Replace old and deteriorated generator - not dependable	New serious deficiency	
	27								Rehabiliate All Levee Roads (all Weather Road Surface) w/ CL2 AB	Provide 4 to 6 -inches of AB to all levee roads approx 5000LF @ $ 40/LF Disposal and emergency ponds have limited access and are deteriorated	0%		X	X						$200,000	$214,000	X	X		Current levee pond roads are dteriorated with limited access		

Notes: **(1)** Completed Reports by SWRCB and USDA meeting guidelines and outlies per grant and loan programs

(2) Specific projects impacts and mitigations destailed as per NEPA and CEQA guidelines, including NODs

(3) All 95% Design Packages to be updated

Color Legend for Project Phases		
Phase 1		Projects Have been aprtially or fully designed and were recommended for funding per Project Reports and SWRCB Grant Agreement No. C-06-8056-210 - Including CEQA/NEPA approvals, except for Item No. 11 (Lift Station 11 Bypass and Piping)
Phase 2		Projects that were a part of prior planning reports (SWRCB and USDA) - Including CEQA/Nepa Approvals
Phase 3		Low Priority -Projects that fall under the current RWQCB Cleanup and Abtement Order

EXHIBIT 1A

Report of 20 October 2021 Inspection, Clearlake Oaks County Water District Wastewater Treatment Facility, Lake County – Guy Childs RWQCB - 2021/2022

10 March 2022

Dianna Mann
Clearlake Oaks County Water District
P.O. Box 736
Clearlake Oaks, California 95423

Sent via email only:
dmann@clocwd.org

REPORT OF 20 OCTOBER 2021 INSPECTION, CLEARLAKE OAKS COUNTY WATER DISTRICT WASTEWATER TREATMENT FACILITY, LAKE COUNTY

The Clearlake Oaks County Water District (CLOCWD) Wastewater Treatment Facility (WWTF) is owned and operated by Clearlake Oaks County Water District (Discharger) and regulated by the Central Valley Water Board under Discharge Requirements (WDRs) Order 98-211, revised Monitoring and Reporting Program (MRP) 98-211, and Cleanup and Abatement Order R5-2014-0707.

The WWTF consists of a headworks with grinder and bar screen for screening solids, an oxidation ditch with two brush aerators, a clarifier, two lined facultative ponds, and a chlorine contact chamber. Disinfected wastewater from the chlorine contact chamber is pumped into a pipeline that is connected to the Lake County Sanitation District Southeast Regional Wastewater storage pond. From the pond, effluent is pumped into the geyser pipeline which is eventually injected into the Calpine Geysers. In addition, there are four emergency storage ponds at the plant.

On 20 October 2021, Board staff conducted an inspection of the Clearlake Oaks County Water District WWTF and was accompanied by Mr. Francisco Castro the Grade 3 Wastewater Treatment Plant Operator. A site inspection photograph log is enclosed with this letter.

The following summarizes the observations made and information obtained from the Discharger during the inspection:

1. The WWTF was fenced, gated, and had appropriate signage (Photo 1).

2. The WWTF receives domestic wastewater from Clearlake Oaks, Orchard Shores, Heritage, and the Keys. The influent flows to the plant are measured using an ultrasonic flow metering device (Photo 2). Mr. Castro indicated that the meter was last calibrated in November 2020 by Telstar Instruments. The next calibration was scheduled for the first week of November 2021. Mr. Castro also indicated that the meter is calibrated annually. The meter is shown in photo 3.

Requested Submittal

By **10 May 2022,** please submit a *Well Disinfection and Re-Development Workplan* that describes the measures to be taken to address the total coliform organisms reported in the monitoring wells (MWs) 2 and 3. In addition, please provide an explanation regarding how CLOCD intends to comply with the groundwater monitoring requirements if MW-2 is dry.

Be advised that if groundwater samples cannot be consistently collected from MW-2, then the well will need to be replaced and developed. Prior to installing the well, a *Groundwater Monitoring Well Installation Workplan* will need to be prepared in accordance with, and include the items listed in, the first section of the enclosure: *"Requirements for Monitoring Well Installation Workplans and Monitoring Well Installation Reports".* The workplan will need to be prepared under the supervision of a California Registered Engineer or Professional Geologist and stamped/signed by the professional.

The requested submittal shall be converted to a searchable Portable Document Format (PDF) and e-mailed to centralvalleysacramento@waterboards.ca.gov. The e-mail shall contain the following: (a) Clearlake Oaks County Water District, (b) Clearlake Oaks County Water District WWTF, (c) Title and Date of the Report, and (d) CIWQS Place ID No. 214812. Documents that are 50 MB or larger should be transferred to a CD, DVD, or flash drive and mailed to our office, attention "ECM Mailroom."

If you have any questions, please contact me at (916) 464-4648 or at guy.childs@waterboards.ca.gov.



GUY CHILDS, P.G. #7671
Engineering Geologist
Title 27 and WDR Compliance and Enforcement Section

Enc. Inspection Photographs
Requirements for Monitoring Well Installation Workplans and Monitoring Well Installation Reports

cc: Lake County Environmental Health Department, Lakeport (email only)
Scott Armstrong, Central Valley Regional Water Board, Rancho Cordova (email only)

CIWQS Inspection No. 45763930

CIWQS Violation ID Nos: 1101893, 1101894, 1101895

EXHIBIT 1B

Approved Grant Agreement No. D17-04010 (Project No. C-06-8056-210)
That Included Various Projects that Were Pre-Approved for Construction.

Clean Water
State Revolving Fund

PROP 1
GOVERNOR EDMUND G. BROWN JR.
WATER BOND 2014

PROPOSITION 1 SMALL COMMUNITY WASTEWATER

CLEARLAKE OAKS COUNTY WATER DISTRICT

AND

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA
Water Boards

CONSTRUCTION GRANT

WASTEWATER INFRASTRUCTURE REHABILITATION PROJECT

PROJECT NO. C-06-8056-210

AGREEMENT NO. D17-04010

AMOUNT: $5,450,000

ELIGIBLE START DATE: OCTOBER 6, 2017
COMPLETION OF CONSTRUCTION DATE: OCTOBER 1, 2019
FINAL DISBURSEMENT REQUEST DATE: APRIL 1, 2020
RECORDS RETENTION TERM END DATE: OCTOBER 1, 2055

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EXHIBIT A - SCOPE OF WORK & INCORPORATED DOCUMENTS
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EXHIBIT G - RESERVED
EXHIBIT H - COMPLIANCE WITH CROSS-CUTTING STATE AUTHORITIES

WHEREAS,

1. The State Water Board is authorized to provide funding under this Agreement pursuant to the following:

   - Chapter 6.5 of Division 7 of the California Water Code (State Act)
   - Title VI of the federal Water Pollution Control Act (Federal Act)
   - Section 79723 of the Water Code (Prop 1)

2. The State Water Board determines eligibility for financial assistance, determines a reasonable schedule for providing financial assistance, establishes compliance with the Federal Act, State Act, and Prop 1, and establishes the terms and conditions of a funding agreement.

3. The Recipient has applied to the State Water Board for funding for the Project described in Exhibit A of this Agreement and the State Water Board has selected the application for funding.

4. The State Water Board proposes to assist in funding the costs of the Project, and the Recipient desires to participate as a recipient of financial assistance from the State Water Board, upon the terms and conditions set forth in this Agreement, all pursuant to the Federal Act and the State Act and Prop 1.

NOW, THEREFORE, in consideration of the premises and of the mutual representations, covenants and agreements herein set forth, the State Water Board and the Recipient, each binding itself, its successors and assigns, do mutually promise, covenant, and agree as follows:

ARTICLE I DEFINITIONS

1.1 Definitions.

Unless otherwise specified, each capitalized term used in this Agreement has the following meaning:

"Additional Payments" means the Additional Payments described in Section 3.2(c) of this Agreement.

"Agreement" means this Grant, including all exhibits and attachments.

"Allowance" means an amount based on a percentage of the accepted bid for an eligible project to help defray the planning, design, and construction engineering and administration costs of the Project.

"Authorized Representative" means the duly appointed representative of the Recipient as set forth in the certified original of the Recipient's authorizing resolution that designates the authorized representative by title.

"Completion of Construction" means the date, as determined by the Division after consultation with the Recipient, that the work of building and erection of the Project is substantially complete.

"CWSRF" means the Clean Water State Revolving Fund.

"Days" means calendar days unless otherwise expressly indicated.

"Division" means the Division of Financial Assistance of the State Water Board or any other segment of the State Water Board authorized to administer this Agreement.

"Eligible Start Date" means the date set forth in Exhibit B, establishing the date on or after which construction costs may be incurred and eligible for reimbursement hereunder.

"Enterprise Fund" means the enterprise fund of the Recipient in which Revenues are deposited.

"Final Disbursement Request Date" means the date after which no further Project Funds disbursements may be requested.

"Fiscal Year" means the period of twelve (12) months terminating on June 30 of any year, or any other annual period selected and designated by the Recipient as its Fiscal Year in accordance with applicable law.

"Force Account" means the use of the Recipient's own employees or equipment.

"GAAP" means generally accepted accounting principles, the uniform accounting and reporting procedures set forth in publications of the American Institute of Certified Public Accountants or its successor, or by any other generally accepted authority on such procedures, and includes, as applicable, the standards set forth by the Governmental Accounting Standards Board or its successor.

"Indirect Costs" means those costs that are incurred for a common or joint purpose benefiting more than one cost objective and are not readily assignable to the Project (i.e., costs that are not directly related to the Project).

"Initiation of Construction" means the date that notice to proceed with work is issued for the Project, or, if notice to proceed is not required, the date of commencement of building and erection of the Project.

"Material Event" means any event that, as determined by the Division, might cause the State Water Board to violate the terms and conditions of its agreements with USEPA, including any of the following: (a) revenue shortfalls; (b) unscheduled draws on the Enterprise Fund; (c) substitution of insurers, or their failure to perform; (d) adverse findings by the Regional Water Quality Control Board; (e) litigation related to the Revenues, the System, or the Project, whether pending or anticipated; (f) any false warranty or representation made by the Recipient relevant to this Agreement; (g) loss, theft, damage, or impairment to the Revenues or the System; (h) dissolution or cessation of operations by the Recipient, termination of Recipient's existence, insolvency of Recipient, or filing of a voluntary or involuntary bankruptcy petition by or on behalf of Recipient; (I) any event set forth in section 2.10 of this Agreement.

"Net Revenues" means, for any Fiscal Year, all Revenues received by the Recipient less the Operations and Maintenance Costs for such Fiscal Year.

"Operations and Maintenance Costs" means the reasonable and necessary costs paid or incurred by the Recipient for maintaining and operating the System, determined in accordance with GAAP, including all reasonable expenses of management and repair and all other expenses necessary to maintain and preserve the System in good repair and working order, and including all reasonable and necessary administrative costs of the Recipient that are charged directly or apportioned to the operation of the System, such as salaries and wages of employees, overhead, taxes (if any), the cost of permits, licenses, and charges to operate the System and insurance premiums; but excluding, in all cases depreciation, replacement, and obsolescence charges or reserves therefor and amortization of intangibles.

"Policy" means the State Water Board's "Policy for Implementing the Clean Water State Revolving Fund," as amended from time to time.

"Project" means the Project financed by this Agreement as described in Exhibit A, Exhibit A-FBA, and in the documents incorporated by reference herein.

"Project Completion" means the date, as determined by the Division after consultation with the Recipient, that operation of the Project is initiated or is capable of being initiated, whichever comes first.

"Project Costs" means the incurred costs of the Recipient which are eligible for financial assistance under this Agreement, which are allowable costs as defined under the Policy, and which are reasonable, necessary and allocable by the Recipient to the Project under GAAP, plus capitalized interest.

"Project Funds" means all moneys disbursed to the Recipient by the State Water Board pursuant to this Agreement.

"Recipient" means Clearlake Oaks County Water District.

"Regional Water Quality Control Board" or "Regional Water Board" means the appropriate Regional Water Quality Control Board.

"Revenues" means, for each Fiscal Year, all gross income and revenue received or receivable by the Recipient from the ownership or operation of the System, determined in accordance with GAAP, including all rates, fees, and charges (including connection fees and charges) as received by the Recipient for the services of the System, and all other income and revenue howsoever derived by the Recipient from the ownership or operation of the System or arising from the System, including all income from the deposit or investment of any money in the Enterprise Fund or any rate stabilization fund of the Recipient or held on the Recipient's behalf, and any refundable deposits made to establish credit, and advances or contributions in aid of construction.

"SRF" means the Clean Water State Revolving Fund.

"State" means State of California.

"State Water Board" means the State Water Resources Control Board.

"System" means all wastewater collection, pumping, transport, treatment, storage, and disposal facilities, including land and easements thereof, owned by the Recipient, including the Project, and all other properties, structures, or works hereafter acquired and constructed by the Recipient and determined to be a part of the System, together with all additions, betterments, extensions, or improvements to such facilities, properties, structures, or works, or any part thereof hereafter acquired and constructed.

"Year" means calendar year unless otherwise expressly indicated.

1.2 Exhibits and Appendices Incorporated.

All exhibits and appendices to this Agreement, including any amendments and supplements hereto, are hereby incorporated herein and made a part of this Agreement.

ARTICLE II REPRESENTATIONS, WARRANTIES, AND COMMITMENTS

The Recipient represents, warrants, and commits to the following as of the Eligible Start Date set forth on the first page hereof and continuing thereafter for the term of this Agreement.

2.1 General Recipient Commitments.

The Recipient shall comply with all terms, provisions, conditions, and commitments of this Agreement, including all incorporated documents, and to fulfill all assurances, declarations, representations, and commitments in its application, accompanying documents, and communications filed in support of its request for financial assistance.

2.2 Authorization and Validity.

The execution and delivery of this Agreement, including all incorporated documents, has been duly authorized by the Recipient. This Agreement constitutes a valid and binding obligation of the Recipient, enforceable in accordance with its terms, except as such enforcement may be limited by law.

2.3 No Violations.

The execution, delivery, and performance by Recipient of this Agreement, including all incorporated documents, do not violate any provision of any law or regulation in effect as of the date set forth on the first page hereof, or result in any breach or default under any contract, obligation, indenture, or other instrument to which Recipient is a party or by which Recipient is bound as of the date set forth on the first page hereof.

2.4 No Litigation.

There are no pending or, to Recipient's knowledge, threatened actions, claims, investigations, suits, or proceedings before any governmental authority, court, or administrative agency which materially affect the financial condition or operations of the Recipient, the System, the Revenues, and/or the Project.

2.5 Solvency.

None of the transactions contemplated by this Agreement will be or have been made with an actual intent to hinder, delay, or defraud any present or future creditors of Recipient. As of the date set forth on the first page hereof, Recipient is solvent and will not be rendered insolvent by the transactions contemplated by this Agreement. Recipient is able to pay its debts as they become due.

2.6 Legal Status and Eligibility.

Recipient is duly organized and existing and in good standing under the laws of the State of California, and will remain so during the term of this Agreement. Recipient shall at all times maintain its current legal existence and preserve and keep in full force and effect its legal rights and authority. Recipient shall maintain its eligibility for funding under this Agreement for the term of this Agreement.

2.7 Financial Statements and Continuing Disclosure.

The financial statements of Recipient previously delivered to the State Water Board as of the date(s) set forth in such financial statements: (a) are materially complete and correct; (b) present fairly the financial condition of the Recipient; and (c) have been prepared in accordance with GAAP. Since the date(s) of such financial statements, there has been no material adverse change in the financial condition of the Recipient, nor have any assets or properties reflected on such financial statements been sold, transferred, assigned, mortgaged, pledged or encumbered, except as previously disclosed in writing by Recipient and approved in writing by the State Water Board. The Recipient is current in its continuing disclosure obligations associated with its material debt.

2.8 Completion of Project.

The Recipient shall expeditiously proceed with and complete construction of the Project in substantial accordance with Exhibit A and Exhibit A-FBA.

2.9 Award of Construction Contracts.

(a) The Recipient shall award the prime construction contract timely in order to meet the construction date specified in Exhibit A.

(b) The Recipient shall promptly notify the Division in writing both of the award of the prime construction contract for the Project and of Initiation of Construction of the Project. The Recipient shall make all reasonable efforts to complete construction in substantial conformance with the terms of the contract by the Completion of Construction date established in Exhibit A. Such date shall be binding upon the Recipient unless modified in writing by the Division upon a showing of good cause by the Recipient. The Recipient shall deliver any request for extension of the Completion of Construction date no less than 90 days prior to the Completion of Construction date. The Division will not unreasonably deny a timely request, but the Division may deny requests received after this time.

2.10 Notice.

(a) The Recipient shall notify the Division in writing within five (5) working days of the occurrence of the following:

(1) Bankruptcy, insolvency, receivership or similar event of the Recipient;

(2) Actions taken pursuant to state law in anticipation of filing for bankruptcy;

(3) Other Material Events, except as set forth in subdivisions (b) or (c) of this section;

(4) Change of ownership of the Project or change of management or service contracts, if any, for operation of the Project; or

(b) The Recipient shall notify the Division within 10 working days of the following:

(1) Material defaults on System obligations;

(2) Unscheduled draws on debt service reserves held for System obligations, if any, reflecting financial difficulties;

(3) Unscheduled draws on credit enhancements on System obligations, if any, reflecting financial difficulties;

(4) Substitution of credit or liquidity providers, if any, or their failure to perform;

(5) Any litigation pending or threatened against Recipient regarding its wastewater capacity or its continued existence, circulation of a petition to challenge rates, consideration of dissolution, or disincorporation, or any other material threat to the Recipient's Revenues;

(6) Adverse tax opinions, the issuance by the Internal Revenue Service or proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices of determinations with respect to the tax status of any tax-exempt bonds;

(7) Rating changes on outstanding System obligations, if any;

(c) The Recipient shall notify the Division promptly of the following:

(1) Any substantial change in scope of the Project. The Recipient shall undertake no substantial change in the scope of the Project until written notice of the proposed change has been provided to the Division and the Division has given written approval for the change;

(2) Cessation of all major construction work on the Project where such cessation of work is expected to or does extend for a period of thirty (30) days or more;

(3) Any circumstance, combination of circumstances, or condition, which is expected to or does delay Completion of Construction for a period of ninety (90) days or more beyond the estimated date of Completion of Construction previously provided to the Division;

(4) Discovery of any potential archeological or historical resource. Should a potential archeological or historical resource be discovered during construction of the Project, the Recipient agrees that all work in the area of the find will cease until a qualified archeologist has evaluated the situation and made recommendations regarding preservation of the resource, and the Division has determined what actions should be taken to protect and preserve the resource. The Recipient shall implement appropriate actions as directed by the Division;

(5) Discovery of any unexpected endangered or threatened species, as defined in the federal Endangered Species Act. Should a federally protected species be unexpectedly encountered during construction of the Project, the Recipient agrees to promptly notify the Division. This notification is in addition to the Recipient's obligations under the federal Endangered Species Act;

(6) Any Project monitoring, demonstration, or other implementation activities such that the State Water Board and/or Regional Water Quality Control Board staff may observe and document such activities;

(7) Any public or media event publicizing the accomplishments and/or results of this Agreement and provide the opportunity for attendance and participation by state representatives with at least ten (10) working days' notice to the Division; or

(8) Completion of Construction of the Project, and actual Project Completion.

2.11 Findings and Challenge.

Upon consideration of a voter initiative to reduce Revenues, the Recipient shall make a finding regarding the effect of such a reduction on the Recipient's ability to satisfy the rate covenant set forth in Section 3.7 of this Agreement. The Recipient shall make its findings available to the public and shall request, if necessary, the authorization of the Recipient's decision-maker or decision-making body to file litigation to challenge any such initiative that it finds will render it unable to satisfy the rate covenant set forth in Section 3.7 and its obligation to operate and maintain the Project for its useful life. The Recipient shall diligently pursue and bear any and all costs related to such challenge. The Recipient shall notify and regularly update the State Water Board regarding the status of any such challenge.

2.12 Project Access.

The Recipient shall ensure that the State Water Board, the Governor of the State, the United States Environmental Protection Agency, the Office of Inspector General, any member of Congress, the President of the United States, or any authorized representative of the foregoing, will have safe and suitable access to the Project site at all reasonable times during Project construction and thereafter for the term of the Obligation. The Recipient acknowledges that, except for a subset of information regarding archaeological records, the Project records and locations are public records, including but not limited to all of the submissions accompanying the application, all of the documents incorporated by Exhibit A and

Exhibit A-FBA, and all reports, disbursement requests, and supporting documentation submitted hereunder.

2.13 Project Completion; Initiation of Operations.

Upon Completion of Construction of the Project, the Recipient shall expeditiously initiate Project operations.

2.14 Continuous Use of Project; Lease Sale, Transfer Ownership, or Disposal of Project.

The Recipient agrees that, except as provided in this Agreement, it will not abandon, substantially discontinue use of, lease, sell , transfer ownership or dispose of all or a significant part or portion of the Project during the useful life of the Project without prior written approval of the Division. Such approval may be conditioned as determined to be appropriate by the Division, including a condition requiring repayment of all disbursed Project Funds or all or any portion of all remaining funds covered by this Agreement together with accrued interest and any penalty assessments that may be due.

2.15 Project Reports.

(a) Status Reports. The Recipient shall provide expeditiously status reports no less frequently than quarterly, starting with the execution of this Agreement. These reports must accompany any disbursement request and are a condition precedent to any disbursement. At a minimum the reports will contain the following information:

(1) A summary of progress to date including a description of progress since the last report, percent construction complete, percent contractor invoiced, and percent schedule elapsed;

(2) A description of compliance with environmental requirements;

(3) A listing of change orders including amount, description of work, and change in contract amount and schedule; and

(4) Any problems encountered, proposed resolution, schedule for resolution, and status of previous problem resolutions.

(b) Project Completion Report. The Recipient shall submit a Project Completion Report to the Division with a copy to the appropriate Regional Water Quality Control Board on or before the due date established by the Division and the Recipient at the time of final project inspection. The Project Completion Report must address the following:

(1) Describe the Project,

(2) Describe the water quality problem the Project sought to address,

(3) Discuss the Project's likelihood of successfully addressing that water quality problem in the future, and

(4) Summarize compliance with environmental conditions, if applicable.

(5) If the Recipient fails to submit a timely Project Completion Report, then the State Water Board may stop processing pending or future applications for new financial assistance, withhold disbursements under this Agreement or other agreements, and begin administrative proceedings.

(c) As Needed Reports. The Recipient shall provide expeditiously, during the term of this Agreement, any reports, data, and information reasonably required by the Division, including but not limited to material necessary or appropriate for evaluation of the funding program or to fulfill any reporting requirements of the state or federal government.

2.16 Federal Disadvantaged Business Enterprise (DBE) Reporting.

The Recipient shall report DBE utilization to the Division on the DBE Utilization Report, State Water Board Form DBE UR334. The Recipient must submit such reports to the Division annually within ten (10) calendar days following October 1 until such time as the "Notice of Completion" is issued. The Recipient shall comply with 40 CFR § 33.301.

2.17 Records.

(a) Without limitation of the requirement to maintain Project accounts in accordance with GAAP, the Recipient shall:

(1) Establish an official file for the Project which adequately documents all significant actions relative to the Project;

(2) Establish separate accounts which will adequately and accurately depict all amounts received and expended on the Project, including all assistance funds received under this Agreement;

(3) Establish separate accounts which will adequately depict all income received which is attributable to the Project, specifically including any income attributable to assistance funds disbursed under this Agreement;

(4) Establish an accounting system which will accurately depict final total costs of the Project, including both direct and indirect costs;

(5) Establish such accounts and maintain such records as may be necessary for the State to fulfill federal reporting requirements, including any and all reporting requirements under federal tax statutes or regulations; and

(6) If Force Account is used by the Recipient for any phase of the Project, other than for planning, design, and construction engineering and administration provided for by allowance, accounts will be established which reasonably document all employee hours charged to the Project and the associated tasks performed by each employee. Indirect Force Account costs are not eligible for funding.

(b) The Recipient shall maintain separate books, records and other material relative to the Project. The Recipient shall also retain such books, records, and other material for itself and for each contractor or subcontractor who performed or performs work on this project for a minimum of thirty-six (36) years after Completion of Construction. The Recipient shall require that such books, records, and other material are subject at all reasonable times (at a minimum during normal business hours) to inspection, copying, and audit by the State Water Board, the Bureau of State Audits, the United States Environmental Protection Agency (USEPA), the Office of Inspector General, the Internal Revenue Service, the Governor, or any authorized representatives of the aforementioned. The Recipient shall allow and shall require its contractors to allow interviews during normal business hours of any employees who might reasonably have information related to such records. The Recipient agrees to include a similar duty regarding audit, interviews, and records retention in any contract or subcontract related to the performance of this Agreement. The provisions of this section shall survive the term of this Agreement.

2.18 Audit.

(a) The Division may call for an audit of financial information relative to the Project if the Division determines that an audit is desirable to assure program integrity or if an audit becomes necessary because of state or federal requirements. If an audit is called for, the audit shall be performed by a certified public accountant independent of the Recipient and at the cost of the Recipient. The audit shall be in the form required by the Division

(b) Audit disallowances will be returned to the State Water Board.

ARTICLE III FINANCING PROVISIONS

3.1 Contingent Disbursement.

The State Water Board's disbursement of funds hereunder is contingent on the Recipient's compliance with the terms and conditions of this Agreement.

3.2 Amounts Payable by the Recipient.

(a) Repayments. Repayments are waived, as provided in Exhibit B.

(b) Project Costs. The Recipient shall pay any and all costs connected with the Project including, without limitation, any and all Project Costs. If the Project Funds are not sufficient to pay the Project Costs in full, the Recipient shall nonetheless complete the Project and pay that portion of the Project Costs in excess of available Project Funds, and shall not be entitled to any reimbursement therefor from the State Water Board.

(c) Additional Payments. The Recipient shall pay to the State Water Board the reasonable extraordinary fees and expenses of the State Water Board, and of any assignee of the State Water Board's right, title, and interest in and to this Agreement, in connection with this Agreement, including all expenses and fees of accountants, trustees, staff, contractors, consultants, costs, insurance premiums and all other extraordinary costs reasonably incurred by the State Water Board or assignee of the State Water Board.

Additional Payments may be billed to the Recipient by the State Water Board from time to time, together with a statement executed by a duly authorized representative of the State Water Board, stating that the amounts billed pursuant to this section have been incurred by the State Water Board or its assignee for one or more of the above items and a copy of the invoice or statement for the amount so incurred or paid. Amounts so billed shall be paid by the Recipient within thirty (30) days after receipt of the bill by the Recipient.

3.3 Reserved.

3.4 No Obligation of the State.

Any obligation of the State Water Board herein contained shall not be an obligation, debt, or liability of the State and any such obligation shall be payable solely out of the moneys encumbered pursuant to this Agreement.

3.5 Disbursement of Project Funds; Availability of Funds.

(a) Except as may be otherwise provided in this Agreement, disbursement of Project Funds will be made as follows:

(1) Upon execution and delivery of this Agreement, the Recipient may request immediate disbursement of any eligible incurred planning and design allowance as specified in Exhibit B from the Project Funds through submission to the State Water Board of the Disbursement Request Form 260, or any amendment thereto, duly completed and executed.

(2) The Recipient may request disbursement of eligible construction and equipment costs consistent with budget amounts referenced in Exhibit B and Exhibit A-FBA. (Note that this Agreement will be amended to incorporate Exhibit A-FBA after final budget approval.)

(3) Additional Project Funds will be promptly disbursed to the Recipient upon receipt of Disbursement Request Form 260, or any amendment thereto, duly completed and executed by the Recipient for incurred costs consistent with this Agreement, along with receipt of status reports due under Section 2.15 above.

(4) The Recipient shall not request disbursement for any Project Cost until such cost has been incurred and is currently due and payable by the Recipient, although the actual payment of such cost by the Recipient is not required as a condition of disbursement request.

(5) Recipient shall spend Project Funds within 30 days of receipt. Any interest earned on Project Funds shall be reported to the State Water Board and may be required to be returned to the State Water Board or deducted from future disbursements.

(6) The Recipient shall not be entitled to interest earned on undisbursed funds.

(7) The Recipient shall not request a disbursement unless that Project Cost is allowable, reasonable, and allocable.

(8) Notwithstanding any other provision of this Agreement, no disbursement shall be required at any time or in any manner which is in violation of or in conflict with federal or state laws, policies, or regulations.

(b) The State Water Board's obligation to disburse Project Funds is contingent upon the availability of sufficient funds to permit the disbursements provided for herein. If sufficient funds are not available for any reason, including but not limited to failure of the federal or State government to appropriate funds necessary for disbursement of Project Funds, the State Water Board shall not be obligated to make any disbursements to the Recipient under this Agreement. This provision shall be construed as a condition precedent to the obligation of the State Water Board to make any disbursements under this Agreement. Nothing in this Agreement shall be construed to provide the Recipient with a right of priority for disbursement over any other agency. If any disbursements due the Recipient under this Agreement are deferred because sufficient funds are unavailable, it is the intention of the State Water Board that such disbursement will be made to the Recipient when sufficient funds do become available, but this intention is not binding.

3.6 Withholding of Disbursements and Material Violations.

(a) The State Water Board may withhold all or any portion of the funds provided for by this Agreement in the event that:

(1) The Recipient has materially violated, or threatens to materially violate, any term, provision, condition, or commitment of this Agreement; or

(2) The Recipient fails to maintain reasonable progress toward completion of the Project.

(b) For the purposes of this Agreement, the terms "material violation" or "threat of material violation" include, but are not limited to:

(1) Placement on the ballot of an initiative or referendum to reduce Revenues;

(2) Passage of such an initiative or referendum;

(3) Successful challenges by ratepayer(s) to the process used by Recipient to set, dedicate, or otherwise secure Revenues; or

(4) Any other action or lack of action that may be construed by the Division as a material violation or threat thereof.

3.7 Rates, Fees and Charges.

The Recipient shall, to the extent permitted by law, fix, prescribe and collect rates, fees and charges for the System during each Fiscal Year which are reasonable, fair, and nondiscriminatory and which will be at least sufficient to yield during each Fiscal Year Net Revenues in an amount necessary to meet its obligations under this Agreement. The Recipient may make adjustments from time to time in such fees and charges and may make such classification thereof as it deems necessary, but shall not reduce the rates, fees and charges then in effect unless the Net Revenues from such reduced rates, fees, and charges will at all times be sufficient to meet the requirements of this section.

3.8 Financial Management System and Standards.

The Recipient shall comply with federal standards for financial management systems. The Recipient agrees that, at a minimum, its fiscal control and accounting procedures will be sufficient to permit preparation of reports required by the federal government and tracking of Project funds to a level of expenditure adequate to establish that such funds have not been used in violation of federal or state law or the terms of this Agreement. To the extent applicable, the Recipient shall be bound by, and to comply with, the provisions and requirements of the federal Single Audit Act of 1984, Office of Management and Budget (OMB) Circular No. A-133 and 2 CFR Part 200, subpart F, and updates or revisions, thereto.

3.9 Accounting and Auditing Standards.

The Recipient must maintain project accounts according to GAAP as issued by the Governmental Accounting Standards Board (GASB) or its successor. The Recipient shall maintain GAAP-compliant project accounts, including GAAP requirements relating to the reporting of infrastructure assets.

3.10 Other Assistance.

If funding for Project Costs is made available to the Recipient from sources other than this Agreement, the Recipient shall notify the Division. The Recipient may retain such funding up to an amount which equals the Recipient's local share of Project Costs. To the extent allowed by requirements of other funding sources, excess funding shall be remitted to the State Water Board.

ARTICLE IV MISCELLANEOUS PROVISIONS

4.1 Amendment.

No amendment or variation of the terms of this Agreement shall be valid unless made in writing, signed by the parties and approved as required. No oral understanding or agreement not incorporated in this Agreement is binding on any of the parties.

4.2 Assignability.

This Agreement is not assignable by the Recipient, either in whole or in part, without the consent of the State Water Board in the form of a formal written amendment to this Agreement.

4.3 Bonding.

Where contractors are used, the Recipient shall not authorize construction to begin until each contractor has furnished a performance bond in favor of the Recipient in the following amounts: faithful performance (100%) of contract value; labor and materials (100%) of contract value. This requirement shall not apply to any contract for less than $25,000.00.

4.4 Competitive Bidding

Recipient shall adhere to any applicable state or local ordinance for competitive bidding and applicable labor laws.

4.5 Compliance with Law, Regulations, etc.

The Recipient shall, at all times, comply with and require its contractors and subcontractors to comply with all applicable federal and state laws, rules, guidelines, regulations, and requirements. Without limitation of the foregoing, to the extent applicable, the Recipient shall:

(a) Comply with the provisions of the adopted environmental mitigation plan, if any, for the term of this Agreement;

(b) Comply with the State Water Board's Policy;

(c) Comply with and require compliance with the list of state laws attached as Exhibit H.

(d) Comply with and require its contractors and subcontractors on the Project to comply with federal DBE requirements; and

(e) Comply with and require its contractors and subcontractors to comply with the list of federal laws attached as Exhibit E.

4.6 Conflict of Interest.

The Recipient certifies that its owners, officers, directors, agents, representatives, and employees are in compliance with applicable state and federal conflict of interest laws.

4.7 Damages for Breach Affecting Tax-Exempt Status or Federal Compliance

In the event that any breach of any of the provisions of this Agreement by the Recipient shall result in the loss of tax-exempt status for any bonds of the State or any subdivision or agency thereof, or if such breach shall result in an obligation on the part of the State or any subdivision or agency thereof to reimburse the federal government by reason of any arbitrage profits, the Recipient shall immediately reimburse the State or any subdivision or agency thereof in an amount equal to any damages paid by or loss incurred by the State or any subdivision or agency thereof due to such breach. In the event that any breach of any of the provisions of this Agreement by the Recipient shall result in the failure of Project Funds to be used pursuant to the provisions of this Agreement, or if such breach shall result in an obligation on the part of the State or any subdivision or agency thereof to reimburse the federal government, the Recipient shall immediately reimburse the State or any subdivision or agency thereof in an amount equal to any damages paid by or loss incurred by the State or any subdivision or agency thereof due to such breach.

4.8 Disputes.

(a) The Recipient may appeal a staff decision within 30 days to the Deputy Director of the Division or designee, for a final Division decision. The Recipient may appeal a final Division decision to the State Water Board within 30 days. The Office of the Chief Counsel of the State Water Board will prepare a summary of the dispute and make recommendations relative to its final resolution, which will be provided to the State Water Board's Executive Director and each State Water Board Member. Upon the motion of any State Water Board Member, the State Water Board will review and resolve the dispute in the manner determined by the State Water Board. Should the State Water Board determine not to review the final Division decision, this decision will represent a final agency action on the dispute.

(b) This clause does not preclude consideration of legal questions, provided that nothing herein shall be construed to make final the decision of the State Water Board, or any official or representative thereof, on any question of law.

(c) Recipient shall continue with the responsibilities under this Agreement during any dispute.

(d) This section 4.8 relating to disputes does not establish an exclusive procedure for resolving claims within the meaning of Government Code sections 930 and 930.4.

4.9 Governing Law.

This Agreement is governed by and shall be interpreted in accordance with the laws of the State of California.

4.10 Income Restrictions.

The Recipient agrees that any refunds, rebates, credits, or other amounts (including any interest thereon) accruing to or received by the Recipient under this Agreement shall be paid by the Recipient to the State Water Board, to the extent that they are properly allocable to costs for which the Recipient has been reimbursed by the State Water Board under this Agreement.

4.11 Indemnification and State Reviews.

The parties agree that review or approval of Project plans and specifications by the State Water Board is for administrative purposes only , including conformity with application and eligibility criteria, and expressly not for the purposes of design defect review or construction feasibility, and does not relieve the Recipient of its responsibility to properly plan, design, construct, operate, and maintain the Project. To the extent permitted by law, the Recipient agrees to indemnify, defend, and hold harmless the State Water Board, the Bank, and any trustee, and their officers, employees, and agents for the Bonds, if any (collectively, "Indemnified Persons"), against any loss or liability arising out of any claim or action brought against any Indemnified Persons from and against any and all losses, claims, damages, liabilities, or expenses, of every conceivable kind, character, and nature whatsoever arising out of, resulting from, or in any way connected with (1) the System or the Project or the conditions, occupancy, use, possession, conduct, or management of, work done in or about, or the planning, design, acquisition, installation, or construction, of the System or the Project or any part thereof; (2) the carrying out of any of the transactions contemplated by this Agreement or any related document; (3) any violation of any applicable law, rule or regulation, any environmental law (including, without limitation, the Federal Comprehensive Environmental Response, Compensation and Liability Act, the Resource Conservation and Recovery Act, the California Hazardous Substance Account Act, the Federal Water Pollution Control Act, the Clean Air Act, the Toxic Substances Control Act, the Occupational Safety and Health Act, the Safe Drinking Water Act, the California Hazardous Waste Control Law, and California Water Code Section 13304, and any successors to said laws), rule or regulation or the release of any toxic substance on or near the System;

or (4) any untrue statement or alleged untrue statement of any material fact or omission or alleged omission to state a material fact necessary to make the statements required to be stated therein, in light of the circumstances under which they were made, not misleading with respect to any information provided by the Recipient for use in any disclosure document utilized in connection with any of the transactions contemplated by this Agreement. The Recipient shall also provide for the defense and indemnification of the Indemnified Parties in any contractual provision extending indemnity to the Recipient in any contract let for the performance of any work under this Agreement, and shall cause the Indemnified Parties to be included within the scope of any provision for the indemnification and defense of the Recipient in any contract or subcontract. To the fullest extent permitted by law, the Recipient agrees to pay and discharge any judgment or award entered or made against Indemnified Persons with respect to any such claim or action, and any settlement, compromise or other voluntary resolution. The provisions of this section shall survive the term of this Agreement.

4.12 Independent Actor.

The Recipient, and its agents and employees, if any, in the performance of this Agreement, shall act in an independent capacity and not as officers, employees, or agents of the State Water Board.

4.13 Reserved.

4.14 Non-Discrimination Clause.

(a) During the performance of this Agreement, Recipient and its contractors and subcontractors shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, sexual orientation, physical disability (including HIV and AIDS), mental disability, medical condition (cancer), age (over 40), marital status, denial of family care leave, or genetic information, gender, gender identity, gender expression, or military and veteran status.

(b) The Recipient, its contractors, and subcontractors shall ensure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment.

(c) The Recipient, its contractors, and subcontractors shall comply with the provisions of the Fair Employment and Housing Act and the applicable regulations promulgated thereunder. (Gov. Code, §12990, subds. (a)-(f) et seq.;Cal. Code Regs., tit. 2, § 7285 et seq.) Such regulations are incorporated into this Agreement by reference and made a part hereof as if set forth in full.

(d) The Recipient, its contractors, and subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.

(e) The Recipient shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under this Agreement.

4.15 No Third Party Rights.

The parties to this Agreement do not create rights in, or grant remedies to, any third party as a beneficiary of this Agreement, or of any duty, covenant, obligation, or undertaking established herein.

4.16 Operation and Maintenance; Insurance.

The Recipient agrees to sufficiently and properly staff, operate and maintain all portions of the System during its useful life in accordance with all applicable state and federal laws, rules, and regulations.

The Recipient will procure and maintain or cause to be maintained insurance on the System with responsible insurers, or as part of a reasonable system of self-insurance, in such amounts and against such risks (including damage to or destruction of the System) as are usually covered in connection with systems similar to the System. Such insurance may be maintained by a self-insurance plan so long as such plan provides for (i) the establishment by the Recipient of a separate segregated self-insurance fund in an amount determined (initially and on at least an annual basis) by an independent insurance consultant experienced in the field of risk management employing accepted actuarial techniques and (ii) the establishment and maintenance of a claims processing and risk management program.

In the event of any damage to or destruction of the System caused by the perils covered by such insurance, the net proceeds thereof shall be applied to the reconstruction, repair or replacement of the damaged or destroyed portion of the System. The Recipient shall begin such reconstruction, repair or replacement as expeditiously as possible, and shall pay out of such net proceeds all costs and expenses in connection with such reconstruction, repair or replacement so that the same shall be completed and the System shall be free and clear of all claims and liens.

Recipient agrees that for any policy of insurance concerning or covering the construction of the Project, it will cause, and will require its contractors and subcontractors to cause, a certificate of insurance to be issued showing the State Water Board, its officers, agents, employees, and servants as additional insured; and shall provide the Division with a copy of all such certificates prior to the commencement of construction of the Project.

4.17 Permits, Subcontracting, and Remedies.

The Recipient shall comply in all material respects with all applicable federal, state and local laws, rules and regulations. Recipient shall procure all permits, licenses and other authorizations necessary to accomplish the work contemplated in this Agreement, pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work. Signed copies of any such permits or licenses shall be submitted to the Division before construction begins.

The Recipient shall not contract or allow subcontracting with excluded parties. The Recipient shall not contract with any party who is debarred or suspended or otherwise excluded from or ineligible for participation in any work overseen, directed, funded, or administered by the State Water Board program for which this funding is authorized. For any work related to this Agreement, the Recipient shall not contract with any individual or organization on the State Water Board's List of Disqualified Businesses and Persons that is identified as debarred or suspended or otherwise excluded from or ineligible for participation in any work overseen, directed, funded, or administered by the State Water Board program for which funding under this Agreement is authorized. The State Water Board's List of Disqualified Businesses and Persons is located at –
http://www.waterboards.ca.gov/water_issues/programs/enforcement/fwa/dbp.shtml

4.18 Prevailing Wages.

The Recipient agrees to be bound by all applicable provisions of State Labor Code regarding prevailing wages. The Recipient shall monitor all agreements subject to reimbursement from this Agreement to ensure that the prevailing wage provisions of the State Labor Code are being met. In addition, the Recipient agrees to comply with the provisions of Exhibit G (Davis-Bacon).

4.19 Public Funding.

This Project is publicly funded. Any service provider or contractor with which the Recipient contracts must not have any role or relationship with the Recipient, that, in effect, substantially limits the Recipient's ability to exercise its rights, including cancellation rights, under the contract, based on all the facts and circumstances.

4.20 Recipient's Responsibility for Work.

The Recipient shall be responsible for all work and for persons or entities engaged in work performed pursuant to this Agreement, including, but not limited to, contractors, subcontractors, suppliers, and providers of services. The Recipient shall be responsible for responding to any and all disputes arising out of its contracts for work on the Project. The State Water Board will not mediate disputes between the Recipient and any other entity concerning responsibility for performance of work.

4.21 Related Litigation.

Under no circumstances may the Recipient use funds from any disbursement under this Agreement to pay costs associated with any litigation the Recipient pursues against the State Water Board or any Regional Water Quality Control Board. Regardless of the outcome of any such litigation, and notwithstanding any conflicting language in this Agreement, the Recipient agrees to repay all of the disbursed funds plus interest in the event that Recipient does not complete the project.

4.22 Rights in Data.

The Recipient agrees that all data, plans, drawings, specifications, reports, computer programs, operating manuals, notes, and other written or graphic work produced in the performance of this Agreement are subject to the rights of the State as set forth in this section. The State shall have the right to reproduce, publish, and use all such work, or any part thereof, in any manner and for any purposes whatsoever and to authorize others to do so. If any such work is copyrightable, the Recipient may copyright the same, except that, as to any work which is copyrighted by the Recipient, the State reserves a royalty-free, nonexclusive, and irrevocable license to reproduce, publish, and use such work, or any part thereof, and to authorize others to do so, and to receive electronic copies from the Recipient upon request.

4.23 State Water Board Action; Costs and Attorney Fees.

Any remedy provided in this Agreement is in addition to and not in derogation of any other legal or equitable remedy available to the State Water Board as a result of breach of this Agreement by the Recipient, whether such breach occurs before or after completion of the Project, and exercise of any remedy provided by this Agreement by the State Water Board shall not preclude the State Water Board from pursuing any legal remedy or right which would otherwise be available. In the event of litigation between the parties hereto arising from this Agreement, it is agreed that each party shall bear its own costs and attorney fees.

4.24 Termination; Immediate Acceleration; Interest.

(a) This Agreement may be terminated by written notice during construction of the Project, or thereafter at any time during the term of this Agreement, at the option of the State Water Board, upon violation by the Recipient of any material provision of this Agreement after such violation has been called to the attention of the Recipient and after failure of the Recipient to bring itself into compliance with the provisions of this Agreement within a reasonable time as established by the Division.

(b) In the event of such termination, the Recipient agrees, upon demand, to immediately repay to the State Water Board an amount equal to Project Funds disbursed hereunder, accrued interest, penalty assessments, and Additional Payments. In the event of termination, interest shall accrue on all amounts due at the highest legal rate of interest from the date that notice of termination is mailed to the Recipient to the date all monies due have been received by the State Water Board.

4.25 Timeliness.

Time is of the essence in this Agreement.

4.26 Unenforceable Provision.

In the event that any provision of this Agreement is unenforceable or held to be unenforceable, then the parties agree that all other provisions of this Agreement have force and effect and shall not be affected thereby.

4.27 Useful Life.

The Recipient warrants that the economic useful life of the Project, commencing at Project Completion, is at least equal to the term of this Agreement, as set forth in Exhibit B.

4.28 Venue.

Any action arising out of this Agreement shall be filed and maintained in the Superior Court in and for the County of Sacramento, California.

4.29 Waiver and Rights of the State Water Board.

Any waiver of rights by the State Water Board with respect to a default or other matter arising under this Agreement at any time shall not be considered a waiver of rights with respect to any other default or matter.

Any rights and remedies of the State Water Board provided for in this Agreement are in addition to any other rights and remedies provided by law.

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto.

CLEARLAKE OAKS COUNTY WATER DISTRICT:

By: _____
Name: Alan Gardner
Title: General Manager

Date: 1-9-18

STATE WATER RESOURCES CONTROL BOARD:

By: _____
Name: Leslie Laudon
Title: Deputy Director
Division of Financial Assistance

Date: 1-23-18

EXHIBIT A – SCOPE OF WORK

1. The Recipient agrees to start construction no later than the date of November 1, 2017.

2. The Completion of Construction date is hereby established as October 1, 2019.

3. The Recipient agrees to ensure that its final Request for Disbursement is received by the Division no later than six months after Completion of Construction, unless prior approval has been granted by the Division. Otherwise, the undisbursed balance of this Agreement will be deobligated.

4. Incorporated by reference into this Agreement are the following documents:

   (a) the Final Plans & Specifications, dated August 23, 2017 and September 20, 2017, respectively, and Addenda Nos. 1, 2, 3, 4 and 5 issued September 28, 2017, October 11, 2017, October 6, 2017, October 9, 2017 and October 11, 2017, respectively, which are the basis for the construction contract to be awarded by the Recipient;

   (b) the Waste Discharge Requirement Order No. 98-211.

5. Reporting. Status Reports due at least quarterly.

6. Purpose:

   The purpose is to address the Recipient's collection system deficiencies and comply with the issued Cleanup and Abatement Order (CAO) dated November 3, 2014. This Project will correct the excessive Infiltration and Inflow (I/I) entering the collection system and operational problems with the Lift Stations. This Project will help prevent the Recipient from using temporary emergency facilities during rainy season.

7. Scope of Work

   The proposed Project is split into two phases because of time sensitivity. Phase 1 consists of addressing the main line and pump station capacity. Phase 2 includes rehabbing existing sewer pipelines and lift stations. The components for the Project are listed below:

   - Addition of new parallel Lift Station No. 7 pump station force-main
   - Lift Station No. 7 replacement – New submersible lift station
   - Lift Station No. 2 upgrades – New pumps, valves and controls
   - I/I rehabilitation – Including pipeline slip lining, grouting and replacements
   - Lift Station No. 1, 3, 4, 5, 6, 8, 9 improvements – New pumps, valves and controls
   - Headworks (minor mods.) – Connect force main and bypass valving
   - SEPs (secondary effluent pump station) improvements – Includes new pumps and controls

8. Signage.

The Recipient shall place a sign at least four feet tall by eight feet wide made of ¾ inch thick exterior grade plywood or other approved material in a prominent location on the Project site and shall

EXHIBIT A – SCOPE OF WORK

"Funding for this Wastewater Infrastructure Rehabilitation Project has been provided in full or in part by the has been provided in full or in part by the Proposition 1 – the Water Quality, Supply, and Infrastructure Improvement Act of 2014 and the Clean Water State Revolving Fund through an agreement with the State Water Resources Control Board. California's Clean Water State Revolving Fund is capitalized through a variety of funding sources, including grants from the United States Environmental Protection Agency and state bond proceeds."

The Project sign may include another agency's required promotional information so long as the above logos and disclosure statement are equally prominent on the sign. The sign shall be prepared in a professional manner.

The Recipient shall include the following disclosure statement in any document, written report, or brochure prepared in whole or in part pursuant to this Agreement:

"Funding for this project has been provided in full or in part through an agreement with the State Water Resources Control Board. California's Clean Water State Revolving Fund is capitalized through a variety of funding sources, including grants from the United States Environmental Protection Agency and state bond proceeds. The contents of this document do not necessarily reflect the views and policies of the foregoing, nor does mention of trade names or commercial products constitute endorsement or recommendation for use."

EXHIBIT A-FBA – FINAL BUDGET APPROVAL

Table 1: Approved Construction Bid Amount

CONTRACTOR	AMOUNT BID	APPROVED COSTS
T&S Construction (Phase I)	$912,000	$912,000

1 - BUDGET

Table 2: Approved Final Project Budget

PROJECT COST TABLE	
TYPE OF WORK	APPROVED BUDGET
A. Construction	
T&S Construction (Phase I)	$912,000
Phase II	$3,240,480
B. Pre-Purchased Material/Equipment	$0
C. Land Purchase	$0
D. Change Order Contingency	$494,910
E. Allowances	
Planning	$0
Design	$380,322
Construction Management	$422,288
Administration	$0
Value Engineering	$0
Subtotal - E	$802,610
TOTAL (Subtotal A+B+C+D+E)	$5,450,000

Note: Adjustments may be made between line items on the final request for disbursement

EXHIBIT A-FBA – FINAL BUDGET APPROVAL

2 - PROJECT ELIGIBILITY DETERMINATION

The eligibility determinations and conditions of approval identified below are based on the review of:

- Stamped and Signed Final Plan and Specifications (P&S) for the Project received October 26, 2017, dated August 23, 2017 and September 20 2017 respectively; and
- Addendums No 1, 2, 3, 4 and 5, issued September 28, 2017, October 11, 2017, October 6, 2017, October 9, 2017, and October 11, 2017, respectively.

The eligibility determination for the bid items shown in the schedule of values provided by the Recipient are as follows:

Table 3: Eligibility Determination Agreement:

Bid Item	Description	Percent Eligibility
1	Mobilization/Demobilization(Maximum 5% of Total Base Bid Price)	100%
2	Forcemain Segments Everglade Alignment and Jensen Alignment	100%
3	Above Grade 14 inch HPDE Forcemain Segment	100%
4	Storm Water Pollution Control Program	100%
5	Adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life or limb, conforming to applicable California safety orders for all Bid items, including additive alternates	100%
6	All other work included in the Contract Documents not included in other Bid Items	100%
A-1	Additive Alternative 1: Forcemain Segment Trenchless Technology Alignment	100%

Bid items as shown in the schedule of values provided by the Recipient

Eligibility Determination Conditions of Approval

1. Necessary insurance directly related to the construction contract and extending throughout the period of the construction contract will be eligible for CWSRF financing. This includes builder risk insurance, public liability insurance, fire, and Project specific insurance.
2. Earthquake insurance and "Act of God" insurance are ineligible for funding.
3. Asphalt pavement, corresponding improvements, and excavation and refill materials due to trenching are limited to replacement of the trench width plus one foot on each side of the trench disturbed due to the construction work of the subject contract only. Full lane width paving or slurry seal is eligible only if required by ordinance or code.
4. The cost of local permits and licenses other than those issued by the Recipient are eligible for CWSRF financing.
5. The approved change order contingency may not be increased above the approved contingency shown in Table 2. Any unclaimed construction or allowance costs may also be used towards construction change orders. The change order approval may not: (1) increase the maximum amount of the financing agreement based on Table 2: Approved Construction Budget, (2) increase the term of the financing agreement, or (3) result in a substantial change in the Project scope.

6. Review of the P&S by the Division is conducted to determine eligibility and administrative compliance with the Policy. Issuance of the FBA does not relieve the Recipient and the design engineer of their legal liability for the adequacy of the design.

3 – PROJECT COMPLETION

Project Completion Report:

The Project completion report shall contain the following:

1. A description of the final constructed Project.

2. A description of the water quality problem the Project sought to address.

3. A discussion of the Project's likelihood of successfully addressing that water quality problem in the future, and

4. Summarize compliance with environmental conditions, if applicable.

Project Completion Reporting

1. The Recipient must notify the appropriate Regional Water Board and the Division that its Project was completed by submitting a Project Completion Report to the Division with a copy to the Regional Water Board. The Project Completion Report must be submitted on or before the due date established per section XIII(B)(2) of the CWSRF Policy.

2. The State Water Board expects the Recipient to prepare and send a timely and complete report. The State Water Board may avail itself of any legal means to obtain this report. (See Water Code §13267.)

EXHIBIT B – FUNDING AMOUNT

1. Estimated Reasonable Cost. The estimated reasonable cost of the total Project, including associated planning and design costs is five million four hundred fifty thousand dollars and no cents ($5,450,000.00).

2. Project Financing. Subject to the terms of this Agreement, the State Water Board agrees to provide Project Funds as a grant in the amount of up to five million four hundred fifty thousand dollars and no cents ($5,450,000.00). The estimated amount of principal that will be due to the State Water Board under this Agreement is five million four hundred fifty thousand dollars and no cents ($5,450,000.00).

3. The term of this agreement is from the Eligible Start Date of October 6, 2017 to October 1, 2055.

4. The useful life of this Project is at least fifty (50) years.

5. Budget costs are contained in the Project Cost, which is part of Exhibit A-FBA.

EXHIBIT C – RESERVED

EXHIBIT D – SPECIAL CONDITIONS

Recipient acknowledges and agrees to the following special conditions:

Environmental:

The documents identified below are incorporated by reference and the Recipient shall comply with the conditions and recommendations therein:

1. The adopted September 18, 2014 Mitigation Monitoring and Reporting Program, June 16, 2016 Addendum to the Initial Study/Mitigated Negative Declaration (MND), and August 17, 2017 Addendum to the MND adopted by the Board of Directors including, but, not limited to, the following mitigation measures:

   - BR-3 for Biological Resources;
   - GS-1 for Geology and Soils;
   - HM-1 and HM-2 for Hazards and Hazardous Materials; and
   - HW-1 for Hydrology and Water Quality.

The Recipient shall make no changes in the Project, construction area, or special conditions, without obtaining the appropriate and necessary prior approval(s) from the State Water Board.

REPORTING TO THE STATE WATER BOARD

1. In its status reports submitted pursuant to this Agreement, the Recipient shall include a discussion of the status of its compliance with environmental measures identified in this Exhibit D.

2. In its Project Completion Report submitted pursuant to this Agreement, the Recipient shall include a discussion of compliance with environmental measures identified in this Exhibit D.

Financial:

Recipient shall establish and maintain rates and charges sufficient to generate Revenues in the amounts necessary to cover Operations and Maintenance Costs; and to meet covenants and requirements of Recipient's outstanding System obligations.

EXHIBIT E - RESERVED

EXHIBIT F - RESERVED

EXHIBIT G - RESERVED

EXHIBIT H – COMPLIANCE WITH CROSS-CUTTING STATE AUTHORITIES

1. EMERGENCY DROUGHT REGULATIONS

The Recipient certifies that it complies with and shall continue to comply with the State Water Board's Drought Emergency Water Conservation regulations in Article 22.5 of Chapter 2 of Division 3 of Title 23 of the California Code of Regulations. The Recipient will include a discussion of its implementation in reports submitted pursuant to Section 2.15 of this Agreement.

2. COMPLIANCE WITH STATE REQUIREMENTS

Recipient represents that is in in compliance with the following conditions precedent and agrees that it will continue to maintain compliance during the term of this Agreement:

(a) Monthly Water Diversion Reporting

If Recipient is a water diverter, Recipient must maintain compliance with Water Code section 5103, subdivision (e)(2)(A) by submitting monthly diversion reports to the Division of Water Rights of the State Water Resources Control Board.

(b) Public Works Contractor Registration with Department Of Industrial Relations

To bid for public works contracts, Recipient and Recipient's subcontractors must register with the Department of Industrial Relations as required by Labor Code sections 1725.5 and 1771.1.

(c) Volumetric Pricing & Water Meters

If Recipient is an "urban water supplier" as defined by Water Code section 10617, Recipient must charge each customer for actual water volume measured by water meter according to the requirements of Water Code sections 526 and 527. Section 527 further requires that such suppliers not subject to section 526 install water meters on all municipal and industrial service connections within their service area by 2025.

(d) Urban Water Management Plan

If Recipient is an "urban water supplier" as defined by Water Code section 10617, the Recipient certifies that this Project complies with the Urban Water Management Planning Act (Water Code, § 10610 et seq.). This shall constitute a condition precedent to this Agreement.

(e) Urban Water Demand Management

If Recipient is an "urban water supplier" as defined by Water Code section 10617, Recipient must comply with water conservation measures established by SBx7-7. (Water Code, Sec. 10608.56.)

(f) Delta Plan Consistency Findings

If Recipient is a state or local public agency and the proposed action is covered by the Delta Plan, Recipient must submit certification of project consistency with the Delta Plan to the Delta Stewardship Council according to the requirements of Water Code section 85225 and California Code of Regulations, title 23, section 5002.

EXHIBIT H – COMPLIANCE WITH CROSS-CUTTING STATE AUTHORITIES

(g) Agricultural Water Management Plan Consistency

If Recipient is an agricultural water supplier as defined by Water Code section 10608.12, Recipient must comply with Agricultural Water Management Planning requirements as mandated by Water Code section 10852.

(h) Charter City Project Labor Requirements

If Recipient is a charter city as defined in Labor Code section 1782, subdivision (d)(2), Recipient will comply with the requirements of Labor Code section 1782 and Public Contract Code section 2503 as discussed in the following subparts (1) and (2).

(1) Prevailing Wage

Recipient certifies that it is eligible for state funding assistance notwithstanding Labor Code section 1782.

Specifically Recipient certifies that no charter provision nor ordinance authorizes a construction project contractor not to comply with Labor Code's prevailing wage rate requirements, nor, within the prior two years (starting from January 1, 2015 or after) has the city awarded a public works contract without requiring the contractor to comply with such wage rate requirements according to Labor Code section 1782.

(2) Labor Agreements

Recipient certifies that no charter provision, initiative, or ordinance limits or constrains the city's authority or discretion to adopt, require, or utilize project labor agreements that include all the taxpayer protection antidiscrimination provisions of Public Contract Code section 2500 in construction projects, and that Recipient is accordingly eligible for state funding or financial assistance pursuant to Public Contract Code section 2503.

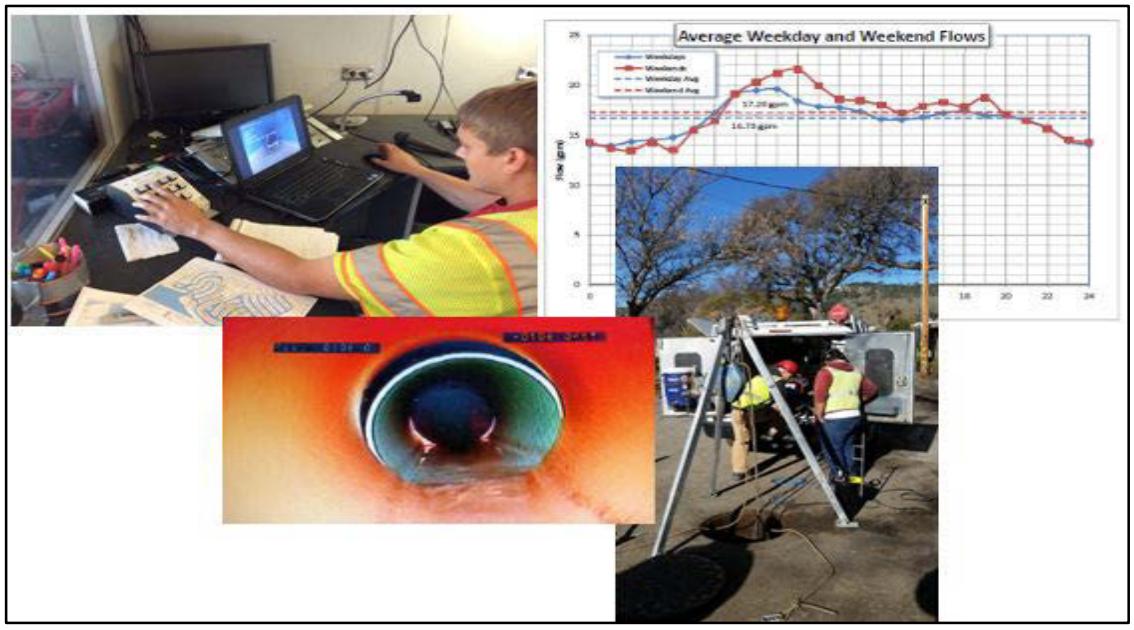
EXHIBIT 1C

CLOCWD/SWRCB Wastewater Collection System Infiltration/Inflow Analysis and Mapping Program Project Report – Appendices (2017/18)

Clearlake Oaks County Water District

WASTEWATER COLLECTION SYSTEM INFILTRATION/INFLOW ANALYSIS AND MAPPING PROGRAM

PROJECT REPORT - APPENDICES



December, 2015

Prepared By:

MC Engineering, Inc.
6917 Ohana Place
Orangevale, CA 95662

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Appendix A

Regulatory Permits

Item No.	Document	Page Number
1	CRWQCB WD Order No. 98-211	A-2
2	Cleanup and Abatement Order R5-2014-0707	A-6
3	LACOSAN Agreement	A-16

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 98-211

FOR
CLEARLAKE OAKS COUNTY WATER DISTRICT
WASTEWATER TREATMENT PLANT
LAKE COUNTY

Sample stations shall be established such that the samples are representative of the volume and nature of the discharge. Specific sample station locations shall be established under direction of the Board's staff and a description of the stations shall be attached to this Order.

EFFLUENT MONITORING

Effluent samples shall be collected just prior to discharge to the disposal facility. Effluent samples should be representative of the volume and nature of the discharge. Samples collected from the outlet structure of ponds will be considered adequately composited. Time of collection of a grab sample shall be recorded. Effluent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Sampling Frequency
Flow	mgd	Cumulative	Daily
BOD_5 @ 20°C	mg/l	Grab	Monthly
Specific Conductivity	µmhos/cm	Grab	Monthly
pH	pH Units	Grab	Monthly
Nitrates as N	mg/l	Grab	Quarterly
Standard Minerals	mg/l	Grab	Annually

SLUDGE MONITORING

A composite sample of sludge shall be collected when sludge is removed from the disposal ponds, or annually when sludge is wasted from the clarifier, in accordance with EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989, and tested for the following metals:

Arsenic	Cadmium	Copper	Chromium
Mercury	Molybdenum	Lead	Nickel
Selenium	Zinc		

Sampling records shall be retained for a minimum of five years. A log shall be kept of sludge quantities generated and of handling and disposal activities. The frequency of entries is discretionary; however, the log should be complete enough to serve as a basis for part of the annual report.

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring shall include at least the following:

Constituents	Units	Sampling Frequency
pH	pH units	Annually
Electrical Conductivity @ 25°C	µmhos/cm	Annually
Standard Minerals	mg/l	Annually

GROUNDWATER MONITORING

Prior to construction, plans and specifications for groundwater monitoring wells shall be submitted to Board staff for review and approval. The approved monitoring wells shall be sampled and tested as follows:

Constituents	Units	Sampling Frequency
Groundwater Elevation	feet, MSL (± 0.01)	As Noted[1]
pH	pH units	Quarterly
Electrical Conductivity @25°C	µmhos/cm	Quarterly
Total Dissolved Solids	mg/l	Quarterly
Total Coliform	MPN/100 ml	Quarterly
Standard Minerals	mg/l	Annually

[1] Monthly November through May, July and September

UNAUTHORIZED SURFACE WATER DISCHARGES

During periods of unauthorized discharges to Clear Lake, the Discharger is required to sample the discharge and receiving water in accordance with the following table:

Effluent Monitoring:

Constituents	Units	Sampling Frequency
Flow (measured)	mgd	Daily
pH	pH units	Daily
Specific Conductivity	µmhos/cm	Daily
Total Coliform	MPN/100 ml	Daily
Total Suspended Solids	mg/l	Weekly
BOD_5[1]	mg/l	Weekly

[1] Biochemical Oxygen Demand, 20°C, 5-Day

Receiving Water Monitoring:

Specific sample locations shall be established. All constituents shall be sampled at each sample location.

Constituents	Units	Sampling Frequency
pH	pH units	Weekly
Specific Conductivity	µmhos/cm	Weekly
Total Coliform	MPN/100 ml	Weekly
Dissolved Oxygen	mg/l	Weekly
Turbidity	NTU	Weekly

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the area nearest the discharge point. Attention shall be given to the presence or absence of:

a. Floating or suspended matter
b. Discoloration
c. Bottom deposits
d. Aquatic life
e. Fungi, slimes, or objectionable growths
f. Potential nuisance conditions
g. Visible films, sheens or coatings

Notes on receiving water conditions shall be summarized in the monitoring report.

EMERGENCY STORAGE BASIN MONITORING

The level of effluent in each emergency storage basin shall be measured to the nearest 0.1 feet of freeboard and reported monthly. The use of each basin shall be recorded and reported to the Board in writing within ten days. This report shall include the reason and period of use, volume stored, duration of storage and any water quality measurements taken. Monthly monitoring reports shall discuss all emergency storage event(s) occurring during the month.

REPORTING

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly the compliance with waste discharge requirements.

Monthly monitoring reports shall be submitted to the Regional Board by the 15th day of the following month.

The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Board.

The Discharger shall submit an annual report to the Board by **30 January** of each year. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.

The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered by: _____
GARY M. CARLTON, Executive Officer

23 October 1998
(Date)

AMENDED
wac/lsb:cirlakco.mrp

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER R5-2014-0707
FOR
CLEARLAKE OAKS COUNTY WATER DISTRICT
WASTEWATER TREATMENT FACILITY
LAKE COUNTY

This Order is issued to Clearlake Oaks County Water District based on provisions of Water Code section 13304, which authorizes the California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board or Board) to issue a Cleanup and Abatement Order (CAO), and Water Code section 13267, which authorizes the Board to require the submittal of technical reports.

The Assistant Executive Officer of the Central Valley Water Board finds, with respect to the Discharger's acts, or failure to act, the following:

1. Clearlake Oaks County Water District (hereafter Discharger) owns and operates the Clearlake Oaks Wastewater Treatment Facility (WWTF).

2. The WWTF is located at 13705 Jensen Road in Clearlake Oaks, Section 32, T14N, R7W, MDB&M, and serves approximately 2,350 residents from Clearlake Oaks, Orchard Shores, Heritage, the Keys, and other unincorporated areas along the southeastern shore of Clear Lake.

3. On 23 October 1998, the Central Valley Water Board adopted Waste Discharge Requirements (WDRs) Order 98-211, which prescribes requirements for the treatment and disposal of domestic wastewater. The WDRs allow a maximum daily flow of 2.1 million gallons per day (mgd), with a monthly average dry weather discharge flow not to exceed 0.5 mgd.

4. The WWTF consists of a treatment plant headworks where a grinder and bar screen collects the solids. From the headworks, the wastewater enters an oxidation ditch where it mixes with backwash from the plant. From the oxidation ditch the wastewater enters a clarifier and then is pumped into two lined facultative ponds, and then to the chlorine contact chamber. The treated wastewater is then pumped from the contact chamber into a pipeline that is connected to the Lake County Sanitation District Southeast Regional wastewater storage pond. Lake County Sanitation District is responsible for disposal of the wastewater.

5. The Discharger is also responsible for operation and maintenance of the sewage collection system. The collection system consists of 12 lift stations and approximately 53,669 feet of piping. The piping is a combination of vitrified clay pipe, asbestos concrete pipe, and ductile iron pipe.

6. This Order is necessary to address the antiquated sewer collection system, sporadically maintained lift stations, and other WWTF components that are in need

of improvements to reduce the threat of sewage spills into Clear Lake, as well as enhance wastewater treatment to better protect water quality.

PREVIOUS BOARD ENFORCEMENT

7. The Clearlake Oaks County Water District has a history of sewage spills and overflows which have resulted in the following enforcement actions since issuance of the 1998 WDRs:

    a. On 24 February 1999, the Executive Officer issued CAO 99-704 for a raw sewage spill estimated at 150,000 gallons per day into Clear Lake. The spill resulted from a ruptured force main pipeline between the last lift station and the wastewater treatment plant. The CAO required the Discharger to immediately cease the discharges of wastewater into surface waters and operate the WWTF in compliance with the WDRs. In addition, the CAO required the Discharger to address the ruptured force main and any other areas of the collection system where pipelines cross under waterways or surface water drainage courses, and submit certain technical reports summarizing completion of the work.

    b. On 3 October 2002, the Executive Officer issued California Water Code Section 13308 Time Schedule Order (TSO) R5-2002-0902 for not completing the work required by the CAO. The TSO required the Discharger to submit an updated compliance schedule to address the items that had not been completed in the CAO.

8. On 7 November 2003, the Executive Officer rescinded the both the CAO and the TSO. The order rescissions were based on a 14 August 2003 site inspection, and Board staff's determination that the Discharger had completed each item required by the CAO and TSO.

SEWAGE SPILL VIOLATIONS

9. Discharge Prohibition No. 1 of WDRs Order 98-11 states: "*Discharge of wastes to surface waters or surface water drainage courses is prohibited.*"

10. Discharge Prohibition No. 2 of the WDRs states: "*Bypass or overflow of untreated or partially treated waste is prohibited.*"

11. The Discharger has experienced various wastewater spills that are in violation of Discharge Prohibitions Nos. 1 and 2 of the WDRs. Board staff's review of records over the last 10 years shows that the Discharger has reported six raw sewage spills exceeding 1,000 gallons, as listed in the table below.

Date of Spill	Volume Discharged (Gallons)	Discharge to Surface Water Drainage Course?	Type of Waste	Cause of Spill
01/07/2007	4,500	Yes	Raw Sewage	Obstruction in sewer line caused by grease.
03/15/2007	3,000	No	Raw Sewage	Overflow from oxidation ditch.
01/20/2010	10,000 to 20,000	Yes	Raw Sewage	Broken force main along with storm surge.
01/25/2010	15,000	No	Raw Sewage	Broken force main at the treatment plant.
07/31/2014	19,000	No	Raw Sewage	Structural failure of sewer line.
10/17/2014	4,000	No	Raw Sewage	Operational error resulting in a pump failure at Lift Station 11.

12. In addition, on 28 July 2014, the Discharger reported that Lift Station 8 experienced a structural and mechanical failure. To avoid raw sewage spills to Clear Lake, pumper trucks were used over a two week period to transport raw sewage from the lift station to the treatment plant. The Discharger then constructed a temporary system to pump the raw sewage from the lift station into a manhole located downstream of the lift station. This practice will continue until Lift Station 8 is repaired.

WASTEWATER SYSTEM ISSUES AND PROPOSED IMPROVEMENTS

13. Because of the aging infrastructure, history of overflows and problems with the treatment facility, in March 2014, the Discharger prepared a Wastewater Preliminary Engineering Report (PER) in accordance with guidelines provided by the United States Department of Agriculture (USDA) Rural Development Agency. The PER was part of a funding request to address issues with the 12 sewer lift stations, sewer collection system, and treatment facility.

Lift Stations

14. Because Lift Station 8 is in need of immediate repairs to prevent likely raw sewage spills to Clear Lake, on 19 August 2014 the Discharger submitted a grant application package to the State Water Resources Control Board (State Water

Board) Division of Financial Assistance. On 26 August 2014, Central Valley Water Board staff met with the Discharger to discuss the issues with Lift Station 8, and those issues associated with wastewater collection and treatment system described in the PER. On 4 September 2014, the SWRCB approved grant funding in the amount of $50,000 from the Cleanup and Abatement Account to cover emergency repairs for Lift Station 8.

15. The 11 other lift stations within the sewer collection system are also in need of repair and or replacement primarily due to sporadic maintenance, as evident by corrosion issues. The Discharger has recommended upgrades to the lift stations which are to include new panels, access doors, pump railings, reconditioned wet wells, and new programmable logic controllers with float controls. This Order requires the Discharger to submit a *Wastewater System Improvement Workplan* and a *Project Completion Report.*

Sewer Collection System

16. The PER indicates that the sewer collection system's pipelines and components have a history of leakage that have resulted in wet weather surcharging, overflows, and excessive flows to the treatment facility. These inflow/infiltration (I/I) issues are associated with cracks, breaks, root intrusions, cracked cleanouts and manholes, cross connections from storm drains, sagging, and other related problems. In addition, because a majority of the sewer collection system is located within close proximity to the lake, groundwater can infiltrate into the sewer collection system during periods of high lake levels and cause excessive flow conditions.

17. The monthly monitoring reports required by the WDRs show that in March 2011 the influent flows to the treatment plant exceeded the maximum daily discharge flow of 2.1 mgd allowed by Discharge Specification B.2 of the WDRs. The highest influent flows were 2.7 mgd reported on 24 March 2011. These high volumes, which the Discharger managed by placing wastewater in the overflow ponds, are attributed to I/I issues within the sewer collection system, and the high lake levels that occurred during this period.

18. On 9 September 2014, the Discharger submitted a *Collection System Mapping and Infiltration and Inflow Analysis Plan of Study* to the State Water Board's Division of Financial Assistance as part of a planning grant application. The *Plan of Study* includes a scope of work for mapping the collection system, and completing an I/I analysis and sewer system survey. The scope of work includes the following tasks:

    a. A mapping and system model to facilitate the I/I evaluation and condition assessment.

b. An I/I Analysis and Sewer System Evaluation Survey which includes: (a) a collection system historical operation condition review, (b) hydraulic modeling and metering plan, (c) sewer manhole inspections, (d) flow meter installations, monitoring, and reporting, (e) rainfall meter installations and monitoring, (f) groundwater monitoring well installations and monitoring, (g) flow and rain monitoring reporting, (h) smoke testing of the sewer lines, (i) flow isolation studies, (j) main sewer line cleaning and video inspections, (k) optional dye testing of the sewer lines, (l) a cost effective analysis, and (m) submittal of a final report that provides recommendations for the collection system improvements.

19. This Order requires the Discharger to submit an *Inflow and Infiltration Assessment Workplan, Inflow and Infiltration Assessment Report,* and an *Inflow and Infiltration Project Completion Report.*

Treatment Facility

20. According to the PER, the WWTF headworks, oxidation ditch, secondary clarifier, return activated sludge pump station, and sludge drying beds are also unreliable, resulting in operational issues. As a result of their age and condition, the following improvements are recommended by the Discharger and required by this Order:

    a. Replace the flow splitter valve at the headworks.

    b. Replace the rotor brush at the oxidation ditch.

    c. Clean and remove accumulated sludge and debris from the oxidation ditch.

    d. Design and construct a new clarifier to replace the existing outdated and under-designed clarifier.

    e. Replace the existing return activated sludge pump and make the necessary pump station improvements, including electrical and controls, wet well, and piping.

    f. Construct a new flow splitter box at the discharge point from the oxidation ditch.

    g. Replace the existing liner in aerated lagoon No. 2.

    h. Replace three of the existing center drains in the sludge drying beds.

    i. Design and construct a fourth sludge drying bed.

    j. Install a new electrical panel, programmable logic controller, and transformer at the operations building.

k. Install a new Supervisory Control and Data Acquisition (SCADA) system that will be used to integrate flow data from the lift stations and various components at the treatment plant to the main control building.

21. This Order requires the Discharger to submit a *Wastewater System Improvement Workplan* and a *Project Completion Report.*

GROUNDWATER ISSUES

22. Provision D.1 of WDRs Order 98-211 states: *"The discharge shall not cause underlying groundwater to be degraded."*

23. A review of groundwater monitoring reports submitted since the first quarter 2009 sampling event shows that total coliform organisms are consistently present in groundwater monitoring wells WWTP-01MW and WWTP-03MW, and in WWTP-02MW when there is sufficient groundwater to sample. This Order requires the Discharger to submit technical reports to address the total coliform detections in the wells.

24. A review of groundwater monitoring reports submitted since the First Quarter 2009 sampling event shows that WWTP-02MW did not contain sufficient water to sample during the following events: Third Quarter 2009, Fourth Quarter 2009, Fourth Quarter 2010, Fourth Quarter 2012, Third Quarter 2013, Fourth Quarter 2013, and Second Quarter 2014. This Order requires the Discharger to submit a report which evaluates the condition and performance of the groundwater monitoring system.

REGULATORY CONSIDERATIONS

25. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Board. Pursuant to Water Code section 13263(a), waste discharge requirements must implement the Basin Plan.

26. Surface water drainage is to Clear Lake. The Basin Plan designates the beneficial uses of Clear Lake as domestic supply; agricultural supply; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; spawning reproduction and/or early development; wildlife habitat; and commercial and sport fishing.

27. The Basin Plan designates the beneficial uses of the underlying groundwater as municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

28. Water Code section 13304(a) states, in relevant part:

> Any person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the regional board, clean up the waste or abate the effects of the waste, or, in the case of threatened pollution or nuisance, take other necessary remedial action, including, but not limited to, overseeing cleanup and abatement efforts.

29. Water Code section 13267(b) states, in relevant part:

> In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

30. The technical reports required by this CAO are necessary to ensure compliance with this CAO and WDRs Order 98-211, and to ensure the protection of water quality. The Discharger is subject to these requirements because the Discharger owns and operates the facility that discharges waste subject to this CAO and WDRs Order 98-211.

31. The issuance of this Order is an enforcement action taken by a regulatory agency and is exempt from the provisions of the California Environmental Quality Act pursuant to California Code of Regulations, title 14, section 15321(a)(2).

IT IS HEREBY ORDERED that, pursuant to Water Code sections 13304 and 13267, Clearlake Oaks County Water District shall cleanup and abate the Clearlake Oaks County Water District WWTF and sewage collection system in accordance with the scope and schedule set forth below in order to comply with WDRs Order 98-211.

All submittals required by this Order shall be converted to PDF and sent to centralvalleysacramento@waterboards.ca.gov. To ensure that the submittals are routed to the appropriate staff as quickly as possible, please include the following

information in the body of the email: Attention Guy Childs, Compliance Unit, Waste Discharge to Land (Non-15). In addition, please include the Discharger name, facility name, county, and CIWQS place ID (No. 214812) in the body of the email.

1. The Discharger shall **immediately** comply with all aspects of WDRs Order No. 98-211(or subsequent WDRs that rescind and replace Order No. 98-211).

2. **Beginning 1 January 2015, and continuing quarterly until this Order is rescinded**, the Discharger submit quarterly progress reports describing the work completed to date to comply with each of the requirements described below. In addition, the reports shall include: (a) signed copies of all applications that have been submitted to obtain the funds necessary to complete the work described in this Order, (b) the status of obtaining those funds, and (c) a copy of the Notice of Award to complete the improvements described in the Findings of this Order. **The Quarterly Progress Reports shall be submitted by the 1st day of the month following the end of the quarter (e.g. 1 January, 1 April, 1 July, and 1 October).**

<u>Collection System Assessment</u>

3. By **1 December 2014**, the Discharger shall submit an *Inflow and Infiltration Assessment Workplan* based on the outline in Finding 18 of this Order. At a minimum, the workplan shall include the following: (a) measures to quantify and identify the I/I sources using information pertaining to observed overflows, surcharges, reported bypasses, chronic maintenance activities, etc., (b) an evaluation of cost effective measures to reduce the I/I, (c) a description of how identified repairs and any sewer line replacements will be implemented and the timing for the work, and (d) an identification of the types of repairs that should be done in the field without further evaluation. The workplan shall also describe methods (i.e., smoke testing, video surveying, manhole surveying, etc.) that will be used to provide an assessment of those segments of the collection system known to exhibit significant I/I and shall describe those portions of the collection system that are in need of immediate repair and shall include a proposed schedule for completing these necessary repairs.

4. By **7 August 2015**, the Discharger shall submit an *Inflow and Infiltration Assessment Report* that describes the results of the Discharger's I/I evaluation of the collection system, and describes the repairs which must be completed to reduce I/I. The report shall also include a proposed schedule for necessary repairs and/or replacement of collection system components contributing to the I/I problems not to extend beyond **1 June 2017**.

5. By **1 June 2017,** the Discharger shall submit an *Inflow and Infiltration Project Completion Report* that provides a description of the final improvements to sewer

collection system that were identified in the *Inflow and Infiltration Assessment Report*.

Wastewater System Improvements

6. By **1 August 2015**, the Discharger shall submit a *Wastewater System Improvement Workplan* that provides final designs of the proposed wastewater system improvements described in Findings 15 and 20 of this Order.

7. By **1 June 2017**, the Discharger shall submit a *Project Completion Report* that provides a description of the final improvements to the wastewater system that have been completed in accordance with the *Wastewater System Improvement Workplan*.

Groundwater Monitoring

8. By **1 December 2014**, the Discharger shall submit a *Groundwater Monitoring Well Disinfection and Development Workplan* that shall describe how the three monitoring wells will be disinfected and re-developed. The purpose of this work is to address the total coliform detections outlined in Finding 23 of this Order.

9. By **1 March 2015**, the Discharger shall submit a *Groundwater Monitoring Well Disinfection and Development Completion Report* that describes the results of the disinfection and development work. This report shall also include an evaluation of the conditions and performance of the monitoring well network.

10. By **1 April 2016**, the Discharger shall submit a *Groundwater Monitoring Well Evaluation Report* that evaluates the total coliform levels in the wells, both before and after the wells were disinfected and re-developed. If the concentrations still show that groundwater is degraded, then the *Report* shall contain a proposal for facility improvements such that the Discharger will comply with Provision D.1 of WDRs Order 98-211.

As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, all reports shall be prepared by, or under the supervision of, a California Registered Engineer or Professional Geologist and signed by the registered professional.

Any person signing a document submitted under this Order shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my knowledge and on my inquiry of those individuals immediately responsible for

obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

If the Discharger is unable to perform any activity or submit any document in compliance with the schedule set forth herein, or in compliance with any work schedule submitted pursuant to this Order and approved by the Assistant Executive Officer, the Discharger may request, in writing, an extension of the time specified. The extension request shall include justification for the delay. Any extension request shall be submitted as soon as a delay is recognized and prior to the compliance date. An extension may be granted by revision of this Order or by a letter from the Assistant Executive Officer.

If the Discharger fails to comply with the provisions of this Order, the Assistant Executive Officer may refer this matter to the Attorney General for judicial enforcement or may issue a complaint for administrative civil liability. Failure to comply with this Order may result in the assessment of administrative civil liability up to $10,000 per violation per day, pursuant to the Water Code sections 13268, 13350, and/or 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

This Order is effective upon the date of signature.

Original signed by

_____

ANDREW ALTEVOGT, Assistant Executive Officer

_____

(Date)

gjc: 3 Nov-14

AGREEMENT FOR THE ACCEPTANCE OF EFFLUENT FROM THE CLEARLAKE OAKS COUNTY WATER DISTRICT

THIS AGREEMENT is made and entered into this 21st day of July, 1998, between the Lake County Sanitation District, hereinafter referred to as "LACOSAN," and the Clearlake Oaks County Water District, hereinafter referred to as "District."

RECITALS

Whereas, on July 9, 1996 the Lake County Sanitation District and the Clearlake Oaks County Water District entered into an Agreement-in-Principle for Effluent Disposal; and

Whereas, the Lake County Sanitation District, Calpine Corporation, NCPA, and UNOCAL jointly own and operate the Geysers Pipeline; and

Whereas, the Lake County Sanitation District has entered into an Operations Agreement with Calpine Corporation, NCPA, and UNOCAL to accept effluent from LACOSAN's Southeast Reservoir; and

Whereas, the Clearlake Oaks County Water District desires to export their effluent to the Southeast Reservoir for inclusion in the Geysers Pipeline disposal.

NOW, THEREFORE, in consideration of the mutual promises, covenants, terms, and conditions; it is agreed between the parties as follows:

1. DEFINITIONS

1.1 "Effluent" shall mean that liquid waste material discharged from the Clearlake Oaks County Water District's Wastewater Treatment Facility or the Northwest Regional Wastewater Treatment Facility.

1.2 "Operation and Maintenance Work" shall mean all labor, services, and material required to operate Project facilities in compliance with their design specifications and prudent industry practices, to maintain Project facilities in good working order.

1.3 "Pipeline" shall mean the sixteen-inch nominal diameter pipeline originating at the District's Wastewater Treatment Facility and extending to the north finger of LACOSAN's Southeast Reservoir.

1.4 "Project" shall mean the Pipeline, Pumping Station(s), outfall, and associated equipment to transport Effluent from the District's Wastewater Treatment Facility to the Southeast Reservoir.

1.5 "Pumping Station" shall mean the pumping facility located at or near the District's Treatment Facility.

1.6 "Steam Suppliers" shall mean Calpine Geysers Company (CGC), Northern California Power Agency (NCPA) and Unocal and their successors or assigns as owners of portions of the Geysers Pipeline and various geothermal facilities including the injection wells which are used for disposal of the Effluent.

2. CONDITIONS

The District shall design and construct the Project, including but not limited to the Pipeline, Pumping station(s), and outfall at the Southeast Reservoir, all associated equipment, and any environmental work.

The District shall obtain all necessary permits, licenses, certificates or any other approvals required by federal, state, or local agencies having jurisdiction over the Project for the construction and operation of the Project. The District shall also modify its Waste Discharge Requirements to comply with the new method of disposal.

LACOSAN shall provide a no cost easement for the construction and operation of the Pipeline and outfall constructed on LACOSAN'S property.

The District shall comply with all the requirements of the Operating Agreement between LACOSAN and Calpine Corporation, NCPA, and UNOCAL or their successors.

LACOSAN reserves the right to participate in the Project.

The District shall provide an easement at the District's Treatment Facility for a pump station and associated equipment should LACOSAN desire to build a pump station. This will be a no cost easement.

3. TERM

3.1 The term of this Agreement shall be for a period of twenty (20) years from the effective date of this Agreement, unless this Agreement is sooner terminated pursuant to Sections 8 & 9. If upon expiration of this Agreement or any extension thereof, LACOSAN elects to continue the Project, the Parties agree to extend this Agreement for an agreed upon term of not less than five years.

3.2 Upon final termination of this Agreement, each Party shall be responsible at its sole cost and expense to remove or otherwise decommission those Project facilities for which it is responsible pursuant to Sections 2 & 4 as may be required by any government agency or private party with authority thereover, or pursuant to any other agreement between the Parties.

4. OPERATION AND MAINTENANCE

4.1 Responsibilities of District

4.1.1 District shall own and be responsible for the Operation and Maintenance Work for the Project facilities to the Southeast Reservoir, which include the pump station, pipeline, meter, control system, outfall, and associated equipment.

4.2 Responsibilities of LACOSAN

4.2.1 LACOSAN shall not have any responsibilities for the Operation and Maintenance Work for the Project facilities unless LACOSAN elects to participate in the Project at a future date.

5. OPERATION & MAINTENANCE EXPENSES

5.1 Operation and maintenance expenses for the District's access to and use of the Geysers Pipeline for the disposal of Effluent shall be a reasonable portion of the total costs to operate and maintain the Geysers Pipeline. That amount is shown on Exhibit "A", which is attached hereto.

5.2 The District shall not receive any compensation from LACOSAN or the Geysers Pipeline participants for the District's Effluent or any operation and maintenance expenses.

6. DELIVERY AND ACCEPTANCE OF EFFLUENT

6.1 District shall commence delivery and LACOSAN shall receive and accept the Effluent transported by the Project on a date to be agreed upon by the Parties following completion of Project construction.

6.2 District's flow shall not exceed a nominal flow rate of 1500 gpm without consent of LACOSAN.

6.3 District shall operate and maintain in accurate working order metering devices properly equipped and located for the measurement of the Effluent delivered to LACOSAN. LACOSAN shall have access to inspect and test such equipment at all reasonable times, but readings, calibrations, adjustments, repair and other maintenance thereof shall be conducted by District.

6.4 All Effluent to be delivered to LACOSAN shall comply with all waste discharge requirements, effluent limitations, or other requirements related to water quality established by the Regional Water Quality Control Board, State Water Resources Control Board, U.S. Environmental Protection Agency, California Division of Oil and Gas and Geothermal Resources, LACOSAN and/or any other federal, state, or local agencies with jurisdiction with respect to the quality of water accepted by LACOSAN and/or Steam Suppliers, such that no additional holding and/or treatment of such delivered Effluent, or processing, by Steam Suppliers or LACOSAN is necessary in order to comply with such requirements. Without limiting the generality of the foregoing, Effluent to be delivered to LACOSAN shall comply with the wastewater discharge requirements for secondary treated water as defined by the California Regional Water Quality Control Board-Central Valley Region, and shall always be of a quality that meets the specific waste discharge requirements of LACOSAN's Southeast Regional Wastewater Treatment Plant that are in effect for disposal of LACOSAN Effluent into the Geysers Pipeline.

6.5 District shall be responsible up to the outfall for all testing, monitoring, and reporting with respect to water quality that may be established by LACOSAN, any federal or state agency in waste discharge requirements, permits, or any other jurisdictional entity authorized by law. District shall provide such information to LACOSAN at the same frequency required by any federal or state agency. Without limiting the generality of the foregoing, District shall be responsible for all testing pursuant to the protocols and procedures required for secondary treated water by the California Regional Water Quality Control Board – Central Valley Region, and shall provide LACOSAN with documentation on a quarterly basis demonstrating that all water delivered to LACOSAN complies with the wastewater discharge requirements as defined by the California Regional Water Quality Control Board – Central Valley Region.

6.6 The Geysers Pipeline Project owners, including LACOSAN, shall be entitled, but not obligated, to conduct, at their own expense, their own testing of the Effluent at any point along the Project as a means of additional water quality examination.

6.7 LACOSAN shall not be required to receive, accept or otherwise take care, custody or control of any of District's Effluent transported by the Pipeline if the testing conducted pursuant to Section 6.4 through 6.5 demonstrates that the Effluent is not in compliance with all applicable water quality standards.

6.8 District represents and warrants that its obligations under this Agreement do not conflict or otherwise circumvent any obligation of District to deliver Effluent to a legal user of such Effluent, and that there are no prior uses that have created a legal right to the Effluent which will be superior to the rights created under this Agreement.

7. OPERATING EMERGENCIES AND REPAIR AND RECONSTRUCTION

7.1 In the event of an operating emergency, the Parties shall take any and all steps reasonably necessary and required to terminate the operating emergency, subject to the provisions set forth in this Section.

7.2 In the event of an operating emergency, it shall be the obligation of the Party with ownership of that portion of the Project facility to repair, restore or reconstruct the damaged or destroyed facility, and to conduct other necessary work as soon as practical and in such a manner as to restore the facility to operation. The responding Party shall report to the other Party as promptly as possible the nature of the emergency and the action taken.

7.3 The cost of all repairs, restoration or reconstruction work, whether caused by an operation emergency or otherwise, shall be the responsibility of the owning Party.

8. SUSPENSION OF OPERATIONS

The District acknowledges that LACOSAN is disposing the District's Effluent via the Geysers Pipeline for injection into The Geysers geothermal reservoir. The District's rights, granted in this agreement, to dispose of its Effluent using the Geysers Pipeline may be suspended at any time by LACOSAN acting on behalf of itself or the Steam Suppliers for the following reasons.

1.) If at any time during the term of the Agreement a Federal, State, or local government agency concludes that the injection of Effluent is causing significant adverse health, safety or environmental effects.

2.) If Steam Suppliers conclude that the operations are causing interference with their steam production or adverse effects upon steam quality or their geothermal facilities

3.) If contractual conditions preclude continued operations or in the event of an operating emergency.

4.) Failure to comply with the delivery and acceptance criteria in Section 6 herein.

LACOSAN may continue to suspend operations hereunder until such time as the cause can be remedied.

9. TERMINATION

If a suspension of operations for the reasons listed under Section 7 or Section 8 would be protracted, or the cause cannot be practically remedied, or if economic conditions make continued operations impractical, either Party may terminate this Agreement at any time during the term hereof

9.1 Upon termination, the share of the costs to satisfy any outstanding obligations of the Parties under this Agreement shall be the sole responsibility of the Party creating the obligation.

10. INSURANCE

10.1 District shall not commence work under this Agreement until it has obtained all the insurance required herein, certificates of insurance have been submitted to LACOSAN and said insurance has been approved by LACOSAN. The certificates of insurance shall contain a provision that coverage afforded under the policies will not be canceled until at least twenty (20) days prior written notice has been given to LACOSAN.

District shall not allow any subcontractor to commence work on their subcontract until the insurance required of the subcontractor has been obtained. Any failure of District to maintain the insurance required by this paragraph, or to comply with any of the requirements of this paragraph, shall constitute a material breach of the entire Agreement. Certificates evidencing the issuance of the following insurance shall be filed with LACOSAN within ten (10) days after the date of execution of this Agreement by District:

10.1(a) Compensation Insurance. District shall procure and maintain, at District's own expense during the term hereof, Workers' Compensation Insurance for all of its employees to be engaged in work. In case of any such work sublet, District shall require subcontractor similarly to provide Workers' Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by District's Workers' Compensation Insurance.

10.1(b) Public Liability and Property Damage Insurance. District shall procure and maintain, at District's own expense during the term hereof, Comprehensive Public Liability Insurance, both bodily injury and property damage, in an amount of not less than (One million dollars ($1,000,000) combined single limit coverage per occurrence, including but not limited to endorsements for the following coverages: personal injury, premises-operations, products and completed operations, blanket contractual, and independent contractor's liability.

District shall not commence work under this Agreement until it has had delivered to LACOSAN an "Additional Insured Endorsement" naming LACOSAN, its officers, employees and agents as additional insured under each of the aforesaid policies in this sub-paragraph.

10.1(c) Automobile Liability Insurance. District shall procure and maintain, at District's own expense during the term hereof, comprehensive Automobile Liability Insurance, both bodily injury and property damage, on owned, hired, leased and non-owned vehicles used in connection with District's business in an amount of not less than (One million dollars ($1,000,000) combined single limit coverage per occurrence.

10.1(d) District shall require each subcontractor to procure and maintain, during the life of his contract, similar Public Liability and Automobile Liability Insurance as specified in sub-paragraphs (b) and (c) hereinabove, with minimum limits equal to one-half the amount required of District and containing the "Additional Insured Endorsement" as required of District in sub-paragraphs (b) and (c) hereinabove.

10.2 The Parties recognize that this Agreement contains provisions for a twenty-year period. During the life of this Agreement inflationary coverages for insurance may need to be considered and invoked. Increases in coverages will be by mutual consent.

11. ACCESS TO PROJECT INFORMATION AND RECORDS RETENTION

11.1 LACOSAN shall be entitled to obtain, in a timely manner, current information concerning Project Operation and Maintenance Work and disposal information as specified in Section 5. This shall be accomplished through reasonable access to all Project facilities and the vicinities thereof, including facilities under construction, and to all data and documents describing current Operation and Maintenance Work affecting any Project facilities.

11.2 All books, records, reports and accounts maintained pursuant to this Agreement, related to District activities under this Agreement, shall be open to inspection and audit by LACOSAN upon demand during the life of this Agreement and for a period of four (4) years thereafter.

12. PARTICIPATION OF LACOSAN

12.1 LACOSAN is currently developing plans for its Northwest Wastewater Treatment Facility. The plans include utilization of the Pipeline and/or Project.

12.2 LACOSAN recognizes that the District's Project may need to proceed prior to LACOSAN's determination of participation. LACOSAN reserves the right to participate in District's Project/Pipeline in stages, phases, or in the entire project.

12.3 LACOSAN may at any time in the future transport Effluent via the District's Pipeline. LACOSAN's percent of participation will be determined at the time LACOSAN elects to join the Project. District will provide a no cost easement for LACOSAN's pump station and associated equipment at the District's Treatment Facility.

12.4 If LACOSAN joins the Project with the District, this participation will be by separate Agreement.

13. INDEMNIFICATION-HOLD HARMLESS

District shall indemnify and defend LACOSAN and its officers, employees, and agents against and hold them harmless from any and all claims losses, damages, and liability for damages, including attorney's fees and other costs of defense incurred by LACOSAN, whether for damage to or loss of property, or injury to or death of person, including properties of LACOSAN and injury to or death of LACOSAN officials, employees or agents, arising out of, or connected with District's operations hereunder or the performance of the work described herein, unless such damages, loss, injury or death is caused solely by the negligence of LACOSAN.

14. ASSIGNMENT

District shall not assign any interest in this Agreement and shall not transfer any interest in the same without the prior written consent of LACOSAN, except that claims for money due or to become due District from LACOSAN under this Agreement may be assigned by District to a bank, trust company, or other financial institution without such approval, written notice of any such transfer shall be furnished promptly to LACOSAN. Any attempt at assignment of right under this Agreement except for those specifically consented to by both parties or as stated above shall be void.

15. INDEPENDENT DISTRICT

It is specifically understood and agreed that in the making and performance of this Agreement, District is an independent and separate District and is not an employee, agent, or servant of LACOSAN.

16. MODIFICATION

This Agreement may only be modified by a written amendment hereto, executed by both parties, however, matters concerning operation and maintenance may be modified by mutual written consent of District and LACOSAN executed by Special Districts Administrator.

17. NON-DISCRIMINATION IN EMPLOYMENT

No Party to this Agreement shall unlawfully discriminate against any qualified worker or firm because of race, religious creed, color, sex, national origin, ancestry, physical disability, mental disability, medical condition, marital status or age (over 40).

18. ATTORNEY'S FEES AND COSTS

If any action at law or in equity is necessary to enforce or interpret the terms of this Agreement, the prevailing party shall be entitled to reasonable attorney's fees, costs, and necessary disbursements in addition to any other relief to which such party may be entitled.

19. COPIES OF PLANS TO LACOSAN

Copies of all non-proprietary reports, drawings, renderings, or other documents or material prepared by District for the Project hereunder shall be provided to LACOSAN. District shall consult with LACOSAN prior to District's final approval of plans and specifications for Project.

20. SEVERABILITY

If any provision of this Agreement is held to be unenforceable, the remainder of this Agreement shall be severable and not affected thereby.

21. NOTICES

All notices that are required to be given by one party to the other under this Agreement shall be in writing and shall be deemed to have been given if delivered personally or enclosed in a properly addressed envelope and deposited with a United States Post Office for delivery by registered or certified mail addressed to the parties at the following addresses, unless such addresses are changed by notice, in writing, to the other party:

Steve Brodnansky, Special Districts Administrator
LAKE COUNTY SANITATION DISTRICT
230 A Main Street
Lakeport, California 95453

BOARD OF DIRECTORS
CLEARLAKE COUNTY WATER DISTRICT
P.O. Box 709
Clearlake Oaks, California 95423

22. ADDITIONAL PROVISIONS

This Agreement shall be governed by the laws of the State of California. It constitutes the entire agreement between the parties regarding its subject matter. This Agreement supercedes all proposals, oral and written, and all negotiations, conversations or discussions heretofore and between the parties related to the subject matter of this Agreement.

LAKE COUNTY SANITATION DISTRICT

CHAIR, Board of Directors

CLEARLAKE OAKS COUNTY WATER DISTRICT

7/14/98
CHAIR, Board of Directors

ATTEST: Kelly F. Cox
Clerk of the Board of Supervisors

BOARD OF SUPERVISORS
LAKE COUNTY, CAL

ATTEST: Ellen Pierson
Auditor/Secretary

By: Georgine Hunt

Ellen Pearson

RISK MANAGEMENT:

By: _____

APPROVED AS TO FORM:
Cameron L. Reeves, County Counsel



Exhibit "A"

SE Geysers Effluent Pipeline Operations and Maintenance Budgeted costs- FY 1998/1999

Administration		40,355
Debt Service		49,632
Operations		311,005
Inspections & Maintenance		283,176
Insurance		14,300
Miscellaneous		10,000
Subtotal (Non-Electricity)	$	708,468
Electricity		
Lake Intake		195,000
SERWTP		674,500
Bear Canyon		705,500
Total	$	2,283,468

Geysers Pipeline's projected average total flow: 6,000

CALCULATION OF DISTRICT'S CONTRIBUTION TO O&M COSTS

Geysers Pipeline's Non-Electricity Annual O&M Budget:	$	708,468
District's projected average flow:		652 gpm
District's flow as a percent of projected total flow:		10.9 %
District's 10.9% equivalent contribution to Geysers Pipeline's Non-Electricity Annual)&M costs:	$	77,223
Projected Lake Intake Electricity Savings		(38,500)
District's Annual O&M contribution	$	38,723

The district's projected annual O&M contribution for Effluent disposal is agreed to be $38,723 for the fiscal year beginning the first day of July, 1998, with that amount to be proportionately reduced to compensate for the delay until the District commences Effluent delivery to LACOSAN. The District's annual O&M contribution is to be determined for each budget year thereafter by re-calculation the District's projected average flow as a percent of the Geysers Pipeline's projected total flow (minimum 5,000 gpm), multiplied by the amount of the Geysers Pipeline's Non-Electricity Annual O&M Budget for that fiscal year, less the projected Lake Intake electricity savings that are attributable to the District's projected Effluent disposal for that fiscal year.

Appendix B

Past Regulatory Violations

Item Number	Document	Page Number
1	Clearlake Facility Information Sheet	B-2
2	SSO Summary Report	B-4
3	SSO Detail Report	B-6
4	Operational Report	B-7
5	Facility and Violation Summary Sheet	B-11

Facility At-A-Glance Report

SEARCH CRITERIA:
Place ID **630669**

General Information

Region	Place ID	Place Name	Place Type	Place Address	Place County
5S	630669	Clearlake Oaks Co Wtr Dis CS	Collection_System	Clearlake Oaks, CA, 95423	Lake

Related Parties

Party	Party Type	Party Name	Role	Classification	Relationship Start Date	Relationship End Date
548729	Person	Dan Hodem	Is Onsite Manager For		10/24/2014	
543105	Person	Larry Swift	Is Onsite Manager For		09/17/2013	
480604	Person	Dawni Luce	Is Onsite Manager For		08/04/2008	
538086	Person	Mike Smith	Is Onsite Manager For		08/01/2008	
357889	Person	Ellen Pearson	Is Onsite Manager For		01/08/2007	09/17/2013
8812	Organization	Clearlake Oaks Cnty Water Dist	Owner	Special District	04/03/2006	

Total Related Parties: 6

Regulatory Measures

Reg Measure ID	Reg Measure Type	Region	Program	Order No.	WDID	Effective Date	Expiration Date	Status	Amended?
301284	Enrollee	5S	SSOMUNISML	2006-0003-DWQ	5SSO10906	01/08/2007	05/02/2011	Active	N

Total Reg Measures: 1

Violations

Violation ID	Occurred Date	Violation Type	(-) Violation Description	Corrective Action	Status	Classification	Source
941217	12/17/2012	SSOS	Debri-Rags caused 100.0 gallons of sewage to spill from Gravity sewer;Manhole at 12735 Island Circle Dr. to Surface water. Surface water body affected.	Cleaned-up (mitigated effects of spill);Contained all or portion of spill. used two vactor trucks to bring surcharge down and high pressure jetter to remove blockage and clean main. after used vactor truck to clean gutter and culvert and disinfected area.	Violation	2	SSO

Report displays most recent five years of violations. Refer to the Interactive Violation Report for more data.

Total Violations: 1 **Priority Violations: 0**

*Click the "(+/-) Violation Description" link to expand and contract the violation description.

*As of 5/20/2010, the Water Board's Enforcement Policy requires that all violations be classified as 1, 2 or 3, with class 1 being the highest. Prior to this, violations were simply classified as Yes or No. If a 123 classification has been assigned to a violation that occurred before this date, that classification data will be displayed instead of the Yes/No data.

Violation Types
SSOS = Sanitary Sewer Overflow/Spill/

December 2015 Final B - 2

Enforcement Actions

Enf Id	Enf Type	Enf Order No.	Effective Date	Status

389214	Notice of Violation	02/19/2013	Historical
373476	Notice of Violation	03/16/2010	Historical

Total Enf Actions: 2

Inspections

Inspection ID	Inspection Type	Lead Inspector	Actual End Date	Planned	Violations	Attachment

Total Inspections: 0 **Last Inspection: None**

The current report was generated with data as of: 11/09/2015

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
STATE WATER RESOURCES CONTROL BOARD

California Integrated Water Quality System Project (CIWQS)

Spill Public Report – Summary Page

Here is the summary page with the results of your spill public report search. These results correspond to the following search criteria:

SEARCH CRITERIA: [REFINE SEARCH]

- City (**clearlake oaks**)
- County (**Lake**)
- Spill Type (**sso_cat1_2_3**)
- Start Date (**1/28/1994**)
- End Date (**11/9/2015**)

Please see the Glossary of Terms for explanations of the search results column headings. **More information about the report is found at the bottom of this page.**

Note: For the "Collection System Performance Report" column, the Performance report will only show the most recent 12 months of data if in the original SSO Interactive Report search the date range was not specified.

[VIEW PRINTER FRIENDLY VERSION] [EXPORT THIS REPORT TO EXCEL] [EXPORT ALL SPILL DETAILS TO EXCEL]

Region	Responsible Agency	Collection System	Total Number of SSO locations	Total Vol of SSOs(gal)	Total Vol Recover (gal)	Total Vol Reach Surface Water	Percent Recover	Percent Reach Surface Water	Miles Pressure Sewer	Miles Gravity Sewer	Miles of Laterals	WDID	Collection System Performance Report
5S	Clearlake Oaks Cnty Water Dist	Clearlake Oaks Co Wtr Dis CS	4	15,204	1,034	14,070	6	92	3.0	17.0	0.0	5SSO10906	Operational Performance
			4	**15,204**	**1,034**	**14,070**			**3.0**	**17.0**	**0.0**		

Each individual SSO report contains the data related to one specific location where sewage discharged from the sanitary sewer system due to a failure (e.g., sewer pipe blockage or pump failure). A single failure within a sanitary sewer system can result in multiple sewage discharge locations and, thus, multiple SSO reports. For example, a lift station power failure can result in sewage being discharged from numerous manholes. In this example, a SSO report would be submitted for each manhole that discharged sewage with all reports sharing the same failure or cause data.

It is important to review SSO reports in detail to determine if individual sewage discharge locations share a common underlying failure or cause when assessing the performance of Enrollees and their sanitary sewer systems through SSO events. This is because it is the failures that are the ultimate problem which the Enrollees should be making all reasonable efforts to prevent.

The search results below present summary data for all sewage discharge locations, as submitted through individual SSO reports, which meet the search criteria selected. To determine if SSO reports relate to a common failure within the sanitary sewer system, the SSO reports should be reviewed in detail by selecting the specific “agency” or “collection sys” name from the table below.

The “agency”, or Enrollee, listed on a SSO report is responsible for the sewage discharge described and should be contacted directly for questions related

to that incident.

The current report was generated with real-time data entered by Enrollees.

Back to Main Page | Back to Top of Page

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SSO Public Report - Detail Page

Here is the detail page of your SSO public report search for the selected region, responsible agency, or collection system. These results correspond to the following search criteria:

SEARCH CRITERIA: [REFINE SEARCH]

- City (**clearlake oaks**)
- County (**Lake**)
- Spill Type (**sso_cat1_2_3**)
- Start Date (**1/28/1994**)
- End Date (**11/9/2015**)

The table below presents important details for all sewage discharge locations, as submitted through individual SSO reports, which meet the search criteria selected. If data is not shown for a particular field, it means the Enrollee did not provide the information and was not required to do so. To view the entire SSO report for a specific sewage discharge location, please select the corresponding EVENT ID.

DRILLDOWN HISTORY:

REGION: **5S**

EVENT ID	Region	Responsible Agency	Collection System	SSO Category	Start Date	SSO Address	SSO City	SSO Vol	Vol of SSO Recovered	Vol of SSO Reached Surface Water	SSO Failure Point	WDID
748594	5S	Clearlake Oaks Cnty Water Dist	Clearlake Oaks Co Wtr Dis CS	Category 1	2010-01-20 07:00:00.0	13705 Jensen Road	Clearlake Oaks	15,000	1,000	14,000	Main	5SSO10906
762162	5S	Clearlake Oaks Cnty Water Dist	Clearlake Oaks Co Wtr Dis CS	Category 3	2011-01-11 08:50:00.0	13340 E Hwy 20 Highway	Clearlake Oaks	100	0	0	Lower Lateral	5SSO10906
780448	5S	Clearlake Oaks Cnty Water Dist	Clearlake Oaks Co Wtr Dis CS	Category 3	2012-04-16 13:35:00.0	12580 East Highway 20 Highway	Clearlake Oaks	4	4	0	Main	5SSO10906
789476	5S	Clearlake Oaks Cnty Water Dist	Clearlake Oaks Co Wtr Dis CS	Category 1	2012-12-17 10:22:00.0	12735 Island Crl Dr Circle	Clearlake Oaks	100	30	70	Main	5SSO10906

The current report was generated with data as of: Monday, November 09, 2015

California Home Monday, November 09, 2015

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
STATE WATER RESOURCES CONTROL BOARD

California Integrated Water Quality System Project (CIWQS)

COLLECTION SYSTEM OPERATIONAL REPORT

Please see the Glossary of Terms for explanations of the search results column headings. More information about the report is found at the bottom of this page.

[VIEW PRINTER FRIENDLY VERSION]

SEARCH CRITERIA: [REFINE SEARCH] [NEW SEARCH] [GLOSSARY]
Date Range: Start_Date (**1/28/1994**) End_Date (**11/9/2015**)

DRILLDOWN HISTORY: [GO BACK TO LISTING OF COLLECTION SYSTEMS]
Clearlake Oaks Co Wtr Dis CS
Agency: Clearlake Oaks Cnty Water Dist

General Information

Region	Place ID	Place Name	CS Category	Place Address	Place County
5S	630669	Clearlake Oaks Co Wtr Dis CS	Municipal (Public)	Clearlake Oaks, CA, 95423	Lake

Collection System Spill Summary

Operational Indices: Clearlake Oaks Co Wtr Dis CS

Spill Rate Indice (#spills/100mi/yr)									
	Category 1			Category 2			Category 3		
	Mainlines	Laterals	Not Specified	Mainlines	Laterals	Not Specified	Mainlines	Laterals	Not Specified
Clearlake Oaks Co Wtr Dis CS	0.46	0.0	0.0	0.69	0.0	0.0	0.92	5.74	0.0
State Municipal (Public) Average	0.65	2.11	0.28	0.24	0.55	0.26	1.59	6.8	0.41
Region Municipal Average	0.67	1.93	0.27	0.42	0.25	0.32	1.78	5.07	0.63

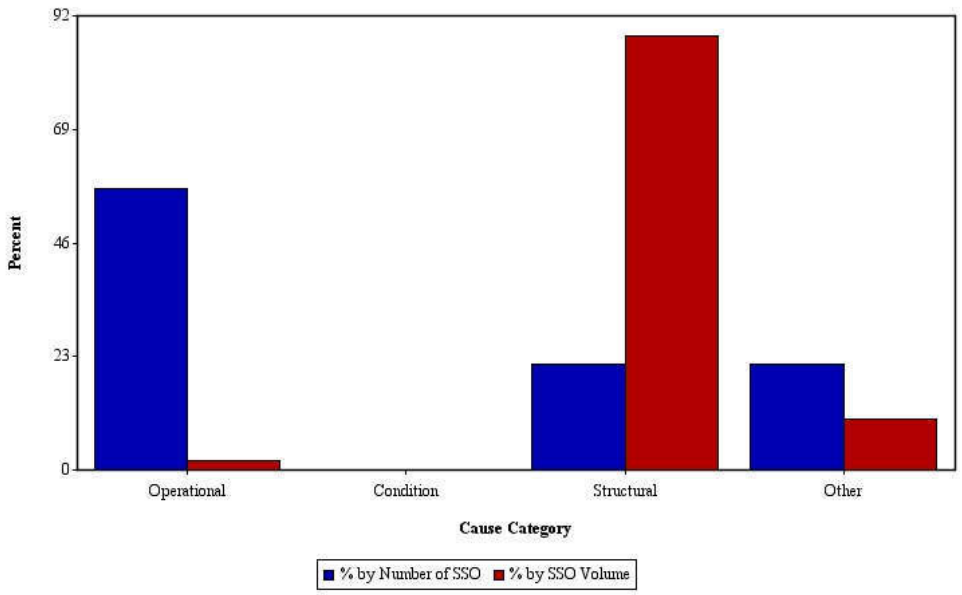
Net Volume Spills Indice (Net Vol in gallons/1000 Capita/yr)									
	Category 1			Category 2			Category 3		
	Mainlines	Laterals	Not Specified	Mainlines	Laterals	Not Specified	Mainlines	Laterals	Not Specified
Clearlake Oaks Co Wtr Dis CS	262.64	0.0	0.0	92.4	0.0	0.0	0.56	5.97	0.0
State Municipal (Public) Average	272.68	154.22	490.45	129.65	25.24	115.63	9.44	1.87	3.09
Region Municipal Average	245.64	356.42	819.54	216.23	66.25	95.97	19.82	3.17	5.61

Note: Click on hyperlinks to get comparison charts for CS, Region, and State grouped by 'Miles Of Pipe'.

(1) The number of Category 1, 2 and 3 SSOs resulting from a failure in the Enrollee sewer system per 100 miles sewer system owned by the Enrollee per year.
(2) Net Volume (volume spilled minus volume recovered) of SSOs, for which the reporting Enrollee is responsible, per capita (i.e. the population served by your agency's sanitary sewer system), per year.
(3) Value calculated using miles of force mains and other pressure systems and miles of gravity sewers the agency is responsible for.
(4) Value calculated using miles of laterals the agency is responsible for (Lower Only, UpperLower). For collection systems with no lateral responsibility a N/A is shown.
(5) Value Calculated using total miles of collection system pipe the agency is responsible for.
(6) Comparison made between similar collection systems type (e.g. municipal) and lateral responsibility for the entire state over the selected time period. Comparison indices are calculated for all similar collection systems and averaged for comparison.
(7) Comparison made between similar collection systems type (e.g. Municipal) and lateral responsibility for collection systems in same region (e.g. Region 5S). Collection system indices are calculated for all similar collection systems and averaged for comparison. For airport, hospital, marinas, military, park, port, prison, school, and other collection systems facilities, only state comparison is shown.
(8) For Criteria used and term definitions refer to the SSO Glossary of Terms.

Percentage of total Number and Volume of SSOs by Spill Cause

Collection System: Clearlake Oaks Co Wtr Dis CS



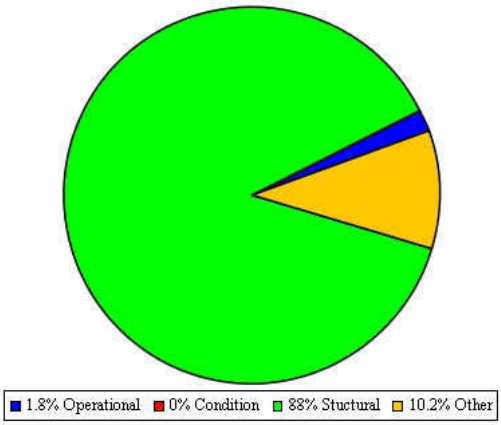
Percentage of total Volume of SSOs by Spill Cause

Operational: Debris from Construction, Debris from Lateral, Debris-General, Debris-Rags, Grease Deposition (FOG), Root Intrusion, Non - Dispersible Wipes

Condition: Flow Exceeded Capacity (Separate CS Only), Natural Disaster, Rainfall Exceeded Design, I&I (Separate CS Only)

Structural: Air Relief Valve (ARV)/Blow-Off Valve (BOV) Failure , Pipe Structural Problem/Failure, Pipe Structural Problem/Failure - Installation, Pump Station Failure-Controls, Pump Station Failure-Mechanical, Pump Station Failure-Power, Siphon Failure

Clearlake Oaks Co Wtr Dis CS



Region 5S

State of California

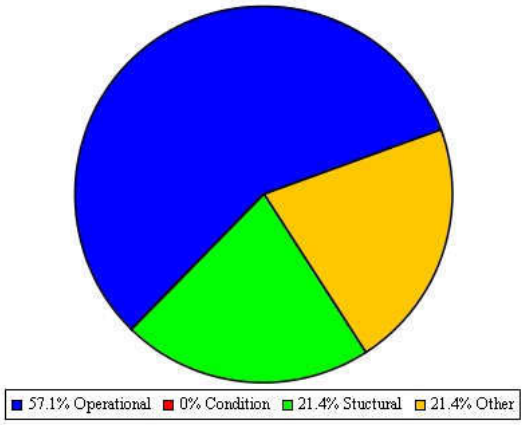
Percentage of total Number of SSOs by Spill Cause

Operational: Debris from Construction, Debris from Lateral, Debris-General, Debris-Rags, Grease Deposition (FOG), Root Intrusion, Non - Dispersible Wipes

Condition: Flow Exceeded Capacity (Separate CS Only), Natural Disaster, Rainfall Exceeded Design, I&I (Separate CS Only)

Structural: Air Relief Valve (ARV)/Blow-Off Valve (BOV) Failure , Pipe Structural Problem/Failure, Pipe Structural Problem/Failure - Installation, Pump Station Failure-Controls, Pump Station Failure-Mechanical, Pump Station Failure-Power, Siphon Failure

Clearlake Oaks Co Wtr Dis CS



Region 5S

State of California

Collection System Questionnaire Data(*)

Collection System Information: Clearlake Oaks Co Wtr Dis CS

Status	Active
Last Updated On	2014-12-16 13:45:04.0
Population Served	2,458
Miles of Force Main	3
Miles of Gravity Sewer	17
Miles of Laterals	4
Portion of Laterals Responsible	lower
Miles of Laterals Responsible	4
Number of Service Lateral Connection	1630
Sewer Constructed 2000 Current	1
Sewer Constructed 1980 1999	5
Sewer Constructed 1960 1979	94
Sewer Constructed 1940 1959	0
Sewer Constructed 1920 1939	0
Sewer Constructed 1900 1919	0
Sewer Constructed Before 1900	0
Inaccessible Sewer (Miles)	0
Sewer Clean Production (Miles/Yr)	3
Gravity Sewer Inspection (Miles/Yr)	3

(*) The information presented above was provided by the Enrollee in the Collection System Questionnaire. Enrollees are required to update the questionnaire information at least once a year; therefore, the information presented above may not be the most current.

Sewer System Management Plan (SSMP) Completion (*)

SSMP Information: Clearlake Oaks Co Wtr Dis CS

Task and Associated Section	Completed
Development Plan and Schedule	Yes
Section I - Goal	Yes
Section II - Organization	Yes
Section III - Legal Authority	Yes
Section IV - Operation & Maintenance Program	Yes
Section V - Design & Performance Provisions	Yes
Section VI - Overflow Emergency Response Plan	Yes
Section VII - FOG Control Program	Yes
Section VIII - System Evaluation & Capacity Assurance Plan	Yes
Section IX - Monitoring, Measurement, and Program Modifications	Yes
Section X - SSMP Program Audits	Yes
Section XI - Communication Program	Yes
Complete SSMP Implementation	Yes

(*) Under theStatewide General WDRs for Sanitary Sewer Systems, WQO No. 2006-0003 , enrollees are required to develop and implement a written Sewer system Management Plan (SSMP) and must make it publicly available. The SSMP must be approved by the deadlines in the SSMP Time Schedule presented in the Sanitary Sewer Systems WDR.

Additional Information:

- Data used for the Operational report is reported by the enrollees through the CIWQS (California Integrated Water Quality System) SSO module.

- Indices are calculated for the date range specified (default is past 4 months) and using data available since reporting was required for all enrollees as specified in the Sanitary Sewer Systems WDR. Reporting was required to begin for Regions

4,8,9 on 1/2/2007, Regions 1,2,3 on 5/2/2007, and, Regions 5,6,7 on 9/2/2007.

- Comparisons are made between similar collection systems type (e.g. Municipal), and lateral responsibility for the entire state and region. Indices are calculated for all similar collection systems and averaged for comparison.
- Category 1 and 2 spills are required to be fully certified 15 calendar days after SSO response conclusion and Category 3 spills are required to be fully certified 30 Calendar days after end of calendar month which SSO occurred. Therefore, spill records for the past approximately 60 days may be incomplete.
- Average Number of Spills per 100 miles: Measures the number of sewer overflows per 100 miles of sewer lines. Notice that these indices are strongly influenced by the length of collection system owned by the enrollee.
    - For instance, an enrollee that owns and operates a collection system of one (1) mile in length having only one (1) spill (analyzing data for ONE year) will have a Operational indice of 100.0 spills/100mi/yr. On the other hand, an enrollee that owns and operates a collection system of one hundred (100) miles in length having only one (1) spill (analyzing data for ONE year) will have a Operational indice of 1.0 spills/100mi/yr.
- Average Net Volume (volume spilled minus volume recovered) of Spills per Capita: Measures the volume in gallons of SSOs, for which the reporting Enrollee is responsible, per capita (the population served by your agency's sanitary sewer system). Where the volume recovered is greater than the volume spilled, the net volume will be considered to be zero.
- The “agency” or Enrollee listed on a SSO report is responsible for the data presented in this report and should be contacted directly for questions related to their Data.
- More information on the Sanitary Sewer Overflow Reduction program is available at: http://www.waterboards.ca.gov/water_issues/programs/sso/index.shtml
- The Sanitary Sewer Overflows Incident Map is available at: http://www.waterboards.ca.gov/water_issues/programs/sso/sso_map/sso_pub.shtml
- The Interactive SSO report: https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/PublicReportSSOServlet?reportAction=criteria&reportId=sso_main

The current report was generated with data as of: Sunday, November 08, 2015
Regional Boards are in the process of entering backlogged data.
As a result, data may be incomplete.

Back to Main Page | **Back to Top of Page**

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The Board is one of six boards, departments, and offices under the umbrella of the California Environmental Protection Agency.
Cal/EPA | ARB | DPR | DTSC | OEHHA | **SWRCB**

Clearlake Oaks Facility with Violations as Reported from CIWQS System

General Information

Party ID	Party Name	Party Name	Mailing Address	Work Phone	Email/Website
8812	Clearlake Oaks Cnty Water Dist	Clearlake Oaks Cnty Water Dist	Po Box 709 Clearlake Oaks, CA 95423	null	null

Related Places

Place ID	Place Name	Place Name	Region	Place Type	Relationship to Party	Relationship Start Date	Relationship End Date
630669	Clearlake Oaks Co Wtr Dis CS	Clearlake Oaks Co Wtr Dis CS	5S	Collection_System	Owner	4/3/2006	null
214812	Clearlake Oaks Co WTR Dis WWTP	Clearlake Oaks Co WTR Dis WWTP	5S	Wastewater Treatment Facility	Owner	2/3/1998	null

Related Parties

Party ID	Party Name	Party Name	Role/Relationship	Relationship Start Date	Relationship End	Classification
548729	Dan Hodem	Dan Hodem	Legally Responsible Official	10/24/2014	null	null
543105	Larry Swift	Larry Swift	Legally Responsible Official	9/17/2013	null	null
538086	Mike Smith	Mike Smith	Legally Responsible Official	8/1/2008	null	null
480604	Dawni Luce	Dawni Luce	Legally Responsible Official	8/4/2008	null	null
357889	Ellen Pearson	Ellen Pearson	Legally Responsible Official	11/3/2006	9/17/2013	null
357889	Ellen Pearson	Ellen Pearson	Facility Contact	11/2/2006	null	null
86072	Tim Bradley	Tim Bradley	Facility Contact	4/18/2006	11/2/2006	null

Regulatory Measures(non-enforcement)

Reg. Measure ID	Regulatory Measure Type	Regulatory Measure Type	WDID	Title	Status	Program	Order No.	RM Effective Date	RM Termination Date	Relationship	Relationship Start Date	Relationship End Date
301284	Enrollee	Enrollee	5SSO10906	Enrollee of SB SSO WDR for Clearlake Oaks Co Water Dist	Active	SSOMUNISML	2006-0003-DWQ	1/8/2007	null	Discharger	4/18/2006	null
147062	WDR	WDR	5A170100002	WDR 98-211 for Clearlake Oaks Co Water Dist,	Active	WDRMUNILRG	98-211	10/23/1998	null	Discharger	10/23/1998	null
141229	WDR	WDR	5A170100002	WDR 94-028 for CLEARLAKE OAKS CO WATER	Historical	WDR	94-028	1/28/1994	null	Discharger	1/28/1994	null

Violations within the past calendar year

Violation ID	Occurrence Date	Occurrence Date	Violation Description	Violation Status	Priority	Source	Facility Name	Violated Reg. Meas. ID	Violated Reg. Meas. Order No.	Linked To Enf.
Enforcement Actions										
Enforcement ID	Enforcement Type	Enforcement Type	Title	Program	Effective Date	Status				
398741	Clean-up and Abatement Order	Clean-up and Abatement Order	CAO R5-2014-0707 for Clearlake Oaks Cnty	WDR	11/3/2014	Active				
389214	Notice of Violation	Notice of Violation	NOV 02/19/2013 for Clearlake Oaks Cnty	SSOMUNISML	2/19/2013	Historical				
384537	Notice of Violation	Notice of Violation	NOV for Clearlake Oaks Cnty Water Dist	WDR	4/20/2012	Historical				
373476	Notice of Violation	Notice of Violation	NOV 03/16/2010 for Clearlake Oaks Cnty	SSOMUNISML	3/16/2010	Historical				
325564	Notice of Violation	Notice of Violation	NOV 05/15/2007 for Clearlake Oaks County	WDR	5/15/2007	Historical				
323931	Notice of Violation	Notice of Violation	NOV 03/22/2007 for Clearlake Oaks County	WDR	3/22/2007	Historical				
314354	Notice of Violation	Notice of Violation	NOV 03/15/2006 for Clearlake Oaks WWTP	WDR	3/15/2006	Historical				
252412	Notice of Violation	Notice of Violation	NOV 05/27/2004 for Clearlake Oaks Cnty	WDR	5/27/2004	Historical				
246116	Time Schedule Order	Time Schedule Order	TSO R5-2002-0902 for Clearlake Oaks Cnty	WDR	10/3/2002	Historical				
245489	Notice of Violation	Notice of Violation	NOV 01/10/2003 for Clearlake Oaks Cnty	WDR	1/10/2003	Historical				
242701	Notice of Violation	Notice of Violation	NOV 09/04/2003 for Clearlake Oaks Cnty	WDR	9/4/2003	Historical				
232217	Staff Enforcement Letter	Staff Enforcement Letter	SEL 09/15/1999 for Clearlake Oaks Co WTR	WDR	9/15/1999	Historical				
232216	Staff Enforcement Letter	Staff Enforcement Letter	SEL 09/15/1999 for Clearlake Oaks Co WTR	WDR	9/15/1999	Historical				
232215	Notice of Violation	Notice of Violation	NOV 08/30/1999 for Clearlake Oaks Cnty	WDR	8/30/1999	Historical				
232211	Oral Communication	Oral Communication	OC 03/13/2000 for Clearlake Oaks Co WTR	WDR	3/13/2000	Historical				
232210	Staff Enforcement Letter	Staff Enforcement Letter	SEL 03/10/2000 for Clearlake Oaks Co WTR	WDR	3/10/2000	Historical				
232150	Notice of Violation	Notice of Violation	NOV 08/30/1999 for Clearlake Oaks Cnty	WDR	8/30/1999	Historical				
231158	Staff Enforcement Letter	Staff Enforcement Letter	Enforcement - 5A170100002	WDR	3/10/2000	Historical				
224439	Clean-up and Abatement Order	Clean-up and Abatement Order	CAO R5-1999-0704 for Clearlake Oaks Cnty	WDR	2/24/1999	Historical				
224191	Cease and Desist Order	Cease and Desist Order	CDO R5-1994-0029 for Clearlake Oaks Cnty	WDR	1/28/1994	Active				

Regulatory Measures linked to Related Parties

Reg. Measure ID	Organization	Organization	Program	Effective Date	Status
No Records					

Appendix C

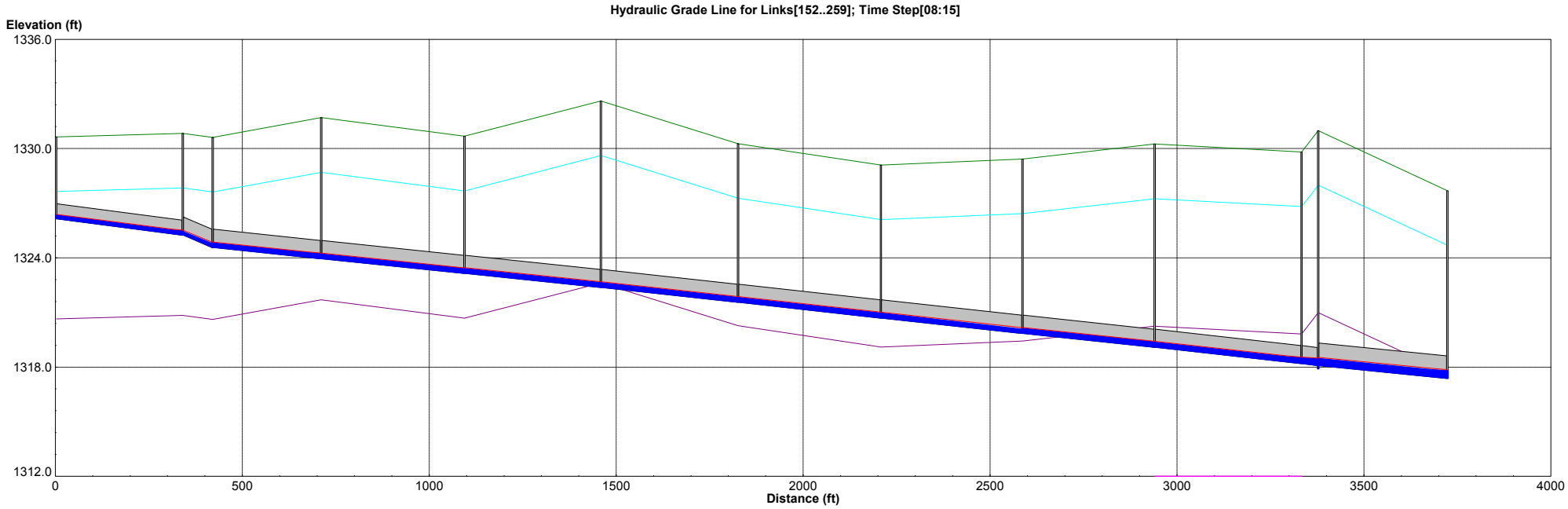
Hydraulic Profiles

Item No	Document	Page Number
1	Highway 20 - East	C-2
2	Highway 20 – North	C-4
3	Highway 20 – West	C-6
4	Keys Blvd to LS 7	C-8
5	Lake St to LS 7	C-10
6	Plaza Blvd to LS 2	C-12
7	LS 7 to WWTP	C-14
8	LS 10 to WWTP	C-16
9	Schindler St to LS 7	C-18
10	Inverts relative to 2011 levels	C-20
11	Inverts relative to 2015 levels	C-21

Job No. CLOCWD-001	No.

HDRLink Hydraulic Grade Line Profiles

Project	CLOCWD SEWER SYSTEM	Printed kprins	Date October 22, 2015
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Scenario	BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT	Page 1	of 2



HYDRAULIC GRADE LINES

LEGEND: Ground Elev.= Deep HGL= Shallow HGL= Pipe Line= Water Surface= HGL=

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
152	EPI	C46-010	C46-008	Highway 20	10.0	0	0	OK	0.00	false	false	339	0.002655	1330.64	1330.84	1326.14	1325.24	1.193	1.49	0.055	0.132	0.176
204	EPI	C46-008	C46-009	Highway 20	12.0	0	0	OK	0.00	false	false	80	0.008375	1330.84	1330.62	1325.24	1324.57	3.447	2.14	0.074	0.202	0.264
206	EPI	C46-009	C46-033	Highway 20	12.0	0	0	OK	0.00	false	false	290	0.002138	1330.62	1331.70	1324.57	1323.95	1.742	1.53	0.074	0.202	0.264
208	EPI	C46-033	C46-032	Highway 20	12.0	0	0	OK	0.00	false	false	383	0.002115	1331.70	1330.68	1323.95	1323.14	1.732	1.53	0.078	0.213	0.278

DATA SUMMARY (Continued on next page . . . .)

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HDRLink Hydraulic Grade Line Profiles



Project CLOCWD SEWER SYSTEM | Printed kprins | Date October 22, 2015

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LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
210	EPI	C46-032	C46-031	Highway 20	12.0	0	0	OK	0.00	false	false	365	0.002110	1330.68	1332.62	1323.14	1322.37	1.730	1.53	0.080	0.218	0.285
212	EPI	C46-031	C46-030	Highway 20	12.0	0	0	OK	0.00	false	false	367	0.002234	1332.62	1330.27	1322.37	1321.55	1.780	1.62	0.082	0.226	0.294
214	EPI	C46-030	C54-034	Highway 20	12.0	0	0	OK	0.00	false	false	382	0.002251	1330.27	1329.10	1321.55	1320.69	1.787	1.65	0.087	0.240	0.312
216	EPI	C54-034	C54-033	Highway 20	12.0	0	0	OK	0.00	false	false	379	0.002216	1329.10	1329.43	1320.69	1319.85	1.773	1.61	0.087	0.240	0.312
218	EPI	C54-033	C54-032	Highway 20	12.0	0	0	OK	0.00	false	false	353	0.002181	1329.43	1330.25	1319.85	1319.08	1.759	1.61	0.087	0.240	0.312
220	EPI	C54-032	C54-031	Highway 20	12.0	0	0	OK	0.00	false	false	393	0.002290	1330.25	1329.82	1319.08	1318.18	1.802	1.68	0.094	0.256	0.335
222	EPI	C54-031	C54-006	Highway 20	12.0	0	0	OK	0.00	false	false	45	0.002444	1329.82	1330.99	1318.18	1318.07	1.862	1.47	0.096	0.261	0.340
259	EPI	C54-006	C54-007	Island Dr	15.0	0	0	OK	0.00	false	false	345	0.002029	1330.99	1327.69	1318.07	1317.37	3.076	1.94	0.211	0.529	0.687

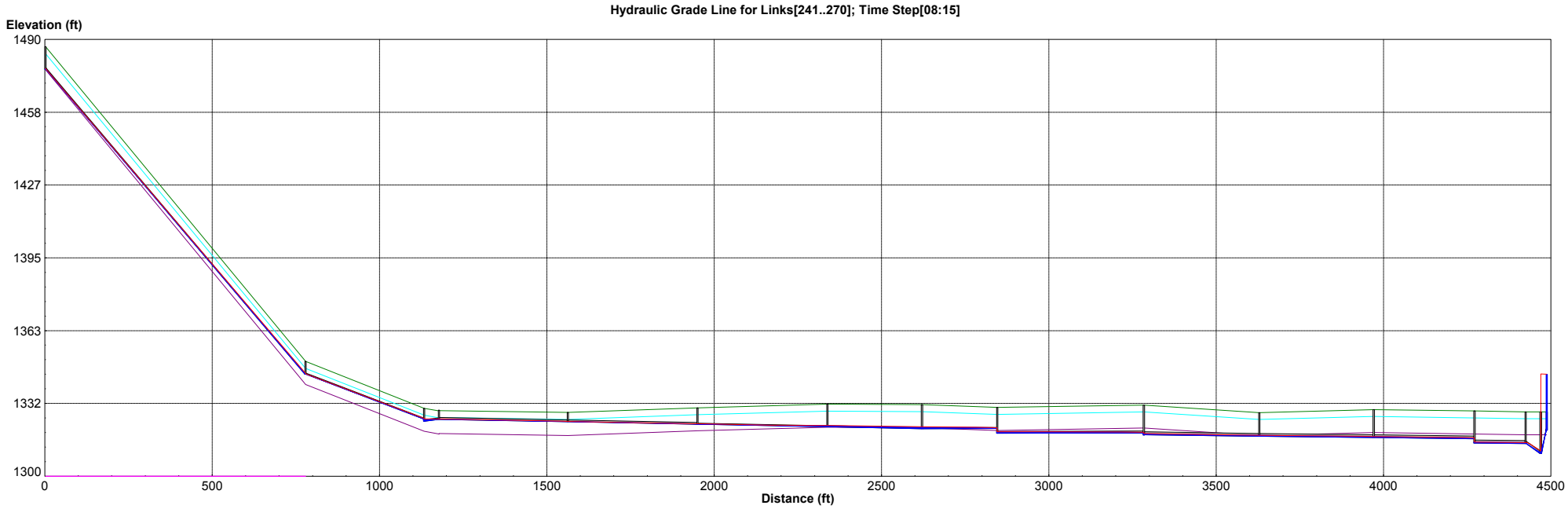
DATA SUMMARY

Note

Job No. CLOCWD-001	No.

HDRLink Hydraulic Grade Line Profiles

Project	CLOCWD SEWER SYSTEM	Printed kprins	Date October 22, 2015
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HYDRAULIC GRADE LINES

LEGEND: Ground Elev.= Deep HGL= Shallow HGL= Pipe Line= Water Surface= HGL=

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
241	EPI	C51-037	C52-045	Mountain View Dr	6.0	0	0	OK	0.00	false	false	777	0.170708	1486.80	1349.94	1477.00	1344.36	2.386	1.53	0.009	0.034	0.040
243	EPI	C52-045	C51-007	Oak Grove Ave	6.0	0	0	OK	0.00	false	false	354	0.054939	1349.94	1329.54	1344.36	1324.89	1.388	1.68	0.018	0.050	0.063
245	EPI	C51-007	C51-004	Oak Grove Ave	8.0	0	0	IH	0.00	false	false	44	-0.018318	1329.54	1328.42	1323.94	1324.75	0.000	0.22	0.024	0.063	0.079
247	EPI	C51-004	C51-005	Highway 20	10.0	0	0	OK	0.00	false	false	385	0.002804	1328.58	1327.74	1324.75	1323.67	1.227	1.24	0.026	0.069	0.086

DATA SUMMARY (Continued on next page . . . .)

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HDRLink Hydraulic Grade Line Profiles



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Scenario BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT | Page 2 | of 2

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
249	EPI	C51-005	C51-006	Highway 20	10.0	0	0	OK	0.00	false	false	388	0.002812	1327.74	1329.78	1323.67	1322.58	1.228	1.30	0.031	0.077	0.096
251	EPI	C51-006	C54-003	Highway 20	6.0	0	0	OK	0.00	false	false	388	0.002784	1329.78	1331.33	1322.58	1321.50	0.313	1.34	0.031	0.077	0.096
253	EPI	C54-003	C54-004	Highway 20	6.0	0	0	OK	0.00	false	false	283	0.002796	1331.33	1331.13	1321.50	1320.71	0.314	1.22	0.084	0.189	0.248
255	EPI	C54-004	C54-005	Highway 20	6.0	10	10	IS	60.00	true	false	225	-0.000222	1331.13	1329.93	1320.71	1320.76	0.000	1.27	0.087	0.198	0.258
257	EPI	C54-005	C54-006	Highway 20	10.0	0	0	OK	0.00	false	false	438	-0.000365	1329.93	1330.99	1318.66	1318.82	0.000	0.65	0.111	0.259	0.336
259	EPI	C54-006	C54-007	Island Dr	15.0	0	0	OK	0.00	false	false	345	0.002029	1330.99	1327.69	1318.07	1317.37	3.076	1.94	0.211	0.529	0.687
261	EPI	C54-007	C54-008	Island Dr	15.0	0	0	OK	0.00	false	false	342	0.001608	1327.69	1329.01	1317.37	1316.82	2.739	1.77	0.211	0.529	0.687
263	EPI	C54-008	C55-027	Island Dr	15.0	0	0	OK	0.00	false	false	301	0.001827	1329.01	1328.39	1316.82	1316.27	2.919	1.87	0.211	0.529	0.687
265	EPI	C55-027	C55-039	Island Dr	16.0	0	0	OK	0.00	false	false	153	0.001307	1328.39	1328.02	1314.41	1314.21	2.933	1.65	0.211	0.529	0.687
267	EPI	C55-039	C55-044	Island Dr	12.0	0	0	OK	0.00	false	false	45	0.093556	1328.02	1328.00	1314.21	1310.00	11.455	2.96	0.238	0.589	0.762
270	PRE	C55-044	C55-001	LS 2	8.0	0	0	UA	0.00	false	false	18	-0.555556	1328.00	1328.00	1310.00	1320.00	0.000	2.69	0.237	0.587	0.942

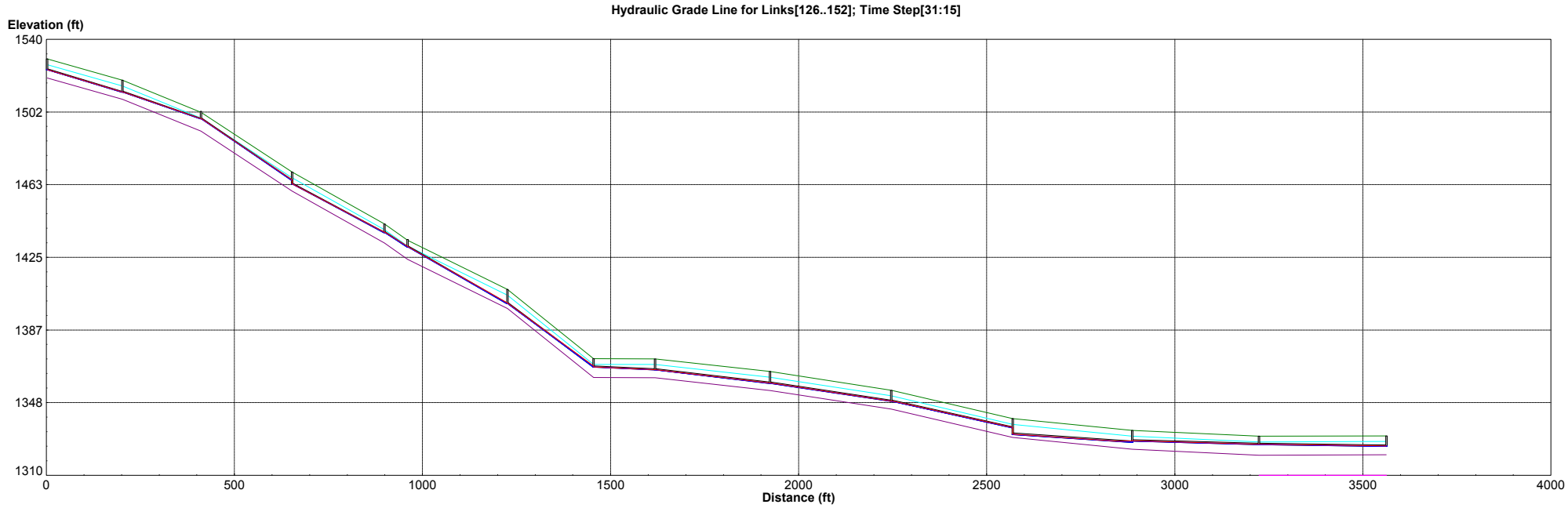
DATA SUMMARY

Note

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Project	CLOCWD SEWER SYSTEM	Printed	kprins	Date	October 22, 2015
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Scenario	BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT	Page	1	of	2



HYDRAULIC GRADE LINES

LEGEND: Ground Elev.= Deep HGL= Shallow HGL= Pipe Line= Water Surface= HGL=

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
126	EPI	C45-008	C45-007	Lakeview Dr	6.0	0	0	OK	0.00	false	false	200	0.059050	1529.62	1518.41	1523.92	1512.11	1.438	1.28	0.005	0.016	0.020
128	EPI	C45-007	C45-004	Lakeview Dr	6.0	0	0	OK	0.00	false	false	209	0.067512	1518.41	1501.50	1512.11	1498.00	1.537	1.41	0.008	0.024	0.032
130	EPI	C45-004	C45-003	Konocti View	6.0	0	0	OK	0.00	false	false	242	0.133884	1501.50	1470.00	1498.00	1465.60	2.142	1.55	0.011	0.035	0.045
132	EPI	C45-003	C44-001	Lakeview Dr	6.0	0	0	OK	0.00	false	false	246	0.104065	1470.00	1442.57	1463.60	1438.00	1.900	1.63	0.014	0.041	0.052

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HDRLink Hydraulic Grade Line Profiles

Project CLOCWD SEWER SYSTEM | Printed kprins | Date October 22, 2015

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Scenario BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT | Page 2 | of 2

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
134	EPI	C44-001	C45-002	Beryl Way	6.0	0	0	OK	0.00	false	false	61	0.123934	1442.57	1433.94	1438.00	1430.44	2.066	1.77	0.019	0.063	0.078
136	EPI	C45-002	C45-019	Beryl Way	6.0	0	0	OK	0.00	false	false	266	0.112556	1433.94	1408.00	1430.44	1400.50	1.973	1.78	0.019	0.063	0.078
138	EPI	C45-019	C45-001	Beryl Way	6.0	0	0	OK	0.00	false	false	229	0.145371	1408.00	1371.55	1400.50	1367.21	2.225	1.90	0.022	0.069	0.088
140	EPI	C45-001	C45-016	Highway 20	8.0	0	0	OK	0.00	false	false	163	0.009202	1371.55	1371.47	1367.04	1365.54	1.225	1.76	0.022	0.069	0.088
142	EPI	C45-016	C45-015	Highway 20	8.0	0	0	OK	0.00	false	false	306	0.023007	1371.47	1364.75	1365.54	1358.50	1.937	1.76	0.022	0.069	0.088
144	EPI	C45-015	C45-017	Highway 20	8.0	0	0	OK	0.00	false	false	322	0.029503	1364.75	1354.89	1358.50	1349.00	2.193	1.80	0.026	0.079	0.101
146	EPI	C45-017	C45-014	Highway 20	8.0	0	0	OK	0.00	false	false	323	0.043344	1354.89	1339.92	1349.00	1335.00	2.657	1.89	0.032	0.093	0.119
148	EPI	C45-014	C45-013	Highway 20	10.0	0	0	OK	0.00	false	false	318	0.013113	1339.92	1333.70	1331.50	1327.33	2.652	1.94	0.047	0.116	0.153
150	EPI	C45-013	C46-010	Highway 20	10.0	0	0	OK	0.00	false	false	337	0.005519	1333.70	1330.64	1328.00	1326.14	1.721	1.94	0.052	0.127	0.168
152	EPI	C46-010	C46-008	Highway 20	10.0	0	0	OK	0.00	false	false	339	0.002655	1330.64	1330.84	1326.14	1325.24	1.193	1.53	0.055	0.132	0.176

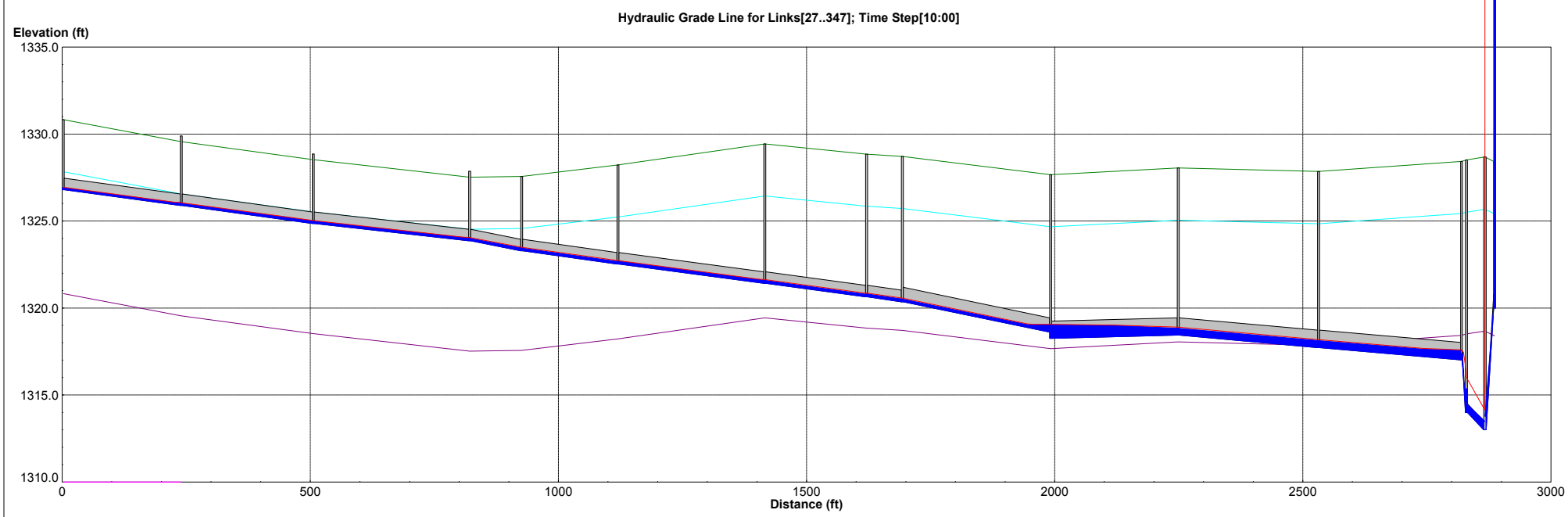
DATA SUMMARY

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HDRLink Hydraulic Grade Line Profiles

Project	CLOCWD SEWER SYSTEM	Printed kprins	Date October 22, 2015
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Scenario	BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT	Page 1	of 2



HYDRAULIC GRADE LINES

LEGEND: Ground Elev.= | Deep HGL= | Shallow HGL= | Pipe Line= | Water Surface= | HGL=

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
27	EPI	C53-013	C53-016	Keys Blvd	8.0	0	0	OK	0.00	false	false	238	0.003824	1330.83	1329.56	1326.80	1325.89	0.790	1.25	0.037	0.037	0.052
29	EPI	C53-016	C53-018	Keys Blvd	8.0	0	0	OK	0.00	false	false	266	0.003872	1329.56	1328.53	1325.89	1324.86	0.795	1.35	0.053	0.053	0.074
31	EPI	C53-018	C53-021	Keys Blvd	8.0	0	0	OK	0.00	false	false	315	0.003175	1328.53	1327.53	1324.86	1323.86	0.720	1.25	0.053	0.053	0.074
33	EPI	C53-021	C53-039	Keys Blvd	8.0	0	0	OK	0.00	false	false	105	0.005429	1327.53	1327.57	1323.86	1323.29	0.941	1.70	0.073	0.073	0.109

DATA SUMMARY (Continued on next page . . . .)

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HDRLink Hydraulic Grade Line Profiles



Project CLOCWD SEWER SYSTEM | Printed kprins | Date October 22, 2015

Configuration EXISTING (2015) SYSTEM | Checked | Date

Scenario BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT | Page 2 | of 2

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
276	EPI	C53-039	C53-023	Keys Blvd	8.0	0	0	OK	0.00	false	false	194	0.003918	1327.57	1328.23	1323.29	1322.53	0.800	1.48	0.125	0.125	0.549
278	EPI	C53-023	C53-024	Keys Blvd	8.0	0	0	OK	0.00	false	false	296	0.003750	1328.23	1329.44	1322.53	1321.42	0.782	1.48	0.125	0.125	0.549
280	EPI	C53-024	C53-025	Keys Blvd	8.0	0	0	OK	0.00	false	false	205	0.003805	1329.44	1328.85	1321.42	1320.64	0.788	1.54	0.136	0.136	0.570
283	EPI	C53-025	C53-031	Keys Blvd	8.0	0	0	OK	0.25	false	false	72	0.003889	1328.85	1328.72	1320.64	1320.36	0.797	1.54	0.161	0.161	0.806
285	EPI	C53-031	C56-043	Keys Blvd	10.0	0	0	OK	0.00	false	false	299	0.005853	1328.72	1327.67	1320.36	1318.61	1.772	1.87	0.174	0.174	0.827
336	EPI	C56-043	C56-036	Keys Blvd	12.0	0	0	OK	0.25	false	false	257	-0.000739	1327.67	1328.05	1318.25	1318.44	0.000	0.87	0.363	0.363	1.250
338	EPI	C56-036	C55-010	Keys Blvd	12.0	0	0	OK	0.00	false	false	283	0.002511	1328.05	1327.85	1318.44	1317.73	1.887	2.05	0.366	0.366	1.256
340	EPI	C55-010	C55-034	Keys Blvd	12.0	0	0	OK	0.00	false	false	288	0.002465	1327.85	1328.43	1317.73	1317.02	1.870	2.02	0.366	0.366	1.256
342	EPI	C55-034	C55-041	Keys Blvd	6.0	0	0	OK	0.00	false	false	10	0.302000	1328.43	1328.51	1317.02	1314.00	3.092	3.73	0.366	0.366	1.256
344	EPI	C55-041	C55-042	Pump Station # 7 Inflow	6.0	10	10	DS	1.00	true	false	37	0.027027	1328.51	1328.68	1314.00	1313.00	0.975	6.44	0.687	0.687	2.029
347	PRE	C55-042	C55-036	LS 7	10.0	0	0	UA	0.00	false	false	20	-0.350000	1328.68	1328.40	1313.00	1320.00	0.000	2.38	0.494	0.494	1.500

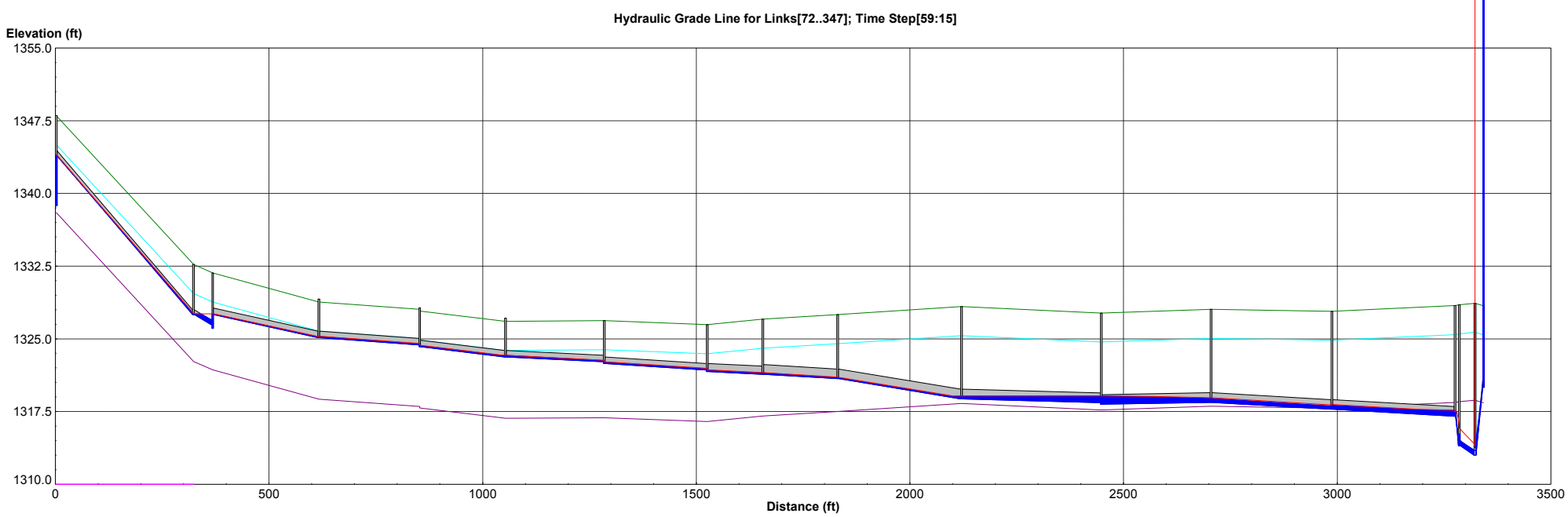
DATA SUMMARY

Note

Job No. CLOCWD-001	No.

HDRLink Hydraulic Grade Line Profiles

Project	CLOCWD SEWER SYSTEM	Printed kprins	Date October 22, 2015
Configuration	EXISTING (2015) SYSTEM	Checked	Date
Scenario	BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT	Page 1	of 2



HYDRAULIC GRADE LINES

LEGEND: Ground Elev.= Deep HGL= Shallow HGL= Pipe Line= Water Surface= HGL=

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
72	EPI	C52-042	C52-043	Oak Grove Ave	6.0	0	0	OK	0.00	false	false	321	0.051035	1348.03	1332.67	1343.89	1327.50	1.338	1.26	0.019	0.019	0.033
74	EPI	C52-043	C52-015	Highway 20	6.0	0	0	OK	0.00	false	false	45	0.024000	1332.67	1331.81	1327.50	1326.42	0.919	1.36	0.019	0.019	0.033
76	EPI	C52-015	C52-016	Lake St.	8.0	0	0	OK	0.00	false	false	249	0.009577	1331.81	1328.79	1327.50	1325.12	1.250	1.33	0.028	0.028	0.048
78	EPI	C52-016	C52-017	Lake St.	8.0	0	0	OK	0.00	false	false	236	0.003178	1328.79	1328.04	1325.12	1324.37	0.720	1.21	0.050	0.050	0.088

DATA SUMMARY (Continued on next page . . . .)

Job No. CLOCWD-001 | No.

HDRLink Hydraulic Grade Line Profiles



Project CLOCWD SEWER SYSTEM | Printed kprins | Date October 22, 2015

Configuration EXISTING (2015) SYSTEM | Checked | Date

Scenario BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT | Page 2 | of 2

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
290	EPI	C52-017	C52-018	Lake St.	8.0	0	0	OK	0.00	false	false	201	0.005323	1327.87	1326.80	1324.20	1323.13	0.932	1.45	0.067	0.067	0.202
292	EPI	C52-018	C52-019	Lake St.	8.0	0	0	OK	0.00	false	false	231	0.002165	1326.80	1326.87	1323.13	1322.63	0.594	1.15	0.083	0.083	0.228
294	EPI	C52-019	C52-020	Lake St.	8.0	0	0	OK	0.00	false	false	241	0.002780	1326.87	1326.47	1322.46	1321.79	0.674	1.23	0.083	0.083	0.228
328	EPI	C52-020	C52-004	Lake St.	10.0	0	0	OK	0.00	false	false	130	0.002077	1326.47	1327.03	1321.62	1321.35	1.056	1.14	0.132	0.132	0.572
330	EPI	C52-004	C52-070	Lake St.	12.0	0	0	OK	0.00	false	false	175	0.002629	1327.03	1327.50	1321.35	1320.89	1.931	1.23	0.154	0.154	0.572
332	EPI	C52-070	C52-003	Road 6	12.0	0	0	OK	0.00	false	false	290	0.007172	1327.50	1328.34	1320.89	1318.81	3.190	1.65	0.154	0.154	0.572
334	EPI	C52-003	C56-043	Road 6	12.0	0	0	OK	0.00	false	false	327	0.001193	1328.34	1327.67	1318.81	1318.42	1.301	0.64	0.188	0.188	0.614
336	EPI	C56-043	C56-036	Keys Blvd	12.0	0	0	OK	0.25	false	false	257	-0.000739	1327.67	1328.05	1318.25	1318.44	0.000	0.94	0.363	0.363	1.250
338	EPI	C56-036	C55-010	Keys Blvd	12.0	0	0	OK	0.00	false	false	283	0.002511	1328.05	1327.85	1318.44	1317.73	1.887	2.10	0.366	0.366	1.256
340	EPI	C55-010	C55-034	Keys Blvd	12.0	0	0	OK	0.00	false	false	288	0.002465	1327.85	1328.43	1317.73	1317.02	1.870	2.10	0.366	0.366	1.256
342	EPI	C55-034	C55-041	Keys Blvd	6.0	0	0	OK	0.00	false	false	10	0.302000	1328.43	1328.51	1317.02	1314.00	3.092	4.01	0.366	0.366	1.256
344	EPI	C55-041	C55-042	Pump Station # 7 Inflow	6.0	10	10	DS	1.00	true	false	37	0.027027	1328.51	1328.68	1314.00	1313.00	0.975	6.16	0.687	0.687	2.029
347	PRE	C55-042	C55-036	LS 7	10.0	0	0	UA	0.00	false	false	20	-0.350000	1328.68	1328.40	1313.00	1320.00	0.000	2.20	0.494	0.494	1.500

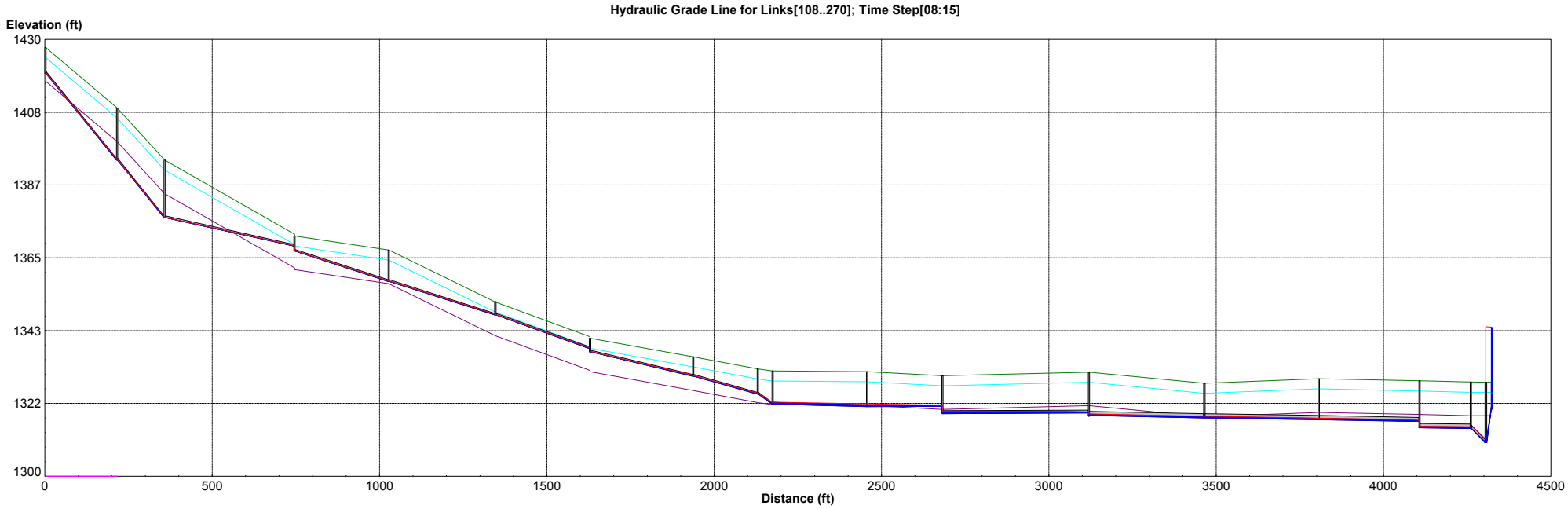
DATA SUMMARY

Note

Job No. CLOCWD-001 | No.

HDRLink Hydraulic Grade Line Profiles

Project	CLOCWD SEWER SYSTEM	Printed kprins	Date October 22, 2015
Configuration	EXISTING (2015) SYSTEM	Checked	Date
Scenario	BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT	Page 1	of 2



HYDRAULIC GRADE LINES

LEGEND: Ground Elev.= | Deep HGL= | Shallow HGL= | Pipe Line= | Water Surface= | HGL=

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
108	EPI	C43-006	C43-007	Mountain View Dr	6.0	0	0	OK	0.00	false	false	214	0.120514	1427.62	1409.59	1419.91	1394.12	2.038	0.93	0.001	0.007	0.008
110	EPI	C43-007	C43-008	The Plaza	6.0	0	0	OK	0.00	false	false	142	0.120563	1409.59	1394.09	1394.12	1377.00	2.039	0.93	0.001	0.007	0.008
112	EPI	C43-008	C51-014	The Plaza	6.0	0	0	OK	0.00	false	false	388	0.021907	1394.09	1372.00	1377.00	1368.50	0.878	0.94	0.001	0.007	0.008
114	EPI	C51-014	C51-015	The Plaza	6.0	0	0	OK	0.00	false	false	281	0.031976	1371.49	1367.29	1367.00	1358.00	1.060	1.45	0.010	0.030	0.039

DATA SUMMARY (Continued on next page . . . .)

Job No. CLOCWD-001 | No.

HDRLink Hydraulic Grade Line Profiles



Project CLOCWD SEWER SYSTEM | Printed kprins | Date October 22, 2015

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Scenario BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT | Page 2 | of 2

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
116	EPI	C51-015	C51-011	The Plaza	6.0	0	0	OK	0.00	false	false	319	0.031390	1367.29	1351.84	1358.00	1348.00	1.050	1.53	0.015	0.039	0.052
118	EPI	C51-011	C51-010	The Plaza	6.0	0	0	OK	0.00	false	false	283	0.035311	1351.84	1341.50	1348.00	1338.00	1.114	1.53	0.015	0.039	0.052
120	EPI	C51-010	C54-009	The Plaza	6.0	0	0	OK	0.00	false	false	308	0.023463	1341.09	1335.53	1337.00	1329.77	0.908	1.69	0.022	0.051	0.069
122	EPI	C54-009	C54-013	Pine St	6.0	0	0	OK	0.00	false	false	193	0.027358	1335.53	1331.92	1329.77	1324.49	0.981	1.75	0.026	0.060	0.081
124	EPI	C54-013	C54-003	Foothill Blvd	6.0	0	0	OK	0.00	false	false	44	0.067955	1331.92	1331.33	1324.49	1321.50	1.542	2.06	0.049	0.101	0.139
253	EPI	C54-003	C54-004	Highway 20	6.0	0	0	OK	0.00	false	false	283	0.002796	1331.33	1331.13	1321.50	1320.71	0.314	1.22	0.084	0.189	0.248
255	EPI	C54-004	C54-005	Highway 20	6.0	10	10	IS	60.00	true	false	225	-0.000222	1331.13	1329.93	1320.71	1320.76	0.000	1.27	0.087	0.198	0.258
257	EPI	C54-005	C54-006	Highway 20	10.0	0	0	OK	0.00	false	false	438	-0.000365	1329.93	1330.99	1318.66	1318.82	0.000	0.65	0.111	0.259	0.336
259	EPI	C54-006	C54-007	Island Dr	15.0	0	0	OK	0.00	false	false	345	0.002029	1330.99	1327.69	1318.07	1317.37	3.076	1.94	0.211	0.529	0.687
261	EPI	C54-007	C54-008	Island Dr	15.0	0	0	OK	0.00	false	false	342	0.001608	1327.69	1329.01	1317.37	1316.82	2.739	1.77	0.211	0.529	0.687
263	EPI	C54-008	C55-027	Island Dr	15.0	0	0	OK	0.00	false	false	301	0.001827	1329.01	1328.39	1316.82	1316.27	2.919	1.87	0.211	0.529	0.687
265	EPI	C55-027	C55-039	Island Dr	16.0	0	0	OK	0.00	false	false	153	0.001307	1328.39	1328.02	1314.41	1314.21	2.933	1.65	0.211	0.529	0.687
267	EPI	C55-039	C55-044	Island Dr	12.0	0	0	OK	0.00	false	false	45	0.093556	1328.02	1328.00	1314.21	1310.00	11.455	2.96	0.238	0.589	0.762
270	PRE	C55-044	C55-001	LS 2	8.0	0	0	UA	0.00	false	false	18	-0.555556	1328.00	1328.00	1310.00	1320.00	0.000	2.69	0.237	0.587	0.942

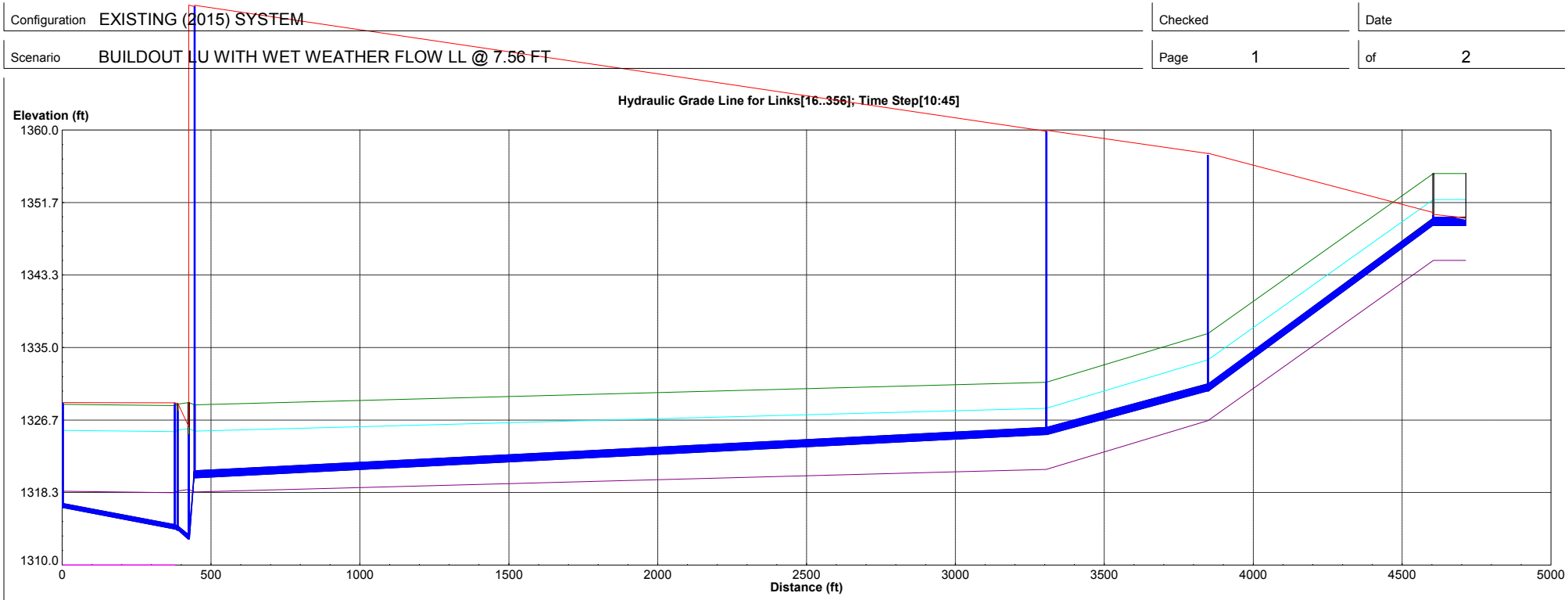
DATA SUMMARY

Note

Job No. CLOCWD-001 | No.

HDRLink Hydraulic Grade Line Profiles

Project	CLOCWD SEWER SYSTEM	Printed kprins	Date October 22, 2015
Configuration	EXISTING (2015) SYSTEM	Checked	Date
Scenario	BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT	Page 1	of 2



HYDRAULIC GRADE LINES

LEGEND: Ground Elev.= | Deep HGL= | Shallow HGL= | Pipe Line= | Water Surface= | HGL=

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
16	EPI	C56-007	C55-008	Everglade Blvd	6.0	0	0	OK	0.00	false	false	376	0.006463	1328.48	1328.32	1316.58	1314.15	0.477	0.37	0.055	0.055	0.101
18	EPI	C55-008	C55-041	Keys Blvd	6.0	0	0	OK	0.00	false	false	10	0.015000	1328.32	1328.51	1314.15	1314.00	0.726	0.57	0.087	0.087	0.158
344	EPI	C55-041	C55-042	Pump Station # 7 Inflow	6.0	10	10	SS	1.00	true	false	37	0.027027	1328.51	1328.68	1314.00	1313.00	0.975	7.78	0.687	0.687	2.029
347	PRE	C55-042	C55-036	LS 7	10.0	0	0	UA	0.00	false	false	20	-0.350000	1328.68	1328.40	1313.00	1320.00	0.000	2.75	0.494	0.494	1.500

DATA SUMMARY (Continued on next page . . . .)

Job No. CLOCWD-001 | No.

HDRLink Hydraulic Grade Line Profiles



Project CLOCWD SEWER SYSTEM | Printed kprins | Date October 22, 2015

Configuration EXISTING (2015) SYSTEM | Checked | Date

Scenario BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT | Page 2 | of 2

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
350	PRE	C55-036	C64-015	LS 7 FM	10.0	0	0	UA	0.00	false	false	2860	-0.001748	1328.40	1331.00	1320.00	1325.00	0.000	2.80	0.683	0.683	2.021
352	PRE	C64-015	D61-014	Pump Station 7 FM	10.0	0	0	UA	0.00	false	false	543	-0.009208	1331.00	1336.60	1325.00	1330.00	0.000	2.80	0.683	0.683	2.021
354	PRE	D61-014	D61-013	sta 7 & 10 fm	10.0	0	0	UA	0.00	false	false	757	-0.025099	1336.60	1355.00	1330.00	1349.00	0.000	3.87	0.768	0.768	2.108
356	PRE	D61-013	D61-015	STA 7, 10 & 11 FM	12.0	0	0	UA	0.00	false	false	109	0.000000	1355.00	1355.00	1349.00	1349.00	0.000	2.70	0.781	0.781	2.123

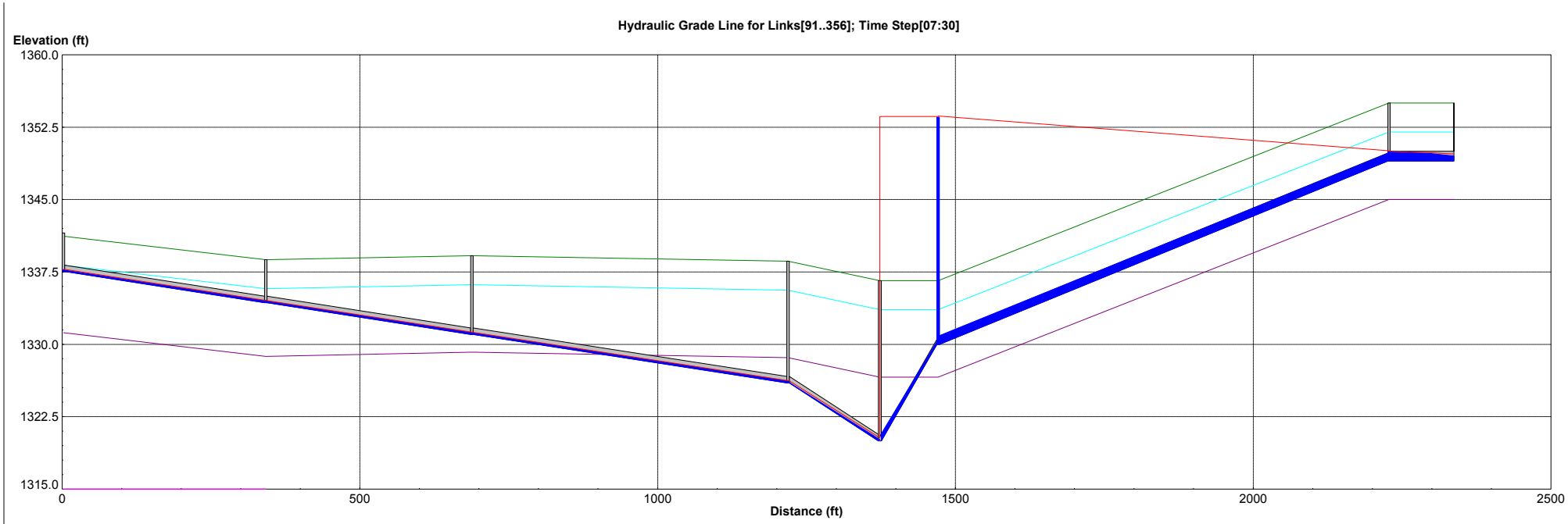
DATA SUMMARY

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HDRLink Hydraulic Grade Line Profiles

Project	CLOCWD SEWER SYSTEM	Printed kprins	Date October 22, 2015
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HYDRAULIC GRADE LINES

LEGEND: Ground Elev.= Deep HGL= Shallow HGL= Pipe Line= Water Surface= HGL=

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
91	EPI	C64-004	C64-005	Peach Circle	8.0	0	0	OK	0.00	false	false	340	0.009500	1341.21	1338.76	1337.54	1334.31	1.245	1.97	0.088	0.088	0.146
93	EPI	C64-005	C64-007	Lemon Circle	8.0	0	0	OK	0.00	false	false	346	0.009480	1338.76	1339.19	1334.31	1331.03	1.244	1.97	0.088	0.088	0.146
95	EPI	C64-007	C64-001	Plum Circle	8.0	0	0	OK	0.00	false	false	531	0.009473	1339.19	1338.62	1331.03	1326.00	1.243	1.97	0.088	0.088	0.146
97	EPI	C64-001	D61-005	Grape Circle	8.0	0	0	OK	0.00	false	false	154	0.038961	1338.62	1336.60	1326.00	1320.00	2.519	2.04	0.088	0.088	0.146

DATA SUMMARY (Continued on next page . . . .)

Job No. CLOCWD-001 | No.

HDRLink Hydraulic Grade Line Profiles



Project CLOCWD SEWER SYSTEM | Printed kprins | Date October 22, 2015

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Scenario BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT | Page 2 | of 2

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
100	PRE	D61-005	D61-014	STA 10	6.0	0	0	UA	0.00	false	false	98	-0.102041	1336.60	1336.60	1320.00	1330.00	0.000	0.00	0.086	0.086	0.579
354	PRE	D61-014	D61-013	sta 7 & 10 fm	10.0	0	0	UA	0.00	false	false	757	-0.025099	1336.60	1355.00	1330.00	1349.00	0.000	2.74	0.768	0.768	2.108
356	PRE	D61-013	D61-015	STA 7, 10 & 11 FM	12.0	0	0	UA	0.00	false	false	109	0.000000	1355.00	1355.00	1349.00	1349.00	0.000	1.98	0.781	0.781	2.123

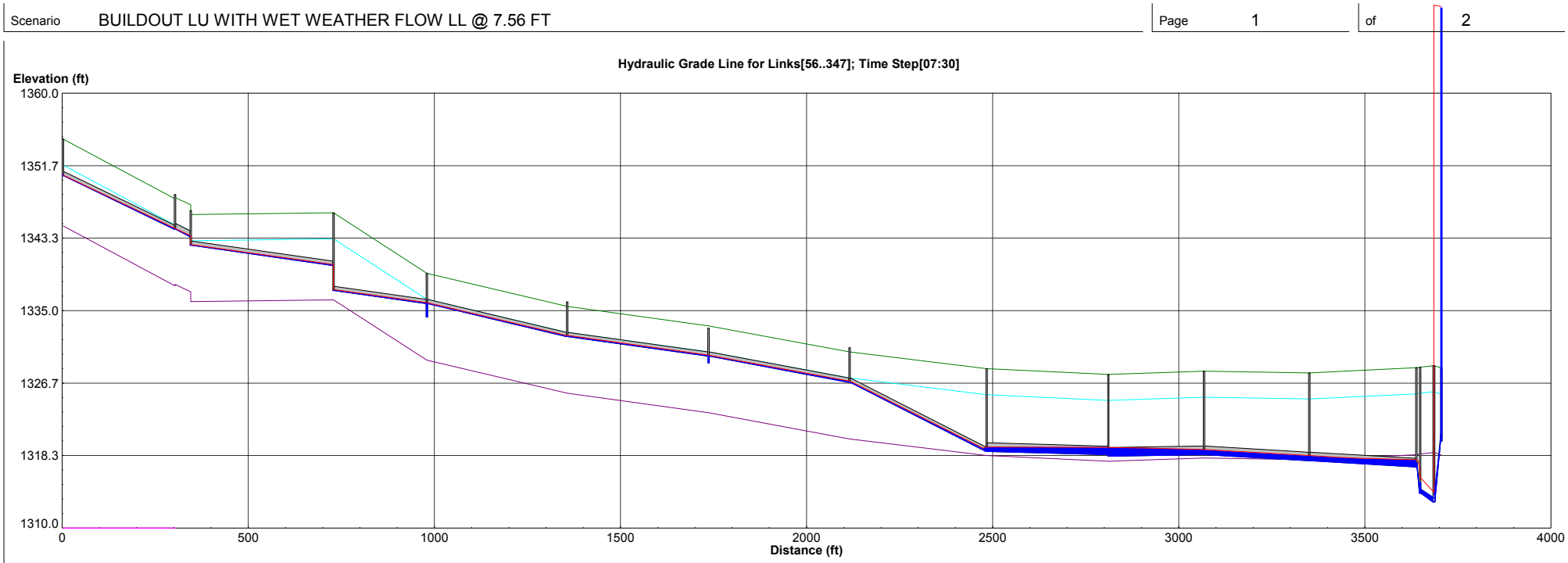
DATA SUMMARY

Note

Job No. CLOCWD-001 | No.

HDRLink Hydraulic Grade Line Profiles

Project	CLOCWD SEWER SYSTEM	Printed kprins	Date October 22, 2015
Configuration	EXISTING (2015) SYSTEM	Checked	Date
Scenario	BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT	Page 1	of 2



HYDRAULIC GRADE LINES

LEGEND: Ground Elev.= | Deep HGL= | Shallow HGL= | Pipe Line= | Water Surface= | HGL=

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
56	EPI	B55-001	C52-036	High Valley Road	6.0	0	0	OK	0.00	false	false	301	0.020405	1354.74	1347.85	1350.50	1344.35	0.847	1.26	0.012	0.012	0.023
58	EPI	C52-036	C52-037	High Valley Road	8.0	0	0	OK	0.00	false	false	42	0.020238	1348.02	1347.17	1344.35	1343.50	1.817	1.27	0.012	0.012	0.023
60	EPI	C52-037	C53-032	Highway 20	6.0	0	0	OK	0.00	false	false	384	0.006017	1346.04	1346.25	1342.50	1340.19	0.460	1.17	0.012	0.012	0.023
62	EPI	C53-032	C53-033	Schindler St.	6.0	0	0	OK	0.00	false	false	251	0.005988	1346.25	1339.30	1337.30	1335.80	0.459	1.32	0.025	0.025	0.038

DATA SUMMARY (Continued on next page . . . .)

Job No. CLOCWD-001 | No.

HDRLink Hydraulic Grade Line Profiles



Project CLOCWD SEWER SYSTEM | Printed kprins | Date October 22, 2015

Configuration EXISTING (2015) SYSTEM | Checked | Date

Scenario BUILDOUT LU WITH WET WEATHER FLOW LL @ 7.56 FT | Page 2 | of 2

LinkNo	Sy_Type	U_Name	D_Name	Lateral Name	Size	Rpl. Dia	Pll. Dia	HglSt	ExcDur	Improve	Resized	Length	Slope	GrUp	GrDn	InvUp	InvDn	QFull	Velocity	San_avg	Tot_avg	Tot_max
64	EPI	C53-033	C53-034	Schindler St.	6.0	0	0	OK	0.00	false	false	377	0.010080	1339.30	1335.50	1335.80	1332.00	0.596	1.48	0.025	0.025	0.038
66	EPI	C53-034	C52-038	Schindler St.	6.0	0	0	OK	0.00	false	false	380	0.005921	1335.50	1333.25	1332.00	1329.75	0.456	1.41	0.028	0.028	0.045
68	EPI	C52-038	C52-044	Schindler St.	6.0	0	0	OK	0.00	false	false	379	0.007916	1333.25	1330.25	1329.75	1326.75	0.528	1.57	0.028	0.028	0.045
70	EPI	C52-044	C52-003	Schindler St.	6.0	0	0	OK	0.00	false	false	368	0.021576	1330.25	1328.34	1326.75	1318.81	0.871	1.60	0.031	0.031	0.051
334	EPI	C52-003	C56-043	Road 6	12.0	0	0	OK	0.00	false	false	327	0.001193	1328.34	1327.67	1318.81	1318.42	1.301	0.90	0.188	0.188	0.614
336	EPI	C56-043	C56-036	Keys Blvd	12.0	0	0	OK	0.25	false	false	257	-0.000739	1327.67	1328.05	1318.25	1318.44	0.000	1.19	0.363	0.363	1.250
338	EPI	C56-036	C55-010	Keys Blvd	12.0	0	0	OK	0.00	false	false	283	0.002511	1328.05	1327.85	1318.44	1317.73	1.887	2.30	0.366	0.366	1.256
340	EPI	C55-010	C55-034	Keys Blvd	12.0	0	0	OK	0.00	false	false	288	0.002465	1327.85	1328.43	1317.73	1317.02	1.870	2.28	0.366	0.366	1.256
342	EPI	C55-034	C55-041	Keys Blvd	6.0	0	0	OK	0.00	false	false	10	0.302000	1328.43	1328.51	1317.02	1314.00	3.092	5.11	0.366	0.366	1.256
344	EPI	C55-041	C55-042	Pump Station # 7 Inflow	6.0	10	10	DS	1.00	true	false	37	0.027027	1328.51	1328.68	1314.00	1313.00	0.975	6.24	0.687	0.687	2.029
347	PRE	C55-042	C55-036	LS 7	10.0	0	0	UA	0.00	false	false	20	-0.350000	1328.68	1328.40	1313.00	1320.00	0.000	2.75	0.494	0.494	1.500

DATA SUMMARY

Note

Clearlake Oaks County Water District
Sewer System Master Plan

Sewer Manholes[$CXSF]
- No Data
- Above 2011 Lake Level
- Below 2011 Lake Level
- No Data

MC Engineering, Inc.
Carmichael, CA

Sewer System Manhole Inverts
Relative to Full Lake Level (1326.82 MSL)

Plot Title		
Jacobus Plot By	**06/03/2015** Date	**1** Map No
Scale 300 0 300 600 Feet		**plotfile.plt** Plot File

Zero Lake Level = 1,318.257 ft MSL
Full Lake Level = 1,326.817 ft MSL (+ 7.56 ft)
Maximum 10-Day Lake Level = 1,327.26 ft (+9.0 ft)

Clearlake Oaks County Water District
Sewer System Master Plan

Sewer Manholes[$CXSF]
- No Data
- Above 2015 Lake Level
- Below 2015 Lake Level
- No Data

MC Engineering, Inc.
Carmichael, CA

Sewer System Manhole Inverts
Relative to Full Lake Level (1326.82 MSL)

Plot Title

Jacobus	06/03/2015	1
Plot By	Date	Map No
Scale: 300 0 300 600 Feet		plotfile.plt (Plot File)

Zero Lake Level = 1,318.257 ft MSL
Full Lake Level = 1,326.817 ft MSL (+ 7.56 ft)
Maximum 10-Day Lake Level = 1,327.26 ft (+9.0 ft)

Appendix D

Independent Analysis of ADS Flow Meter Results

Item No.	Document	Page Number
1	Flow Meter Shed Map	D-2
2	Shed LS 1-2 North	D-3
3	Shed LS 1-2 West	D-6
4	LS 2 East	D-10
5	LS 7 South	D-14
6	LS 7 West	D-18
7	LS 8-7 N	D-22
8	LS 10 North	D-26
9	LS 10 East	D-30
10	LS 10 – North	D-34

Clearlake Oaks County Water District

LS 7W
LS 7N8
LS 1,2
LS 2E
LS 7S
LS 10
WWTP

N

LEGEND

- Flow Meter Locations

Flow Meter Shed Area

- LS 1,2-North
- LS 1,2-West
- Lakes
- LS 10 - North
- LS 10 - South
- LS 2E
- LS 7N8
- LS 7S
- LS 7W

December 2015 Final

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Orangevale, CA 95662
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Client/Project

CLEARLAKE OAKS, CA
SANITARY SEWER EVALUATION STUDY

Sheet Title:

FIGURE 3.2 - FLOW METER SHED MAP

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS1-2N (North)

Date: August 27, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	10.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23893

Basin Size	144.00 acres
Selected Flows	Q_FlowTote

RAINFALL RECORDS

Rainfall/Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.32 in
Max Event Precipitation	2.01 in
Max Event Duration	17.8 hrs
Total Precipitation	4.11 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

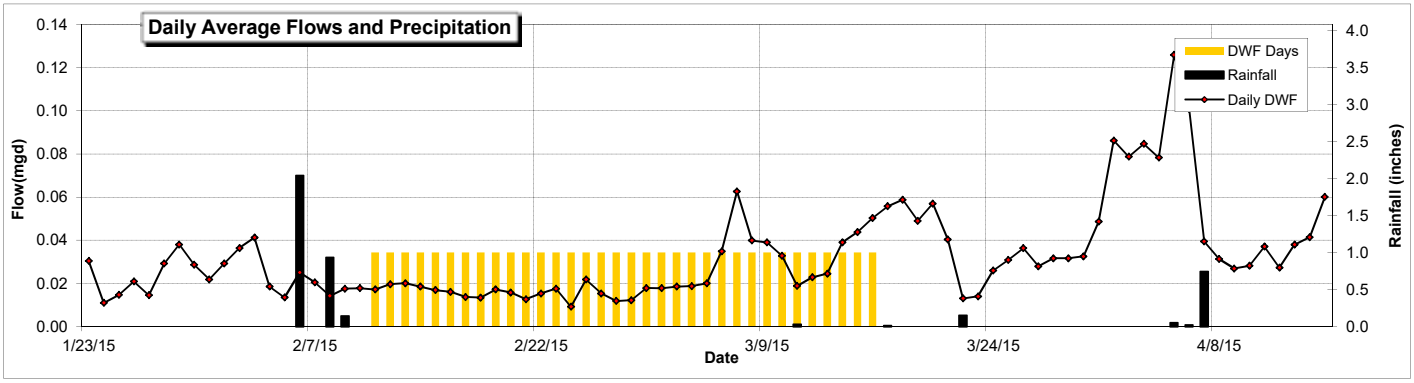
Manhole: LS1-2N (North)

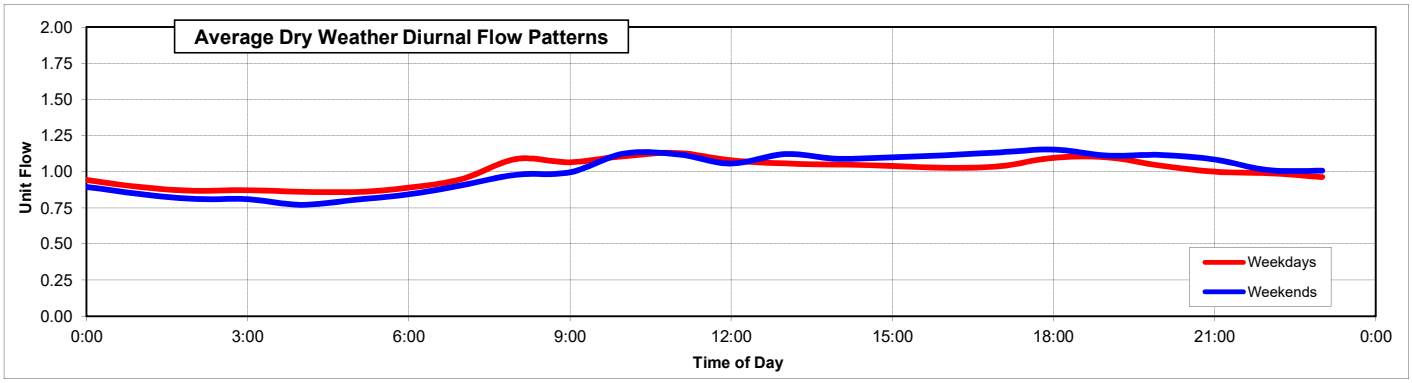
Date: August 27, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.017 mgd	0.013 mgd	72.17%	0.016 mgd	0.012 mgd	76.32%	-0.006 mgd
- Peaking Factors	1.5129	0.4972	32.86%	1.3500	0.1638	12.13%	
- Num Records	26	26		8	8		





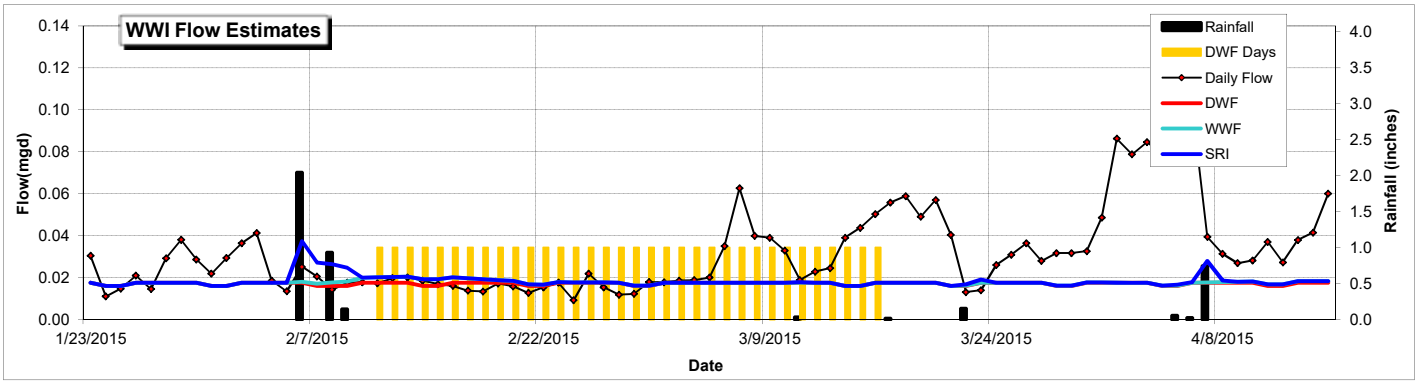
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	0.25%
WWI Inflow Period (Tn)	9 days
WWI Recession Coeff. (Kn)	0.3
Storm Limit	0.001 in/day
WWI @ Start of Simulation	0.000 mgd

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.000 mgd	0.002 mgd	0.02 MG
WWI Rate	1.3 gpad	16.7 gpad	106 gpa
Perc og DWF			1.08%
Perc of Precip.			0.10%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS1-2N (North)

Date: August 27, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	35.00%	60.00%	5.00%
Tn	2	4	4
Kn	4	6	6

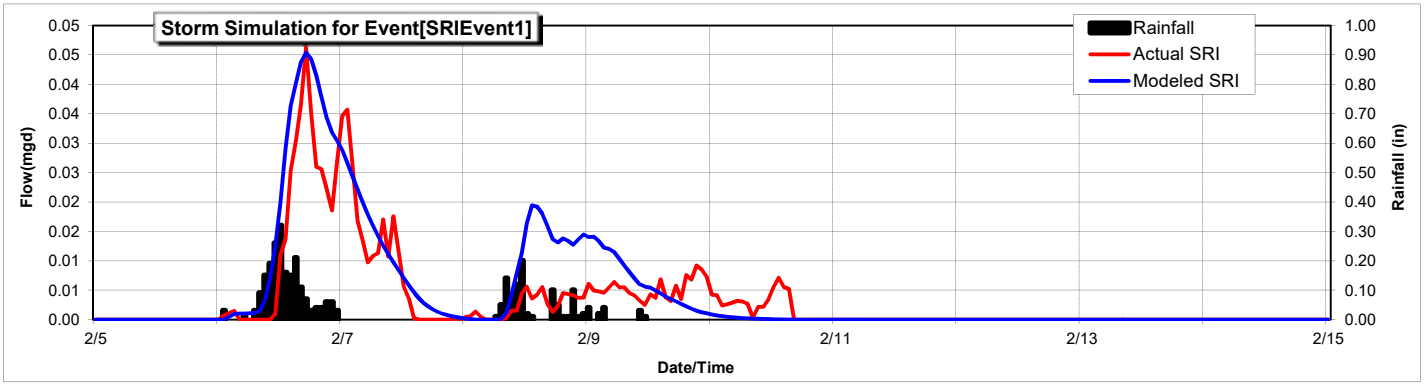
SRI/I Volume Parameters

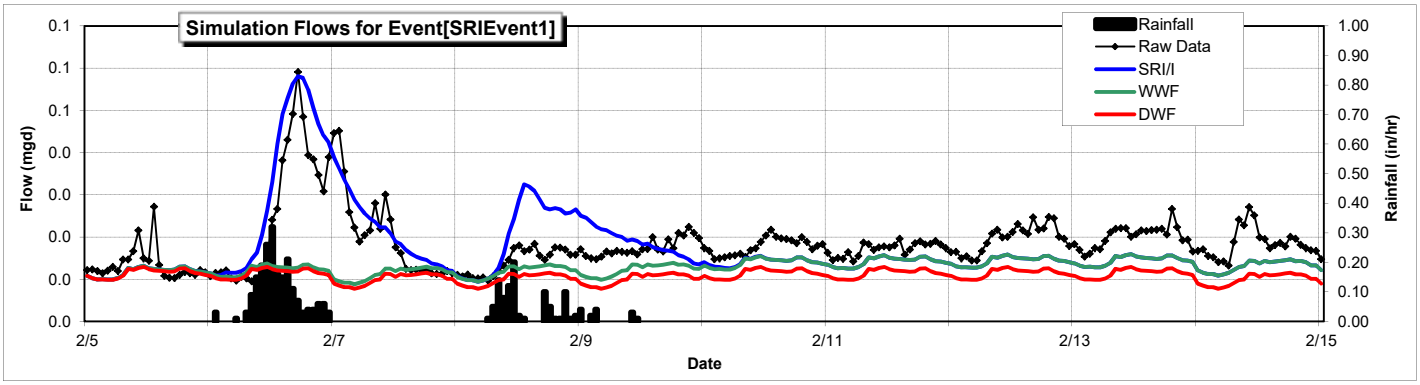
SRI Retention Coeff. (Rt)	0.37%
Total SRI Volume	0.06 MG
Perc. of DWF	4.176%
Perc. of Rainfall	0.370%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/15/15 00:00	22.1	315.0	0.045	12.163	0.370%	0.7719
All WWF Days			16.7	315.0	0.059	15.953	0.370%	-0.0255

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS1-2N (West)

Date: September 10, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	12.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23893

Basin Size	175.00 acres
Selected Flows	Q_FlowTote

RAINFALL RECORDS

Rainfall / Runnoff Parameters

Duration Limit	24.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

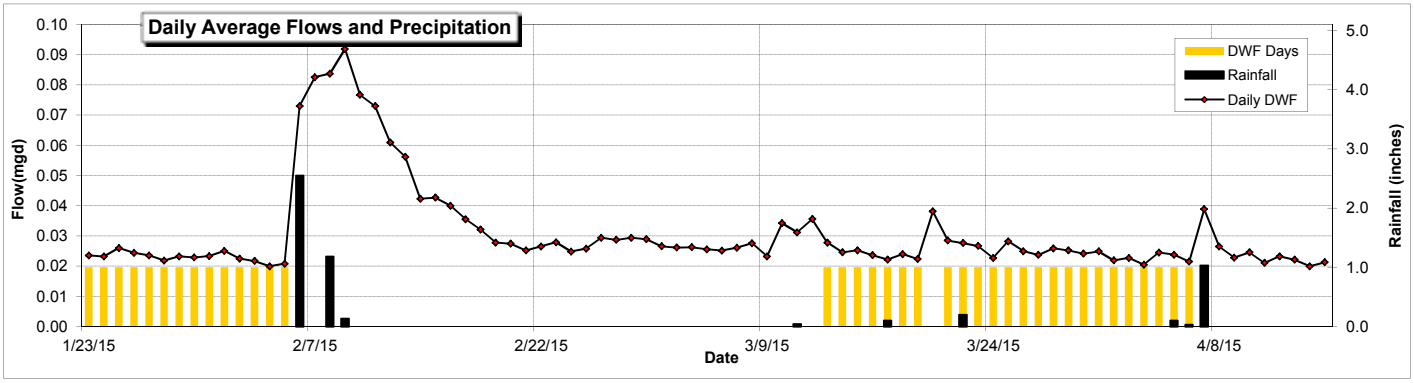
Manhole: LS1-2N (West)

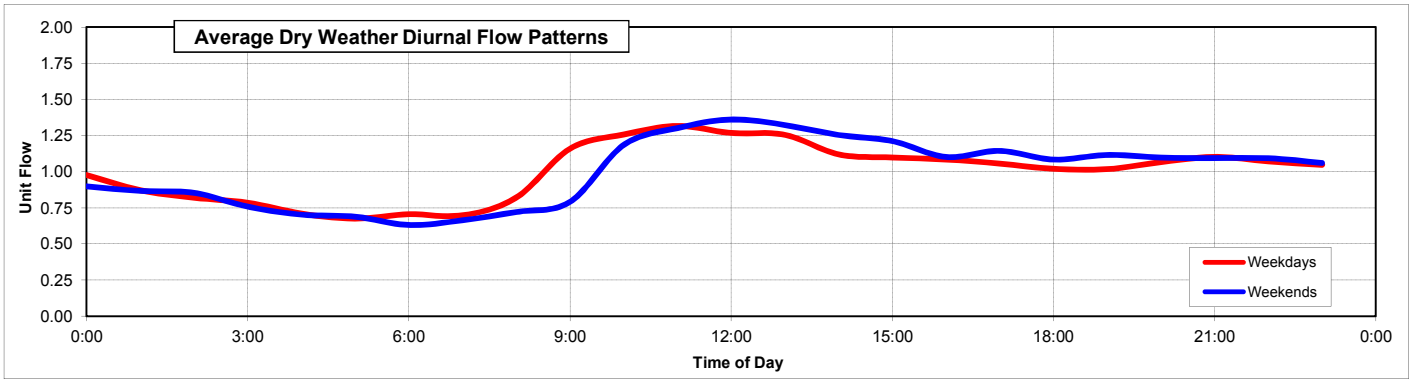
Date: September 10, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.020 mgd	0.010 mgd	48.48%	0.020 mgd	0.002 mgd	7.95%	-0.005 mgd
- Peaking Factors	1.5203	0.1485	9.77%	1.5981	0.1748	10.94%	
- Num Records	27	27		12	12		





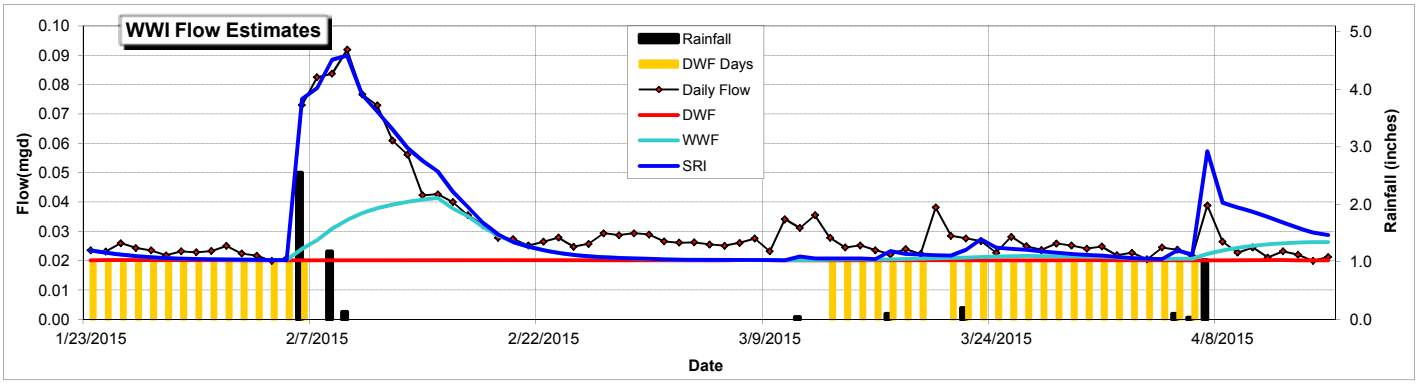
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	1.10%
WWI Inflow Period (Tn)	9 days
WWI Recession Coeff. (Kn)	0.3
Storm Limit	0.001 in/day
WWI @ Start of Simulation	

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.003 mgd	0.021 mgd	0.27 MG
WWI Rate	18.4 gpad	120.6 gpad	1,525 gpa
Perc og DWF			15.94%
Perc of Precip.			1.05%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS1-2N (West)

Date: September 10, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	25.00%	30.00%	45.00%
Tn	2	10	16
Kn	6	16	16

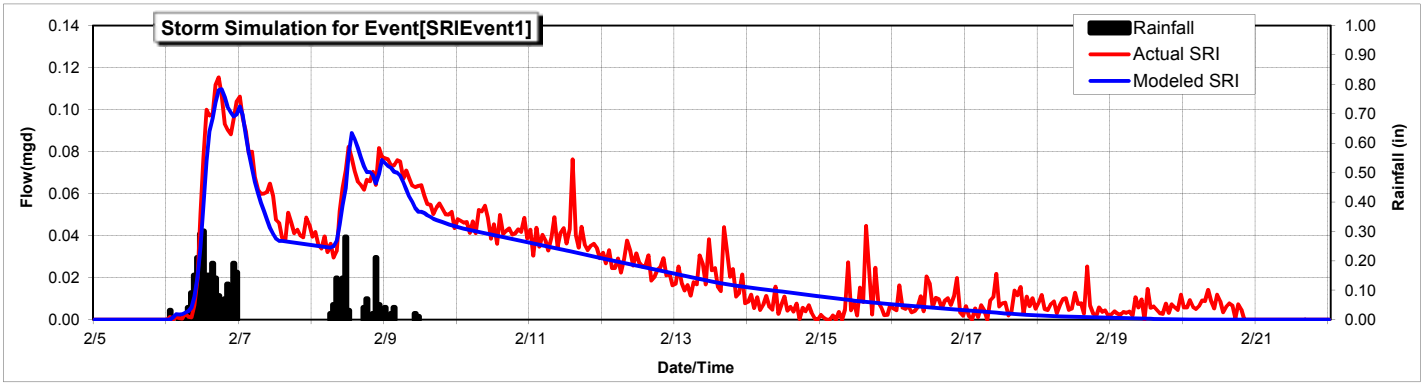
SRI/I Volume Parameters

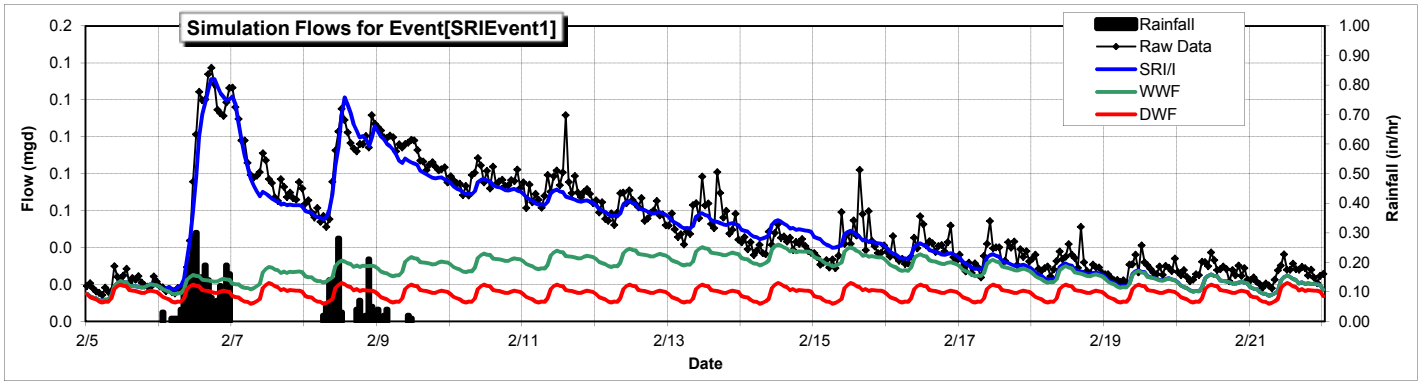
SRI Retention Coeff. (Rt)	2.00%
Total SRI Volume	0.42 MG
Perc. of DWF	25.226%
Perc. of Rainfall	3.736%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	120.6	626.4	0.367	18.346	2.000%	0.9663
SRIEvent2	04/06/15 00:00	04/11/15 00:00	30.8	386.4	0.078	5.038	1.557%	0.8804
All WWF Days			120.6	626.4	0.422	11.309	3.736%	0.8666

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS1-2N (West)

Date: September 10, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	25.00%	30.00%	45.00%
Tn	2	10	16
Kn	6	16	16

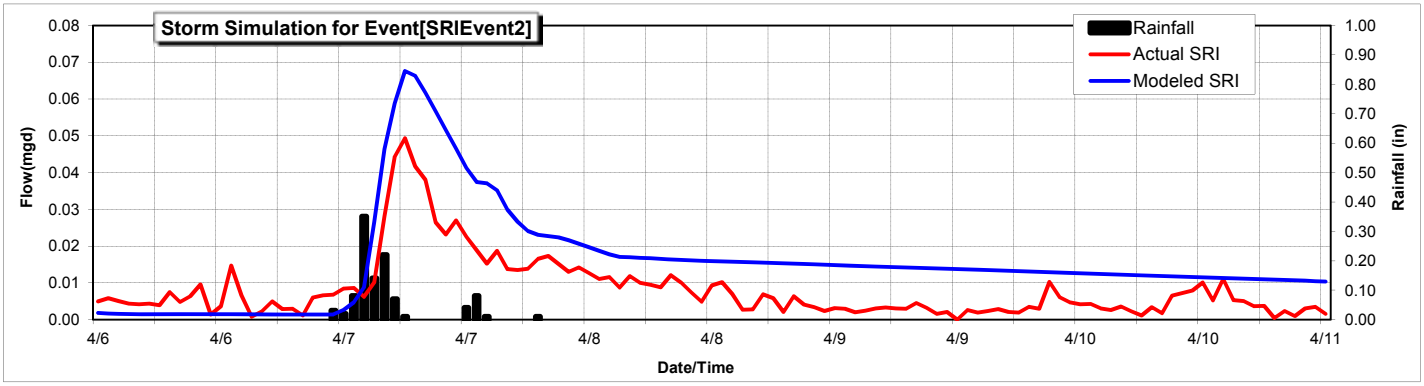
SRI/I Volume Parameters

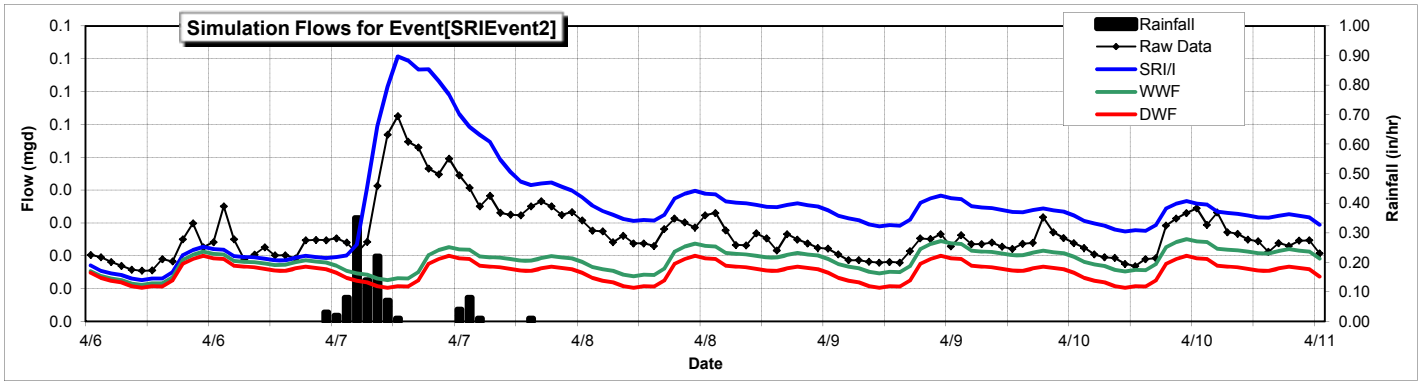
SRI Retention Coeff. (Rt)	2.00%
Total SRI Volume	0.42 MG
Perc. of DWF	25.226%
Perc. of Rainfall	3.736%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	120.6	626.4	0.367	18.346	2.000%	0.9663
SRIEvent2	04/06/15 00:00	04/11/15 00:00	30.8	386.4	0.078	5.038	1.557%	0.8804
All WWF Days			120.6	626.4	0.422	11.309	3.736%	0.8666

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System	
Basin:	Addin Version: v2.0.3
Manhole: LS2E	Date: August 27, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	6.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23893

Basin Size	16.70 acres

Selected Flows: Q_FlowTote

RAINFALL RECORDS

Rainfall/Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

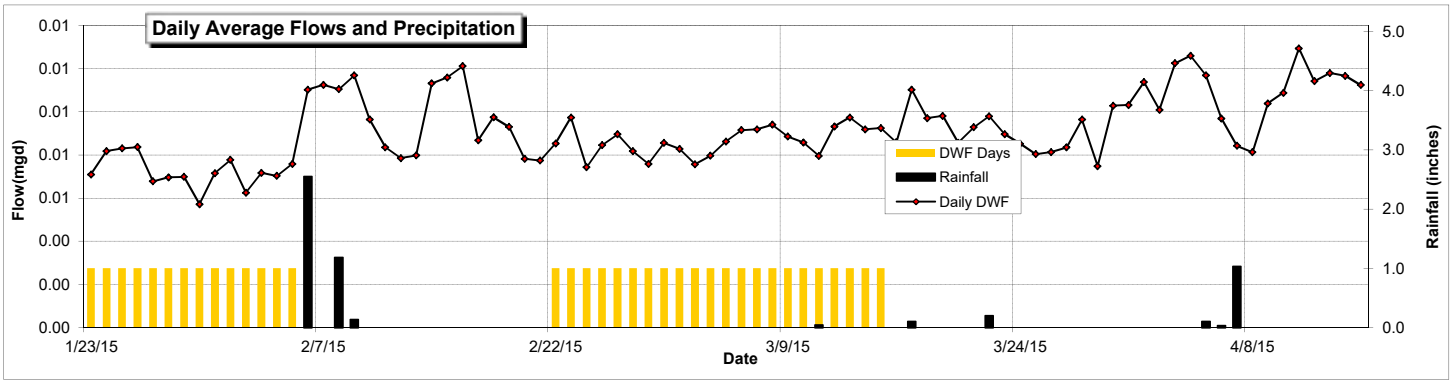
Manhole: LS2E

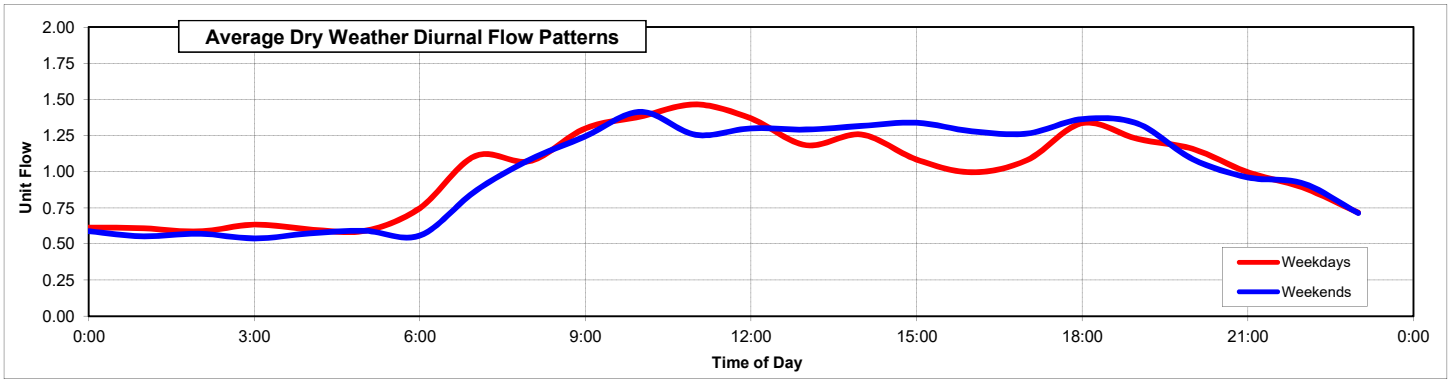
Date: August 27, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.007 mgd	0.001 mgd	15.23%	0.007 mgd	0.001 mgd	10.04%	-0.001 mgd
- Peaking Factors	1.9425	0.2861	14.73%	1.9655	0.2086	10.61%	
- Num Records	25	25		11	11		





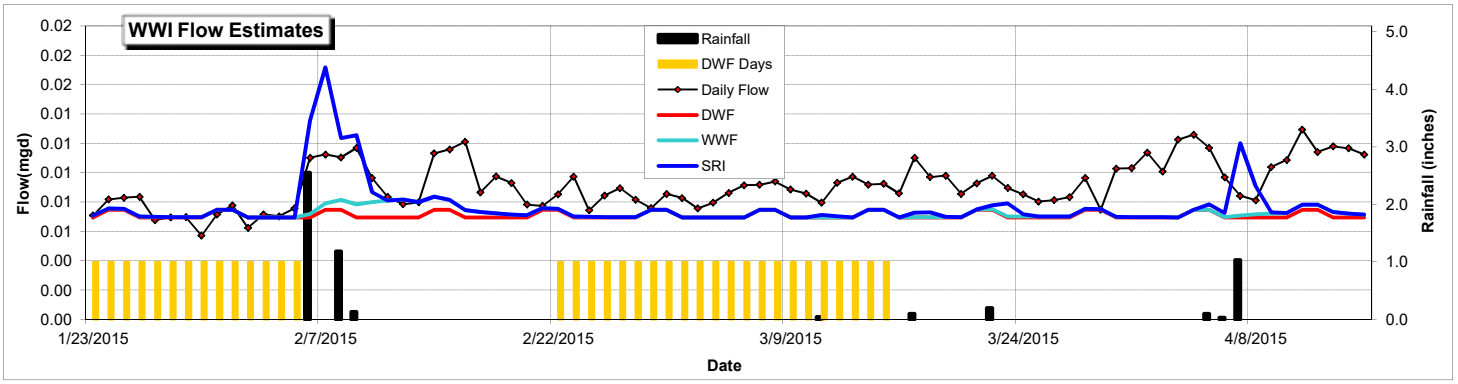
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	0.50%
WWI Inflow Period (Tn)	6 days
WWI Recession Coeff. (Kn)	0.3
Storm Limit	0.000 in/day
WWI @ Start of Simulation	

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.000 mgd	0.001 mgd	0.01 MG
WWI Rate	9.6 gpad	74.0 gpad	799 gpa
Perc og DWF			2.26%
Perc of Precip.			0.55%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS2E

Date: August 27, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	20.00%	70.00%	10.00%
Tn	2	8	10
Kn	2	4	12

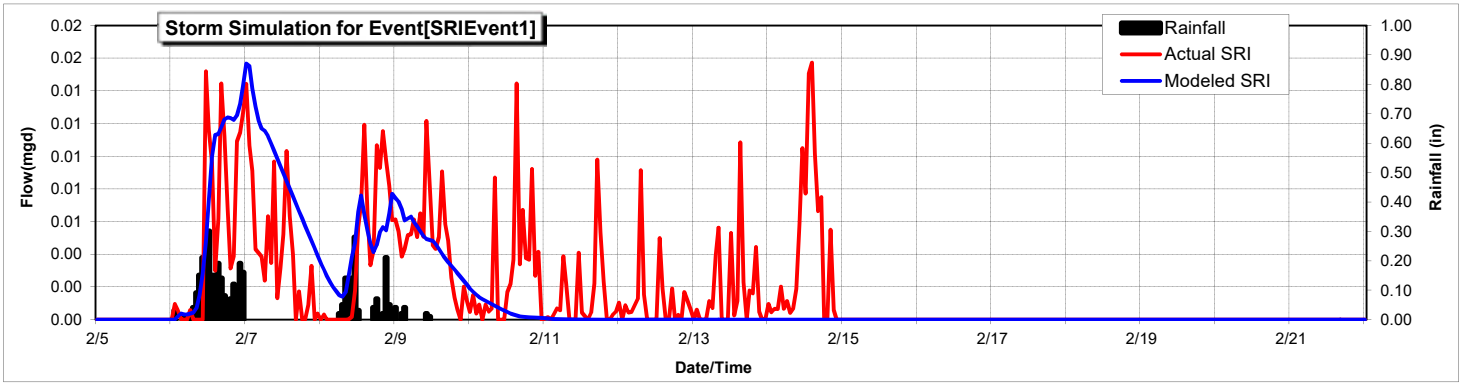
SRI/I Volume Parameters

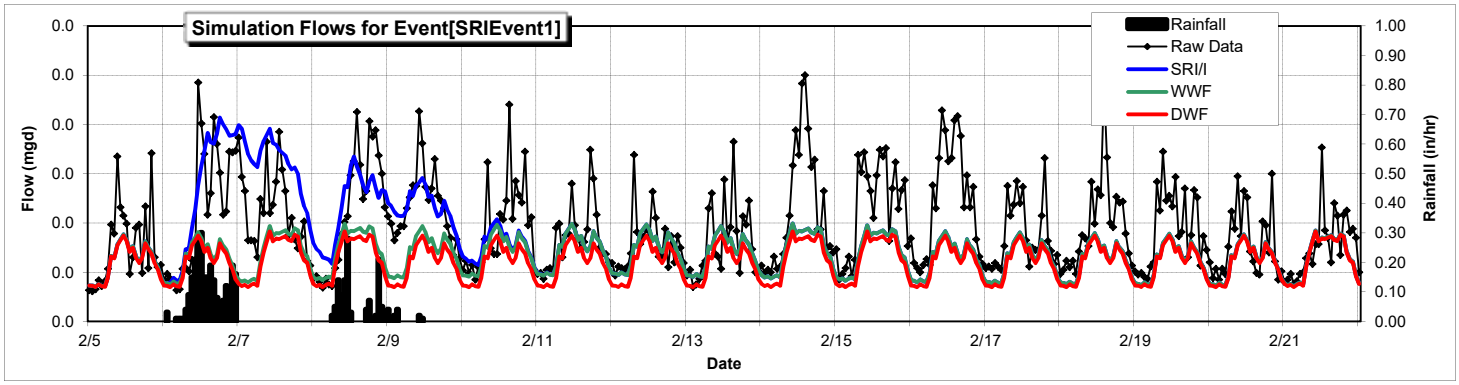
SRI Retention Coeff. (Rt)	1.50%
Total SRI Volume	0.03 MG
Perc. of DWF	5.909%
Perc. of Rainfall	1.443%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	74.0	938.1	0.025	1.751	1.442%	0.5655
SRIEvent2	04/06/15 00:00	04/11/15 00:00	20.9	498.3	0.007	0.481	1.504%	0.3207
All WWF Days			74.0	938.1	0.035	2.412	1.443%	0.5689

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS2E

Date: August 27, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	20.00%	70.00%	10.00%
Tn	2	8	10
Kn	2	4	12

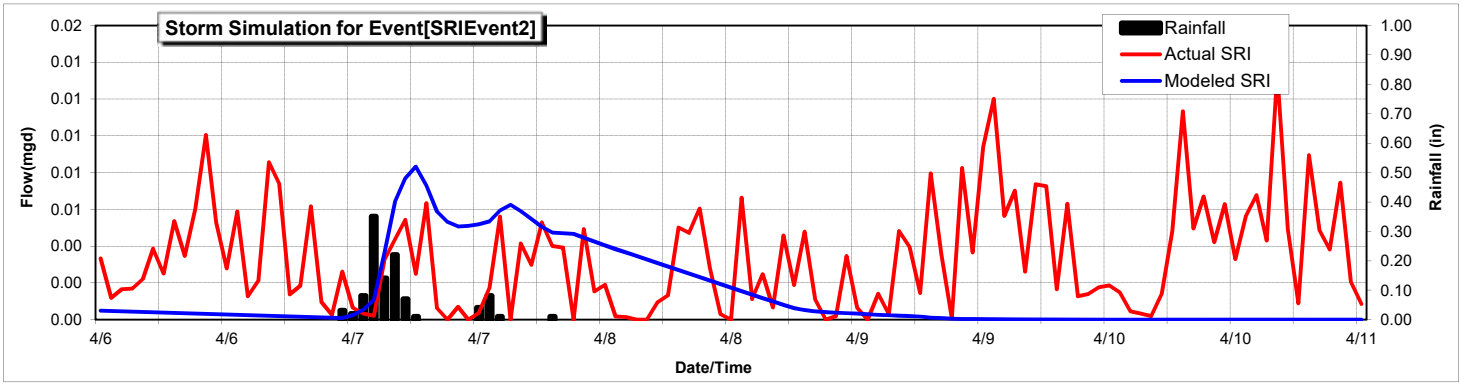
SRI/I Volume Parameters

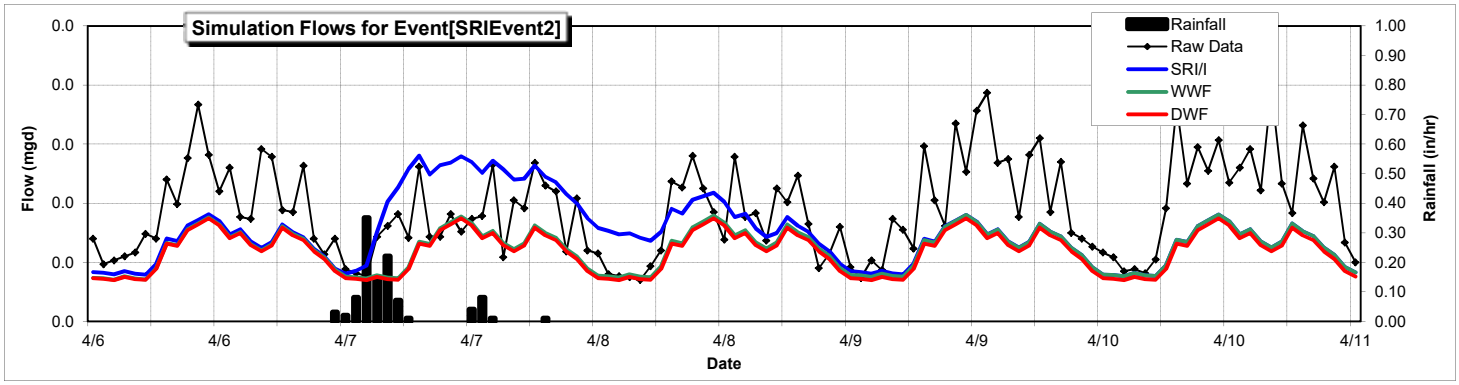
SRI Retention Coeff. (Rt)	1.50%
Total SRI Volume	0.03 MG
Perc. of DWF	5.909%
Perc. of Rainfall	1.443%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	74.0	938.1	0.025	1.751	1.442%	0.5655
SRIEvent2	04/06/15 00:00	04/11/15 00:00	20.9	498.3	0.007	0.481	1.504%	0.3207
All WWF Days			74.0	938.1	0.035	2.412	1.443%	0.5689

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7-South

Date: August 27, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	6.0 inches
Slope	0.0018
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23893

Basin Size	38.00 acres
Selected Flows	Q_FlowTote

RAINFALL RECORDS

Rainfall/Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

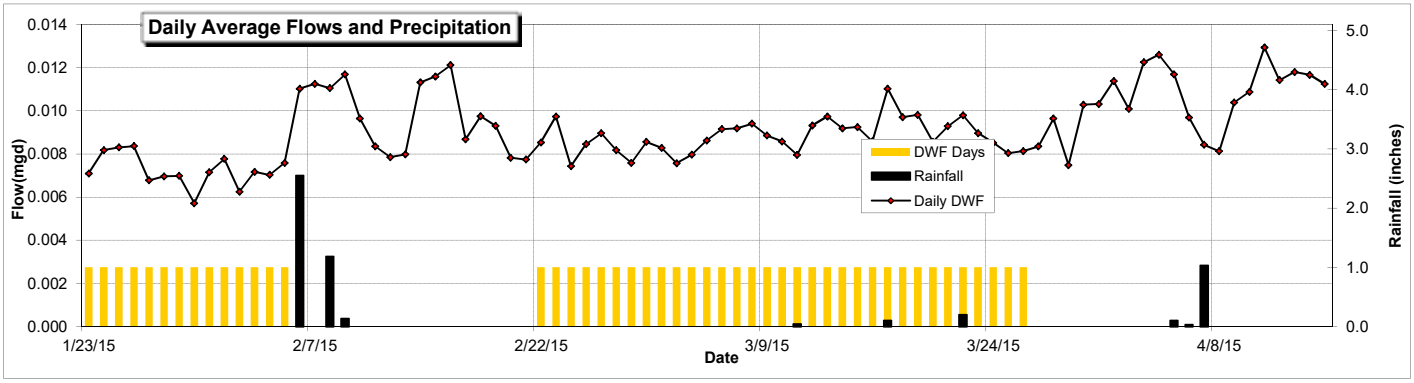
Manhole: LS7-South

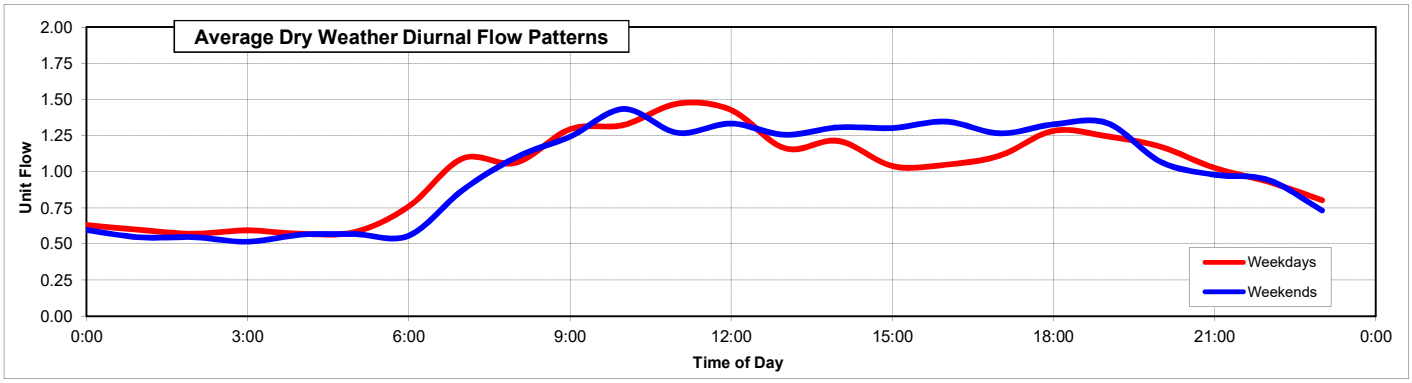
Date: August 27, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.007 mgd	0.001 mgd	16.55%	0.008 mgd	0.001 mgd	10.50%	-0.001 mgd
- Peaking Factors	1.9533	0.2620	13.41%	1.9511	0.2200	11.27%	
- Num Records	35	35		13	13		





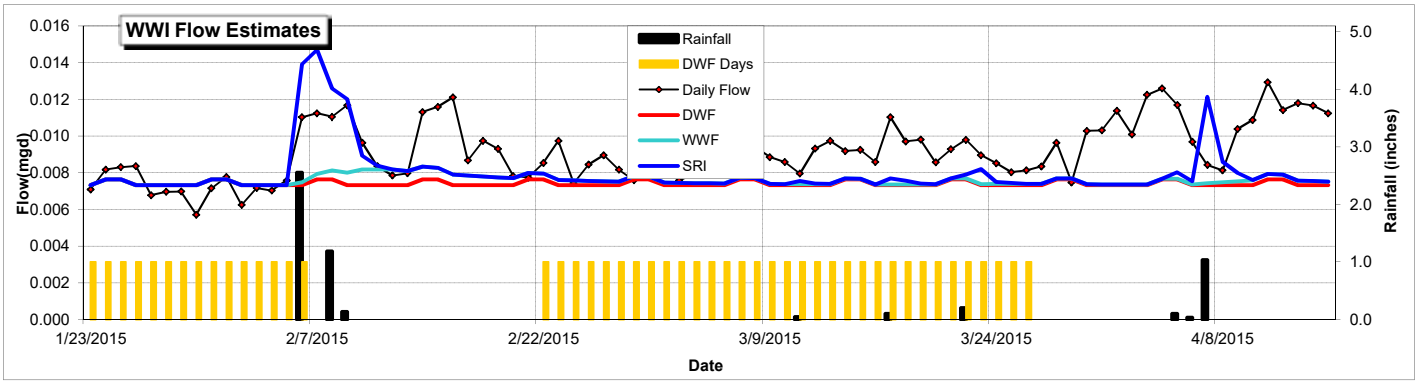
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	0.25%
WWI Inflow Period (Tn)	4 days
WWI Recession Coeff. (Kn)	0.1
Storm Limit	0.001 in/day
WWI @ Start of Simulation	

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.000 mgd	0.001 mgd	0.01 MG
WWI Rate	3.7 gpad	22.6 gpad	303 gpa
Perc og DWF			1.88%
Perc of Precip.			0.21%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7-South

Date: August 27, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	20.00%	50.00%	30.00%
Tn	3	4	10
Kn	2	6	10

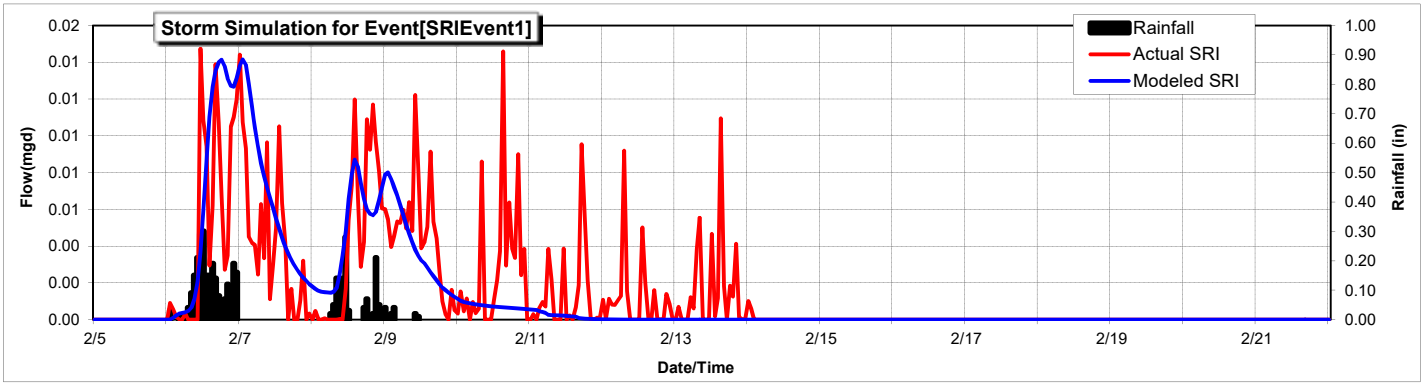
SRI/I Volume Parameters

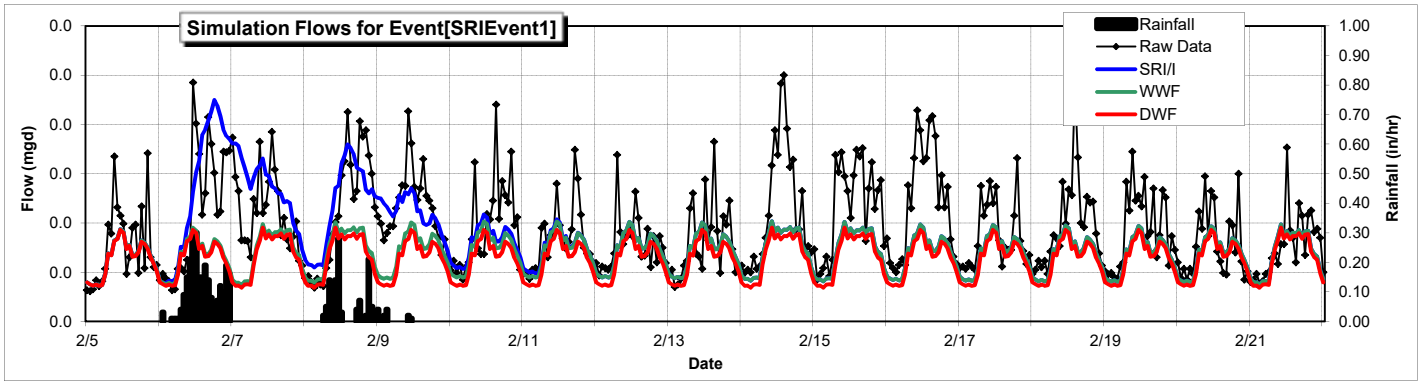
SRI Retention Coeff. (Rt)	0.60%
Total SRI Volume	0.02 MG
Perc. of DWF	3.747%
Perc. of Rainfall	0.904%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	22.6	372.5	0.023	3.984	0.569%	0.6030
SRIEvent2	04/06/15 00:00	04/11/15 00:00	8.1	237.5	0.006	1.094	0.590%	0.3698
All WWF Days			22.6	372.5	0.023	2.549	0.904%	0.5967

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7-South

Date: August 27, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	20.00%	50.00%	30.00%
Tn	3	4	10
Kn	2	6	10

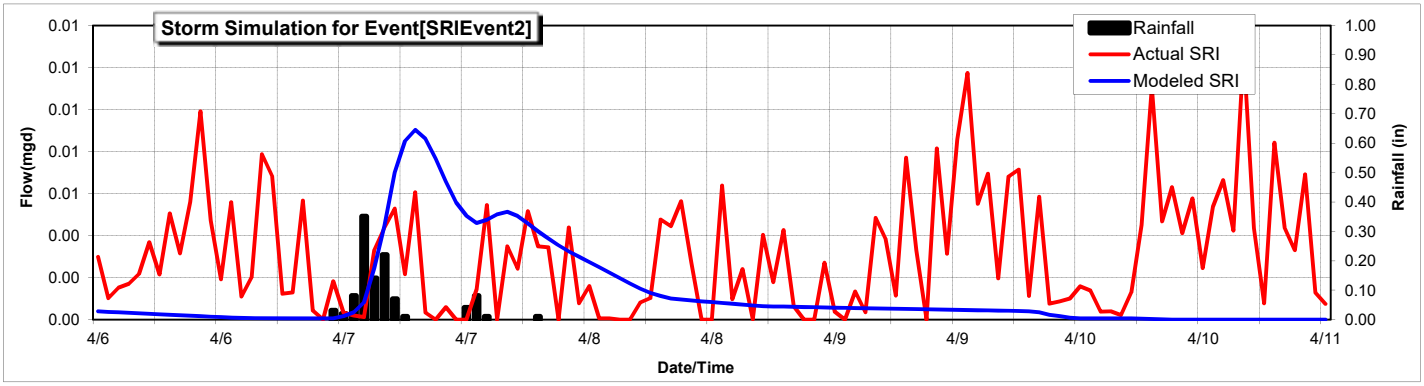
SRI/I Volume Parameters

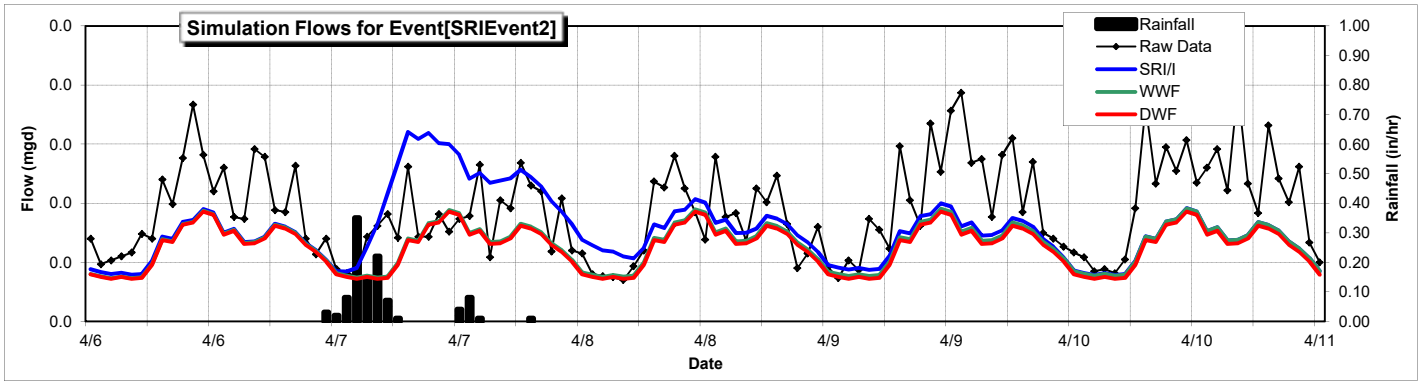
SRI Retention Coeff. (Rt)	0.60%
Total SRI Volume	0.02 MG
Perc. of DWF	3.747%
Perc. of Rainfall	0.904%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	22.6	372.5	0.023	3.984	0.569%	0.6030
SRIEvent2	04/06/15 00:00	04/11/15 00:00	8.1	237.5	0.006	1.094	0.590%	0.3698
All WWF Days			22.6	372.5	0.023	2.549	0.904%	0.5967

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7W

Date: August 27, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	12.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23893

Basin Size	136.00 acres
Selected Flows	Q_FlowTote

RAINFALL RECORDS

Rainfall/Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

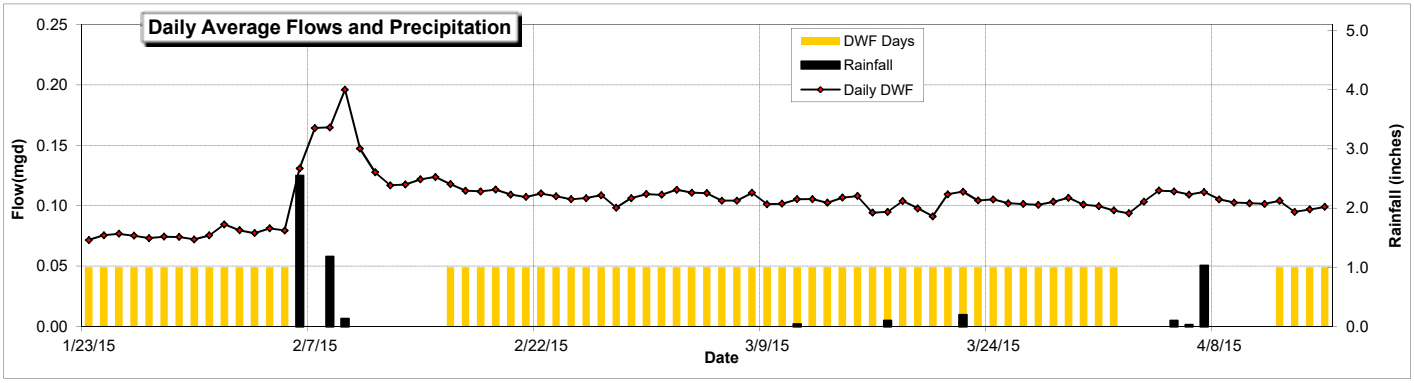
Manhole: LS7W

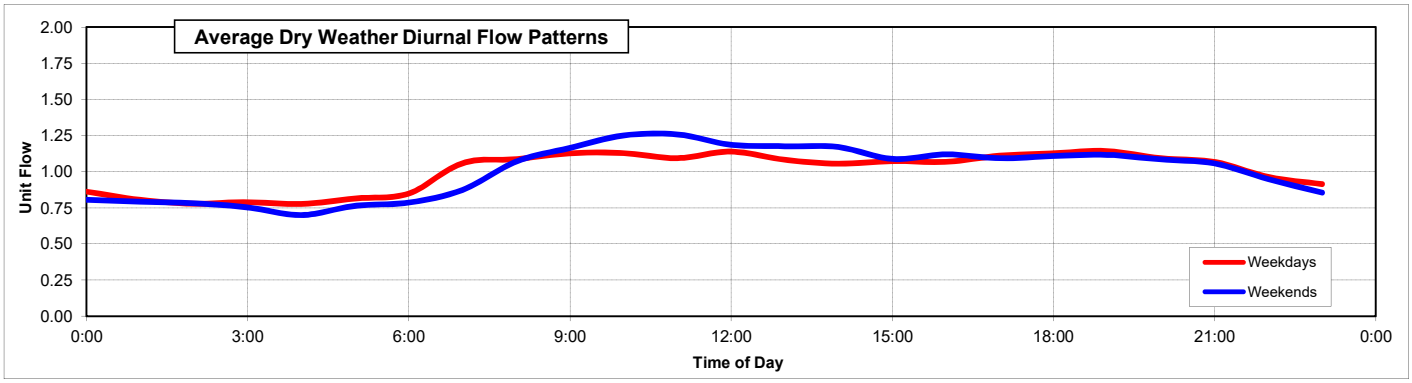
Date: August 27, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.078 mgd	0.013 mgd	16.73%	0.081 mgd	0.013 mgd	16.41%	-0.020 mgd
- Peaking Factors	1.3268	0.0995	7.50%	1.3693	0.1193	8.71%	
- Num Records	46	46		17	17		





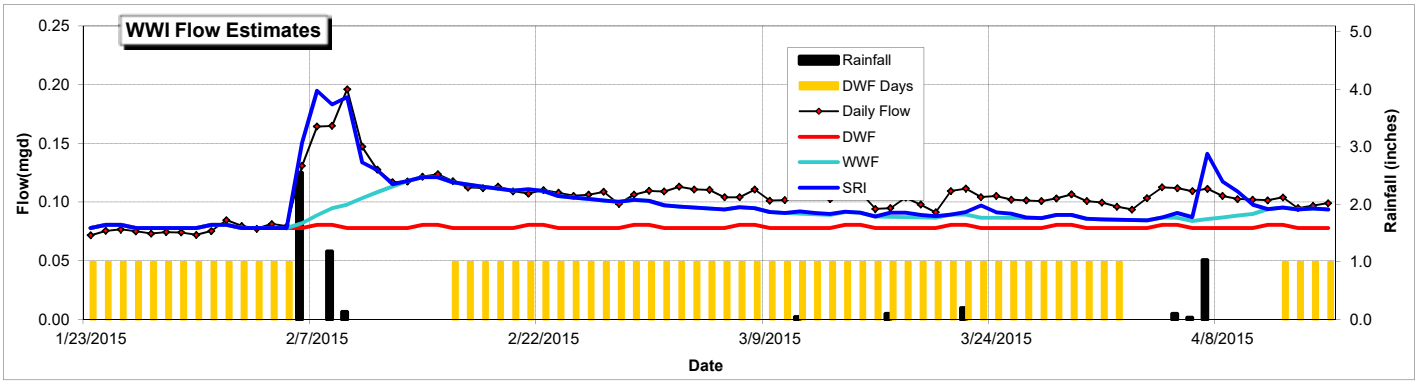
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	6.50%
WWI Inflow Period (Tn)	7.0 days
WWI Recession Coeff. (Kn)	0.05
Storm Limit	0.001 in/day
WWI @ Start of Simulation	0.000 mgd

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.004 mgd	0.041 mgd	0.35 MG
WWI Rate	30.6 gpad	299.7 gpad	2,537 gpa
Perc og DWF			5.29%
Perc of Precip.			1.74%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7W

Date: August 27, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	10.00%	20.00%	70.00%
Tn	2	4	12
Kn	4	6	12

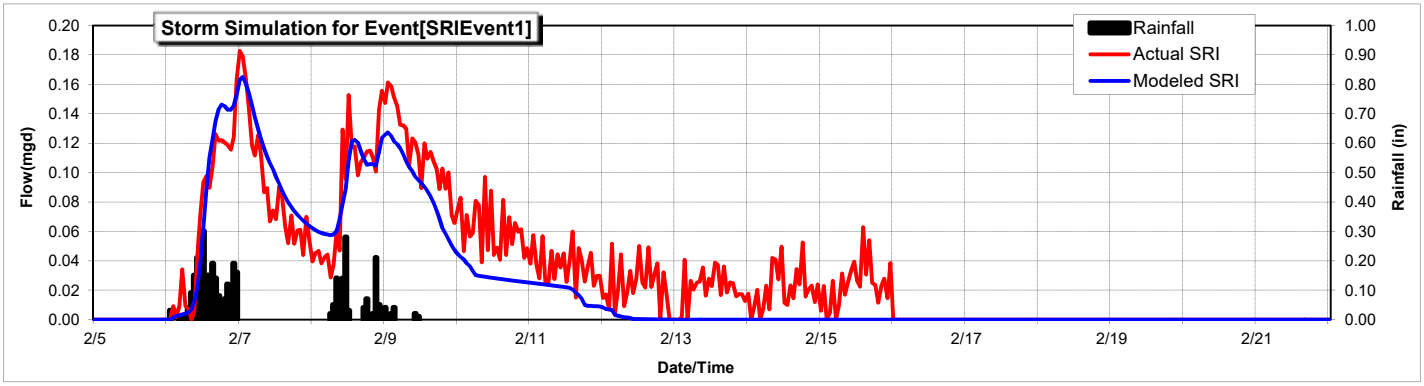
SRI/I Volume Parameters

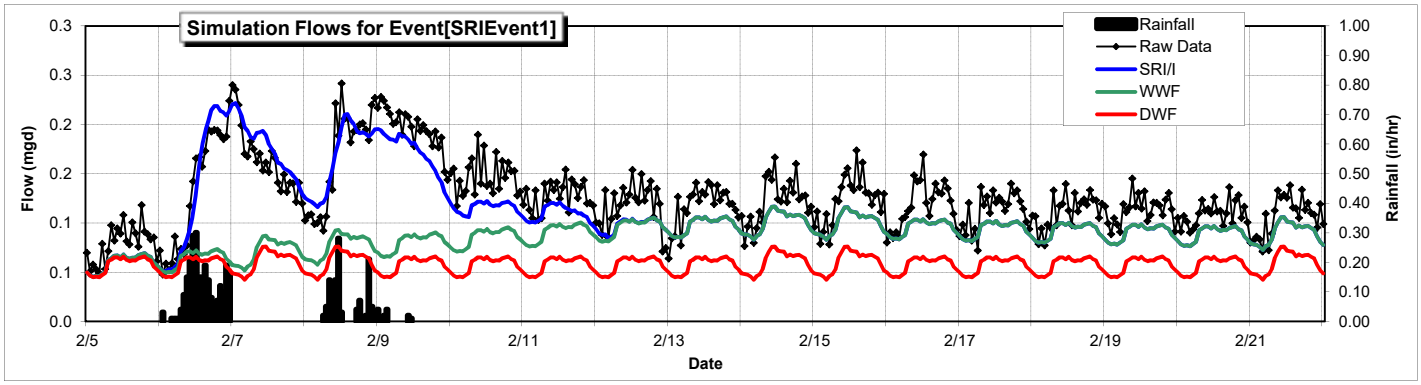
SRI Retention Coeff. (Rt)	3.50%
Total SRI Volume	0.53 MG
Perc. of DWF	8.090%
Perc. of Rainfall	2.846%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	299.7	1,213.1	0.406	14.258	2.845%	0.8836
SRIEvent2	04/06/15 00:00	04/11/15 00:00	99.2	637.3	0.118	3.915	3.014%	0.3660
All WWF Days			299.7	1,213.1	0.528	18.537	2.846%	0.8154

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7W

Date: August 27, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	10.00%	20.00%	70.00%
Tn	2	4	12
Kn	4	6	12

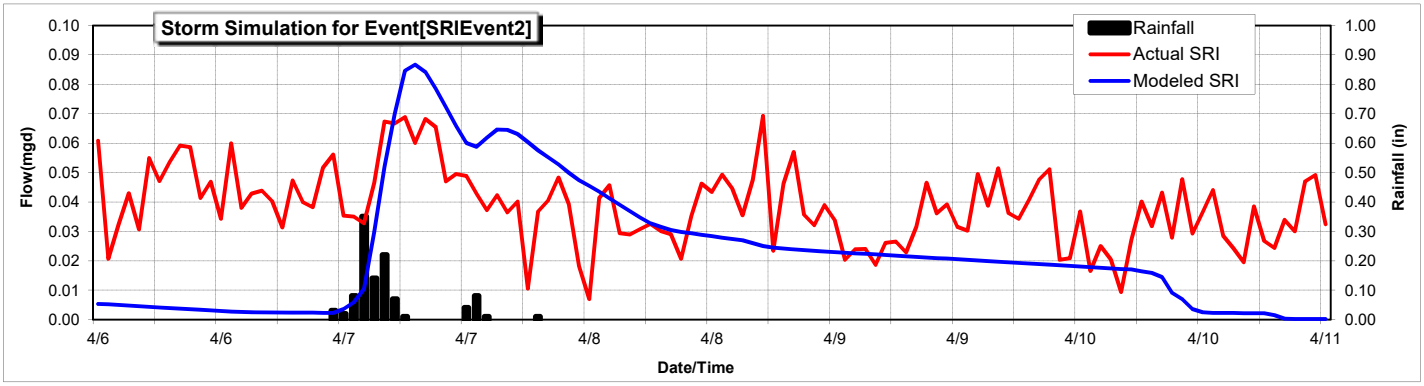
SRI/I Volume Parameters

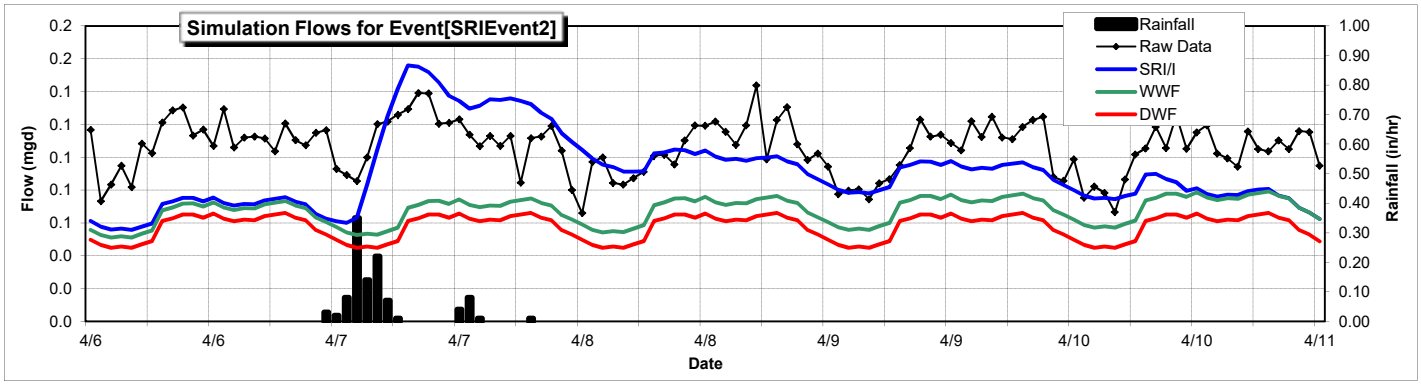
SRI Retention Coeff. (Rt)	3.50%
Total SRI Volume	0.53 MG
Perc. of DWF	8.090%
Perc. of Rainfall	2.846%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	299.7	1,213.1	0.406	14.258	2.845%	0.8836
SRIEvent2	04/06/15 00:00	04/11/15 00:00	99.2	637.3	0.118	3.915	3.014%	0.3660
All WWF Days			299.7	1,213.1	0.528	18.537	2.846%	0.8154

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System	
Basin:	Addin Version: v2.0.3
Manhole: LS8-7N	Date: August 28, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	12.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23893

Basin Size	112.00 acres
Selected Flows	Q_FlowTote

RAINFALL RECORDS

Rainfall/Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

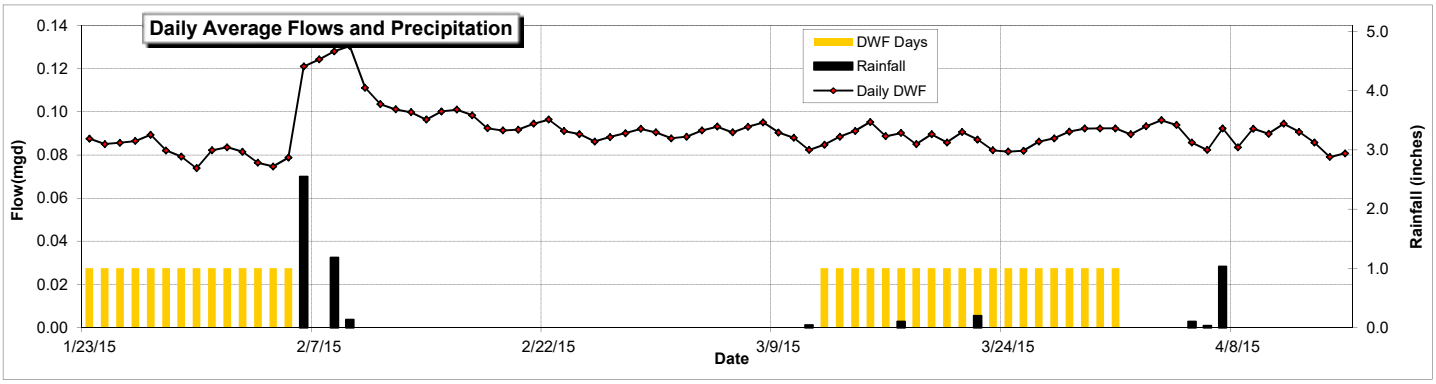
Manhole: LS8-7N

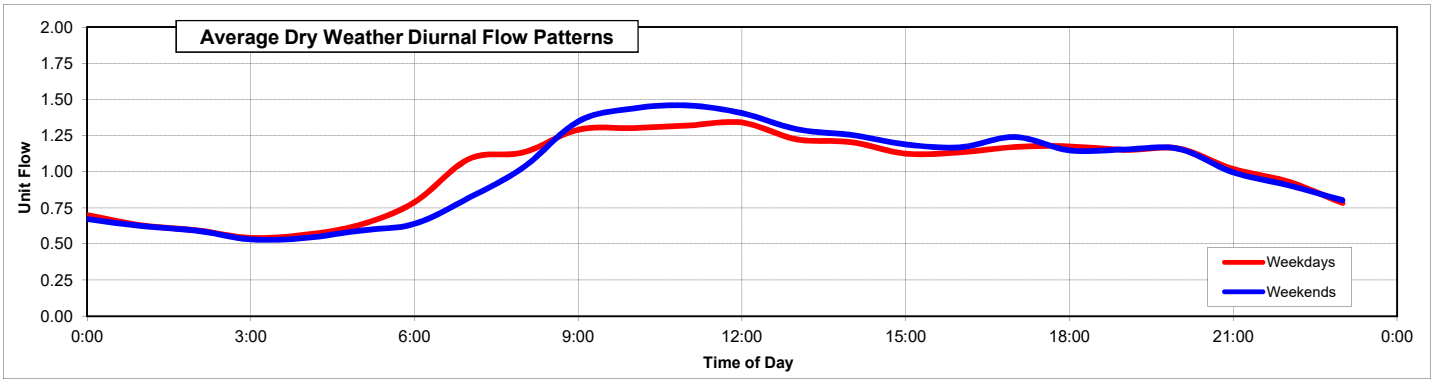
Date: August 28, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.084 mgd	0.005 mgd	6.23%	0.088 mgd	0.004 mgd	4.82%	
- Peaking Factors	1.4695	0.0983	6.69%	1.5375	0.1063	6.92%	
- Num Records	24	24		10	10		





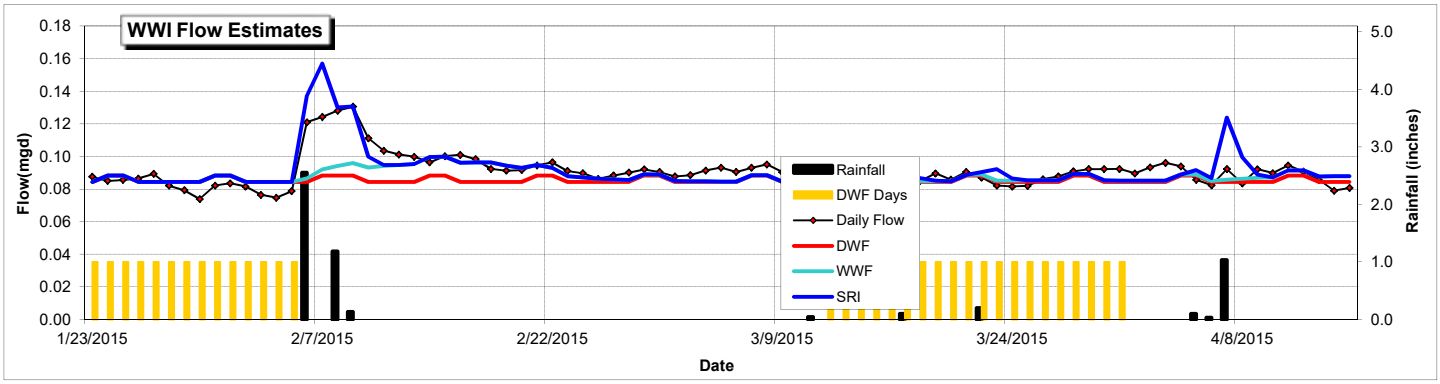
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	1.25%
WWI Inflow Period (Tn)	12 days
WWI Recession Coeff. (Kn)	0.3
Storm Limit	0.001 in/day
WWI @ Start of Simulation	0.000 mgd

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.002 mgd	0.012 mgd	0.19 MG
WWI Rate	20.2 gpad	107.0 gpad	1,681 gpa
Perc og DWF			2.65%
Perc of Precip.			1.15%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS8-7N

Date: August 28, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	20.00%	50.00%	30.00%
Tn	3	4	6
Kn	2	8	10

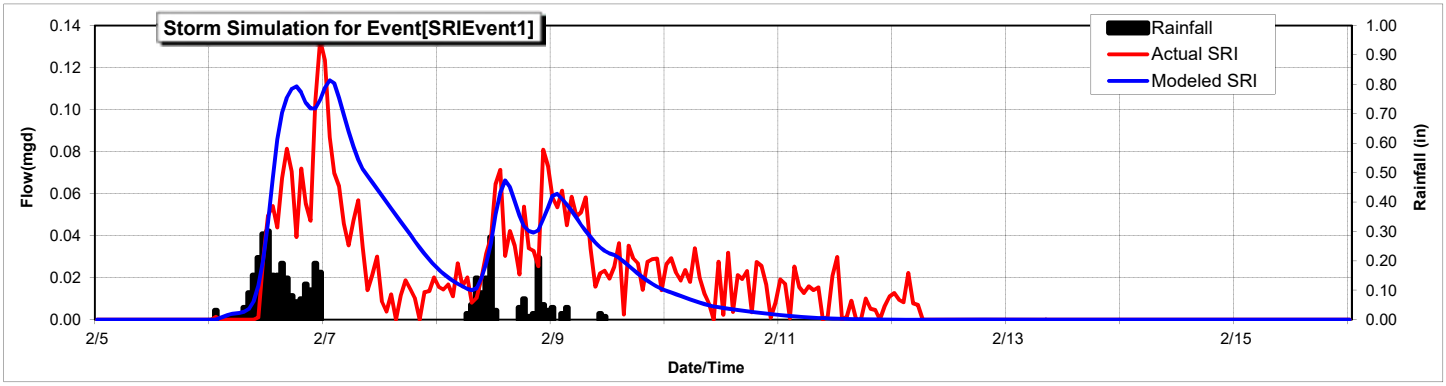
SRI/I Volume Parameters

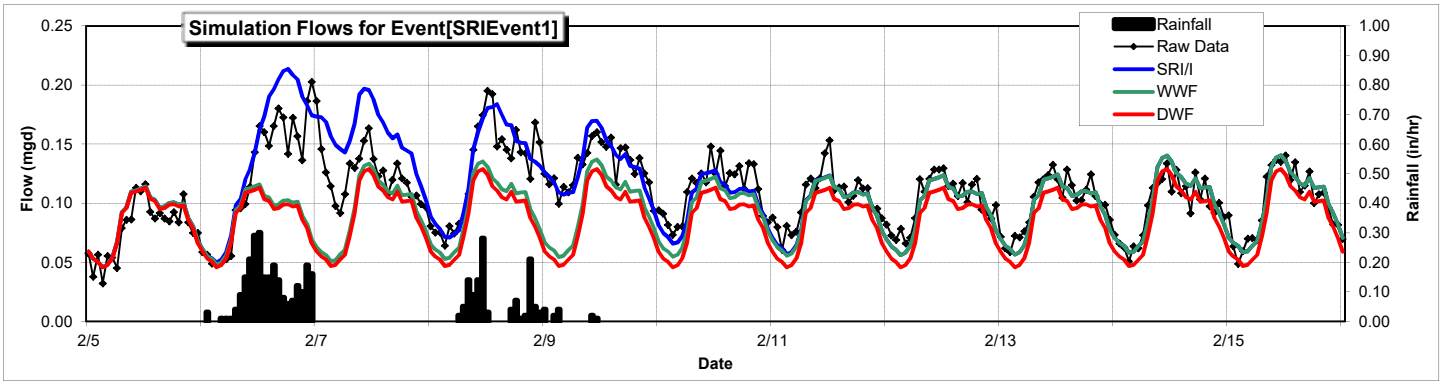
SRI Retention Coeff. (Rt)	1.65%
Total SRI Volume	0.25 MG
Perc. of DWF	3.566%
Perc. of Rainfall	1.646%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/16/15 00:00	104.6	1,016.9	0.194	11.742	1.650%	0.8896
SRIEvent2	04/06/15 00:00	04/11/15 00:00	26.6	627.2	0.055	3.224	1.718%	0.7453
All WWF Days			107.0	1,016.9	0.253	15.388	1.646%	0.8946

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS8-7N

Date: August 28, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	20.00%	50.00%	30.00%
Tn	3	4	6
Kn	2	8	10

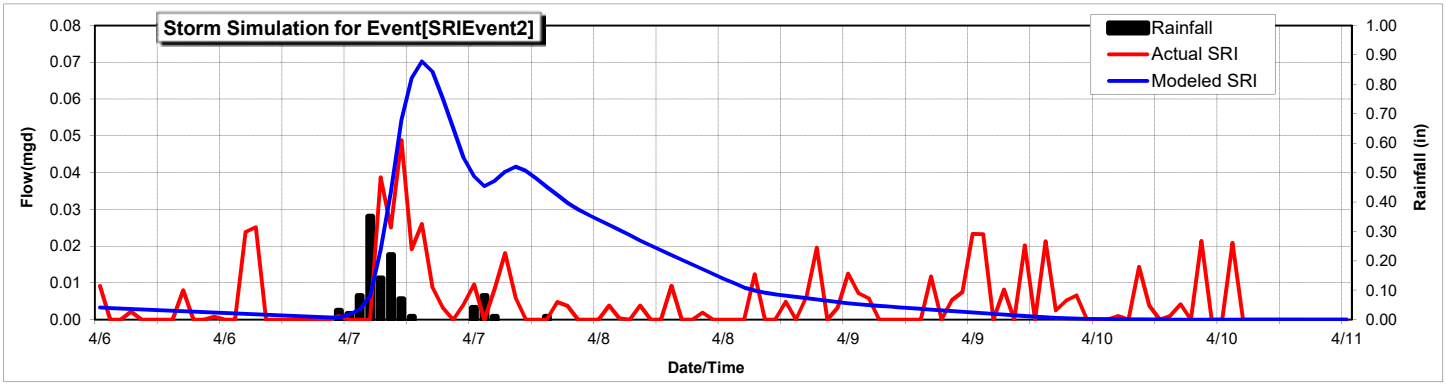
SRI/I Volume Parameters

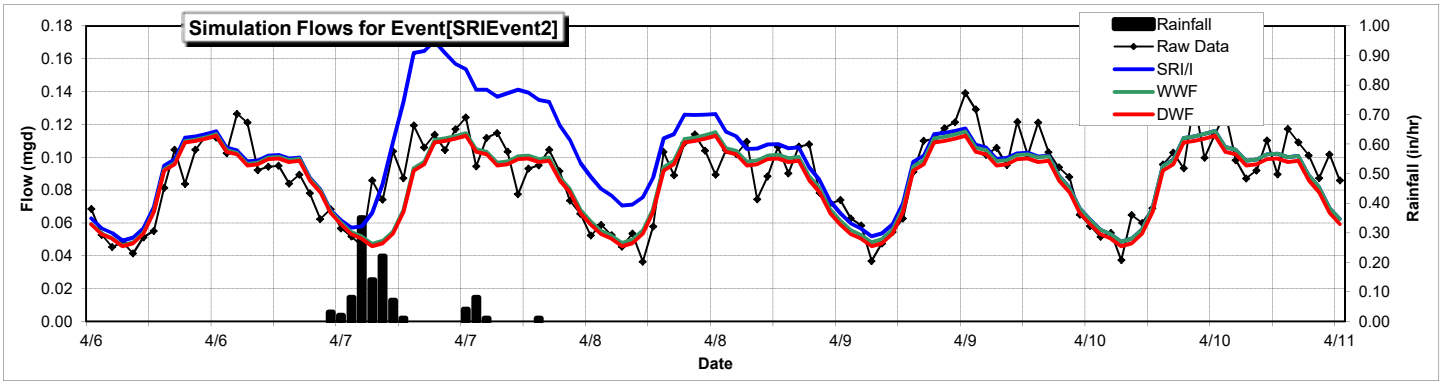
SRI Retention Coeff. (Rt)	1.65%
Total SRI Volume	0.25 MG
Perc. of DWF	3.566%
Perc. of Rainfall	1.646%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/16/15 00:00	104.6	1,016.9	0.194	11.742	1.650%	0.8896
SRIEvent2	04/06/15 00:00	04/11/15 00:00	26.6	627.2	0.055	3.224	1.718%	0.7453
All WWF Days			107.0	1,016.9	0.253	15.388	1.646%	0.8946

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-NORTH

Date: August 28, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	8.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23892

Basin Size	67.00 acres

Selected Flows: Q_FlowTote

RAINFALL RECORDS

Rainfall/Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

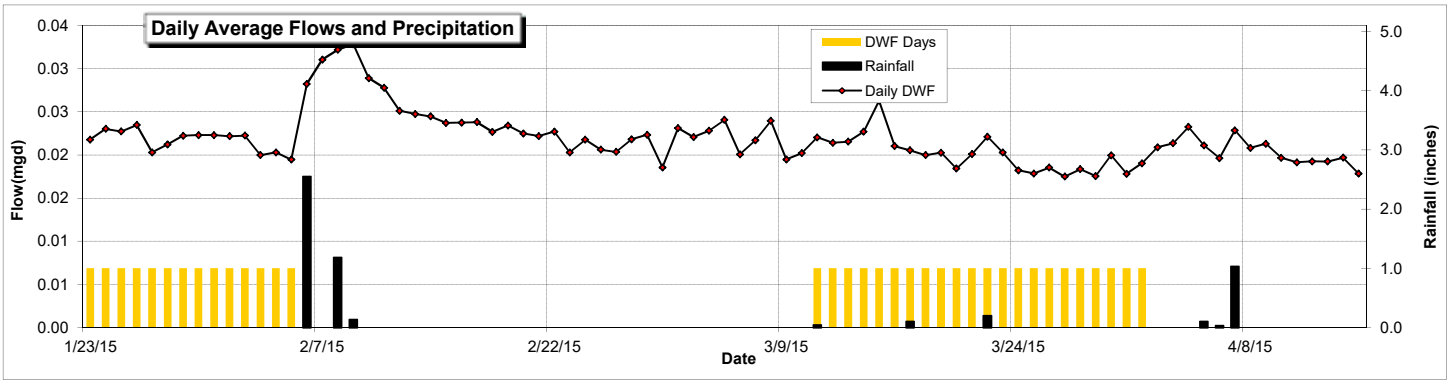
Manhole: LS10-NORTH

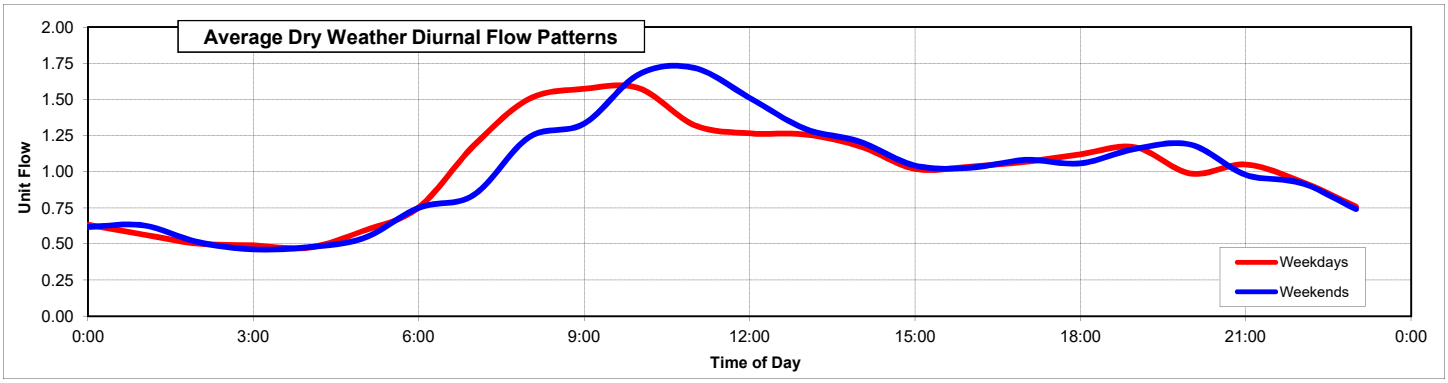
Date: August 28, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.020 mgd	0.002 mgd	7.91%	0.022 mgd	0.003 mgd	11.54%	
- Peaking Factors	2.0886	0.6220	29.78%	1.9706	0.3017	15.31%	
- Num Records	26	26		10	10		





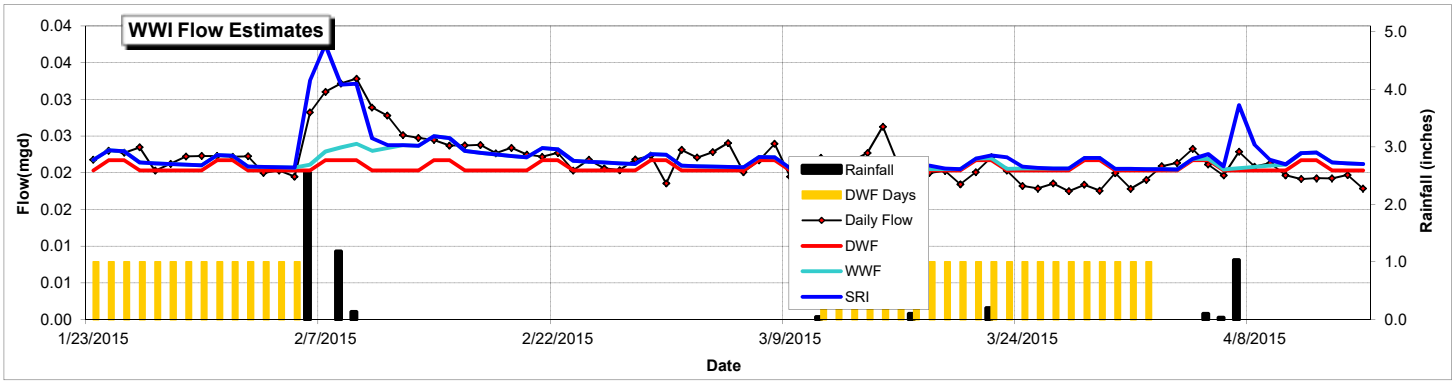
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	0.60%
WWI Inflow Period (Tn)	6.0 days
WWI Recession Coeff. (Kn)	0.1
Storm Limit	0.001 in/day
WWI @ Start of Simulation	

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.001 mgd	0.003 mgd	0.06 MG
WWI Rate	10.5 gpad	51.7 gpad	870 gpa
Perc og DWF			3.39%
Perc of Precip.			0.60%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-NORTH

Date: August 28, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	20.00%	50.00%	30.00%
Tn	2	5	8
Kn	3	6	10

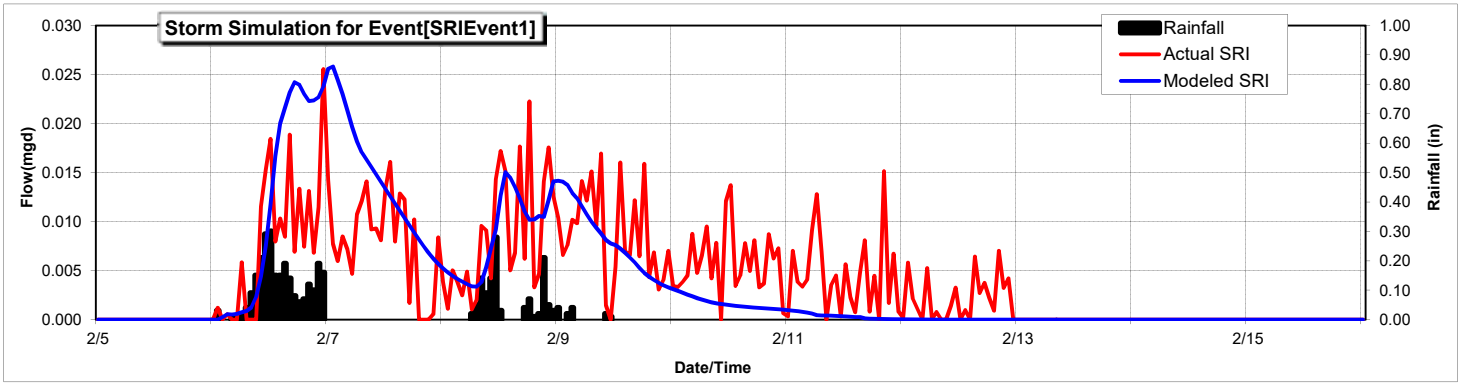
SRI/I Volume Parameters

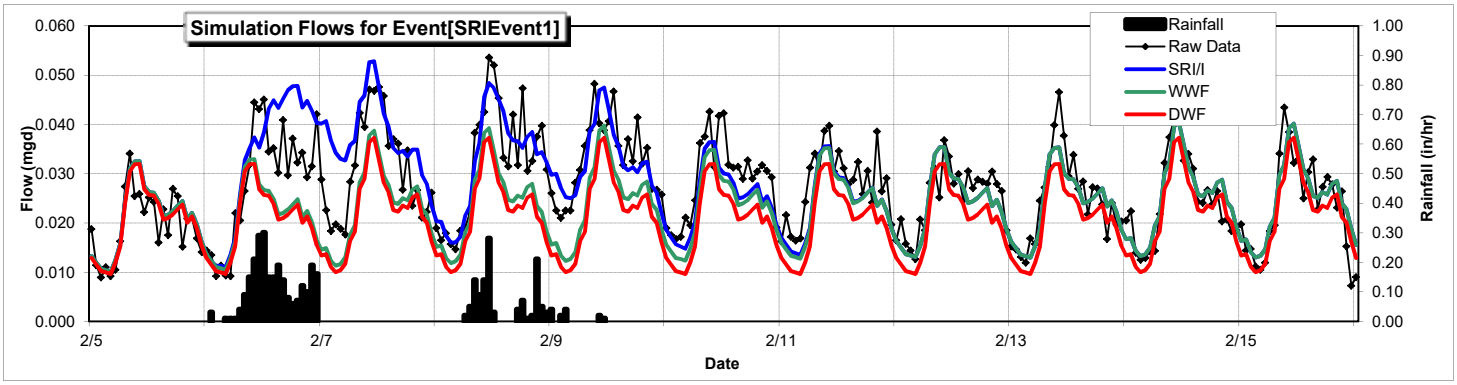
SRI Retention Coeff. (Rt)	0.65%
Total SRI Volume	0.06 MG
Perc. of DWF	3.384%
Perc. of Rainfall	0.637%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/16/15 00:00	51.7	385.0	0.045	7.024	0.637%	0.8281
SRIEvent2	04/06/15 00:00	04/11/15 00:00	13.9	224.3	0.013	1.929	0.664%	0.7028
All WWF Days			51.7	385.0	0.058	9.132	0.637%	0.8195

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-NORTH

Date: August 28, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	20.00%	50.00%	30.00%
Tn	2	5	8
Kn	3	6	10

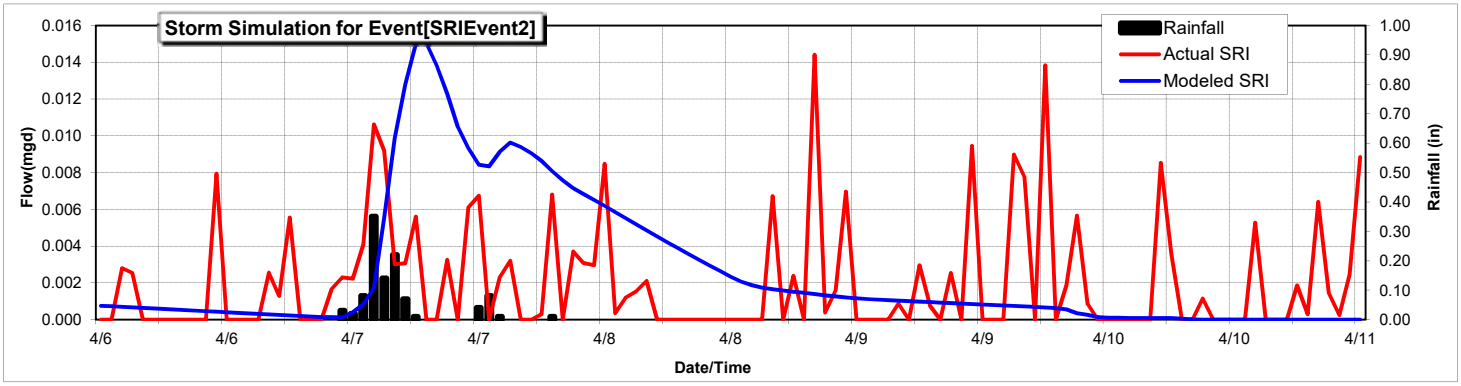
SRI/I Volume Parameters

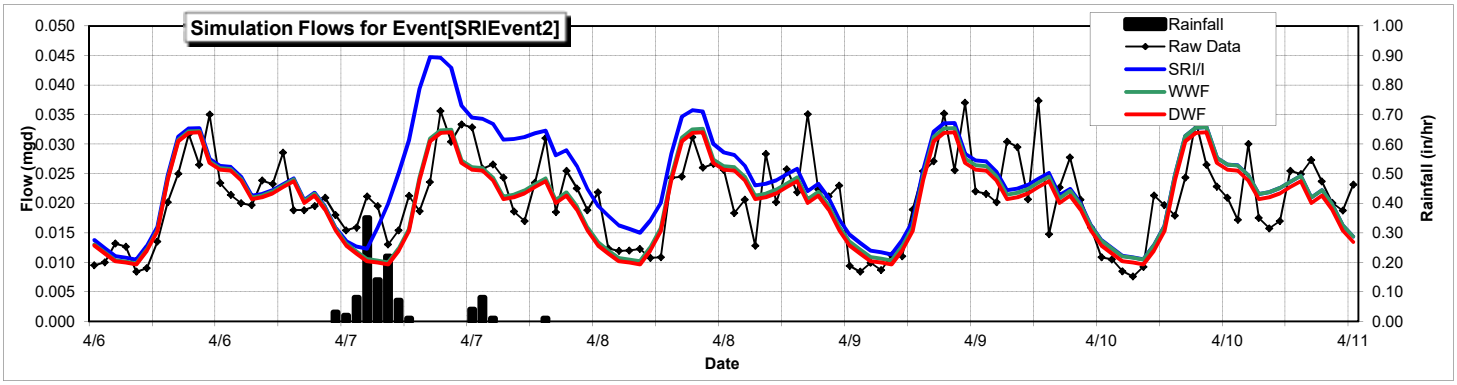
SRI Retention Coeff. (Rt)	0.65%
Total SRI Volume	0.06 MG
Perc. of DWF	3.384%
Perc. of Rainfall	0.637%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/16/15 00:00	51.7	385.0	0.045	7.024	0.637%	0.8281
SRIEvent2	04/06/15 00:00	04/11/15 00:00	13.9	224.3	0.013	1.929	0.664%	0.7028
All WWF Days			51.7	385.0	0.058	9.132	0.637%	0.8195

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-EAST

Date: August 28, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	6.0 inches
Slope	0.0600
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23892

Basin Size	16.00 acres

Selected Flows: Q_FlowTote

RAINFALL RECORDS

Rainfall/Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

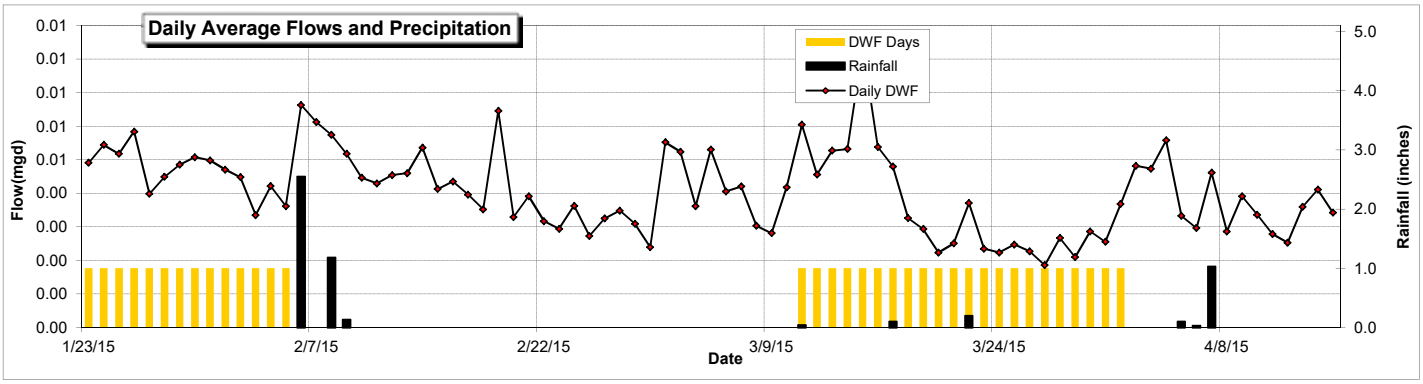
Manhole: LS10-EAST

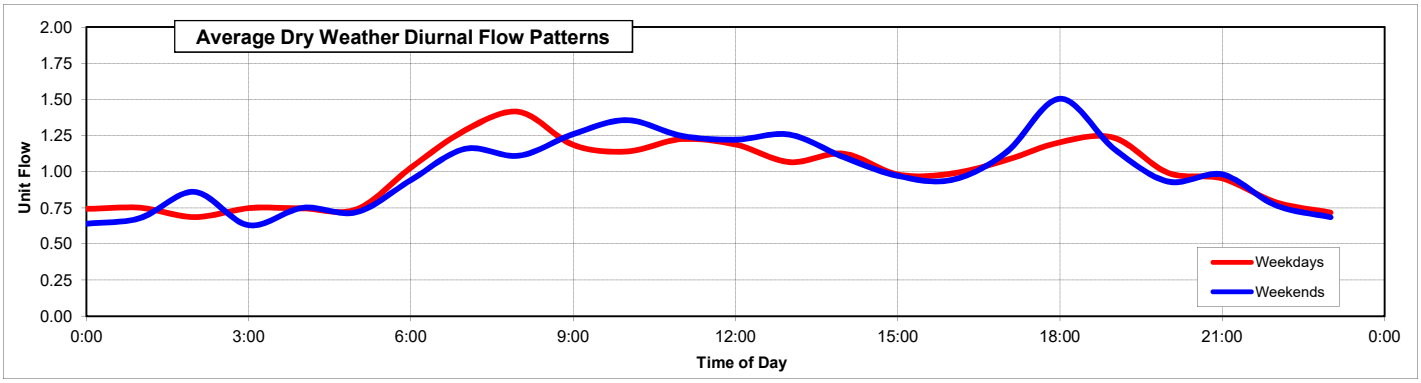
Date: August 28, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.004 mgd	0.001 mgd	32.65%	0.004 mgd	0.002 mgd	41.20%	
- Peaking Factors	2.3382	0.6220	26.60%	1.9076	0.1765	9.25%	
- Num Records	26	26		10	10		





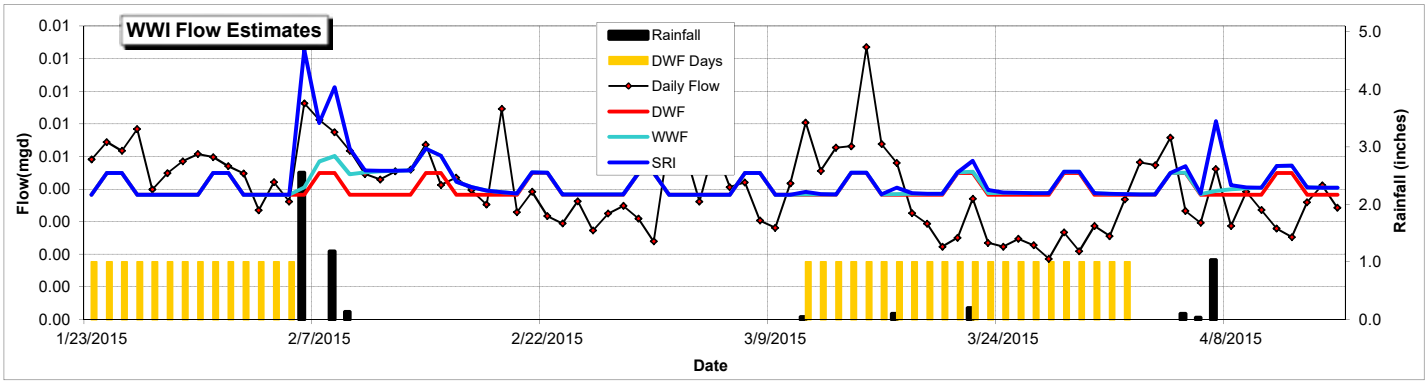
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	0.35%
WWI Inflow Period (Tn)	8 days
WWI Recession Coeff. (Kn)	0.6
Storm Limit	0.001 in/day
WWI @ Start of Simulation	0.000 mgd

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.000 mgd	0.001 mgd	0.01 MG
WWI Rate	6.4 gpad	46.5 gpad	534 gpa
Perc og DWF			2.56%
Perc of Precip.			0.37%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-EAST

Date: August 28, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	80.00%	15.00%	5.00%
Tn	1	4	8
Kn	4	8	10

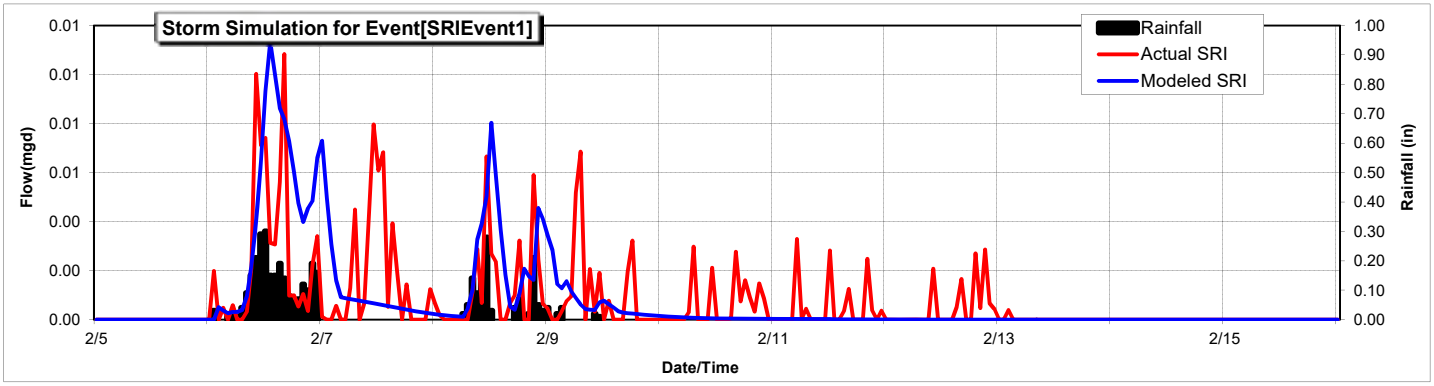
SRI/I Volume Parameters

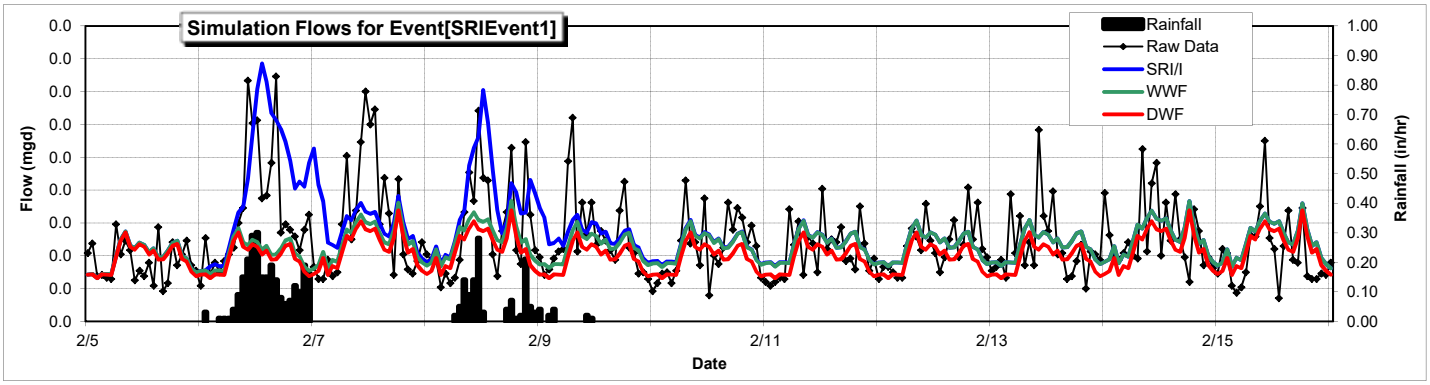
SRI Retention Coeff. (Rt)	0.50%
Total SRI Volume	0.01 MG
Perc. of DWF	3.268%
Perc. of Rainfall	0.500%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/16/15 00:00	46.5	708.9	0.008	1.677	0.500%	0.5382
SRIEvent2	04/06/15 00:00	04/11/15 00:00	13.5	557.5	0.002	0.461	0.505%	0.3574
All WWF Days			46.5	708.9	0.011	2.181	0.500%	0.3776

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-EAST

Date: August 28, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	80.00%	15.00%	5.00%
Tn	1	4	8
Kn	4	8	10

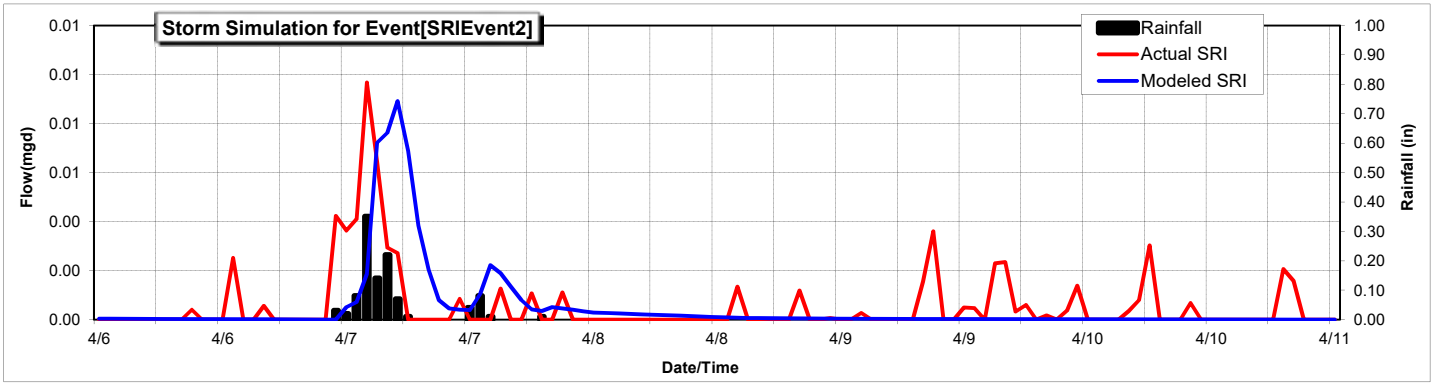
SRI/I Volume Parameters

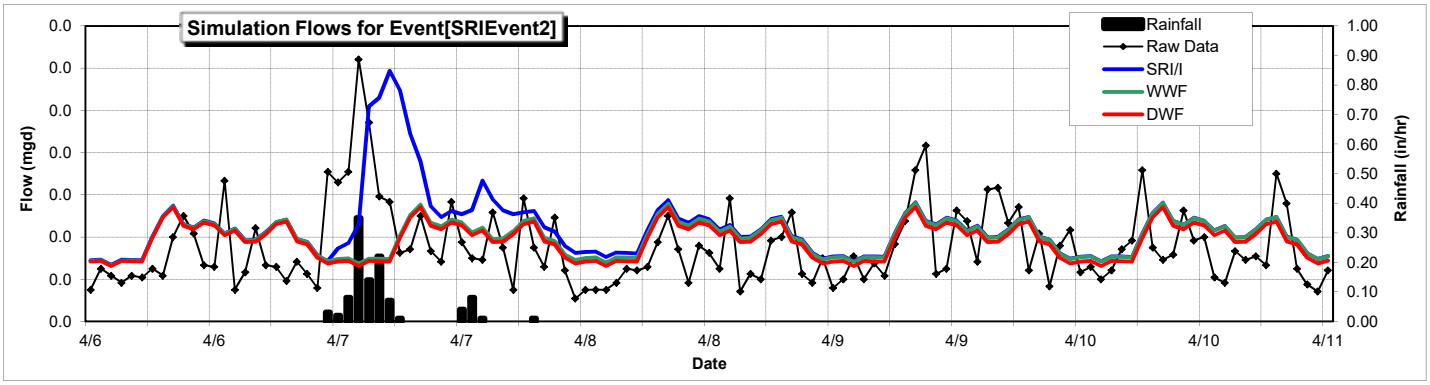
SRI Retention Coeff. (Rt)	0.50%
Total SRI Volume	0.01 MG
Perc. of DWF	3.268%
Perc. of Rainfall	0.500%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/16/15 00:00	46.5	708.9	0.008	1.677	0.500%	0.5382
SRIEvent2	04/06/15 00:00	04/11/15 00:00	13.5	557.5	0.002	0.461	0.505%	0.3574
All WWF Days			46.5	708.9	0.011	2.181	0.500%	0.3776

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-NORTH

Date: August 28, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	8.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23892

Basin Size	51.00 acres
Selected Flows	Q_FlowTote

RAINFALL RECORDS

Rainfall/Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

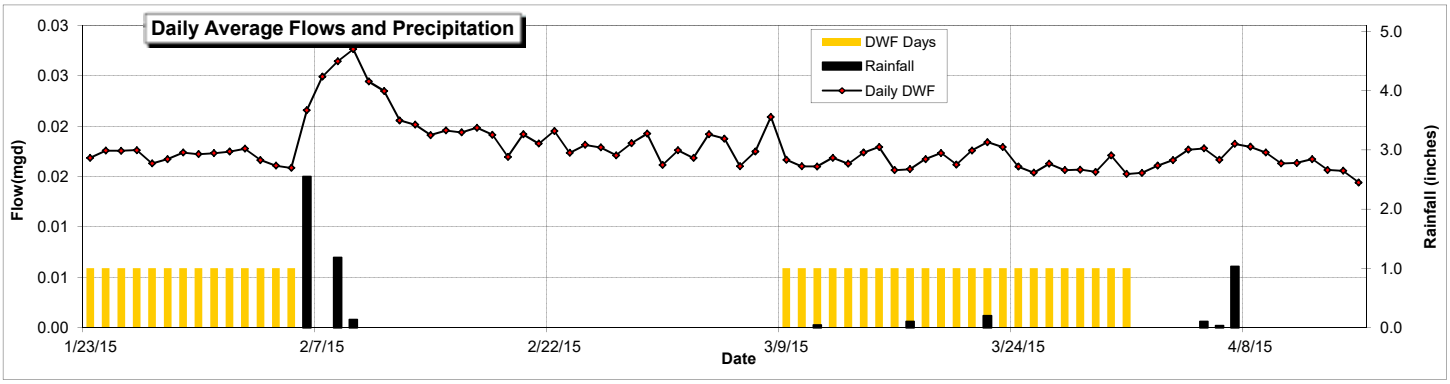
Manhole: LS10-NORTH

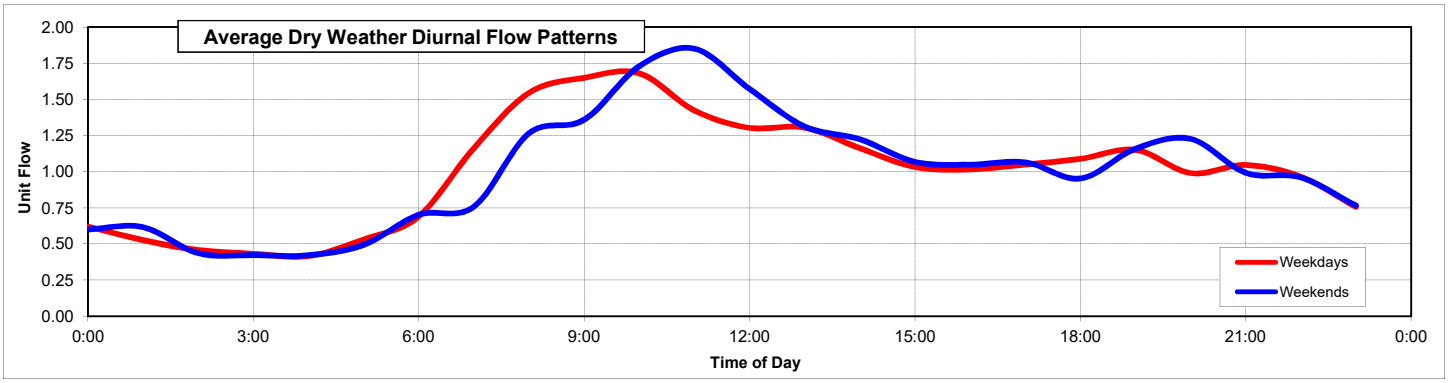
Date: August 28, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.016 mgd	0.001 mgd	4.46%	0.017 mgd	0.001 mgd	5.43%	
- Peaking Factors	2.2930	0.7768	33.87%	2.1683	0.4441	20.48%	
- Num Records	27	27		10	10		





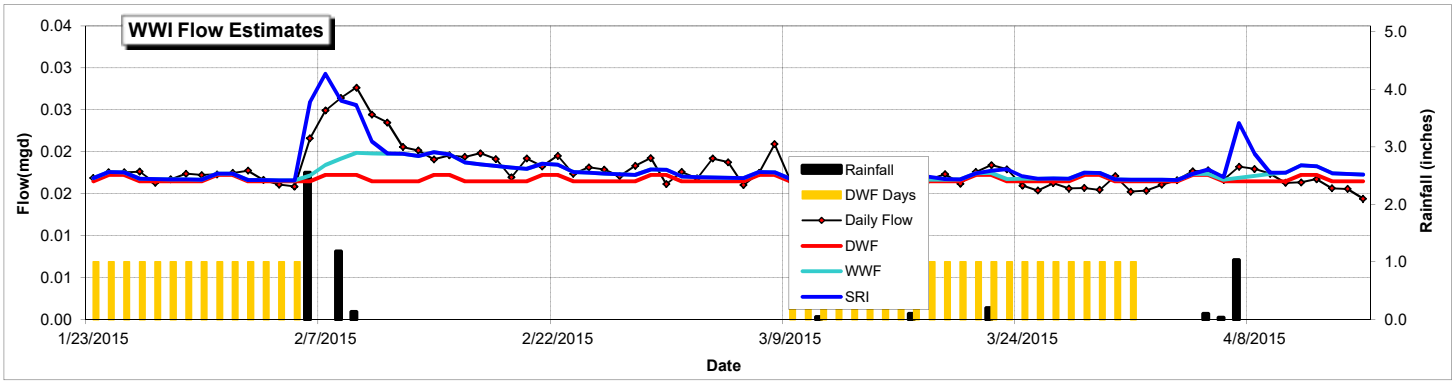
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	0.70%
WWI Inflow Period (Tn)	4.0 days
WWI Recession Coeff. (Kn)	0.1
Storm Limit	0.001 in/day
WWI @ Start of Simulation	

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.001 mgd	0.003 mgd	0.05 MG
WWI Rate	12.6 gpad	64.6 gpad	1,048 gpa
Perc og DWF			3.85%
Perc of Precip.			0.72%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-NORTH

Date: August 28, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	10.00%	30.00%	60.00%
Tn	2	4	8
Kn	3	4	10

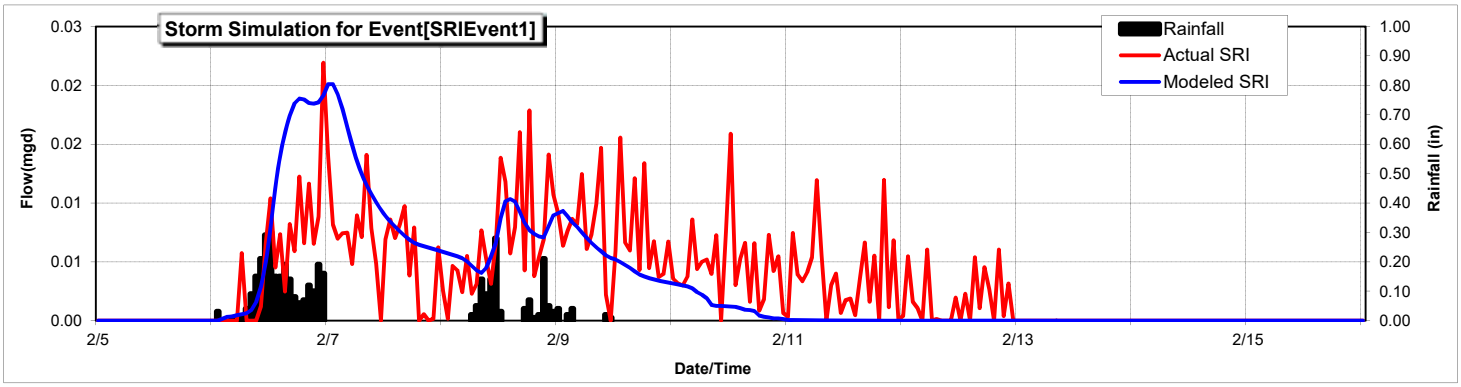
SRI/I Volume Parameters

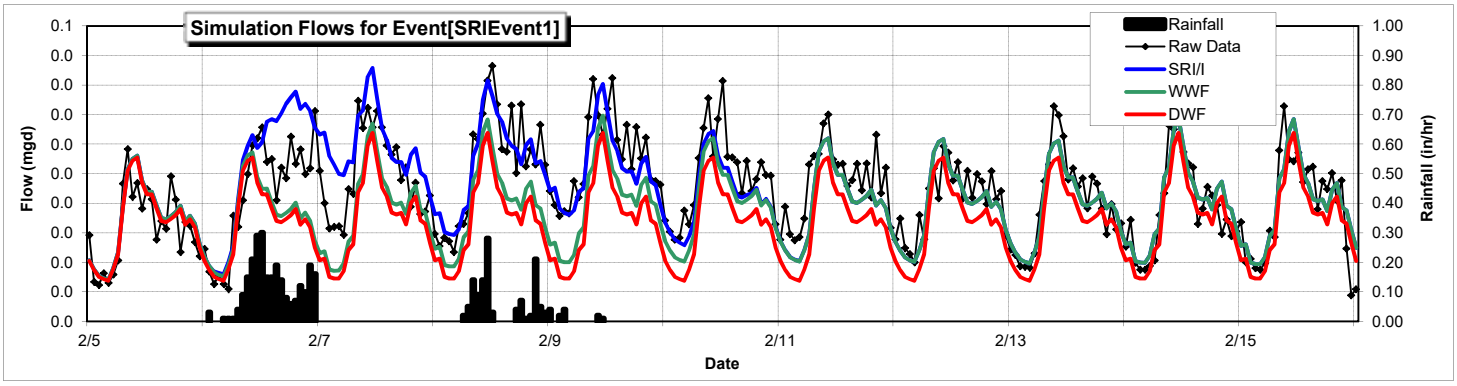
SRI Retention Coeff. (Rt)	0.75%
Total SRI Volume	0.04 MG
Perc. of DWF	3.153%
Perc. of Rainfall	0.629%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/16/15 00:00	64.6	394.1	0.034	5.347	0.629%	0.8320
SRIEvent2	04/06/15 00:00	04/11/15 00:00	22.5	216.6	0.010	1.468	0.654%	0.7310
All WWF Days			64.6	394.1	0.044	6.952	0.629%	0.8230

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-NORTH

Date: August 28, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	10.00%	30.00%	60.00%
Tn	2	4	8
Kn	3	4	10

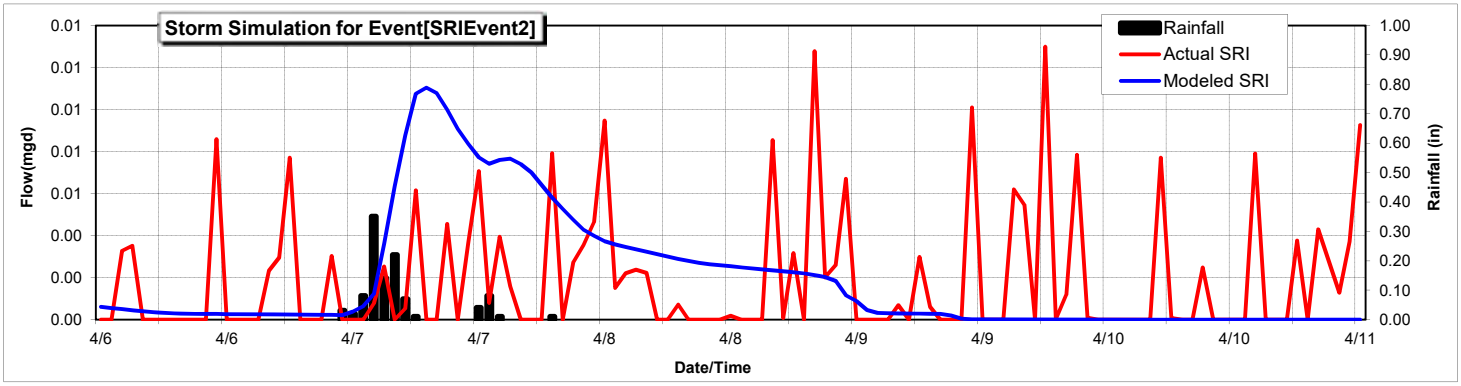
SRI/I Volume Parameters

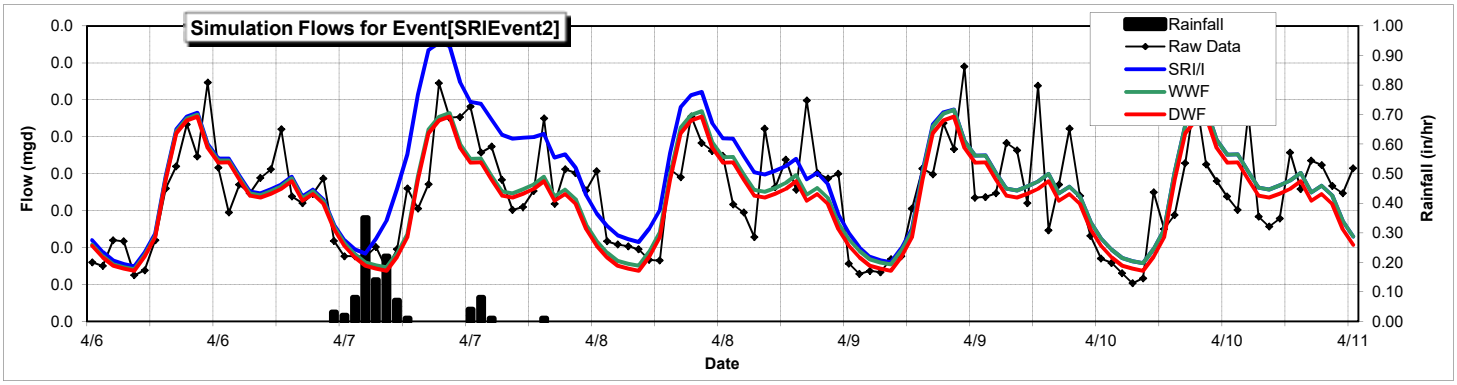
SRI Retention Coeff. (Rt)	0.75%
Total SRI Volume	0.04 MG
Perc. of DWF	3.153%
Perc. of Rainfall	0.629%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/16/15 00:00	64.6	394.1	0.034	5.347	0.629%	0.8320
SRIEvent2	04/06/15 00:00	04/11/15 00:00	22.5	216.6	0.010	1.468	0.654%	0.7310
All WWF Days			64.6	394.1	0.044	6.952	0.629%	0.8230

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT

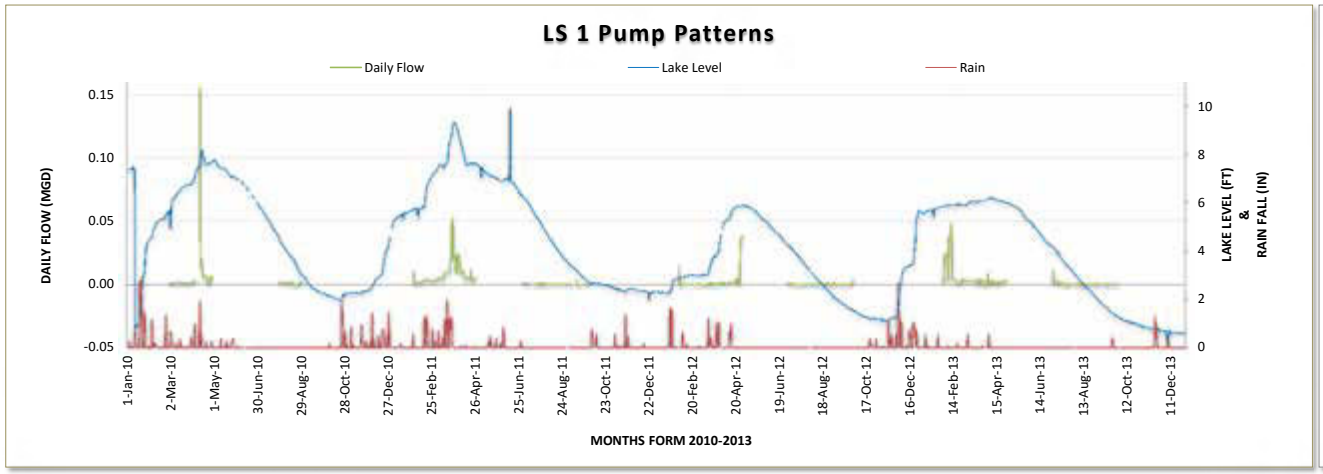


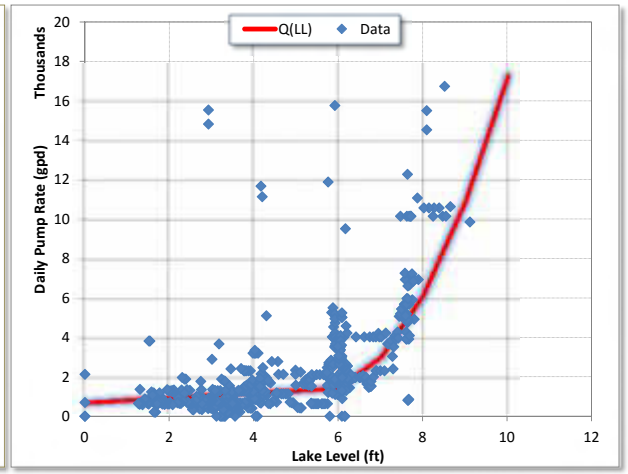


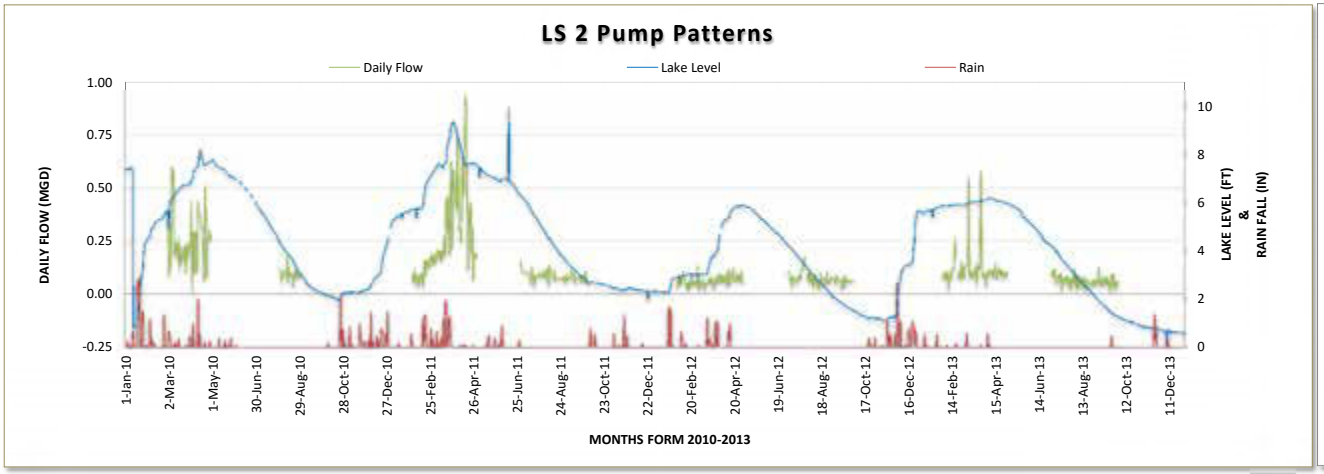
Appendix E

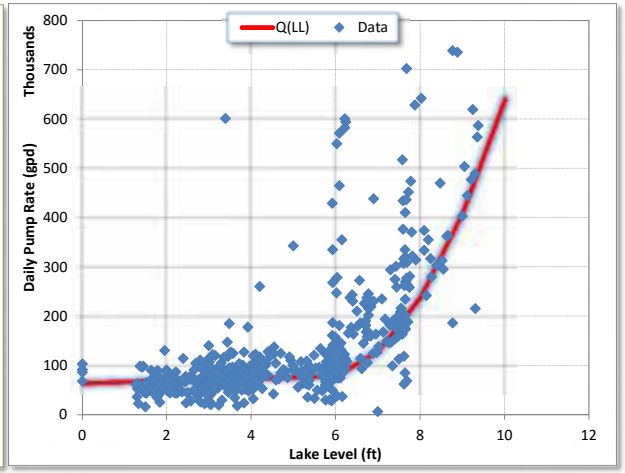
Lift Station Analysis of Historical Operator Logs and Data Loggers

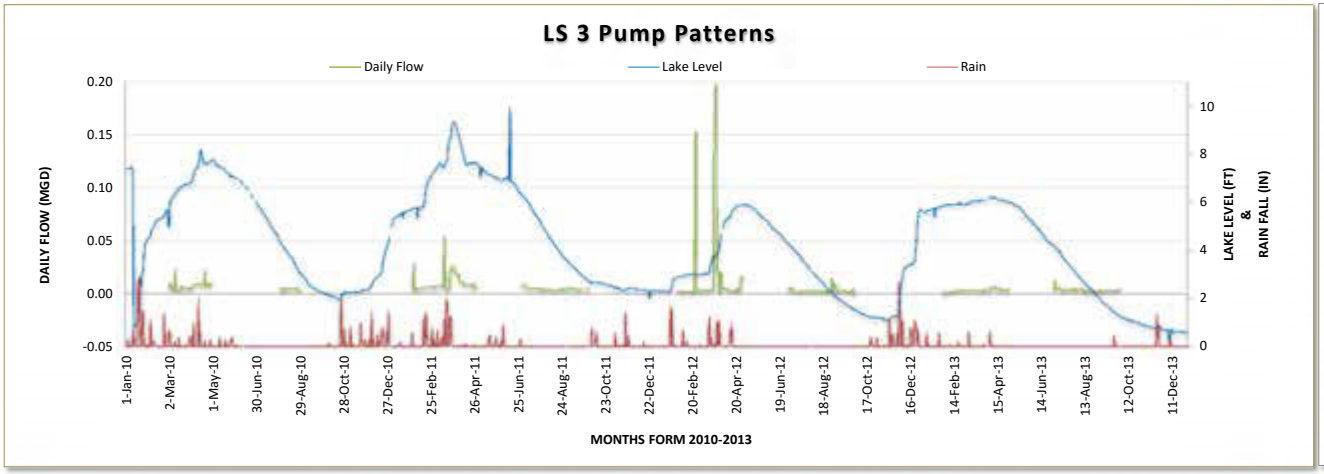
Item No.	Document	Page Number
1	Historical Flow Charts	E-2
2	Data Logger Summary	E-6

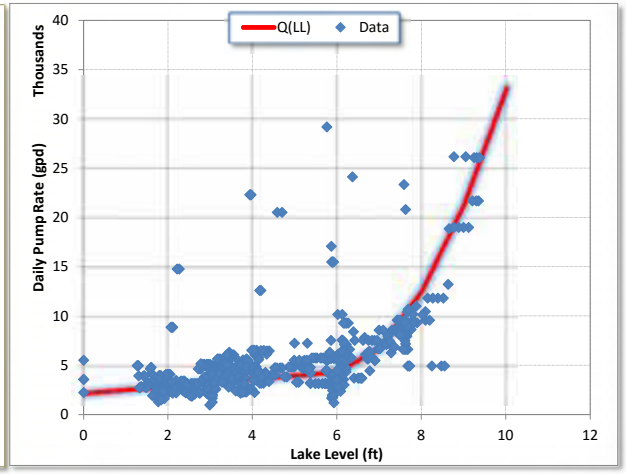

LS 1 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013

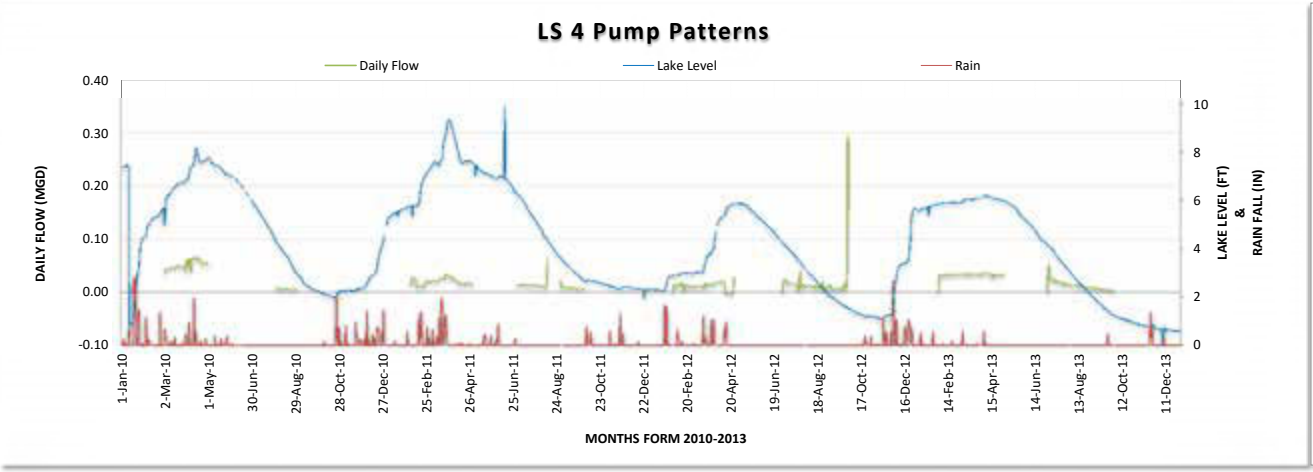

Q(LL)
Data
Thousands
Daily Pump Rate (gpd)
Lake Level (ft)

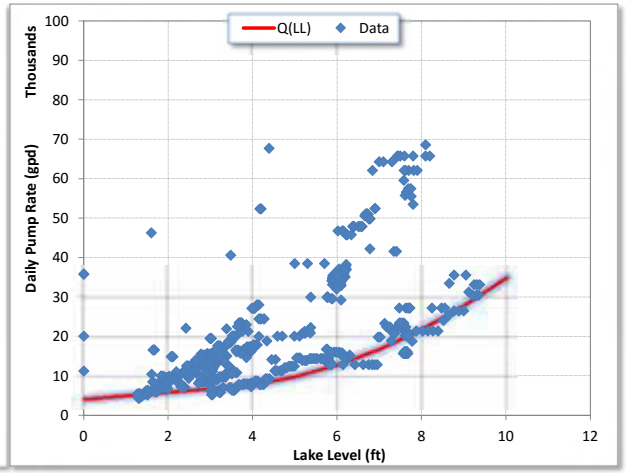

LS 2 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013

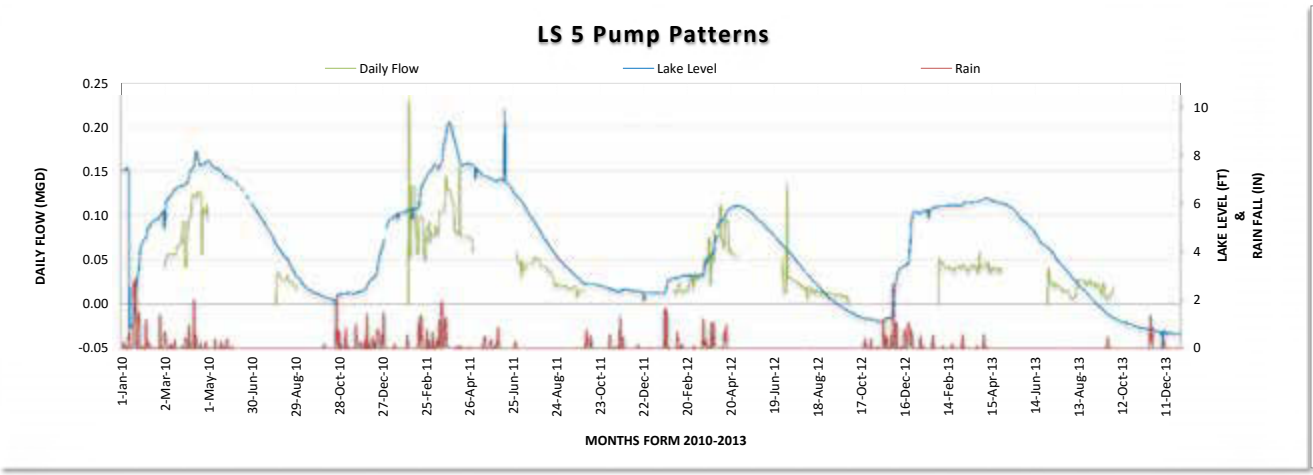

Q(LL)
Data
Thousands
Daily Pump Rate (gpd)
Lake Level (ft)

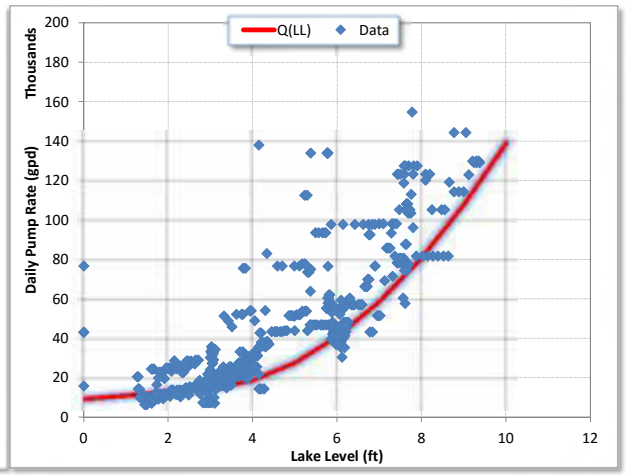

LS 3 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013

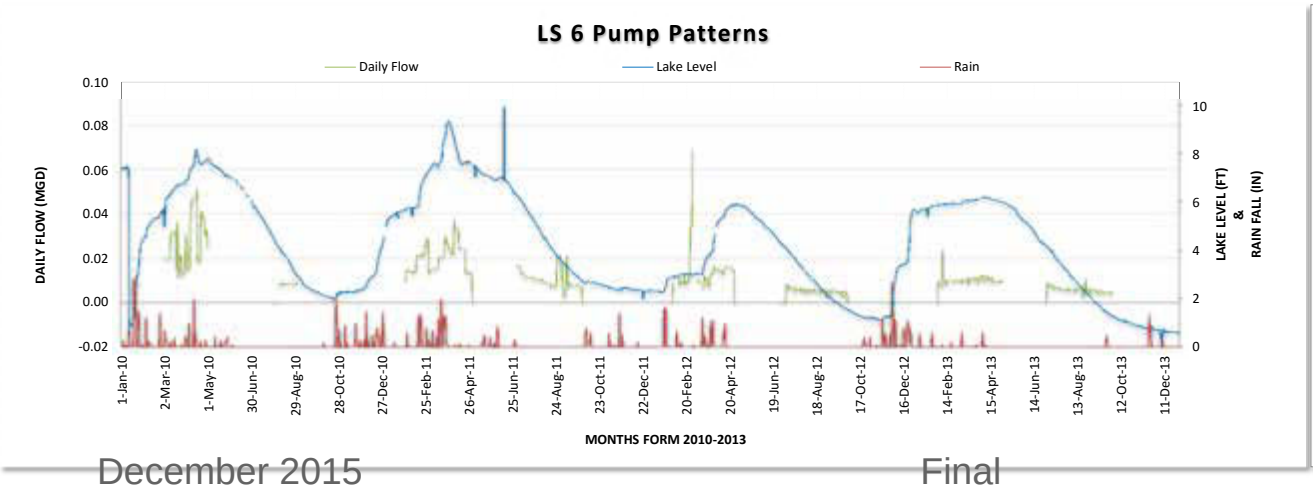

Q(LL)
Data
Thousands
Daily Pump Rate (gpd)
Lake Level (ft)

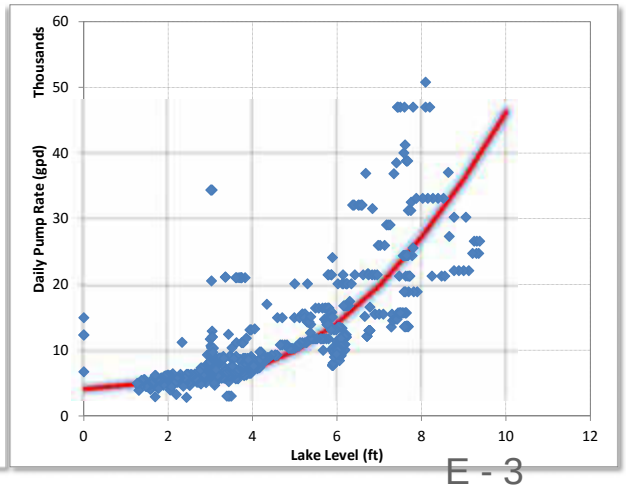

LS 4 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013

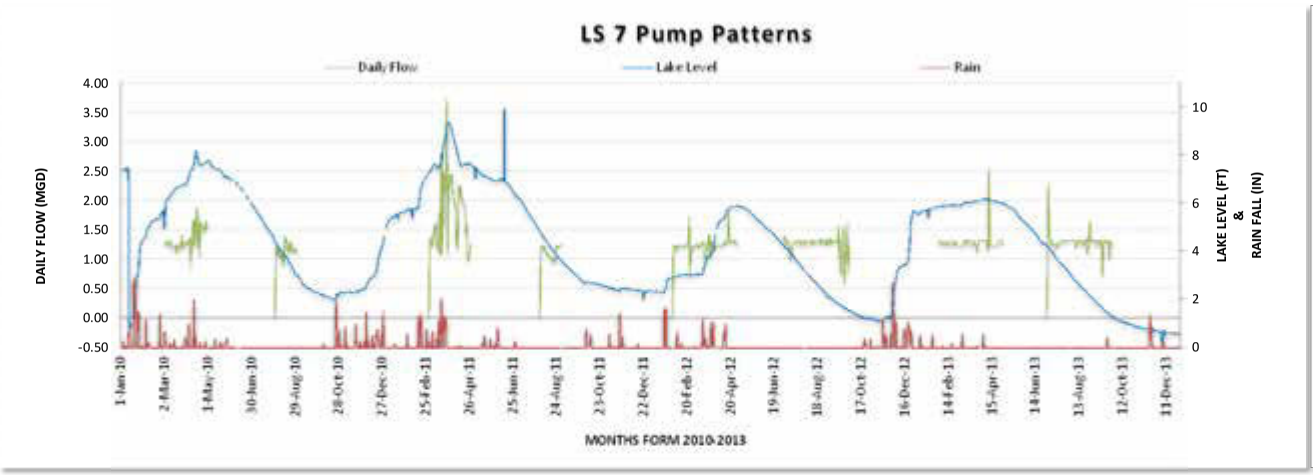

Q(LL)
Data
Thousands
Daily Pump Rate (gpd)
Lake Level (ft)

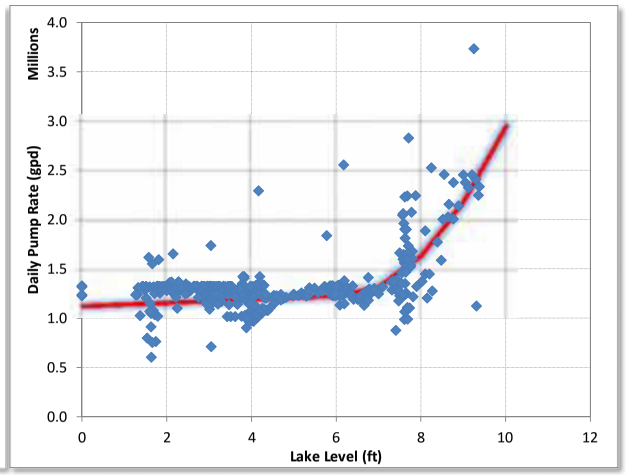

LS 5 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013

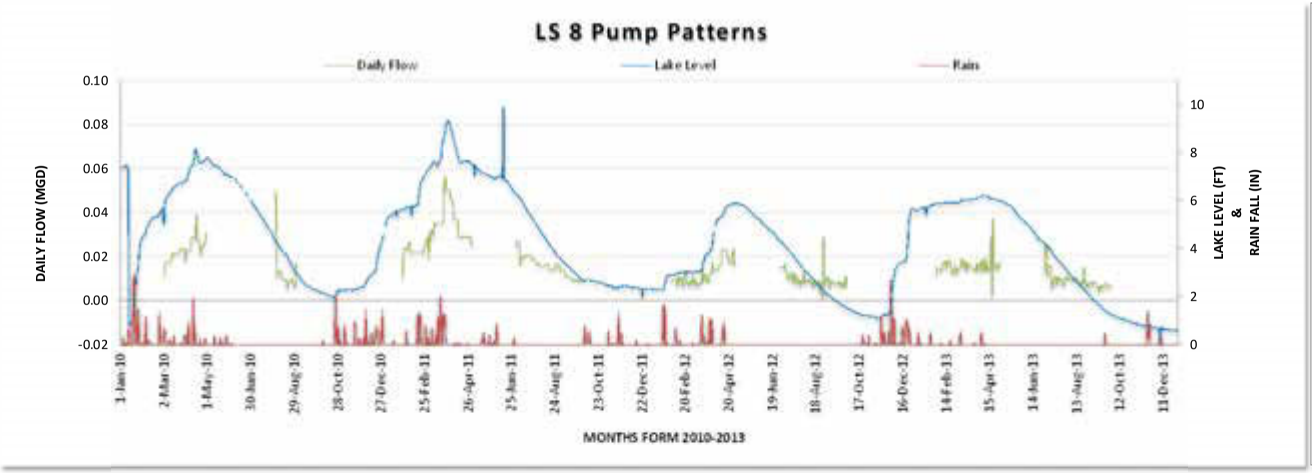

Q(LL)
Data
Thousands
Daily Pump Rate (gpd)
Lake Level (ft)

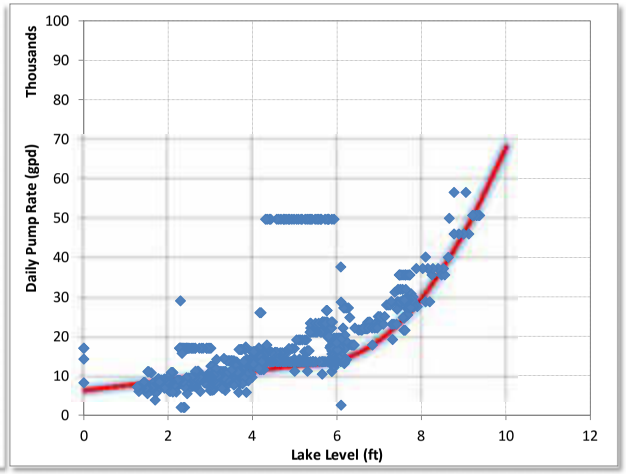

LS 6 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013

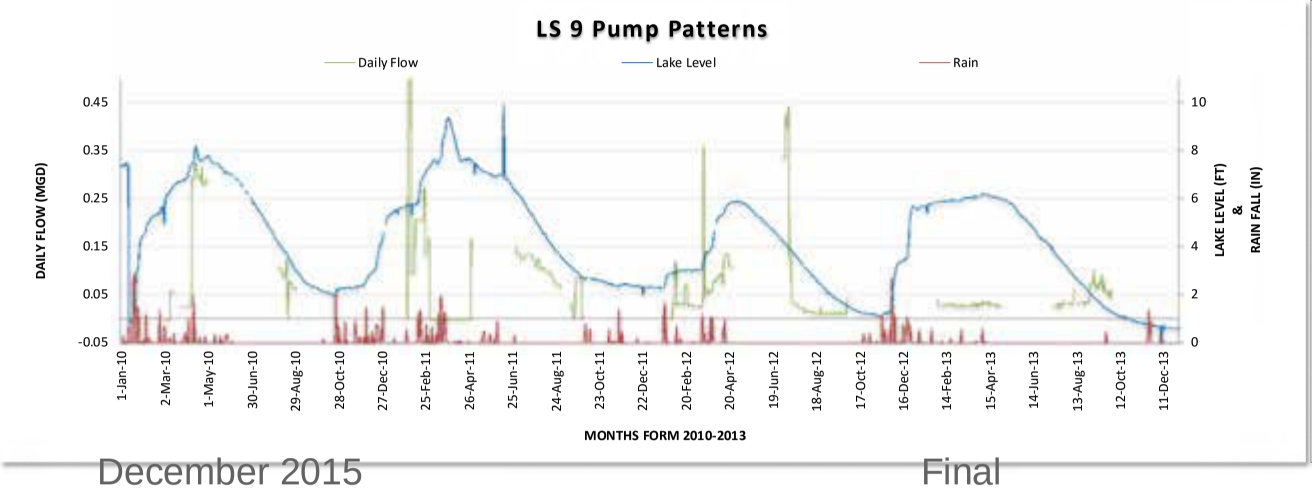

Thousands
Daily Pump Rate (gpd)
Lake Level (ft)

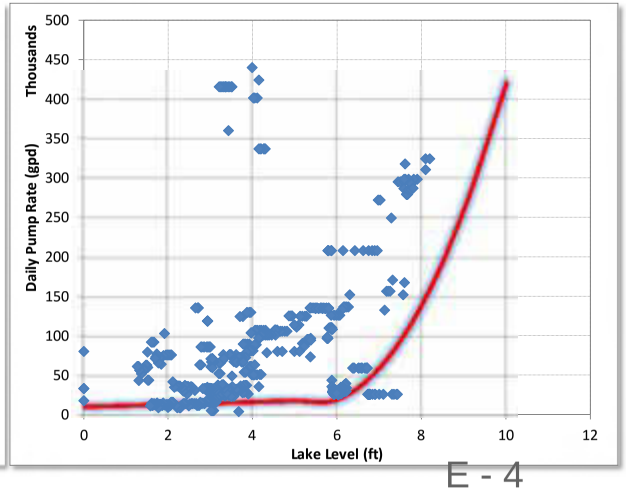

LS 7 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013

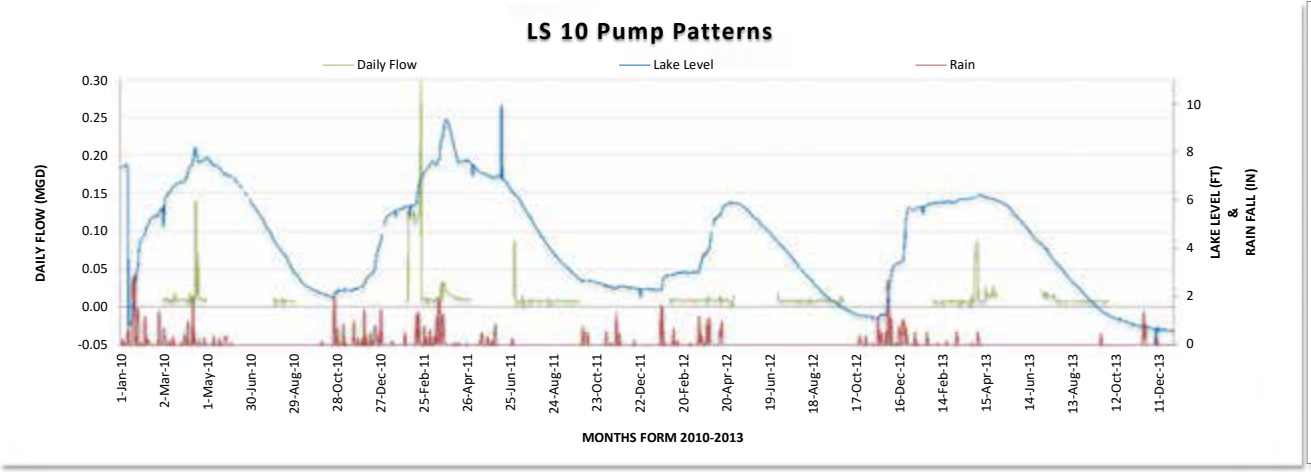

Millions
Daily Pump Rate (gpd)
Lake Level (ft)

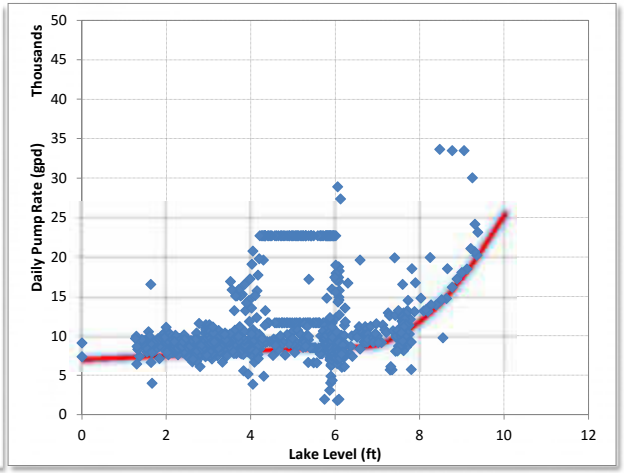

LS 8 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013

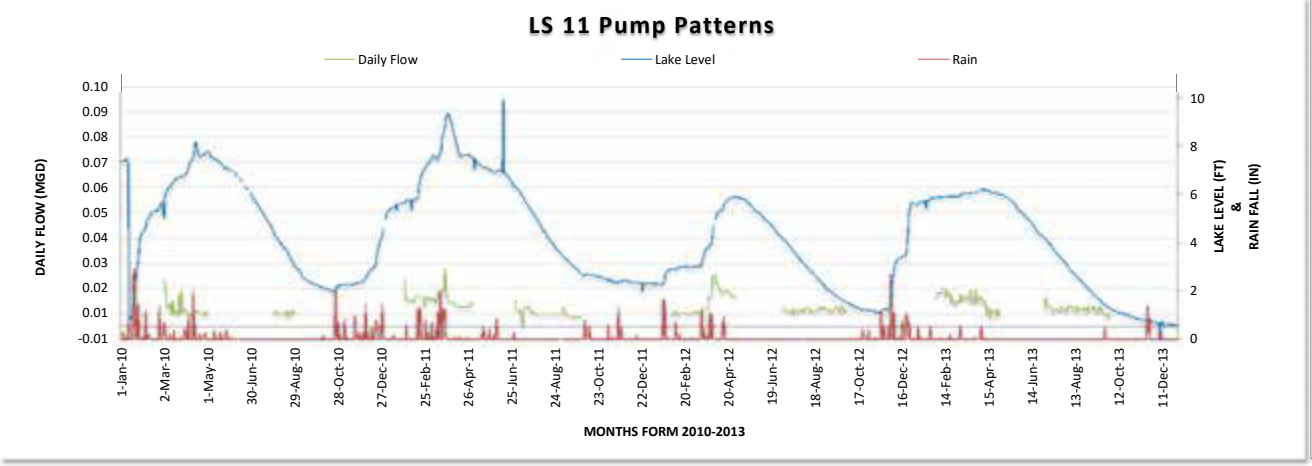

Thousands
Daily Pump Rate (gpd)
Lake Level (ft)

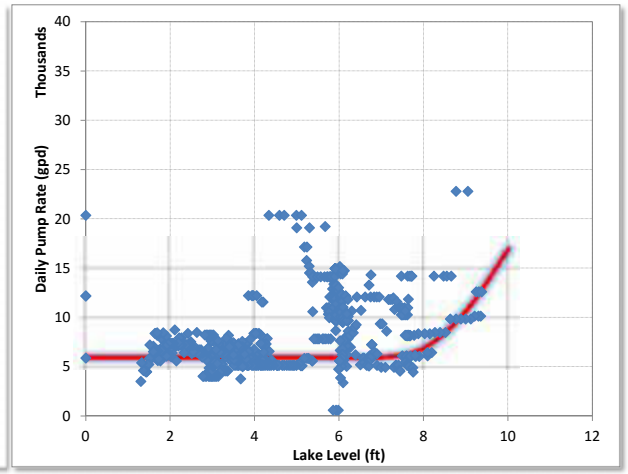

LS 9 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013

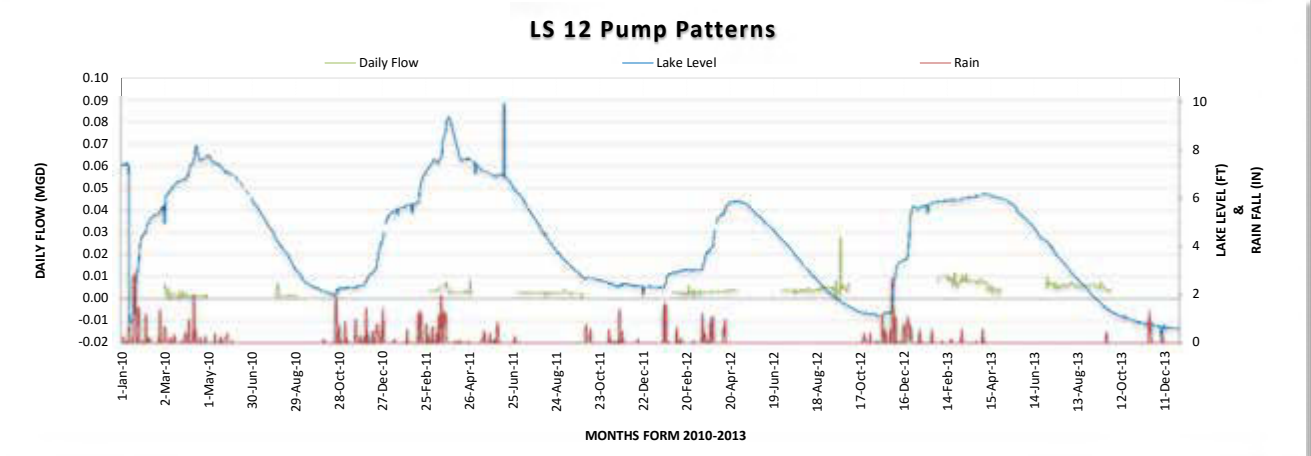

Thousands
Daily Pump Rate (gpd)
Lake Level (ft)

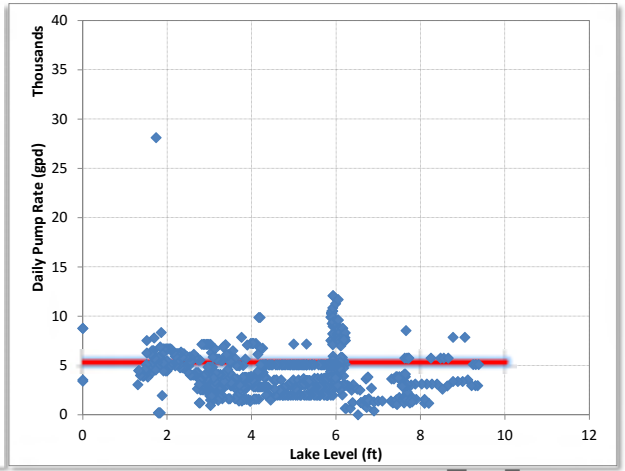

LS 10 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013


Thousands
Daily Pump Rate (gpd)
Lake Level (ft)


LS 11 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013


Thousands
Daily Pump Rate (gpd)
Lake Level (ft)


LS 12 Pump Patterns
Daily Flow
Lake Level
Rain
DAILY FLOW (MGD)
LAKE LEVEL (FT) & RAIN FALL (IN)
MONTHS FORM 2010-2013


Thousands
Daily Pump Rate (gpd)
Lake Level (ft)

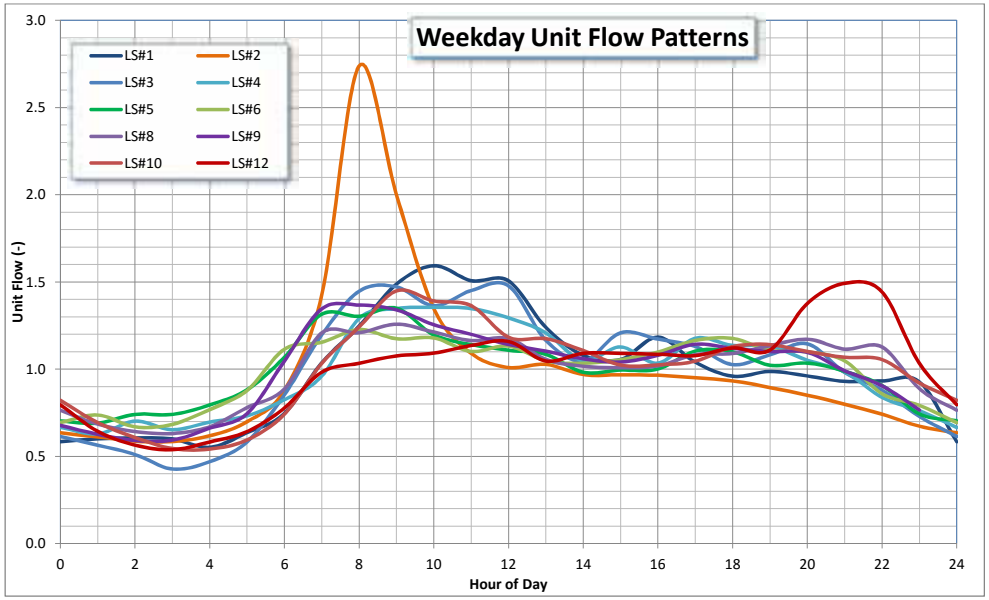
HOBO Flow Log Analysis Summary

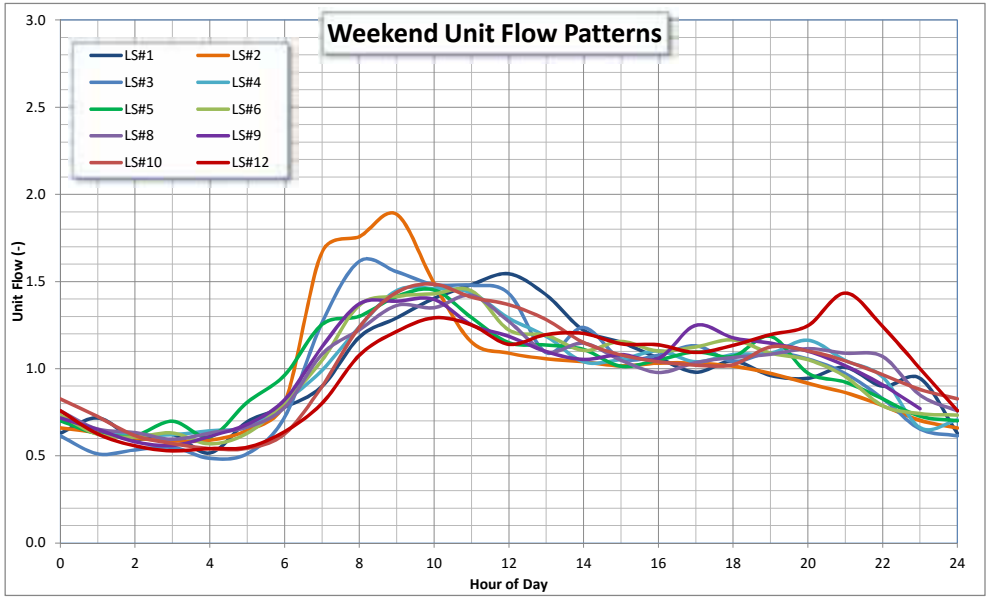
Station	Assumed Pump Capacities		Weekday Flows		Weekend Flows		Estimated Infiltration
	Pump 1	Pump 2	Avg. Flow	Peak Factor	Avg. Flow	Peak Factor	
LS#1	110 gpm	110 gpm	0.69 gpm	1.70	0.76 gpm	1.65	
LS#2	420 gpm	400 gpm	51.95 gpm	2.75	48.72 gpm	1.88	
LS#3	90 gpm	90 gpm	2.69 gpm	1.48	2.79 gpm	1.62	
LS#4	225 gpm	225 gpm	2.16 gpm	1.35	2.15 gpm	1.46	
LS#5	210 gpm	210 gpm	10.03 gpm	1.35	10.59 gpm	1.45	6.70 gpm
LS#6	205 gpm	217 gpm	2.53 gpm	1.23	2.76 gpm	1.45	3.50 gpm
LS#8	320 gpm	0 gpm	3.50 gpm	1.26	3.92 gpm	1.42	
LS#9	315 gpm	290 gpm	9.18 gpm	1.37	9.46 gpm	1.40	
LS#10	110 gpm	110 gpm	5.31 gpm	1.45	5.34 gpm	1.48	
LS#12	80 gpm	85 gpm	4.02 gpm	1.49	3.75 gpm	1.43	

HBO Log Unit Flow Summary

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Weekday Patterns																								
LS#1	0.584	0.600	0.606	0.600	0.553	0.636	0.746	1.037	1.247	1.488	1.593	1.508	1.506	1.239	1.080	1.056	1.184	1.040	0.960	0.987	0.961	0.930	0.932	0.927
LS#2	0.635	0.612	0.587	0.585	0.618	0.699	0.880	1.425	2.738	2.001	1.347	1.091	1.010	1.028	0.969	0.968	0.965	0.951	0.933	0.895	0.851	0.799	0.742	0.673
LS#3	0.615	0.564	0.511	0.428	0.470	0.583	0.853	1.197	1.447	1.472	1.363	1.451	1.478	1.165	1.047	1.209	1.173	1.130	1.026	1.083	1.146	0.981	0.880	0.729
LS#4	0.667	0.629	0.702	0.653	0.697	0.733	0.825	0.960	1.291	1.347	1.354	1.348	1.294	1.208	1.047	1.128	1.035	1.178	1.136	1.133	1.051	0.985	0.838	0.762
LS#5	0.703	0.691	0.741	0.741	0.795	0.882	1.069	1.315	1.304	1.350	1.196	1.141	1.109	1.085	0.983	0.995	1.001	1.104	1.100	1.022	1.036	0.988	0.907	0.744
LS#6	0.694	0.737	0.670	0.684	0.769	0.878	1.115	1.155	1.227	1.174	1.179	1.102	1.133	1.048	1.034	1.055	1.098	1.165	1.176	1.108	1.099	1.047	0.859	0.793
LS#8	0.765	0.685	0.643	0.631	0.670	0.780	0.887	1.208	1.209	1.258	1.213	1.164	1.176	1.056	1.017	1.008	1.019	1.083	1.090	1.135	1.172	1.115	1.127	0.888
LS#9	0.678	0.627	0.591	0.593	0.662	0.745	1.047	1.346	1.368	1.340	1.255	1.200	1.142	1.103	1.060	1.041	1.080	1.143	1.120	1.101	1.096	0.991	0.905	0.766
LS#10	0.822	0.694	0.608	0.545	0.542	0.594	0.742	1.033	1.242	1.449	1.391	1.364	1.183	1.175	1.107	1.024	1.025	1.046	1.129	1.141	1.101	1.068	1.055	0.921
LS#12	0.796	0.644	0.565	0.538	0.583	0.642	0.778	0.983	1.034	1.076	1.092	1.136	1.159	1.047	1.091	1.091	1.086	1.078	1.122	1.110	1.377	1.492	1.443	1.033

Weekend Patterns																								
LS#1	0.630	0.718	0.599	0.623	0.516	0.696	0.779	0.898	1.181	1.291	1.404	1.482	1.544	1.423	1.220	1.152	1.061	0.980	1.044	0.961	0.945	1.008	0.899	0.945
LS#2	0.660	0.634	0.602	0.586	0.590	0.647	0.803	1.669	1.757	1.885	1.489	1.153	1.089	1.057	1.040	1.016	1.032	1.032	1.014	0.974	0.915	0.863	0.788	0.703
LS#3	0.615	0.512	0.534	0.549	0.486	0.513	0.721	1.263	1.616	1.556	1.483	1.479	1.432	1.092	1.236	1.058	1.078	1.131	1.042	1.092	1.056	0.972	0.829	0.654
LS#4	0.707	0.650	0.622	0.622	0.644	0.667	0.809	0.991	1.240	1.448	1.459	1.436	1.289	1.187	1.039	1.053	1.102	1.040	1.082	1.088	1.163	1.048	0.952	0.662
LS#5	0.702	0.627	0.617	0.699	0.609	0.807	0.963	1.254	1.301	1.414	1.452	1.293	1.149	1.136	1.110	1.014	1.050	1.095	1.071	1.186	0.975	0.923	0.826	0.728
LS#6	0.734	0.624	0.608	0.631	0.569	0.630	0.808	1.048	1.365	1.415	1.430	1.447	1.222	1.191	1.104	1.156	1.101	1.125	1.165	1.089	1.052	0.955	0.788	0.743
LS#8	0.758	0.654	0.634	0.595	0.631	0.665	0.778	1.083	1.223	1.363	1.350	1.421	1.271	1.097	1.146	1.049	0.978	1.035	1.065	1.083	1.115	1.089	1.070	0.849
LS#9	0.717	0.651	0.581	0.560	0.612	0.681	0.821	1.125	1.372	1.387	1.397	1.252	1.186	1.098	1.053	1.081	1.059	1.249	1.177	1.146	1.101	1.017	0.907	0.771
LS#10	0.827	0.725	0.616	0.571	0.542	0.543	0.626	0.898	1.239	1.438	1.485	1.410	1.367	1.281	1.150	1.080	1.039	1.021	1.023	1.125	1.102	1.045	0.966	0.881
LS#12	0.759	0.626	0.557	0.529	0.542	0.549	0.639	0.801	1.077	1.214	1.292	1.251	1.140	1.196	1.202	1.143	1.137	1.093	1.134	1.196	1.247	1.434	1.242	1.000

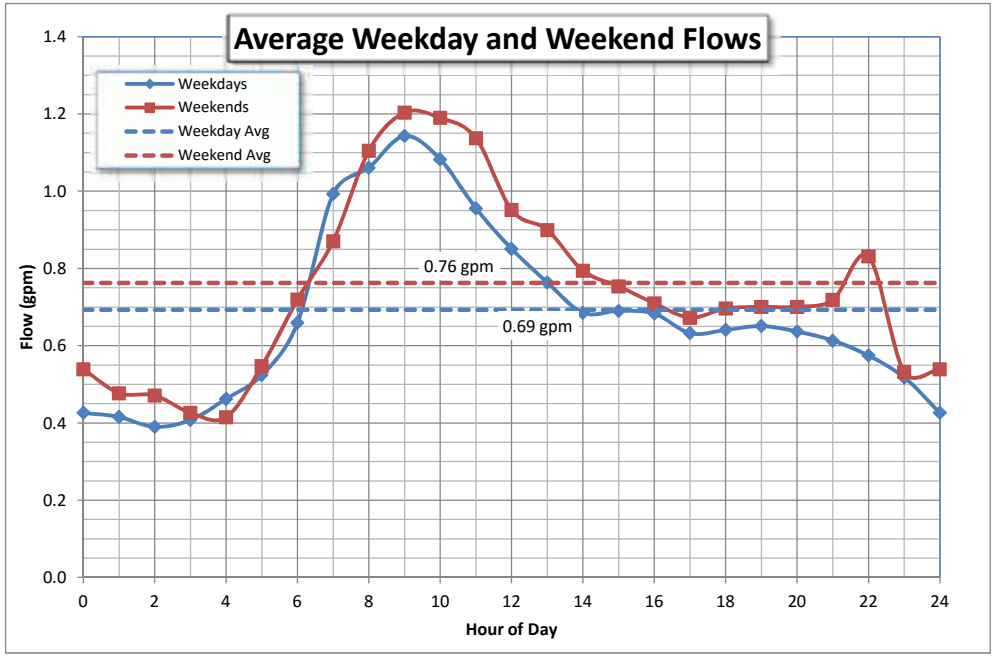


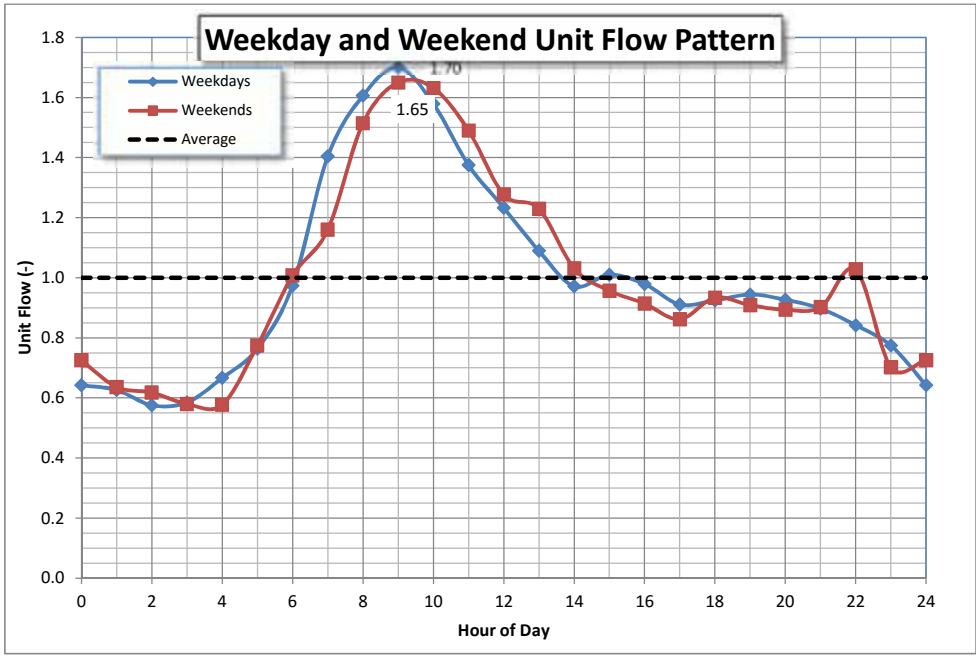


Lift Station 1 Flow Analysis Summary

Weekdays	Qavg = 0.69 gpm	PF =	1.70
Weekends	Qavg = 0.76 gpm	PF =	1.65

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	0.43	0.42	0.39	0.41	0.46	0.52	0.66	0.99	1.06	1.14	1.08	0.96	0.85	0.76	0.69	0.69	0.68	0.63	0.64	0.65	0.64	0.61	0.57	0.52
Min	0.07	0.07	0.07	0.13	0.13	0.13	0.13	0.15	0.15	0.14	0.14	0.14	0.29	0.18	0.11	0.11	0.11	0.11	0.14	0.14	0.14	0.07	0.07	0.07
Max	1.07	1.14	1.18	3.19	3.44	2.34	2.13	10.27	2.91	2.86	3.30	2.77	2.08	2.71	2.44	2.64	2.45	1.90	1.99	4.16	1.93	2.46	1.44	1.53
Weekends																								
Qavg	0.54	0.48	0.47	0.43	0.41	0.55	0.72	0.87	1.10	1.20	1.19	1.14	0.95	0.90	0.79	0.75	0.71	0.67	0.70	0.70	0.70	0.72	0.83	0.53
Min	0.09	0.09	0.09	0.09	0.09	0.23	0.24	0.24	0.24	0.42	0.40	0.36	0.27	0.22	0.22	0.22	0.22	0.19	0.19	0.17	0.17	0.17	0.22	0.00
Max	1.69	1.51	1.35	1.02	1.00	1.17	1.55	2.39	2.72	2.74	2.58	3.30	3.00	2.86	2.29	2.48	1.78	1.85	1.49	2.62	2.56	2.67	9.30	1.44
Unit Flow Summary																								
Weekdays																								
Qunit	0.642	0.626	0.575	0.585	0.666	0.764	0.974	1.404	1.606	1.702	1.579	1.375	1.233	1.089	0.971	1.010	0.979	0.911	0.925	0.944	0.927	0.897	0.842	0.774
Min	0.144	0.144	0.144	0.182	0.182	0.249	0.294	0.392	0.128	0.128	0.325	0.325	0.537	0.377	0.148	0.148	0.148	0.148	0.406	0.406	0.365	0.283	0.283	0.252
Max	1.834	1.965	1.371	1.808	2.768	2.947	2.999	8.749	4.393	5.036	4.691	3.490	2.842	3.622	2.863	6.064	2.777	2.075	2.500	5.224	2.418	2.851	2.053	2.334
Weekends																								
Qunit	0.725	0.636	0.618	0.580	0.577	0.774	1.008	1.160	1.515	1.650	1.632	1.490	1.277	1.229	1.031	0.957	0.914	0.862	0.934	0.909	0.894	0.902	1.027	0.702
Min	0.183	0.136	0.136	0.130	0.130	0.292	0.397	0.476	0.699	0.839	0.604	0.656	0.575	0.575	0.508	0.429	0.282	0.282	0.282	0.282	0.316	0.316	0.336	0.000
Max	1.971	1.243	1.591	1.149	1.149	1.707	2.609	2.226	4.257	3.077	3.637	3.633	3.448	3.811	1.925	1.807	1.764	1.721	3.040	1.915	1.872	2.418	9.475	1.466

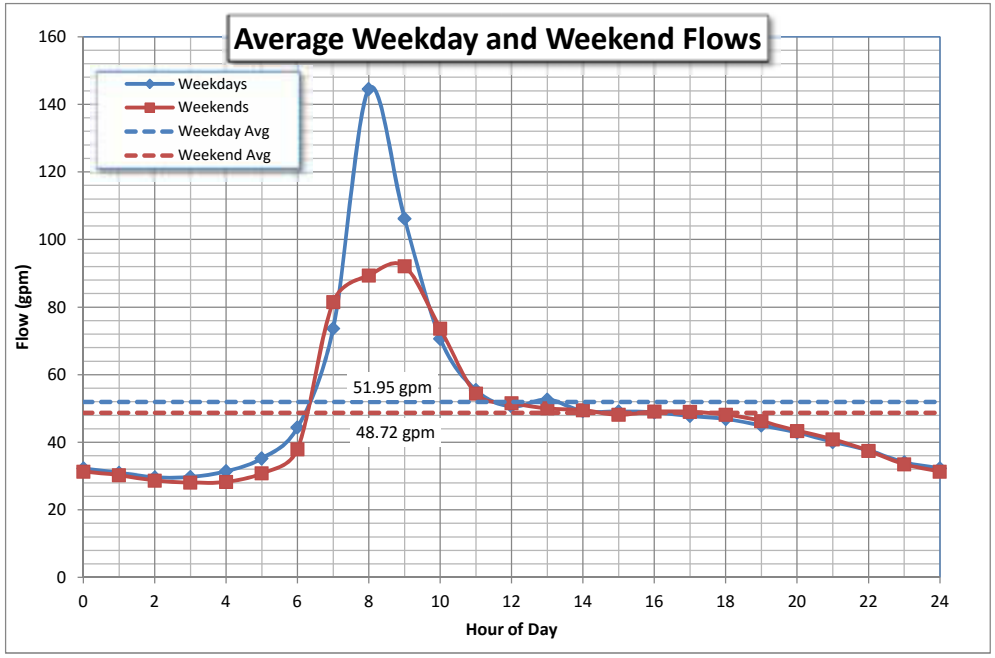


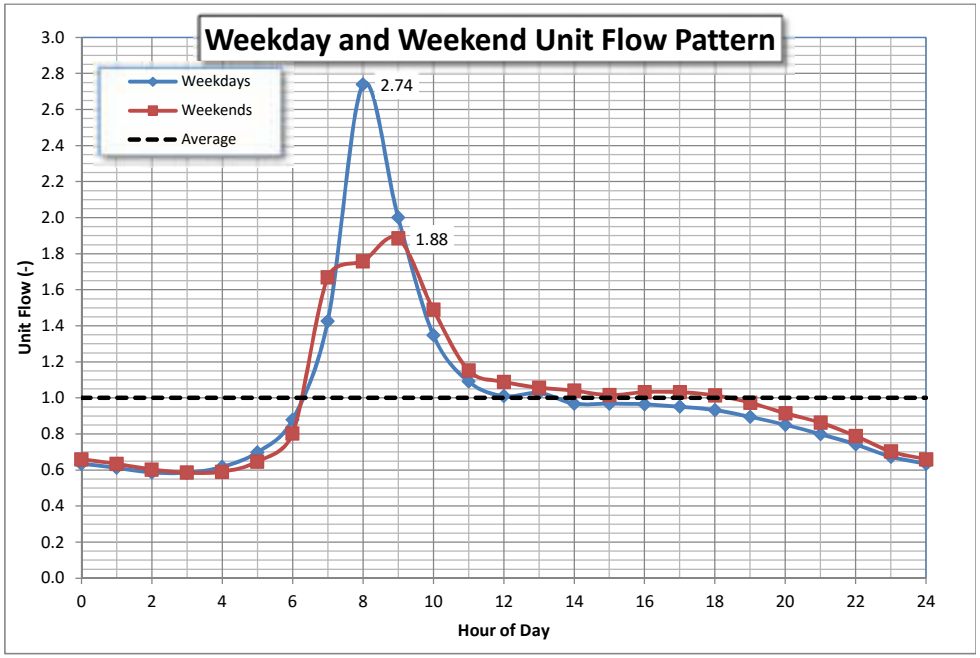


Lift Station 2 Flow Analysis Summary

Weekdays	Qavg = 51.95 gpm	PF =	2.74
Weekends	Qavg = 48.72 gpm	PF =	1.88

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	32.27	30.99	29.64	29.74	31.42	35.23	44.36	73.64	144.51	106.23	70.66	55.44	50.62	52.67	49.20	49.12	48.86	47.80	46.89	45.00	42.91	40.08	37.63	34.08
Min	16.38	16.84	14.68	14.29	14.37	15.47	23.74	27.91	30.61	33.27	34.00	30.54	35.09	31.84	30.74	28.23	34.46	27.86	30.39	30.66	26.09	26.73	23.58	20.55
Max	87.34	78.71	74.85	76.20	82.23	88.51	231.71	348.58	391.73	353.90	420.00	235.24	130.31	242.93	226.83	216.52	215.25	155.23	144.91	124.60	128.63	110.59	115.13	91.80
Weekends																								
Qavg	31.38	30.28	28.71	28.09	28.31	30.86	37.98	81.56	89.38	92.07	73.64	54.46	51.55	50.08	49.49	48.16	49.10	49.03	48.20	46.32	43.40	40.94	37.50	33.52
Min	21.66	17.76	15.92	15.96	15.70	18.11	27.67	30.95	33.32	43.26	37.85	40.49	37.52	31.67	31.63	36.38	33.48	36.75	32.79	35.60	30.51	29.68	26.56	20.89
Max	45.05	46.11	42.70	42.68	41.56	43.95	50.53	329.81	346.25	366.28	347.05	71.45	68.81	69.94	71.70	65.52	74.91	70.88	78.11	73.34	73.22	59.56	54.91	50.27
Unit Flow Summary																								
Weekdays																								
Qunit	0.635	0.612	0.587	0.585	0.618	0.699	0.880	1.425	2.738	2.001	1.347	1.091	1.010	1.028	0.969	0.968	0.965	0.951	0.933	0.895	0.851	0.799	0.742	0.673
Min	0.375	0.330	0.324	0.280	0.323	0.303	0.514	0.616	0.735	0.749	0.741	0.592	0.545	0.626	0.498	0.502	0.520	0.525	0.522	0.385	0.421	0.419	0.450	0.392
Max	0.894	0.846	0.856	0.874	1.121	1.249	4.151	6.735	7.612	6.841	6.377	4.285	1.431	2.932	1.500	1.432	1.792	1.311	1.237	1.289	1.337	1.275	1.156	0.922
Weekends																								
Qunit	0.660	0.634	0.602	0.586	0.590	0.647	0.803	1.669	1.757	1.885	1.489	1.153	1.089	1.057	1.040	1.016	1.032	1.032	1.014	0.974	0.915	0.863	0.788	0.703
Min	0.468	0.387	0.410	0.345	0.377	0.391	0.529	0.577	0.827	0.833	0.838	0.815	0.853	0.806	0.683	0.770	0.800	0.784	0.761	0.748	0.627	0.619	0.583	0.451
Max	0.863	0.864	0.807	0.788	0.774	0.815	1.067	6.049	5.284	6.795	6.390	1.787	1.384	1.344	1.290	1.266	1.353	1.277	1.381	1.232	1.246	1.251	1.098	0.920

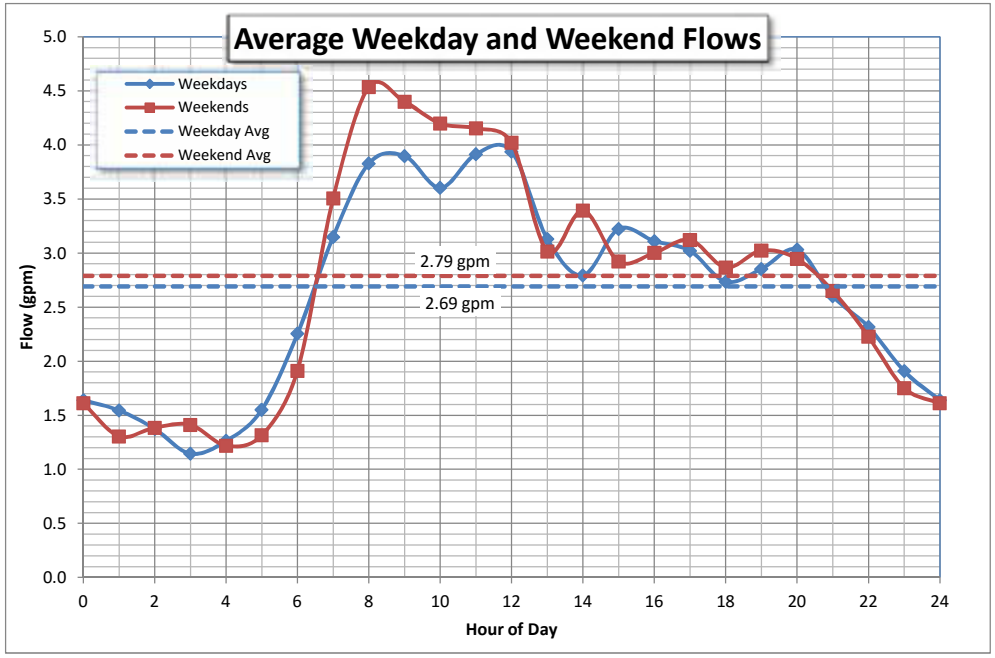


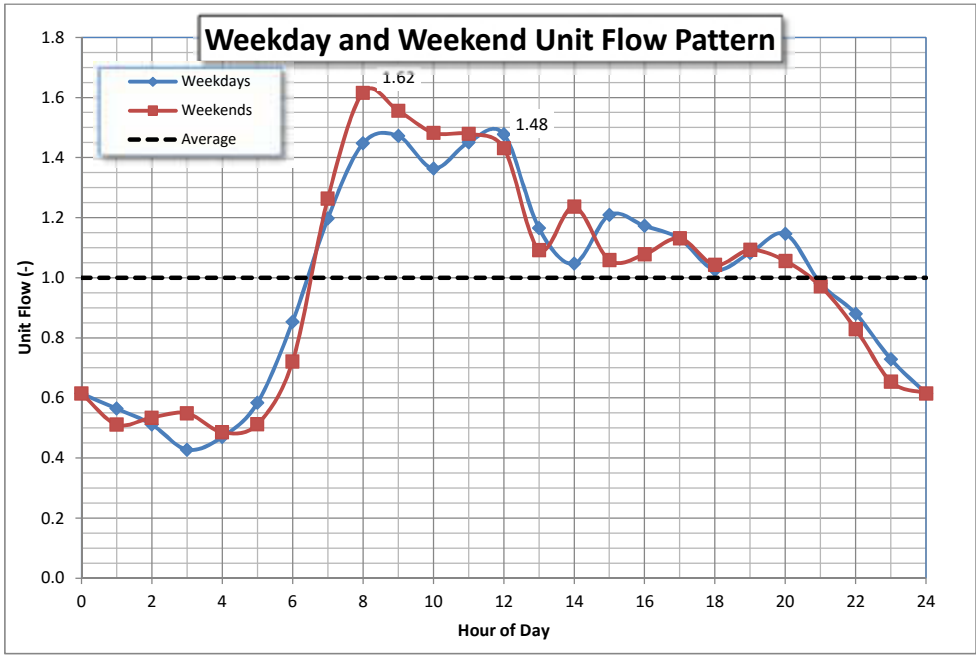


Lift Station 3 Flow Analysis Summary

Weekdays	Qavg = 2.69 gpm	PF =	1.48
Weekends	Qavg = 2.79 gpm	PF =	1.62

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	1.64	1.55	1.37	1.14	1.26	1.55	2.25	3.15	3.83	3.90	3.60	3.91	3.94	3.13	2.79	3.22	3.11	3.02	2.73	2.85	3.03	2.60	2.32	1.91
Min	0.74	0.60	0.56	0.51	0.51	0.51	1.09	1.62	1.87	1.76	1.57	1.40	1.63	1.33	1.33	1.64	1.36	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Max	3.03	5.67	4.03	2.45	2.87	3.37	4.16	4.88	6.20	7.35	5.78	8.01	8.64	6.02	6.19	6.69	5.54	5.93	5.19	5.21	6.44	4.01	4.84	3.93
Weekends																								
Qavg	1.61	1.31	1.38	1.41	1.22	1.32	1.91	3.51	4.54	4.40	4.20	4.15	4.02	3.01	3.39	2.92	3.00	3.12	2.87	3.02	2.95	2.65	2.23	1.75
Min	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Max	2.97	2.25	3.87	3.43	2.00	2.15	4.40	5.68	6.36	7.10	6.63	6.88	7.14	4.94	6.44	4.55	5.96	5.20	4.71	5.07	5.14	5.13	3.61	4.26
Unit Flow Summary																								
Weekdays																								
Qunit	0.615	0.564	0.511	0.428	0.470	0.583	0.853	1.197	1.447	1.472	1.363	1.451	1.478	1.165	1.047	1.209	1.173	1.130	1.026	1.083	1.146	0.981	0.880	0.729
Min	0.310	0.253	0.197	0.197	0.216	0.216	0.394	0.566	0.894	0.835	0.688	0.630	0.733	0.591	0.524	0.666	0.471	0.292	0.292	0.292	0.292	0.292	0.292	0.292
Max	1.242	1.634	1.469	0.891	0.988	1.243	1.508	2.054	2.171	2.721	2.560	3.470	3.008	1.884	2.497	2.353	1.865	1.946	1.677	1.862	2.747	1.568	2.177	1.685
Weekends																								
Qunit	0.615	0.512	0.534	0.549	0.486	0.513	0.721	1.263	1.616	1.556	1.483	1.479	1.432	1.092	1.236	1.058	1.078	1.131	1.042	1.092	1.056	0.972	0.829	0.654
Min	0.230	0.230	0.230	0.259	0.234	0.234	0.323	0.620	1.000	0.917	0.974	0.898	0.667	0.676	0.729	0.644	0.499	0.506	0.556	0.697	0.680	0.532	0.443	0.330
Max	1.042	1.000	1.258	1.174	1.000	1.000	1.716	1.937	2.546	2.524	2.031	2.290	2.444	1.691	2.102	1.617	1.847	1.930	1.577	1.736	1.610	1.607	1.237	1.314

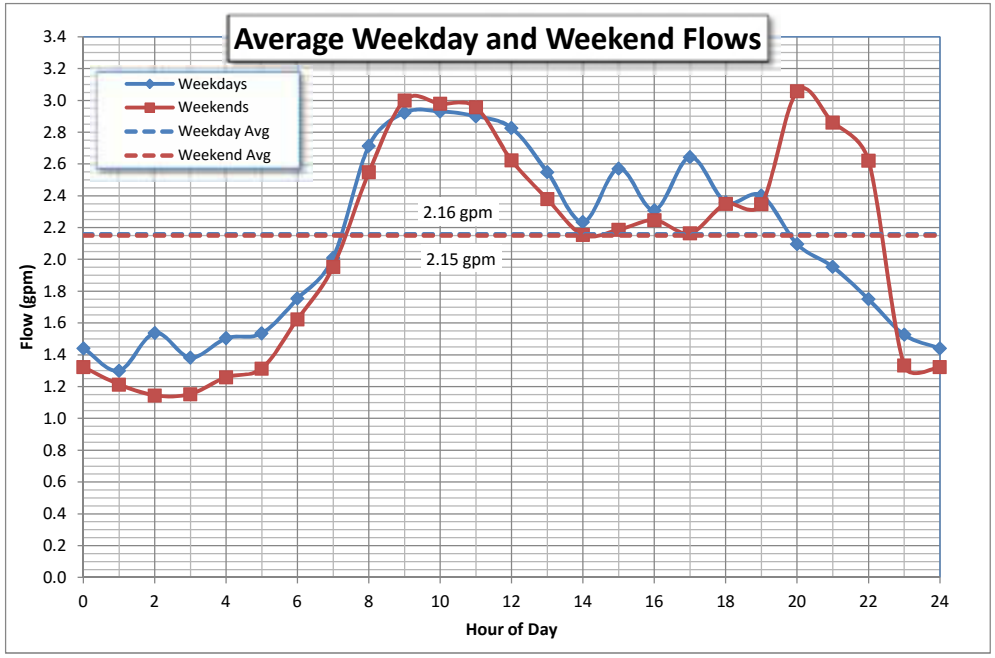


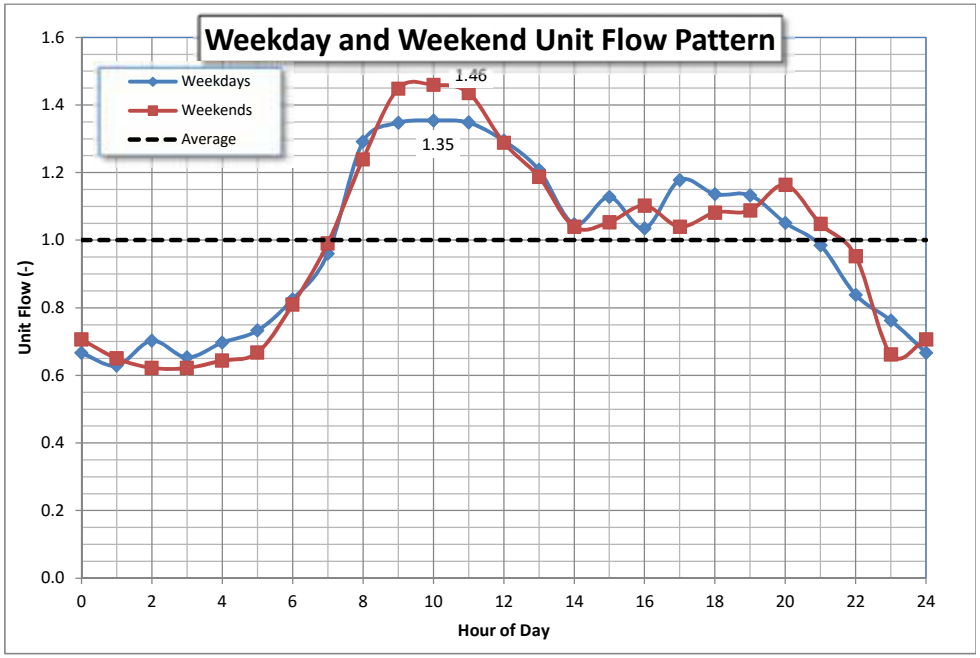


Lift Station 4 Flow Analysis Summary

Weekdays	Qavg = 2.16 gpm	PF = 1.35
Weekends	Qavg = 2.15 gpm	PF = 1.46

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	1.44	1.30	1.54	1.38	1.50	1.54	1.75	2.01	2.71	2.92	2.93	2.90	2.83	2.55	2.23	2.57	2.31	2.64	2.36	2.40	2.10	1.95	1.75	1.53
Min	0.01	0.01	0.27	0.27	0.27	0.27	0.27	0.27	0.29	0.29	0.29	0.29	0.29	0.78	0.78	0.78	0.78	0.78	0.64	0.64	0.64	0.01	0.01	0.01
Max	7.03	5.66	13.25	6.84	7.79	7.03	9.08	9.08	21.04	21.04	21.04	18.98	18.98	14.28	14.28	26.63	18.74	18.74	14.28	14.28	6.90	7.00	8.62	7.10
Weekends																								
Qavg	1.32	1.21	1.15	1.15	1.26	1.31	1.62	1.95	2.55	3.00	2.98	2.96	2.62	2.38	2.15	2.19	2.25	2.16	2.35	2.35	3.06	2.86	2.62	1.33
Min	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Max	3.97	2.43	2.43	2.46	5.03	5.03	4.62	4.62	6.15	8.35	8.88	7.78	7.22	6.98	6.38	8.61	5.07	6.23	7.05	7.05	35.84	35.84	35.84	6.07
Unit Flow Summary																								
Weekdays																								
Qunit	0.667	0.629	0.702	0.653	0.697	0.733	0.825	0.960	1.291	1.347	1.354	1.348	1.294	1.208	1.047	1.128	1.035	1.178	1.136	1.133	1.051	0.985	0.838	0.762
Min	0.006	0.006	0.151	0.151	0.151	0.151	0.151	0.151	0.416	0.416	0.416	0.382	0.382	0.382	0.364	0.364	0.364	0.364	0.173	0.173	0.139	0.006	0.006	0.006
Max	1.530	1.177	6.596	1.605	1.306	1.651	1.584	2.678	5.355	5.355	5.355	6.078	6.078	5.352	2.570	10.587	2.761	5.704	2.439	3.149	2.254	3.393	1.730	2.447
Weekends																								
Qunit	0.707	0.650	0.622	0.622	0.644	0.667	0.809	0.991	1.240	1.448	1.459	1.436	1.289	1.187	1.039	1.053	1.102	1.040	1.082	1.088	1.163	1.048	0.952	0.662
Min	0.225	0.225	0.225	0.225	0.251	0.251	0.338	0.357	0.567	0.571	0.510	0.510	0.510	0.272	0.272	0.272	0.272	0.272	0.330	0.330	0.330	0.330	0.294	0.162
Max	2.028	1.408	1.408	1.408	1.408	1.408	2.378	2.445	2.445	2.727	2.898	3.568	3.528	3.528	2.748	2.748	2.748	2.506	2.321	2.110	4.690	4.690	4.690	1.408

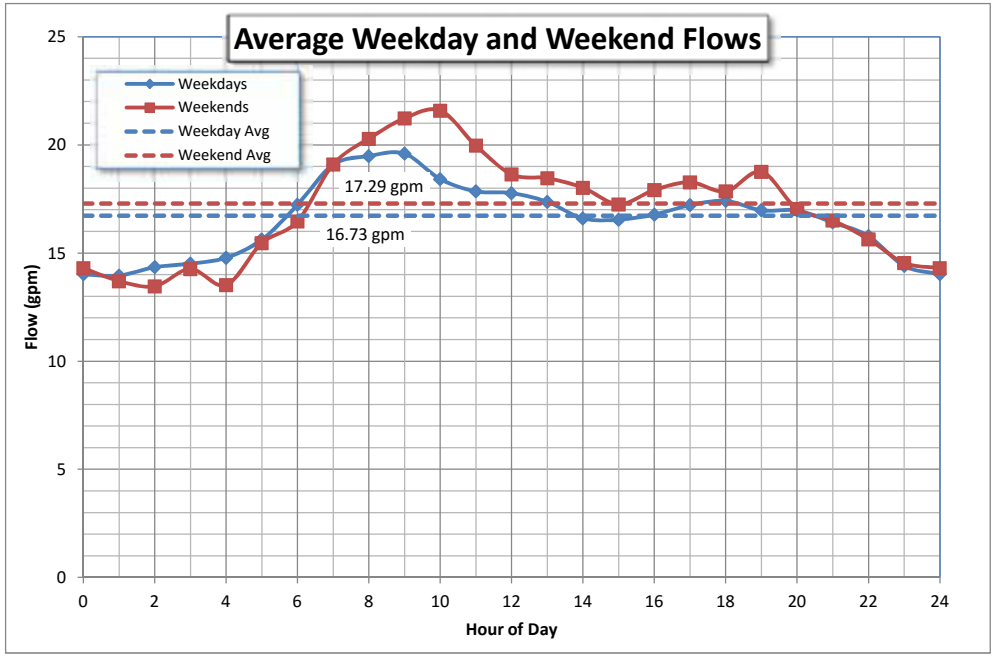


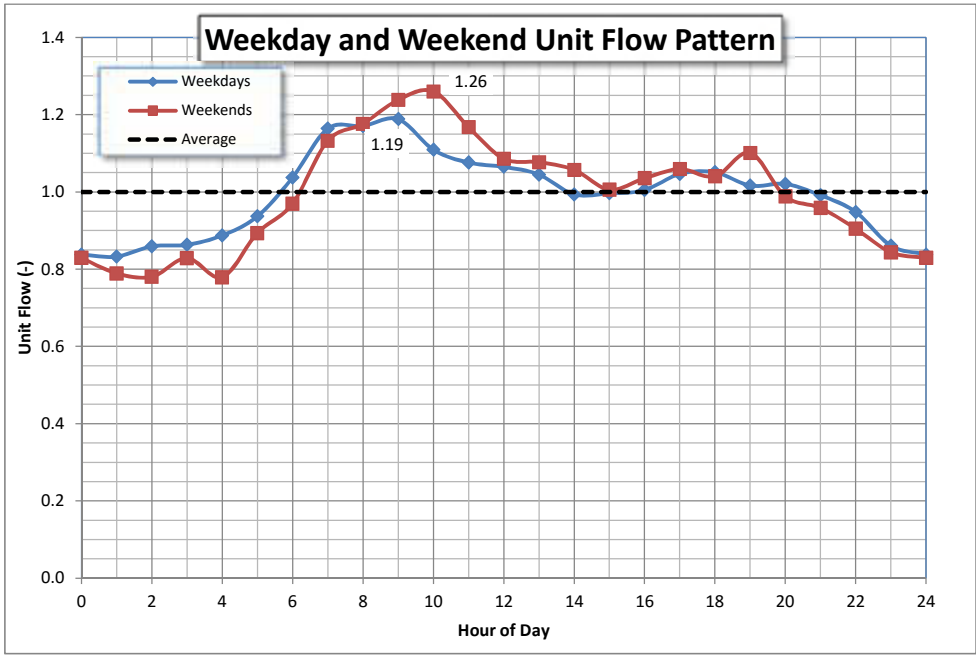


Lift Station 5 Flow Analysis Summary

Weekdays	Qavg = 16.73 gpm	PF =	1.19
Weekends	Qavg = 17.29 gpm	PF =	1.26

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	14.02	13.96	14.35	14.51	14.78	15.62	17.24	19.08	19.48	19.59	18.42	17.85	17.77	17.37	16.60	16.54	16.78	17.22	17.41	16.97	16.96	16.41	15.78	14.41
Min	7.69	7.05	7.08	6.97	7.71	8.43	8.88	11.61	10.85	10.42	10.25	9.08	9.75	10.06	9.62	8.91	9.45	9.14	9.72	9.00	8.75	8.77	8.83	8.05
Max	27.38	23.30	25.13	28.19	34.71	26.05	30.93	30.20	32.92	30.49	34.23	30.56	28.79	35.55	26.50	26.48	27.42	30.02	27.59	28.17	28.21	28.17	30.22	25.39
Weekends																								
Qavg	14.31	13.70	13.47	14.26	13.51	15.46	16.47	19.10	20.29	21.22	21.59	19.96	18.64	18.46	18.02	17.25	17.92	18.27	17.85	18.76	17.04	16.50	15.64	14.55
Min	7.63	7.10	6.77	7.43	7.68	7.13	10.71	11.49	13.56	13.24	12.87	11.35	10.73	10.71	10.58	10.71	8.72	9.92	10.69	10.67	9.49	8.96	6.87	8.41
Max	23.11	25.41	21.33	22.91	21.70	24.16	25.29	28.42	31.18	30.66	32.32	33.75	29.73	27.38	29.54	26.65	29.27	34.64	28.31	28.02	28.04	26.17	24.71	24.35
Unit Flow Summary																								
Weekdays																								
Qunit	0.838	0.833	0.859	0.863	0.887	0.937	1.037	1.164	1.171	1.188	1.109	1.076	1.065	1.045	0.993	0.996	1.005	1.046	1.051	1.016	1.021	0.991	0.948	0.861
Min	0.656	0.591	0.519	0.585	0.682	0.655	0.714	0.896	0.827	0.874	0.845	0.800	0.778	0.814	0.693	0.738	0.778	0.816	0.760	0.759	0.711	0.730	0.682	0.627
Max	1.460	1.266	1.458	1.515	2.653	1.884	1.674	2.275	1.727	2.043	1.729	1.742	1.951	2.129	1.754	1.690	1.694	2.042	2.002	2.017	1.583	2.140	1.765	1.247
Weekends																								
Qunit	0.829	0.789	0.780	0.829	0.779	0.893	0.970	1.133	1.176	1.238	1.260	1.168	1.086	1.077	1.057	1.006	1.035	1.059	1.040	1.101	0.988	0.958	0.904	0.844
Min	0.460	0.467	0.408	0.566	0.556	0.543	0.743	0.811	0.901	0.988	0.929	0.903	0.828	0.820	0.721	0.765	0.780	0.755	0.818	0.819	0.723	0.640	0.523	0.566
Max	1.416	1.391	1.186	1.554	1.229	1.476	1.872	1.945	1.504	1.781	2.171	2.442	1.384	1.570	1.897	1.613	1.591	1.904	1.640	2.020	1.341	1.346	1.363	1.425



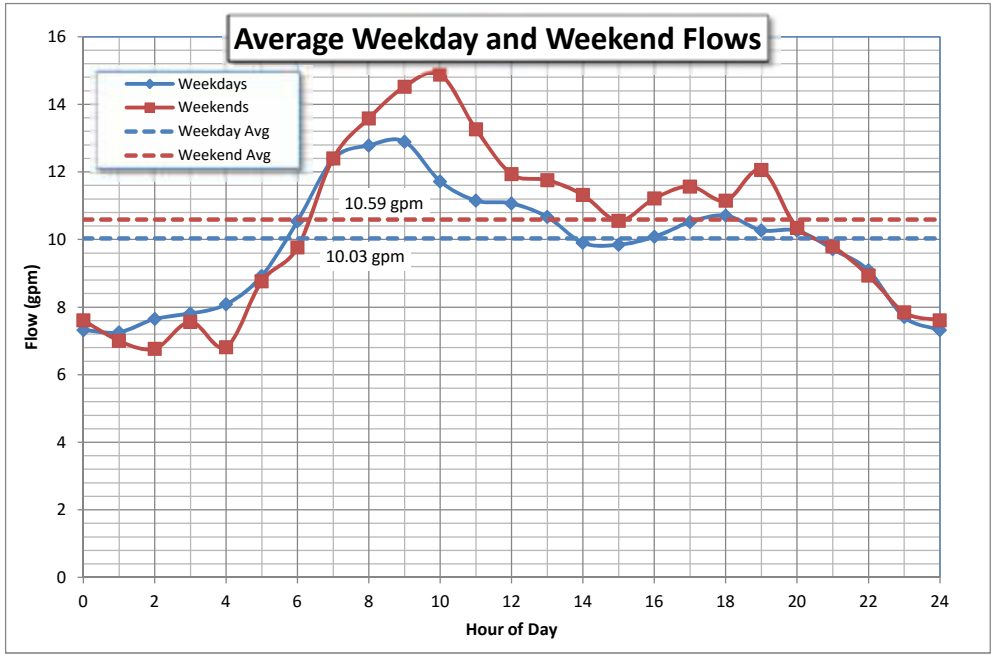


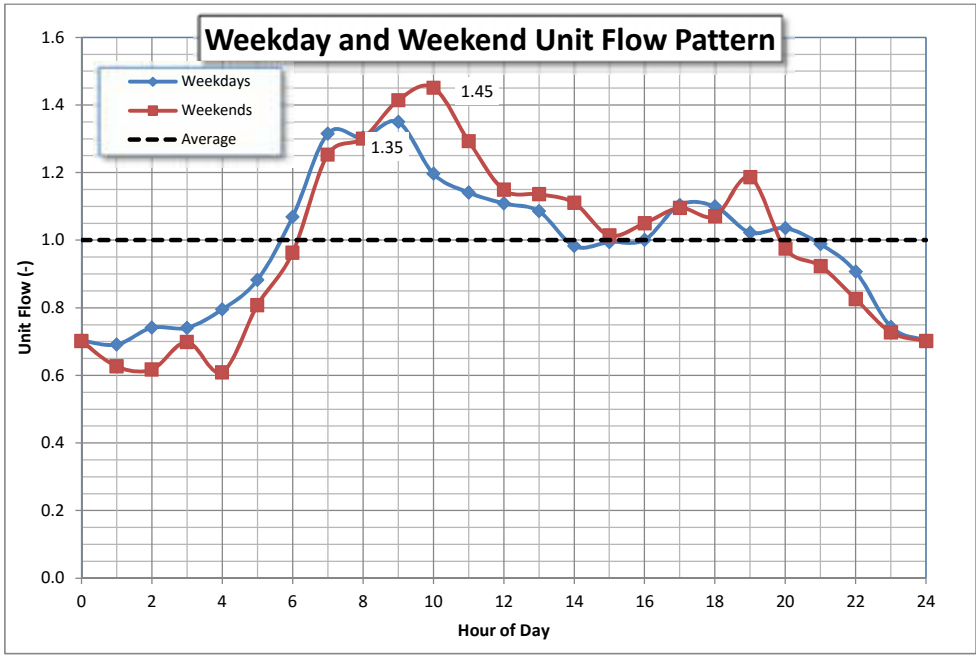
Lift Station 5 Flow Analysis Summary

WWI =	6.7 gpm

Weekdays	Qavg = 10.03 gpm	PF =	1.35
Weekends	Qavg = 10.59 gpm	PF =	1.45

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	7.32	7.26	7.65	7.81	8.08	8.92	10.54	12.38	12.78	12.89	11.72	11.15	11.07	10.67	9.90	9.84	10.08	10.52	10.71	10.27	10.26	9.71	9.08	7.71
Min	0.99	0.35	0.38	0.27	1.01	1.73	2.18	4.91	4.15	3.72	3.55	2.38	3.05	3.36	2.92	2.21	2.75	2.44	3.02	2.30	2.05	2.07	2.13	1.35
Max	20.68	16.60	18.43	21.49	28.01	19.35	24.23	23.50	26.22	23.79	27.53	23.86	22.09	28.85	19.80	19.78	20.72	23.32	20.89	21.47	21.51	21.47	23.52	18.69
Weekends																								
Qavg	7.61	7.00	6.77	7.56	6.81	8.76	9.77	12.40	13.59	14.52	14.89	13.26	11.94	11.76	11.32	10.55	11.22	11.57	11.15	12.06	10.34	9.80	8.94	7.85
Min	0.93	0.40	0.07	0.73	0.98	0.43	4.01	4.79	6.86	6.54	6.17	4.65	4.03	4.01	3.88	4.01	2.02	3.22	3.99	3.97	2.79	2.26	0.17	1.71
Max	16.41	18.71	14.63	16.21	15.00	17.46	18.59	21.72	24.48	23.96	25.62	27.05	23.03	20.68	22.84	19.95	22.57	27.94	21.61	21.32	21.34	19.47	18.01	17.65
Unit Flow Summary																								
Weekdays																								
Qunit	0.703	0.691	0.741	0.741	0.795	0.882	1.069	1.315	1.304	1.350	1.196	1.141	1.109	1.085	0.983	0.995	1.001	1.104	1.100	1.022	1.036	0.988	0.907	0.744
Min	0.196	0.066	0.070	0.051	0.241	0.333	0.380	0.789	0.741	0.713	0.700	0.528	0.542	0.636	0.407	0.440	0.518	0.583	0.556	0.505	0.441	0.390	0.427	0.236
Max	2.144	1.527	2.068	1.995	4.389	2.725	2.744	3.968	2.483	3.594	2.554	2.929	2.949	3.810	2.723	2.512	2.504	3.706	3.266	3.256	2.189	3.337	2.785	1.490
Weekends																								
Qunit	0.702	0.627	0.617	0.699	0.609	0.807	0.963	1.254	1.301	1.414	1.452	1.293	1.149	1.136	1.110	1.014	1.050	1.095	1.071	1.186	0.975	0.923	0.826	0.728
Min	0.095	0.062	0.007	0.114	0.138	0.067	0.634	0.674	0.853	0.983	0.895	0.821	0.643	0.680	0.532	0.585	0.452	0.501	0.668	0.630	0.434	0.350	0.027	0.272
Max	1.807	1.757	1.369	2.017	1.400	1.917	2.730	3.018	1.773	2.741	3.391	3.800	1.744	2.163	2.916	2.267	1.929	2.430	2.307	3.134	1.614	1.632	1.609	1.782

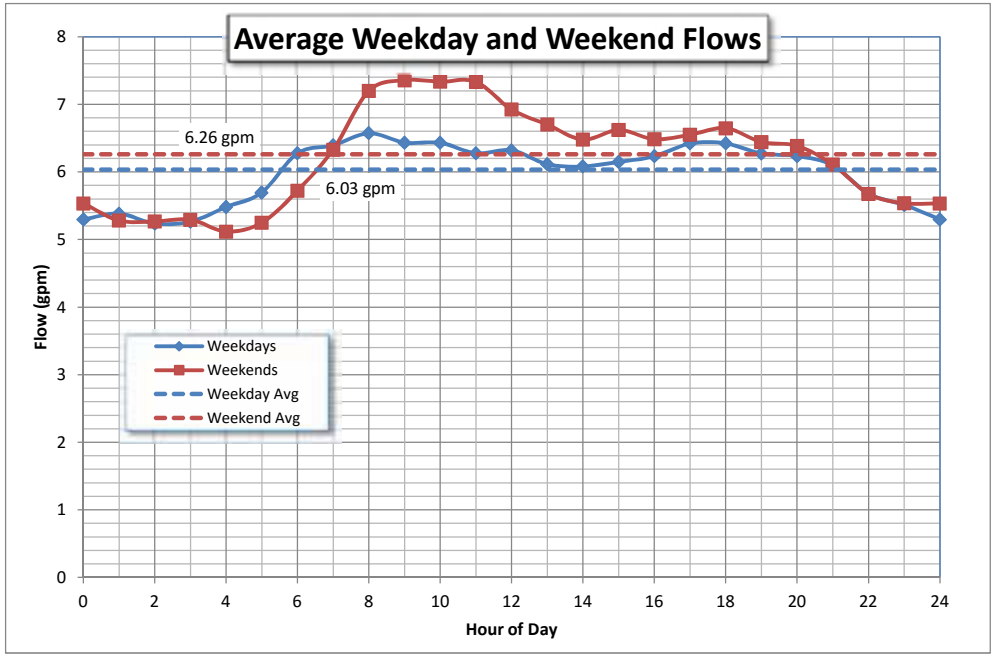


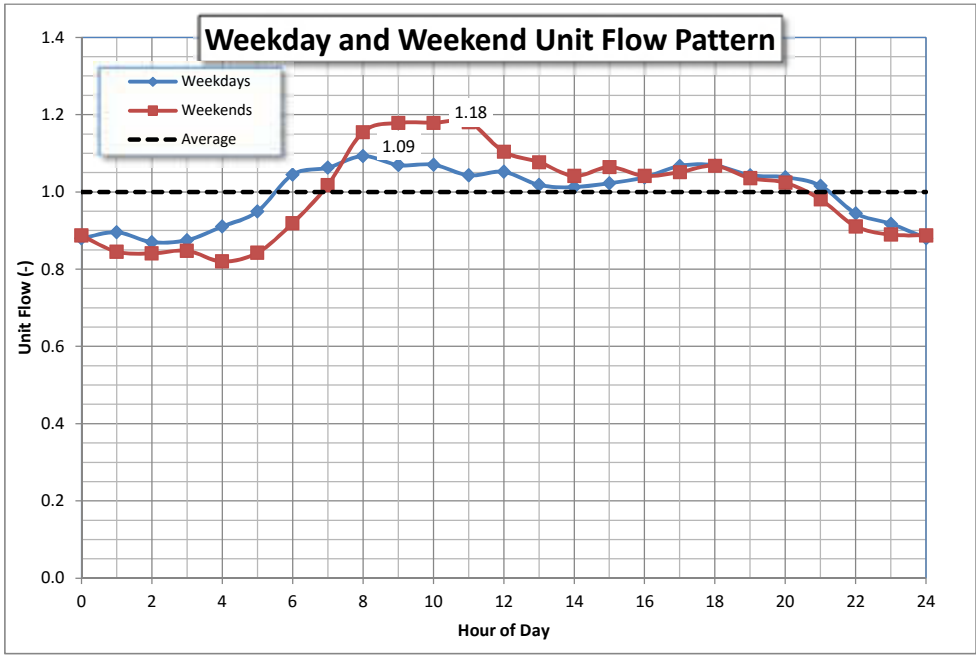


Lift Station 6 Flow Analysis Summary

Weekdays	Qavg = 6.03 gpm	PF =	1.09
Weekends	Qavg = 6.26 gpm	PF =	1.18

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	5.30	5.38	5.24	5.26	5.48	5.70	6.28	6.39	6.57	6.43	6.43	6.28	6.32	6.12	6.08	6.15	6.23	6.42	6.42	6.27	6.24	6.10	5.68	5.51
Min	3.32	2.91	3.18	3.15	3.57	3.16	4.56	4.44	3.61	4.00	4.15	3.89	3.63	3.87	3.85	4.46	3.96	4.46	4.53	4.45	4.49	4.23	3.45	3.86
Max	7.05	8.89	6.75	7.05	9.96	9.01	8.79	8.87	9.10	9.61	10.21	8.66	8.04	7.79	8.41	8.39	8.80	9.17	10.17	8.54	8.73	7.80	7.90	7.25
Weekends																								
Qavg	5.53	5.28	5.27	5.29	5.12	5.25	5.72	6.33	7.20	7.36	7.33	7.33	6.92	6.70	6.48	6.62	6.48	6.55	6.65	6.44	6.38	6.11	5.68	5.54
Min	4.06	3.71	3.63	3.68	3.85	3.59	4.14	3.63	4.96	4.53	4.90	5.39	4.13	5.04	4.81	4.77	4.61	4.54	4.99	4.70	4.78	3.75	4.03	3.32
Max	8.01	7.37	8.80	8.14	7.52	6.39	7.49	8.48	9.93	10.46	9.15	9.89	10.92	9.66	8.09	8.23	8.34	8.25	9.05	8.43	8.28	8.35	7.02	7.15
Unit Flow Summary																								
Weekdays																								
Qunit	0.880	0.895	0.870	0.875	0.910	0.949	1.045	1.062	1.093	1.070	1.070	1.043	1.052	1.018	1.012	1.023	1.038	1.067	1.069	1.043	1.038	1.016	0.944	0.917
Min	0.601	0.590	0.654	0.607	0.745	0.617	0.835	0.854	0.752	0.778	0.868	0.696	0.747	0.752	0.688	0.844	0.792	0.748	0.810	0.821	0.807	0.793	0.730	0.763
Max	1.255	1.365	1.062	1.260	1.362	1.371	1.369	1.410	1.417	1.501	1.484	1.347	1.352	1.260	1.376	1.304	1.509	1.460	1.473	1.295	1.581	1.315	1.260	1.315
Weekends																								
Qunit	0.888	0.845	0.841	0.847	0.820	0.843	0.919	1.018	1.155	1.179	1.179	1.181	1.104	1.077	1.041	1.064	1.041	1.051	1.068	1.036	1.024	0.981	0.911	0.890
Min	0.707	0.625	0.659	0.647	0.687	0.670	0.742	0.712	0.922	0.831	0.943	0.897	0.795	0.843	0.850	0.841	0.888	0.826	0.888	0.857	0.843	0.735	0.737	0.656
Max	1.125	1.101	1.236	1.196	1.057	1.162	1.101	1.302	1.428	1.502	1.397	1.519	1.521	1.669	1.509	1.384	1.249	1.367	1.349	1.527	1.283	1.190	1.077	1.127



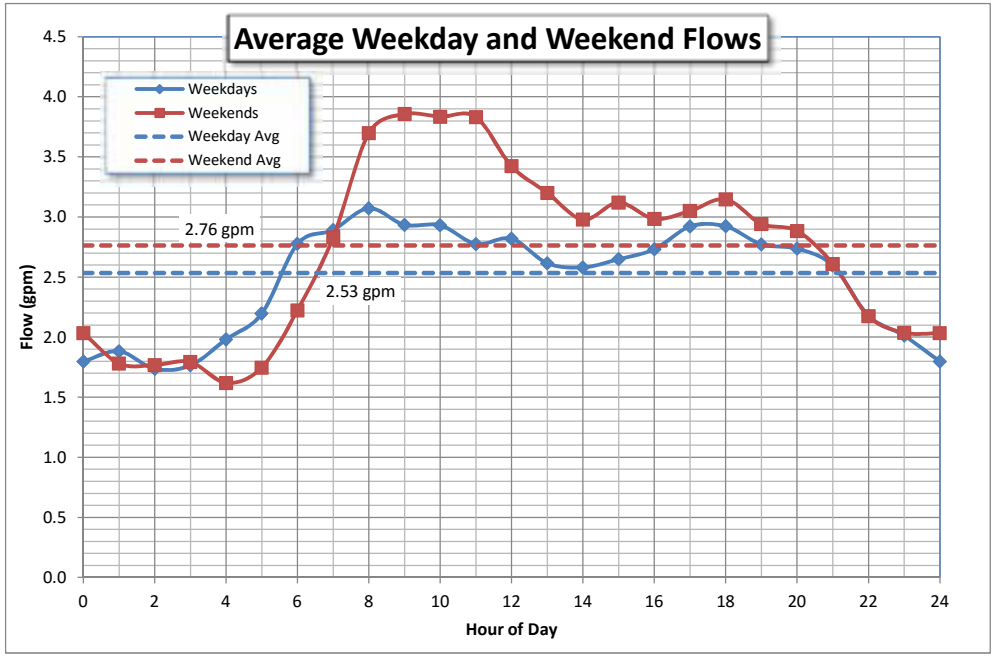


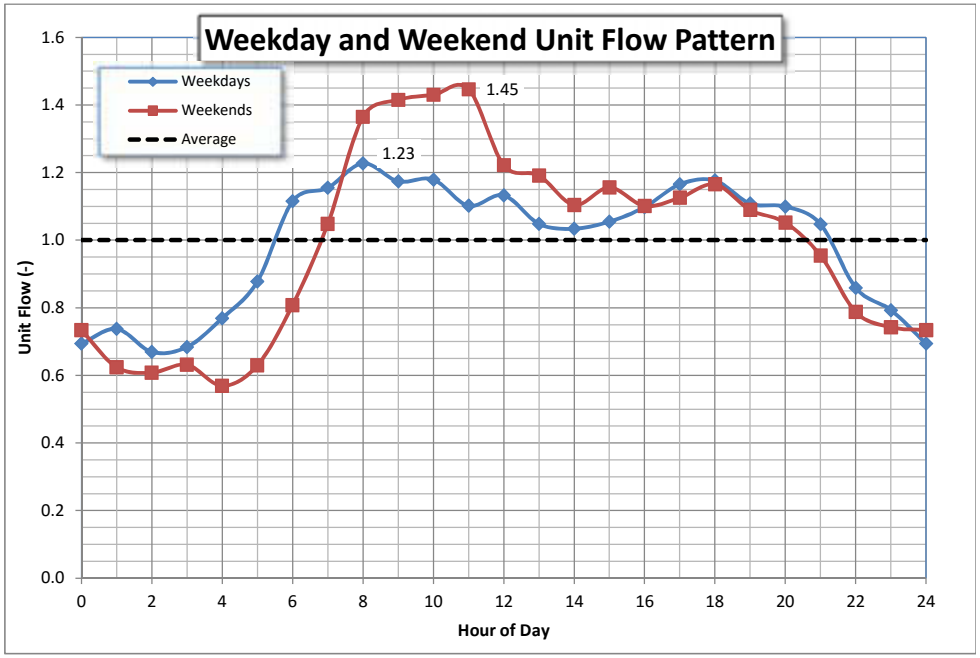
Lift Station 6 Flow Analysis Summary

WWI =	3.5 gpm

Weekdays	Qavg = 2.53 gpm	PF = 1.23
Weekends	Qavg = 2.76 gpm	PF = 1.45

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	1.80	1.88	1.74	1.76	1.98	2.20	2.78	2.89	3.07	2.93	2.93	2.78	2.82	2.62	2.58	2.65	2.73	2.92	2.92	2.77	2.74	2.60	2.18	2.01
Min	-0.18	-0.59	-0.32	-0.35	0.07	-0.34	1.06	0.94	0.11	0.50	0.65	0.39	0.13	0.37	0.35	0.96	0.46	0.96	1.03	0.95	0.99	0.73	-0.05	0.36
Max	3.55	5.39	3.25	3.55	6.46	5.51	5.29	5.37	5.60	6.11	6.71	5.16	4.54	4.29	4.91	4.89	5.30	5.67	6.67	5.04	5.23	4.30	4.40	3.75
Weekends																								
Qavg	2.03	1.78	1.77	1.79	1.62	1.75	2.22	2.83	3.70	3.86	3.83	3.83	3.42	3.20	2.98	3.12	2.98	3.05	3.15	2.94	2.88	2.61	2.18	2.04
Min	0.56	0.21	0.13	0.18	0.35	0.09	0.64	0.13	1.46	1.03	1.40	1.89	0.63	1.54	1.31	1.27	1.11	1.04	1.49	1.20	1.28	0.25	0.53	-0.18
Max	4.51	3.87	5.30	4.64	4.02	2.89	3.99	4.98	6.43	6.96	5.65	6.39	7.42	6.16	4.59	4.73	4.84	4.75	5.55	4.93	4.78	4.85	3.52	3.65
Unit Flow Summary																								
Weekdays																								
Qunit	0.694	0.737	0.670	0.684	0.769	0.878	1.115	1.155	1.227	1.174	1.179	1.102	1.133	1.048	1.034	1.055	1.098	1.165	1.176	1.108	1.099	1.047	0.859	0.793
Min	-0.092	-0.408	-0.234	-0.207	0.056	-0.214	0.646	0.604	0.085	0.304	0.530	0.188	0.097	0.223	0.165	0.556	0.309	0.390	0.493	0.579	0.540	0.398	-0.038	0.241
Max	1.682	1.788	1.144	1.696	1.693	2.047	2.015	2.135	2.109	2.666	2.004	1.793	2.353	1.783	2.127	1.742	2.608	2.128	2.312	1.675	2.587	1.975	1.692	1.863
Weekends																								
Qunit	0.734	0.624	0.608	0.631	0.569	0.630	0.808	1.048	1.365	1.415	1.430	1.447	1.222	1.191	1.104	1.156	1.101	1.125	1.165	1.089	1.052	0.955	0.788	0.743
Min	0.316	0.130	0.073	0.115	0.168	0.046	0.410	0.082	0.805	0.641	0.824	0.785	0.371	0.657	0.606	0.681	0.656	0.531	0.736	0.700	0.609	0.155	0.333	-0.116
Max	1.298	1.211	1.465	1.404	1.111	1.448	1.212	1.897	2.249	2.122	2.049	2.503	2.018	2.693	2.621	2.047	1.572	2.171	1.931	2.524	1.617	1.437	1.229	1.405



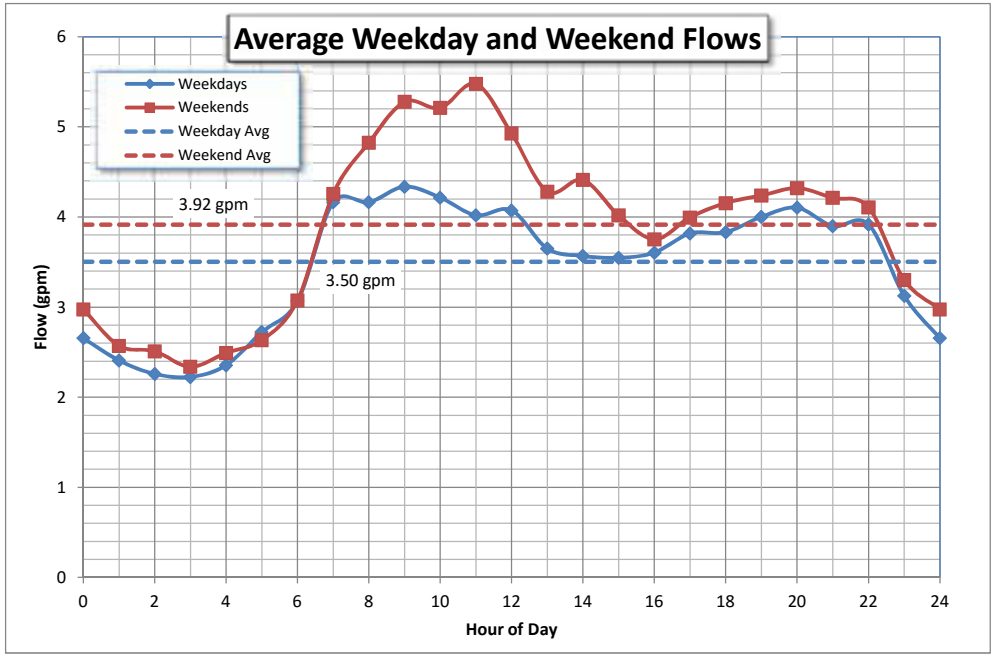


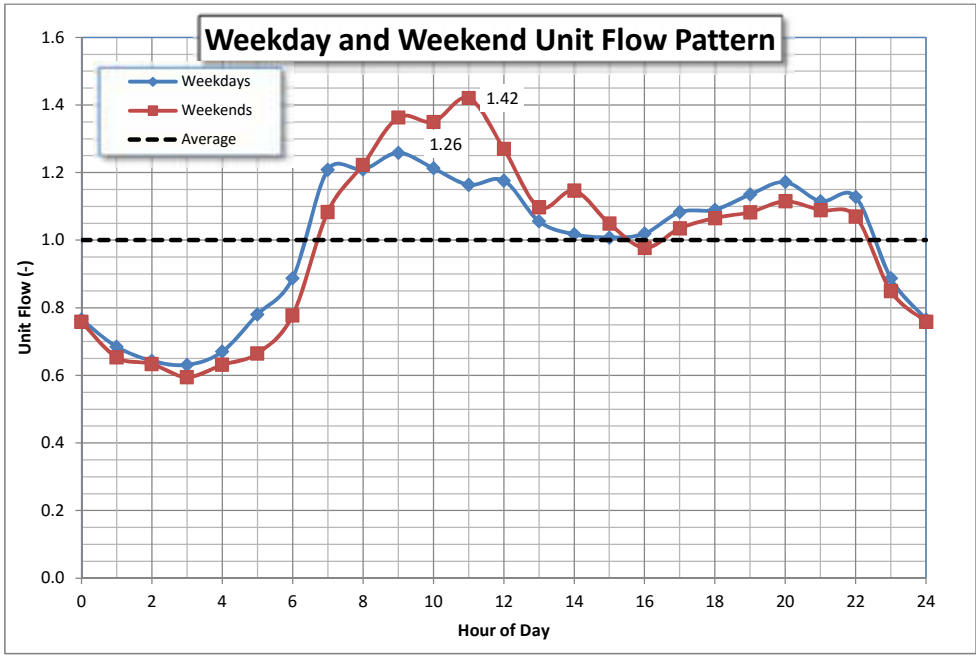
Lift Station 8 Flow Analysis Summary

WWI =	0.0 gpm

Weekdays	Qavg = 3.50 gpm	PF = 1.26
Weekends	Qavg = 3.92 gpm	PF = 1.42

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	2.65	2.41	2.26	2.22	2.36	2.72	3.07	4.16	4.16	4.34	4.21	4.02	4.07	3.65	3.57	3.55	3.61	3.82	3.83	4.00	4.10	3.90	3.92	3.13
Min	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Max	6.55	7.00	6.87	6.83	7.52	7.40	8.07	11.80	10.72	13.83	13.01	10.26	9.83	8.24	7.83	7.54	8.11	8.99	11.63	11.54	10.46	9.63	8.94	9.98
Weekends																								
Qavg	2.97	2.57	2.51	2.34	2.49	2.63	3.07	4.26	4.82	5.28	5.21	5.48	4.93	4.28	4.41	4.02	3.75	4.00	4.15	4.24	4.32	4.21	4.11	3.30
Min	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Max	6.96	6.87	6.44	5.66	7.13	8.65	10.03	13.15	15.52	12.64	12.59	11.99	13.59	12.06	10.31	8.58	8.35	8.32	10.17	11.95	9.61	8.62	9.53	8.36
Unit Flow Summary																								
Weekdays																								
Qunit	0.765	0.685	0.643	0.631	0.670	0.780	0.887	1.208	1.209	1.258	1.213	1.164	1.176	1.056	1.017	1.008	1.019	1.083	1.090	1.135	1.172	1.115	1.127	0.888
Min	0.542	0.489	0.417	0.469	0.373	0.514	0.523	0.590	0.590	0.590	0.817	0.800	0.816	0.706	0.716	0.728	0.690	0.798	0.802	0.769	0.755	0.695	0.578	0.612
Max	1.139	0.963	0.944	0.939	1.059	1.295	1.388	1.683	1.697	2.022	1.977	1.579	1.600	1.513	1.324	1.453	1.551	1.423	1.841	1.848	1.666	1.694	1.761	1.647
Weekends																								
Qunit	0.758	0.654	0.634	0.595	0.631	0.665	0.778	1.083	1.223	1.363	1.350	1.421	1.271	1.097	1.146	1.049	0.978	1.035	1.065	1.083	1.115	1.089	1.070	0.849
Min	0.473	0.398	0.511	0.279	0.422	0.500	0.524	0.717	0.809	0.938	0.892	1.012	1.060	0.819	0.691	0.797	0.642	0.685	0.753	0.812	0.854	0.823	0.708	0.574
Max	0.933	0.860	0.939	0.807	1.049	1.272	1.158	1.515	1.788	1.758	1.872	1.870	1.799	1.652	1.641	1.571	1.301	1.312	1.382	1.421	1.648	1.347	1.607	1.208



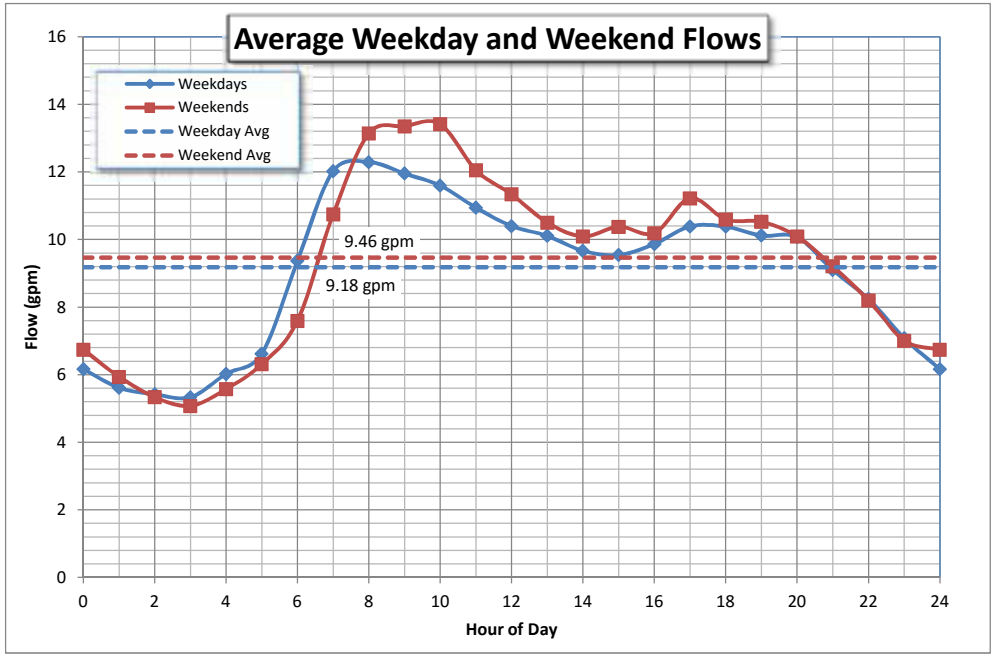


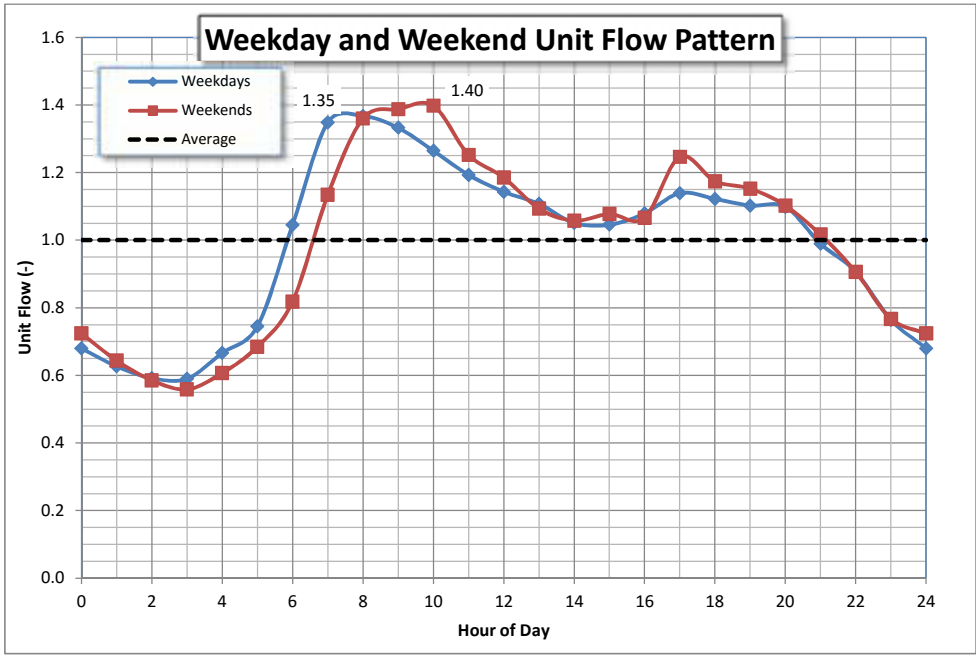
Lift Station 9 Flow Analysis Summary

WWI =	0.0 gpm

Weekdays	Qavg = 9.18 gpm	PF =	1.37
Weekends	Qavg = 9.46 gpm	PF =	1.40

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	6.16	5.61	5.42	5.33	6.03	6.62	9.37	12.02	12.29	11.95	11.60	10.94	10.40	10.11	9.66	9.54	9.87	10.39	10.38	10.12	10.07	9.09	8.24	7.08
Min	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Max	18.27	18.14	15.02	15.20	21.21	15.44	21.03	26.35	28.30	23.37	30.12	24.85	21.27	22.02	24.24	19.95	22.86	20.23	28.23	23.97	18.97	23.24	17.24	19.42
Weekends																								
Qavg	6.74	5.94	5.34	5.07	5.57	6.31	7.60	10.74	13.14	13.35	13.41	12.05	11.34	10.50	10.09	10.38	10.19	11.22	10.59	10.52	10.09	9.21	8.20	7.01
Min	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Max	10.91	11.74	9.70	11.38	12.41	11.80	12.99	20.25	26.29	22.49	22.74	19.56	18.67	17.60	16.11	20.03	16.09	16.90	16.49	17.96	16.22	18.39	13.26	11.55
Unit Flow Summary																								
Weekdays																								
Qunit	0.680	0.627	0.592	0.590	0.666	0.745	1.045	1.348	1.368	1.333	1.264	1.193	1.143	1.108	1.051	1.046	1.079	1.139	1.122	1.102	1.099	0.990	0.906	0.764
Min	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.077	0.169	0.169	0.169	0.169	0.169	0.169	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044
Max	1.991	2.173	1.547	1.547	2.264	2.264	2.577	4.248	2.855	3.410	2.073	1.964	1.898	1.909	1.619	2.004	1.772	1.720	1.819	2.264	1.977	1.584	1.716	1.850
Weekends																								
Qunit	0.724	0.644	0.586	0.558	0.607	0.685	0.819	1.134	1.360	1.388	1.398	1.253	1.185	1.093	1.058	1.077	1.066	1.247	1.174	1.153	1.102	1.017	0.906	0.767
Min	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.870	0.711	0.202	0.202	0.202	0.202	0.202
Max	1.237	1.057	1.126	1.000	1.000	1.006	1.177	1.741	1.986	1.992	2.563	1.816	1.569	1.582	1.448	1.800	1.532	4.410	3.759	3.628	3.062	3.110	2.712	1.491



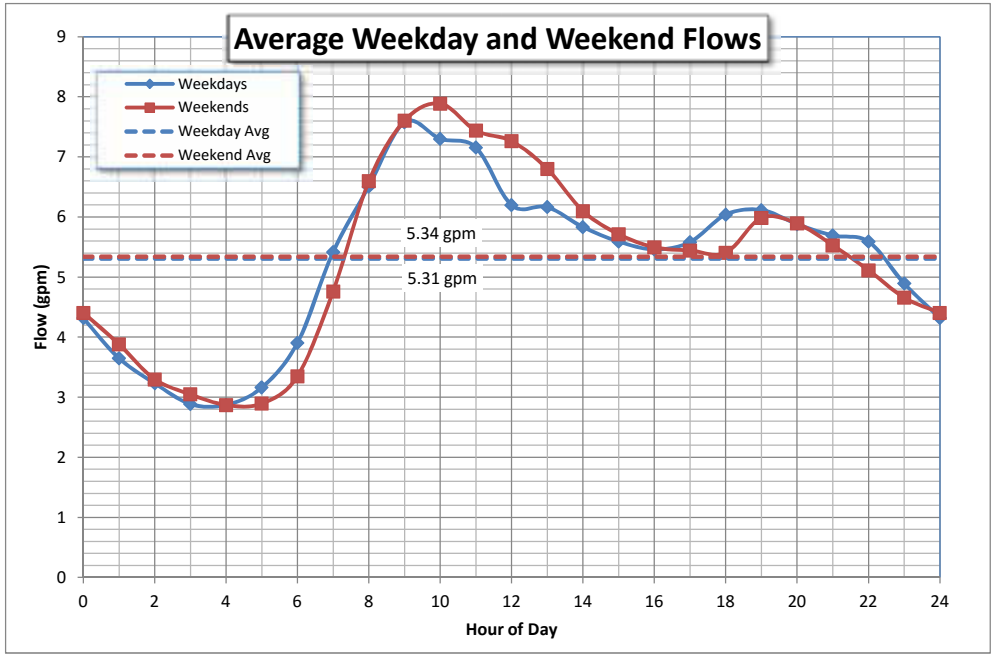


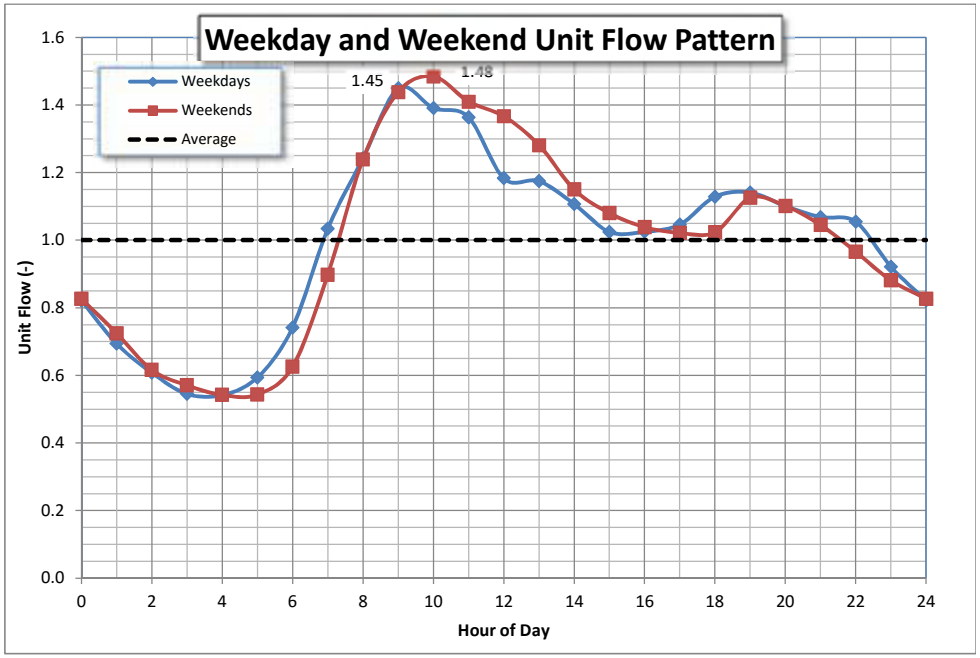
Lift Station 10 Flow Analysis Summary

WWI =	0.0 gpm

Weekdays	Qavg = 5.31 gpm	PF =	1.45
Weekends	Qavg = 5.34 gpm	PF =	1.48

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	4.32	3.65	3.23	2.89	2.87	3.16	3.90	5.42	6.51	7.58	7.30	7.16	6.20	6.17	5.83	5.59	5.46	5.58	6.04	6.11	5.88	5.69	5.59	4.89
Min	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Max	12.65	9.04	9.10	7.18	10.70	11.13	9.31	10.41	12.40	13.39	13.14	14.65	12.11	12.60	12.28	18.74	12.68	13.12	12.29	13.03	12.49	11.70	11.96	9.87
Weekends																								
Qavg	4.41	3.88	3.30	3.05	2.87	2.90	3.35	4.76	6.60	7.60	7.89	7.44	7.26	6.80	6.10	5.71	5.50	5.44	5.40	5.99	5.89	5.53	5.11	4.66
Min	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Max	8.56	11.24	6.28	7.56	5.84	6.55	6.24	9.06	12.92	11.88	14.25	12.71	12.66	12.95	11.26	11.02	10.16	10.56	10.45	12.50	11.30	9.77	9.84	8.62
Unit Flow Summary																								
Weekdays																								
Qunit	0.822	0.694	0.608	0.545	0.542	0.594	0.742	1.033	1.242	1.449	1.391	1.364	1.183	1.175	1.107	1.024	1.025	1.046	1.129	1.141	1.101	1.068	1.055	0.921
Min	0.499	0.289	0.289	0.341	0.340	0.302	0.416	0.695	0.860	0.911	0.841	0.857	0.817	0.812	0.634	0.556	0.608	0.666	0.718	0.788	0.664	0.701	0.595	0.540
Max	1.900	1.489	1.266	0.977	1.480	1.369	1.313	1.619	1.868	1.910	1.940	2.043	1.809	2.077	1.564	1.508	1.789	1.646	1.786	1.762	1.871	1.651	1.736	1.408
Weekends																								
Qunit	0.827	0.725	0.616	0.571	0.542	0.543	0.626	0.898	1.239	1.438	1.485	1.410	1.367	1.281	1.150	1.080	1.039	1.021	1.023	1.125	1.102	1.045	0.966	0.881
Min	0.606	0.375	0.371	0.314	0.314	0.342	0.342	0.574	0.852	1.121	1.099	0.899	0.959	0.969	0.658	0.725	0.599	0.618	0.618	0.703	0.644	0.765	0.744	0.524
Max	1.321	1.483	0.857	1.136	0.953	1.005	0.833	1.296	1.777	1.758	1.881	2.036	1.811	1.760	1.553	1.483	1.460	1.471	1.702	1.650	1.533	1.400	1.477	1.406



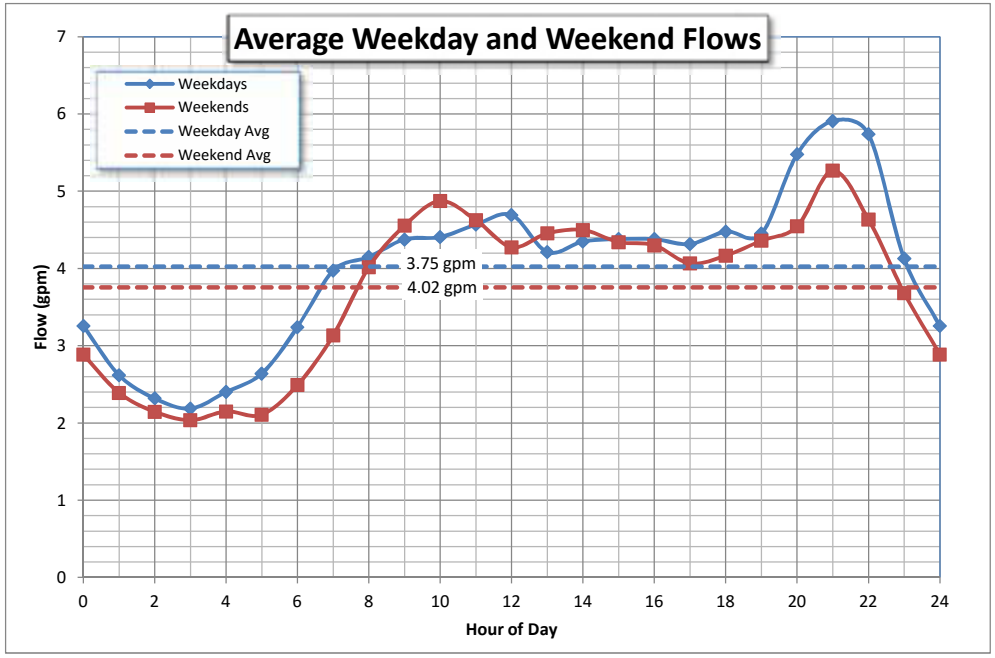


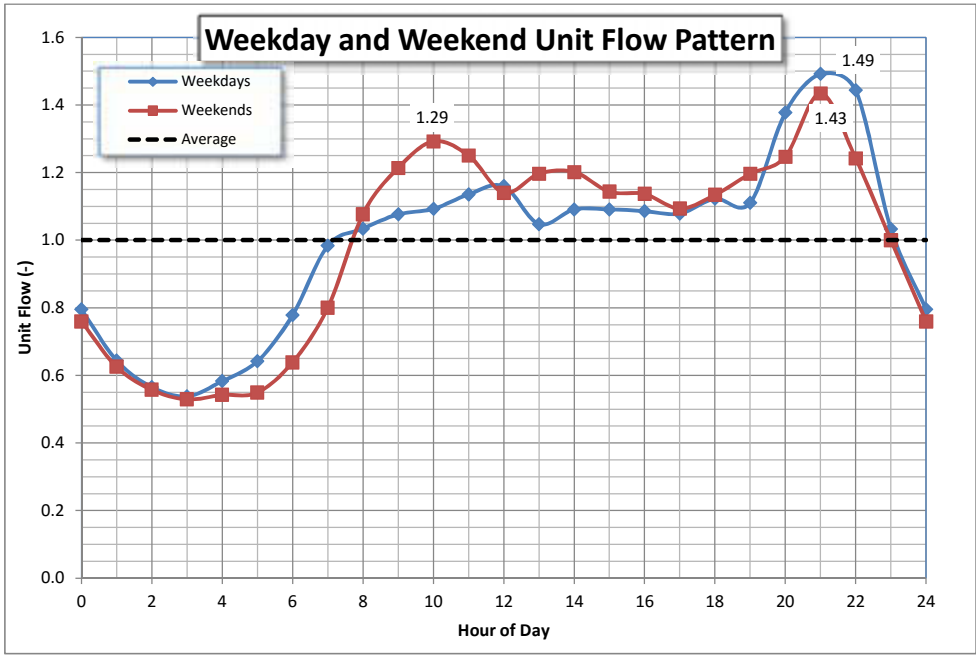
Lift Station 12 Flow Analysis Summary

WWI =	0.0 gpm

Weekdays	Qavg = 4.02 gpm	PF = 1.49
Weekends	Qavg = 3.75 gpm	PF = 1.43

Hours =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hourly Flow Summary																								
WeekDays																								
Qavg	3.25	2.62	2.32	2.19	2.40	2.64	3.24	3.97	4.15	4.38	4.41	4.57	4.69	4.21	4.35	4.38	4.38	4.32	4.48	4.45	5.48	5.91	5.74	4.13
Min	1.15	1.15	1.15	1.15	1.15	1.25	1.25	1.53	1.83	2.05	2.05	2.05	2.05	2.05	2.21	2.17	2.17	2.17	2.17	2.32	2.32	2.32	1.71	1.50
Max	14.58	13.63	12.48	13.40	12.78	11.68	17.09	13.22	12.41	14.12	12.10	11.41	17.24	11.85	15.81	16.38	19.86	11.11	15.92	16.08	15.51	12.47	14.43	13.91
Weekends																								
Qavg	2.89	2.39	2.15	2.04	2.15	2.11	2.49	3.13	4.02	4.56	4.87	4.63	4.28	4.45	4.50	4.34	4.30	4.07	4.17	4.36	4.55	5.27	4.64	3.68
Min	1.15	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.60	1.80	1.80	1.80	1.73	1.73	1.73	1.73	1.95	1.95	1.98	2.04	2.04	2.37	1.54	0.00
Max	9.40	8.08	8.34	8.33	16.58	7.45	10.69	14.29	11.65	9.05	12.17	12.35	14.92	13.19	12.28	11.91	12.77	8.69	8.50	9.85	9.27	18.74	13.65	14.58
Unit Flow Summary																								
Weekdays																								
Qunit	0.796	0.644	0.565	0.538	0.583	0.642	0.778	0.983	1.034	1.076	1.092	1.136	1.159	1.047	1.091	1.091	1.086	1.078	1.122	1.110	1.377	1.492	1.443	1.033
Min	0.270	0.270	0.270	0.270	0.274	0.307	0.333	0.370	0.382	0.382	0.382	0.443	0.443	0.443	0.442	0.442	0.442	0.496	0.496	0.568	0.568	0.568	0.491	0.350
Max	3.193	2.986	2.007	2.155	2.056	2.205	3.408	2.869	2.546	2.897	1.895	2.775	3.212	2.006	2.943	3.049	3.695	2.127	3.466	2.517	3.750	3.271	3.403	3.298
Weekends																								
Qunit	0.759	0.626	0.557	0.529	0.542	0.549	0.639	0.801	1.077	1.214	1.292	1.251	1.140	1.196	1.202	1.143	1.137	1.093	1.134	1.196	1.247	1.434	1.242	1.000
Min	0.283	0.283	0.283	0.336	0.336	0.336	0.336	0.336	0.470	0.571	0.697	0.582	0.582	0.582	0.651	0.651	0.403	0.403	0.403	0.457	0.457	0.457	0.374	0.000
Max	1.541	1.324	1.367	1.365	2.718	1.534	2.208	2.951	3.344	2.318	2.682	2.721	3.047	3.336	3.106	2.576	2.761	2.128	2.230	2.296	2.514	3.456	2.517	2.689





Appendix F

Inspection & Defect Log

Item Number	Document	Page Number
1	Repair & Follow-up Summary Index	F2
2	Inspection and Defect Log	F-5
3	Lateral Defect Log	F-36

Count of Action 1	Column Labels																	
Row Labels	CIPP(10)	CIPP(14)	CIPP(2)	CIPP(4)	CIPP(6)	DA	DR	DR(10)	DR(24)	FISP(1)	FISP(2)	FM	GRT	PM	RC	SL(288)	SL(4)	Grand Total
100-101				1						1				4				6
101-102											1			8				9
102-104_1														3				3
103-104_2						2				4					1			7
104-105_4										3				4				7
105-PS6_2				2						4								6
106-107				1		8				1	1			7				18
106A-106						7					1							8
107-108						4				1	1			2				8
108-109						3				4				5				12
109-PS5						1				3			2	7				13
110-111						9				1			1					11
110A-110						2				1				4				7
111-112						1				1				1				3
11-12					1	8								2				11
112-PS#4						7				1				2				10
113-114				1			2					3		8	2			16
113A-113										1			1					2
114-115							1						1	7	2			11
115-116			1	2									1	7				11
116-117				1										5				6
117-118													1	6				7
118-119				1		1								6	2			10
119-PS#5				1		2					2	1	2	2	2			12
1-2												1	1	2	1		1	6
12-13						1				1				3				5
13-14										4				6	1			11
14-15_1					1					2				3	1	1		8
144-145_2										1			1	2	1			5
15-16										3	3			1				7
16-17				3						4			1	3				11
17-18	1	1		2						2			1	3				10
18-19	1	1		2										6				10
19-20					1	2							2	5	1			11
20-19										1				1	1			3
20-20A						1				6				1	4			12
20A-27										1			1	1	2			5
21A-20				1						2	1			4				8
22A-22_1						1							1	3				5
2-3							2			1	1	1		4	2			11
24-25						1				1				9				11
24A-24_1						1				1	1			2				5
24B-24A						3					1			2				6
25-26											2			6				8
26-27						1				3	1			4	1			10
31-32						13				2				3				18
32-23						5					1		1	5				12

32-23_1						1				2			1	4				8
33-25				1		3								6				10
33A-33										3				2				5
3-4						1				1				1	2			5
34-35						3				7				2	1			13
34A-34				1			1			2			1	2	1			8
35-24				1		6				3				3				13
35-24_3				1		2				8				2				13
37-38						6				2				6				14
37A-37						4				1				3				8
38-39						3								3				6
38-39_2				1		1				2			1	6				11
39-25						2				2	1			5				10
40-41														4	1			5
40A-40											1			6				7
41-26										2	1			2	1			6
42-43						21				3			1	4	1			30
42A-42						6								1				7
43-44_1				1						2	1			1	1			6
44-26				1						5				6	6			18
59-60				1		7				1		1		10				20
59A-59				1		14								6				21
60-61						16					1			4				21
61-62						15				1				5				21
6-2				1								1			1			3
62-LS # 9				1	1	13								2				17
63-64						12				2	1			8				23
63A-63						15					2			5	2			24
64-65						11				2	5			3	2			23
65-66				1		11								4	1			17
67-68_1						19				1	1			2	1			24
67A-67						2								1				3
67A-67_1						11			1	1	1						3	17
68-69					1	16								8				25
6A-6							1							4				5
73-78														7				7
74-75				1			1			1		1			1			5
74A-74						3					3			2	10			18
75-76				1		1	2	1							2			7
7-8				3			2			1	1		1		3			11
78-79						2	3			5	5			8	4			27
78-79_1														10	1			11
78-79_2														1	1			2
79-82														5				5
7A-7				1		1				1	1			6	6			16
80-81						1	3			6	2	6			9			27
80A-80						1	4			3	3	2		6	4			23
82-85_3														12				12
82A-82						1								6				7

85-86														8				8
85A-85						2	3			2	7	1		5	1			21
86-92										1	1			1				3
87B-87										2		1		1				4
8-9				1														1
8A-8															2			2
9-10															1			1
92-93														8				8
93-94														3				3
94-95_2										1				7				8
95-27A														6				6
99-100						1								4				5
9-9A														14				14
99A-99						1				2				3				6
9A-PS2														3				3
Grand Total	**2**	**2**	**1**	**37**	**5**	**319**	**25**	**1**	**1**	**139**	**55**	**19**	**23**	**426**	**90**	**1**	**4**	**1150**

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
1	2	1-2	ISLAND DR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		5.06	8.7	-2.36	-3.07		0				0		
1	2	1-2	ISLAND DR	0.00	FALSE					AMH	Manhole	0	0	0	1	5.06	8.7	-2.36	-3.07		0				0		
1	2	1-2	ISLAND DR	0.00	FALSE					MWL	Water Level	5	0	0		5.06	8.7	-2.36	-3.07		0				0		
1	2	1-2	ISLAND DR	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	5.06	8.7	-2.36	-3.07		0				0		
1	2	1-2	ISLAND DR	5.00	FALSE				6	DSF	Deposits Settled Fine	0	0	0		5.06	8.7	-2.36	-3.07		0				0		
1	2	1-2	ISLAND DR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	5.06	8.7	-2.36	-3.07		0				0		
1	2	1-2	ISLAND DR	10.00	FALSE					JOM	Joint Offset Medium	2	0	0	Slight offset, no significant restirction or I & I	5.06	8.7	-2.36	-3.07	P	0.25	2	3	2	7	SL(4)	
1	2	1-2	ISLAND DR	14.60	FALSE				9	TFA	Tap Factory Active	0	0	0		5.06	8.7	-2.36	-3.07		0				0		
1	2	1-2	ISLAND DR	14.60	FALSE				6	RML	Roots Medium Lateral	3	0	0		5.06	8.7	-2.36	-3.07	P	0.25	2	2	2	6	RC	
1	2	1-2	ISLAND DR	59.40	FALSE					MWLS	Water Level Sag	5	0	0		5.06	8.7	-2.36	-3.07	N	0	1	1	1	3	PM	
1	2	1-2	ISLAND DR	63.70	FALSE				3	TFA	Tap Factory Active	0	0	0		5.06	8.7	-2.36	-3.07		0				0		
1	2	1-2	ISLAND DR	63.70	FALSE				9	RFL	Roots Fine Lateral	3	0	0		5.06	8.7	-2.36	-3.07	P	0.25	1	2	1	4	FM	
1	2	1-2	ISLAND DR	84.90	FALSE					MWLS	Water Level Sag	5	0	0	Place on routine maintenance cleaning list	5.06	8.7	-2.36	-3.07	N	0	1	2	1	4	PM	
1	2	1-2	ISLAND DR	138.00	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	5.06	8.7	-2.36	-3.07		0				0		
1	2	1-2	ISLAND DR	140.10	FALSE					AMH	Manhole	1	0	0	Manhole appears to have Infil stains in barrel , follow up	5.06	8.7	-2.36	-3.07	P	0.25	1	2	1	4	GRT	
1	2	1-2	ISLAND DR	140.10	FALSE					STOP	Inspection stopped	0	0	0		5.06	8.7	-2.36	-3.07		0				0		
2	3	2-3	ISLAND DR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	0.00	FALSE					AMH	Manhole	0	0	0	2	8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	0.00	FALSE					MWL	Water Level	5	0	0	Heavy stains 40% of pipe,indication of PM needed	8.7	9.19	-3.07	-6.29	P	0.25	1	2	1	4	PM	
2	3	2-3	ISLAND DR	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	3.00	FALSE					MWL	Water Level	5	0	0		8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	20.30	FALSE					MWM	Water Mark	5	0	0	high flow Stains	8.7	9.19	-3.07	-6.29	N	0	1	2	1	4	PM	
2	3	2-3	ISLAND DR	31.60	FALSE					JAL	Joint Angular Large	2	0	0	Using angle to create radius, no defect apparent	8.7	9.19	-3.07	-6.29	N	0	0	0	0	0	FISP(2)	
2	3	2-3	ISLAND DR	51.90	FALSE				2	TFA	Tap Factory Active	0	0	0		8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	51.90	FALSE					MGO	General Observation	2	0	0	OFFSET JOINT IN TAP	8.7	9.19	-3.07	-6.29	P	0.25	2	1	1	4	FISP(1)	CIPP(2)
2	3	2-3	ISLAND DR	64.80	FALSE					MWM	Water Mark	5	0	0		8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	79.60	FALSE				1	TFA	Tap Factory Active	0	0	0		8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	79.60	FALSE				6	RML	Roots Medium Lateral	3	0	0	Possible Infiltration source in high ground water	8.7	9.19	-3.07	-6.29	P	0.25	2	2	1	5	RC	CIPP(2)
2	3	2-3	ISLAND DR	82.40	FALSE					MWM	Water Mark	5	0	0	Stains indicating higher flows,PM	8.7	9.19	-3.07	-6.29	P	0.25	1	1	1	3	PM	
2	3	2-3	ISLAND DR	153.00	FALSE				1	TFC	Tap Factory Capped	0	0	0		8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	196.70	FALSE				11	TF	Tap Factory	0	0	0		8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	196.70	FALSE				12	12 RBL	Roots Ball Lateral	3	0	0	Severe roots in lateral , possible I & I	8.7	9.19	-3.07	-6.29	P	0.25	3	2	2	7	RC	
2	3	2-3	ISLAND DR	240.40	FALSE				12	TBD	Tap Break-in Defective	0	0	0	OFFSET	8.7	9.19	-3.07	-6.29	P	0.25	2	2	1	5		
2	3	2-3	ISLAND DR	240.40	FALSE				12	RFC	Roots Fine Connection	3	0	0		8.7	9.19	-3.07	-6.29	P	0.25	2	2	1	5	FM	
2	3	2-3	ISLAND DR	282.80	FALSE					MMC	Material Change	0	0	0	PVC	8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	284.40	FALSE				12	TFA	Tap Factory Active	0	0	0		8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	285.60	FALSE					MMC	Material Change	0	0	0	VCP	8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	285.60	FALSE					JOM	Joint Offset Medium	2	0	0	Calders have moved , backfill settle or wrong type	8.7	9.19	-3.07	-6.29	P	0.25	2	3	3	8	DR	
2	3	2-3	ISLAND DR	305.40	FALSE					MWM	Water Mark	5	0	0		8.7	9.19	-3.07	-6.29	N	0	2	2	1	5	PM	
2	3	2-3	ISLAND DR	331.00	FALSE				11	TFD	Tap Factory Defective	2	0	0	OFFSET	8.7	9.19	-3.07	-6.29	P	0.25	2	3	2	7	DR	
2	3	2-3	ISLAND DR	331.00	FALSE				6	RML	Roots Medium Lateral	3	0	0		8.7	9.19	-3.07	-6.29	P	0.25	2	3	2	7	Drcomb	
2	3	2-3	ISLAND DR	348.50	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	350.00	FALSE					AMH	Manhole	0	0	0	3	8.7	9.19	-3.07	-6.29		0				0		
2	3	2-3	ISLAND DR	350.00	FALSE					STOP	Inspection stopped	0	0	0		8.7	9.19	-3.07	-6.29		0				0		
3	4	3-4	ISLAND DR EASMENT	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		9.19	7.65	-6.29	-5.31		0				0		
3	4	3-4	ISLAND DR EASMENT	0.00	FALSE					AMH	Manhole	0	0	0	3	9.19	7.65	-6.29	-5.31		0				0		
3	4	3-4	ISLAND DR EASMENT	0.00	FALSE					MWL	Water Level	5	0	0		9.19	7.65	-6.29	-5.31	N	0	0	0	0	0	PM	
3	4	3-4	ISLAND DR EASMENT	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	9.19	7.65	-6.29	-5.31		0				0		
3	4	3-4	ISLAND DR EASMENT	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	9.19	7.65	-6.29	-5.31		0				0		
3	4	3-4	ISLAND DR EASMENT	100.50	FALSE				11	TFA	Tap Factory Active	0	0	0		9.19	7.65	-6.29	-5.31		0				0		
3	4	3-4	ISLAND DR EASMENT	100.50	FALSE				3	RML	Roots Medium Lateral	3	0	0		9.19	7.65	-6.29	-5.31	P	0.25	2	2	2	6	RC	CIPP(2)
3	4	3-4	ISLAND DR EASMENT	106.60	FALSE				6	7 ISSR	Intruding Sealing Ring	0	0	0		9.19	7.65	-6.29	-5.31	N	0	0	0	0	0	DA	
3	4	3-4	ISLAND DR EASMENT	159.10	FALSE				11	TFA	Tap Factory Active	0	0	0		9.19	7.65	-6.29	-5.31		0				0		
3	4	3-4	ISLAND DR EASMENT	159.10	FALSE				12	12 RBL	Roots Ball Lateral	3	0	0	Appears completely blocked	9.19	7.65	-6.29	-5.31	P	0.25	3	3	2	8	RC	FM
3	4	3-4	ISLAND DR EASMENT	174.30	FALSE				3	9 IS	Infil Stain	0	0	0	Appears to show high flows or sag	9.19	7.65	-6.29	-5.31	N	0	0	0	0	0	FISP(1)	PM
3	4	3-4	ISLAND DR EASMENT	213.90	FALSE					MSA	Abandoned Survey	0	0	0	CAMERA FLIPPED	9.19	7.65	-6.29	-5.31		0				0		
3	4	3-4	ISLAND DR EASMENT	213.90	FALSE					STOP	Inspection stopped	0	0	0		9.19	7.65	-6.29	-5.31		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	0.00	FALSE	Yes	SL			START WITH FL	Start Inspection With the Flow	0	0	0		5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	0.00	FALSE	Yes	SL			AMH	Manhole	0	0	0	59	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	0.00	FALSE	Yes	SL			MWL	Water Level	5	0	0		5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	2.00	FALSE	Yes	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	2.00	FALSE	Yes	SL			MLC	Lining Change	4	0	0	START OF LINER	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	2.00	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE,minor	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	PM	
59	60	59-60	DRIFTWOOD VILLAGE	7.00	FALSE	Yes	SL	6		DSC	Deposits Settled Compacted	0	0	0		5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	PM	
59	60	59-60	DRIFTWOOD VILLAGE	10.00	FALSE	Yes	SL			MGP	General Photo	0	0	0	CAMERA SET	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	22.60	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0	GREASE IN TAP,minor	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	PM	
59	60	59-60	DRIFTWOOD VILLAGE	44.20	FALSE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	DA	
59	60	59-60	DRIFTWOOD VILLAGE	45.80	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0	GREASE IN TAP,Minor	5.7	7.22	-5.57	-7.19		0				0	PM	
59	60	59-60	DRIFTWOOD VILLAGE	52.40	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	DA	
59	60	59-60	DRIFTWOOD VILLAGE	62.10	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	DA	
59	60	59-60	DRIFTWOOD VILLAGE	72.00	FALSE	Yes	SL	4	6	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	DA	
59	60	59-60	DRIFTWOOD VILLAGE	82.20	FALSE	Yes	SL	1	11	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	DA	
59	60	59-60	DRIFTWOOD VILLAGE	83.70	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	90.50	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE,minor	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	PM	
59	60	59-60	DRIFTWOOD VILLAGE	106.60	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0	GREASE IN TAP,minor	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	106.60	FALSE	Yes	SL			MGO	General Observation	0	0	0	POSSIBLE INFIL FROM LATERAL,none observed	5.7	7.22	-5.57	-7.19	P	0.25	1	2	1	4	DA	
59	60	59-60	DRIFTWOOD VILLAGE	128.20	FALSE	Yes	SL	6	7	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	PM	
59	60	59-60	DRIFTWOOD VILLAGE	135.80	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	PM	
59	60	59-60	DRIFTWOOD VILLAGE	138.40	FALSE	Yes	SL	5		IR	Infil Runner	1	0	0	Active I & I	5.7	7.22	-5.57	-7.19	IR	4	1	2	3	6	CIPP(4)	
59	60	59-60	DRIFTWOOD VILLAGE	139.70	FALSE	Yes	SL	3		TB	Tap Break-in	0	0	0		5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	152.00	FALSE	Yes	SL	6		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	161.00	FALSE	Yes	SL	5		RFJ	Roots Fine Joint	3	0	0		5.7	7.22	-5.57	-7.19	P	0.25	1	2	1	4	FM	
59	60	59-60	DRIFTWOOD VILLAGE	161.00	FALSE	Yes	SL	1	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	161.40	FALSE	Yes	SL			MGO	General Observation	2	0	0	POSSIBLE INFIL FROM JOINT	5.7	7.22	-5.57	-7.19	P	0.25	1	2	1	4	FISP(1)	CIPP(4)
59	60	59-60	DRIFTWOOD VILLAGE	162.70	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	164.40	FALSE	Yes	SL	1	3	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	169.20	FALSE	Yes	SL	5	7	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	186.70	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	5.7	7.22	-5.57	-7.19		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	US Invert-Lake		DS Invert-Lake		I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
																USMH Depth	DSMH Depth	Level	Level								
59	60	59-60	DRIFTWOOD VILLAGE	189.40	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	199.60	FALSE	Yes	SL	5	6	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	200.30	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	PM	
59	60	59-60	DRIFTWOOD VILLAGE	206.50	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE, Minor	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	PM	
59	60	59-60	DRIFTWOOD VILLAGE	222.10	FALSE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	223.50	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	225.10	FALSE	Yes	SL	10	11	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING	5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	DA	
59	60	59-60	DRIFTWOOD VILLAGE	238.00	FALSE	Yes	SL			MWLS	Water Level Sag	5	0	0		5.7	7.22	-5.57	-7.19	N	0	1	2	1	4	PM	
59	60	59-60	DRIFTWOOD VILLAGE	259.80	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	269.60	FALSE	Yes	SL			MGO	General Observation	0	0	0	END OF PIPE SEGMENT	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	271.70	FALSE					AMH	Manhole	0	0	0	60	5.7	7.22	-5.57	-7.19		0				0		
59	60	59-60	DRIFTWOOD VILLAGE	271.70	FALSE					STOP	Inspection stopped	0	0	0		5.7	7.22	-5.57	-7.19		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	0.00	TRUE	Yes	SL			AMH	Manhole	0	0	0	59	#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	0.00	TRUE	Yes	SL			MWL	Water Level	5	0	0		#N/A	5.7	#N/A	-5.57	N	0	0	0	0	0	PM	
59A	59	59A-59	DRIFTWOOD VILLAGE	2.00	TRUE	Yes	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	2.00	TRUE	Yes	SL			MLC	Lining Change	4	0	0	START OF LINER	#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	2.00	TRUE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE,minor	#N/A	5.7	#N/A	-5.57	N	0	1	2	1	4	PM	
59A	59	59A-59	DRIFTWOOD VILLAGE	9.50	TRUE	Yes	SL	6	7	CS	Crack Spiral	1	0	0		#N/A	5.7	#N/A	-5.57	P	0.25	2	3	2	7	CIPP(4)	CIPP(4)
59A	59	59A-59	DRIFTWOOD VILLAGE	10.00	TRUE	Yes	SL			MGP	General Photo	0	0	0	CAMERA SET	#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	10.00	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	31.00	TRUE	Yes	SL			MWLS	Water Level Sag	5	0	0		#N/A	5.7	#N/A	-5.57	N	0	1	2	1	4	PM	
59A	59	59A-59	DRIFTWOOD VILLAGE	36.70	TRUE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	73.60	TRUE	Yes	SL	12		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	74.50	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	95.40	TRUE	Yes	SL	3		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	97.60	TRUE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0	GREASE IN TAP,minor	#N/A	5.7	#N/A	-5.57	N	0	1	2	1	4	PM	
59A	59	59A-59	DRIFTWOOD VILLAGE	98.20	TRUE	Yes	SL	3	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	108.90	TRUE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	122.70	TRUE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	#N/A	5.7	#N/A	-5.57	N	0	2	2	2	6	PM	
59A	59	59A-59	DRIFTWOOD VILLAGE	130.10	TRUE	Yes	SL			MWLS	Water Level Sag	5	0	0		#N/A	5.7	#N/A	-5.57	N	0	2	2	2	6	PM	
59A	59	59A-59	DRIFTWOOD VILLAGE	133.90	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	134.70	TRUE	Yes	SL	12		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	155.00	TRUE	Yes	SL	1		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	157.20	TRUE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	178.20	TRUE	Yes	SL	11	1	LFB	Lining Failure Blistered	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	187.70	TRUE	Yes	SL	2	11	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	193.30	TRUE	Yes	SL	5	7	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	195.30	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		#N/A	5.7	#N/A	-5.57		0	0	0	0	0		
59A	59	59A-59	DRIFTWOOD VILLAGE	195.30	TRUE	Yes	SL	7	10	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	208.40	TRUE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	219.70	TRUE	Yes	SL	7		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	221.80	TRUE	Yes	SL	10		TB	Tap Break-in	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	224.90	TRUE	Yes	SL	3		TB	Tap Break-in	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	225.90	TRUE	Yes	SL	1		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	236.60	TRUE	Yes	SL	12		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	238.10	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	239.50	TRUE	Yes	SL			MMC	Material Change	0	0	0	END OF LINER/ AC PIPE, End 1ft short of end of line segment.	#N/A	5.7	#N/A	-5.57	N	0	1	1	1	3	DA	
59A	59	59A-59	DRIFTWOOD VILLAGE	240.40	TRUE	Yes	SL			AMH	Manhole	0	0	0	59A C/O	#N/A	5.7	#N/A	-5.57		0				0		
59A	59	59A-59	DRIFTWOOD VILLAGE	240.40	TRUE	Yes	SL			STOP	Inspection stopped	0	0	0		#N/A	5.7	#N/A	-5.57		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	0.00	FALSE					AMH	Manhole	0	0	0	60	7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	0.00	FALSE					MWL	Water Level	5	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	2.00	FALSE	Yes	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	2.00	FALSE	Yes	SL			MLC	Lining Change	4	0	0	START OF LINER	7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	10.00	FALSE	Yes	SL			MGP	General Photo	0	0	0	CAMERA SET	7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	10.00	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease,minor	0	0	0	GREASE	7.22	9.49	-7.19	-9.03	N	0	2	1	1	4	PM	
60	61	60-61	DRIFTWOOD VILLAGE	11.30	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	16.80	FALSE	Yes	SL			MWL	Water Level	5	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	18.20	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	28.00	FALSE	Yes	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	49.30	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	70.90	FALSE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	72.60	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	89.30	FALSE	Yes	SL	3		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	99.00	FALSE	Yes	SL	2	10	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	109.00	FALSE	Yes	SL	10	1	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	110.60	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	117.10	FALSE	Yes	SL	1	10	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	123.80	FALSE	Yes	SL			MWLS	Water Level Sag	5	0	0	Significant sag	7.22	9.49	-7.19	-9.03	P	0.25	2	2	1	5	PM	
60	61	60-61	DRIFTWOOD VILLAGE	128.80	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	170.10	FALSE	Yes	SL	5	10	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	171.60	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	177.90	FALSE	Yes	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	189.60	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	191.20	FALSE	Yes	SL	1	2	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	211.20	FALSE	Yes	SL	3	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03		0	1	1	1	3		
60	61	60-61	DRIFTWOOD VILLAGE	232.50	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		7.22	9.49	-7.19	-9.03	N	0				0	DA	
60	61	60-61	DRIFTWOOD VILLAGE	233.00	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE,minor	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	PM	
60	61	60-61	DRIFTWOOD VILLAGE	234.20	FALSE	Yes	SL	12		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	239.80	FALSE	Yes	SL			MWLS	Water Level Sag	5	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	250.50	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	252.10	FALSE	Yes	SL	1	8	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	271.90	FALSE	Yes	SL	3	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	281.90	FALSE	Yes	SL	3	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	293.40	FALSE	Yes	SL	2		TBA	Tap Break-in Active	0	0	0	GREASE IN TAP	7.22	9.49	-7.19	-9.03	N	0	2	2	1	5	PM	
60	61	60-61	DRIFTWOOD VILLAGE	298.20	FALSE	Yes	SL	1	6	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	7.22	9.49	-7.19	-9.03	N	0	1	1	1	3	DA	
60	61	60-61	DRIFTWOOD VILLAGE	298.60	FALSE	Yes	SL			MGO	General Observation	0	0	0	POSSIBLE INFIL AT JOINT, not observed	7.22	9.49	-7.19	-9.03	P	0.25	2	2	2	6	FISP(2)	
60	61	60-61	DRIFTWOOD VILLAGE	301.80	FALSE	Yes	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	7.22	9.49	-7.19	-9.03		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
60	61	60-61	DRIFTWOOD VILLAGE	303.80	FALSE	Yes	SL			AMH	Manhole	0	0	0	61	7.22	9.49	-7.19	-9.03		0				0		
60	61	60-61	DRIFTWOOD VILLAGE	303.80	FALSE					STOP	Inspection stopped	0	0	0	0	7.22	9.49	-7.19	-9.03		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	0.00	FALSE					AMH	Manhole	0	0	0	61	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	0.00	FALSE	Yes	SL			MWL	Water Level	5	0	0	0	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	PM	
61	62	61-62	DRIFTWOOD VILLAGE	2.00	FALSE	Yes	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	2.00	FALSE	Yes	SL			MLC	Lining Change	4	0	0	START OF LINER	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	2.00	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	9.49	10.32	-9.03	-10.52	N	0	2	1	1	4	PM	
61	62	61-62	DRIFTWOOD VILLAGE	4.00	FALSE	Yes	SL			MWLS	Water Level Sag	5	0	0	0	9.49	10.32	-9.03	-10.52	N	0	2	1	1	4	PM	
61	62	61-62	DRIFTWOOD VILLAGE	6.00	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	6.50	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	10.00	FALSE	Yes	SL			MGP	General Photo	0	0	0	CAMERA SET	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	49.60	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	51.20	FALSE	Yes	SL	1		LFDE	Lining Failure Defective End	4	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	65.90	FALSE	Yes	SL	9	1	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	67.70	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	69.20	FALSE	Yes	SL	3	12	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	102.30	FALSE	Yes	SL	1		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3		
61	62	61-62	DRIFTWOOD VILLAGE	112.20	FALSE	Yes	SL	9	3	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	114.00	FALSE	Yes	SL	3		TBA	Tap Break-in Active	1	0	0	Appears to have clean water flowing ,possible I & I	9.49	10.32	-9.03	-10.52	P	0.25	2	2	2	6	FISP(1)	CIPP(2)
61	62	61-62	DRIFTWOOD VILLAGE	115.60	FALSE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	124.00	FALSE	Yes	SL			MWLS	Water Level Sag	5	0	0	0	9.49	10.32	-9.03	-10.52	N	0	1	2	1	4	PM	
61	62	61-62	DRIFTWOOD VILLAGE	125.80	FALSE	Yes	SL	1	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	127.20	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	148.60	FALSE	Yes	SL	3	11	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	158.50	FALSE	Yes	SL	1	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	158.50	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE,minor	9.49	10.32	-9.03	-10.52	N	0	1	2	1	4	PM	
61	62	61-62	DRIFTWOOD VILLAGE	168.80	FALSE	Yes	SL	8	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	178.50	FALSE	Yes	SL	5	11	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	180.30	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	181.80	FALSE	Yes	SL	5	11	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	186.60	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	203.00	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	213.10	FALSE	Yes	SL	5	11	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	233.20	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	243.20	FALSE	Yes	SL	1	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	9.49	10.32	-9.03	-10.52	N	0	1	1	1	3	DA	
61	62	61-62	DRIFTWOOD VILLAGE	244.60	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	247.90	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	252.60	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	254.60	FALSE					AMH	Manhole	0	0	0	62	9.49	10.32	-9.03	-10.52		0				0		
61	62	61-62	DRIFTWOOD VILLAGE	254.60	FALSE					STOP	Inspection stopped	0	0	0	0	9.49	10.32	-9.03	-10.52		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0	0	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	0.00	FALSE	Yes	SL			AMH	Manhole	0	0	0	62	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	0.00	FALSE	Yes	SL			MWL	Water Level	5	0	0	0	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	PM	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	2.00	FALSE	Yes	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	2.00	FALSE	Yes	SL			MLC	Lining Change	4	0	0	START OF LINER	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	6.00	FALSE	Yes	SL	11	1	ISSR	Intruding Sealing Ring	0	0	0	no restriction , deferred action	10.32	4.06	-10.52	-4.03	N	0	1	2	1	4	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	6.00	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	10.00	FALSE	Yes	SL			MGP	General Photo	0	0	0	CAMERA SET	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	10.00	FALSE	Yes	SL			MGP	General Photo	0	0	0	CAMERA SET	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	15.80	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	23.00	FALSE	Yes	SL			MWM	Water Mark	5	0	0	0	10.32	4.06	-10.52	-4.03	N	0				0	PM	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	26.00	FALSE	Yes	SL	7	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	36.90	FALSE	Yes	SL	11		TBA	Tap Break-in Active	0	0	0	0	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	68.20	FALSE	Yes	SL	1	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	69.70	FALSE	Yes	SL	1		TBA	Tap Break-in Active	0	0	0	0	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	81.40	FALSE	Yes	SL	7		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	91.40	FALSE	Yes	SL	3	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	92.80	FALSE	Yes	SL	11		TBA	Tap Break-in Active	0	0	0	0	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	104.40	FALSE	Yes	SL	2		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	114.20	FALSE	Yes	SL	7		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	123.70	FALSE	Yes	SL			MMC	Material Change	0	0	0	PVC	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	125.10	FALSE	Yes	SL	12		TFA	Tap Factory Active	0	0	0	0	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	125.80	FALSE	Yes	SL			MMC	Material Change	0	0	0	AC	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	125.80	FALSE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	153.70	FALSE	Yes	SL	12		TBA	Tap Break-in Active	0	0	0	0	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	155.40	FALSE	Yes	SL	5	7	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	194.50	FALSE	Yes	SL			MMC	Material Change	0	0	0	PVC, cut in tee	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	195.90	FALSE	Yes	SL	12		TFA	Tap Factory Active	0	0	0	0	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	196.60	FALSE	Yes	SL			MMC	Material Change	0	0	0	AC	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	198.10	FALSE	Yes	SL	3	7	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	199.70	FALSE	Yes	SL	1		TBC	Tap Break-in Capped	0	0	0	0	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	201.60	FALSE	Yes	SL	3	6	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	10.32	4.06	-10.52	-4.03	N	0	1	1	1	3	DA	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	220.30	FALSE	Yes	SL	12		ID	Infil Dripper	1	0	0	Infil dripper approx 2gpm	10.32	4.06	-10.52	-4.03	ID	3	2	2	2	6	CIPP(6)	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	220.40	FALSE	Yes	SL	12		RPPD	Repair Patch Defective	4	0	0	BUCKELLING	10.32	4.06	-10.52	-4.03	P	0.25	2	3	2	7	CIPPcomb	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	223.30	FALSE	Yes	CIPP			MGO	General Observation	0	0	0	END OF PATCH	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	229.30	FALSE	Yes	CIPP	12	12	RPP	Repair Patch	0	0	0	START OF PATCH	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	239.90	FALSE	Yes	CIPP	12	12	RPLD	Repair Localized Liner Defective	4	0	0	SPALLING	10.32	4.06	-10.52	-4.03	P	0.25	2	2	2	6	CIPP(4)	
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	243.20	FALSE	Yes	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	243.40	FALSE	YES	?			AMH	Manhole	0	0	0	LS # 9	10.32	4.06	-10.52	-4.03		0				0		
62	LS 9	62-LS # 9	DRIFTWOOD VILLAGE	243.40	FALSE	YES	?			STOP	Inspection stopped	0	0	0	0	10.32	4.06	-10.52	-4.03		0				0		
63	64	63-64	ANCHOR VILLAGE	0.00	FALSE	YES	?			START WITH FL	Start Inspection With the Flow	0	0	0	0	5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	0.00	FALSE	Yes	SL			AMH	Manhole	0	0	0	63	5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	0.00	FALSE	Yes	SL			MWL	Water Level	5	0	0	0	5.7	8.68	-6.06	-8.15	N	0				0	PM	
63	64	63-64	ANCHOR VILLAGE	2.00	FALSE	Yes	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	2.00	FALSE	Yes	SL			MLC	Lining Change	4	0	0	START OF LINER	5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	2.00	FALSE	Yes	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	5.00	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0	0	5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	9.30	FALSE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
63	64	63-64	ANCHOR VILLAGE	10.00	FALSE	Yes	SL			MGP	General Photo	0	0	0	CAMERA SET	5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	27.30	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	5.7	8.68	-6.06	-8.15	N	0	1	2	2	5	PM	
63	64	63-64	ANCHOR VILLAGE	59.50	FALSE	Yes	SL	9	11	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	61.40	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0	GREASE IN TAP	5.7	8.68	-6.06	-8.15	N	0	2	1	1	4	PM	
63	64	63-64	ANCHOR VILLAGE	61.40	FALSE	Yes	SL			MGO	General Observation	0	0	0	POSSIBLE INFIL FROM LATERAL, not observed	5.7	8.68	-6.06	-8.15	P	0.25	2	2	2	6	FISP(2)	CIPP(2)
63	64	63-64	ANCHOR VILLAGE	63.10	FALSE	Yes	SL			MGO	General Observation	2	0	0	POSSIBLE INFIL AT JOINT, not observed but likely under higher	5.7	8.68	-6.06	-8.15	P	0.25	2	2	2	6	FISP(1)	GRT
63	64	63-64	ANCHOR VILLAGE	63.10	FALSE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	64.50	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	76.20	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	5.7	8.68	-6.06	-8.15	N	0	2	2	1	5	PM	
63	64	63-64	ANCHOR VILLAGE	90.90	FALSE	Yes	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	121.50	FALSE	Yes	SL			MWL	Water Level	5	0	0		5.7	8.68	-6.06	-8.15	N	0				0	PM	
63	64	63-64	ANCHOR VILLAGE	122.50	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	124.30	FALSE	Yes	SL	12		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	125.50	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	127.20	FALSE	Yes	SL	3	10	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	150.20	FALSE	Yes	SL	4	10	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	158.90	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	5.7	8.68	-6.06	-8.15	P	0.25	1	2	1	4	PM	
63	64	63-64	ANCHOR VILLAGE	180.20	FALSE	Yes	SL	4	10	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	181.90	FALSE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	188.30	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	189.90	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	223.90	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	5.7	8.68	-6.06	-8.15	N	0	2	2	2	6	PM	
63	64	63-64	ANCHOR VILLAGE	239.40	FALSE	Yes	SL	1	8	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	241.00	FALSE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	244.40	FALSE	Yes	SL			MGO	General Observation	2	0	0	POSSIBLE INFIL AT TAP CONNECTION,observed	5.7	8.68	-6.06	-8.15	ID	3	2	2	2	6	FISP(1)	CIPP(4)-PR
63	64	63-64	ANCHOR VILLAGE	244.40	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	271.60	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	5.7	8.68	-6.06	-8.15	N	0	2	2	2	6	PM	
63	64	63-64	ANCHOR VILLAGE	278.90	FALSE	Yes	SL			MWLS	Water Level Sag	5	0	0		5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	299.40	FALSE	Yes	SL	3	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	5.7	8.68	-6.06	-8.15	N	0	1	1	1	3	DA	
63	64	63-64	ANCHOR VILLAGE	300.60	FALSE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	303.60	FALSE	Yes	SL	2		TBA	Tap Break-in Active	0	0	0		5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	306.80	FALSE	Yes	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	309.00	FALSE	Yes	SL			AMH	Manhole	0	0	0	64	5.7	8.68	-6.06	-8.15		0				0		
63	64	63-64	ANCHOR VILLAGE	309.00	FALSE	Yes	SL			STOP	Inspection stopped	0	0	0		5.7	8.68	-6.06	-8.15		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	0.00	TRUE	Yes	SL			START AGAINS	Start Inspection Against the Flow	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	0.00	TRUE	Yes	SL			AMH	Manhole	0	0	0	63	4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	0.00	TRUE	Yes	SL			MWL	Water Level	5	0	0		4.95	5.7	-4.3	-6.06	N	0	0	0	0	0		
63A	63	63A-63	ARNCHOR VILLAGE	2.00	TRUE	Yes	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	2.00	TRUE	Yes	SL			MLC	Lining Change	4	0	0	START OF LINER	4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	2.00	TRUE	Yes	SL	6	8	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	5.00	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	5.00	TRUE	Yes	SL			MGO	General Observation	0	0	0	SEVERE GREASE IN LATERAL, may be epoxy residue , needs furth	4.95	5.7	-4.3	-6.06	N	0	3	2	2	7	RC	DR
63A	63	63A-63	ARNCHOR VILLAGE	5.00	TRUE	Yes	SL	1	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	10.00	TRUE	Yes	SL			MGP	General Photo	0	0	0	CAMERA SET	4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	25.70	TRUE	Yes	SL	10		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review ,slight JO no I & I observed	4.95	5.7	-4.3	-6.06	N	0	2	1	1	4	FISP(2)	
63A	63	63A-63	ARNCHOR VILLAGE	45.50	TRUE	Yes	SL	3		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	57.80	TRUE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	58.90	TRUE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	60.90	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0	POSSIBLE INFIL FROM LATERAL	4.95	5.7	-4.3	-6.06	P	0.25	2	2	2	6	RC	CIPP(2)
63A	63	63A-63	ARNCHOR VILLAGE	113.70	TRUE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	114.90	TRUE	Yes	SL	7	5	DAZ	Deposits Attached Other	0	0	0	UNKNOWN, may be epoxy residue	4.95	5.7	-4.3	-6.06	N	0	2	1	1	4	PM	FISP (2)
63A	63	63A-63	ARNCHOR VILLAGE	117.00	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	127.90	TRUE	Yes	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review , Infil stain observed	4.95	5.7	-4.3	-6.06	P	0.25	2	1	1	4	FISP(2)	
63A	63	63A-63	ARNCHOR VILLAGE	137.60	TRUE	Yes	SL	5	6	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	138.80	TRUE	Yes	SL	12		LFB	Lining Failure Blistered	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	147.90	TRUE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	4.95	5.7	-4.3	-6.06	N	0	2	1	1	4	PM	
63A	63	63A-63	ARNCHOR VILLAGE	157.00	TRUE	Yes	SL	6		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	167.10	TRUE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	4.95	5.7	-4.3	-6.06	N	0	2	1	1	4	PM	
63A	63	63A-63	ARNCHOR VILLAGE	174.60	TRUE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	176.00	TRUE	Yes	SL	3		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	177.90	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	199.20	TRUE	Yes	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	202.90	TRUE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	4.95	5.7	-4.3	-6.06	N	0				0	PM	
63A	63	63A-63	ARNCHOR VILLAGE	218.40	TRUE	Yes	SL	7		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	225.70	TRUE	Yes	SL	5	8	DAGS	Deposits Attached Grease	0	0	0		4.95	5.7	-4.3	-6.06	N	0	2	1	1	4	PM	
63A	63	63A-63	ARNCHOR VILLAGE	236.00	TRUE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	239.00	TRUE	Yes	SL	12	10	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	239.00	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	249.80	TRUE	Yes	SL	6	7	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	280.00	TRUE	Yes	SL	3	12	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	285.30	TRUE	Yes	SL	9		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	288.70	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	299.80	TRUE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	301.80	TRUE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	302.80	TRUE	Yes	SL	3	12	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING	4.95	5.7	-4.3	-6.06	N	0	1	1	1	3	DA	
63A	63	63A-63	ARNCHOR VILLAGE	305.10	TRUE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	308.30	TRUE	Yes	SL	12		TBC	Tap Break-in Capped	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	315.00	TRUE	Yes	SL			AMH	Manhole	0	0	0	63A LAMPHOLE	4.95	5.7	-4.3	-6.06		0				0		
63A	63	63A-63	ARNCHOR VILLAGE	315.00	TRUE					STOP	Inspection stopped	0	0	0		4.95	5.7	-4.3	-6.06		0				0		
64	65	64-65	ANCHOR VILLAGE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	0.00	FALSE					AMH	Manhole	0	0	0	64	8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	0.00	FALSE					MWL	Water Level	5	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	2.00	FALSE	Yes	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	2.00	FALSE	Yes	SL			MLC	Lining Change	4	0	0	START OF LINER	8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	8.00	FALSE	Yes	SL	6		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	10.00	FALSE	Yes	SL			MGP	General Photo	0	0	0	CAMERA SET	8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	27.50	FALSE	Yes	SL	3		LFBK	Lining Failure Buckled	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	49.00	FALSE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	50.60	FALSE	Yes	SL	5	7	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
64	65	64-65	ANCHOR VILLAGE	60.50	FALSE	Yes	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	62.40	FALSE	Yes	SL	2		TBA	Tap Break-in Active	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	62.40	FALSE	Yes	SL	3		RML	Roots Medium Lateral	3	0	0		8.68	9.79	-8.15	-9.99	P	0.25	2	2	2	6	RC	CIPP(2)
64	65	64-65	ANCHOR VILLAGE	62.40	FALSE	Yes	SL			MGO	General Observation	0	0	0	POSSIBLE INFIL FROM LATERAL	8.68	9.79	-8.15	-9.99	P	0.25	2	2	2	6	RC	
64	65	64-65	ANCHOR VILLAGE	84.00	FALSE	Yes	SL	12		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	86.10	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	94.00	FALSE	Yes	SL	3		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	105.40	FALSE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	109.90	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	8.68	9.79	-8.15	-9.99	N	0	1	2	1	4	PM	
64	65	64-65	ANCHOR VILLAGE	118.50	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	118.50	FALSE	Yes	SL			MGO	General Observation	0	0	0	POSSIBLE INFIL FROM LATERAL,not observed	8.68	9.79	-8.15	-9.99	P	0.25	1	2	1	4	FISP(2)	
64	65	64-65	ANCHOR VILLAGE	120.40	FALSE	Yes	SL			MGO	General Observation	0	0	0	POSSIBLE INFIL FROM JOINT	8.68	9.79	-8.15	-9.99	P	0.25	1	2	1	4	FISP(2)	
64	65	64-65	ANCHOR VILLAGE	130.30	FALSE	Yes	SL	7	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	140.30	FALSE	Yes	SL			MGO	General Observation	2	0	0	POSSIBLE INFIL FROM JOINT	8.68	9.79	-8.15	-9.99	P	0.25	2	2	2	6	FISP(1)	CIPP(4)-PR
64	65	64-65	ANCHOR VILLAGE	140.30	FALSE	Yes	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	171.90	FALSE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	171.90	FALSE	Yes	SL			MGO	General Observation	0	0	0	POSSIBLE INFIL FROM LATERAL,not observed	8.68	9.79	-8.15	-9.99	P	0.25	2	2	1	5	FISP(2)	FISP(2)
64	65	64-65	ANCHOR VILLAGE	178.50	FALSE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	180.10	FALSE	Yes	SL	2		TBA	Tap Break-in Active	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	180.10	FALSE	Yes	SL			MGO	General Observation	0	0	0	POSSIBLE INFIL FROM LATERAL,not observed	8.68	9.79	-8.15	-9.99	P	0.25	2	2	1	5	FISP(2)	FISP(2)
64	65	64-65	ANCHOR VILLAGE	180.80	FALSE	Yes	SL	7	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	181.60	FALSE	Yes	SL			MGO	General Observation	0	0	0	POSSIBLE INFIL FROM JOINT,not observed	8.68	9.79	-8.15	-9.99	P	0.25	2	2	1	5	FISP(2)	FISP (2)
64	65	64-65	ANCHOR VILLAGE	191.40	FALSE	Yes	SL	11		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	204.80	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	211.50	FALSE	Yes	SL	12		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0				0		
64	65	64-65	ANCHOR VILLAGE	229.80	FALSE	Yes	SL			MWLS	Water Level Sag	5	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	231.30	FALSE	Yes	SL	1	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review ,may have I & I	8.68	9.79	-8.15	-9.99	P	0.25	2	2	2	6	FISP(1)	CIPP(4)-PR
64	65	64-65	ANCHOR VILLAGE	233.00	FALSE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	234.50	FALSE	Yes	SL	3		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	236.10	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	236.40	FALSE	Yes	SL	2	9	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	247.90	FALSE	Yes	SL	6		LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3		
64	65	64-65	ANCHOR VILLAGE	262.50	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	8.68	9.79	-8.15	-9.99	N	0	1	2	1	4	PM	
64	65	64-65	ANCHOR VILLAGE	265.80	FALSE	Yes	SL			MWLS	Water Level Sag	5	0	0		8.68	9.79	-8.15	-9.99	N	0	2	2	1	5	PM	
64	65	64-65	ANCHOR VILLAGE	297.90	FALSE	Yes	SL	11	5	LFDL	Lining Failure Delaminating	4	0	0	no restrictions, needs further review	8.68	9.79	-8.15	-9.99	N	0	1	1	1	3	DA	
64	65	64-65	ANCHOR VILLAGE	298.80	FALSE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
64	65	64-65	ANCHOR VILLAGE	310.40	FALSE	Yes	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	8.68	9.79	-8.15	-9.99		0				0		
64	65	65	65	65	65	65	65	65	65	65	65	65	0	65	65	65	65	65	65	65	0	65	65	65	195		GRT MH
64	65	64-65	ANCHOR VILLAGE	312.20	FALSE					STOP	Inspection stopped	0	0	0		8.68	9.79	-8.15	-9.99		0				0		
65	66	65-66	ANCHOR VILLAGE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	0.00	FALSE	Yes	SL			AMH	Manhole	0	0	0	65	9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	0.00	FALSE	Yes	SL			MWL	Water Level	5	0	0		9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	2.00	FALSE	Yes	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	2.00	FALSE	Yes	SL			MLC	Lining Change	4	0	0	START OF LINER	9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	4.00	FALSE	Yes	SL	12	5	ISSR	Intruding Sealing Ring	0	0	0		9.79	11.54	-9.99	-11.13	N	0	1	1	1	3	DA	FISP(1)
65	66	65-66	ANCHOR VILLAGE	4.00	FALSE	Yes	SL	2	8	LFDL	Lining Failure Delaminating	4	0	0		9.79	11.54	-9.99	-11.13	N	0	1	1	1	3	DA	
65	66	65-66	ANCHOR VILLAGE	10.00	FALSE	Yes	SL			MGP	General Photo	0	0	0	CAMERA SET	9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	10.00	FALSE	Yes	SL			JSM	Joint Separated Medium	2	0	0	Large separation observed by DC	9.79	11.54	-9.99	-11.13	P	0.25	2	2	2	6	CIPP(4)	CIPP(4)
65	66	65-66	ANCHOR VILLAGE	10.00	FALSE	Yes	SL	6		LFDL	Lining Failure Delaminating	4	0	0		9.79	11.54	-9.99	-11.13	N	0	1	1	1	3	DA	
65	66	65-66	ANCHOR VILLAGE	12.00	FALSE	Yes	SL	8	12	LFDL	Lining Failure Delaminating	4	0	0		9.79	11.54	-9.99	-11.13	N	0	1	1	1	3	DA	
65	66	65-66	ANCHOR VILLAGE	13.80	FALSE	Yes	SL	2		TBA	Tap Break-in Active	0	0	0		9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	23.00	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	No restrictions, increased PM	9.79	11.54	-9.99	-11.13	N	0	2	2	1	5	PM	
65	66	65-66	ANCHOR VILLAGE	35.10	FALSE	Yes	SL	12	5	LFDL	Lining Failure Delaminating	4	0	0		9.79	11.54	-9.99	-11.13	N	0	1	1	1	3	DA	
65	66	65-66	ANCHOR VILLAGE	36.80	FALSE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	68.40	FALSE	Yes	SL	5		LFDL	Lining Failure Delaminating	4	0	0		9.79	11.54	-9.99	-11.13	N	0	1	1	1	3	DA	
65	66	65-66	ANCHOR VILLAGE	74.70	FALSE	Yes	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	9.79	11.54	-9.99	-11.13	N	0	1	1	1	3	DA	
65	66	65-66	ANCHOR VILLAGE	78.30	FALSE	Yes	SL	2		LFDL	Lining Failure Delaminating	4	0	0		9.79	11.54	-9.99	-11.13	N	0	1	1	1	3	DA	
65	66	65-66	ANCHOR VILLAGE	88.20	FALSE	Yes	SL	5	11	LFDL	Lining Failure Delaminating	4	0	0		9.79	11.54	-9.99	-11.13	N	0	1	1	1	3	DA	
65	66	65-66	ANCHOR VILLAGE	90.10	FALSE	Yes	SL	10		TBA	Tap Break-in Active	0	0	0		9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	93.10	FALSE	Yes	SL	3		TBA	Tap Break-in Active	0	0	0		9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	93.10	FALSE	Yes	SL	3	9	RML	Roots Medium Lateral	3	0	0	Type of roots may cause blockage,separate joint allowing I & I	9.79	11.54	-9.99	-11.13	P	0.25	2	2	2	6	RC	CIPP(2)
65	66	65-66	ANCHOR VILLAGE	93.20	FALSE	Yes	SL	2	10	DAR	Deposits Attached Ragging	0	0	0	GREASE	9.79	11.54	-9.99	-11.13	N	0	2	2	1	5	PM	
65	66	65-66	ANCHOR VILLAGE	95.80	FALSE	Yes	SL			JAM	Joint Angular Medium	2	0	0		9.79	11.54	-9.99	-11.13	N	0	1	2	2	5	DA	
65	66	65-66	ANCHOR VILLAGE	95.80	FALSE	Yes	SL			MWLS	Water Level Sag	5	0	0		9.79	11.54	-9.99	-11.13	N	0	2	2	1	5	PM	
65	66	65-66	ANCHOR VILLAGE	114.50	FALSE	Yes	SL			MCU	Camera Underwater	0	0	0		9.79	11.54	-9.99	-11.13	P	0.25	3	2	2	7	PM	
65	66	65-66	ANCHOR VILLAGE	135.90	FALSE	Yes	SL	12		TB	Tap Break-in	0	0	0		9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	157.20	FALSE	Yes	SL	9		LFDL	Lining Failure Delaminating	4	0	0		9.79	11.54	-9.99	-11.13	N	0	1	1	1	3	DA	
65	66	65-66	ANCHOR VILLAGE	186.90	FALSE	Yes	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	187.70	FALSE	Yes	SL			AMH	Manhole	0	0	0	66	9.79	11.54	-9.99	-11.13		0				0		
65	66	65-66	ANCHOR VILLAGE	187.70	FALSE	Yes	SL			STOP	Inspection stopped	0	0	0		9.79	11.54	-9.99	-11.13		0				0		
67	68	67-68_1	MARINA VILLAGE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	0.00	FALSE					AMH	Manhole	0	0	0	67	5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	0.00	FALSE					MWL	Water Level	5	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	2.00	FALSE					MLC	Lining Change	4	0	0	START OF LINER	5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	4.00	FALSE			1	4	LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	17.90	FALSE			1	7	LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	17.90	FALSE					JOM	Joint Offset Medium	2	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	19.60	FALSE			3		TB	Tap Break-in	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	30.80	FALSE			2	10	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING	5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	32.80	FALSE			9		TBA	Tap Break-in Active	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	57.10	FALSE			6	9	LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	78.70	FALSE			3		TB	Tap Break-in	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	90.90	FALSE			3	8	LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	92.40	FALSE			9		TBA	Tap Break-in Active	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	94.10	FALSE			1	8	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING	5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	109.00	FALSE			5	7	LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	119.10	FALSE			5	7	LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
67	68	67-68_1	MARINA VILLAGE	140.50	FALSE			2		TBA	Tap Break-in Active	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	152.00	FALSE			1	6	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING	5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	153.80	FALSE			10		TBA	Tap Break-in Active	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	155.00	FALSE			2		LFB	Lining Failure Blistered	4	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	161.00	FALSE			5		LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	170.40	FALSE			5	6	LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	186.90	FALSE					MWLS	Water Level Sag	5	0	0		5.48	8.11	-5.94	-7.59	N	0	2	2	1	5	PM	
67	68	67-68_1	MARINA VILLAGE	190.30	FALSE			9		LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	199.80	FALSE			7		LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	201.90	FALSE			3		TBA	Tap Break-in Active	0	0	0		5.48	8.11	-5.94	-7.59	N	0				0		
67	68	67-68_1	MARINA VILLAGE	202.90	FALSE			7	9	LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	212.90	FALSE			1	5	LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	214.50	FALSE			10		TBA	Tap Break-in Active	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	223.80	FALSE					MWLS	Water Level Sag	5	0	0		5.48	8.11	-5.94	-7.59	N	0	2	2	1	5	PM	
67	68	67-68_1	MARINA VILLAGE	226.50	FALSE			3		LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	235.80	FALSE			5	7	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING	5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	255.50	FALSE					JOM	Joint Offset Medium	2	0	0	appears sound, no infil	5.48	8.11	-5.94	-7.59	N	0	2	2	1	5	FISP(2)	
67	68	67-68_1	MARINA VILLAGE	258.00	FALSE			3		TBA	Tap Break-in Active	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	258.70	FALSE			1	8	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING,suspect I & I ,need further inspection	5.48	8.11	-5.94	-7.59	P	0.25	2	2	2	6	FISP(1)	CIPP(4)-PR
67	68	67-68_1	MARINA VILLAGE	269.30	FALSE			3		TBA	Tap Break-in Active	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	269.30	FALSE					MGO	General Observation	0	0	0	POSSIBLE INFIL FROM TAP	5.48	8.11	-5.94	-7.59	P	0.25	2	2	2	6	RC	CIPP(2)
67	68	67-68_1	MARINA VILLAGE	274.20	FALSE			6	8	LFDL	Lining Failure Delaminating	4	0	0		5.48	8.11	-5.94	-7.59	N	0	1	1	1	3	DA	
67	68	67-68_1	MARINA VILLAGE	275.90	FALSE			9		TBA	Tap Break-in Active	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	298.40	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	300.30	FALSE					AMH	Manhole	0	0	0	68	5.48	8.11	-5.94	-7.59		0				0		
67	68	67-68_1	MARINA VILLAGE	300.30	FALSE					STOP	Inspection stopped	0	0	0		5.48	8.11	-5.94	-7.59		0				0		
67A	67	67A-67_1	MARINA VILLAGE	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	0.00	TRUE					AMH	Manhole	0	0	0	67	4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	0.00	TRUE					MWL	Water Level	5	0	0		4.51	5.48	-3.91	-5.94	N	0	1	1	1	3	DA	
67A	67	67A-67_1	MARINA VILLAGE	2.00	TRUE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	2.00	TRUE					MLC	Lining Change	4	0	0	START OF LINER	4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	5.30	TRUE			5	7	LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94	N	0				0	DA	
67A	67	67A-67_1	MARINA VILLAGE	10.00	TRUE					MGP	General Photo	0	0	0	CAMERA SET	4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	16.80	TRUE					JOM	Joint Offset Medium	2	0	0	appears sound, no infil	4.51	5.48	-3.91	-5.94	N	0	2	1	1	4	SL(4)	FISP(2)
67A	67	67A-67_1	MARINA VILLAGE	28.30	TRUE			9		LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94	N	0				0	DA	
67A	67	67A-67_1	MARINA VILLAGE	28.90	TRUE			3		TBA	Tap Break-in Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	29.60	TRUE					JOM	Joint Offset Medium	2	0	0	appears sound, no infil	4.51	5.48	-3.91	-5.94	N	0	2	1	1	4	SL(4)	FISP(2)
67A	67	67A-67_1	MARINA VILLAGE	29.90	TRUE			4		LFB	Lining Failure Blistered	4	0	0		4.51	5.48	-3.91	-5.94	N	0	2	1	1	4	FISP(1)	CIPP(14)
67A	67	67A-67_1	MARINA VILLAGE	39.20	TRUE			3	5	LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94	N	0	1	1	1	3	DA	
67A	67	67A-67_1	MARINA VILLAGE	39.20	TRUE					JOM	Joint Offset Medium	2	0	0	appears sound, no infil	4.51	5.48	-3.91	-5.94	N	0	2	1	1	4	SL(4)	FISP(2)
67A	67	67A-67_1	MARINA VILLAGE	42.10	TRUE			9		TBA	Tap Break-in Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	42.70	TRUE			7	10	LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94	N	0				0	DA	
67A	67	67A-67_1	MARINA VILLAGE	52.60	TRUE					JOM	Joint Offset Medium	2	0	0		4.51	5.48	-3.91	-5.94	N	0	2	1	1	4	FISP(2)	CIPP(4)
67A	67	67A-67_1	MARINA VILLAGE	85.00	TRUE			3		TBA	Tap Break-in Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	85.90	TRUE			9	11	LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94	N	0	1	1	1	3	DA	
67A	67	67A-67_1	MARINA VILLAGE	98.10	TRUE			9		TBA	Tap Break-in Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	119.30	TRUE			3	4	LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94	N	0	1	1	1	3	DA	
67A	67	67A-67_1	MARINA VILLAGE	140.90	TRUE			6		LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94	N	0	1	1	1	3	DA	
67A	67	67A-67_1	MARINA VILLAGE	146.30	TRUE			3		TB	Tap Break-in	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	159.40	TRUE			9		TBA	Tap Break-in Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	159.90	TRUE			6	10	LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94	N	0	1	1	1	3	DA	
67A	67	67A-67_1	MARINA VILLAGE	190.50	TRUE					JOM	Joint Offset Medium	2	0	0		4.51	5.48	-3.91	-5.94		0				0	DR(24)	
67A	67	67A-67_1	MARINA VILLAGE	190.50	TRUE					MGO	General Observation	2	0	0	POSSIBLE INFIL AT JOINT,not observed	4.51	5.48	-3.91	-5.94	P	0.25	2	2	2	6	Drcomb	
67A	67	67A-67_1	MARINA VILLAGE	190.50	TRUE			9		LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94		0				0	Drcomb	
67A	67	67A-67_1	MARINA VILLAGE	204.10	TRUE			5		LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94		0				0	Drcomb	
67A	67	67A-67_1	MARINA VILLAGE	205.10	TRUE					JOM	Joint Offset Medium	2	0	0	infil possible	4.51	5.48	-3.91	-5.94	P	0.25	3	3	2	8	Drcomb	
67A	67	67A-67_1	MARINA VILLAGE	205.10	TRUE					MGO	General Observation	2	0	0	POSSIBLE INFIL AT JOINT	4.51	5.48	-3.91	-5.94	P	0.25	3	3	2	8	Drcomb	
67A	67	67A-67_1	MARINA VILLAGE	207.50	TRUE			3		TB	Tap Break-in	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	208.30	TRUE			6	7	LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94		0				0	DA	
67A	67	67A-67_1	MARINA VILLAGE	218.10	TRUE			9		LFDL	Lining Failure Delaminating	4	0	0		4.51	5.48	-3.91	-5.94		0				0	DA	
67A	67	67A-67_1	MARINA VILLAGE	219.40	TRUE					MSA	Abandoned Survey	0	0	0	CAMERA FLIPPED	4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67_1	MARINA VILLAGE	219.40	TRUE					STOP	Inspection stopped	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
68	69	68-69	MARINA VILLAGE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	0.00	FALSE					AMH	Manhole	0	0	0	68	8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	0.00	FALSE					MWL	Water Level	5	0	0		8.11	11.3	-7.59	-9.58	N	0				0		
68	69	68-69	MARINA VILLAGE	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	2.00	FALSE					MLC	Lining Change	4	0	0	START OF LINER	8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	11.30	FALSE			6		LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	17.90	FALSE			5	7	DAGS	Deposits Attached Grease	0	0	0		8.11	11.3	-7.59	-9.58	N	0				0	PM	
68	69	68-69	MARINA VILLAGE	21.10	FALSE			2	7	LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	22.60	FALSE			2		TBA	Tap Break-in Active	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	34.60	FALSE			2	5	LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	35.60	FALSE			10		TBA	Tap Break-in Active	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	39.70	FALSE					MWL	Water Level	5	0	0		8.11	11.3	-7.59	-9.58	N	0				0	PM	
68	69	68-69	MARINA VILLAGE	65.90	FALSE					MWL	Water Level	5	0	0		8.11	11.3	-7.59	-9.58	N	0				0		
68	69	68-69	MARINA VILLAGE	78.60	FALSE			2		TB	Tap Break-in	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	80.60	FALSE			6		LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	90.40	FALSE			3		LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	96.60	FALSE			10		TBA	Tap Break-in Active	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	98.50	FALSE			9		LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	108.40	FALSE			9		LFB	Lining Failure Blistered	4	0	0		8.11	11.3	-7.59	-9.58	N	0	2	1	1	4	DA	
68	69	68-69	MARINA VILLAGE	108.40	FALSE			3		LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	118.40	FALSE			2	10	LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	138.20	FALSE			5		LFBK	Lining Failure Buckled	4	0	0		8.11	11.3	-7.59	-9.58	N	0	3	3	2	8	CIPP(6)	
68	69	68-69	MARINA VILLAGE	138.20	FALSE			6		LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	139.50	FALSE			3		TBA	Tap Break-in Active	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	141.40	FALSE			2	6	LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	144.70	FALSE			11		LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
68	69	68-69	MARINA VILLAGE	151.70	FALSE					MWL	Water Level	5	0	0		8.11	11.3	-7.59	-9.58		0				0	PM	
68	69	68-69	MARINA VILLAGE	156.10	FALSE			9		TB	Tap Break-in	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	157.80	FALSE			11	1	LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	199.00	FALSE			3		TBA	Tap Break-in Active	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	199.00	FALSE			9		LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	199.20	FALSE			4	5	LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	212.30	FALSE			10		TBA	Tap Break-in Active	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	214.10	FALSE			2	8	LFDL	Lining Failure Delaminating	4	0	0		8.11	11.3	-7.59	-9.58	N	0	1	1	1	3	DA	
68	69	68-69	MARINA VILLAGE	232.60	FALSE			5	8	DAGS	Deposits Attached Grease	0	0	0	GREASE	8.11	11.3	-7.59	-9.58	N	0	2	2	1	5	PM	
68	69	68-69	MARINA VILLAGE	238.90	FALSE					MWLS	Water Level Sag	5	0	0		8.11	11.3	-7.59	-9.58	N	0	2	2	1	5	PM	
68	69	68-69	MARINA VILLAGE	255.70	FALSE			3		TB	Tap Break-in	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	258.90	FALSE			10		TBA	Tap Break-in Active	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	262.10	FALSE					MWLS	Water Level Sag	5	0	0		8.11	11.3	-7.59	-9.58	N	0	2	2	1	5	PM	
68	69	68-69	MARINA VILLAGE	300.60	FALSE			3	9	DAGS	Deposits Attached Grease	0	0	0		8.11	11.3	-7.59	-9.58	N	0	1	2	1	4	PM	
68	69	68-69	MARINA VILLAGE	301.90	FALSE					MWL	Water Level	5	0	0		8.11	11.3	-7.59	-9.58	N	0	2	2	1	5	PM	
68	69	68-69	MARINA VILLAGE	303.20	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	304.50	FALSE					AMH	Manhole	0	0	0	69	8.11	11.3	-7.59	-9.58		0				0		
68	69	68-69	MARINA VILLAGE	304.50	FALSE					STOP	Inspection stopped	0	0	0		8.11	11.3	-7.59	-9.58		0				0		
85A	85	85A-85	FIFTH ST	0.00	FALSE	N				START WITH FL	Start Inspection With the Flow	0	0	0		#N/A	8.02	#N/A	-5.9		0				0		
85A	85	85A-85	FIFTH ST	0.00	FALSE	N				AMH	Manhole	0	0	0	85A LAMPHOLE	#N/A	8.02	#N/A	-5.9		0				0		
85A	85	85A-85	FIFTH ST	0.00	FALSE	N				MWL	Water Level	5	0	0		#N/A	8.02	#N/A	-5.9	N	0	2	2	2	6	PM	
85A	85	85A-85	FIFTH ST	2.50	FALSE	N		9		TBA	Tap Break-in Active	0	0	0		#N/A	8.02	#N/A	-5.9		0				0		
85A	85	85A-85	FIFTH ST	5.30	FALSE	N				MWL	Water Level	5	0	0		#N/A	8.02	#N/A	-5.9	N	0	2	1	1	4	PM	
85A	85	85A-85	FIFTH ST	33.20	FALSE	N		3		TFA	Tap Factory Active	0	0	0		#N/A	8.02	#N/A	-5.9		0				0		
85A	85	85A-85	FIFTH ST	33.20	FALSE	N		9		RML	Roots Medium Lateral	3	0	0	may be abandoned	#N/A	8.02	#N/A	-5.9	P	0.25	2	1	2	5	RC	CIPP(2)
85A	85	85A-85	FIFTH ST	53.10	FALSE	N		9		TBD	Tap Break-in Defective	0	0	0	OFFSET,minor	#N/A	8.02	#N/A	-5.9	P	0.25	2	1	2	5	FISP(2)	
85A	85	85A-85	IPP(4)	96.00	FALSE	N		9		TBD	Tap Break-in Defective	2	0	0	OFFSET	#N/A	8.02	#N/A	-5.9	P	0.25	2	1	2	5	DR	
85A	85	85A-85	FIFTH ST	96.00	FALSE	N				MGO	General Observation	2	0	0	POSSIBLE INFIL FROM SEVERE OFFSET JOINT, possible exfil also	#N/A	8.02	#N/A	-5.9	P	0.25	3	2	3	8	Drcomb	
85A	85	85A-85	FIFTH ST	113.30	FALSE	N		3		TBD	Tap Break-in Defective	0	0	0	OFFSET,minor	#N/A	8.02	#N/A	-5.9	N	0	2	1	1	4	FISP(2)	
85A	85	85A-85	FIFTH ST	127.60	FALSE	N		3		TBA	Tap Break-in Active	0	0	0		#N/A	8.02	#N/A	-5.9		0				0		
85A	85	85A-85	FIFTH ST	158.90	FALSE	N		10		TFD	Tap Factory Defective	0	0	0	OFFSET	#N/A	8.02	#N/A	-5.9	P	0.25	2	1	2	5	FISP(2)	
85A	85	85A-85	FIFTH ST	160.10	FALSE	N				JSM	Joint Separated Medium	2	0	0	Minor	#N/A	8.02	#N/A	-5.9	N	0	2	2	1	5	DA	
85A	85	85A-85	FIFTH ST	185.40	FALSE	N				MGO	General Observation	0	0	0	POSSIBLE INFIL, observed	#N/A	8.02	#N/A	-5.9	IW	2	2	2	2	6	FISP(1)	CIPP(4)
85A	85	85A-85	FIFTH ST	186.20	FALSE	N		9		TFA	Tap Factory Active	0	0	0		#N/A	8.02	#N/A	-5.9		0				0		
85A	85	85A-85	FIFTH ST	218.30	FALSE	N		3		TBD	Tap Break-in Defective	2	0	0	OFFSET	#N/A	8.02	#N/A	-5.9	P	0.25	2	2	2	6	DR	
85A	85	85A-85	FIFTH ST	218.30	FALSE	N		3		RFC	Roots Fine Connection	3	0	0		#N/A	8.02	#N/A	-5.9	P	0.25	2	2	2	6	FM	
85A	85	85A-85	FIFTH ST	218.30	FALSE	N				MGO	General Observation	2	0	0	POSSIBLE INFIL AT OFFSET JOINT IN LATERAL	#N/A	8.02	#N/A	-5.9	P	0.25	2	2	2	6	DRcomb	
85A	85	85A-85	FIFTH ST	275.40	FALSE	N		3		B	Broken	0	0	0	Just chipped pipe	#N/A	8.02	#N/A	-5.9	P	0.25	2	1	2	5	FISP(2)	CIPP(4)
85A	85	85A-85	FIFTH ST	284.40	FALSE	N		11		TBA	Tap Break-in Active	0	0	0		#N/A	8.02	#N/A	-5.9		0				0		
85A	85	85A-85	FIFTH ST	300.80	FALSE	N				MWM	Water Mark	5	0	0		#N/A	8.02	#N/A	-5.9	P	0.25	2	2	1	5	PM	
85A	85	85A-85	FIFTH ST	312.10	FALSE	N		9		TBD	Tap Break-in Defective	2	0	0	OFFSET AT TAP	#N/A	8.02	#N/A	-5.9	P	0.25	3	2	2	7	DR	
85A	85	85A-85	FIFTH ST	312.10	FALSE	N				MGO	General Observation	2	0	0	POSSIBLE INFIL AT TAP CONNECTION	#N/A	8.02	#N/A	-5.9	IR	4	2	2	2	6	Drcomb	
85A	85	85A-85	FIFTH ST	312.10	FALSE	N				MGO	General Observation	2	0	0	SEVERE OFFSET JOINT IN LATERAL	#N/A	8.02	#N/A	-5.9	P	0.25	3	2	3	8	Drcomb	
85A	85	85A-85	FIFTH ST	336.00	FALSE	N		3	9	IS	Infil Stain	0	0	0	INFIL	#N/A	8.02	#N/A	-5.9	P	0.25	2	1	1	4	DA	
85A	85	85A-85	FIFTH ST	344.40	FALSE	N				MWLS	Water Level Sag	5	0	0		#N/A	8.02	#N/A	-5.9		0	2	2	1	5	PM	
85A	85	85A-85	FIFTH ST	354.80	FALSE	N				JAM	Joint Angular Medium	2	0	0		#N/A	8.02	#N/A	-5.9	N	0	1	2	1	4	FISP(2)	
85A	85	85A-85	FIFTH ST	358.50	FALSE	N				JOM	Joint Offset Medium	2	0	0		#N/A	8.02	#N/A	-5.9	N	0	1	2	1	4	FISP(2)	
85A	85	85A-85	FIFTH ST	360.30	FALSE	N				JSL	Joint Separated Large	2	0	0	calders in place ,appears sound	#N/A	8.02	#N/A	-5.9	N	0	2	3	1	6	FISP(2)	
85A	85	85A-85	FIFTH ST	362.80	FALSE	N				MGO	General Observation	0	0	0	INSIDE DROP CONNECTION / BLOCKED NOT FLOWING	#N/A	8.02	#N/A	-5.9	N	0	2	2	1	5	PM	
85A	85	85A-85	FIFTH ST	363.80	FALSE	N				MSA	Abandoned Survey	0	0	0	CANNOT PASS INSIDE DROP CONNECTION	#N/A	8.02	#N/A	-5.9		0				0	FISP(1)	GRT
85A	85	85A-85	FIFTH ST	363.80	FALSE					STOP	Inspection stopped	0	0	0		#N/A	8.02	#N/A	-5.9		0				0		
106	107	106-107	ISLAND CIR	0.00	FALSE	YES	SL			START WITH FL	Start Inspection With the Flow	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	0.00	FALSE	YES	SL			AMH	Manhole	0	0	0	106	5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	0.00	FALSE	YES	SL			MWL	Water Level	5	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	2.00	FALSE	YES	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	2.00	FALSE	YES	SL			MLC	Lining Change	4	0	0	START OF LINER	5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	5.00	FALSE	YES	SL	4	8	DAGS	Deposits Attached Grease	0	0	0	GREASE	5.17	7.31	-4.84	-6.66	N	0	2	2	1	5	PM	
106	107	106-107	ISLAND CIR	5.00	FALSE	YES	SL	9	1	LFDL	Lining Failure Delaminating	4	0	0		5.17	7.31	-4.84	-6.66	N	0	1	1	1	3	DA	
106	107	106-107	ISLAND CIR	5.50	FALSE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	33.40	FALSE	YES	SL	12	12	LFB	Lining Failure Blistered	4	0	0		5.17	7.31	-4.84	-6.66	N	0	2	2	1	5	FISP(2)	
106	107	106-107	ISLAND CIR	34.80	FALSE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	57.10	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		5.17	7.31	-4.84	-6.66	N	0	2	2	1	5	PM	
106	107	106-107	ISLAND CIR	62.90	FALSE	YES	SL	3		LFDL	Lining Failure Delaminating	4	0	0	n	5.17	7.31	-4.84	-6.66	N	0	1	1	1	3	DA	
106	107	106-107	ISLAND CIR	63.90	FALSE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	65.70	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	not restricting flow	5.17	7.31	-4.84	-6.66	N	0	1	1	1	3	DA	
106	107	106-107	ISLAND CIR	78.10	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		5.17	7.31	-4.84	-6.66		0				0	PM	
106	107	106-107	ISLAND CIR	79.90	FALSE	YES	SL	9		LFDL	Lining Failure Delaminating	4	0	0	not restricting flow	5.17	7.31	-4.84	-6.66	N	0	1	1	1	3	DA	
106	107	106-107	ISLAND CIR	106.10	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	135.20	FALSE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	138.40	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		5.17	7.31	-4.84	-6.66	N	0	2	2	1	5	PM	
106	107	106-107	ISLAND CIR	164.40	FALSE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	181.40	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		5.17	7.31	-4.84	-6.66	N	0				0	PM	
106	107	106-107	ISLAND CIR	191.90	FALSE	YES	SL	2	10	LFDL	Lining Failure Delaminating	4	0	0	not restricting flow	5.17	7.31	-4.84	-6.66	N	0	1	1	1	3	DA	
106	107	106-107	ISLAND CIR	193.30	FALSE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	207.90	FALSE	YES	SL	5		RFJ	Roots Fine Joint	3	0	0	POSSIBLE I & I , JOINT OFFSET	5.17	7.31	-4.84	-6.66	P	0.25	2	2	2	6	CIPP(4)	DR
106	107	106-107	ISLAND CIR	221.20	FALSE	YES	SL	6	11	LFDL	Lining Failure Delaminating	4	0	0	not restricting flow	5.17	7.31	-4.84	-6.66	N	0	1	1	1	3	DA	
106	107	106-107	ISLAND CIR	222.40	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	224.20	FALSE	YES	SL	1		LFB	Lining Failure Blistered	4	0	0	not restricting flow appears sound	5.17	7.31	-4.84	-6.66	N	0	2	2	1	5	DA	
106	107	106-107	ISLAND CIR	245.30	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		5.17	7.31	-4.84	-6.66	N	0	2	2	1	5	PM	
106	107	106-107	ISLAND CIR	251.60	FALSE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	269.50	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		5.17	7.31	-4.84	-6.66	N	0	2	2	1	5	PM	
106	107	106-107	ISLAND CIR	281.00	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	295.40	FALSE	YES	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0	not restricting flow	5.17	7.31	-4.84	-6.66	N	0	1	1	1	3	DA	
106	107	106-107	ISLAND CIR	297.10	FALSE	YES	SL	2		TB	Tap Break-in	0	0	0		5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	298.60	FALSE	YES	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	300.70	FALSE	YES	SL			MGO	General Observation	0	0	0	INFIL STAIN ON BOTTOM SECTION OF MH BARREL	5.17	7.31	-4.84	-6.66	P	0.25				0	FISP(1)	GRT
106	107	106-107	ISLAND CIR	300.70	FALSE	YES	SL			AMH	Manhole	0	0	0	107	5.17	7.31	-4.84	-6.66		0				0		
106	107	106-107	ISLAND CIR	300.70	FALSE	YES	SL			STOP	Inspection stopped	0	0	0		5.17	7.31	-4.84	-6.66		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
106A	106	106A-106	ISLAND CIR	0.00	TRUE	YES	SL			START AGAINS	Start Inspection Against the Flow	0	0	0		#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	0.00	TRUE	YES	SL			AMH	Manhole	0	0	0	106	#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	0.00	TRUE	YES	SL			MWL	Water Level	5	0	0		#N/A	5.17	#N/A	-4.84	N	0				0		
106A	106	106A-106	ISLAND CIR	2.00	TRUE	YES	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	2.00	TRUE	YES	SL			MLC	Lining Change	4	0	0	START OF LINER	#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	10.00	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	10.70	TRUE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	11.20	TRUE	YES	SL	3	5	LFDL	Lining Failure Delaminating	4	0	0		#N/A	5.17	#N/A	-4.84	N	0	1	1	1	3	DA	
106A	106	106A-106	ISLAND CIR	36.20	TRUE	YES	SL	3	5	LFDL	Lining Failure Delaminating	4	0	0		#N/A	5.17	#N/A	-4.84	N	0	1	1	1	3	DA	
106A	106	106A-106	ISLAND CIR	43.40	TRUE	YES	SL	5		LFDL	Lining Failure Delaminating	4	0	0		#N/A	5.17	#N/A	-4.84	N	0	1	1	1	3	DA	
106A	106	106A-106	ISLAND CIR	50.80	TRUE	YES	SL	5	7	LFDL	Lining Failure Delaminating	4	0	0		#N/A	5.17	#N/A	-4.84	N	0	1	1	1	3	DA	
106A	106	106A-106	ISLAND CIR	52.70	TRUE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	52.70	TRUE	YES	SL	5		LFDL	Lining Failure Delaminating	4	0	0		#N/A	5.17	#N/A	-4.84	N	0	1	1	1	3	DA	
106A	106	106A-106	ISLAND CIR	55.50	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0		#N/A	5.17	#N/A	-4.84	N	0				0		
106A	106	106A-106	ISLAND CIR	82.40	TRUE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	98.10	TRUE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	116.10	TRUE	YES	SL	9		TBD	Tap Break-in Defective	0	0	0	OFFSET, Minor, no I & I observed	#N/A	5.17	#N/A	-4.84	N	0	2	2	1	5	FISP(2)	
106A	106	106A-106	ISLAND CIR	127.30	TRUE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	130.50	TRUE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	130.50	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		#N/A	5.17	#N/A	-4.84	N	0	1	1	1	3	DA	
106A	106	106A-106	ISLAND CIR	146.70	TRUE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	147.10	TRUE	YES	SL	6	9	LFDL	Lining Failure Delaminating	4	0	0		#N/A	5.17	#N/A	-4.84	N	0	1	1	1	3	DA	
106A	106	106A-106	ISLAND CIR	147.90	TRUE	YES	SL			MMC	Material Change	0	0	0	AC / END OF LINER	#N/A	5.17	#N/A	-4.84	N	0				0		
106A	106	106A-106	ISLAND CIR	152.70	TRUE	YES	SL			MLC	Lining Change	4	0	0	START OF LINER	#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	154.90	TRUE					AMH	Manhole	0	0	0	106A / LAMPHOLE	#N/A	5.17	#N/A	-4.84		0				0		
106A	106	106A-106	ISLAND CIR	154.90	TRUE					STOP	Inspection stopped	0	0	0		#N/A	5.17	#N/A	-4.84		0				0		
107	108	107-108	ISLAND CIR	0.00	FALSE	YES	SL			START WITH FL	Start Inspection With the Flow	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	0.00	FALSE	YES	SL			AMH	Manhole	0	0	0	107	7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	0.00	FALSE	YES	SL			MWL	Water Level	5	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	2.00	FALSE	YES	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	2.00	FALSE	YES	SL			MLC	Lining Change	4	0	0	START OF LINER	7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	31.30	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.31	8.85	-6.66	-8.46	N	0	2	2	1	5	PM	
107	108	107-108	ISLAND CIR	47.50	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	63.60	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	64.90	FALSE	YES	SL			JAM	Joint Angular Medium	2	0	0	Appears sound and intact	7.31	8.85	-6.66	-8.46	N	0	2	2	1	5	FISP(2)	
107	108	107-108	ISLAND CIR	105.70	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		7.31	8.85	-6.66	-8.46		0	0	0	0	0		
107	108	107-108	ISLAND CIR	120.10	FALSE	YES	SL	5	12	LFB	Lining Failure Blistered	4	0	0		7.31	8.85	-6.66	-8.46	N	0	2	2	1	5	DA	
107	108	107-108	ISLAND CIR	122.10	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	135.80	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.31	8.85	-6.66	-8.46	N	0	1	1	1	3	DA	
107	108	107-108	ISLAND CIR	146.50	FALSE	YES	SL	11		TBA	Tap Break-in Active	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	177.10	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	180.30	FALSE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	197.50	FALSE	YES	SL	12		LFB	Lining Failure Blistered	4	0	0		7.31	8.85	-6.66	-8.46	N	0	2	2	1	5	DA	
107	108	107-108	ISLAND CIR	221.00	FALSE	YES	SL	12		LFB	Lining Failure Blistered	4	0	0		7.31	8.85	-6.66	-8.46	N	0	2	2	1	5	DA	
107	108	107-108	ISLAND CIR	235.50	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	238.70	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0	Suspect I & I	7.31	8.85	-6.66	-8.46	P	0.25	2	2	2	6	FISP(1)	CIPP(2)
107	108	107-108	ISLAND CIR	249.50	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.31	8.85	-6.66	-8.46	N	0	2	2	1	5	PM	
107	108	107-108	ISLAND CIR	293.90	FALSE	YES	SL	2		TB	Tap Break-in	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	297.00	FALSE	YES	SL	10		TB	Tap Break-in	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	299.40	FALSE	YES	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	299.60	FALSE					AMH	Manhole	0	0	0	108	7.31	8.85	-6.66	-8.46		0				0		
107	108	107-108	ISLAND CIR	299.60	FALSE					STOP	Inspection stopped	0	0	0		7.31	8.85	-6.66	-8.46		0				0		
110	111	110-111	BLUE HERON CT	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	0.00	FALSE					AMH	Manhole	0	0	0	110	10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	0.00	FALSE	YES	SL			MGO	General Observation	3	0	0	ROOTS IN MH	10.66	9.97	-10.44	-9.27	P	0.25	2	2	2	6	GRT	FISP
110	111	110-111	BLUE HERON CT	0.00	FALSE	YES	SL			MWL	Water Level	5	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	2.00	FALSE	YES	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	2.00	FALSE	YES	SL			MLC	Lining Change	4	0	0	START OF LINER	10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	2.00	FALSE	YES	SL	12		LFDL	Lining Failure Delaminating	4	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	2.50	FALSE	YES	SL	5	8	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING	10.66	9.97	-10.44	-9.27	N	0	1	1	1	3	DA	
110	111	110-111	BLUE HERON CT	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	38.30	FALSE	YES	SL	5	6	LFDL	Lining Failure Delaminating	4	0	0		10.66	9.97	-10.44	-9.27	N	0	1	1	1	3	DA	
110	111	110-111	BLUE HERON CT	39.80	FALSE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	49.40	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	63.10	FALSE	YES	SL	5	11	LFDL	Lining Failure Delaminating	4	0	0		10.66	9.97	-10.44	-9.27	N	0	1	1	1	3	DA	
110	111	110-111	BLUE HERON CT	90.00	FALSE	YES	SL	6	8	LFDL	Lining Failure Delaminating	4	0	0		10.66	9.97	-10.44	-9.27	N	0	1	1	1	3	DA	
110	111	110-111	BLUE HERON CT	104.60	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	106.30	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		10.66	9.97	-10.44	-9.27	N	0	1	1	1	3	DA	
110	111	110-111	BLUE HERON CT	107.90	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	122.70	FALSE	YES	SL	7		LFDL	Lining Failure Delaminating	4	0	0		10.66	9.97	-10.44	-9.27	N	0	1	1	1	3	DA	
110	111	110-111	BLUE HERON CT	135.90	FALSE	YES	SL	5	7	LFDL	Lining Failure Delaminating	4	0	0		10.66	9.97	-10.44	-9.27	N	0	1	1	1	3	DA	
110	111	110-111	BLUE HERON CT	147.90	FALSE	YES	SL	1	10	LFDL	Lining Failure Delaminating	4	0	0	LINER MISSING, appears cracked at 154 ft	10.66	9.97	-10.44	-9.27	p	0.25	2	2	2	6	FISP(1)	CIPP(4)
110	111	110-111	BLUE HERON CT	161.50	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		10.66	9.97	-10.44	-9.27	N	0	1	1	1	3	DA	
110	111	110-111	BLUE HERON CT	162.90	FALSE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	172.50	FALSE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	208.30	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	224.60	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	239.30	FALSE	YES	SL	3	6	LFDL	Lining Failure Delaminating	4	0	0		10.66	9.97	-10.44	-9.27	N	0	1	1	1	3	DA	
110	111	110-111	BLUE HERON CT	266.80	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	296.10	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	297.90	FALSE	YES	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	299.70	FALSE					AMH	Manhole	0	0	0	111	10.66	9.97	-10.44	-9.27		0				0		
110	111	110-111	BLUE HERON CT	299.70	FALSE					STOP	Inspection stopped	0	0	0		10.66	9.97	-10.44	-9.27		0				0		
110A	110	110A-110	BLUE HERON CT	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	0.00	TRUE					AMH	Manhole	0	0	0	110	11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	0.00	TRUE					MWL	Water Level	5	0	0		11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	2.00	TRUE	YES	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	10.00	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	11.16	10.66	-10.94	-10.44		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
110A	110	110A-110	BLUE HERON CT	15.40	TRUE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	18.60	TRUE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	20.00	TRUE	YES	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0		11.16	10.66	-10.94	-10.44	N	0	1	1	1	3	DA	
110A	110	110A-110	BLUE HERON CT	22.50	TRUE	YES	SL			MWL	Water Level	5	0	0		11.16	10.66	-10.94	-10.44	N	0	1	1	1	3	PM	
110A	110	110A-110	BLUE HERON CT	45.70	TRUE	YES	SL	2		LFDL	Lining Failure Delaminating	4	0	0		11.16	10.66	-10.94	-10.44	N	0				0	DA	
110A	110	110A-110	BLUE HERON CT	73.70	TRUE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	75.10	TRUE	YES	SL	1	4	CC	Crack Circumferential	1	0	0	appears as JO ,follow up	11.16	10.66	-10.94	-10.44	P	0.25	2	2	2	6	FISP(1)	CIPP(4)
110A	110	110A-110	BLUE HERON CT	76.80	TRUE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	102.20	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0		11.16	10.66	-10.94	-10.44	N	0	3	2	1	6	PM	
110A	110	110A-110	BLUE HERON CT	119.20	TRUE	YES	SL	9		TB	Tap Break-in	0	0	0		11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	122.10	TRUE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	125.80	TRUE	YES	SL	6		DSGV	Deposits Settled Gravel	0	0	0		11.16	10.66	-10.94	-10.44	N	0	2	2	1	5	PM	
110A	110	110A-110	BLUE HERON CT	138.20	TRUE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	141.50	TRUE	YES	SL			MMC	Material Change	0	0	0	AC / END OF LINER	11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	146.40	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0		11.16	10.66	-10.94	-10.44	N	0	2	2	1	5	PM	
110A	110	110A-110	BLUE HERON CT	147.70	TRUE	YES	SL			MLC	Lining Change	4	0	0	START OF LINER	11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	149.40	TRUE					AMH	Manhole	0	0	0	110A / LAMPHOLE	11.16	10.66	-10.94	-10.44		0				0		
110A	110	110A-110	BLUE HERON CT	149.40	TRUE					STOP	Inspection stopped	0	0	0		11.16	10.66	-10.94	-10.44		0				0		
111	112	111-112	BLUE HERON CT	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	0.00	FALSE					AMH	Manhole	0	0	0	111	9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	0.00	FALSE					MWL	Water Level	5	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	2.00	FALSE	YES	SL			MGO	General Observation	4	0	0	START OF LINE SEGMENT,appears inflow behind liner	9.97	8.88	-9.27	-8.13	P	0.25	2	2	2	6	FISP(1)	GRT(1)
111	112	111-112	BLUE HERON CT	2.00	FALSE	YES	SL			MLC	Lining Change	4	0	0	START OF LINER	9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	29.20	FALSE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	71.40	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	74.60	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	129.90	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	133.10	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	176.70	FALSE	YES	SL	2	4	LFDL	Lining Failure Delaminating	4	0	0		9.97	8.88	-9.27	-8.13	N	0	1	1	1	3	DA	
111	112	111-112	BLUE HERON CT	188.30	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	198.00	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	253.20	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	256.40	FALSE	YES	SL	11		TBA	Tap Break-in Active	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	295.00	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		9.97	8.88	-9.27	-8.13	N	0	2	2	1	5	PM	
111	112	111-112	BLUE HERON CT	298.50	FALSE	YES	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	300.50	FALSE					AMH	Manhole	0	0	0	112	9.97	8.88	-9.27	-8.13		0				0		
111	112	111-112	BLUE HERON CT	300.50	FALSE					STOP	Inspection stopped	0	0	0		9.97	8.88	-9.27	-8.13		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	0.00	FALSE					AMH	Manhole	0	0	0	112	8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	0.00	FALSE					MWL	Water Level	5	0	0		8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	2.00	FALSE	YES	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	2.00	FALSE	YES	SL			MLC	Lining Change	4	0	0	START OF LINER	8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	5.00	FALSE	YES	SL	3		TBA	Tap Break-in Active	0	0	0		8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	22.10	FALSE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	49.70	FALSE	YES	SL	6	12	LFDL	Lining Failure Delaminating	4	0	0		8.88	10.75	-8.13	-9.52		0	1	1	1	3	DA	
112	LS 4	112-PS#4	BLUE HERON CT	54.90	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		8.88	10.75	-8.13	-9.52	P	0.25	3	3	2	8	PM	
112	LS 4	112-PS#4	BLUE HERON CT	64.50	FALSE	YES	SL			MCU	Camera Underwater	0	0	0		8.88	10.75	-8.13	-9.52	P	0.25	3	3	2	8	PM	
112	LS 4	112-PS#4	BLUE HERON CT	132.80	FALSE	YES	SL	12		LFDL	Lining Failure Delaminating	4	0	0		8.88	10.75	-8.13	-9.52	P	0.25	1	1	1	3	DA	
112	LS 4	112-PS#4	BLUE HERON CT	181.80	FALSE	YES	SL	2		TB	Tap Break-in	0	0	0		8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	183.50	FALSE	YES	SL	7		B	Broken	1	0	0	follow up inspection to determine severity	8.88	10.75	-8.13	-9.52	P	0.25	3	3	2	8	FISP(1)	CIPP(4)
112	LS 4	112-PS#4	BLUE HERON CT	183.50	FALSE	YES	SL	12	12	LFDL	Lining Failure Delaminating	4	0	0		8.88	10.75	-8.13	-9.52	N	0	1	1	1	3	DA	
112	LS 4	112-PS#4	BLUE HERON CT	196.50	FALSE	YES	SL	10	5	LFDL	Lining Failure Delaminating	4	0	0		8.88	10.75	-8.13	-9.52	N	0	1	1	1	3	DA	
112	LS 4	112-PS#4	BLUE HERON CT	198.00	FALSE	YES	SL	12		TB	Tap Break-in	0	0	0		8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	199.60	FALSE	YES	SL	4	5	LFB	Lining Failure Blistered	4	0	0		8.88	10.75	-8.13	-9.52	N	0	2	2	1	5	DA	
112	LS 4	112-PS#4	BLUE HERON CT	199.70	FALSE	YES	SL	10	1	LFDL	Lining Failure Delaminating	4	0	0		8.88	10.75	-8.13	-9.52	N	0	1	1	1	3	DA	
112	LS 4	112-PS#4	BLUE HERON CT	227.00	FALSE	YES	SL	2		TB	Tap Break-in	0	0	0		8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	231.90	FALSE	YES	SL	5	7	LFDL	Lining Failure Delaminating	4	0	0		8.88	10.75	-8.13	-9.52	N	0	1	1	1	3	DA	
112	LS 4	112-PS#4	BLUE HERON CT	235.40	FALSE	YES	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	235.60	FALSE					AMH	Manhole	0	0	0	PS#4	8.88	10.75	-8.13	-9.52		0				0		
112	LS 4	112-PS#4	BLUE HERON CT	235.60	FALSE					STOP	Inspection stopped	0	0	0		8.88	10.75	-8.13	-9.52		0				0		
113	114	113-114	ISLAND CIR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	0.00	FALSE					AMH	Manhole	0	0	0	113	3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	0.00	FALSE					MWL	Water Level	5	0	0		3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	5.00	FALSE			12	7	RMJ	Roots Medium Joint	3	0	0	High risk of SSO and probable I & I	3.8	4.76	-3.14	-5	P	0.25	4	3	3	10	RC	CIPP(4)
113	114	113-114	ISLAND CIR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	13.00	FALSE			9		TFA	Tap Factory Active	3	0	0	severe roots in main from 5ft to 10ft	3.8	4.76	-3.14	-5	P	0.25	3			3	DR	
113	114	113-114	ISLAND CIR	13.00	FALSE			5	12	dr	Roots Medium Lateral	3	0	0		3.8	4.76	-3.14	-5	P	0.25	3	2	2	7	Drcomb	DR
113	114	113-114	ISLAND CIR	14.80	FALSE			3		TFA	Tap Factory Active	2	0	0	may have crk adjacent to it	3.8	4.76	-3.14	-5	P	0.25	2	2	2	6	Drcomb	DR
113	114	113-114	ISLAND CIR	23.30	FALSE			6		DSF	Deposits Settled Fine	0	0	0		3.8	4.76	-3.14	-5	N	0	2	2	1	5	PM	
113	114	113-114	ISLAND CIR	39.20	FALSE			9		TFA	Tap Factory Active	0	0	0		3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	39.20	FALSE					MGO	General Observation	0	0	0	WATER IN TAP FROM MAIN	3.8	4.76	-3.14	-5	P	0.25	2	2	2	6	PM	
113	114	113-114	ISLAND CIR	39.20	FALSE					MWLS	Water Level Sag	5	0	0		3.8	4.76	-3.14	-5	N	0	2	2	1	5	PM	
113	114	113-114	ISLAND CIR	68.60	FALSE			3		TFA	Tap Factory Active	0	0	0		3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	68.60	FALSE					MGO	General Observation	0	0	0	GREASE IN TAPminor	3.8	4.76	-3.14	-5	N	0	1	2	1	4	PM	
113	114	113-114	ISLAND CIR	97.70	FALSE			9		TF	Tap Factory	2	0	0		3.8	4.76	-3.14	-5		0				0	DR	
113	114	113-114	ISLAND CIR	97.70	FALSE			12	12	RBL	Roots Ball Lateral	3	0	0	severe roots , RC and or DR	3.8	4.76	-3.14	-5	P	0.25	4	3	3	10	Drcomb	
113	114	113-114	ISLAND CIR	98.60	FALSE			1		RFJ	Roots Fine Joint	3	0	0		3.8	4.76	-3.14	-5	P	0.25	2	2	1	5	Drcomb	
113	114	113-114	ISLAND CIR	116.40	FALSE					MWLS	Water Level Sag	5	0	0		3.8	4.76	-3.14	-5	N	0	2	2	1	5	PM	
113	114	113-114	ISLAND CIR	127.00	FALSE			3		TFA	Tap Factory Active	0	0	0		3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	127.00	FALSE			7		RFL	Roots Fine Lateral	3	0	0		3.8	4.76	-3.14	-5	P	0.25	2	2	1	5	FM	
113	114	113-114	ISLAND CIR	146.00	FALSE			3	5	RFJ	Roots Fine Joint	3	0	0		3.8	4.76	-3.14	-5	P	0.25	2	2	1	5	FM	
113	114	113-114	ISLAND CIR	160.50	FALSE			9		TFA	Tap Factory Active	0	0	0		3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	160.50	FALSE			6		RFL	Roots Fine Lateral	3	0	0		3.8	4.76	-3.14	-5	P	0.25	2	2	1	5	FM	
113	114	113-114	ISLAND CIR	166.50	FALSE					MWLS	Water Level Sag	5	0	0		3.8	4.76	-3.14	-5		0	2	2	2	6	PM	
113	114	113-114	ISLAND CIR	194.40	FALSE			3		TFA	Tap Factory Active	0	0	0		3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	194.40	FALSE			3		RML	Roots Medium Lateral	3	0	0		3.8	4.76	-3.14	-5	P	0.25	3	2	2	7	RC	DR

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
113	114	113-114	ISLAND CIR	232.50	FALSE			9		TF	Tap Factory	0	0	0		3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	240.90	FALSE					MWLS	Water Level Sag	5	0	0		3.8	4.76	-3.14	-5		0	2	2	1	5	PM	
113	114	113-114	ISLAND CIR	247.90	FALSE			3		TF	Tap Factory	0	0	0		3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	247.90	FALSE					MGO	General Observation	0	0	0	WATER ENTERING TAP FROM MAIN	3.8	4.76	-3.14	-5		0	2	2	1	5	PM	
113	114	113-114	ISLAND CIR	295.60	FALSE			12	12	CC	Crack Circumferential	1	0	0		3.8	4.76	-3.14	-5	P	0.25	3	3	3	9	CIPP(4)	DR
113	114	113-114	ISLAND CIR	298.70	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	299.50	FALSE					AMH	Manhole	0	0	0	114	3.8	4.76	-3.14	-5		0				0		
113	114	113-114	ISLAND CIR	299.50	FALSE					STOP	Inspection stopped	0	0	0		3.8	4.76	-3.14	-5		0				0		
113A	113	113A-113	ISLAND CIR	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	0.00	TRUE					AMH	Manhole	0	0	0	113	#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	0.00	TRUE					MWL	Water Level	5	0	0		#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	2.00	TRUE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	10.00	TRUE					MGP	General Photo	0	0	0	CAMERA SET	#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	29.90	TRUE			6	7	CC	Crack Circumferential	1	0	0	minor crk need follow up inspection	#N/A	3.8	#N/A	-3.14	P	0.25	2	2	2	6	FISP(1)	CIPP(4)
113A	113	113A-113	ISLAND CIR	44.50	TRUE			9		TFA	Tap Factory Active	0	0	0		#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	92.10	TRUE			3		TFA	Tap Factory Active	0	0	0		#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	103.10	TRUE			9		TFA	Tap Factory Active	0	0	0		#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	112.10	TRUE			3		TBD	Tap Break-in Defective	2	0	0	NOT SEALED AT POINT OF BREAK IN	#N/A	3.8	#N/A	-3.14	P	0.25	2	2	2	6	GRT	
113A	113	113A-113	ISLAND CIR	114.00	TRUE			9		TFA	Tap Factory Active	0	0	0		#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	134.40	TRUE			3		TFA	Tap Factory Active	0	0	0		#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	160.00	TRUE					AMH	Manhole	0	0	0	113A LAMPHOLE	#N/A	3.8	#N/A	-3.14		0				0		
113A	113	113A-113	ISLAND CIR	160.00	TRUE					STOP	Inspection stopped	0	0	0		#N/A	3.8	#N/A	-3.14		0				0		
114	115	114-115	ISLAND CIR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	0.00	FALSE					AMH	Manhole	0	0	0	114	4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	0.00	FALSE					MWL	Water Level	5	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	2.00	FALSE			3		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	17.10	FALSE			9		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	46.40	FALSE			3		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	89.10	FALSE			9		TF	Tap Factory	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	89.10	FALSE			6		RBL	Roots Ball Lateral	3	0	0		4.76	7.46	-5	-7.21	P	0.25	3	2	2	7	RC	CIPP(2)
114	115	114-115	ISLAND CIR	95.70	FALSE			3		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	106.20	FALSE					MWLS	Water Level Sag	5	0	0		4.76	7.46	-5	-7.21	N	0	2	2	1	5	PM	
114	115	114-115	ISLAND CIR	123.20	FALSE					MWLS	Water Level Sag	5	0	0		4.76	7.46	-5	-7.21	N	0	3	2	1	6	PM	
114	115	114-115	ISLAND CIR	146.60	FALSE			3	5	CS	Crack Spiral	1	0	0	appears minor , 2-4 ft patch recommended	4.76	7.46	-5	-7.21	p	0.25	2	3	2	7	DR	CIPP(4)
114	115	114-115	ISLAND CIR	156.60	FALSE			2		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	158.50	FALSE					MWLS	Water Level Sag	5	0	0		4.76	7.46	-5	-7.21		0	3	2	1	6	PM	
114	115	114-115	ISLAND CIR	163.10	FALSE			9		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	210.10	FALSE					MWLS	Water Level Sag	5	0	0		4.76	7.46	-5	-7.21		0	2	2	1	5	PM	
114	115	114-115	ISLAND CIR	215.20	FALSE			2		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	222.00	FALSE			9		TF	Tap Factory	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	242.70	FALSE					MWLS	Water Level Sag	5	0	0		4.76	7.46	-5	-7.21		0	2	2	1	5	PM	
114	115	114-115	ISLAND CIR	273.00	FALSE					MWLS	Water Level Sag	5	0	0		4.76	7.46	-5	-7.21		0	2	2	1	5	PM	
114	115	114-115	ISLAND CIR	278.20	FALSE			2		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	280.20	FALSE			10		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	280.20	FALSE			6		RML	Roots Medium Lateral	3	0	0	growing into mainline	4.76	7.46	-5	-7.21	P	0.25	3	2	2	7	RC	DR
114	115	114-115	ISLAND CIR	315.50	FALSE					MWLS	Water Level Sag	5	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	332.00	FALSE			9		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	341.60	FALSE					MWLS	Water Level Sag	5	0	0		4.76	7.46	-5	-7.21	N	0	2	2	1	5	PM	
114	115	114-115	ISLAND CIR	365.50	FALSE			2		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	367.50	FALSE			12		TFA	Tap Factory Active	0	0	0		4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	372.50	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	373.90	FALSE					MGO	General Observation	1	0	0	PIPE CHANNEL SEPERATED	4.76	7.46	-5	-7.21	p	0.25	2	2	2	6	GRT	
114	115	114-115	ISLAND CIR	374.00	FALSE					AMH	Manhole	0	0	0	115	4.76	7.46	-5	-7.21		0				0		
114	115	114-115	ISLAND CIR	374.00	FALSE					STOP	Inspection stopped	0	0	0		4.76	7.46	-5	-7.21		0				0		
115	116	115-116	ISLAND CIR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	0.00	FALSE					AMH	Manhole	0	0	0	115	7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	0.00	FALSE					MWL	Water Level	5	0	0		7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	16.20	FALSE			6		DSGV	Deposits Settled Gravel	0	0	0		7.46	8.3	-7.21	-8.54	N	0	2	2	1	5	PM	
115	116	115-116	ISLAND CIR	29.00	FALSE			6		DSGV	Deposits Settled Gravel	0	0	0		7.46	8.3	-7.21	-8.54	N	0	2	2	1	5	PM	
115	116	115-116	ISLAND CIR	40.50	FALSE					MWLS	Water Level Sag	5	0	0		7.46	8.3	-7.21	-8.54	N	0	2	2	1	5	PM	
115	116	115-116	ISLAND CIR	43.40	FALSE			9		TF	Tap Factory	0	0	0	cant determine condition due to water level	7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	59.20	FALSE					MWLS	Water Level Sag	5	0	0		7.46	8.3	-7.21	-8.54	N	0	2	2	1	5	PM	
115	116	115-116	ISLAND CIR	77.30	FALSE			3		TFA	Tap Factory Active	0	0	0		7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	82.70	FALSE			2	6	FS	Fracture Spiral	1	0	0	4 ft CIPP patch	7.46	8.3	-7.21	-8.54	P	0.25	3	3	2	8	CIPP(4)	CIPP(4)
115	116	115-116	ISLAND CIR	92.60	FALSE					MWLS	Water Level Sag	5	0	0		7.46	8.3	-7.21	-8.54	N	0	2	2	1	5	PM	
115	116	115-116	ISLAND CIR	115.50	FALSE					MWLS	Water Level Sag	5	0	0		7.46	8.3	-7.21	-8.54	N	0	2	2	1	5	PM	
115	116	115-116	ISLAND CIR	153.70	FALSE			3		TFA	Tap Factory Active	0	0	0		7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	164.70	FALSE			9		TFD	Tap Factory Defective	1	0	0	BROKEN IN TAP, lgtd crk in service	7.46	8.3	-7.21	-8.54	P	0.25	3	3	2	8	CIPP(2)	
115	116	115-116	ISLAND CIR	164.70	FALSE					MGO	General Observation	1	0	0	POSSIBLE INFIL FROM BROKEN PIPE IN TAP	7.46	8.3	-7.21	-8.54	P	0.25	3	3	2	8	CIPPcomb	
115	116	115-116	ISLAND CIR	197.50	FALSE			10		FH3	Fracture Longitudinal Hinge, 3	1	0	0	4 ft cipp patch	7.46	8.3	-7.21	-8.54	P	0.25	4	3	3	10	CIPP(4)	
115	116	115-116	ISLAND CIR	197.50	FALSE			1		FH3	Fracture Longitudinal Hinge, 3	1	0	0	same as above	7.46	8.3	-7.21	-8.54		0				0	CIPPcomb	
115	116	115-116	ISLAND CIR	216.90	FALSE			3		TFA	Tap Factory Active	0	0	0		7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	218.20	FALSE					MWLS	Water Level Sag	5	0	0		7.46	8.3	-7.21	-8.54	N	0	2	2	1	5	PM	
115	116	115-116	ISLAND CIR	218.90	FALSE			9		TFA	Tap Factory Active	0	0	0		7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	241.90	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	242.30	FALSE					MGO	General Observation	1	0	0	BROKEN PIPE IN CHANNEL, needs grouting	7.46	8.3	-7.21	-8.54	P	0.25	2	2	2	6	GRT	
115	116	115-116	ISLAND CIR	243.60	FALSE					AMH	Manhole	0	0	0	116	7.46	8.3	-7.21	-8.54		0				0		
115	116	115-116	ISLAND CIR	243.60	FALSE					STOP	Inspection stopped	0	0	0		7.46	8.3	-7.21	-8.54		0				0		
116	117	116-117	ISLAND CIR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		8.3	10.08	-8.54	-9.67		0				0		
116	117	116-117	ISLAND CIR	0.00	FALSE					AMH	Manhole	0	0	0	116	8.3	10.08	-8.54	-9.67		0				0		
116	117	116-117	ISLAND CIR	0.00	FALSE					MWL	Water Level	5	0	0		8.3	10.08	-8.54	-9.67		0				0		
116	117	116-117	ISLAND CIR	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	8.3	10.08	-8.54	-9.67		0				0		
116	117	116-117	ISLAND CIR	2.60	FALSE					JSM	Joint Separated Medium	2	0	0	I & I likely but not observed	8.3	10.08	-8.54	-9.67	P	0.25	3	3	2	8	CIPP(4)	
116	117	116-117	ISLAND CIR	2.60	FALSE					JOM	Joint Offset Medium	2	0	0	not restrictive	8.3	10.08	-8.54	-9.67	P	0.25	3	3	2	8	CIPPcomb	
116	117	116-117	ISLAND CIR	2.60	FALSE			5		OBJ	Obstacle In Joint	0	0	0	DEBRIS	8.3	10.08	-8.54	-9.67	N	0	2	2	1	5	PM	

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
116	117	116-117	ISLAND CIR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	8.3	10.08	-8.54	-9.67		0				0		
116	117	116-117	ISLAND CIR	17.90	FALSE			10		TFA	Tap Factory Active	0	0	0		8.3	10.08	-8.54	-9.67		0				0		
116	117	116-117	ISLAND CIR	21.60	FALSE					MWLS	Water Level Sag	5	0	0		8.3	10.08	-8.54	-9.67	N	0	3	3	1	7	PM	
116	117	116-117	ISLAND CIR	65.50	FALSE			10		TFA	Tap Factory Active	0	0	0		8.3	10.08	-8.54	-9.67		0				0		
116	117	116-117	ISLAND CIR	65.50	FALSE					MWLS	Water Level Sag	5	0	0		8.3	10.08	-8.54	-9.67	N	0	2	2	1	5	PM	
116	117	116-117	ISLAND CIR	67.50	FALSE			2		TFA	Tap Factory Active	0	0	0		8.3	10.08	-8.54	-9.67		0				0		
116	117	116-117	ISLAND CIR	86.60	FALSE					MWLS	Water Level Sag	5	0	0		8.3	10.08	-8.54	-9.67	N	0	2	2	1	5	PM	
116	117	116-117	ISLAND CIR	93.60	FALSE					MWM	Water Mark	5	0	0		8.3	10.08	-8.54	-9.67	P	0.25	3	3	1	7	PM	
116	117	116-117	ISLAND CIR	111.00	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	8.3	10.08	-8.54	-9.67		0				0		
116	117	116-117	ISLAND CIR	113.00	FALSE					AMH	Manhole	0	0	0	117	8.3	10.08	-8.54	-9.67		0				0		
116	117	116-117	ISLAND CIR	113.00	FALSE					STOP	Inspection stopped	0	0	0		8.3	10.08	-8.54	-9.67		0				0		
117	118	117-118	BLUE HERON CT AND ISL	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	0.00	FALSE					AMH	Manhole	0	0	0	117	10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	0.00	FALSE					MWL	Water Level	5	0	0		10.08	10.41	-9.67	-10.79	N	0	2	2	1	5	PM	
117	118	117-118	BLUE HERON CT AND ISL	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	11.80	FALSE					MWM	Water Mark	5	0	0		10.08	10.41	-9.67	-10.79	P	0.25	2	3	1	6	PM	
117	118	117-118	BLUE HERON CT AND ISL	37.40	FALSE					MWLS	Water Level Sag	5	0	0		10.08	10.41	-9.67	-10.79	N	0	2	2	1	5	PM	
117	118	117-118	BLUE HERON CT AND ISL	52.40	FALSE					MWL	Water Level	5	0	0		10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	71.00	FALSE			9		TFA	Tap Factory Active	0	0	0		10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	77.60	FALSE			2		TFA	Tap Factory Active	0	0	0		10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	124.80	FALSE			9		TFA	Tap Factory Active	0	0	0		10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	136.10	FALSE			3	9	DAGS	Deposits Attached Grease	0	0	0		10.08	10.41	-9.67	-10.79	N	0	2	1	1	4	PM	
117	118	117-118	BLUE HERON CT AND ISL	140.90	FALSE					MWLS	Water Level Sag	5	0	0		10.08	10.41	-9.67	-10.79	N	0	2	2	1	5	PM	
117	118	117-118	BLUE HERON CT AND ISL	154.00	FALSE			3		TFA	Tap Factory Active	0	0	0		10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	178.60	FALSE			10		TFA	Tap Factory Active	0	0	0		10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	179.70	FALSE					MWLS	Water Level Sag	5	0	0		10.08	10.41	-9.67	-10.79	N	0	2	2	1	5	PM	
117	118	117-118	BLUE HERON CT AND ISL	184.00	FALSE			12		IR	Infil Runner	1	0	0	active I nfil observed	10.08	10.41	-9.67	-10.79	IR	4	2	3	3	8	GRT	CIPP(4)
117	118	117-118	BLUE HERON CT AND ISL	184.00	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	184.40	FALSE			9		IR	Infil Runner	0	0	0	same as above	10.08	10.41	-9.67	-10.79		0	3	3	3	9	GRT	CIPP(4)
117	118	117-118	BLUE HERON CT AND ISL	185.70	FALSE					AMH	Manhole	0	0	0		10.08	10.41	-9.67	-10.79		0				0		
117	118	117-118	BLUE HERON CT AND ISL	185.70	FALSE					STOP	Inspection stopped	0	0	0		10.08	10.41	-9.67	-10.79		0				0		
119	LS 5	119-PS#5	ISLAND CIR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		11.85	14.48	-11.87	-11.77		0				0		
119	LS 5	119-PS#5	ISLAND CIR	0.00	FALSE					AMH	Manhole	0	0	0	119	11.85	14.48	-11.87	-11.77		0				0		
119	LS 5	119-PS#5	ISLAND CIR	0.00	FALSE	YES	SL			MGO	General Observation	1	0	0	BROKEN	11.85	14.48	-11.87	-11.77	P	0.25	2	3	3	8	GRT	
119	LS 5	119-PS#5	ISLAND CIR	0.00	FALSE	YES	SL			MGO	General Observation	1	0	0	INFIL IN MH AT BENCH TO BARREL	11.85	14.48	-11.87	-11.77	IR	4	2	3	3	8	GRT	
119	LS 5	119-PS#5	ISLAND CIR	0.00	FALSE	YES	SL			MWL	Water Level	5	0	0		11.85	14.48	-11.87	-11.77	N	0	2	2	1	5	PM	
119	LS 5	119-PS#5	ISLAND CIR	2.00	FALSE	YES	SL			MGO	General Observation	0	0	0	START OF LINE SEGMENT	11.85	14.48	-11.87	-11.77		0				0		
119	LS 5	119-PS#5	ISLAND CIR	2.00	FALSE	YES	SL			MLC	Lining Change	4	0	0	CIP, liner was poorly installed ,many taps cut wrong	11.85	14.48	-11.87	-11.77		0	2	2	2	6	FISP(2)	CUT
119	LS 5	119-PS#5	ISLAND CIR	6.00	FALSE	YES	SL			MWM	Water Mark	5	0	0		11.85	14.48	-11.87	-11.77	P	0.25				0		
119	LS 5	119-PS#5	ISLAND CIR	9.00	FALSE	YES	SL	9		TBA	Tap Break-in Active	0	0	0		11.85	14.48	-11.87	-11.77		0				0		
119	LS 5	119-PS#5	ISLAND CIR	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	11.85	14.48	-11.87	-11.77		0				0		
119	LS 5	119-PS#5	ISLAND CIR	10.00	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		11.85	14.48	-11.87	-11.77	N	0				0		
119	LS 5	119-PS#5	ISLAND CIR	20.10	FALSE	YES	SL	9	3	DAE	Deposits Attached Encrustation	0	0	0	DAE	11.85	14.48	-11.87	-11.77	N	0				0		
119	LS 5	119-PS#5	ISLAND CIR	51.80	FALSE	YES	SL	3		TBD	Tap Break-in Defective	0	0	0	TAP NOT CUT PROPERLY	11.85	14.48	-11.87	-11.77	P	0.25	2	3	2	7	FISP(2)	CUT
119	LS 5	119-PS#5	ISLAND CIR	65.50	FALSE	YES	SL	9	3	LFB	Lining Failure Blistered	4	0	0		11.85	14.48	-11.87	-11.77	N	0	2	2	2	6	DA	
119	LS 5	119-PS#5	ISLAND CIR	72.00	FALSE	YES	SL	10		TBA	Tap Break-in Active	0	0	0	GREASE IN TAP, may have I & I at 2nd joint	11.85	14.48	-11.87	-11.77	P	0.25	2	2	2	6	RC	FISP(1)
119	LS 5	119-PS#5	ISLAND CIR	76.60	FALSE	YES	SL	9	3	LFB	Lining Failure Blistered	4	0	0	LINER BLISTERED	11.85	14.48	-11.87	-11.77	N	0	2	2	2	6	DA	
119	LS 5	119-PS#5	ISLAND CIR	115.00	FALSE	YES	SL	2		TBA	Tap Break-in Active	0	0	0		11.85	14.48	-11.87	-11.77		0				0		
119	LS 5	119-PS#5	ISLAND CIR	126.00	FALSE	YES	SL	11		TBA	Tap Break-in Active	0	0	0		11.85	14.48	-11.87	-11.77		0				0		
119	LS 5	119-PS#5	ISLAND CIR	132.40	FALSE	YES	SL			MWM	Water Mark	5	0	0		11.85	14.48	-11.87	-11.77	N	0	3	2	1	6	PM	
119	LS 5	119-PS#5	ISLAND CIR	170.90	FALSE	YES	SL	2		TBD	Tap Break-in Defective	1	0	0	CRACK MULTIPLE IN TAP	11.85	14.48	-11.87	-11.77	P	0.25	3	3	3	9	CIPP(4)	CIPP(2)
119	LS 5	119-PS#5	ISLAND CIR	170.90	FALSE	YES	SL			MGO	General Observation	1	0	0	POSSIBLE INFIL FROM TAP AT CRACKS	11.85	14.48	-11.87	-11.77	P	0.25	3	3	3	9	CIPPcomb	
119	LS 5	119-PS#5	ISLAND CIR	174.10	FALSE	YES	SL	12		RFC	Roots Fine Connection	3	0	0		11.85	14.48	-11.87	-11.77	P	0.25	2	3	2	7	FM	CIPP (4)
119	LS 5	119-PS#5	ISLAND CIR	174.30	FALSE	YES	SL	12		TBA	Tap Break-in Active	0	0	0		11.85	14.48	-11.87	-11.77	P	0.25	2	3	2	7	RC	
119	LS 5	119-PS#5	ISLAND CIR	195.40	FALSE	YES	SL			MGO	General Observation	0	0	0	END OF LINE SEGMENT	11.85	14.48	-11.87	-11.77		0				0		
119	LS 5	119-PS#5	ISLAND CIR	195.40	FALSE					AMH	Manhole	0	0	0	PS#5	11.85	14.48	-11.87	-11.77		0				0		
119	LS 5	119-PS#5	ISLAND CIR	195.40	FALSE					STOP	Inspection stopped	0	0	0		11.85	14.48	-11.87	-11.77		0				0		
6	2	6-2	ISLAND DR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		5.85	8.7	17.43	-3.07		0				0		
6	2	6-2	ISLAND DR	0.00	FALSE					AMH	Manhole	0	0	0	6	5.85	8.7	17.43	-3.07		0				0		
6	2	6-2	ISLAND DR	0.00	FALSE					MWL	Water Level	5	0	0		5.85	8.7	17.43	-3.07		0				0		
6	2	6-2	ISLAND DR	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	5.85	8.7	17.43	-3.07		0				0		
6	2	6-2	ISLAND DR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	5.85	8.7	17.43	-3.07		0				0		
6	2	6-2	ISLAND DR	44.20	FALSE			3		TFA	Tap Factory Active	0	0	0		5.85	8.7	17.43	-3.07		0				0		
6	2	6-2	ISLAND DR	97.10	FALSE			3		TFA	Tap Factory Active	0	0	0		5.85	8.7	17.43	-3.07	P	0.25	2	2	1	5	RC	
6	2	6-2	ISLAND DR	97.10	FALSE			9		RFL	Roots Fine Lateral	3	0	0		5.85	8.7	17.43	-3.07	P	0.25	2	2	1	5	FM	
6	2	6-2	ISLAND DR	143.30	FALSE					JOM	Joint Offset Medium	2	0	0	joint separated , needs 2-4ft patch	5.85	8.7	17.43	-3.07	p	0.25	3	3	2	8	CIPP(4)	
6	2	6-2	ISLAND DR	144.90	FALSE					MGO	General Observation	0	0	0	DROP CONNECTION	5.85	8.7	17.43	-3.07		0				0		
6	2	6-2	ISLAND DR	145.80	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	5.85	8.7	17.43	-3.07		0				0		
6	2	6-2	ISLAND DR	145.80	FALSE					AMH	Manhole	0	0	0	2	5.85	8.7	17.43	-3.07		0				0		
6	2	6-2	ISLAND DR	145.80	FALSE					STOP	Inspection stopped	0	0	0		5.85	8.7	17.43	-3.07		0				0		
6A	6	6A-6	ISLAND DR	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		3.5	5.85	23.18	17.43		0				0		
6A	6	6A-6	ISLAND DR	0.00	TRUE					AMH	Manhole	0	0	0	6	3.5	5.85	23.18	17.43		0				0		
6A	6	6A-6	ISLAND DR	0.00	TRUE					MWL	Water Level	5	0	0		3.5	5.85	23.18	17.43		0				0		
6A	6	6A-6	ISLAND DR	2.00	TRUE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	3.5	5.85	23.18	17.43		0				0		
6A	6	6A-6	ISLAND DR	4.00	TRUE					JOL	Joint Offset Large	2	0	0		3.5	5.85	23.18	17.43	P	0.25	4	3	3	10	DR	
6A	6	6A-6	ISLAND DR	4.00	TRUE					MGO	General Observation	2	0	0	POSSIBLE INFIL AT OFFSET	3.5	5.85	23.18	17.43	P	0.25	4	3	3	10	Drcomb	
6A	6	6A-6	ISLAND DR	4.00	TRUE					MMC	Material Change	0	0	0	PVC	3.5	5.85	23.18	17.43		0				0		
6A	6	6A-6	ISLAND DR	6.00	TRUE			10		TFA	Tap Factory Active	0	0	0		3.5	5.85	23.18	17.43		0				0		
6A	6	6A-6	ISLAND DR	6.50	TRUE					JSL	Joint Separated Large	2	0	0	dig and repair with above defect	3.5	5.85	23.18	17.43	P	0.25	4	3	3	10	Drcomb	
6A	6	6A-6	ISLAND DR	6.50	TRUE					MMC	Material Change	0	0	0	VCP	3.5	5.85	23.18	17.43		0				0		
6A	6	6A-6	ISLAND DR	6.50	TRUE					JSL	Joint Separated Large	2	0	0	same defect as above	3.5	5.85	23.18	17.43		0				0		
6A	6	6A-6	ISLAND DR	10.00	TRUE					MGP	General Photo	0	0	0	CAMERA SET	3.5	5.85	23.18	17.43		0				0		
6A	6	6A-6	ISLAND DR	53.00	TRUE			3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	3.5	5.85	23.18	17.43	N	0	2	2	1	5	PM	
6A	6	6A-6	ISLAND DR	67.80	TRUE			11		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	3.5	5.85	23.18	17.43	N	0	2	2	1	5	PM	
6A	6	6A-6	ISLAND DR	99.80	TRUE			11		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	3.5	5.85	23.18	17.43	N	0	2	2	1	5	PM	
6A	6	6A-6	ISLAND DR	104.50	TRUE			5	7	DAGS	Deposits Attached Grease	0	0	0	GREASE	3.5	5.85	23.18	17.43	N	0	3	2	1	6	PM	RC
6A	6	6A-6	ISLAND DR	147.20	TRUE			11		TF	Tap Factory	0	0	0		3.5	5.85	23.18	17.43		0				0		
6A	6	6A-6	ISLAND DR	148.90	TRUE					AMH	Manhole	0	0	0	6A / C/O	3.5	5.85	23.18	17.43		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
6A	6	6A-6	ISLAND DR	148.90	TRUE					STOP	Inspection stopped	0	0	0		3.5	5.85	23.18	17.43		0				0		
7	8	7-8	OAK KNOLL AVE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0	0	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	0.00	FALSE					AMH	Manhole	0	0	0	7	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	0.00	FALSE					MWL	Water Level	5	0	0	0	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	16.20	FALSE			10		TFD	Tap Factory Defective	0	0	0	OFFSET,minor	5	6.09	47.68	41.83	N	0	2	2	2	6	FISP(2)	
7	8	7-8	OAK KNOLL AVE	16.90	FALSE					JSM	Joint Separated Medium	2	0	0	appears to have previous repair coupling	5	6.09	47.68	41.83	P	0.25	3	3	3	9	CIPP(4)	DR
7	8	7-8	OAK KNOLL AVE	17.30	FALSE					JOL	Joint Offset Large	2	0	0		5	6.09	47.68	41.83	P	0.25	3	3	3	9	FISP(1)	CIPP(4)
7	8	7-8	OAK KNOLL AVE	61.40	FALSE			10		TBD	Tap Break-in Defective	2	0	0	NOT SEALED AT TAP CONNECTION	5	6.09	47.68	41.83		0				0	GRT	DR
7	8	7-8	OAK KNOLL AVE	61.40	FALSE			12	12	RBL	Roots Ball Lateral	3	0	0	severe	5	6.09	47.68	41.83	P	0.25	4	3	3	10	RC	DR
7	8	7-8	OAK KNOLL AVE	61.40	FALSE			3	9	RTC	Roots Tap Connection	3	0	0		5	6.09	47.68	41.83	P	0.25	3	3	3	9	RC	DR
7	8	7-8	OAK KNOLL AVE	68.80	FALSE			3		TFA	Tap Factory Active	0	0	0		5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	110.10	FALSE			6	9	CS	Crack Spiral	1	0	0	crk at joint, needs 2-4 ft patch	5	6.09	47.68	41.83	P	0.25	3	3	3	9	CIPP(4)	DR
7	8	7-8	OAK KNOLL AVE	111.20	FALSE			9		TFA	Tap Factory Active	0	0	0		5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	151.60	FALSE			3		TFD	Tap Factory Defective	0	0	0	OFFSET	5	6.09	47.68	41.83		0				0		DR
7	8	7-8	OAK KNOLL AVE	151.60	FALSE			3		RFL	Roots Fine Lateral	3	0	0	rod and camera for possible I & I	5	6.09	47.68	41.83	P	0.25	2	3	2	7	RC	FM
7	8	7-8	OAK KNOLL AVE	208.10	FALSE					MGO	General Observation	0	0	0	END OF LINE SEGMENT	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	209.70	FALSE					AMH	Manhole	0	0	0	8	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	209.70	FALSE					STOP	Inspection stopped	0	0	0		5	6.09	47.68	41.83		0				0		
7A	7	7A-7	OAK KNOLL AVE	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	0.00	TRUE					AMH	Manhole	0	0	0	7	7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	0.00	TRUE					MWL	Water Level	5	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	2.00	TRUE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	3.00	TRUE			12	12	CM	Crack Multiple	1	0	0		7.5	5	50.18	47.68	P	0.25	4	3	3	10	CIPP(4)	
7A	7	7A-7	OAK KNOLL AVE	10.00	TRUE					MGP	General Photo	0	0	0	CAMERA SET	7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	10.00	TRUE					MWLS	Water Level Sag	5	0	0	camera under water	7.5	5	50.18	47.68	N	0	3	3	1	7	PM	
7A	7	7A-7	OAK KNOLL AVE	56.70	TRUE			9		TFA	Tap Factory Active	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	60.60	TRUE					MWL	Water Level	5	0	0		7.5	5	50.18	47.68	N	0	1	3	1	5	PM	
7A	7	7A-7	OAK KNOLL AVE	92.20	TRUE			3		TBD	Tap Break-in Defective	0	0	0	OFFSET	7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	92.20	TRUE			3		CL	Crack Longitudinal	1	0	0	minor crk need follow up inspection	7.5	5	50.18	47.68	P	0.25	2	3	2	7	FISP(1)	CIPP(4)
7A	7	7A-7	OAK KNOLL AVE	108.90	TRUE			9		TFA	Tap Factory Active	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	108.90	TRUE			9		RML	Roots Medium Lateral	3	0	0		7.5	5	50.18	47.68	P	0.25	3	3	2	8	RC	CIPP(2)
7A	7	7A-7	OAK KNOLL AVE	131.10	TRUE			3		TFA	Tap Factory Active	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	148.30	TRUE			10		TFA	Tap Factory Active	0	0	0	GREASE IN TAP,minor	7.5	5	50.18	47.68	N	0	2	3	1	6	PM	
7A	7	7A-7	OAK KNOLL AVE	174.40	TRUE					JOM	Joint Offset Medium	2	0	0	Minor, but could dig and repair with defective tap	7.5	5	50.18	47.68	P	0.25	3	3	2	8	RC	DR
7A	7	7A-7	OAK KNOLL AVE	176.00	TRUE			1		TFD	Tap Factory Defective	0	0	0	OFFSET	7.5	5	50.18	47.68	P	0.25	3	3	2	8	RC	DR
7A	7	7A-7	OAK KNOLL AVE	176.00	TRUE					MGO	General Observation	0	0	0	POSSIBLE INFIL FROM OFFET JOINT	7.5	5	50.18	47.68	P	0.25	3	3	2	8	RC	DR
7A	7	7A-7	OAK KNOLL AVE	190.30	TRUE			10		TFA	Tap Factory Active	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	192.10	TRUE			10		TFA	Tap Factory Active	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	194.20	TRUE			3		TFA	Tap Factory Active	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	196.10	TRUE					AMH	Manhole	0	0	0	7A / C/O	7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	196.10	TRUE					STOP	Inspection stopped	0	0	0		7.5	5	50.18	47.68		0				0		
11	12	11-12	KEYS BLVD	0.00	TRUE	REHAB				START AGAINS	Start Inspection Against the Flow	0	0	0		4.26	4.53	-3.1	-3.75		0				0		
11	12	11-12	KEYS BLVD	0.00	TRUE	YES	SL			AMH	Manhole	0	0	0	12	4.26	4.53	-3.1	-3.75		0				0		
11	12	11-12	KEYS BLVD	0.00	TRUE	YES	SL			MWL	Water Level	5	0	0		4.26	4.53	-3.1	-3.75		0				0		
11	12	11-12	KEYS BLVD	2.00	TRUE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	4.26	4.53	-3.1	-3.75		0				0		
11	12	11-12	KEYS BLVD	10.00	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	4.26	4.53	-3.1	-3.75		0				0		
11	12	11-12	KEYS BLVD	13.30	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		4.26	4.53	-3.1	-3.75	N	0	1	1	1	3	DA	
11	12	11-12	KEYS BLVD	34.90	TRUE	YES	SL	12	12	LFDL	Lining Failure Delaminating	4	0	0		4.26	4.53	-3.1	-3.75	N	0	1	1	1	3	DA	
11	12	11-12	KEYS BLVD	35.70	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	4.26	4.53	-3.1	-3.75	N	0	2	2	1	5	PM	
11	12	11-12	KEYS BLVD	38.90	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	4.26	4.53	-3.1	-3.75	N	0	2	2	1	5	PM	
11	12	11-12	KEYS BLVD	49.80	TRUE	YES	SL	7	10	LFDL	Lining Failure Delaminating	4	0	0		4.26	4.53	-3.1	-3.75	N	0	1	1	1	3	DA	
11	12	11-12	KEYS BLVD	59.60	TRUE	YES	SL	1	11	LFDL	Lining Failure Delaminating	4	0	0		4.26	4.53	-3.1	-3.75	N	0	1	1	1	3	DA	
11	12	11-12	KEYS BLVD	61.40	TRUE	YES	SL	5		LFDL	Lining Failure Delaminating	4	0	0		4.26	4.53	-3.1	-3.75	N	0	1	1	1	3	DA	
11	12	11-12	KEYS BLVD	68.80	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		4.26	4.53	-3.1	-3.75	N	0	1	1	1	3	DA	
11	12	11-12	KEYS BLVD	80.00	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	pipe invert appears	4.26	4.53	-3.1	-3.75	P	0.25	3	3	3	9	CIPP(6)	FISP(4)
11	12	11-12	KEYS BLVD	81.40	TRUE	YES	SL	8		LFDL	Lining Failure Delaminating	4	0	0	worn through,unstable	4.26	4.53	-3.1	-3.75	P	0.25	3	3	3	9	CIPPcomb	FISP (4)
11	12	11-12	KEYS BLVD	82.10	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		4.26	4.53	-3.1	-3.75		0				0		
11	12	11-12	KEYS BLVD	82.90	TRUE	YES	SL	12	12	LFDL	Lining Failure Delaminating	4	0	0		4.26	4.53	-3.1	-3.75	N	0	1	1	1	3	DA	
11	12	11-12	KEYS BLVD	85.30	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		4.26	4.53	-3.1	-3.75		0				0		
11	12	11-12	KEYS BLVD	96.30	TRUE	YES	SL	10	1	LFDL	Lining Failure Delaminating	4	0	0	CONTINUOUS	4.26	4.53	-3.1	-3.75	N	0	1	1	1	3	DA	
11	12	11-12	KEYS BLVD	128.40	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		4.26	4.53	-3.1	-3.75		0				0		
11	12	11-12	KEYS BLVD	149.40	TRUE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	4.26	4.53	-3.1	-3.75		0				0		
11	12	11-12	KEYS BLVD	150.50	TRUE					AMH	Manhole	0	0	0	11	4.26	4.53	-3.1	-3.75		0				0		
11	12	11-12	KEYS BLVD	150.50	TRUE					STOP	Inspection stopped	0	0	0		4.26	4.53	-3.1	-3.75		0				0		
12	13	12-13	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	12	4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	11.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		4.53	5.79	-3.75	-4.82	N	0	1	1	1	3	DA	
12	13	12-13	KEYS BLVD	23.20	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	36.50	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	79.60	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	4.53	5.79	-3.75	-4.82	N	0	2	2	1	5	PM	
12	13	12-13	KEYS BLVD	92.80	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	133.60	FALSE	YES	SL	4	7	DAGS	Deposits Attached Grease	0	0	0	CONTINUOUS	4.53	5.79	-3.75	-4.82	N	0	2	2	1	5	PM	
12	13	12-13	KEYS BLVD	146.00	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	150.00	FALSE	YES	SL			MWL	Water Level	5	0	0		4.53	5.79	-3.75	-4.82	N	0	3	2	1	6	PM	
12	13	12-13	KEYS BLVD	159.10	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	Needs camera of lateral ,suspect I & I	4.53	5.79	-3.75	-4.82	P	0.25	2	3	1	6	FISP(1)	CIPP(2)
12	13	12-13	KEYS BLVD	180.30	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	180.80	FALSE					AMH	Manhole	0	0	0	13	4.53	5.79	-3.75	-4.82		0				0		
12	13	12-13	KEYS BLVD	180.80	FALSE					STOP	Inspection stopped	0	0	0		4.53	5.79	-3.75	-4.82		0				0		
13	14	13-14	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	13	5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0	May have circ crk at 2ft FISP	5.79	7.24	-4.82	-5.8	P	0.25	3	3	2	8	FISP(1)	CIPP(4)
13	14	13-14	KEYS BLVD	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT,	5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	10.90	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		5.79	7.24	-4.82	-5.8		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
13	14	13-14	KEYS BLVD	21.10	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	GREASE IN TAP,may be abandoned	5.79	7.24	-4.82	-5.8	P	0.25	3	2	2	7	RC	
13	14	13-14	KEYS BLVD	26.30	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		5.79	7.24	-4.82	-5.8	N	0	3	3	1	7	PM	
13	14	13-14	KEYS BLVD	34.20	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	5.79	7.24	-4.82	-5.8	N	0	2	2	1	5	PM	
13	14	13-14	KEYS BLVD	69.00	FALSE	YES	SL			MWL	Water Level	5	0	0		5.79	7.24	-4.82	-5.8	N	0	2	3	1	6	PM	
13	14	13-14	KEYS BLVD	77.40	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	90.60	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	94.10	FALSE	YES	SL			MWL	Water Level	5	0	0		5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	143.80	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	156.90	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	188.00	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION	5.79	7.24	-4.82	-5.8	P	0.25	2	2	2	6	FISP(1)	CIPP(4)
13	14	13-14	KEYS BLVD	199.80	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	5.79	7.24	-4.82	-5.8	N	0	2	2	1	5	PM	
13	14	13-14	KEYS BLVD	212.80	FALSE	YES	SL	3		TFA	Tap Factory Active	2	0	0	at 244ft ,JO and possible I & I	5.79	7.24	-4.82	-5.8	P	0.25	3	3	2	8	FISP(1)	CIPP(4)
13	14	13-14	KEYS BLVD	253.30	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		5.79	7.24	-4.82	-5.8	N	0	3	3	1	7	PM	
13	14	13-14	KEYS BLVD	278.90	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	possible I&I, fisp	5.79	7.24	-4.82	-5.8	P	0.25	3	2	2	7	FISP(1)	CIPP(2)
13	14	13-14	KEYS BLVD	285.00	FALSE	YES	SL			MWL	Water Level	5	0	0	high water mark stain 70%	5.79	7.24	-4.82	-5.8	N	0	3	3	1	7	PM	
13	14	13-14	KEYS BLVD	300.50	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	301.30	FALSE					AMH	Manhole	0	0	0	14	5.79	7.24	-4.82	-5.8		0				0		
13	14	13-14	KEYS BLVD	301.30	FALSE					STOP	Inspection stopped	0	0	0		5.79	7.24	-4.82	-5.8		0				0		
14	15	14-15_1	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	14	7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	2.00	FALSE	YES	SL	12	12	LFDL	Lining Failure Delaminating	4	0	0	severe delam,possible I & I	7.24	8.26	-5.8	-6.83	P	0.25	2	3	2	7	SL(288)	
14	15	14-15_1	KEYS BLVD	10.00	FALSE	YES	SL			MGP	General Photo	1	0	0	CAMERA SET, brkn jt. @ 11ft.	7.24	8.26	-5.8	-6.83	P	0.25	3	3	2	8	SIcomb	
14	15	14-15_1	KEYS BLVD	23.10	FALSE	YES	SL	3		TFA	Tap Factory Active	1	0	0	brkn pipe @ 21ft	7.24	8.26	-5.8	-6.83	P	0.25	3	3	2	8	SLcomb	
14	15	14-15_1	KEYS BLVD	26.20	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	29.20	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0	joint separated ,large	7.24	8.26	-5.8	-6.83	P	0.25	3	2	2	7	FISP(1)	CIPP(4)
14	15	14-15_1	KEYS BLVD	66.70	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.24	8.26	-5.8	-6.83	N	0	2	2	1	5	PM	
14	15	14-15_1	KEYS BLVD	88.90	FALSE	YES	SL	1		TFA	Tap Factory Active	0	0	0		7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	91.90	FALSE	YES	SL	10		TF	Tap Factory	0	0	0	tap full of debris, may be abandoned	7.24	8.26	-5.8	-6.83	P	0.25	3	3	1	7	RC	
14	15	14-15_1	KEYS BLVD	103.90	FALSE	YES	SL			MGP	General Photo	0	0	0	POSSIBLE INFILTRATION	7.24	8.26	-5.8	-6.83	P	0.25	2	2	2	6	FISP(1)	CIPP(4)
14	15	14-15_1	KEYS BLVD	140.60	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.24	8.26	-5.8	-6.83	N	0	3	3	1	7	PM	
14	15	14-15_1	KEYS BLVD	144.60	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	148.00	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	156.00	FALSE	YES	SL			MWL	Water Level	5	0	0		7.24	8.26	-5.8	-6.83	N	0	2	3	1	6	PM	
14	15	14-15_1	KEYS BLVD	196.20	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	209.50	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	231.50	FALSE	YES	SL			MGO	General Observation	1	0	0	INFILTRATION	7.24	8.26	-5.8	-6.83	IR	4	3	3	3	9	SIcomb	
14	15	14-15_1	KEYS BLVD	251.40	FALSE	YES	SL			MGO	General Observation	1	0	0	POSSIBLE INFILTRATION	7.24	8.26	-5.8	-6.83	ID	3	3	3	2	8	SIcomb	
14	15	14-15_1	KEYS BLVD	261.20	FALSE	YES	SL			MGO	General Observation	1	0	0	INFILTRATION	7.24	8.26	-5.8	-6.83	ID	3	3	3	2	8	CIPP(6)	
14	15	14-15_1	KEYS BLVD	262.40	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	264.40	FALSE	YES	SL			MGO	General Observation	1	0	0	POSSIBLE INFILTRATION	7.24	8.26	-5.8	-6.83	ID	3	3	3	2	8	CIPPcomb	
14	15	14-15_1	KEYS BLVD	265.50	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	287.10	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	288.50	FALSE					AMH	Manhole	0	0	0	15	7.24	8.26	-5.8	-6.83		0				0		
14	15	14-15_1	KEYS BLVD	288.50	FALSE					STOP	Inspection stopped	0	0	0		7.24	8.26	-5.8	-6.83		0				0		
15	16	15-16	KEYS BLVD	0.00	FALSE	**REINSPECT**				START WITH FL	Start Inspection With the Flow	0	0	0		8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	15	8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	33.70	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	OFFSET IN TAP	8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	41.00	FALSE	YES	SL	9		TFA	Tap Factory Active	1	0	0	right pipe wall may have crack	8.26	9.09	-6.83	-7.94	P	0.25	2	3	2	7	FISP(1)	CIPP(4)
15	16	15-16	KEYS BLVD	92.10	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	pipe wall stained ,FISP	8.26	9.09	-6.83	-7.94	P	0.25	2	3	2	7	FISP(2)	CIPP
15	16	15-16	KEYS BLVD	102.40	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	OFFSET JOINT IN TAP	8.26	9.09	-6.83	-7.94	P	0.25	2	2	2	6	FISP(2)	CIPP
15	16	15-16	KEYS BLVD	152.70	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	OFFSET JOINT IN TAP	8.26	9.09	-6.83	-7.94	P	0.25	2	2	2	6	FISP(2)	CIPP
15	16	15-16	KEYS BLVD	160.50	FALSE	YES	SL	9		TFA	Tap Factory Active	2	0	0	OFFSET IN TAP,infil stains in pipe	8.26	9.09	-6.83	-7.94	P	0.25	2	3	2	7	FISP(1)	CIPP(2)
15	16	15-16	KEYS BLVD	174.50	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		8.26	9.09	-6.83	-7.94	N	0	2	3	1	6	PM	
15	16	15-16	KEYS BLVD	210.10	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	OFFSET IN TAP	8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	218.50	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	224.50	FALSE	YES	SL			MWL	Water Level	5	0	0	crk & stains @ 222 ft	8.26	9.09	-6.83	-7.94	P	0.25	3	3	2	8	FISP(1)	CIPP(4)
15	16	15-16	KEYS BLVD	247.50	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		8.26	9.09	-6.83	-7.94	P	0.25	2			2		
15	16	15-16	KEYS BLVD	276.80	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	279.50	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		8.26	9.09	-6.83	-7.94	N	0	3	3	1	7		
15	16	15-16	KEYS BLVD	280.40	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	304.40	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	306.00	FALSE					AMH	Manhole	0	0	0	16	8.26	9.09	-6.83	-7.94		0				0		
15	16	15-16	KEYS BLVD	306.00	FALSE					STOP	Inspection stopped	0	0	0		8.26	9.09	-6.83	-7.94		0				0		
16	17	16-17	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		9.09	10.53	-7.94	-8.68		0				0		
16	17	16-17	KEYS BLVD	0.00	FALSE					AMH	Manhole	1	0	0	16 linfil stains at manhole, inspect during high water	9.09	10.53	-7.94	-8.68	P	0.25	2	2	2	6	FISP(1)	GRT
16	17	16-17	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		9.09	10.53	-7.94	-8.68	N	0	1	2	1	4	PM	
16	17	16-17	KEYS BLVD	2.00	FALSE	YES	?			MGP	General Photo	0	0	0	START OF LINE SEGMENT	9.09	10.53	-7.94	-8.68		0				0		
16	17	16-17	KEYS BLVD	10.00	FALSE	YES	?			MGP	General Photo	0	0	0	CAMERA SET	9.09	10.53	-7.94	-8.68		0				0		
16	17	16-17	KEYS BLVD	10.00	FALSE	YES	?			MWLS	Water Level Sag	5	0	0		9.09	10.53	-7.94	-8.68	N	0	3	3	1	7	PM	
16	17	16-17	KEYS BLVD	29.60	FALSE	YES	?	9		TFA	Tap Factory Active	1	0	0	long crk ,I & I stains around tap	9.09	10.53	-7.94	-8.68	P	0.25	3	3	1	7	CIPP(4)	GRT
16	17	16-17	KEYS BLVD	40.40	FALSE	YES	?			MWL	Water Level	5	0	0	active I & I @ jt 34ft	9.09	10.53	-7.94	-8.68	IW	2	3	2	3	8	CIPP(4)	GRT
16	17	16-17	KEYS BLVD	45.30	FALSE	YES	?	3		TFA	Tap Factory Active	1	0	0	infil around tap connection, possible main crk	9.09	10.53	-7.94	-8.68	IW	2	3	3	2	8	GRT	CIPP
16	17	16-17	KEYS BLVD	52.80	FALSE	YES	?			MWLS	Water Level Sag	5	0	0		9.09	10.53	-7.94	-8.68	N	0	3	3	1	7		
16	17	16-17	KEYS BLVD	73.30	FALSE	YES	?			MWL	Water Level	5	0	0		9.09	10.53	-7.94	-8.68	N	0	2	2	1	5		
16	17	16-17	KEYS BLVD	85.90	FALSE	YES	?	9		TFA	Tap Factory Active	0	0	0		9.09	10.53	-7.94	-8.68		0				0		
16	17	16-17	KEYS BLVD	107.80	FALSE	YES	?	3		TFA	Tap Factory Active	2	0	0	OFFSET IN TAP, may also have long crk	9.09	10.53	-7.94	-8.68	P	0.25	3	3	2	8	FISP(1)	CIPP(4)
16	17	16-17	KEYS BLVD	134.30	FALSE	YES	?			MWLS	Water Level Sag	5	0	0	also may have crk ,reinspect	9.09	10.53	-7.94	-8.68	P	0.25	3	3	2	8	FISP(1)	CIPP(4)
16	17	16-17	KEYS BLVD	141.40	FALSE	YES	?	9		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	9.09	10.53	-7.94	-8.68	N	0	2	2	1	5	PM	
16	17	16-17	KEYS BLVD	175.40	FALSE	YES	?	3		TFA	Tap Factory Active	0	0	0		9.09	10.53	-7.94	-8.68		0				0		
16	17	16-17	KEYS BLVD	189.50	FALSE	YES	?	9		TFA	Tap Factory Active	0	0	0	may have crk in main @ 186	9.09	10.53	-7.94	-8.68	P	0.25	3	3	2	8	FISP(1)	CIPP(4)
16	17	16-17	KEYS BLVD	190.40	FALSE	YES	?			MWL	Water Level	5	0	0		9.09	10.53	-7.94	-8.68		0	2	2	1	5		
16	17	16-17	KEYS BLVD	197.90	FALSE	YES	?			MGO	General Observation	1	0	0	INFILTRATION	9.09	10.53	-7.94	-8.68	IR	4	3	3	2	8	CIPP(4)	GRT
16	17	16-17	KEYS BLVD	197.90	FALSE	YES	?	7	5	CC	Crack Circumferential	1	0	0	previous rehab effort	9.09	10.53	-7.94	-8.68	P	0.25	3	3	3	9		
16	17	16-17	KEYS BLVD	203.50	FALSE	YES	?			MGP	General Photo	0	0	0	END OF LINE SEGMENT	9.09	10.53	-7.94	-8.68		0				0		
16	17	16-17	KEYS BLVD	203.80	FALSE					AMH	Manhole	0	0	0	17	9.09	10.53	-7.94	-8.68		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
16	17	16-17	KEYS BLVD	203.80	FALSE					STOP	Inspection stopped	0	0	0		9.09	10.53	-7.94	-8.68		0				0		
17	18	17-18	KEYS BLVD	0.00	FALSE	YES	?			START WITH FL	Start Inspection With the Flow	0	0	0		10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	0.00	FALSE	YES	?			AMH	Manhole	0	0	0	17	10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	0.00	FALSE	YES	?			MWL	Water Level	5	0	0		10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	2.00	FALSE	YES	?			MGP	General Photo	0	0	0	START OF LINE SEGMENT	10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	7.20	FALSE	YES	?			MWM	Water Mark	5	0	0	heavy dark deposits,	10.53	10.28	-8.68	-9.44	P	0.25	4	3	1	8	PM	
17	18	17-18	KEYS BLVD	14.30	FALSE	YES	?			MWLS	Water Level Sag	5	0	0		10.53	10.28	-8.68	-9.44	N	0	4	3	1	8	PM	
17	18	17-18	KEYS BLVD	24.10	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0		10.53	10.28	-8.68	-9.44	P	0.25	3	2	2	7	CIPP(14)	
17	18	17-18	KEYS BLVD	28.10	FALSE	YES	?	11		CL	Crack Longitudinal	1	0	0	cracked full pipe length	10.53	10.28	-8.68	-9.44	P	0.25	4	4	4	12	CIPPcomb	
17	18	17-18	KEYS BLVD	28.90	FALSE	YES	?	3		TFA	Tap Factory Active	0	0	0		10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	30.90	FALSE	YES	?	1		CL	Crack Longitudinal	1	0	0		10.53	10.28	-8.68	-9.44	P	0.25	3	3	3	9	CIPPcomb	
17	18	17-18	KEYS BLVD	31.20	FALSE	YES	?	9		TFA	Tap Factory Active	0	0	0		10.53	10.28	-8.68	-9.44	P	0.25	3	2	2	7	FISP(1)	CIPP(2)
17	18	17-18	KEYS BLVD	31.20	FALSE	YES	?			MGP	General Photo	0	0	0	INFILTRATION,high flow ,fisp	10.53	10.28	-8.68	-9.44	P	0.25	3	2	2	7	FISP(1)	CIPP(4)
17	18	17-18	KEYS BLVD	35.60	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0		10.53	10.28	-8.68	-9.44	IW	2	3	3	2	8	CIPPcomb	
17	18	17-18	KEYS BLVD	36.00	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0		10.53	10.28	-8.68	-9.44	P	0.25	3	3	2	8	CIPPcomb	
17	18	17-18	KEYS BLVD	50.50	FALSE	YES	CIPP			MWL	Water Level	5	0	0	existing patch from 46-54	10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	54.60	FALSE	YES	?			MWLS	Water Level Sag	5	0	0		10.53	10.28	-8.68	-9.44	P	0.25	3			3		
17	18	17-18	KEYS BLVD	65.30	FALSE	YES	?			MWL	Water Level	5	0	0		10.53	10.28	-8.68	-9.44		0	2			2		
17	18	17-18	KEYS BLVD	80.70	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0		10.53	10.28	-8.68	-9.44	P	0.25				0		
17	18	17-18	KEYS BLVD	81.10	FALSE	YES	?	9		TFA	Tap Factory Active	0	0	0		10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	89.60	FALSE	YES	?	3	4 CM		Crack Multiple	1	0	0	I & I stains	10.53	10.28	-8.68	-9.44	P	0.25	4	4	3	11	CIPP(4)	
17	18	17-18	KEYS BLVD	100.40	FALSE	YES	?	11		CL	Crack Longitudinal	1	0	0		10.53	10.28	-8.68	-9.44	P	0.25	3	4	3	10	CIPP(10)	
17	18	17-18	KEYS BLVD	101.70	FALSE	YES	?	3		TFA	Tap Factory Active	0	0	0		10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	103.10	FALSE	YES	?			MGO	General Observation	1	0	0	POSSIBLE INFILTRATION	10.53	10.28	-8.68	-9.44	IW	2	3	3	3	9	CIPPcomb	
17	18	17-18	KEYS BLVD	106.70	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0		10.53	10.28	-8.68	-9.44	P	0.25	4	3	3	10	CIPPcomb	
17	18	17-18	KEYS BLVD	107.10	FALSE	YES	?			MGO	General Observation	1	0	0	INFILTRATION	10.53	10.28	-8.68	-9.44	ID	3	4	3	3	10	CIPPcomb	
17	18	17-18	KEYS BLVD	135.90	FALSE	YES	?	9		TFA	Tap Factory Active	0	0	0		10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	169.40	FALSE	YES	?	11		CL	Crack Longitudinal	1	0	0		10.53	10.28	-8.68	-9.44	ID	3	4	4	3	11	CIPP(4)	
17	18	17-18	KEYS BLVD	169.40	FALSE	YES	?			MGO	General Observation	1	0	0	POSSIBLE INFILTRATION	10.53	10.28	-8.68	-9.44	P	0.25	3	3	3	9	CIPPcomb	
17	18	17-18	KEYS BLVD	169.70	FALSE	YES	?	3		TFA	Tap Factory Active	0	0	0		10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	182.30	FALSE	YES	?	9		TFA	Tap Factory Active	1	0	0	observed infil	10.53	10.28	-8.68	-9.44	IW	2	3	3	2	8	GRT	CIPP
17	18	17-18	KEYS BLVD	204.50	FALSE	YES	?			MWLS	Water Level Sag	5	0	0		10.53	10.28	-8.68	-9.44	P	0.25	3	3	2	8	PM	
17	18	17-18	KEYS BLVD	209.20	FALSE	YES	?			MGP	General Photo	0	0	0	END OF LINE SEGMENT	10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	210.40	FALSE					AMH	Manhole	0	0	0	18	10.53	10.28	-8.68	-9.44		0				0		
17	18	17-18	KEYS BLVD	210.40	FALSE					STOP	Inspection stopped	0	0	0		10.53	10.28	-8.68	-9.44		0				0		
18	19	18-19	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		10.28	11.4	-9.44	-10.27		0				0		
18	19	18-19	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	18	10.28	11.4	-9.44	-10.27		0				0		
18	19	18-19	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		10.28	11.4	-9.44	-10.27		0				0		
18	19	18-19	KEYS BLVD	2.00	FALSE	YES	?			MGP	General Photo	0	0	0	START OF LINE SEGMENT	10.28	11.4	-9.44	-10.27		0				0		
18	19	18-19	KEYS BLVD	2.00	FALSE	YES	?			MWLS	Water Level Sag	5	0	0	camera underwater	10.28	11.4	-9.44	-10.27	P	0.25	3	3	2	8	PM	
18	19	18-19	KEYS BLVD	10.00	FALSE	YES	?			MGP	General Photo	0	0	0	CAMERA SET	10.28	11.4	-9.44	-10.27		0				0		
18	19	18-19	KEYS BLVD	10.00	FALSE	YES	?			MWLS	Water Level Sag	5	0	0		10.28	11.4	-9.44	-10.27	P	0.25	3	3	2	8	PM	
18	19	18-19	KEYS BLVD	42.10	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0	I & I stains	10.28	11.4	-9.44	-10.27	P	0.25	4	3	3	10	CIPP(10)	
18	19	18-19	KEYS BLVD	42.10	FALSE	YES	?			MGO	General Observation	1	0	0	POSSIBLE INFILTRATION	10.28	11.4	-9.44	-10.27	P	0.25	3	3	3	9	CIPPcomb	
18	19	18-19	KEYS BLVD	46.10	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0		10.28	11.4	-9.44	-10.27	P	0.25	3	4	3	10	CIPPcomb	
18	19	18-19	KEYS BLVD	47.70	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0		10.28	11.4	-9.44	-10.27	P	0.25	3	4	3	10	CIPPcomb	
18	19	18-19	KEYS BLVD	47.80	FALSE	YES	?			MGO	General Observation	1	0	0	POSSIBLE INFILTRATION	10.28	11.4	-9.44	-10.27	P	0.25	3	3	2	8	CIPPcomb	
18	19	18-19	KEYS BLVD	59.40	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0		10.28	11.4	-9.44	-10.27	P	0.25	3	4	3	10	CIPP(4)	
18	19	18-19	KEYS BLVD	75.60	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0		10.28	11.4	-9.44	-10.27	P	0.25	3	4	3	10	CIPP(14)	
18	19	18-19	KEYS BLVD	87.80	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0		10.28	11.4	-9.44	-10.27	P	0.25	3	4	3	10	CIPPcomb	
18	19	18-19	KEYS BLVD	87.80	FALSE	YES	?			MGO	General Observation	1	0	0	POSSIBLE INFILTRATION	10.28	11.4	-9.44	-10.27	P	0.25	3	3	2	8	CIPPcomb	
18	19	18-19	KEYS BLVD	88.50	FALSE	YES	?			MGO	General Observation	1	0	0	INFILTRATION	10.28	11.4	-9.44	-10.27	ID	3	3	3	2	8	CIPPcomb	
18	19	18-19	KEYS BLVD	122.50	FALSE	YES	?			MWL	Water Level	5	0	0		10.28	11.4	-9.44	-10.27	N	0	2	2	1	5	PM	
18	19	18-19	KEYS BLVD	125.20	FALSE	YES	?	9		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	10.28	11.4	-9.44	-10.27	N	0	2	2	1	5	PM	
18	19	18-19	KEYS BLVD	146.60	FALSE	YES	?	3		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	10.28	11.4	-9.44	-10.27	N	0	2	2	1	5	PM	
18	19	18-19	KEYS BLVD	186.70	FALSE	YES	?	9		TFA	Tap Factory Active	0	0	0		10.28	11.4	-9.44	-10.27		0				0		
18	19	18-19	KEYS BLVD	193.70	FALSE	YES	?	12		CL	Crack Longitudinal	1	0	0	weeper observed	10.28	11.4	-9.44	-10.27	ID	3	3	3	3	9	CIPP(4)	
18	19	18-19	KEYS BLVD	193.70	FALSE	YES	?			MGO	General Observation	1	0	0	POSSIBLE INFILTRATION	10.28	11.4	-9.44	-10.27	ID	3	3	3	3	9	CIPPcomb	
18	19	18-19	KEYS BLVD	194.90	FALSE	YES	?			MWL	Water Level	5	0	0		10.28	11.4	-9.44	-10.27	N	0	2	3	1	6	PM	
18	19	18-19	KEYS BLVD	233.10	FALSE	YES	?			MGP	General Photo	0	0	0	END OF LINE SEGMENT	10.28	11.4	-9.44	-10.27		0				0		
18	19	18-19	KEYS BLVD	233.90	FALSE					AMH	Manhole	0	0	0	19	10.28	11.4	-9.44	-10.27		0				0		
18	19	18-19	KEYS BLVD	233.90	FALSE					STOP	Inspection stopped	0	0	0		10.28	11.4	-9.44	-10.27		0				0		
20	19	20-19	FLYING JIB CT	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		13.12	11.4	-11.77	-10.27		0				0		
20	19	20-19	FLYING JIB CT	0.00	FALSE					AMH	Manhole	0	0	0	20	13.12	11.4	-11.77	-10.27		0				0		
20	19	20-19	FLYING JIB CT	0.00	FALSE					MWL	Water Level	5	0	0		13.12	11.4	-11.77	-10.27		0				0		
20	19	20-19	FLYING JIB CT	2.00	FALSE	YES	SL/CIPP			MGP	General Photo	0	0	0	START OF LINE SEGMENT	13.12	11.4	-11.77	-10.27		0				0		
20	19	20-19	FLYING JIB CT	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	13.12	11.4	-11.77	-10.27		0				0		
20	19	20-19	FLYING JIB CT	42.40	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	may have infiltration	13.12	11.4	-11.77	-10.27	P	0.25	3	3	2	8	RC	CIPP(2)
20	19	20-19	FLYING JIB CT	47.00	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		13.12	11.4	-11.77	-10.27		0				0		
20	19	20-19	FLYING JIB CT	74.70	FALSE	YES	SL			MWL	Water Level	5	0	0		13.12	11.4	-11.77	-10.27	N	0	2	3	1	6	PM	
20	19	20-19	FLYING JIB CT	111.90	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		13.12	11.4	-11.77	-10.27		0				0		
20	19	20-19	FLYING JIB CT	133.60	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		13.12	11.4	-11.77	-10.27		0				0		
20	19	20-19	FLYING JIB CT	217.90	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0	may be cracked, but camera UW	13.12	11.4	-11.77	-10.27	P	0.25	3	3	3	9	FISP(1)	CIPP(4)
20	19	20-19	FLYING JIB CT	248.00	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	13.12	11.4	-11.77	-10.27		0				0		
20	19	20-19	FLYING JIB CT	248.00	FALSE					AMH	Manhole	0	0	0	19	13.12	11.4	-11.77	-10.27		0				0		
20	19	20-19	FLYING JIB CT	248.00	FALSE					STOP	Inspection stopped	0	0	0		13.12	11.4	-11.77	-10.27		0				0		
21A	20	21A-20	FLYING JIB CT	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		#N/A	13.12	#N/A	-11.77		0				0		
21A	20	21A-20	FLYING JIB CT	0.00	TRUE					AMH	Manhole	0	0	0	20	#N/A	13.12	#N/A	-11.77		0				0		
21A	20	21A-20	FLYING JIB CT	0.00	TRUE					MWL	Water Level	5	0	0		#N/A	13.12	#N/A	-11.77	N	0	2	2	1	5	PM	
21A	20	21A-20	FLYING JIB CT	2.00	TRUE			12	12 CC		Crack Circumferential	1	0	0	footage may be corrected by 2ft	#N/A	13.12	#N/A	-11.77	P	0.25	3	3	3	9	CIPP(4)	
21A	20	21A-20	FLYING JIB CT	2.00	TRUE					MGO	General Observation	0	0	0	INFILTRATION,not observed	#N/A	13.12	#N/A	-11.77	P	0.25	3	3	3	9	FISP(1)	CIPP(4)
21A	20	21A-20	FLYING JIB CT	2.00	TRUE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	#N/A	13.12	#N/A	-11.77		0				0		
21A	20	21A-20	FLYING JIB CT	10.00	TRUE					MGP	General Photo	0	0	0	CAMERA SET	#N/A	13.12	#N/A	-11.77		0				0		
21A	20	21A-20	FLYING JIB CT	10.00	TRUE					MWLS	Water Level Sag	5	0	0		#N/A	13.12	#N/A	-11.77	N	0	3	3	2	8	PM	
21A	20	21A-20	FLYING JIB CT	14.00	TRUE			6		LFDL	Lining Failure Delaminating	4	0	0	existing repair shows infil stains	#N/A	13.12	#N/A	-11.77	P	0.25	3	3	3	9	FISP(2)	CIPP
21A	20	21A-20	FLYING JIB CT	24.30	TRUE			9		TFA	Tap Factory Active	0	0	0		#N/A	13.12	#N/A	-11.77		0				0		
21A	20	21A-20	FLYING JIB CT	27.70	TRUE			3		TFA	Tap Factory Active	0	0	0	high volume of clean water ,suspect infil	#N/A	13.12	#N/A	-11.77	P	0.25	3	3	2	8	FISP(1)	CIPP
21A	20	21A-20	FLYING JIB CT	32.20	TRUE					MWL	Water Level	5	0	0		#N/A	13.12	#N/A	-11.77	N	0	1	3	1	5	PM	
21A	20	21A-20	FLYING JIB CT	71.30	TRUE			3		TFA	Tap Factory Active	0	0	0		#N/A	13.12	#N/A	-11.77		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
21A	20	21A-20	FLYING JIB CT	74.70	TRUE			9		TFA	Tap Factory Active	0	0	0		#N/A	13.12	#N/A	-11.77		0				0		
21A	20	21A-20	FLYING JIB CT	83.00	TRUE			3		TFA	Tap Factory Active	0	0	0		#N/A	13.12	#N/A	-11.77		0				0		
21A	20	21A-20	FLYING JIB CT	85.00	TRUE					MWL	Water Level	5	0	0		#N/A	13.12	#N/A	-11.77	N	0	2	3	1	6	PM	
21A	20	21A-20	FLYING JIB CT	85.80	TRUE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	#N/A	13.12	#N/A	-11.77		0				0		
21A	20	21A-20	FLYING JIB CT	85.80	TRUE					AMH	Manhole	0	0	0	21A	#N/A	13.12	#N/A	-11.77		0				0		
21A	20	21A-20	FLYING JIB CT	85.80	TRUE					STOP	Inspection stopped	0	0	0		#N/A	13.12	#N/A	-11.77		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	0.00	TRUE					AMH	Manhole	0	0	0	22	#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	0.00	TRUE					MWL	Water Level	5	0	0		#N/A	3.87	#N/A	-2.93	N	0	2	3	1	6	PM	
22A	22	22A-22_1	EVERGLADE BLVD	2.00	TRUE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	10.00	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	24.60	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	24.60	TRUE	YES	SL	12		TFA	Tap Factory Active	0	0	0		#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	27.70	TRUE	YES	SL	12		LFDL	Lining Failure Delaminating	4	0	0	49ft ,liner failed at jt. Infil possible	#N/A	3.87	#N/A	-2.93	N	0	1	1	1	3	GRT	CIPP
22A	22	22A-22_1	EVERGLADE BLVD	82.30	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	85.30	TRUE	YES	SL	10		LFDL	Lining Failure Delaminating	4	0	0		#N/A	3.87	#N/A	-2.93	N	0	1	1	1	3	DA	
22A	22	22A-22_1	EVERGLADE BLVD	138.40	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	141.20	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	174.60	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	178.00	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	178.30	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0		#N/A	3.87	#N/A	-2.93	N	0	3	3	2	8	PM	
22A	22	22A-22_1	EVERGLADE BLVD	184.80	TRUE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT CAMERA UNDERWATER	#N/A	3.87	#N/A	-2.93	P	0.25	3	3	2	8	PM	
22A	22	22A-22_1	EVERGLADE BLVD	184.80	TRUE					AMH	Manhole	0	0	0	22A	#N/A	3.87	#N/A	-2.93		0				0		
22A	22	22A-22_1	EVERGLADE BLVD	184.80	TRUE					STOP	Inspection stopped	0	0	0		#N/A	3.87	#N/A	-2.93		0				0		
24	25	24-25	EVERGLADE BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		7.95	9.9	-7.14	-8.84		0				0		
24	25	24-25	EVERGLADE BLVD	0.00	FALSE					AMH	Manhole	0	0	0	24	7.95	9.9	-7.14	-8.84		0				0		
24	25	24-25	EVERGLADE BLVD	0.00	FALSE					MWL	Water Level	5	0	0		7.95	9.9	-7.14	-8.84		0				0		
24	25	24-25	EVERGLADE BLVD	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.95	9.9	-7.14	-8.84		0				0		
24	25	24-25	EVERGLADE BLVD	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.95	9.9	-7.14	-8.84		0				0		
24	25	24-25	EVERGLADE BLVD	20.10	FALSE	YES	SL			MWL	Water Level	5	0	0		7.95	9.9	-7.14	-8.84	N	0	1	3	1	5	PM	
24	25	24-25	EVERGLADE BLVD	46.00	FALSE	YES	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	CONTINUOUS	7.95	9.9	-7.14	-8.84	P	0.25	3	3	2	8	PM	
24	25	24-25	EVERGLADE BLVD	52.30	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.95	9.9	-7.14	-8.84	N	0	3	3	1	7	PM	
24	25	24-25	EVERGLADE BLVD	76.20	FALSE	YES	SL			MWL	Water Level	5	0	0		7.95	9.9	-7.14	-8.84	N	0	2	3	1	6	PM	
24	25	24-25	EVERGLADE BLVD	151.20	FALSE	YES	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	CONTINUOUS	7.95	9.9	-7.14	-8.84	N	0	1	3	2	6	PM	
24	25	24-25	EVERGLADE BLVD	195.90	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.95	9.9	-7.14	-8.84	N	0	3	3	1	7	PM	
24	25	24-25	EVERGLADE BLVD	266.20	FALSE	YES	SL			MWL	Water Level	5	0	0		7.95	9.9	-7.14	-8.84	N	0	1	3	1	5	PM	
24	25	24-25	EVERGLADE BLVD	288.10	FALSE	YES	SL	12	3	LFDL	Lining Failure Delaminating	4	0	0		7.95	9.9	-7.14	-8.84	N	0	1	1	1	3	DA	
24	25	24-25	EVERGLADE BLVD	297.20	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.95	9.9	-7.14	-8.84	N	0	3	3	1	7	PM	
24	25	24-25	EVERGLADE BLVD	311.30	FALSE	YES	SL			MWL	Water Level	5	0	0		7.95	9.9	-7.14	-8.84	N	0	1	3	1	5	PM	
24	25	24-25	EVERGLADE BLVD	352.50	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.95	9.9	-7.14	-8.84		0				0		
24	25	24-25	EVERGLADE BLVD	353.80	FALSE					AMH	Manhole	1	0	0	25, inspect mh for infil	7.95	9.9	-7.14	-8.84	P	0.25	2	3	2	7	FISP(1)	GRT
24	25	24-25	EVERGLADE BLVD	353.80	FALSE					STOP	Inspection stopped	0	0	0		7.95	9.9	-7.14	-8.84		0				0		
24A	24	24A-24_1	PEBBLE WY	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	0.00	FALSE					AMH	Manhole	0	0	0	24A	6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	0.00	FALSE	YES	SL			MWL	Water Level	5	0	0		6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	10.00	FALSE	YES	SL			MWL	Water Level	5	0	0		6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	25.20	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	58.50	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	67.40	FALSE	YES	SL			MWL	Water Level	5	0	0		6.64	7.95	-6.16	-7.14	P	0.25	2	3	1	6	PM	
24A	24	24A-24_1	PEBBLE WY	87.30	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	may have I & I	6.64	7.95	-6.16	-7.14	P	0.25	2	2	2	6	FISP(1)	CIPP(2)
24A	24	24A-24_1	PEBBLE WY	87.70	FALSE	YES	SL			MWL	Water Level	5	0	0		6.64	7.95	-6.16	-7.14	N	0	1	3	1	5	PM	
24A	24	24A-24_1	PEBBLE WY	93.80	FALSE	YES	SL	9		LFDL	Lining Failure Delaminating	4	0	0		6.64	7.95	-6.16	-7.14	N	0	1	1	1	3	DA	
24A	24	24A-24_1	PEBBLE WY	116.20	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	134.60	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	186.00	FALSE	YES	SL			JAM	Joint Angular Medium	2	0	0	DOWN	6.64	7.95	-6.16	-7.14	N	0	2	3	2	7	FISP(2)	FISP
24A	24	24A-24_1	PEBBLE WY	195.60	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	195.60	FALSE					AMH	Manhole	0	0	0	24	6.64	7.95	-6.16	-7.14		0				0		
24A	24	24A-24_1	PEBBLE WY	195.60	FALSE					STOP	Inspection stopped	0	0	0		6.64	7.95	-6.16	-7.14		0				0		
24B	24A	24B-24A	PEBBLE WY	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		#N/A	6.64	#N/A	-6.16		0				0		
24B	24A	24B-24A	PEBBLE WY	0.00	TRUE					AMH	Manhole	0	0	0	24A	#N/A	6.64	#N/A	-6.16		0				0		
24B	24A	24B-24A	PEBBLE WY	0.00	TRUE					MWL	Water Level	5	0	0		#N/A	6.64	#N/A	-6.16		0				0		
24B	24A	24B-24A	PEBBLE WY	10.00	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	#N/A	6.64	#N/A	-6.16		0				0		
24B	24A	24B-24A	PEBBLE WY	27.30	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		#N/A	6.64	#N/A	-6.16		0				0		
24B	24A	24B-24A	PEBBLE WY	28.90	TRUE	YES	SL			MWL	Water Level	5	0	0		#N/A	6.64	#N/A	-6.16	N	0	2	3	1	6	PM	
24B	24A	24B-24A	PEBBLE WY	58.80	TRUE	YES	SL			MWL	Water Level	5	0	0		#N/A	6.64	#N/A	-6.16	N	0	1	3	1	5	DA	
24B	24A	24B-24A	PEBBLE WY	70.90	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		#N/A	6.64	#N/A	-6.16		0				0		
24B	24A	24B-24A	PEBBLE WY	105.60	TRUE	YES	SL			MWL	Water Level	5	0	0		#N/A	6.64	#N/A	-6.16	N	0	2	3	1	6	PM	
24B	24A	24B-24A	PEBBLE WY	105.60	TRUE	YES	SL	3	9	LFDL	Lining Failure Delaminating	4	0	0	DELAMINATING CONTINUOUS	#N/A	6.64	#N/A	-6.16	N	0	2	1	1	4	DA	DA
24B	24A	24B-24A	PEBBLE WY	112.60	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		#N/A	6.64	#N/A	-6.16		0				0		
24B	24A	24B-24A	PEBBLE WY	114.60	TRUE	YES	SL			MWL	Water Level	5	0	0		#N/A	6.64	#N/A	-6.16	N	0	1	3	1	5	DA	
24B	24A	24B-24A	PEBBLE WY	126.00	TRUE	YES	SL	10		TFA	Tap Factory Active	0	0	0		#N/A	6.64	#N/A	-6.16		0				0		
24B	24A	24B-24A	PEBBLE WY	138.20	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0	JO medium here also	#N/A	6.64	#N/A	-6.16	P	0.25	3	3	1	7	FISP(2)	CIPP
24B	24A	24B-24A	PEBBLE WY	142.00	TRUE	YES	SL			MMC	Material Change	0	0	0	PVC	#N/A	6.64	#N/A	-6.16	N	0				0		
24B	24A	24B-24A	PEBBLE WY	142.30	TRUE	YES	SL			AMH	Manhole	0	0	0	24B	#N/A	6.64	#N/A	-6.16		0				0		
24B	24A	24B-24A	PEBBLE WY	142.30	TRUE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	#N/A	6.64	#N/A	-6.16		0				0		
24B	24A	24B-24A	PEBBLE WY	142.30	TRUE					STOP	Inspection stopped	0	0	0		#N/A	6.64	#N/A	-6.16		0				0		
25	26	25-26	EVERGLADE BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		9.9	11.9	-8.84	-10.74		0				0		
25	26	25-26	EVERGLADE BLVD	0.00	FALSE					AMH	Manhole	0	0	0	25	9.9	11.9	-8.84	-10.74		0				0		
25	26	25-26	EVERGLADE BLVD	0.00	FALSE					MWL	Water Level	5	0	0		9.9	11.9	-8.84	-10.74		0				0		
25	26	25-26	EVERGLADE BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	9.9	11.9	-8.84	-10.74		0				0		
25	26	25-26	EVERGLADE BLVD	10.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	9.9	11.9	-8.84	-10.74		0				0		
25	26	25-26	EVERGLADE BLVD	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET, JS medium @ 16ft	9.9	11.9	-8.84	-10.74	N	0	2	2	1	5	FISP(2)	
25	26	25-26	EVERGLADE BLVD	74.20	FALSE					MWL	Water Level	5	0	0		9.9	11.9	-8.84	-10.74	N	0	3	2	2	7	PM	
25	26	25-26	EVERGLADE BLVD	82.80	FALSE					MWLS	Water Level Sag	5	0	0		9.9	11.9	-8.84	-10.74	N	0	3	2	1	6	PM	
25	26	25-26	EVERGLADE BLVD	128.20	FALSE					MWL	Water Level	5	0	0		9.9	11.9	-8.84	-10.74	N	0	3	2	1	6	PM	
25	26	25-26	EVERGLADE BLVD	256.90	FALSE					MWLS	Water Level Sag	5	0	0		9.9	11.9	-8.84	-10.74	N	0	3	2	1	6	PM	
25	26	25-26	EVERGLADE BLVD	319.20	FALSE					MWL	Water Level	5	0	0		9.9	11.9	-8.84	-10.74	N	0	3	2	1	6	PM	
25	26	25-26	EVERGLADE BLVD	328.90	FALSE					MWLS	Water Level Sag	5	0	0		9.9	11.9	-8.84	-10.74	N	0	3	2	1	6	PM	

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
25	26	25-26	EVERGLADE BLVD	354.20	FALSE					MWLS	Water Level Sag	5	0	0	0 joint @ 345 needs reinspection	9.9	11.9	-8.84	-10.74	N	0	4	3	1	8	FISP(2)	
25	26	25-26	EVERGLADE BLVD	354.20	FALSE					MGP	General Photo	0	0	0	0 END OF LINE SEGMENT	9.9	11.9	-8.84	-10.74		0				0		
25	26	25-26	EVERGLADE BLVD	354.50	FALSE					AMH	Manhole	0	0	0	0 26	9.9	11.9	-8.84	-10.74		0				0		
25	26	25-26	EVERGLADE BLVD	354.50	FALSE					MSA	Abandoned Survey	0	0	0	0 REACHED DOWNSTREAM MANHOLE	9.9	11.9	-8.84	-10.74		0				0		
31	32	31-32	SURF LN	0.00	FALSE	YES	?			START WITH FL	Start Inspection With the Flow	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	0.00	FALSE	YES	?			AMH	Manhole	0	0	0	0 31	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	0.00	FALSE					MWL	Water Level	5	0	0	0 flow appears at MH bench	4.59	5.31	-2.69	-4.19	IR	4	3	3	2	8	FISP(1)	GRT
31	32	31-32	SURF LN	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	0 START OF LINE SEGMENT	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	2.00	FALSE	YES	SL	4	7	LFDL	Lining Failure Delaminating	4	0	0	0 CONTINUOUS, may be crkd	4.59	5.31	-2.69	-4.19	P	0.25	3	3	2	8	FISP(1)	CIPP
31	32	31-32	SURF LN	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	0 CAMERA SET, footage may be off	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	10.30	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	32.40	FALSE	YES	SL	7	9	LFDL	Lining Failure Delaminating	4	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	44.50	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	52.50	FALSE	YES	SL	4		LFDL	Lining Failure Delaminating	4	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	63.50	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	66.60	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	68.40	FALSE	YES	SL	3		LFDL	Lining Failure Delaminating	4	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	70.30	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	76.40	FALSE	YES	SL	5		LFDL	Lining Failure Delaminating	4	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	77.00	FALSE	YES	SL	7		LFDL	Lining Failure Delaminating	4	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	79.70	FALSE	YES	SL	4	7	LFDL	Lining Failure Delaminating	4	0	0	0 CONTINUOUS	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	109.90	FALSE	YES	SL	4	7	DAGS	Deposits Attached Grease	0	0	0	0 GREASE	4.59	5.31	-2.69	-4.19	N	0	2	3	1	6	PM	
31	32	31-32	SURF LN	119.60	FALSE	YES	SL	2		TFA	Tap Factory Active	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	131.90	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0	0	4.59	5.31	-2.69	-4.19	N	0	2	3	1	6	PM	
31	32	31-32	SURF LN	132.50	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	172.90	FALSE	YES	SL			MWL	Water Level	5	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	3	1	5	PM	
31	32	31-32	SURF LN	181.00	FALSE	YES	SL	1	10	LFDL	Lining Failure Delaminating	4	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	185.70	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	188.90	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	231.90	FALSE	YES	SL	7		LFDL	Lining Failure Delaminating	4	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	242.30	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	244.20	FALSE	YES	SL	3	11	LFDL	Lining Failure Delaminating	4	0	0	0	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	245.40	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	249.20	FALSE	YES	SL	4	9	LFDL	Lining Failure Delaminating	4	0	0	0 CONTINUOUS	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	263.30	FALSE	YES	SL	4	8	LFDL	Lining Failure Delaminating	4	0	0	0 CONTINUOUS	4.59	5.31	-2.69	-4.19	N	0	1	1	1	3	DA	
31	32	31-32	SURF LN	265.90	FALSE	YES	SL			MGP	General Photo	0	0	0	0 END OF LINE SEGMENT	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	266.50	FALSE					AMH	Manhole	0	0	0	0 32	4.59	5.31	-2.69	-4.19		0				0		
31	32	31-32	SURF LN	266.50	FALSE					STOP	Inspection stopped	0	0	0	0	4.59	5.31	-2.69	-4.19		0				0		
32	23	32-23	SURF LN	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0	0	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23	SURF LN	0.00	FALSE					AMH	Manhole	0	0	0	0 32	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23	SURF LN	0.00	FALSE					MWL	Water Level	5	0	0	0	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23	SURF LN	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	0 START OF LINE SEGMENT	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23	SURF LN	8.90	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	0 District repair of damaged invert	5.31	6.5	-4.19	-5.45	P	0.25	2	2	2	6	GRT	
32	23	32-23	SURF LN	35.80	FALSE	YES	SL	4	7	DAGS	Deposits Attached Grease	0	0	0	0 CONTINUOUS	5.31	6.5	-4.19	-5.45	N	0	2	3	1	6	PM	
32	23	32-23	SURF LN	37.80	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23	SURF LN	40.80	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	0	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23	SURF LN	45.90	FALSE	YES	SL	4	7	DAGS	Deposits Attached Grease	0	0	0	0 CONTINUOUS	5.31	6.5	-4.19	-5.45	N	0	2	3	1	6	PM	
32	23	32-23	SURF LN	49.90	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0	0	5.31	6.5	-4.19	-5.45	P	0.25	3	3	1	7	PM	
32	23	32-23	SURF LN	51.90	FALSE	YES	SL	1	9	LFDL	Lining Failure Delaminating	4	0	0	0	5.31	6.5	-4.19	-5.45	N	0	1	1	1	3	DA	
32	23	32-23	SURF LN	62.00	FALSE	YES	SL	4	8	LFDL	Lining Failure Delaminating	4	0	0	0	5.31	6.5	-4.19	-5.45	N	0	1	1	1	3	DA	
32	23	32-23	SURF LN	62.00	FALSE	YES	SL			MWL	Water Level	5	0	0	0	5.31	6.5	-4.19	-5.45	N	0				0		
32	23	32-23	SURF LN	69.40	FALSE	YES	SL	5		LFDL	Lining Failure Delaminating	4	0	0	0	5.31	6.5	-4.19	-5.45	N	0	1	1	1	3	DA	
32	23	32-23	SURF LN	71.80	FALSE	YES	SL	4	7	LFDL	Lining Failure Delaminating	4	0	0	0 CONTINUOUS	5.31	6.5	-4.19	-5.45	N	0	1	1	1	3	DA	
32	23	32-23	SURF LN	88.70	FALSE	YES	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	0 CONTINUOUS	5.31	6.5	-4.19	-5.45	N	0	2	3	1	6	PM	
32	23	32-23	SURF LN	94.10	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23	SURF LN	102.30	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0	0	5.31	6.5	-4.19	-5.45	N	0	3	3	1	7	PM	
32	23	32-23	SURF LN	105.90	FALSE	YES	SL	3		LFDL	Lining Failure Delaminating	4	0	0	0	5.31	6.5	-4.19	-5.45	N	0	1	1	1	3	DA	
32	23	32-23	SURF LN	140.90	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23	SURF LN	173.30	FALSE	YES	SL			MSA	Abandoned Survey	0	0	0	0 CAMERA UNDERWATER	5.31	6.5	-4.19	-5.45	P	0.25	3	3	1	7	FISP(2)	
32	23	32-23	SURF LN	173.30	FALSE	YES	SL			STOP	Inspection stopped	0	0	0	0	5.31	6.5	-4.19	-5.45		0				0		
33	25	33-25	BASS LN	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	0.00	FALSE					AMH	Manhole	0	0	0	0 33	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	0.00	FALSE					MWL	Water Level	5	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	0 START OF LINE SEGMENT	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	0 CAMERA SET	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	39.40	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	44.00	FALSE	YES	SL			MWL	Water Level	5	0	0	0	8.28	9.9	-7.36	-8.84	N	0	1	3	1	5	PM	
33	25	33-25	BASS LN	72.90	FALSE	YES	SL	3		TF	Tap Factory	0	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	101.00	FALSE	YES	SL	9		TF	Tap Factory	0	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	103.90	FALSE	YES	SL			MWL	Water Level	5	0	0	0	8.28	9.9	-7.36	-8.84	N	0	2	3	1	6	PM	
33	25	33-25	BASS LN	118.20	FALSE	YES	SL			MWL	Water Level	5	0	0	0	8.28	9.9	-7.36	-8.84	N	0	1	3	1	5	PM	
33	25	33-25	BASS LN	129.30	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	135.50	FALSE	YES	SL			MWL	Water Level	5	0	0	0	8.28	9.9	-7.36	-8.84	N	0	1	3	1	5	PM	
33	25	33-25	BASS LN	150.10	FALSE	YES	SL			MWL	Water Level	5	0	0	0	8.28	9.9	-7.36	-8.84	N	0	1	3	1	5	PM	
33	25	33-25	BASS LN	162.50	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	164.50	FALSE	YES	SL	6	5	CC	Crack Circumferential	1	0	0	0 possible infil	8.28	9.9	-7.36	-8.84	P	0.25	3	3	2	8	CIPP(4)	
33	25	33-25	BASS LN	190.30	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	193.50	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	0	8.28	9.9	-7.36	-8.84	N	0	1	1	1	3	DA	
33	25	33-25	BASS LN	197.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	0	8.28	9.9	-7.36	-8.84	N	0	1	1	1	3	DA	
33	25	33-25	BASS LN	223.60	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	239.90	FALSE	YES	SL			MWL	Water Level	5	0	0	0	8.28	9.9	-7.36	-8.84	N	0	1	3	1	5	PM	
33	25	33-25	BASS LN	242.50	FALSE	YES	SL	3		TF	Tap Factory	0	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	296.80	FALSE	YES	SL	5	7	LFDL	Lining Failure Delaminating	4	0	0	0	8.28	9.9	-7.36	-8.84	N	0	1	1	1	3	DA	
33	25	33-25	BASS LN	297.20	FALSE	YES	SL			MGO	General Observation	0	0	0	0 END OF LINE SEGMENT	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	297.20	FALSE					AMH	Manhole	0	0	0	0 25	8.28	9.9	-7.36	-8.84		0				0		
33	25	33-25	BASS LN	297.20	FALSE					STOP	Inspection stopped	0	0	0	0	8.28	9.9	-7.36	-8.84		0				0		
33A	33	33A-33	BASS LN	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0	0	8.02	8.28	-6.68	-7.36		0				0		
33A	33	33A-33	BASS LN	0.00	TRUE					MWL	Water Level	5	0	0	0	8.02	8.28	-6.68	-7.36		0				0		
33A	33	33A-33	BASS LN	0.00	TRUE					AMH	Manhole	0	0	0	0 33	8.02	8.28	-6.68	-7.36		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
33A	33	33A-33	BASS LN	2.00	TRUE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	8.02	8.28	-6.68	-7.36		0				0		
33A	33	33A-33	BASS LN	10.00	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	8.02	8.28	-6.68	-7.36		0				0		
33A	33	33A-33	BASS LN	22.80	TRUE	YES	SL			MWL	Water Level	5	0	0		8.02	8.28	-6.68	-7.36	N	0	1	3	1	5	PM	
33A	33	33A-33	BASS LN	27.40	TRUE	YES	SL	3		TFA	Tap Factory Active	2	0	0	mainline joint separation 1ft DS	8.02	8.28	-6.68	-7.36	P	0.25	3	3	2	8	FISP(1)	CIPP(4)
33A	33	33A-33	BASS LN	50.70	TRUE	YES	SL	9		TFA	Tap Factory Active	2	0	0	mainline joint separation or crk	8.02	8.28	-6.68	-7.36	p	0.25	3	3	2	8	FISP(1)	CIPP(4)
33A	33	33A-33	BASS LN	56.90	TRUE	YES	SL			MWL	Water Level	5	0	0		8.02	8.28	-6.68	-7.36	N	0	1	1	1	3	PM	
33A	33	33A-33	BASS LN	84.20	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		8.02	8.28	-6.68	-7.36		0				0		
33A	33	33A-33	BASS LN	97.70	TRUE	YES	SL	9		TF	Tap Factory	0	0	0		8.02	8.28	-6.68	-7.36		0				0		
33A	33	33A-33	BASS LN	130.90	TRUE	YES	SL	3		TFA	Tap Factory Active	2	0	0	128 ft. joint separation or offset	8.02	8.28	-6.68	-7.36	P	0.25	3	3	2	8	FISP(1)	CIPP(4)
33A	33	33A-33	BASS LN	134.40	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		8.02	8.28	-6.68	-7.36		0				0		
33A	33	33A-33	BASS LN	135.20	TRUE					AMH	Manhole	0	0	0	33A	8.02	8.28	-6.68	-7.36		0				0		
33A	33	33A-33	BASS LN	135.90	TRUE					STOP	Inspection stopped	0	0	0		8.02	8.28	-6.68	-7.36		0				0		
34	35	34-35	PEBBLE WY	0.00	FALSE	YES	SL			START WITH FL	Start Inspection With the Flow	0	0	0		7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	0.00	FALSE	YES	SL			AMH	Manhole	0	0	0	34	7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	0.00	FALSE	YES	SL			MWL	Water Level	5	0	0		7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	24.40	FALSE	YES	SL	12	12	LFDL	Lining Failure Delaminating	4	0	0	joint separated or cir crk	7.02	7.16	-4.71	-5.87	P	0.25	3	3	3	9	FISP(1)	CIPP(4)
34	35	34-35	PEBBLE WY	29.20	FALSE	YES	SL	9		TF	Tap Factory	0	0	0	observed possible I & I	7.02	7.16	-4.71	-5.87	P	0.25	2	3	2	7	RC	CIPP(2)
34	35	34-35	PEBBLE WY	60.40	FALSE	YES	SL			MWL	Water Level	5	0	0		7.02	7.16	-4.71	-5.87	N	0	2	3	1	6	PM	
34	35	34-35	PEBBLE WY	62.40	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	64.20	FALSE	YES	SL	4	6	LFDL	Lining Failure Delaminating	4	0	0	possible I & I at joint	7.02	7.16	-4.71	-5.87	P	0.25	2	3	3	8	FISP(1)	CIPP(4)
34	35	34-35	PEBBLE WY	66.30	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	79.70	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	86.10	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	91.20	FALSE	YES	SL	4	6	LFDL	Lining Failure Delaminating	4	0	0	CONTINUOUS	7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	95.70	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	113.90	FALSE	YES	SL	4	6	LFDL	Lining Failure Delaminating	4	0	0	possible I & I	7.02	7.16	-4.71	-5.87	P	0.25	2	3	3	8	FISP(1)	SL
34	35	34-35	PEBBLE WY	128.20	FALSE	YES	SL	4	7	LFDL	Lining Failure Delaminating	4	0	0	possible I & I	7.02	7.16	-4.71	-5.87	P	0.25	2	3	3	8	FISP(1)	SL
34	35	34-35	PEBBLE WY	132.20	FALSE	YES	SL	2		TFA	Tap Factory Active	4	0	0	possible I & I	7.02	7.16	-4.71	-5.87	P	0.25	2	3	2	7	FISP(1)	CIPP
34	35	34-35	PEBBLE WY	143.50	FALSE	YES	SL	12	12	LFDL	Lining Failure Delaminating	4	0	0	possible I & I	7.02	7.16	-4.71	-5.87	P	0.25	2	3	2	7	FISP(1)	SL
34	35	34-35	PEBBLE WY	145.50	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	148.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.02	7.16	-4.71	-5.87	N	0	1	1	1	3	DA	
34	35	34-35	PEBBLE WY	157.80	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.02	7.16	-4.71	-5.87	N	0	1	1	1	3	DA	
34	35	34-35	PEBBLE WY	168.60	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	168.60	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.02	7.16	-4.71	-5.87	N	0	1	1	1	3	DA	
34	35	34-35	PEBBLE WY	195.00	FALSE	YES	SL			MWL	Water Level	5	0	0		7.02	7.16	-4.71	-5.87	N	0	2	3	1	6	PM	
34	35	34-35	PEBBLE WY	206.90	FALSE	YES	SL	9		TF	Tap Factory	2	0	0	joint separation	7.02	7.16	-4.71	-5.87	P	0.25	2	3	2	7	FISP(1)	CIPP
34	35	34-35	PEBBLE WY	208.40	FALSE	YES	SL	12	12	LFDL	Lining Failure Delaminating	4	0	0		7.02	7.16	-4.71	-5.87	N	0				0		
34	35	34-35	PEBBLE WY	210.10	FALSE	YES	SL	2		TF	Tap Factory	0	0	0		7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	232.10	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	232.60	FALSE					AMH	Manhole	0	0	0	35	7.02	7.16	-4.71	-5.87		0				0		
34	35	34-35	PEBBLE WY	232.60	FALSE					STOP	Inspection stopped	0	0	0		7.02	7.16	-4.71	-5.87		0				0		
34A	34	34A-34	PEBBLE WAY	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	0.00	TRUE					AMH	Manhole	0	0	0	34	6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	0.00	TRUE					MWL	Water Level	5	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	0.00	TRUE					LFDL	Lining Failure Delaminating	4	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	2.00	TRUE	YES	SL			MGP	General Photo	2	0	0	START OF LINE SEGMENT,JO	6.35	7.02	-4.04	-4.71	P	0.25	2	3	2	7	CIPP(4)	GRT
34A	34	34A-34	PEBBLE WAY	3.70	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET,footage may be off	6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	31.50	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	34.20	TRUE	YES	SL	6	7	LFDL	Lining Failure Delaminating	4	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	41.40	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	47.10	TRUE	YES	SL	12	12	LFDL	Lining Failure Delaminating	4	0	0	possible I & I	6.35	7.02	-4.04	-4.71	P	0.25	2	3	2	7	FISP(1)	SL
34A	34	34A-34	PEBBLE WAY	49.70	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	49.70	TRUE	YES	SL			MGO	General Observation	0	0	0	GREASE IN TAP,may be abandoned	6.35	7.02	-4.04	-4.71	P	0.25	3	2	2	7	RC	FISP(1)
34A	34	34A-34	PEBBLE WAY	66.90	TRUE	YES	SL			MWL	Water Level	5	0	0		6.35	7.02	-4.04	-4.71	N	0	3	3	1	7	PM	
34A	34	34A-34	PEBBLE WAY	88.00	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	88.00	TRUE	YES	SL	4		LFDL	Lining Failure Delaminating	4	0	0	intruding sealing ring, possible I & I	6.35	7.02	-4.04	-4.71	P	0.25	2	3	2	7	FISP(1)	CIPP
34A	34	34A-34	PEBBLE WAY	91.10	TRUE	YES	SL	9		TF	Tap Factory	0	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	92.40	TRUE	YES	SL			MWL	Water Level	5	0	0		6.35	7.02	-4.04	-4.71	N	0	1	3	1	5	PM	
34A	34	34A-34	PEBBLE WAY	114.20	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	121.50	TRUE	YES	SL			MWL	water level	5	0	0	US JO at 124,possible I & I	6.35	7.02	-4.04	-4.71	P	0.25	3	3	3	9	GRT	CIPP
34A	34	34A-34	PEBBLE WAY	127.40	TRUE	YES	SL	3		TF	Tap Factory	0	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	139.40	TRUE	YES	SL	9		TF	Tap Factory	0	0	0		6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	139.40	TRUE	YES	SL			MGO	General Observation	5	0	0	CANNOT PASS CAMERA	6.35	7.02	-4.04	-4.71	P	0.25	4	3	3	10	DR	
34A	34	34A-34	PEBBLE WAY	139.40	TRUE					AMH	Manhole	0	0	0	34A	6.35	7.02	-4.04	-4.71		0				0		
34A	34	34A-34	PEBBLE WAY	139.40	TRUE					STOP	Inspection stopped	0	0	0		6.35	7.02	-4.04	-4.71		0				0		
35	24	35-24	PEBBLE WY	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	0.00	FALSE	YES	SL			AMH	Manhole	0	0	0	35	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	0.00	FALSE	YES	SL			MWL	Water Level	5	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	3.00	FALSE	YES	SL	8	4	CC	Crack Circumferential	1	0	0		7.16	7.95	-5.87	-7.14	P	0.25	3	3	3	9	CIPP(4)	
35	24	35-24	PEBBLE WY	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	10.50	FALSE	YES	CIPP	9		TF	Tap Factory	0	0	0	previous patch in lateral okay	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	12.10	FALSE	YES	SL	3	12	LFDL	Lining Failure Delaminating	4	0	0		7.16	7.95	-5.87	-7.14	N	0	1	1	1	3	DA	
35	24	35-24	PEBBLE WY	16.90	FALSE	YES	SL	5	7	LFDL	Lining Failure Delaminating	4	0	0	CONTINUOUS	7.16	7.95	-5.87	-7.14	N	0	1	1	1	3	DA	
35	24	35-24	PEBBLE WY	28.50	FALSE	YES	SL	10		TF	Tap Factory	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	36.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.16	7.95	-5.87	-7.14	N	0	1	1	1	3	DA	
35	24	35-24	PEBBLE WY	41.70	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	48.60	FALSE	YES	SL	7		LFDL	Lining Failure Delaminating	4	0	0		7.16	7.95	-5.87	-7.14	N	0	1	1	1	3	DA	
35	24	35-24	PEBBLE WY	69.10	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.16	7.95	-5.87	-7.14	N	0	1	1	1	3	DA	
35	24	35-24	PEBBLE WY	82.70	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	85.00	FALSE	YES	SL	3		TF	Tap Factory	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	85.60	FALSE	YES	SL	7		LFDL	Lining Failure Delaminating	4	0	0	suspect ,crk and or I & I	7.16	7.95	-5.87	-7.14	P	0.25	2	3	2	7	FISP(1)	CIPP
35	24	35-24	PEBBLE WY	88.20	FALSE	YES	SL	9		TF	Tap Factory	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	99.40	FALSE	YES	SL	12	12	LFDL	Lining Failure Delaminating	4	0	0	suspect I & I	7.16	7.95	-5.87	-7.14	P	0.25	2	3	2	7	FISP(1)	CIPP
35	24	35-24	PEBBLE WY	114.60	FALSE	YES	SL	3	9	DAGS	Deposits Attached Grease	0	0	0	GREASE	7.16	7.95	-5.87	-7.14	N	0	3	3	2	8	PM	
35	24	35-24	PEBBLE WY	121.00	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	121.00	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.16	7.95	-5.87	-7.14	N	0	3	3	2	8	PM	
35	24	35-24	PEBBLE WY	144.20	FALSE	YES	SL			MWL	Water Level	5	0	0	delam @ jt. Suspect I & I	7.16	7.95	-5.87	-7.14	P	0.25	3	2	2	7	FISP(1)	CIPP
35	24	35-24	PEBBLE WY	159.20	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.16	7.95	-5.87	-7.14	N	0	3	3	2	8	PM	

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
35	24	35-24	PEBBLE WY	187.90	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	191.10	FALSE	YES	SL	10		TF	Tap Factory	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	247.60	FALSE	YES	SL			MWL	Water Level	5	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	247.60	FALSE	YES	SL			JAL	Joint Angular Large	2	0	0	DOWN	7.16	7.95	-5.87	-7.14	N	0	2	3	1	6	DA	FISP
35	24	35-24	PEBBLE WY	253.10	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	253.20	FALSE					AMH	Manhole	0	0	0	24	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24	PEBBLE WY	253.20	FALSE					STOP	Inspection stopped	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
37	38	37-38	BASS LN	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	0.00	FALSE					AMH	Manhole	0	0	0	37	6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	0.00	FALSE					MWL	Water Level	5	0	0		6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	3.80	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	possible I & I	6.11	6.17	-3.74	-5.17	P	0.25	2	2	3	7	FISP(1)	GRT
37	38	37-38	BASS LN	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	13.00	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	23.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	possible I & I	6.11	6.17	-3.74	-5.17	P	0.25	2	2	3	7	FISP(1)	CIPP
37	38	37-38	BASS LN	29.90	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		6.11	6.17	-3.74	-5.17	N	0	1	1	1	3	DA	
37	38	37-38	BASS LN	36.20	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	40.00	FALSE	YES	SL	4	7	LFDL	Lining Failure Delaminating	4	0	0		6.11	6.17	-3.74	-5.17	N	0	1	1	1	3	DA	
37	38	37-38	BASS LN	47.00	FALSE	YES	SL			MWL	Water Level	5	0	0		6.11	6.17	-3.74	-5.17	N	0	2	3	1	6	PM	
37	38	37-38	BASS LN	49.20	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	65.30	FALSE	YES	SL	6	7	LFDL	Lining Failure Delaminating	4	0	0	CONTINUOUS	6.11	6.17	-3.74	-5.17	N	0	1	1	1	3	DA	
37	38	37-38	BASS LN	82.20	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	95.50	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	95.50	FALSE	YES	SL			MGO	General Observation	0	0	0	GREASE IN TAP	6.11	6.17	-3.74	-5.17	N	0	2	3	1	6	PM	
37	38	37-38	BASS LN	106.10	FALSE	YES	SL	4	7	DAGS	Deposits Attached Grease	0	0	0	GREASE	6.11	6.17	-3.74	-5.17	N	0	3	3	2	8	PM	
37	38	37-38	BASS LN	114.90	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		6.11	6.17	-3.74	-5.17	N	0	3	3	2	8	PM	
37	38	37-38	BASS LN	117.10	FALSE	YES	SL	7	4	LFDL	Lining Failure Delaminating	4	0	0		6.11	6.17	-3.74	-5.17	N	0	1	1	1	3	DA	
37	38	37-38	BASS LN	118.40	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	118.90	FALSE	YES	SL			MWL	Water Level	5	0	0		6.11	6.17	-3.74	-5.17	N	0	1	2	1	4	PM	
37	38	37-38	BASS LN	151.60	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	6.11	6.17	-3.74	-5.17	N	0	1	2	1	4	PM	
37	38	37-38	BASS LN	154.70	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	185.40	FALSE	YES	SL	7		LFDL	Lining Failure Delaminating	4	0	0		6.11	6.17	-3.74	-5.17	N	0	1	1	1	3	DA	
37	38	37-38	BASS LN	187.90	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	199.40	FALSE	YES	SL	7	10	LFDL	Lining Failure Delaminating	4	0	0		6.11	6.17	-3.74	-5.17	N	0	1	1	1	3	DA	
37	38	37-38	BASS LN	204.60	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	205.30	FALSE					AMH	Manhole	0	0	0	38	6.11	6.17	-3.74	-5.17		0				0		
37	38	37-38	BASS LN	205.30	FALSE					STOP	Inspection stopped	0	0	0		6.11	6.17	-3.74	-5.17		0				0		
37A	37	37A-37	BASS LN	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	0.00	TRUE					AMH	Manhole	0	0	0	37	5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	0.00	TRUE					MWL	Water Level	5	0	0		5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	2.00	TRUE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	2.00	TRUE			6		LFDL	Lining Failure Delaminating	4	0	0	POSSIBLE CRK & I & I	5.47	6.11	-3.04	-3.74	P	0.25	3	3	2	8	FISP(1)	CIPP
37A	37	37A-37	BASS LN	10.00	TRUE					MGP	General Photo	0	0	0	CAMERA SET	5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	24.40	TRUE			3		TFA	Tap Factory Active	0	0	0		5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	30.50	TRUE					MWL	Water Level	5	0	0		5.47	6.11	-3.04	-3.74	N	0	2	3	1	6	PM	
37A	37	37A-37	BASS LN	37.50	TRUE			9		TFA	Tap Factory Active	0	0	0		5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	42.50	TRUE					MWLS	Water Level Sag	5	0	0		5.47	6.11	-3.04	-3.74	N	0	3	3	1	7	PM	
37A	37	37A-37	BASS LN	58.70	TRUE			3	10	LFDL	Lining Failure Delaminating	4	0	0		5.47	6.11	-3.04	-3.74	N	0	1	1	1	3	DA	
37A	37	37A-37	BASS LN	61.30	TRUE			9		TFA	Tap Factory Active	0	0	0		5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	74.10	TRUE			3		TFA	Tap Factory Active	0	0	0		5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	74.10	TRUE			7	11	LFDL	Lining Failure Delaminating	4	0	0		5.47	6.11	-3.04	-3.74	N	0	1	1	1	3	DA	
37A	37	37A-37	BASS LN	85.40	TRUE					MWL	Water Level	5	0	0	END OF SAG	5.47	6.11	-3.04	-3.74	N	0	1	3	1	5	DA	
37A	37	37A-37	BASS LN	87.50	TRUE			10		TFA	Tap Factory Active	0	0	0		5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	95.20	TRUE			6	10	LFDL	Lining Failure Delaminating	4	0	0		5.47	6.11	-3.04	-3.74	N	0	1	1	1	3	DA	
37A	37	37A-37	BASS LN	100.50	TRUE			3		TFA	Tap Factory Active	0	0	0		5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	100.50	TRUE					MGO	General Observation	0	0	0	GREASE IN TAP	5.47	6.11	-3.04	-3.74	N	0	1	3	1	5	PM	
37A	37	37A-37	BASS LN	113.40	TRUE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	113.40	TRUE					AMH	Manhole	0	0	0	37A	5.47	6.11	-3.04	-3.74		0				0		
37A	37	37A-37	BASS LN	113.40	TRUE					STOP	Inspection stopped	0	0	0		5.47	6.11	-3.04	-3.74		0				0		
38	39	38-39	BASS LN	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39	BASS LN	0.00	FALSE					AMH	Manhole	0	0	0	38	6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39	BASS LN	0.00	FALSE					MWL	Water Level	5	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39	BASS LN	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39	BASS LN	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39	BASS LN	15.40	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39	BASS LN	20.00	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39	BASS LN	22.80	FALSE	YES	SL	4	7	DAGS	Deposits Attached Grease	0	0	0	GREASE	6.17	7.81	-5.17	-7.07	N	0	3	3	2	8	PM	
38	39	38-39	BASS LN	38.50	FALSE	YES	SL			MWL	Water Level	5	0	0		6.17	7.81	-5.17	-7.07	N	0	2	3	1	6	PM	
38	39	38-39	BASS LN	39.90	FALSE	YES	SL	4	9	LFDL	Lining Failure Delaminating	4	0	0	DELAMINATING	6.17	7.81	-5.17	-7.07	N	0	1	1	1	3	DA	
38	39	38-39	BASS LN	63.40	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39	BASS LN	66.80	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39	BASS LN	66.80	FALSE	YES	SL	6	8	LFDL	Lining Failure Delaminating	4	0	0		6.17	7.81	-5.17	-7.07	N	0	1	1	1	3	DA	
38	39	38-39	BASS LN	72.60	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		6.17	7.81	-5.17	-7.07	N	0	1	1	1	3	DA	
38	39	38-39	BASS LN	87.00	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		6.17	7.81	-5.17	-7.07	N	0	3	3	1	7	PM	
42	43	42-43	SPINNAKER CT	0.00	TRUE					START WITH FL	Start Inspection With the Flow	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	0.00	TRUE					AMH	Manhole	0	0	0	42	7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	0.00	TRUE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	3.20	TRUE	YES	SL			MGP	General Photo	2	0	0	CAMERA SET, infil at delam	7.48	8.43	-5.11	-7.27	IW	2	2	3	2	7	GRT	CIPP
42	43	42-43	SPINNAKER CT	17.50	TRUE	YES	SL	5		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27		0				0	DA	
42	43	42-43	SPINNAKER CT	18.00	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	19.50	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27		0				0	DA	
42	43	42-43	SPINNAKER CT	29.60	TRUE	YES	SL	3		LFDL	Lining Failure Delaminating	4	0	0	possible I & I	7.48	8.43	-5.11	-7.27	P	0.25	2	3	2	7	FISP(1)	CIPP
42	43	42-43	SPINNAKER CT	31.90	TRUE	YES	SL			MWL	Water Level	5	0	0		7.48	8.43	-5.11	-7.27	N	0	2	3	1	6	PM	
42	43	42-43	SPINNAKER CT	39.70	TRUE	YES	SL	3	5	LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	40.90	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	41.60	TRUE	YES	SL	3	6	LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	41.70	TRUE	YES	SL	7		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	52.70	TRUE	YES	SL	1	11	LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	53.80	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.48	8.43	-5.11	-7.27		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
42	43	42-43	SPINNAKER CT	53.80	TRUE	YES	SL	4	7	LFDL	Lining Failure Delaminating	4	0	0	CONTINUOUS	7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	72.80	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27		0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	86.90	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	87.60	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	89.50	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	98.50	TRUE	YES	SL	6	8	LFDL	Lining Failure Delaminating	4	0	0	possible I & I	7.48	8.43	-5.11	-7.27	N	0	2	3	2	7	FISP(1)	CIPP
42	43	42-43	SPINNAKER CT	99.90	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	109.40	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	110.30	TRUE	YES	SL	6	9	LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	123.10	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0	DEPOSITS SETTLED, debris,grease infil	7.48	8.43	-5.11	-7.27	P	0.25	3	3	2	8	RC	
42	43	42-43	SPINNAKER CT	123.40	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	153.70	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	156.30	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	156.60	TRUE	YES	SL	4	7	LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0				0	DA	
42	43	42-43	SPINNAKER CT	159.00	TRUE	YES	SL	5	10	LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0				0	DA	
42	43	42-43	SPINNAKER CT	159.60	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	160.10	TRUE	YES	SL	8		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	163.50	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	167.80	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	174.60	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	182.10	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	P	0.25	2	2	2	6	FISP(1)	CIPP
42	43	42-43	SPINNAKER CT	188.50	TRUE	YES	SL	4	7	LFDL	Lining Failure Delaminating	4	0	0	CONTINUOUS	7.48	8.43	-5.11	-7.27	N	0	1	1	1	3	DA	
42	43	42-43	SPINNAKER CT	192.50	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	213.80	TRUE	YES	SL			MWL	Water Level	5	0	0		7.48	8.43	-5.11	-7.27	N	0	2	3	1	6	PM	
42	43	42-43	SPINNAKER CT	225.60	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	228.70	TRUE	YES	SL	3		TF	Tap Factory	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	233.60	TRUE	YES	SL			MWL	Water Level	5	0	0		7.48	8.43	-5.11	-7.27		0	1	3	1	5	PM	
42	43	42-43	SPINNAKER CT	241.90	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.48	8.43	-5.11	-7.27	N	0				0		
42	43	42-43	SPINNAKER CT	262.20	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0	high grease line and water mark	7.48	8.43	-5.11	-7.27	P	0.25	3	3	2	8	PM	
42	43	42-43	SPINNAKER CT	262.30	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	281.90	TRUE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.48	8.43	-5.11	-7.27		0				0		
42	43	42-43	SPINNAKER CT	282.60	TRUE					AMH	Manhole	0	0	0	43	7.48	8.43	-5.11	-7.27		0				0		
42A	42	42A-42	SPINNAKER CT	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	0.00	TRUE					AMH	Manhole	0	0	0	42	7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	0.00	TRUE					MWL	Water Level	5	0	0		7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	2.00	TRUE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	2.00	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.04	7.48	-4.67	-5.11	N	0				0		
42A	42	42A-42	SPINNAKER CT	2.50	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	10.00	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	12.50	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	36.90	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.04	7.48	-4.67	-5.11	N	0	1	1	1	3	DA	
42A	42	42A-42	SPINNAKER CT	40.40	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.04	7.48	-4.67	-5.11	N	0	1	1	1	3	DA	
42A	42	42A-42	SPINNAKER CT	43.50	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.04	7.48	-4.67	-5.11	N	0	1	1	1	3	DA	
42A	42	42A-42	SPINNAKER CT	46.50	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.04	7.48	-4.67	-5.11	N	0	1	1	1	3	DA	
42A	42	42A-42	SPINNAKER CT	55.60	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.04	7.48	-4.67	-5.11	N	0	1	1	1	3	DA	
42A	42	42A-42	SPINNAKER CT	60.10	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.04	7.48	-4.67	-5.11	N	0	1	1	1	3	DA	
42A	42	42A-42	SPINNAKER CT	65.50	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	68.80	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	73.20	TRUE	YES	SL	3	9	DAZ	Deposits Attached Other	0	0	0	CALCIUM,GREASE	7.04	7.48	-4.67	-5.11	N	0	2	3	1	6	PM	
42A	42	42A-42	SPINNAKER CT	87.70	TRUE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	87.70	TRUE					AMH	Manhole	0	0	0	42A	7.04	7.48	-4.67	-5.11		0				0		
42A	42	42A-42	SPINNAKER CT	87.70	TRUE					STOP	Inspection stopped	0	0	0		7.04	7.48	-4.67	-5.11		0				0		
7	8	7-8	OAK KNOLL AVE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	0.00	FALSE					AMH	Manhole	0	0	0	7	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	0.00	FALSE					MWL	Water Level	5	0	0		5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	17.70	FALSE			9		TFA	Tap Factory Active	0	0	0		5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	18.90	FALSE					JOM	Joint Offset Medium	2	0	0	possible I & I	5	6.09	47.68	41.83	P	0.25	3	3	2	8	CIPP(4)	GRT
7	8	7-8	OAK KNOLL AVE	63.00	FALSE			9		TBA	Tap Break-in Active	3	0	0	ROOTS IN TAP,SEVERE	5	6.09	47.68	41.83	P	0.25	4	3	3	10	DR	
7	8	7-8	OAK KNOLL AVE	70.50	FALSE			3		TFA	Tap Factory Active	0	0	0		5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	112.20	FALSE			10	7	CM	Crack Multiple	1	0	0		5	6.09	47.68	41.83	P	0.25	4	4	3	11	DR	CIPP
7	8	7-8	OAK KNOLL AVE	113.10	FALSE			9		TFA	Tap Factory Active	0	0	0		5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	153.00	FALSE			3		TFA	Tap Factory Active	0	0	0		5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	209.90	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	210.70	FALSE					AMH	Manhole	0	0	0	8	5	6.09	47.68	41.83		0				0		
7	8	7-8	OAK KNOLL AVE	210.70	FALSE					STOP	Inspection stopped	0	0	0		5	6.09	47.68	41.83		0				0		
7A	7	7A-7	OAK KNOLL AVE	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	0.00	TRUE					AMH	Manhole	0	0	0	7	7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	0.00	TRUE					MWL	Water Level	5	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	2.00	TRUE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	10.00	TRUE					MGP	General Photo	0	0	0	CAMERA SET	7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	16.60	TRUE					MWLS	Water Level Sag	5	0	0		7.5	5	50.18	47.68	N	0	3	3	1	7	PM	
7A	7	7A-7	OAK KNOLL AVE	33.50	TRUE					MWL	Water Level	5	0	0		7.5	5	50.18	47.68	N	0	2	3	1	6	PM	
7A	7	7A-7	OAK KNOLL AVE	62.20	TRUE			9		TF	Tap Factory	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	97.70	TRUE			3		TB	Tap Break-in	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	115.00	TRUE			9		TFA	Tap Factory Active	0	0	0	ROOTS	7.5	5	50.18	47.68	P	0.25	3	2	2	7	RC	DR
7A	7	7A-7	OAK KNOLL AVE	136.60	TRUE			3		TF	Tap Factory	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	154.30	TRUE			9		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	7.5	5	50.18	47.68	N	0	2	2	1	5	RC	
7A	7	7A-7	OAK KNOLL AVE	179.90	TRUE					JOM	Joint Offset Medium	2	0	0	reinspect	7.5	5	50.18	47.68	P	0.25	2	3	2	7	FISP(2)	CIPP
7A	7	7A-7	OAK KNOLL AVE	181.90	TRUE			3		TFA	Tap Factory Active	0	0	0	OFFSET IN TAP	7.5	5	50.18	47.68	P	0.25	2	2	1	5	DA	
7A	7	7A-7	OAK KNOLL AVE	186.80	TRUE					MWL	Water Level	5	0	0		7.5	5	50.18	47.68	N	0	2	2	1	5	PM	
7A	7	7A-7	OAK KNOLL AVE	196.10	TRUE			9		TFA	Tap Factory Active	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	198.30	TRUE			9		TFA	Tap Factory Active	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	199.70	TRUE			3		TFA	Tap Factory Active	0	0	0		7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	201.30	TRUE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	201.30	TRUE					AMH	Manhole	0	0	0	7A	7.5	5	50.18	47.68		0				0		
7A	7	7A-7	OAK KNOLL AVE	201.30	TRUE					STOP	Inspection stopped	0	0	0		7.5	5	50.18	47.68		0				0		
8	9	8-9	OAK KNOLL AVE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		6.09	6.27	41.83	14.68		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
8	9	8-9	OAK KNOLL AVE	0.00	FALSE					MWL	Water Level	5	0	0		6.09	6.27	41.83	14.68		0				0		
8	9	8-9	OAK KNOLL AVE	0.00	FALSE					AMH	Manhole	0	0	0	8	6.09	6.27	41.83	14.68		0				0		
8	9	8-9	OAK KNOLL AVE	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	6.09	6.27	41.83	14.68		0				0		
8	9	8-9	OAK KNOLL AVE	2.00	FALSE			12	12	RFJ	Roots Fine Joint	3	0	0		6.09	6.27	41.83	14.68	P	0.25	2	3	2	7	CIPP(4)	FM
8	9	8-9	OAK KNOLL AVE	2.00	FALSE			12	12	CC	Crack Circumferential	1	0	0		6.09	6.27	41.83	14.68	P	0.25	3	3	3	9		
8	9	8-9	OAK KNOLL AVE	2.00	FALSE			12	12	RMB	Roots Medium Barrel	3	0	0		6.09	6.27	41.83	14.68	P	0.25	2	3	2	7	CIPPcomb	RC
8	9	8-9	OAK KNOLL AVE	62.00	FALSE			9		TFA	Tap Factory Active	0	0	0		6.09	6.27	41.83	14.68		0				0		
8	9	8-9	OAK KNOLL AVE	174.40	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	6.09	6.27	41.83	14.68		0				0		
8	9	8-9	OAK KNOLL AVE	174.40	FALSE					AMH	Manhole	0	0	0	9	6.09	6.27	41.83	14.68		0				0		
8	9	8-9	OAK KNOLL AVE	174.40	FALSE					STOP	Inspection stopped	0	0	0		6.09	6.27	41.83	14.68		0				0		
8A	8	8A-8	OAK KNOLL AVE	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		3.5	6.09	47.18	41.83		0				0		
8A	8	8A-8	OAK KNOLL AVE	0.00	TRUE					AMH	Manhole	0	0	0	8	3.5	6.09	47.18	41.83		0				0		
8A	8	8A-8	OAK KNOLL AVE	0.00	TRUE					MWL	Water Level	5	0	0		3.5	6.09	47.18	41.83		0				0		
8A	8	8A-8	OAK KNOLL AVE	2.00	TRUE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	3.5	6.09	47.18	41.83		0				0		
8A	8	8A-8	OAK KNOLL AVE	10.00	TRUE					MGP	General Photo	0	0	0	CAMERA SET	3.5	6.09	47.18	41.83		0				0		
8A	8	8A-8	OAK KNOLL AVE	27.60	TRUE			6	10	RBJ	Roots Ball Joint	3	0	0		3.5	6.09	47.18	41.83	P	0.25	5	4	4	13	RC	DR
8A	8	8A-8	OAK KNOLL AVE	29.30	TRUE					MSA	Abandoned Survey	0	0	0	CANNOT PASS ROOT BALL	3.5	6.09	47.18	41.83	P	0.25	5	4	4	13	RC	DR
8A	8	8A-8	OAK KNOLL AVE	29.40	TRUE					STOP	Inspection stopped	0	0	0		3.5	6.09	47.18	41.83		0				0		
9	10	9-10	OAK KNOLL AVE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		6.27	10.85	14.68	-5.95		0				0		
9	10	9-10	OAK KNOLL AVE	0.00	FALSE					AMH	Manhole	0	0	0	9	6.27	10.85	14.68	-5.95		0				0		
9	10	9-10	OAK KNOLL AVE	0.00	FALSE					MWL	Water Level	5	0	0		6.27	10.85	14.68	-5.95		0				0		
9	10	9-10	OAK KNOLL AVE	2.00	FALSE					MGO	General Observation	0	0	0	START OF LINE SEGMENT	6.27	10.85	14.68	-5.95		0				0		
9	10	9-10	OAK KNOLL AVE	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	6.27	10.85	14.68	-5.95		0				0		
9	10	9-10	OAK KNOLL AVE	128.60	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	6.27	10.85	14.68	-5.95		0				0		
9	10	9-10	OAK KNOLL AVE	128.60	FALSE					AMH	Manhole	0	0	0	10, 124ft & 128ft crk & rts	6.27	10.85	14.68	-5.95	P	0.25	4	3	3	10	RC	FISP(1)
9	10	9-10	OAK KNOLL AVE	128.60	FALSE					STOP	Inspection stopped	0	0	0		6.27	10.85	14.68	-5.95		0				0		
74	75	74-75	HOOVER ST	2.00	FALSE			7	5	CC	Crack Circumferential	1			***Settled , no separation***	5.16	3.29	5.18	1.99	P	0.25	***2***	***3***	***2***	7	CIPP(4)	
74	75	74-75	HOOVER ST	2.00	FALSE					MGO	General Observation	0			START OF LINE SEGMENT	5.16	3.29	5.18	1.99		0				0		
74	75	74-75	HOOVER ST	10.00	FALSE					MGP	General Photo	0			CAMERA SET	5.16	3.29	5.18	1.99		0				0		
74	75	74-75	HOOVER ST	52.10	FALSE			9		TBD	Tap Break-in Defective	2				5.16	3.29	5.18	1.99	P	0.25	***4***	***3***	***2***	9	DR	
74	75	74-75	HOOVER ST	52.10	FALSE			10		HSV	Hole Soil Visible	0			AT BREAK IN TAP	5.16	3.29	5.18	1.99	P	0.25	***4***	***3***	***3***	10		
74	75	74-75	HOOVER ST	85.60	FALSE			10		TFA	Tap Factory Active	0				5.16	3.29	5.18	1.99		0				0		
74	75	74-75	HOOVER ST	85.60	FALSE			9		RFL	Roots Fine Lateral	3				5.16	3.29	5.18	1.99	P	0.25	***2***	***3***	***1***	6	FM	RC
74	75	74-75	HOOVER ST	122.60	FALSE			3		TFA	Tap Factory Active	0				5.16	3.29	5.18	1.99		0				0		
74	75	74-75	HOOVER ST	190.30	FALSE			3		TFA	Tap Factory Active	0				5.16	3.29	5.18	1.99		0				0		
74	75	74-75	HOOVER ST	268.00	FALSE			3		TFA	Tap Factory Active	0				5.16	3.29	5.18	1.99		0				0		
74	75	74-75	HOOVER ST	291.40	FALSE			9		TBA	Tap Break-in Active	0				5.16	3.29	5.18	1.99		0				0		
74	75	74-75	HOOVER ST	292.90	FALSE			2		TBA	Tap Break-in Active	0				5.16	3.29	5.18	1.99		0				0		
74	75	74-75	HOOVER ST	326.00	FALSE			9		TF	Tap Factory	0			DIRT IN TAP ***May be abandoned***	5.16	3.29	5.18	1.99	P	0.25	***2***	***3***	***2***	***7***	***RC***	***FISP(1)***
74	75	74-75	HOOVER ST	328.90	FALSE			4		TBA	Tap Break-in Active	0				5.16	3.29	5.18	1.99		0				0		
74	75	74-75	HOOVER ST	341.90	FALSE					MGO	General Observation	2			POSSIBLE INFIL AT JOINT	5.16	3.29	5.18	1.99	P	0.25	***1***	***2***	***1***	4	FISP(1)	GRT
74	75	74-75	HOOVER ST	342.80	FALSE					MGO	General Observation	0			END OF LINE SEGMENT	5.16	3.29	5.18	1.99		0				0		
74	75	74-75	HOOVER ST	343.90	FALSE					AMH	Manhole	0			75	5.16	3.29	5.18	1.99		0				0		
		74-75										0				#N/A	#N/A	#N/A	#N/A		0				0		
74A	74	74A-74	HOOVER ST	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0				2.01	5.16	10.93	5.18		0				0		
74A	74	74A-74	HOOVER ST	0.00	TRUE					AMH	Manhole	0			74	2.01	5.16	10.93	5.18		0				0		
74A	74	74A-74	HOOVER ST	0.00	TRUE					MWL	Water Level	5		10%		2.01	5.16	10.93	5.18		0	***1***	***1***	***1***	***3***	***DA***	
74A	74	74A-74	HOOVER ST	2.00	TRUE					MGO	General Observation	0			START OF LINE SEGMENT	2.01	5.16	10.93	5.18		0				0		
74A	74	74A-74	HOOVER ST	10.00	TRUE					MGP	General Photo	0			CAMERA SET	2.01	5.16	10.93	5.18		0				0		
74A	74	74A-74	HOOVER ST	58.80	TRUE			3		TFA	Tap Factory Active	0				2.01	5.16	10.93	5.18		0				0		
74A	74	74A-74	HOOVER ST	58.80	TRUE			3		RFL	Roots Fine Lateral	3			possible I & I	2.01	5.16	10.93	5.18	P	0.25	***2***	***3***	***1***	***6***	***RC***	***FM***
74A	74	74A-74	HOOVER ST	66.10	TRUE			9		TBA	Tap Break-in Active	0				2.01	5.16	10.93	5.18		0				***0***		
74A	74	74A-74	HOOVER ST	106.50	TRUE			3		TF	Tap Factory	0				2.01	5.16	10.93	5.18		0				***0***		
74A	74	74A-74	HOOVER ST	106.50	TRUE			3		RFL	Roots Fine Lateral	3				2.01	5.16	10.93	5.18	P	0.25	***2***	***3***	***1***	***6***	***RC***	***FM***
74A	74	74A-74	HOOVER ST	113.90	TRUE					JSL	Joint Separated Large	2			***Calder cplgs --acceptable,appear sound***	2.01	5.16	10.93	5.18	N	0	***2***	***3***	***1***	***6***	***DA***	
74A	74	74A-74	HOOVER ST	115.10	TRUE			10		TFD	Tap Factory Defective	0			OFFSET	2.01	5.16	10.93	5.18	P	0.25	***2***	***2***	***1***	***5***	***FISP(2)***	***CIPP(2)***
74A	74	74A-74	HOOVER ST	115.90	TRUE					JOM	Joint Offset Medium	2			***Calder intact***	2.01	5.16	10.93	5.18	N	0	***2***	***1***	***1***	***4***	***FISP(2)***	
74A	74	74A-74	HOOVER ST	115.90	TRUE			9	2	ISSR	Intruding Sealing Ring	0			***Intact, no flow restriction***	2.01	5.16	10.93	5.18	P	0.25	***2***	***1***	***1***	***4***	***DA***	
74A	74	74A-74	HOOVER ST	128.50	TRUE			9		TF	Tap Factory	0				2.01	5.16	10.93	5.18		0				***0***		
74A	74	74A-74	HOOVER ST	128.50	TRUE			9		RBL	Roots Ball Lateral	3		100%		2.01	5.16	10.93	5.18	P	0.25	***3***	***3***	***2***	***8***	***RC***	***DR***
74A	74	74A-74	HOOVER ST	130.30	TRUE					MWLS	Water Level Sag	5		30%		2.01	5.16	10.93	5.18	N	0	***3***	***2***	***1***	***6***	***PM***	
74A	74	74A-74	HOOVER ST	141.30	TRUE					MWLS	Water Level Sag	5		30%		2.01	5.16	10.93	5.18	N	0	***3***	***2***	***1***	***6***	***PM***	
74A	74	74A-74	HOOVER ST	147.70	TRUE			3		TBD	Tap Break-in Defective	0			OFFSET	2.01	5.16	10.93	5.18	P	0.25	***2***	***3***	***1***	***6***	***FISP(2)***	***RC***
74A	74	74A-74	HOOVER ST	192.00	TRUE			3		TF	Tap Factory	0				2.01	5.16	10.93	5.18		0				***0***		
74A	74	74A-74	HOOVER ST	192.00	TRUE			3		RBC	Roots Ball Connection	3		100%		2.01	5.16	10.93	5.18	P	0.25	***3***	***3***	***2***	***8***	***RC***	***DR***
74A	74	74A-74	HOOVER ST	193.70	TRUE			9		TFA	Tap Factory Active	0				2.01	5.16	10.93	5.18		0				***0***		
74A	74	74A-74	HOOVER ST	193.70	TRUE			9		RML	Roots Medium Lateral	3		30%		2.01	5.16	10.93	5.18	P	0.25	***2***	***3***	***2***	***7***	***RC***	***DR***
74A	74	74A-74	HOOVER ST	262.30	TRUE			3		TF	Tap Factory	0				2.01	5.16	10.93	5.18		0				***0***		
74A	74	74A-74	HOOVER ST	262.30	TRUE			3		RBL	Roots Ball Lateral	3		100%		2.01	5.16	10.93	5.18	P	0.25	***4***	***3***	***2***	***9***	***RC***	***DR***
74A	74	74A-74	HOOVER ST	264.10	TRUE			9		TFA	Tap Factory Active	0				2.01	5.16	10.93	5.18		0				***0***		
74A	74	74A-74	HOOVER ST	264.10	TRUE			9		RML	Roots Medium Lateral	3		40%		2.01	5.16	10.93	5.18	P	0.25	***3***	***3***	***2***	***8***	***RC***	***FM***
74A	74	74A-74	HOOVER ST	312.10	TRUE			2		TFA	Tap Factory Active	0				2.01	5.16	10.93	5.18		0				***0***		
74A	74	74A-74	HOOVER ST	312.10	TRUE			3		RML	Roots Medium Lateral	3				2.01	5.16	10.93	5.18	P	0.25	***2***	***3***	***2***	***7***	***RC***	***FM***
74A	74	74A-74	HOOVER ST	355.10	TRUE			3		TFA	Tap Factory Active	0				2.01	5.16	10.93	5.18		0				***0***		
74A	74	74A-74	HOOVER ST	355.10	TRUE			3		RML	Roots Medium Lateral	3		20%		2.01	5.16	10.93	5.18	P	0.25	***2***	***3***	***2***	***7***	***RC***	***FM***
74A	74	74A-74	HOOVER ST	362.00	TRUE			9		TFA	Tap Factory Active	0				2.01	5.16	10.93	5.18		0				***0***		
74A	74	74A-74	HOOVER ST	362.00	TRUE			9		RML	Roots Medium Lateral	3		30%		2.01	5.16	10.93	5.18	P	0.25	***3***	***3***	***2***	***8***	***RC***	***FM***
74A	74	74A-74	HOOVER ST	368.70	TRUE					AMH	Manhole	0			74A LAMPHOLE	2.01	5.16	10.93	5.18		0	***1***	***1***	***1***	***3***		
		74A-75										0				#N/A	#N/A	#N/A	#N/A		0				0		
75	76	75-76	FIRST ST	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0				3.29	3.32	1.99	-1.43		0				0		
75	76	75-76	FIRST ST	0.00	FALSE					AMH	Manhole	0			75	3.29	3.32	1.99	-1.43		0				0		
75	76	75-76	FIRST ST	0.00	FALSE					MWL	Water Level	5		10%		3.29	3.32	1.99	-1.43	N	0	1%	1	1	2.01	DA	
75	76	75-76	FIRST ST	2.00	FALSE					MGO	General Observation	0			START OF LINE SEGMENT	3.29	3.32	1.99	-1.43		0				0		
75	76	75-76	FIRST ST	2.90	FALSE			1	7	CM	Crack Multiple	1			***failure would result in SSO***	3.29	3.32	1.99	-1.43	P	0.25	***3***	***4***	***3***	***10***	CIPP(4)	***FISP***
75	76	75-76	FIRST ST	10.00	FALSE					MGP	General Photo	0			CAMERA SET	3.29	3.32	1.99	-1.43		0				0		
75	76	75-76	FIRST ST	18.90	FALSE			9		TBA	Tap Break-in Active	0				3.29	3.32	1.99	-1.43		0				0		
75	76	75-76	FIRST ST	34.30	FALSE			9		TF	Tap Factory	0				3.29	3.32	1.99	-1.43		0				0		
75	76	75-76	FIRST ST	87.00	FALSE			9		TFA	Tap Factory Active	0				3.29	3.32	1.99	-1.43		0	0	0	0	0		
75	76	75-76	FIRST ST	87.00	FALSE			9		RFL	Roots Fine Lateral	3				3.29	3.32	1.99	-1.43	P	0.25	***2***	***3***	***1***	***6***	***RC***	***FM***

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
75	76	75-76	FIRST ST	135.00	FALSE			3		TFD	Tap Factory Defective	1			OFFSET	3.29	3.32	1.99	-1.43	P	0.25	3	3	2	8	DR(10)	
75	76	75-76	FIRST ST	135.00	FALSE			3		CL	Crack Longitudinal	1			potential failure	3.29	3.32	1.99	-1.43	P	0.25	3	3	3	9	Drcomb	
75	76	75-76	FIRST ST	135.20	FALSE			3	5	CM	Crack Multiple	1			potential failure	3.29	3.32	1.99	-1.43	P	0.25	3	3	3	9	Drcomb	
75	76	75-76	FIRST ST	139.80	FALSE			9		TFD	Tap Factory Defective	2			OFFSET	3.29	3.32	1.99	-1.43	P	0.25	2	3	2	7	Drcomb	
75	76	75-76	FIRST ST	139.80	FALSE			9		RFL	Roots Fine Lateral	3				3.29	3.32	1.99	-1.43	P	0.25	2	3	1	6	Drcomb	
75	76	75-76	FIRST ST	168.10	FALSE			10		CL	Crack Longitudinal	1			no separation	3.29	3.32	1.99	-1.43	P	0.25	3	3	2	8	DR	CIPP
75	76	75-76	FIRST ST	169.70	FALSE			9		TF	Tap Factory	0				3.29	3.32	1.99	-1.43		0				0		
75	76	75-76	FIRST ST	185.00	FALSE			3		TBA	Tap Break-in Active	0				3.29	3.32	1.99	-1.43		0				0		
75	76	75-76	FIRST ST	185.00	FALSE					MGO	General Observation	0			POSSIBLE INFIL FROM TAP	3.29	3.32	1.99	-1.43		0	2	3	1	6	RC	CIPP
75	76	75-76	FIRST ST	209.30	FALSE					JOL	Joint Offset Large	2				3.29	3.32	1.99	-1.43	P	0.25	4	4	3	11	DR	
75	76	75-76	FIRST ST	209.30	FALSE					MMC	Material Change	0			PVC	3.29	3.32	1.99	-1.43		0	0	0	0	0		
75	76	75-76	FIRST ST	210.40	FALSE					MSA	Abandoned Survey	2			CANNOT PASS OFFSET	3.29	3.32	1.99	-1.43		0	5	4	3	12	Drcomb	
		75-76										0				#N/A	#N/A	#N/A	#N/A		0				0		
78	79	78-79	2ND ST	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0				3.07	2.99	1.92	-2.46		0				0		
78	79	78-79	2ND ST	0.00	FALSE					AMH	Manhole	0			78	3.07	2.99	1.92	-2.46		0				0		
78	79	78-79	2ND ST	0.00	FALSE					MWL	Water Level	5		15		3.07	2.99	1.92	-2.46		0	1	1	1	3		
78	79	78-79	2ND ST	2.00	FALSE					MGO	General Observation	0			START OF LINE SEGMENT	3.07	2.99	1.92	-2.46		0				0		
78	79	78-79	2ND ST	3.60	FALSE			1	6	CS	Crack Spiral	1			Settled	3.07	2.99	1.92	-2.46	P	0.25	3	3	2	8	DR	CIPP(4)
78	79	78-79	2ND ST	10.00	FALSE					MGP	General Photo	0			CAMERA SET	3.07	2.99	1.92	-2.46		0				0		
78	79	78-79	2ND ST	14.20	FALSE			9		TFA	Tap Factory Active	0				3.07	2.99	1.92	-2.46		0				0		
78	79	78-79	2ND ST	56.10	FALSE			3	9	IS	Infil Stain	0				3.07	2.99	1.92	-2.46	P	0.25	1	1	1	3	DA	
78	79	78-79	2ND ST	68.20	FALSE			11		TB	Tap Break-in	0				3.07	2.99	1.92	-2.46		0				0		
78	79	78-79	2ND ST	97.60	FALSE			3		TF	Tap Factory	0				3.07	2.99	1.92	-2.46		0				0		
78	79	78-79	2ND ST	97.60	FALSE			3		RFL	Roots Fine Lateral	3				3.07	2.99	1.92	-2.46	P	0.25	2	3	1	6	RC	FM
78	79	78-79	2ND ST	114.50	FALSE			3		TBD	Tap Break-in Defective	0			OFFSET IN TAP	3.07	2.99	1.92	-2.46	P	0.25	2	3	1	6	RC	CIPP
78	79	78-79	2ND ST	114.50	FALSE			3		RML	Roots Medium Lateral	3				3.07	2.99	1.92	-2.46	P	0.25	2	3	1	6	RC	FM
78	79	78-79	2ND ST	119.60	FALSE			11		TBA	Tap Break-in Active	0				3.07	2.99	1.92	-2.46		0				0		
78	79	78-79	2ND ST	119.60	FALSE					LD	Alignment Down	0		20%		3.07	2.99	1.92	-2.46	N	0	1	1	1	3	DA	
78	79	78-79	2ND ST	127.10	FALSE			3		TBD	Tap Break-in Defective	2			OFFSET AT BREAK IN	3.07	2.99	1.92	-2.46	P	0.25	2	3	1	6	FISP(1)	DR
78	79	78-79	2ND ST	127.10	FALSE					MGO	General Observation	4			DEBRIS IN LATERAL	3.07	2.99	1.92	-2.46	P	0.25	2	3	1	6	FISP(1)	RC
78	79	78-79	2ND ST	168.90	FALSE					JOL	Joint Offset Large	2				3.07	2.99	1.92	-2.46	P	0.25	3	3	2	8	FISP(1)	DR
78	79	78-79	2ND ST	170.00	FALSE					MWLS	Water Level Sag	5		30%		3.07	2.99	1.92	-2.46	N	0	3	2	2	7	PM	
78	79	78-79	2ND ST	171.90	FALSE			9		TBD	Tap Break-in Defective	0			OFFSET JOINT IN TAP	3.07	2.99	1.92	-2.46	P	0.25	3	2	2	7	RC	CIPP
78	79	78-79	2ND ST	173.40	FALSE					JOM	Joint Offset Medium	2			Appears intact and sound	3.07	2.99	1.92	-2.46	P	0.25	2	3	2	7	FISP(2)	CIPP
78	79	78-79	2ND ST	178.90	FALSE					MWLS	Water Level Sag	5		30%		3.07	2.99	1.92	-2.46	N	0	3	2	1	6	PM	
78	79	78-79	2ND ST	191.70	FALSE			3		TBD	Tap Break-in Defective	0			OFFSET IN TAP	3.07	2.99	1.92	-2.46	P	0.25	2	3	1	6	FISP(2)	CIPP
78	79	78-79	2ND ST	230.40	FALSE					MWLS	Water Level Sag	5		30%		3.07	2.99	1.92	-2.46	N	0	3	2	2	7	PM	
78	79	78-79	2ND ST	238.80	FALSE			3		TBA	Tap Break-in Active	0				3.07	2.99	1.92	-2.46		0				0		
78	79	78-79	2ND ST	243.40	FALSE					MWLS	Water Level Sag	5		30%		3.07	2.99	1.92	-2.46	N	0	3	2	2	7	PM	
78	79	78-79	2ND ST	245.00	FALSE			6		OBZ	Obstacle Other	0			Used battery stuck at joint	3.07	2.99	1.92	-2.46	N	0	1	1	1	3	PM	
78	79	78-79	2ND ST	257.80	FALSE			9		TBD	Tap Break-in Defective	0			OFFSET IN TAP	3.07	2.99	1.92	-2.46	P	0.25	3	2	2	7	FISP(2)	DR
78	79	78-79	2ND ST	258.70	FALSE					JOM	Joint Offset Medium	2			no restriction of flow and appears sound	3.07	2.99	1.92	-2.46	P	0.25	2	3	2	7	FISP(2)	CIPP
78	79	78-79	2ND ST	312.90	FALSE			9		CL	Crack Longitudinal	1			no apparent fracturing	3.07	2.99	1.92	-2.46	P	0.25	2	3	2	7	FISP(1)	DR
78	79	78-79	2ND ST	312.90	FALSE			9		TBD	Tap Break-in Defective	2			OFFSET AT TAP CONNECTION	3.07	2.99	1.92	-2.46	P	0.25	2	2	2	6	FISP(1)	CIPP(2)
78	79	78-79	2ND ST	346.40	FALSE			9		TBD	Tap Break-in Defective	2			SEVERE OFFSET AT TAP CONNECTION	3.07	2.99	1.92	-2.46	P	0.25	4	3	3	10	DR	
78	79	78-79	2ND ST	346.40	FALSE					MGO	General Observation	0			POSSIBLE INFIL FROM LATERAL	3.07	2.99	1.92	-2.46	P	0.25	2	2	3	7	FISP(2)	DR
78	79	78-79	2ND ST	359.90	FALSE					MWLS	Water Level Sag	5			Risk of SSO WL 50%	3.07	2.99	1.92	-2.46	N	0	3	3	2	8	PM	FISP
78	79	78-79	2ND ST	364.30	FALSE					MCU	Camera Underwater	0			Risk of SSO WL 75%	3.07	2.99	1.92	-2.46	P	0.25	4	3	2	9	PM	FISP
78	79	78-79	2ND ST	364.30	FALSE					MWLS	Water Level Sag	5			Risk of SSO WL 50%	3.07	2.99	1.92	-2.46		0	3	3	2	8	PM	FISP
78	**79**	**78-79**	**2ND ST**	**366.90**	**FALSE**					**MSA**	**Abandoned Survey**	**2**			**CANNOT PASS CAMERA**	3.07	**2.99**	**1.92**	**-2.46**	**P**	**0.25**	5	4	3	12	DR	FISP
		78-79										0				#N/A	#N/A	#N/A	#N/A		0				0		
80	81	80-81	3rd St	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0				4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	0.00	FALSE					AMH	Manhole	0			80	4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	0.00	FALSE					MWL	Water Level	5		100%		4.36	3.86	2.38	0.58		0	2	2	1	5	PM	
80	81	80-81	3rd St	2.00	FALSE					MGO	General Observation	0			START OF LINE SEGMENT	4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	4.00	FALSE	5	7	BSV		Broken Soil Visible		1			pipe intact	4.36	3.86	2.38	0.58	P	0.25	4	3	3	10	DR	DR
80	81	80-81	3rd St	4.00	FALSE	9		RFJ		Roots Fine Joint		3				4.36	3.86	2.38	0.58	P	0.25	3	2	1	6	FM	CIPP
80	81	80-81	3rd St	4.00	FALSE					MGO	General Observation	0			POSSIBLE INFIL	4.36	3.86	2.38	0.58	P	0.25	2	2	2	6	FISP(1)	CIPP
80	81	80-81	3rd St	5.00	FALSE	3		TFA		Tap Factory Active		0				4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	5.00	FALSE	3		RML		Roots Medium Lateral		3		25		4.36	3.86	2.38	0.58	P	0.25	2	3	2	7	RC	CIPP
80	81	80-81	3rd St	5.00	FALSE					MGO	General Observation	0			POSSIBLE INFIL FROM LATERAL	4.36	3.86	2.38	0.58	P	0.25	2	2	2	6	RC	CIPP
80	81	80-81	3rd St	6.00	FALSE	3	5	BSV		Broken Soil Visible		1				4.36	3.86	2.38	0.58	P	0.25	4	3	3	10	Drcomb	CIPP
80	81	80-81	3rd St	6.00	FALSE	3	5	RFJ		Roots Fine Joint		3				4.36	3.86	2.38	0.58	P	0.25	2	3	1	6	FM	CIPP
80	81	80-81	3rd St	10.00	FALSE					MGP	General Photo	0			CAMERA SET	4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	37.10	FALSE	10		TFA		Tap Factory Active		0				4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	37.10	FALSE	9		RBL		Roots Ball Lateral		3		60		4.36	3.86	2.38	0.58	P	0.25	3	3	2	8	RC	DR
80	81	80-81	3rd St	40.40	FALSE	2	10	IS		Infil Stain		0			POSSIBLE INFIL	4.36	3.86	2.38	0.58	P	0.25	1	1	1	3	DA	
80	81	80-81	3rd St	49.50	FALSE	3		CL		Crack Longitudinal		1				4.36	3.86	2.38	0.58	P	0.25	3	3	3	9	DR	CIPP
80	81	80-81	3rd St	49.60	FALSE	3		TBD		Tap Break-in Defective		2			OFFSET	4.36	3.86	2.38	0.58	P	0.25	2	2	2	6	Drcomb	CIPP
80	81	80-81	3rd St	49.60	FALSE					MGO	General Observation	2			POSSIBLE INFIL AT TAP CONNECTION	4.36	3.86	2.38	0.58	P	0.25	2	2	2	6	Drcomb	CIPP
80	81	80-81	3rd St	49.60	FALSE	3		RFC		Roots Fine Connection		3				4.36	3.86	2.38	0.58	P	0.25	2	2	2	6	FM	CIPP
80	81	80-81	3rd St	89.80	FALSE	9		TF		Tap Factory		0				4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	89.80	FALSE	9		RFL		Roots Fine Lateral		3				4.36	3.86	2.38	0.58	P	0.25	2	3	2	7	RC	FM
80	81	80-81	3rd St	106.10	FALSE	2	10	IS		Infil Stain		0			POSSIBLE INFIL	4.36	3.86	2.38	0.58	P	0.25	1	1	1	3	FISP(1)	DR
80	81	80-81	3rd St	122.40	FALSE	3		TBD		Tap Break-in Defective		0			SEVERE OFFSET IN TAP	4.36	3.86	2.38	0.58	P	0.25	4	3	2	9	RC	DR
80	81	80-81	3rd St	122.40	FALSE	3		RBC		Roots Ball Connection		3		60		4.36	3.86	2.38	0.58	P	0.25	4	3	2	9	RC	DR
80	81	80-81	3rd St	122.40	FALSE	3		RBL		Roots Ball Lateral		3		80		4.36	3.86	2.38	0.58	P	0.25	4	3	2	9	RC	DR
80	81	80-81	3rd St	122.40	FALSE					MGO	General Observation	0			POSSIBLE INFIL FROM LATERAL	4.36	3.86	2.38	0.58	P	0.25	2	2	2	6	RC	DR
80	81	80-81	3rd St	135.30	FALSE	12		BVV		broken void visible		3				4.36	3.86	2.38	0.58	P	0.25	4	3	2	9	DR	
80	81	80-81	3rd St	135.30	FALSE	7		RFJ		Roots Fine Joint		3				4.36	3.86	2.38	0.58	P	0.25	1	2	1	4	FM	CIPP
80	81	80-81	3rd St	136.00	FALSE	9		TBA		Tap Break-in Active		0				4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	136.00	FALSE	9		RFC		Roots Fine Connection		3				4.36	3.86	2.38	0.58	P	0.25	2	3	1	6	FM	RC
80	81	80-81	3rd St	136.00	FALSE	9		CL		Crack Longitudinal		1				4.36	3.86	2.38	0.58	P	0.25	3	3	2	8	Drcomb	
80	81	80-81	3rd St	145.50	FALSE					MGO	General Observation	0			POSSIBLE INFIL	4.36	3.86	2.38	0.58	P	0.25	1	2	1	4	FISP(1)	DR
80	81	80-81	3rd St	170.50	FALSE	9		OBJ		Obstacle In Joint		0		5		4.36	3.86	2.38	0.58	N	0	1	2	1	4	FISP(1)	DR
80	81	80-81	3rd St	170.50	FALSE					MGO	General Observation	0			POSSIBLE INFIL	4.36	3.86	2.38	0.58	P	0.25	1	2	1	4	FISP(1)	DR
80	81	80-81	3rd St	202.70	FALSE	9		RFL		Roots Fine Lateral		3				4.36	3.86	2.38	0.58	P	0.25	2	3	1	6	RC	FM
80	81	80-81	3rd St	202.70	FALSE	9		TF		Tap Factory		0				4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	261.30	FALSE	3		TBD		Tap Break-in Defective		2			OFFSET	4.36	3.86	2.38	0.58	P	0.25	2	3	1	6	FISP(1)	DR

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
80	81	80-81	3rd St	261.30	FALSE			2		RFC	Roots Fine Connection	3				4.36	3.86	2.38	0.58	P	0.25	2	2	1	5	FM	RC
80	81	80-81	3rd St	269.10	FALSE			3	9	IS	Infil Stain	0			POSSIBLE INFIL	4.36	3.86	2.38	0.58	P	0.25	1	2	1	4	FISP(2)	DA
80	81	80-81	3rd St	284.20	FALSE			3		TF	Tap Factory	0				4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	286.30	FALSE			3		TF	Tap Factory	0				4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	296.80	FALSE			3	9	IS	Infil Stain	0			POSSIBLE INFIL	4.36	3.86	2.38	0.58	P	0.25	1	2	1	4	FISP(2)	DA
80	81	80-81	3rd St	299.30	FALSE					MGO	General Observation	0			END OF LINE SEGMENT	4.36	3.86	2.38	0.58		0				0		
80	81	80-81	3rd St	300.50	FALSE					AMH	Manhole	0			81	4.36	3.86	2.38	0.58		0				0		
		80-82										0				#N/A	#N/A	#N/A	#N/A		0				0		
80A	80	80A-80	3rd St	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0				2.78	4.36	4.18	2.38		0				0		
80A	80	80A-80	3rd St	0.00	TRUE					AMH	Manhole	0			80	2.78	4.36	4.18	2.38		0				0		
80A	80	80A-80	3rd St	0.00	TRUE					MWL	Water Level	5		10%		2.78	4.36	4.18	2.38	N	0	1	1	1	3	DA	
80A	80	80A-80	3rd St	2.00	TRUE					MGO	General Observation	0			START OF LINE SEGMENT	2.78	4.36	4.18	2.38		0				0		
80A	80	80A-80	3rd St	2.80	TRUE					MGO	General Observation	0			POSSIBLE INFIL	2.78	4.36	4.18	2.38	P	0.25	2	3	2	7	FISP(1)	GRT
80A	80	80A-80	3rd St	10.00	TRUE					MGP	General Photo	0			CAMERA SET	2.78	4.36	4.18	2.38		0				0		
80A	80	80A-80	3rd St	10.00	TRUE					MGO	General Observation	0			POSSIBLE INFIL	2.78	4.36	4.18	2.38	P	0.25	2	3	2	7	FISP(1)	GRT
80A	80	80A-80	3rd St	10.90	TRUE					MWLS	Water Level Sag	5		30%		2.78	4.36	4.18	2.38	N	0	3	2	1	6	PM	
80A	80	80A-80	3rd St	25.60	TRUE			2	10	IS	Infil Stain	0			POSSIBLE INFIL	2.78	4.36	4.18	2.38	P	0.25	2	2	1	5	FISP(2)	
80A	80	80A-80	3rd St	34.10	TRUE			2		RTC	Roots Tap Connection	3		10%		2.78	4.36	4.18	2.38	P	0.25	2	3	1	6	DR	FM
80A	80	80A-80	3rd St	34.10	TRUE			3		CL	Crack Longitudinal	1				2.78	4.36	4.18	2.38	P	0.25	3	3	2	8	Drcomb	CIPP
80A	80	80A-80	3rd St	34.10	TRUE			3		TBD	Tap Break-in Defective	2			OFFSET	2.78	4.36	4.18	2.38	P	0.25	2	3	2	7	Drcomb	CIPP
80A	80	80A-80	3rd St	34.10	TRUE					MGO	General Observation	0			POSSIBLE INFIL AT TAP CONNECTION	2.78	4.36	4.18	2.38	P	0.25	2	2	2	6	RC	DR
80A	80	80A-80	3rd St	46.20	TRUE			2	10	IS	Infil Stain	0			POSSIBLE INFIL	2.78	4.36	4.18	2.38	P	0.25	1	2	1	4	FISP(2)	DA
80A	80	80A-80	3rd St	49.70	TRUE			1	6	B	Broken	1			*pipe still intact*	2.78	4.36	4.18	2.38	P	0.25	3	3	2	8	Dr	CIPP
80A	80	80A-80	3rd St	49.70	TRUE			1	2	RFB	Roots Fine Barrel	3				2.78	4.36	4.18	2.38	P	0.25	2	2	1	5	Drcomb	FM
80A	80	80A-80	3rd St	51.00	TRUE			9		TBD	Tap Break-in Defective	2			OFFSET	2.78	4.36	4.18	2.38	P	0.25	1	2	1	4	Drcomb	CIPP
80A	80	80A-80	3rd St	51.00	TRUE					MGO	General Observation	2			POSSIBLE INFIL FROM LATERAL	2.78	4.36	4.18	2.38	P	0.25	1	2	1	4	Drcomb	CIPP
80A	80	80A-80	3rd St	51.50	TRUE			9	10	CM	Crack Multiple	1				2.78	4.36	4.18	2.38	P	0.25	2	2	3	7	Drcomb	CIPP
80A	80	80A-80	3rd St	51.50	TRUE			9		RFB	Roots Fine Barrel	3				2.78	4.36	4.18	2.38	P	0.25	1	2	1	4	FM	DR
80A	80	80A-80	3rd St	52.10	TRUE					MWLS	Water Level Sag	5		30		2.78	4.36	4.18	2.38	N	0	3	2	1	6	PM	
80A	80	80A-80	3rd St	66.80	TRUE					MWLS	Water Level Sag	5		25		2.78	4.36	4.18	2.38	N	0	3	2	1	6	PM	
80A	80	80A-80	3rd St	76.30	TRUE			3		TB	Tap Break-in	0				2.78	4.36	4.18	2.38		0				0		
80A	80	80A-80	3rd St	76.30	TRUE			3		RBC	Roots Ball Connection	3			*Severe roots*	2.78	4.36	4.18	2.38	P	0.25	4	3	2	9	RC	DR
80A	80	80A-80	3rd St	76.30	TRUE					MGO	General Observation	0			POSSIBLE INFIL AT TAP CONNECTION	2.78	4.36	4.18	2.38	P	0.25	2	2	2	6	RC	DR
80A	80	80A-80	3rd St	81.30	TRUE					MWLS	Water Level Sag	5		25		2.78	4.36	4.18	2.38	N	0	2	2	2	6	PM	
80A	80	80A-80	3rd St	102.50	TRUE			9	11	B	Broken	1			*Fractured with rts intruding*	2.78	4.36	4.18	2.38	P	0.25	4	4	3	11	DR	DR
80A	80	80A-80	3rd St	102.50	TRUE			7	3	RMJ	Roots medium joint	3			*Severe roots, potential I&I source*	2.78	4.36	4.18	2.38	P	0.25	2	3	2	7	Drcomb	CIPP(2)
80A	80	80A-80	3rd St	103.30	TRUE			9		RFC	Roots Fine Connection	3				2.78	4.36	4.18	2.38	P	0.25	2	2	1	5	Drcomb	CIPP
80A	80	80A-80	3rd St	103.30	TRUE			9		TBD	Tap Break-in Defective	0			OFFSET IN TAP	2.78	4.36	4.18	2.38	P	0.25	2	3	2	7	RC	DR
80A	80	80A-80	3rd St	149.50	TRUE			10		TBA	Tap Break-in Active	0				2.78	4.36	4.18	2.38		0				0		
80A	80	80A-80	3rd St	162.70	TRUE			3	4	RFJ	Roots Fine Joint	3				2.78	4.36	4.18	2.38	P	0.25	2	3	1	6	FM	
80A	80	80A-80	3rd St	163.00	TRUE					MGO	General Observation	2			POSSIBLE INFIL AT JOINT	2.78	4.36	4.18	2.38	P	0.25	2	2	1	5	FISP(1)	GRT
80A	80	80A-80	3rd St	169.20	TRUE					MWLS	Water Level Sag	5		30		2.78	4.36	4.18	2.38	N	0	3	2	2	7	PM	
80A	80	80A-80	3rd St	178.20	TRUE					JSM	Joint Separated Medium	2			*Joint appears sound*	2.78	4.36	4.18	2.38	P	0.25	3	3	2	8	FISP(2)	CIPP
80A	80	80A-80	3rd St	178.20	TRUE					MWLS	Water Level Sag	5		30		2.78	4.36	4.18	2.38	N	0	3	2	1	6	PM	
80A	80	80A-80	3rd St	196.70	TRUE					JOL	Joint Offset Large	2			*Intact but may fail*	2.78	4.36	4.18	2.38	P	0.25	4	4	4	12	DR	
80A	80	80A-80	3rd St	196.70	TRUE					MMC	Material Change	0			PVC	2.78	4.36	4.18	2.38		0				0		
80A	80	80A-80	3rd St	196.70	TRUE			12	12	RPRD	Repair Point Defective	4			OFFSET	2.78	4.36	4.18	2.38	P	0.25	4	4	4	12	Drcomb	
80A	80	80A-80	3rd St	197.20	TRUE					MSA	Abandoned Survey	2			CANNOT PASS OFFSET JOINT	2.78	4.36	4.18	2.38		0	5	4	4	13	Drcomb	
80A	80	80A-80	3rd St	197.20	TRUE					STOP	Inspection stopped	0				2.78	4.36	4.18	2.38		0				0		
100	101	100-101	LAKELAND ST	0.00	FALSE	YES	SL			START WITH FL	Start Inspection With the Flow	0	0	0		7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	0.00	FALSE	YES	SL			AMH	Manhole	0	0	0	100	7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	0.00	FALSE	YES	SL			MWL	Water Level	5	0	0		7.24	7.99	-6.26	-7.8	N	0	2	2	1	5	PM	
100	101	100-101	LAKELAND ST	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	20.90	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	39.00	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	70.90	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION, observed as active	7.24	7.99	-6.26	-7.8	IW	2	2	3	2	7	FISP(1)	*CIPP(4)*
100	101	100-101	LAKELAND ST	72.10	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	105.30	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	137.20	FALSE	YES	SL	7	9	CM	Crack Multiple	1	0	0	appears as fracture in invert	7.24	7.99	-6.26	-7.8	P	0.25	3	3	2	8	CIPP(4)	
100	101	100-101	LAKELAND ST	137.20	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	appears a crack at edge of delamination	7.24	7.99	-6.26	-7.8	P	0.25	3	3	2	8	CIPPcomb	*CIPP*
100	101	100-101	LAKELAND ST	138.40	FALSE	YES	SL	3		TFA	Tap Factory Active	1	0	0	may have infil, follow up inspection	7.24	7.99	-6.26	-7.8	P	0.25	2	2	2	6	CIPPcomb	*DR*
100	101	100-101	LAKELAND ST	161.70	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	184.80	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	203.60	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.24	7.99	-6.26	-7.8	N	0	3	3	1	7	PM	
100	101	100-101	LAKELAND ST	227.80	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	242.10	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.24	7.99	-6.26	-7.8		0	0	0	0	0		
100	101	100-101	LAKELAND ST	245.40	FALSE	YES	SL			MWL	Water Level	5	0	0		7.24	7.99	-6.26	-7.8	N	0	2	3	1	6	PM	
100	101	100-101	LAKELAND ST	250.10	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.24	7.99	-6.26	-7.8	N	0	3	3	1	7	PM	
100	101	100-101	LAKELAND ST	250.60	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	251.70	FALSE	YES	SL			AMH	Manhole	0	0	0	101	7.24	7.99	-6.26	-7.8		0				0		
100	101	100-101	LAKELAND ST	251.70	FALSE					STOP	Inspection stopped	0	0	0		7.24	7.99	-6.26	-7.8		0				0		
101	102	101-102	LAKELAND ST	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		7.99	9.87	-7.8	-9.31		0				0		
101	102	101-102	LAKELAND ST	0.00	FALSE					AMH	Manhole	0	0	0	101	7.99	9.87	-7.8	-9.31		0				0		
101	102	101-102	LAKELAND ST	0.00	FALSE					MWL	Water Level	5	0	0		7.99	9.87	-7.8	-9.31	N	0	4	3	1	8	PM	*routine flushing*
101	102	101-102	LAKELAND ST	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.99	9.87	-7.8	-9.31		0				0		
101	102	101-102	LAKELAND ST	2.00	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.99	9.87	-7.8	-9.31	N	0	4	3	1	8	PM	*routine flushing*
101	102	101-102	LAKELAND ST	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	7.99	9.87	-7.8	-9.31		0				0		
101	102	101-102	LAKELAND ST	35.20	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.99	9.87	-7.8	-9.31		0				0		
101	102	101-102	LAKELAND ST	58.50	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.99	9.87	-7.8	-9.31		0				0		
101	102	101-102	LAKELAND ST	122.60	FALSE	YES	SL			MWL	Water Level	5	0	0		7.99	9.87	-7.8	-9.31	N	0	2	3	1	6	PM	
101	102	101-102	LAKELAND ST	125.30	FALSE	YES	SL	2		TFA	Tap Factory Active	0	0	0		7.99	9.87	-7.8	-9.31		0				0		
101	102	101-102	LAKELAND ST	131.50	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.99	9.87	-7.8	-9.31	N	0	3	3	1	7	PM	
101	102	101-102	LAKELAND ST	148.40	FALSE	YES	SL			MWL	Water Level	5	0	0		7.99	9.87	-7.8	-9.31	N	0	2	3	1	6	PM	
101	102	101-102	LAKELAND ST	158.70	FALSE	YES	SL	10		TFA	Tap Factory Active	0	0	0		7.99	9.87	-7.8	-9.31		0				0		
101	102	101-102	LAKELAND ST	181.80	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	7.99	9.87	-7.8	-9.31	N	0	2	2	1	5	PM	
101	102	101-102	LAKELAND ST	195.50	FALSE	YES	SL			MWL	Water Level	5	0	0		7.99	9.87	-7.8	-9.31	N	0	2	3	1	6	PM	
101	102	101-102	LAKELAND ST	223.20	FALSE	YES	SL			JAL	Joint Angular Large	2	0	0	DOWN TO THE LEFT	7.99	9.87	-7.8	-9.31	P	0.25	3	3	2	8	FISP(2)	
101	102	101-102	LAKELAND ST	225.10	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	7.99	9.87	-7.8	-9.31	N	0	2	2	1	5	PM	

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
101	102	101-102	LAKELAND ST	251.80	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.99	9.87	-7.8	-9.31		0				0		
101	102	101-102	LAKELAND ST	252.40	FALSE					AMH	Manhole	0	0	0	102	7.99	9.87	-7.8	-9.31		0				0		
101	102	101-102	LAKELAND ST	252.40	FALSE					STOP	Inspection stopped	0	0	0		7.99	9.87	-7.8	-9.31		0				0		
102	104	102-104_1	LAKELAND ST	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		9.87	11.3	-9.31	-10.15		0				0		
102	104	102-104_1	LAKELAND ST	0.00	TRUE					AMH	Manhole	0	0	0	104	9.87	11.3	-9.31	-10.15		0				0		
102	104	102-104_1	LAKELAND ST	0.00	TRUE					MWL	Water Level	5	0	0	water level and grease higher than noted	9.87	11.3	-9.31	-10.15	N	0	4	3	1	8	PM	*routine flushing*
102	104	102-104_1	LAKELAND ST	2.00	TRUE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	9.87	11.3	-9.31	-10.15		0				0		
102	104	102-104_1	LAKELAND ST	10.00	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	9.87	11.3	-9.31	-10.15		0				0		
102	104	102-104_1	LAKELAND ST	11.90	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0	water level and grease higher than noted	9.87	11.3	-9.31	-10.15	N	0	4	3	1	8	PM	*routine flushing*
102	104	102-104_1	LAKELAND ST	60.90	TRUE	YES	SL		3	TFA	Tap Factory Active	0	0	0		9.87	11.3	-9.31	-10.15		0				0		
102	104	102-104_1	LAKELAND ST	94.30	TRUE	YES	SL			MWL	Water Level	5	0	0		9.87	11.3	-9.31	-10.15	N	0	2	3	1	6	PM	
102	104	102-104_1	LAKELAND ST	105.80	TRUE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	9.87	11.3	-9.31	-10.15		0				0		
102	104	102-104_1	LAKELAND ST	106.10	TRUE	YES	SL			AMH	Manhole	0	0	0	102	9.87	11.3	-9.31	-10.15		0				0		
102	104	102-104_1	LAKELAND ST	106.10	TRUE					STOP	Inspection stopped	0	0	0		9.87	11.3	-9.31	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	0.00	FALSE					AMH	Manhole	0	0	0	103	6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	0.00	FALSE					MWL	Water Level	5	0	0		6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	19.50	FALSE	YES	SL		9	TFA	Tap Factory Active	0	0	0	debris in tap , needs follow up	6.71	11.3	-4.61	-10.15	P	0.25	2	2	2	6	RC	***FISP(1)***
103	104	103-104_2	KONOCTI VIEW	26.10	FALSE	YES	SL			MWL	Water Level	5	0	0		6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	42.70	FALSE	YES	SL		9	TFA	Tap Factory Active	0	0	0		6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	47.80	FALSE	YES	SL		9	10 CC	Crack Circumferential	1	0	0	crack may be only liner and not pipe	6.71	11.3	-4.61	-10.15	P	0.25	3	3	2	8	FISP(1)	***CIPP(4)***
103	104	103-104_2	KONOCTI VIEW	112.10	FALSE	YES	SL		9	TFA	Tap Factory Active	0	0	0		6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	143.80	FALSE	YES	SL		6	LFDL	Lining Failure Delaminating	4	0	0	may have infil, follow up inspection to observe	6.71	11.3	-4.61	-10.15	P	0.25	3	3	2	8	FISP(1)	***CIPP(4)***
103	104	103-104_2	KONOCTI VIEW	195.30	FALSE	YES	SL		9	TFA	Tap Factory Active	0	0	0		6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	205.80	FALSE	YES	SL			MWL	Water Level	5	0	0		6.71	11.3	-4.61	-10.15	N	0	1	1	1	3	DA	
103	104	103-104_2	KONOCTI VIEW	226.90	FALSE	YES	SL		9	LFDL	Lining Failure Delaminating	4	0	0		6.71	11.3	-4.61	-10.15	N	0	1	1	1	3	DA	
103	104	103-104_2	KONOCTI VIEW	226.90	FALSE	YES	SL			MGP	General Photo	0	0	0	POSSIBLE INFILTRATION 9 O'CLOCK	6.71	11.3	-4.61	-10.15	P	0.25	3	3	2	8	FISP(1)	***CIPP(4)***
103	104	103-104_2	KONOCTI VIEW	291.80	FALSE	YES	SL			MGP	General Photo	0	0	0	POSSIBLE INFILTRATION	6.71	11.3	-4.61	-10.15	P	0.25	3	3	2	8	FISP(1)	***CIPP(4)***
103	104	103-104_2	KONOCTI VIEW	293.10	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	293.10	FALSE					AMH	Manhole	0	0	0	104	6.71	11.3	-4.61	-10.15		0				0		
103	104	103-104_2	KONOCTI VIEW	293.10	FALSE					STOP	Inspection stopped	0	0	0		6.71	11.3	-4.61	-10.15		0				0		
104	105	104-105_4	LAKELAND ST	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		11.3	11.78	-10.15	-11.17		0				0		
104	105	104-105_4	LAKELAND ST	0.00	FALSE					AMH	Manhole	0	0	0	104	11.3	11.78	-10.15	-11.17		0				0		
104	105	104-105_4	LAKELAND ST	0.00	FALSE					MWL	Water Level	5	0	0		11.3	11.78	-10.15	-11.17		0				0		
104	105	104-105_4	LAKELAND ST	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	11.3	11.78	-10.15	-11.17		0				0		
104	105	104-105_4	LAKELAND ST	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	11.3	11.78	-10.15	-11.17		0				0		
104	105	104-105_4	LAKELAND ST	12.70	FALSE	YES	SL			MWL	Water Level	5	0	0		11.3	11.78	-10.15	-11.17	P	0.25	2	3	1	6	PM	
104	105	104-105_4	LAKELAND ST	17.00	FALSE	YES	SL		6	LFDL	Lining Failure Delaminating	4	0	0		11.3	11.78	-10.15	-11.17		0				0		
104	105	104-105_4	LAKELAND ST	71.50	FALSE	YES	SL		10	TFA	Tap Factory Active	2	0	0	may have infil, follow up inspection high lake level	11.3	11.78	-10.15	-11.17	P	0.25	2	2	2	6	FISP(1)	***CIPP(2)***
104	105	104-105_4	LAKELAND ST	88.80	FALSE	YES	SL			MWL	Water Level	5	0	0		11.3	11.78	-10.15	-11.17		0				0		
104	105	104-105_4	LAKELAND ST	125.10	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION	11.3	11.78	-10.15	-11.17	P	0.25	2	3	2	7	FISP(1)	***CIPP(6)***
104	105	104-105_4	LAKELAND ST	126.40	FALSE	YES	SL		10	TFA	Tap Factory Active	2	0	0	joint @ 128 ft possible I & I	11.3	11.78	-10.15	-11.17	P	0.25	3	3	2	8	FISP(1)	***CIPPcomb***
104	105	104-105_4	LAKELAND ST	151.90	FALSE	YES	SL			MWL	Water Level	5	0	0	water level and grease higher than noted	11.3	11.78	-10.15	-11.17	N	0	3	3	1	7	PM	
104	105	104-105_4	LAKELAND ST	162.60	FALSE	YES	SL			MWL	Water Level	5	0	0	water level and grease higher than noted	11.3	11.78	-10.15	-11.17	N	0	4	3	1	8	PM	*routine flushing*
104	105	104-105_4	LAKELAND ST	166.80	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0	water level and grease higher than noted	11.3	11.78	-10.15	-11.17	N	0	4	3	1	8	PM	*routine flushing*
104	105	104-105_4	LAKELAND ST	174.40	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	11.3	11.78	-10.15	-11.17		0				0		
104	105	104-105_4	LAKELAND ST	174.80	FALSE					AMH	Manhole	0	0	0	105	11.3	11.78	-10.15	-11.17		0				0		
104	105	104-105_4	LAKELAND ST	174.80	FALSE					STOP	Inspection stopped	0	0	0		11.3	11.78	-10.15	-11.17		0				0		
105	PS6	105-PS6_2	LAKELAND ST	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		11.78	#N/A	-11.17	#N/A		0				0		
105	PS6	105-PS6_2	LAKELAND ST	0.00	FALSE					AMH	Manhole	0	0	0	105	11.78	#N/A	-11.17	#N/A		0				0		
105	PS6	105-PS6_2	LAKELAND ST	0.00	FALSE					MWL	Water Level	5	0	0		11.78	#N/A	-11.17	#N/A		0				0		
105	PS6	105-PS6_2	LAKELAND ST	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	11.78	#N/A	-11.17	#N/A		0				0		
105	PS6	105-PS6_2	LAKELAND ST	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	11.78	#N/A	-11.17	#N/A		0				0		
105	PS6	105-PS6_2	LAKELAND ST	14.30	FALSE	YES	SL		3	5 LFDL	Lining Failure Delaminating	4	0	0	CONTINUOUS, infil weeper	11.78	#N/A	-11.17	#N/A	IW	2	3	3	2	8	CIPP(4)	
105	PS6	105-PS6_2	LAKELAND ST	15.50	FALSE	YES	SL		1	TFA	Tap Factory Active	2	0	0	infil possible	11.78	#N/A	-11.17	#N/A	P	0.25	3	2	2	7	FISP(1)	***CIPP(2)***
105	PS6	105-PS6_2	LAKELAND ST	30.40	FALSE	YES	SL			MGP	General Photo	0	0	0	POSSIBLE INFILTRATION	11.78	#N/A	-11.17	#N/A	P	0.25	3	3	2	8	FISP(1)	***CIPP(4)***
105	PS6	105-PS6_2	LAKELAND ST	44.80	FALSE	YES	SL		11	TFA	Tap Factory Active	0	0	0		11.78	#N/A	-11.17	#N/A		0				0		
105	PS6	105-PS6_2	LAKELAND ST	72.70	FALSE	YES	SL			MGP	General Photo	1	0	0	INFILTRATION 5 O'CLOCK	11.78	#N/A	-11.17	#N/A	IW	2	3	3	2	8	CIPP(4)	***GRT***
105	PS6	105-PS6_2	LAKELAND ST	113.00	FALSE	YES	SL		11	TFA	Tap Factory Active	0	0	0		11.78	#N/A	-11.17	#N/A		0				0		
105	PS6	105-PS6_2	LAKELAND ST	168.50	FALSE	YES	SL		11	TFA	Tap Factory Active	0	0	0		11.78	#N/A	-11.17	#N/A		0				0		
105	PS6	105-PS6_2	LAKELAND ST	236.50	FALSE	YES	SL		11	TFA	Tap Factory Active	1	0	0	broken ,chipped joint , possible infil	11.78	#N/A	-11.17	#N/A	P	0.25	3	3	2	8	FISP(1)	***CIPP(2)***
105	PS6	105-PS6_2	LAKELAND ST	257.80	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION FROM 3-6 O'CLOCK	11.78	#N/A	-11.17	#N/A	P	0.25	3	3	2	8	FISP(1)	***CIPP(4)***
105	PS6	105-PS6_2	LAKELAND ST	270.40	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	11.78	#N/A	-11.17	#N/A		0				0		
105	PS6	105-PS6_2	LAKELAND ST	270.40	FALSE					AMH	Manhole	0	0	0	PS6	11.78	#N/A	-11.17	#N/A		0				0		
105	PS6	105-PS6_2	LAKELAND ST	270.40	FALSE					STOP	Inspection stopped	0	0	0		11.78	#N/A	-11.17	#N/A		0				0		
108	109	108-109	ISLAND CIR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	0.00	FALSE					AMH	Manhole	0	0	0	108	8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	0.00	FALSE					MWL	Water Level	5	0	0		8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	16.60	FALSE	YES	SL		6	LFDL	Lining Failure Delaminating	4	0	0		8.85	10.26	-8.46	-9.96	N	0	2	2	1	5	DA	
108	109	108-109	ISLAND CIR	28.00	FALSE	YES	SL			MWL	Water Level	5	0	0		8.85	10.26	-8.46	-9.96	N	0	2	3	1	6	PM	
108	109	108-109	ISLAND CIR	29.00	FALSE	YES	SL		11	CL	Crack Longitudinal	1	0	0	needs follow up to clearly identify	8.85	10.26	-8.46	-9.96	P	0.25	2	3	2	7	FISP(1)	***CIPP(4)***
108	109	108-109	ISLAND CIR	39.70	FALSE	YES	SL			MWL	Water Level	5	0	0		8.85	10.26	-8.46	-9.96	N	0	1	1	1	3	DA	
108	109	108-109	ISLAND CIR	51.60	FALSE	YES	SL		4	CL	Crack Longitudinal	1	0	0	needs follow up to clearly identify	8.85	10.26	-8.46	-9.96	P	0.25	2	3	2	7	FISP(1)	***CIPP(4)***
108	109	108-109	ISLAND CIR	56.80	FALSE	YES	SL		3	TFA	Tap Factory Active	0	0	0		8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	58.40	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION	8.85	10.26	-8.46	-9.96	P	0.25	2	3	2	7	FISP(1)	***GRT***
108	109	108-109	ISLAND CIR	59.70	FALSE	YES	SL		11	TFA	Tap Factory Active	0	0	0		8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	115.10	FALSE	YES	SL		2	TFA	Tap Factory Active	0	0	0		8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	130.50	FALSE	YES	SL			MWL	Water Level	5	0	0		8.85	10.26	-8.46	-9.96	N	0	2	3	1	6	PM	
108	109	108-109	ISLAND CIR	131.10	FALSE	YES	SL		11	TFA	Tap Factory Active	0	0	0		8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	175.90	FALSE	YES	SL			MWL	Water Level	5	0	0		8.85	10.26	-8.46	-9.96	N	0	1	3	1	5	DA	
108	109	108-109	ISLAND CIR	186.40	FALSE	YES	SL		10	TFA	Tap Factory Active	0	0	0		8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	188.90	FALSE	YES	SL			MWL	Water Level	5	0	0		8.85	10.26	-8.46	-9.96	N	0	2	3	1	6	PM	
108	109	108-109	ISLAND CIR	228.70	FALSE	YES	SL		2	TFA	Tap Factory Active	0	0	0		8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	256.50	FALSE	YES	SL			MWL	Water Level	5	0	0		8.85	10.26	-8.46	-9.96	N	0	3	3	1	7	PM	
108	109	108-109	ISLAND CIR	258.00	FALSE	YES	SL		10	TFA	Tap Factory Active	0	0	0		8.85	10.26	-8.46	-9.96		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
108	109	108-109	ISLAND CIR	264.30	FALSE	YES	SL			MWL	Water Level	5	0	0		8.85	10.26	-8.46	-9.96	N	0	2	3	1	6	PM	
108	109	108-109	ISLAND CIR	287.40	FALSE	YES	SL		2	TFA	Tap Factory Active	2	0	0	JA @285 --DA, JS @ @ 290 --FISP	8.85	10.26	-8.46	-9.96	P	0.25	2	3	2	7	FISP(1)	***CIPP(6)***
108	109	108-109	ISLAND CIR	301.90	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	302.60	FALSE					AMH	Manhole	0	0	0	109	8.85	10.26	-8.46	-9.96		0				0		
108	109	108-109	ISLAND CIR	302.60	FALSE					STOP	Inspection stopped	0	0	0		8.85	10.26	-8.46	-9.96		0				0		
109	PS5	109-PS5	ISLAND CIR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	0.00	FALSE					AMH	Manhole	0	0	0	109	10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	0.00	FALSE					MWL	Water Level	5	0	0		10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	22.90	FALSE	YES	SL		10	TFA	Tap Factory Active	0	0	0		10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	24.50	FALSE	YES	SL		7	LFDL	Lining Failure Delaminating	4	0	0		10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	32.90	FALSE	YES	SL			MWL	Water Level	5	0	0	high grease and water marks	10.26	#N/A	-9.96	#N/A	N	0	3	3	2	8	PM	***routine flushing***
109	PS5	109-PS5	ISLAND CIR	37.10	FALSE	YES	SL			JAM	Joint Angular Medium	2	0	0	TO THE LEFT	10.26	#N/A	-9.96	#N/A	P	0.25	2	3	2	7	DA	
109	PS5	109-PS5	ISLAND CIR	39.10	FALSE	YES	SL		2	TFA	Tap Factory Active	0	0	0	possible I & I , inspect	10.26	#N/A	-9.96	#N/A	P	0.25	3	2	2	7	FISP(1)	***CIPP(2)***
109	PS5	109-PS5	ISLAND CIR	41.00	FALSE	YES	SL			MWL	Water Level	5	0	0	high grease and water marks	10.26	#N/A	-9.96	#N/A	N	0	3	3	2	8	PM	***routine flushing***
109	PS5	109-PS5	ISLAND CIR	66.40	FALSE	YES	SL			MWL	Water Level	5	0	0		10.26	#N/A	-9.96	#N/A	N	0	2	3	1	6	PM	
109	PS5	109-PS5	ISLAND CIR	81.30	FALSE	YES	SL		10	TFA	Tap Factory Active	0	0	0		10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	97.50	FALSE	YES	SL		1	TFA	Tap Factory Active	0	0	0		10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	139.70	FALSE	YES	SL		11	TFA	Tap Factory Active	0	0	0		10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	155.90	FALSE	YES	SL		1	TFA	Tap Factory Active	0	0	0		10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	197.90	FALSE	YES	SL		11	TFA	Tap Factory Active	0	0	0		10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	199.80	FALSE	YES	SL			MGO	General Observation	1	0	0	INFILTRATION ifil dripper @ jt. Intruding sealing ring. Clean ,pa	10.26	#N/A	-9.96	#N/A	ID	3	3	3	2	8	GRT	***CIPP(4)***
109	PS5	109-PS5	ISLAND CIR	200.40	FALSE	YES	SL			MWL	Water Level	5	0	0		10.26	#N/A	-9.96	#N/A	N	0	2	3	1	6	PM	
109	PS5	109-PS5	ISLAND CIR	213.60	FALSE	YES	SL			MWL	Water Level	5	0	0		10.26	#N/A	-9.96	#N/A	N	0	1	3	1	5	PM	
109	PS5	109-PS5	ISLAND CIR	214.20	FALSE	YES	SL		1	TFA	Tap Factory Active	0	0	0		10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	229.30	FALSE	YES	SL			MWL	Water Level	5	0	0		10.26	#N/A	-9.96	#N/A	N	0	2	3	1	6	PM	
109	PS5	109-PS5	ISLAND CIR	269.30	FALSE	YES	SL		11	TFA	Tap Factory Active	1	0	0	lateral appears to have cir crk .	10.26	#N/A	-9.96	#N/A	P	0.25	3	2	2	7	FISP(1)	***CIPP(2)***
109	PS5	109-PS5	ISLAND CIR	269.30	FALSE	YES	SL			MWL	Water Level	5	0	0		10.26	#N/A	-9.96	#N/A	N	0	1	3	1	5	PM	
109	PS5	109-PS5	ISLAND CIR	278.90	FALSE	YES	SL		1	TFA	Tap Factory Active	2	0	0	jt @ 280 JA & JS , needs inspection annually	10.26	#N/A	-9.96	#N/A	P	0.25	3	3	2	8	FISP(1)	***CIPP(4)***
109	PS5	109-PS5	ISLAND CIR	296.00	FALSE	YES	SL			MGO	General Observation	1	0	0	INFILTRATION, infil dripper @ jt.	10.26	#N/A	-9.96	#N/A	ID	3	3	3	2	8	GRT	***CIPP(4)***
109	PS5	109-PS5	ISLAND CIR	300.10	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	300.10	FALSE					AMH	Manhole	0	0	0	PS5	10.26	#N/A	-9.96	#N/A		0				0		
109	PS5	109-PS5	ISLAND CIR	300.10	FALSE					STOP	Inspection stopped	0	0	0		10.26	#N/A	-9.96	#N/A		0				0		
118	119	118-119	ISLAND CIR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		10.41	11.85	-10.79	-11.87		0				0		
118	119	118-119	ISLAND CIR	0.00	FALSE					AMH	Manhole	0	0	0	118	10.41	11.85	-10.79	-11.87		0				0		
118	119	118-119	ISLAND CIR	0.00	FALSE					MWL	Water Level	5	0	0		10.41	11.85	-10.79	-11.87		0				0		
118	119	118-119	ISLAND CIR	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	10.41	11.85	-10.79	-11.87		0				0		
118	119	118-119	ISLAND CIR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	10.41	11.85	-10.79	-11.87		0				0		
118	119	118-119	ISLAND CIR	11.60	FALSE					MWL	Water Level	5	0	0	water level is high with high grease content	10.41	11.85	-10.79	-11.87	N	0	3	3	1	7	PM	
118	119	118-119	ISLAND CIR	27.80	FALSE					MWLS	Water Level Sag	5	0	0	water level is high with high grease content	10.41	11.85	-10.79	-11.87	N	0	4	3	1	8	PM	***routine flushing***
118	119	118-119	ISLAND CIR	50.70	FALSE					MWL	Water Level	5	0	0	water level is high with high grease content	10.41	11.85	-10.79	-11.87	N	0	3	3	1	7	PM	
118	119	118-119	ISLAND CIR	55.60	FALSE					MWL	Water Level	5	0	0		10.41	11.85	-10.79	-11.87	N	0	1	3	1	5	DA	
118	119	118-119	ISLAND CIR	66.00	FALSE					MWLS	Water Level Sag	5	0	0	water level is high with high grease content	10.41	11.85	-10.79	-11.87	N	0	4	3	1	8	PM	***routine flushing***
118	119	118-119	ISLAND CIR	67.60	FALSE			3		TFA	Tap Factory Active	0	0	0		10.41	11.85	-10.79	-11.87		0				0		
118	119	118-119	ISLAND CIR	91.90	FALSE			10		TFA	Tap Factory Active	0	0	0	GREASE IN TAP, severe grease and poss infil	10.41	11.85	-10.79	-11.87	P	0.25	3	3	2	8	RC	***CIPP(2)***
118	119	118-119	ISLAND CIR	106.30	FALSE			7	10	CM	Crack Multiple	1	0	0	POSSIBLE INFILTRATION, fracture @ jt. 7-10	10.41	11.85	-10.79	-11.87	P	0.25	3	3	2	8	CIPP(4)	
118	119	118-119	ISLAND CIR	125.50	FALSE			3		TFA	Tap Factory Active	0	0	0		10.41	11.85	-10.79	-11.87		0				0		
118	119	118-119	ISLAND CIR	132.60	FALSE					MWL	Water Level	5	0	0		10.41	11.85	-10.79	-11.87	N	0	2	3	1	6	PM	
118	119	118-119	ISLAND CIR	144.30	FALSE			7	12	RMJ	Roots Medium Joint	3	0	0	root or sealing ring from joint , obstructing pipe	10.41	11.85	-10.79	-11.87	P	0.25	3	3	3	9	RC	***CIPP(4)***
118	119	118-119	ISLAND CIR	148.40	FALSE					MWLS	Water Level Sag	5	0	0		10.41	11.85	-10.79	-11.87	N	0	4	3	2	9	PM	***routine flushing***
118	119	118-119	ISLAND CIR	149.80	FALSE			10		TFA	Tap Factory Active	0	0	0		10.41	11.85	-10.79	-11.87		0				0		
118	119	118-119	ISLAND CIR	176.90	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	10.41	11.85	-10.79	-11.87		0				0		
118	119	118-119	ISLAND CIR	177.50	FALSE					AMH	Manhole	0	0	0	119	10.41	11.85	-10.79	-11.87		0				0		
118	119	118-119	ISLAND CIR	177.50	FALSE					STOP	Inspection stopped	0	0	0		10.41	11.85	-10.79	-11.87		0				0		
144	145	144-145_2	ISLAND DR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		12.19	13.98	-10.5	-12.91		0				0		
144	145	144-145_2	ISLAND DR	0.00	FALSE					AMH	Manhole	1	0	0	144, infil stains appear to indicate lake influence	12.19	13.98	-10.5	-12.91	P	0.25	2	3	2	7	GRT	***FISP(2)***
144	145	144-145_2	ISLAND DR	0.00	FALSE					MWL	Water Level	5	0	0		12.19	13.98	-10.5	-12.91		0				0		
144	145	144-145_2	ISLAND DR	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	12.19	13.98	-10.5	-12.91		0				0		
144	145	144-145_2	ISLAND DR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	12.19	13.98	-10.5	-12.91		0				0		
144	145	144-145_2	ISLAND DR	57.90	FALSE					MWL	Water Level	5	0	0		12.19	13.98	-10.5	-12.91	N	0	2	3	1	6	PM	
144	145	144-145_2	ISLAND DR	159.40	FALSE			1		TFA	Tap Factory Active	0	0	0		12.19	13.98	-10.5	-12.91		0				0		
144	145	144-145_2	ISLAND DR	165.80	FALSE			11		TFA	Tap Factory Active	2	0	0	infil from tap @ first joint	12.19	13.98	-10.5	-12.91	P	0.25	2	3	2	7	FISP(1)	***CIPP(2)***
144	145	144-145_2	ISLAND DR	263.60	FALSE					MWL	Water Level	5	0	0		12.19	13.98	-10.5	-12.91	N	0	3	3	1	7	PM	
144	145	144-145_2	ISLAND DR	305.10	FALSE			10		TFA	Tap Factory Active	0	0	0	HEAVY GREASE IN TAP, appears to have infil also	12.19	13.98	-10.5	-12.91	P	0.25	4	3	2	9	RC	***CIPP(2)***
144	145	144-145_2	ISLAND DR	346.30	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	12.19	13.98	-10.5	-12.91		0				0		
144	145	144-145_2	ISLAND DR	346.30	FALSE					AMH	Manhole	0	0	0	145	12.19	13.98	-10.5	-12.91		0				0		
144	145	144-145_2	ISLAND DR	346.30	FALSE					STOP	Inspection stopped	0	0	0		12.19	13.98	-10.5	-12.91		0				0		
19	20	19-20	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		11.4	13.12	-10.27	-11.77		0				0		
19	20	19-20	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	19	11.4	13.12	-10.27	-11.77		0				0		
19	20	19-20	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		11.4	13.12	-10.27	-11.77		0				0		
19	20	19-20	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	11.4	13.12	-10.27	-11.77		0				0		
19	20	19-20	KEYS BLVD	3.00	FALSE					JOM	Joint Offset Medium	2	0	0	appears sound but will need follow up in future	11.4	13.12	-10.27	-11.77	P	0.25	2	3	2	7	DA	***FISP(2)***
19	20	19-20	KEYS BLVD	3.50	FALSE			9		TFA	Tap Factory Active	0	0	0		11.4	13.12	-10.27	-11.77		0				0		
19	20	19-20	KEYS BLVD	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	11.4	13.12	-10.27	-11.77		0				0		
19	20	19-20	KEYS BLVD	43.60	FALSE					MGO	General Observation	1	0	0	INFILTRATION	11.4	13.12	-10.27	-11.77	IW	2	2	3	2	7	GRT	***CIPP(4)***
19	20	19-20	KEYS BLVD	66.70	FALSE			12		TFA	Tap Factory Active	0	0	0		11.4	13.12	-10.27	-11.77		0				0		
19	20	19-20	KEYS BLVD	66.70	FALSE			12		CL	Crack Longitudinal	1	0	0	crack @ lateral connection	11.4	13.12	-10.27	-11.77	P	0.25	3	3	2	8	GRT	***CIPP(4)***
19	20	19-20	KEYS BLVD	69.10	FALSE					MWL	Water Level	5	0	0		11.4	13.12	-10.27	-11.77	N	0	2	3	1	6	PM	
19	20	19-20	KEYS BLVD	72.20	FALSE			12		TFA	Tap Factory Active	0	0	0		11.4	13.12	-10.27	-11.77		0				0		
19	20	19-20	KEYS BLVD	72.20	FALSE					MWLS	Water Level Sag	5	0	0		11.4	13.12	-10.27	-11.77	N	0	3	3	1	7	PM	
19	20	19-20	KEYS BLVD	123.80	FALSE			10	1	ID	Infil Dripper	1	0	0	active observed	11.4	13.12	-10.27	-11.77	ID	3	3	3	2	8	CIPP(6)	***GRT***
19	20	19-20	KEYS BLVD	125.20	FALSE			12		ID	Infil Dripper	1	0	0	active observed	11.4	13.12	-10.27	-11.77	ID	3	3	3	2	8	CIPPcomb	***GRT***
19	20	19-20	KEYS BLVD	132.10	FALSE					MWL	Water Level	5	0	0		11.4	13.12	-10.27	-11.77	N	0	1	3	1	5	PM	
19	20	19-20	KEYS BLVD	152.40	FALSE					MWLS	Water Level Sag	5	0	0	water level is high with high grease content	11.4	13.12	-10.27	-11.77	N	0	3	3	1	7	PM	
19	20	19-20	KEYS BLVD	185.20	FALSE			12		TFA	Tap Factory Active	0	0	0	GREASE IN TAP, minimal	11.4	13.12	-10.27	-11.77	N	0	2	3	1	6	DA	***RC***
19	20	19-20	KEYS BLVD	186.50	FALSE			12		TFC	Tap Factory Capped	0	0	0	heavy grease build up in main,	11.4	13.12	-10.27	-11.77	N	0	3	3	2	8	PM	
19	20	19-20	KEYS BLVD	232.90	FALSE					MSA	Abandoned Survey	0	0	0	CANNOT PASS DEBRIS, may have activve I & I	11.4	13.12	-10.27	-11.77	P	0.25	4	4	3	11	RC	***FISP(1)***
19	20	19-20	KEYS BLVD	232.90	FALSE					STOP	Inspection stopped	0	0	0		11.4	13.12	-10.27	-11.77		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
20	20A	20-20A	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		13.12	14.42	-11.77	-12.86		0				0		
20	20A	20-20A	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	20	13.12	14.42	-11.77	-12.86		0				0		
20	20A	20-20A	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		13.12	14.42	-11.77	-12.86		0				0		
20	20A	20-20A	KEYS BLVD	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	13.12	14.42	-11.77	-12.86		0				0		
20	20A	20-20A	KEYS BLVD	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	13.12	14.42	-11.77	-12.86		0				0		
20	20A	20-20A	KEYS BLVD	14.60	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		13.12	14.42	-11.77	-12.86	P	0.25	1	1	1	3	DA	
20	20A	20-20A	KEYS BLVD	30.10	FALSE	YES	SL	1		TFA	Tap Factory Active	0	0	0	GREASE IN TAP, severe with roots	13.12	14.42	-11.77	-12.86	P	0.25	5	3	2	10	RC	*CIPP(2)*
20	20A	20-20A	KEYS BLVD	33.60	FALSE	YES	SL	11		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	13.12	14.42	-11.77	-12.86	P	0.25	3	2	1	6	RC	*FISP(2)*
20	20A	20-20A	KEYS BLVD	57.30	FALSE	YES	SL	1		TFA	Tap Factory Active	0	0	0	may have I & I	13.12	14.42	-11.77	-12.86	P	0.25	2	3	2	7	FISP(1)	*CIPP(2)*
20	20A	20-20A	KEYS BLVD	58.60	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		13.12	14.42	-11.77	-12.86	N	0	3	3	1	7	PM	
20	20A	20-20A	KEYS BLVD	95.30	FALSE	YES	SL	1		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	13.12	14.42	-11.77	-12.86	N	0	2	3	1	6	RC	*FISP(1)*
20	20A	20-20A	KEYS BLVD	98.30	FALSE	YES	SL	11		TFA	Tap Factory Active	0	0	0		13.12	14.42	-11.77	-12.86		0				0		
20	20A	20-20A	KEYS BLVD	126.60	FALSE	YES	SL	1		TFA	Tap Factory Active	0	0	0	possible I & I	13.12	14.42	-11.77	-12.86	P	0.25	2	3	1	6	FISP(1)	*CIPP(2)*
20	20A	20-20A	KEYS BLVD	159.60	FALSE	YES	SL	1		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	13.12	14.42	-11.77	-12.86	N	0	2	3	1	6	RC	*FISP(1)*
20	20A	20-20A	KEYS BLVD	162.80	FALSE	YES	SL	1		TFA	Tap Factory Active	0	0	0		13.12	14.42	-11.77	-12.86		0				0		
20	20A	20-20A	KEYS BLVD	196.10	FALSE	YES	SL	1		TFA	Tap Factory Active	0	0	0	possible I & I	13.12	14.42	-11.77	-12.86	P	0.25	2	3	1	6	FISP(1)	*CIPP(2)*
20	20A	20-20A	KEYS BLVD	214.60	FALSE	YES	SL	12		TFA	Tap Factory Active	0	0	0	possible 3-4 gpm I & I	13.12	14.42	-11.77	-12.86	P	0.25	2	3	3	8	FISP(1)	*GRT*
20	20A	20-20A	KEYS BLVD	230.20	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION	13.12	14.42	-11.77	-12.86	IW	2	2	3	2	7	FISP(1)	*GRT*
20	20A	20-20A	KEYS BLVD	230.20	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	may have cir crk @ jt 236.	13.12	14.42	-11.77	-12.86	P	0.25	3	3	2	8	FISP(1)	*CIPP(6)*
20	20A	20-20A	KEYS BLVD	242.90	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	13.12	14.42	-11.77	-12.86		0				0		
20	20A	20-20A	KEYS BLVD	243.70	FALSE					AMH	Manhole	0	0	0	20A	13.12	14.42	-11.77	-12.86		0				0		
20	20A	20-20A	KEYS BLVD	243.70	FALSE					STOP	Inspection stopped	0	0	0		13.12	14.42	-11.77	-12.86		0				0		
20A	27	20A-27	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		14.42	14.17	-12.86	-13.17		0				0		
20A	27	20A-27	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	20A	14.42	14.17	-12.86	-13.17		0				0		
20A	27	20A-27	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		14.42	14.17	-12.86	-13.17		0				0		
20A	27	20A-27	KEYS BLVD	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	14.42	14.17	-12.86	-13.17		0				0		
20A	27	20A-27	KEYS BLVD	2.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	possible I & I	14.42	14.17	-12.86	-13.17	P	0.25	2	3	3	8	FISP(1)	*CIPP(4)*
20A	27	20A-27	KEYS BLVD	9.60	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	HEAVY GREASE IN TAP	14.42	14.17	-12.86	-13.17	P	0.25	4	3	1	8	RC	*CIPP(2)*
20A	27	20A-27	KEYS BLVD	13.30	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	HEAVY GREASE IN TAP	14.42	14.17	-12.86	-13.17	P	0.25	4	3	1	8	RC	*FISP(2)*
20A	27	20A-27	KEYS BLVD	30.60	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0	high water and grease marks through out line	14.42	14.17	-12.86	-13.17	N	0	3	3	2	8	PM	*routine maintenance*
20A	27	20A-27	KEYS BLVD	44.70	FALSE	YES	SL	12		IG	Infil Gusher	1	0	0	active ,observed	14.42	14.17	-12.86	-13.17	IG	5	4	3	3	10	GRT	*CIPP(4)*
20A	27	20A-27	KEYS BLVD	93.60	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	14.42	14.17	-12.86	-13.17		0				0		
20A	27	20A-27	KEYS BLVD	94.10	FALSE					AMH	Manhole	0	0	0	27	14.42	14.17	-12.86	-13.17		0				0		
20A	27	20A-27	KEYS BLVD	94.10	FALSE					STOP	Inspection stopped	0	0	0		14.42	14.17	-12.86	-13.17		0				0		
26	27	26-27	EVERGLADE BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		11.9	14.17	-10.74	-13.17		0				0		
26	27	26-27	EVERGLADE BLVD	0.00	FALSE					AMH	Manhole	0	0	0	, may have I & I	11.9	14.17	-10.74	-13.17	P	0.25	1	3	2	6	FISP(2)	
26	27	26-27	EVERGLADE BLVD	0.00	FALSE					MWL	Water Level	5	0	0		11.9	14.17	-10.74	-13.17		0				0		
26	27	26-27	EVERGLADE BLVD	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	11.9	14.17	-10.74	-13.17		0				0		
26	27	26-27	EVERGLADE BLVD	2.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		11.9	14.17	-10.74	-13.17	N	0	1	1	1	3	DA	
26	27	26-27	EVERGLADE BLVD	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	11.9	14.17	-10.74	-13.17		0				0		
26	27	26-27	EVERGLADE BLVD	15.40	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		11.9	14.17	-10.74	-13.17	N	0	3	3	1	7	PM	
26	27	26-27	EVERGLADE BLVD	52.30	FALSE	YES	SL			MWL	Water Level	5	0	0		11.9	14.17	-10.74	-13.17	N	0	2	3	1	6	PM	
26	27	26-27	EVERGLADE BLVD	106.40	FALSE	YES	SL	3	4	CM	Crack Multiple	1	0	0	POSSIBLE INFILTRATION, needs further inspection	11.9	14.17	-10.74	-13.17	P	0.25	3	3	2	8	FISP(1)	*CIPP(4)*
26	27	26-27	EVERGLADE BLVD	145.60	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		11.9	14.17	-10.74	-13.17	N	0	3	3	1	7	PM	
26	27	26-27	EVERGLADE BLVD	259.50	FALSE	YES	SL			MWL	Water Level	5	0	0		11.9	14.17	-10.74	-13.17	N	0	1	2	1	4	PM	
26	27	26-27	EVERGLADE BLVD	276.90	FALSE	YES	SL	2	3	CC	Crack Circumferential	1	0	0	Crack not observed , needs further inspection	11.9	14.17	-10.74	-13.17	P	0.25	2	2	2	6	FISP(1)	*CIPP(4)*
26	27	26-27	EVERGLADE BLVD	311.70	FALSE	YES	SL			MMC	Material Change	0	0	0	VCP OR PVC	11.9	14.17	-10.74	-13.17	N	0	2	2	2	6	FISP(1)	*DA*
26	27	26-27	EVERGLADE BLVD	320.50	FALSE	YES	CIPP			MSA	Abandoned Survey	0	0	0	CANNOT PASS, replace liner , obstructing flow	11.9	14.17	-10.74	-13.17	P	0.25	3	3	3	9	RC	*CIPP*
26	27	26-27	EVERGLADE BLVD	320.50	FALSE					STOP	Inspection stopped	0	0	0		11.9	14.17	-10.74	-13.17		0				0		
32	23	32-23_1	SURF LN	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	0.00	FALSE					AMH	Manhole	0	0	0	32	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	0.00	FALSE					MWL	Water Level	5	0	0		5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	10.10	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		5.31	6.5	-4.19	-5.45	N	0	1	1	1	3	DA	
32	23	32-23_1	SURF LN	26.20	FALSE	YES	SL	3	4	CC	Crack Circumferential	1	0	0	POSSIBLE INFILTRATION, needs further inspection	5.31	6.5	-4.19	-5.45	P	0.25	2	2	2	6	FISP(1)	*CIPP(4)*
32	23	32-23_1	SURF LN	37.30	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	40.40	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	50.60	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		5.31	6.5	-4.19	-5.45	N	0	3	3	1	7	PM	
32	23	32-23_1	SURF LN	66.70	FALSE	YES	SL			MWL	Water Level	5	0	0		5.31	6.5	-4.19	-5.45	N	0	1	2	1	4	PM	
32	23	32-23_1	SURF LN	93.90	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	103.60	FALSE	YES	SL			MGP	General Photo	1	0	0	POSSIBLE INFILTRATION, observed as active	5.31	6.5	-4.19	-5.45	IW	2	2	3	2	7	GRT	*CIPP*
32	23	32-23_1	SURF LN	104.50	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	106.60	FALSE	YES	SL			MWL	Water Level	5	0	0	Camera was actually under water for awhile	5.31	6.5	-4.19	-5.45	P	0.25	4	3	2	9	PM	*routine maintenance*
32	23	32-23_1	SURF LN	137.80	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	171.40	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	174.80	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	206.90	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		5.31	6.5	-4.19	-5.45	N	0	3	3	1	7	PM	
32	23	32-23_1	SURF LN	246.00	FALSE	YES	SL			JAM	Joint Angular Medium	2	0	0	DOWN, lfdl and possible I & I	5.31	6.5	-4.19	-5.45	p	0.25	3	3	2	8	FISP(1)	*CIPP(4)*
32	23	32-23_1	SURF LN	249.70	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	250.20	FALSE					AMH	Manhole	0	0	0	23	5.31	6.5	-4.19	-5.45		0				0		
32	23	32-23_1	SURF LN	250.20	FALSE					STOP	Inspection stopped	0	0	0		5.31	6.5	-4.19	-5.45		0				0		
35	24	35-24_3	PEBBLE WY	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	0.00	FALSE					AMH	Manhole	0	0	0	35	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	0.00	FALSE					MWL	Water Level	5	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	2.00	FALSE	YES	SL	1	6	CC	Crack Circumferential	1	0	0		7.16	7.95	-5.87	-7.14	P	0.25	3	3	2	8	CIPP(4)	*FISP*
35	24	35-24_3	PEBBLE WY	2.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.16	7.95	-5.87	-7.14	N	0	1	1	1	3	DA	
35	24	35-24_3	PEBBLE WY	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	12.20	FALSE	YES	SL	1	6	CC	Crack Circumferential	1	0	0	not observed, needs further inspection	7.16	7.95	-5.87	-7.14	P	0.25	2	3	2	7	FISP(1)	*CIPP(4)*
35	24	35-24_3	PEBBLE WY	13.30	FALSE	YES	SL	3		TFA	Tap Factory Active	4	0	0	previous repair, needs follow up inspection	7.16	7.95	-5.87	-7.14	P	0.25	2	3	1	6	FISP(1)	*CIPP(2)*
35	24	35-24_3	PEBBLE WY	31.70	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	43.80	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRAION AT 6 AND 4 O CLOCK	7.16	7.95	-5.87	-7.14	P	0.25	2	3	2	7	FISP(1)	*CIPP(4)*
35	24	35-24_3	PEBBLE WY	44.80	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	88.30	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	90.40	FALSE	YES	SL	4	8	CC	Crack Circumferential	1	0	0	crack not well defined	7.16	7.95	-5.87	-7.14	P	0.25	3	3	2	8	FISP(1)	*CIPP*
35	24	35-24_3	PEBBLE WY	90.40	FALSE	YES	SL	3	5	CC	Crack Circumferential	1	0	0	crack not well defined	7.16	7.95	-5.87	-7.14	P	0.25	3	3	2	8	FISP(1)	*CIPP*
35	24	35-24_3	PEBBLE WY	93.40	FALSE	YES	SL	3	4	CM	Crack Multiple	1	0	0	crack not well defined	7.16	7.95	-5.87	-7.14	P	0.25	3	3	2	8	FISP(1)	*CIPP*
35	24	35-24_3	PEBBLE WY	121.90	FALSE	YES	SL			MWL	Water Level	5	0	0		7.16	7.95	-5.87	-7.14	N	0	2	3	1	6	PM	

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
35	24	35-24_3	PEBBLE WY	124.60	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	146.60	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION	7.16	7.95	-5.87	-7.14	P	0.25	2	3	2	7	FISP(1)	***GRT***
35	24	35-24_3	PEBBLE WY	147.70	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	168.70	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		7.16	7.95	-5.87	-7.14	N	0	3	3	1	7	PM	
35	24	35-24_3	PEBBLE WY	169.60	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	191.20	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	194.40	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	203.80	FALSE	YES	SL			MWL	Water Level	5	0	0	may have I & I @ jt	7.16	7.95	-5.87	-7.14	P	0.25	2	3	1	6	FISP(1)	***CIPP(4)***
35	24	35-24_3	PEBBLE WY	250.20	FALSE	YES	SL			JAL	Joint Angular Large	2	0	0	DOWN	7.16	7.95	-5.87	-7.14	P	0.25	2	3	1	6	DA	***FISP***
35	24	35-24_3	PEBBLE WY	255.80	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	255.80	FALSE					AMH	Manhole	0	0	0	24	7.16	7.95	-5.87	-7.14		0				0		
35	24	35-24_3	PEBBLE WY	255.80	FALSE					STOP	Inspection stopped	0	0	0		7.16	7.95	-5.87	-7.14		0				0		
38	39	38-39_2	BASS LN	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	0.00	FALSE					AMH	Manhole	0	0	0	38	6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	0.00	FALSE					MWL	Water Level	5	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	3.80	FALSE			10		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	14.00	FALSE			6		LFDL	Lining Failure Delaminating	4	0	0		6.17	7.81	-5.17	-7.07	N	0	1	1	1	3	DA	
38	39	38-39_2	BASS LN	20.20	FALSE			3		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	38.90	FALSE					MWL	Water Level	5	0	0	possible infil @ joint 32 ft, high grease marks	6.17	7.81	-5.17	-7.07	P	0.25	3	3	2	8	FISP(1)	***PM***
38	39	38-39_2	BASS LN	41.70	FALSE					MWLS	Water Level Sag	5	0	0		6.17	7.81	-5.17	-7.07	N	0	3	3	1	7	PM	
38	39	38-39_2	BASS LN	52.10	FALSE					MGO	General Observation	1	0	0	INFILTRATION 5 O'CLOCK, weeper	6.17	7.81	-5.17	-7.07	IW	2	3	3	2	8	CIPP(4)	***GRT***
38	39	38-39_2	BASS LN	55.10	FALSE					MWL	Water Level	5	0	0		6.17	7.81	-5.17	-7.07	N	0	2	3	1	6	PM	
38	39	38-39_2	BASS LN	63.10	FALSE			3		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	66.40	FALSE			9		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	69.00	FALSE					MWL	Water Level	5	0	0		6.17	7.81	-5.17	-7.07	N	0	2	3	1	6	PM	
38	39	38-39_2	BASS LN	99.80	FALSE			3		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	102.00	FALSE					MGO	General Observation	1	0	0	POSSIBLE INFILTRATION	6.17	7.81	-5.17	-7.07	P	0.25	3	3	2	8	GRT	***CIPP***
38	39	38-39_2	BASS LN	113.30	FALSE					MWL	Water Level	5	0	0		6.17	7.81	-5.17	-7.07	N	0	2	3	1	6	PM	
38	39	38-39_2	BASS LN	116.20	FALSE					MWLS	Water Level Sag	5	0	0	camera is under water , sag is greater than noted	6.17	7.81	-5.17	-7.07	N	0	4	3	2	9	PM	***routine flushing***
38	39	38-39_2	BASS LN	123.00	FALSE			9		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	126.10	FALSE			3		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	130.70	FALSE					MWL	Water Level	5	0	0		6.17	7.81	-5.17	-7.07	N	0	2	3	1	6	PM	
38	39	38-39_2	BASS LN	135.80	FALSE			9		CL	Crack Longitudinal	1	0	0	needs follow up to clearly identify	6.17	7.81	-5.17	-7.07	P	0.25	2	3	2	7	FISP(1)	***CIPP(4)***
38	39	38-39_2	BASS LN	169.40	FALSE			3		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	192.60	FALSE			9		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	205.90	FALSE			3		TFA	Tap Factory Active	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	217.40	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	218.60	FALSE					AMH	Manhole	0	0	0	39	6.17	7.81	-5.17	-7.07		0				0		
38	39	38-39_2	BASS LN	218.60	FALSE					STOP	Inspection stopped	0	0	0		6.17	7.81	-5.17	-7.07		0				0		
39	25	39-25	BASS LN	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	0.00	FALSE					AMH	Manhole	0	0	0	39	7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	0.00	FALSE					MWL	Water Level	5	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	2.00	FALSE	YES	CIPP			MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	2.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		7.81	9.9	-7.07	-8.84	N	0	2	1	1	4	DA	
39	25	39-25	BASS LN	10.00	FALSE	YES	CIPP			MGP	General Photo	0	0	0	CAMERA SET, existing CIPP patch, intact 11-14ft	7.81	9.9	-7.07	-8.84	N	0	2	3	1	6	FISP(2)	
39	25	39-25	BASS LN	23.70	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	27.00	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	60.30	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	93.70	FALSE	YES	?	10		TFA	Tap Factory Active	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	96.90	FALSE	YES	?	3		TFA	Tap Factory Active	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	98.10	FALSE	YES	?			MWL	Water Level	5	0	0		7.81	9.9	-7.07	-8.84	N	0	2	3	1	6	PM	
39	25	39-25	BASS LN	109.00	FALSE	YES	?	11		CL	Crack Longitudinal	1	0	0	crack is not well defined , needs further inspection	7.81	9.9	-7.07	-8.84	P	0.25	2	3	2	7	FISP(1)	***CIPP(4)***
39	25	39-25	BASS LN	125.80	FALSE	YES	?			MWLS	Water Level Sag	5	0	0		7.81	9.9	-7.07	-8.84	N	0	3	3	1	7	PM	
39	25	39-25	BASS LN	130.30	FALSE	YES	?	2		TFA	Tap Factory Active	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	138.60	FALSE	YES	?			MWL	Water Level	5	0	0		7.81	9.9	-7.07	-8.84	N	0	2	3	1	6	PM	
39	25	39-25	BASS LN	143.60	FALSE	YES	?	9		TFA	Tap Factory Active	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	186.00	FALSE	YES	?	3	4	CM	Crack Multiple	1	0	0	crack is not well defined , needs further inspection	7.81	9.9	-7.07	-8.84	P	0.25	2	3	2	7	FISP(1)	***CIPP(4)***
39	25	39-25	BASS LN	187.80	FALSE	YES	?			MWL	Water Level	5	0	0		7.81	9.9	-7.07	-8.84	N	0				0	DA	
39	25	39-25	BASS LN	197.30	FALSE	YES	?	1		TFA	Tap Factory Active	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	200.50	FALSE	YES	?	10		TFA	Tap Factory Active	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	212.60	FALSE	YES	?			MWL	Water Level	5	0	0		7.81	9.9	-7.07	-8.84	N	0	2	3	1	6	PM	
39	25	39-25	BASS LN	226.90	FALSE	YES	?			MWL	Water Level	5	0	0		7.81	9.9	-7.07	-8.84	N	0	1	3	1	5	PM	
39	25	39-25	BASS LN	252.40	FALSE	YES	?			MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	252.50	FALSE					AMH	Manhole	0	0	0	25	7.81	9.9	-7.07	-8.84		0				0		
39	25	39-25	BASS LN	252.50	FALSE					STOP	Inspection stopped	0	0	0		7.81	9.9	-7.07	-8.84		0				0		
40	41	40-41	SPINNAKER CT	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	0.00	FALSE					AMH	Manhole	0	0	0	40	4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	0.00	FALSE					MWL	Water Level	5	0	0		4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	34.40	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	40.80	FALSE	YES	SL	5	7	DAGS	Deposits Attached Grease	0	0	0	CONTINUOUS	4.22	7.44	-2.99	-6.81	N	0	3	3	1	7	PM	
40	41	40-41	SPINNAKER CT	47.80	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	91.10	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	114.40	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	114.40	FALSE	YES	SL	4	7	DAGS	Deposits Attached Grease	0	0	0	CONTINUOUS	4.22	7.44	-2.99	-6.81	N	0	3	3	1	7	PM	
40	41	40-41	SPINNAKER CT	140.80	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0		4.22	7.44	-2.99	-6.81	N	0	3	3	1	7	PM	
40	41	40-41	SPINNAKER CT	152.70	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	has roots or debris in tap	4.22	7.44	-2.99	-6.81	P	0.25	3	3	2	8	RC	***CIPP(2)***
40	41	40-41	SPINNAKER CT	154.20	FALSE	YES	SL			MWL	Water Level	5	0	0		4.22	7.44	-2.99	-6.81	N	0	1	3	1	5	PM	
40	41	40-41	SPINNAKER CT	175.70	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	201.70	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	202.50	FALSE					AMH	Manhole	0	0	0	41	4.22	7.44	-2.99	-6.81		0				0		
40	41	40-41	SPINNAKER CT	202.50	FALSE					STOP	Inspection stopped	0	0	0		4.22	7.44	-2.99	-6.81		0				0		
40A	40	40A-40	SPINNAKER CT	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	0.00	TRUE					AMH	Manhole	0	0	0	40	2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	0.00	TRUE					MWL	Water Level	5	0	0		2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	2.00	TRUE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	2.21	4.22	-0.29	-2.99		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
40A	40	40A-40	SPINNAKER CT	2.50	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	jt offset @ 3ft also	2.21	4.22	-0.29	-2.99	P	0.25	2	3	2	7	FISP(2)	***CIPP(4)***
40A	40	40A-40	SPINNAKER CT	4.60	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0		2.21	4.22	-0.29	-2.99	N	0	3	3	1	7	PM	
40A	40	40A-40	SPINNAKER CT	10.00	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	20.90	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	22.50	TRUE	YES	SL			MWL	Water Level	5	0	0		2.21	4.22	-0.29	-2.99	N	0	2	3	1	6	PM	
40A	40	40A-40	SPINNAKER CT	24.10	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	48.20	TRUE	YES	SL			MWL	Water Level	5	0	0		2.21	4.22	-0.29	-2.99	N	0	2	3	1	6	PM	
40A	40	40A-40	SPINNAKER CT	75.30	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0		2.21	4.22	-0.29	-2.99	N	0	3	3	1	7	PM	
40A	40	40A-40	SPINNAKER CT	87.50	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	106.30	TRUE	YES	SL			MWL	Water Level	5	0	0		2.21	4.22	-0.29	-2.99	N	0	2	3	1	6	PM	
40A	40	40A-40	SPINNAKER CT	123.90	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	135.00	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0		2.21	4.22	-0.29	-2.99	N	0	3	3	1	7	PM	
40A	40	40A-40	SPINNAKER CT	136.60	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	150.20	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	153.60	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	156.00	TRUE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	156.00	TRUE					AMH	Manhole	0	0	0	40A	2.21	4.22	-0.29	-2.99		0				0		
40A	40	40A-40	SPINNAKER CT	156.00	TRUE					STOP	Inspection stopped	0	0	0		2.21	4.22	-0.29	-2.99		0				0		
41	26	41-26	SPINNAKER CT	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		7.44	11.9	-6.81	-10.74		0				0		
41	26	41-26	SPINNAKER CT	0.00	FALSE					AMH	Manhole	0	0	0	41	7.44	11.9	-6.81	-10.74		0				0		
41	26	41-26	SPINNAKER CT	0.00	FALSE					MWL	Water Level	5	0	0		7.44	11.9	-6.81	-10.74		0				0		
41	26	41-26	SPINNAKER CT	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT, possible crack @ 6FT	7.44	11.9	-6.81	-10.74	P	0.25	2	3	2	7	FISP(1)	***GRT***
41	26	41-26	SPINNAKER CT	37.60	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	high grease deposits in main	7.44	11.9	-6.81	-10.74	N	0	4	3	1	8	PM	***routine flushing***
41	26	41-26	SPINNAKER CT	66.10	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.44	11.9	-6.81	-10.74		0				0		
41	26	41-26	SPINNAKER CT	98.70	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		7.44	11.9	-6.81	-10.74		0				0		
41	26	41-26	SPINNAKER CT	122.00	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	debris in tap , needs follow up	7.44	11.9	-6.81	-10.74	P	0.25	2	3	2	7	RC	***CIPP(2)***
41	26	41-26	SPINNAKER CT	165.30	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0	high volume of "clean water" flowing	7.44	11.9	-6.81	-10.74	P	0.25	2	3	2	7	FISP(1)	***CIPP(2)***
41	26	41-26	SPINNAKER CT	178.30	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		7.44	11.9	-6.81	-10.74		0				0		
41	26	41-26	SPINNAKER CT	217.60	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0	water and grease level higher than noted	7.44	11.9	-6.81	-10.74	N	0	4	3	2	9	PM	***routine flushing***
41	26	41-26	SPINNAKER CT	233.90	FALSE	YES	CIPP			MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.44	11.9	-6.81	-10.74		0				0		
41	26	41-26	SPINNAKER CT	233.90	FALSE					AMH	Manhole	0	0	0	26, has stains at joints indicating infil	7.44	11.9	-6.81	-10.74	P	0.25	2	3	2	7	FISP(2)	***GRT***
41	26	41-26	SPINNAKER CT	233.90	FALSE					STOP	Inspection stopped	0	0	0		7.44	11.9	-6.81	-10.74		0				0		
43	44	43-44_1	SPINNAKER CT	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	0.00	FALSE					AMH	Manhole	0	0	0	43	8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	0.00	FALSE					MWL	Water Level	5	0	0		8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	2.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	many joints are chipped,brkn may need slip line	8.43	9.61	-7.27	-8.78	P	0.25	3	3	2	8	FISP(2)	***CIPP***
43	44	43-44_1	SPINNAKER CT	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	25.20	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0	water level and marks are higher than noted	8.43	9.61	-7.27	-8.78	N	0	4	3	1	8	PM	***routine flushing***
43	44	43-44_1	SPINNAKER CT	27.40	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	some grease build up	8.43	9.61	-7.27	-8.78	P	0.25	3	2	1	6	RC	***FISP(2)***
43	44	43-44_1	SPINNAKER CT	36.90	FALSE	YES	SL			MWL	Water Level	5	0	0		8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	60.70	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	63.80	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	97.30	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	119.40	FALSE	YES	SL	3	4	CM	Crack Multiple	1	0	0	appears to be surface crack, needs follow up	8.43	9.61	-7.27	-8.78	P	0.25	2	3	2	7	FISP(1)	***CIPP(4)***
43	44	43-44_1	SPINNAKER CT	120.40	FALSE	YES	SL	10		TFA	Tap Factory Active	0	0	0		8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	133.70	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	167.20	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	180.40	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	203.60	FALSE	YES	SL	2		TFA	Tap Factory Active	0	0	0	possible infil at connection	8.43	9.61	-7.27	-8.78	P	0.25	2	3	2	7	FISP(1)	***GRT***
43	44	43-44_1	SPINNAKER CT	215.70	FALSE	YES	CIPP			D	Deformed	4	0	0	previous patch is failing,bulging	8.43	9.61	-7.27	-8.78	P	0.25	3	4	3	10	CIPP(4)	***FISP(1)***
43	44	43-44_1	SPINNAKER CT	215.70	FALSE	YES	?			MGP	General Photo	0	0	0	END OF LINE SEGMENT	8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	215.70	FALSE					AMH	Manhole	0	0	0	44 CANNOT REACH MANHOLE	8.43	9.61	-7.27	-8.78		0				0		
43	44	43-44_1	SPINNAKER CT	215.70	FALSE					STOP	Inspection stopped	0	0	0		8.43	9.61	-7.27	-8.78		0				0		
44	26	44-26	SPINNAKER CT	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		9.61	11.9	-8.78	-10.74		0				0		
44	26	44-26	SPINNAKER CT	0.00	FALSE					MWL	Water Level	5	0	0		9.61	11.9	-8.78	-10.74		0				0		
44	26	44-26	SPINNAKER CT	0.00	FALSE					AMH	Manhole	0	0	0	44	9.61	11.9	-8.78	-10.74		0				0		
44	26	44-26	SPINNAKER CT	2.00	FALSE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	9.61	11.9	-8.78	-10.74		0				0		
44	26	44-26	SPINNAKER CT	2.00	FALSE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0	many joints are chipped,brkn may need slip line	9.61	11.9	-8.78	-10.74	P	0.25	3	3	2	8	CIPP(4)	***FISP***
44	26	44-26	SPINNAKER CT	10.00	FALSE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	9.61	11.9	-8.78	-10.74		0				0		
44	26	44-26	SPINNAKER CT	17.60	FALSE	YES	SL			MWL	Water Level	5	0	0	high water marks and grease line	9.61	11.9	-8.78	-10.74	N	0	4	3	1	8	PM	***routine flushing***
44	26	44-26	SPINNAKER CT	21.30	FALSE	YES	SL	10		TFA	Tap Factory Active	0	0	0	GREASE IN TAP, also suspect infil at 1st jt	9.61	11.9	-8.78	-10.74	P	0.25	3	3	2	8	RC	***CIPP(2)***
44	26	44-26	SPINNAKER CT	24.40	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	HEAVY GREASE IN TAP	9.61	11.9	-8.78	-10.74	P	0.25	4	3	1	8	RC	***FISP(2)***
44	26	44-26	SPINNAKER CT	26.10	FALSE	YES	SL			MWL	Water Level	5	0	0	high water marks and grease line	9.61	11.9	-8.78	-10.74	N	0	3	3	1	7	PM	
44	26	44-26	SPINNAKER CT	57.70	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	HEAVY GREASE IN TAP	9.61	11.9	-8.78	-10.74	P	0.25	4	3	2	9	RC	***PM***
44	26	44-26	SPINNAKER CT	77.50	FALSE	YES	SL			MWL	Water Level	5	0	0	high water marks and grease line	9.61	11.9	-8.78	-10.74	N	0	3	3	1	7	PM	
44	26	44-26	SPINNAKER CT	81.00	FALSE	YES	SL	10		TFA	Tap Factory Active	0	0	0	HEAVY GREASE IN TAP	9.61	11.9	-8.78	-10.74	P	0.25	4	3	2	9	RC	***PM***
44	26	44-26	SPINNAKER CT	92.90	FALSE	YES	SL	5		CL	Crack Longitudinal	1	0	0	may only be crk in liner, follow up	9.61	11.9	-8.78	-10.74	P	0.25	2	3	2	7	FISP(1)	***CIPP(4)***
44	26	44-26	SPINNAKER CT	94.30	FALSE	YES	SL	2		TFA	Tap Factory Active	0	0	0		9.61	11.9	-8.78	-10.74		0				0		
44	26	44-26	SPINNAKER CT	106.10	FALSE	YES	SL	9	10	CC	Crack Circumferential	1	0	0	may only be crk in liner, follow up	9.61	11.9	-8.78	-10.74	P	0.25	2	3	2	7	FISP(1)	***CIPP(4)***
44	26	44-26	SPINNAKER CT	122.20	FALSE	YES	SL			MWLS	Water Level Sag	5	0	0	high water marks and grease line	9.61	11.9	-8.78	-10.74	N	0	4	3	1	8	PM	***routine flushing***
44	26	44-26	SPINNAKER CT	127.00	FALSE	YES	SL	4		CL	Crack Longitudinal	1	0	0	may only be crk in liner, follow up	9.61	11.9	-8.78	-10.74	P	0.25	2	3	2	7	FISP(1)	***CIPP(4)***
44	26	44-26	SPINNAKER CT	127.60	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0	heavy grea se in tap observed	9.61	11.9	-8.78	-10.74	P	0.25	4	2	1	7	RC	***FISP(2)***
44	26	44-26	SPINNAKER CT	140.60	FALSE	YES	SL	10		TFA	Tap Factory Active	0	0	0	GREASE IN TAP	9.61	11.9	-8.78	-10.74	P	0.25	3	3	2	8	RC	
44	26	44-26	SPINNAKER CT	141.80	FALSE	YES	SL	12		DAGS	Deposits Attached Grease	0	0	0		9.61	11.9	-8.78	-10.74	N	0	3	3	1	7	PM	
44	26	44-26	SPINNAKER CT	162.40	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION, at joint	9.61	11.9	-8.78	-10.74	P	0.25	2	3	2	7	FISP(1)	***CIPP(4)***
44	26	44-26	SPINNAKER CT	191.30	FALSE	YES	SL			MWL	Water Level	5	0	0		9.61	11.9	-8.78	-10.74	N	0	2	3	1	6	PM	
44	26	44-26	SPINNAKER CT	193.30	FALSE	YES	SL	3		TFA	Tap Factory Active	0	0	0		9.61	11.9	-8.78	-10.74		0				0		
44	26	44-26	SPINNAKER CT	193.90	FALSE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION ABOVE TAP 3 O'CLOCK	9.61	11.9	-8.78	-10.74	P	0.25	3	3	2	8	FISP(1)	***GRT***
44	26	44-26	SPINNAKER CT	196.80	FALSE	YES	SL	9		TFA	Tap Factory Active	0	0	0		9.61	11.9	-8.78	-10.74		0				0		
44	26	44-26	SPINNAKER CT	250.00	FALSE	YES	SL			MGP	General Photo	0	0	0	END OF LINE SEGMENT	9.61	11.9	-8.78	-10.74		0				0		
44	26	44-26	SPINNAKER CT	250.00	FALSE					AMH	Manhole	0	0	0	26	9.61	11.9	-8.78	-10.74		0				0		
44	26	44-26	SPINNAKER CT	250.00	FALSE					STOP	Inspection stopped	0	0	0		9.61	11.9	-8.78	-10.74		0				0		
67A	67	67A-67	MARINA VILLAGE	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	0.00	FALSE					AMH	Manhole	0	0	0	67A	4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	0.00	FALSE					MWL	Water Level	5	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	1.40	FALSE			12		TFA	Tap Factory Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	4.20	FALSE					MGP	General Photo	0	0	0	BOTTOM OF WYE	4.51	5.48	-3.91	-5.94	N	0	1	1	1	3	DA	
67A	67	67A-67	MARINA VILLAGE	4.30	FALSE			3		TFA	Tap Factory Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
67A	67	67A-67	MARINA VILLAGE	7.50	FALSE			9		TFA	Tap Factory Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	30.60	FALSE			3	9	LFDL	Lining Failure Delaminating	4	0	0	CONTINUOUS	4.51	5.48	-3.91	-5.94	N	0	2	1	1	4	DA	
67A	67	67A-67	MARINA VILLAGE	31.30	FALSE			2		TFA	Tap Factory Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	38.00	FALSE			9		TFA	Tap Factory Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	74.70	FALSE					MWL	Water Level	5	0	0		4.51	5.48	-3.91	-5.94	N	0	2	3	1	6	PM	
67A	67	67A-67	MARINA VILLAGE	81.00	FALSE			3		TFA	Tap Factory Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	94.30	FALSE			9		TFA	Tap Factory Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	142.10	FALSE			2		TFA	Tap Factory Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	155.10	FALSE			9		TFA	Tap Factory Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	203.00	FALSE			2		TFA	Tap Factory Active	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	203.10	FALSE					AMH	Manhole	0	0	0	67	4.51	5.48	-3.91	-5.94		0				0		
67A	67	67A-67	MARINA VILLAGE	203.10	FALSE					STOP	Inspection stopped	0	0	0		4.51	5.48	-3.91	-5.94		0				0		
73	78	73-78	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		4.03	3.07	-0.52	1.92		0				0		
73	78	73-78	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	73	4.03	3.07	-0.52	1.92		0				0		
73	78	73-78	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		4.03	3.07	-0.52	1.92		0				0		
73	78	73-78	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	4.03	3.07	-0.52	1.92		0				0		
73	78	73-78	KEYS BLVD	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	4.03	3.07	-0.52	1.92		0				0		
73	78	73-78	KEYS BLVD	72.60	FALSE					MWL	Water Level	5	0	0		4.03	3.07	-0.52	1.92	N	0	2	3	1	6	PM	
73	78	73-78	KEYS BLVD	79.80	FALSE					MWLS	Water Level Sag	5	0	0		4.03	3.07	-0.52	1.92	N	0	3	3	1	7	PM	
73	78	73-78	KEYS BLVD	123.90	FALSE					MWL	Water Level	5	0	0		4.03	3.07	-0.52	1.92	N	0	2	3	1	6	PM	
73	78	73-78	KEYS BLVD	160.50	FALSE					MWLS	Water Level Sag	5	0	0		4.03	3.07	-0.52	1.92	N	0	3	3	1	7	PM	
73	78	73-78	KEYS BLVD	160.50	FALSE					MWLS	Water Level Sag	5	0	0		4.03	3.07	-0.52	1.92	N	0	3	3	1	7	PM	
73	78	73-78	KEYS BLVD	198.30	FALSE					MWLS	Water Level Sag	5	0	0		4.03	3.07	-0.52	1.92	N	0	3	3	1	7	PM	
73	78	73-78	KEYS BLVD	253.50	FALSE					MWL	Water Level	5	0	0		4.03	3.07	-0.52	1.92	N	0	2	3	1	6	PM	
73	78	73-78	KEYS BLVD	270.00	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	4.03	3.07	-0.52	1.92		0				0		
73	78	73-78	KEYS BLVD	271.70	FALSE					AMH	Manhole	0	0	0	78	4.03	3.07	-0.52	1.92		0				0		
73	78	73-78	KEYS BLVD	271.70	FALSE					STOP	Inspection stopped	0	0	0		4.03	3.07	-0.52	1.92		0				0		
78	79	78-79_1	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		3.07	2.99	1.92	-2.46		0				0		
78	79	78-79_1	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	78	3.07	2.99	1.92	-2.46		0				0		
78	79	78-79_1	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		3.07	2.99	1.92	-2.46	N	0	2	3	1	6	PM	
78	79	78-79_1	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	3.07	2.99	1.92	-2.46		0				0		
78	79	78-79_1	KEYS BLVD	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	3.07	2.99	1.92	-2.46		0				0		
78	79	78-79_1	KEYS BLVD	26.20	FALSE					MWLS	Water Level Sag	5	0	0		3.07	2.99	1.92	-2.46	N	0	3	3	1	7	PM	
78	79	78-79_1	KEYS BLVD	38.70	FALSE					MWLS	Water Level Sag	5	0	0		3.07	2.99	1.92	-2.46	N	0	3	3	1	7	PM	
78	79	78-79_1	KEYS BLVD	62.20	FALSE					MWL	Water Level	5	0	0		3.07	2.99	1.92	-2.46	N	0	2	2	1	5	PM	
78	79	78-79_1	KEYS BLVD	82.30	FALSE					MWLS	Water Level Sag	5	0	0		3.07	2.99	1.92	-2.46	N	0	3	3	1	7	PM	
78	79	78-79_1	KEYS BLVD	107.40	FALSE					MWL	Water Level	5	0	0		3.07	2.99	1.92	-2.46	N	0	1	2	1	4	PM	
78	79	78-79_1	KEYS BLVD	126.10	FALSE					MWLS	Water Level Sag	5	0	0		3.07	2.99	1.92	-2.46	N	0	3	3	1	7	PM	
78	79	78-79_1	KEYS BLVD	194.90	FALSE					MWLS	Water Level Sag	5	0	0		3.07	2.99	1.92	-2.46	N	0	3	3	1	7	PM	
78	79	78-79_1	KEYS BLVD	232.40	FALSE					MWLS	Water Level Sag	5	0	0		3.07	2.99	1.92	-2.46	N	0	3	3	1	7	PM	
78	79	78-79_1	KEYS BLVD	253.50	FALSE					MWL	Water Level	5	0	0		3.07	2.99	1.92	-2.46	N	0	2	3	1	6	PM	
78	79	78-79_1	KEYS BLVD	314.30	FALSE					MSA	Abandoned Survey	0	0	0	CANNOT PASS OBJECT	3.07	2.99	1.92	-2.46	N	0	4	4	2	10	RC	*FISP(1)*
78	79	78-79_1	KEYS BLVD	314.30	FALSE					STOP	Inspection stopped	0	0	0		3.07	2.99	1.92	-2.46		0				0		
78	79	78-79_2	KEYS BLVD	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		3.07	2.99	1.92	-2.46		0				0		
78	79	78-79_2	KEYS BLVD	0.00	TRUE					AMH	Manhole	0	0	0	79	3.07	2.99	1.92	-2.46		0				0		
78	79	78-79_2	KEYS BLVD	0.00	TRUE					MWL	Water Level	5	0	0		3.07	2.99	1.92	-2.46	N	0	2	3	1	6	PM	
78	79	78-79_2	KEYS BLVD	2.00	TRUE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	3.07	2.99	1.92	-2.46		0				0		
78	79	78-79_2	KEYS BLVD	3.50	TRUE					MSA	Abandoned Survey	0	0	0	CANNOT PASS OBJECT, possible cir crk also	3.07	2.99	1.92	-2.46	P	0.25	4	3	2	9	RC	*CIPP(4)*
78	79	78-79_2	KEYS BLVD	3.50	TRUE					STOP	Inspection stopped	0	0	0		3.07	2.99	1.92	-2.46		0				0		
79	82	79-82	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		2.99	3.19	-2.46	-3.46		0				0		
79	82	79-82	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	79	2.99	3.19	-2.46	-3.46		0				0		
79	82	79-82	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		2.99	3.19	-2.46	-3.46		0				0		
79	82	79-82	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	2.99	3.19	-2.46	-3.46		0				0		
79	82	79-82	KEYS BLVD	3.90	FALSE					MWLS	Water Level Sag	5	0	0	water and grease level higher than noted	2.99	3.19	-2.46	-3.46	N	0	4	3	1	8	PM	*routine flushing*
79	82	79-82	KEYS BLVD	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	2.99	3.19	-2.46	-3.46		0				0		
79	82	79-82	KEYS BLVD	38.50	FALSE					MWL	Water Level	5	0	0		2.99	3.19	-2.46	-3.46	N	0	2	3	1	6	PM	
79	82	79-82	KEYS BLVD	52.30	FALSE					MWLS	Water Level Sag	5	0	0	water and grease level higher than noted	2.99	3.19	-2.46	-3.46	N	0	4	3	1	8	PM	*routine flushing*
79	82	79-82	KEYS BLVD	72.50	FALSE					MWL	Water Level	5	0	0		2.99	3.19	-2.46	-3.46		0	2	3	1	6	PM	
79	82	79-82	KEYS BLVD	89.40	FALSE					MWLS	Water Level Sag	5	0	0	water and grease level higher than noted	2.99	3.19	-2.46	-3.46	N	0	5	3	1	9	PM	*routine flushing*
79	82	79-82	KEYS BLVD	100.90	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	2.99	3.19	-2.46	-3.46		0				0		
79	82	79-82	KEYS BLVD	101.90	FALSE					AMH	Manhole	0	0	0	82A	2.99	3.19	-2.46	-3.46		0				0		
79	82	79-82	KEYS BLVD	101.90	FALSE					STOP	Inspection stopped	0	0	0		2.99	3.19	-2.46	-3.46		0				0		
82	85	82-85_3	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		3.19	8.02	-3.46	-5.9		0				0		
82	85	82-85_3	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	82, use pole cam to confirm I & I	3.19	8.02	-3.46	-5.9		0				0		
82	85	82-85_3	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		3.19	8.02	-3.46	-5.9		0				0		
82	85	82-85_3	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	3.19	8.02	-3.46	-5.9		0				0		
82	85	82-85_3	KEYS BLVD	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	3.19	8.02	-3.46	-5.9		0				0		
82	85	82-85_3	KEYS BLVD	21.20	FALSE					MWLS	Water Level Sag	5	0	0		3.19	8.02	-3.46	-5.9	N	0	3	3	1	7	PM	*ROUTINE FLUSHING*
82	85	82-85_3	KEYS BLVD	52.20	FALSE					MWL	Water Level	5	0	0		3.19	8.02	-3.46	-5.9	N	0	2	3	1	6	PM	*OF LINE*
82	85	82-85_3	KEYS BLVD	73.00	FALSE					MWLS	Water Level Sag	5	0	0		3.19	8.02	-3.46	-5.9	N	0	3	3	1	7	PM	
82	85	82-85_3	KEYS BLVD	98.50	FALSE					MWL	Water Level	5	0	0		3.19	8.02	-3.46	-5.9	N	0	1	3	1	5	PM	
82	85	82-85_3	KEYS BLVD	116.80	FALSE					MWLS	Water Level Sag	5	0	0		3.19	8.02	-3.46	-5.9	N	0	3	3	1	7	PM	
82	85	82-85_3	KEYS BLVD	127.20	FALSE					MWL	Water Level	5	0	0		3.19	8.02	-3.46	-5.9	N	0	2	3	1	6	PM	
82	85	82-85_3	KEYS BLVD	143.00	FALSE					MWLS	Water Level Sag	5	0	0		3.19	8.02	-3.46	-5.9	N	0	3	3	1	7	PM	
82	85	82-85_3	KEYS BLVD	165.90	FALSE					MWLS	Water Level Sag	5	0	0		3.19	8.02	-3.46	-5.9	N	0	3	3	1	7	PM	
82	85	82-85_3	KEYS BLVD	205.20	FALSE					MWL	Water Level	5	0	0		3.19	8.02	-3.46	-5.9	N	0	1	3	1	5	PM	
82	85	82-85_3	KEYS BLVD	240.60	FALSE					MWLS	Water Level Sag	5	0	0		3.19	8.02	-3.46	-5.9	N	0	3	3	1	7	PM	
82	85	82-85_3	KEYS BLVD	276.70	FALSE					MWL	Water Level	5	0	0		3.19	8.02	-3.46	-5.9	N	0	2	3	1	6	PM	
82	85	82-85_3	KEYS BLVD	288.30	FALSE					MWLS	Water Level Sag	5	0	0		3.19	8.02	-3.46	-5.9	N	0	3	3	1	7	PM	
82	85	82-85_3	KEYS BLVD	290.70	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	3.19	8.02	-3.46	-5.9		0				0		
82	85	82-85_3	KEYS BLVD	292.20	FALSE					AMH	Manhole	0	0	0	85	3.19	8.02	-3.46	-5.9		0				0		
82	85	82-85_3	KEYS BLVD	292.20	FALSE					STOP	Inspection stopped	0	0	0		3.19	8.02	-3.46	-5.9		0				0		
82A	82	82A-82	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		#N/A	3.19	#N/A	-3.46		0				0		
82A	82	82A-82	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	82A	#N/A	3.19	#N/A	-3.46		0				0		
82A	82	82A-82	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		#N/A	3.19	#N/A	-3.46		0				0		
82A	82	82A-82	KEYS BLVD	2.00	FALSE	YES	CIPP			MGP	General Photo	0	0	0	START OF LINE SEGMENT	#N/A	3.19	#N/A	-3.46		0				0		
82A	82	82A-82	KEYS BLVD	7.50	FALSE					MWLS	Water Level Sag	5	0	0	Prior CIPP intact	#N/A	3.19	#N/A	-3.46	N	0	2	3	1	6	DA	
82A	82	82A-82	KEYS BLVD	16.50	FALSE					MWL	Water Level	5	0	0		#N/A	3.19	#N/A	-3.46	N	0	2	3	1	6	PM	
82A	82	82A-82	KEYS BLVD	24.00	FALSE					MWLS	Water Level Sag	5	0	0		#N/A	3.19	#N/A	-3.46	N	0	3	3	1	7	PM	

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
82A	82	82A-82	KEYS BLVD	51.60	FALSE					MWL	Water Level	5	0	0		#N/A	3.19	#N/A	-3.46	N	0	2	3	1	6	PM	
82A	82	82A-82	KEYS BLVD	88.70	FALSE					MWLS	Water Level Sag	5	0	0		#N/A	3.19	#N/A	-3.46	N	0	3	3	1	7	PM	
82A	82	82A-82	KEYS BLVD	156.80	FALSE					MWL	Water Level	5	0	0		#N/A	3.19	#N/A	-3.46	N	0	2	3	1	6	PM	
82A	82	82A-82	KEYS BLVD	196.40	FALSE					MWLS	Water Level Sag	5	0	0		#N/A	3.19	#N/A	-3.46	N	0	3	3	1	7	PM	
82A	82	82A-82	KEYS BLVD	198.30	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	#N/A	3.19	#N/A	-3.46		0				0		
82A	82	82A-82	KEYS BLVD	198.80	FALSE					AMH	Manhole	0	0	0	82	#N/A	3.19	#N/A	-3.46		0				0		
82A	82	82A-82	KEYS BLVD	198.80	FALSE					STOP	Inspection stopped	0	0	0		#N/A	3.19	#N/A	-3.46		0				0		
85	86	85-86	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		8.02	8.21	-5.9	-6.68		0				0		
85	86	85-86	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	85	8.02	8.21	-5.9	-6.68		0				0		
85	86	85-86	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		8.02	8.21	-5.9	-6.68		0				0		
85	86	85-86	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	8.02	8.21	-5.9	-6.68		0				0		
85	86	85-86	KEYS BLVD	56.00	FALSE					MWL	Water Level	5	0	0		8.02	8.21	-5.9	-6.68	N	0	2	3	1	6	PM	
85	86	85-86	KEYS BLVD	67.90	FALSE					MWLS	Water Level Sag	5	0	0		8.02	8.21	-5.9	-6.68	N	0	3	3	1	7	PM	
85	86	85-86	KEYS BLVD	87.10	FALSE					MWLS	Water Level Sag	5	0	0		8.02	8.21	-5.9	-6.68	N	0	3	3	1	7	PM	
85	86	85-86	KEYS BLVD	105.70	FALSE					MWLS	Water Level Sag	5	0	0		8.02	8.21	-5.9	-6.68	N	0	3	3	1	7	PM	
85	86	85-86	KEYS BLVD	130.40	FALSE					MWL	Water Level	5	0	0		8.02	8.21	-5.9	-6.68	N	0	2	3	1	6	PM	
85	86	85-86	KEYS BLVD	138.20	FALSE					MWLS	Water Level Sag	5	0	0		8.02	8.21	-5.9	-6.68	N	0	3	3	1	7	PM	
85	86	85-86	KEYS BLVD	163.60	FALSE					MWLS	Water Level Sag	5	0	0		8.02	8.21	-5.9	-6.68	N	0	4	3	1	8	PM	***routine flushing***
85	86	85-86	KEYS BLVD	199.20	FALSE					MWL	Water Level	5	0	0		8.02	8.21	-5.9	-6.68	N	0	2	3	1	6	PM	
85	86	85-86	KEYS BLVD	202.20	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	8.02	8.21	-5.9	-6.68		0				0		
85	86	85-86	KEYS BLVD	203.10	FALSE					AMH	Manhole	0	0	0	86, use pole cam to confirm I & I in manhole	8.02	8.21	-5.9	-6.68		0				0		
85	86	85-86	KEYS BLVD	203.10	FALSE					STOP	Inspection stopped	0	0	0		8.02	8.21	-5.9	-6.68		0				0		
86	92	86-92	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		8.21	8.36	-6.68	-6.96		0				0		
86	92	86-92	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	86	8.21	8.36	-6.68	-6.96		0				0		
86	92	86-92	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		8.21	8.36	-6.68	-6.96		0				0		
86	92	86-92	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	8.21	8.36	-6.68	-6.96		0				0		
86	92	86-92	KEYS BLVD	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	8.21	8.36	-6.68	-6.96		0				0		
86	92	86-92	KEYS BLVD	21.80	FALSE					MWLS	Water Level Sag	5	0	0		8.21	8.36	-6.68	-6.96	N	0	3	3	1	7	PM	
86	92	86-92	KEYS BLVD	73.40	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	8.21	8.36	-6.68	-6.96		0				0		
86	92	86-92	KEYS BLVD	74.10	FALSE					AMH	Manhole	0	0	0	92, 1ft Upstream appears size/material change	8.21	8.36	-6.68	-6.96	P	0.25	3	3	2	8	FISP(2)	
86	92	86-92	KEYS BLVD	74.10	FALSE					STOP	Inspection stopped	0	0	0	Confirm I & I with pole cam in MH 92	8.21	8.36	-6.68	-6.96	P	0.25	2	3	2	7	FISP(1)	***GRT***
87B	87	87B-87	1ST STREET	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		3.45	4.47	9.89	7.56		0				0		
87B	87	87B-87	1ST STREET	0.00	FALSE					AMH	Manhole	0	0	0	87B	3.45	4.47	9.89	7.56		0				0		
87B	87	87B-87	1ST STREET	0.00	FALSE					MWL	Water Level	5	0	0		3.45	4.47	9.89	7.56		0				0		
87B	87	87B-87	1ST STREET	5.20	FALSE			3		TFA	Tap Factory Active	0	0	0		3.45	4.47	9.89	7.56		0				0		
87B	87	87B-87	1ST STREET	7.10	FALSE					MGP	General Photo	0	0	0	BOTTOM OF WYE, may be cracked	3.45	4.47	9.89	7.56	P	0.25	3	3	2	8	FISP(1)	***CIPP(4)***
87B	87	87B-87	1ST STREET	12.60	FALSE			10		TFA	Tap Factory Active	0	0	0		3.45	4.47	9.89	7.56		0				0		
87B	87	87B-87	1ST STREET	18.20	FALSE					MWL	Water Level	5	0	0		3.45	4.47	9.89	7.56	N	0	2	3	1	6	PM	
87B	87	87B-87	1ST STREET	54.40	FALSE			3		TFA	Tap Factory Active	0	0	0		3.45	4.47	9.89	7.56		0				0		
87B	87	87B-87	1ST STREET	59.30	FALSE			9		TFA	Tap Factory Active	0	0	0		3.45	4.47	9.89	7.56		0				0		
87B	87	87B-87	1ST STREET	101.10	FALSE			10		TFA	Tap Factory Active	0	0	0		3.45	4.47	9.89	7.56		0				0		
87B	87	87B-87	1ST STREET	117.40	FALSE			3		RFJ	Roots Fine Joint	3	0	0		3.45	4.47	9.89	7.56	P	0.25	2	3	2	7	FM	
87B	87	87B-87	1ST STREET	119.60	FALSE			3		TFA	Tap Factory Active	0	0	0		3.45	4.47	9.89	7.56		0				0		
87B	87	87B-87	1ST STREET	156.60	FALSE			9		B	Broken	0	0	0		3.45	4.47	9.89	7.56		0				0		
87B	87	87B-87	1ST STREET	156.70	FALSE					MSA	Abandoned Survey	0	0	0	BROKEN PIPE, could not observe defect fully	3.45	4.47	9.89	7.56	P	0.25	4	3	2	9	FISP(1)	***CIPP(4)***
87B	87	87B-87	1ST STREET	156.70	FALSE					STOP	Inspection stopped	0	0	0		3.45	4.47	9.89	7.56		0				0		
9	9A	9-9A	ISLAND DR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		6.27	7.75	14.68	-7.07		0				0		
9	9A	9-9A	ISLAND DR	0.00	FALSE					AMH	Manhole	0	0	0	9	6.27	7.75	14.68	-7.07		0				0		
9	9A	9-9A	ISLAND DR	0.00	FALSE					MWL	Water Level	5	0	0		6.27	7.75	14.68	-7.07		0				0		
9	9A	9-9A	ISLAND DR	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	6.27	7.75	14.68	-7.07		0				0		
9	9A	9-9A	ISLAND DR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	6.27	7.75	14.68	-7.07		0				0		
9	9A	9-9A	ISLAND DR	14.20	FALSE					MWL	Water Level	5	0	0		6.27	7.75	14.68	-7.07	N	0	2	3	2	7	PM	
9	9A	9-9A	ISLAND DR	32.60	FALSE					MWL	Water Level	5	0	0		6.27	7.75	14.68	-7.07	N	0	3	3	2	8	PM	***routine flushing***
9	9A	9-9A	ISLAND DR	44.90	FALSE					MWLS	Water Level Sag	5	0	0		6.27	7.75	14.68	-7.07	N	0	4	3	2	9	PM	***routine flushing***
9	9A	9-9A	ISLAND DR	45.80	FALSE					MWL	Water Level	5	0	0		6.27	7.75	14.68	-7.07	N	0	3	3	2	8	PM	***routine flushing***
9	9A	9-9A	ISLAND DR	48.20	FALSE					MWLS	Water Level Sag	5	0	0		6.27	7.75	14.68	-7.07	N	0	4	3	2	9	PM	***routine flushing***
9	9A	9-9A	ISLAND DR	60.00	FALSE			3		TFA	Tap Factory Active	0	0	0		6.27	7.75	14.68	-7.07		0				0		
9	9A	9-9A	ISLAND DR	75.40	FALSE					MWL	Water Level	5	0	0		6.27	7.75	14.68	-7.07	N	0	2	3	2	7	PM	
9	9A	9-9A	ISLAND DR	142.40	FALSE			2		TFA	Tap Factory Active	0	0	0		6.27	7.75	14.68	-7.07		0				0		
9	9A	9-9A	ISLAND DR	152.80	FALSE					MWLS	Water Level Sag	5	0	0		6.27	7.75	14.68	-7.07	N	0	4	3	2	9	PM	***routine flushing***
9	9A	9-9A	ISLAND DR	163.90	FALSE					MWL	Water Level	5	0	0		6.27	7.75	14.68	-7.07	N	0	2	3	2	7	PM	
9	9A	9-9A	ISLAND DR	225.50	FALSE					MWLS	Water Level Sag	5	0	0		6.27	7.75	14.68	-7.07	N	0	4	3	2	9	PM	***routine flushing***
9	9A	9-9A	ISLAND DR	267.00	FALSE					MWL	Water Level	5	0	0		6.27	7.75	14.68	-7.07	N	0	1	3	2	6	PM	
9	9A	9-9A	ISLAND DR	290.00	FALSE					MWLS	Water Level Sag	5	0	0		6.27	7.75	14.68	-7.07	N	0	4	3	2	9	PM	***routine flushing***
9	9A	9-9A	ISLAND DR	322.00	FALSE					MWL	Water Level	5	0	0		6.27	7.75	14.68	-7.07	N	0	2	3	2	7	PM	
9	9A	9-9A	ISLAND DR	329.30	FALSE					MWLS	Water Level Sag	5	0	0		6.27	7.75	14.68	-7.07	N	0	3	3	2	8	PM	***routine flushing***
9	9A	9-9A	ISLAND DR	362.80	FALSE					MWL	Water Level	5	0	0		6.27	7.75	14.68	-7.07	N	0	1	3	2	6	PM	
9	9A	9-9A	ISLAND DR	410.30	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGENT	6.27	7.75	14.68	-7.07		0				0		
9	9A	9-9A	ISLAND DR	411.30	FALSE					AMH	Manhole	0	0	0	9A	6.27	7.75	14.68	-7.07		0				0		
9	9A	9-9A	ISLAND DR	411.30	FALSE					STOP	Inspection stopped	0	0	0		6.27	7.75	14.68	-7.07		0				0		
92	93	92-93	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		8.36	9.42	-6.96	-9.07		0				0		
92	93	92-93	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0		8.36	9.42	-6.96	-9.07		0				0		
92	93	92-93	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		8.36	9.42	-6.96	-9.07	P	0.25				0		
92	93	92-93	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	8.36	9.42	-6.96	-9.07		0				0		
92	93	92-93	KEYS BLVD	8.40	FALSE					MWLS	Water Level Sag	5	0	0		8.36	9.42	-6.96	-9.07	N	0	4	3	1	8	PM	***routine flushing***
92	93	92-93	KEYS BLVD	37.90	FALSE					MWLS	Water Level Sag	5	0	0		8.36	9.42	-6.96	-9.07	N	0	4	3	1	8	PM	***routine flushing***
92	93	92-93	KEYS BLVD	85.80	FALSE					MWLS	Water Level Sag	5	0	0		8.36	9.42	-6.96	-9.07	N	0	3	3	1	7	PM	
92	93	92-93	KEYS BLVD	113.00	FALSE					MWLS	Water Level Sag	5	0	0		8.36	9.42	-6.96	-9.07	N	0	4	3	1	8	PM	***routine flushing***
92	93	92-93	KEYS BLVD	113.00	FALSE					MWLS	Water Level Sag	5	0	0		8.36	9.42	-6.96	-9.07	N	0	4	3	1	8	PM	***routine flushing***
92	93	92-93	KEYS BLVD	122.70	FALSE					MWLS	Water Level Sag	5	0	0		8.36	9.42	-6.96	-9.07	N	0	4	3	1	8	PM	***routine flushing***
92	93	92-93	KEYS BLVD	166.00	FALSE					MWLS	Water Level Sag	5	0	0		8.36	9.42	-6.96	-9.07	N	0	4	3	1	8	PM	***routine flushing***
92	93	92-93	KEYS BLVD	204.70	FALSE					MWLS	Water Level Sag	5	0	0		8.36	9.42	-6.96	-9.07	N	0	4	3	1	8	PM	***routine flushing***
92	93	92-93	KEYS BLVD	266.10	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	8.36	9.42	-6.96	-9.07		0				0		
92	93	92-93	KEYS BLVD	267.50	FALSE					AMH	Manhole	0	0	0		8.36	9.42	-6.96	-9.07		0				0		
92	93	92-93	KEYS BLVD	267.50	FALSE					STOP	Inspection stopped	0	0	0		8.36	9.42	-6.96	-9.07		0				0		
93	94	93-94	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		9.42	9.61	-9.07	-8.88		0				0		
93	94	93-94	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	93 appears to have line size change to 10 or 12 inch	9.42	9.61	-9.07	-8.88		0				0		
93	94	93-94	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		9.42	9.61	-9.07	-8.88		0				0		
93	94	93-94	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	9.42	9.61	-9.07	-8.88		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
93	94	93-94	KEYS BLVD	10.00	FALSE					MWLS	Water Level Sag	5	0	0		9.42	9.61	-9.07	-8.88	N	0	3	3	1	7	PM	
93	94	93-94	KEYS BLVD	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	9.42	9.61	-9.07	-8.88		0				0		
93	94	93-94	KEYS BLVD	208.10	FALSE					MWLS	Water Level Sag	5	0	0		9.42	9.61	-9.07	-8.88	N	0	4	3	1	8	PM	*routine flushing*
93	94	93-94	KEYS BLVD	263.10	FALSE					MWLS	Water Level Sag	5	0	0		9.42	9.61	-9.07	-8.88	P	0.25	4	4	1	9	PM	*routine flushing*
93	94	93-94	KEYS BLVD	287.70	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	9.42	9.61	-9.07	-8.88		0				0		
93	94	93-94	KEYS BLVD	289.40	FALSE					AMH	Manhole	0	0	0	94	9.42	9.61	-9.07	-8.88		0				0		
93	94	93-94	KEYS BLVD	289.40	FALSE					STOP	Inspection stopped	0	0	0		9.42	9.61	-9.07	-8.88		0				0		
94	95	94-95_2	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		9.61	10.12	-8.88	-9.59		0				0		
94	95	94-95_2	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	94	9.61	10.12	-8.88	-9.59		0				0		
94	95	94-95_2	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		9.61	10.12	-8.88	-9.59	N	0	2	3	1	6	PM	
94	95	94-95_2	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	9.61	10.12	-8.88	-9.59		0				0		
94	95	94-95_2	KEYS BLVD	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	9.61	10.12	-8.88	-9.59		0				0		
94	95	94-95_2	KEYS BLVD	74.30	FALSE					MWL	Water Level	5	0	0		9.61	10.12	-8.88	-9.59	N	0	3	3	1	7	PM	
94	95	94-95_2	KEYS BLVD	102.10	FALSE					MWL	Water Level	5	0	0		9.61	10.12	-8.88	-9.59	N	0	1	3	1	5	PM	
94	95	94-95_2	KEYS BLVD	140.30	FALSE					MWL	Water Level	5	0	0		9.61	10.12	-8.88	-9.59	N	0	3	3	1	7	PM	
94	95	94-95_2	KEYS BLVD	177.20	FALSE					MWLS	Water Level Sag	5	0	0		9.61	10.12	-8.88	-9.59	N	0	4	3	1	8	PM	*routine flushing*
94	95	94-95_2	KEYS BLVD	196.30	FALSE					MWL	Water Level	5	0	0		9.61	10.12	-8.88	-9.59	N	0	2	3	1	6	PM	
94	95	94-95_2	KEYS BLVD	207.60	FALSE					MWL	Water Level	5	0	0		9.61	10.12	-8.88	-9.59	N	0	4	3	1	8	PM	*routine flushing*
94	95	94-95_2	KEYS BLVD	283.10	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT, infil possible at manhole	9.61	10.12	-8.88	-9.59	P	0.25	2	2	2	6	FISP(1)	*GRT*
94	95	94-95_2	KEYS BLVD	283.60	FALSE					AMH	Manhole	0	0	0	95	9.61	10.12	-8.88	-9.59		0				0		
94	95	94-95_2	KEYS BLVD	283.60	FALSE					STOP	Inspection stopped	0	0	0		9.61	10.12	-8.88	-9.59		0				0		
95	27A	95-27A	KEYS BLVD	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		10.12	#N/A	-9.59	#N/A		0				0		
95	27A	95-27A	KEYS BLVD	0.00	FALSE					AMH	Manhole	0	0	0	95	10.12	#N/A	-9.59	#N/A		0				0		
95	27A	95-27A	KEYS BLVD	0.00	FALSE					MWL	Water Level	5	0	0		10.12	#N/A	-9.59	#N/A		0				0		
95	27A	95-27A	KEYS BLVD	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	10.12	#N/A	-9.59	#N/A		0				0		
95	27A	95-27A	KEYS BLVD	41.60	FALSE					MWLS	Water Level Sag	5	0	0	water and grease level higher than noted	10.12	#N/A	-9.59	#N/A	N	0	4	3	2	9	PM	*routine flushing*
95	27A	95-27A	KEYS BLVD	60.90	FALSE					MWL	Water Level	5	0	0		10.12	#N/A	-9.59	#N/A	N	0	3	3	1	7	PM	
95	27A	95-27A	KEYS BLVD	134.60	FALSE					MWLS	Water Level Sag	5	0	0		10.12	#N/A	-9.59	#N/A	N	0	4	3	1	8	PM	*routine flushing*
95	27A	95-27A	KEYS BLVD	155.50	FALSE					MWL	Water Level	5	0	0		10.12	#N/A	-9.59	#N/A	N	0	2	3	1	6	PM	
95	27A	95-27A	KEYS BLVD	216.90	FALSE					MWL	Water Level	5	0	0		10.12	#N/A	-9.59	#N/A	N	0	3	3	1	7	PM	
95	27A	95-27A	KEYS BLVD	266.30	FALSE					MMC	Material Change	0	0	0	ACSBESTOS	10.12	#N/A	-9.59	#N/A		0				0		
95	27A	95-27A	KEYS BLVD	266.30	FALSE			10	1	DAGS	Deposits Attached Grease	0	0	0	heavy grease	10.12	#N/A	-9.59	#N/A	N	0	4	3	2	9	PM	*routine flushing*
95	27A	95-27A	KEYS BLVD	283.80	FALSE					MGP	General Photo	0	0	0	ENF OF LINE SEGMENT	10.12	#N/A	-9.59	#N/A		0				0		
95	27A	95-27A	KEYS BLVD	283.80	FALSE					AMH	Manhole	0	0	0	27A	10.12	#N/A	-9.59	#N/A		0				0		
95	27A	95-27A	KEYS BLVD	283.80	FALSE					STOP	Inspection stopped	0	0	0		10.12	#N/A	-9.59	#N/A		0				0		
99	100	99-100	LAKELAND ST	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	0.00	FALSE					AMH	Manhole	0	0	0	99	4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	0.00	FALSE					MWL	Water Level	5	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	23.10	FALSE			9		TFA	Tap Factory Active	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	25.10	FALSE			6		LFDL	Lining Failure Delaminating	4	0	0		4.58	7.24	-4.44	-6.26		0	1	1	1	3	DA	
99	100	99-100	LAKELAND ST	26.20	FALSE			3		TFA	Tap Factory Active	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	75.60	FALSE					MWLS	Water Level Sag	5	0	0		4.58	7.24	-4.44	-6.26	N	0	3	3	1	7	PM	
99	100	99-100	LAKELAND ST	79.30	FALSE			9		TFA	Tap Factory Active	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	82.40	FALSE			3		TFA	Tap Factory Active	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	101.20	FALSE					MWL	Water Level	5	0	0		4.58	7.24	-4.44	-6.26	N	0	2	3	1	6	PM	
99	100	99-100	LAKELAND ST	140.40	FALSE			3		TFA	Tap Factory Active	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	144.00	FALSE			9		TFA	Tap Factory Active	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	197.50	FALSE			3		TFA	Tap Factory Active	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	200.20	FALSE			9		TFA	Tap Factory Active	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	208.90	FALSE					MWLS	Water Level Sag	5	0	0		4.58	7.24	-4.44	-6.26	N	0	3	3	1	7	PM	
99	100	99-100	LAKELAND ST	264.40	FALSE			3		TFA	Tap Factory Active	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	269.40	FALSE					MWLS	Water Level Sag	5	0	0		4.58	7.24	-4.44	-6.26	N	0	3	3	1	7	PM	
99	100	99-100	LAKELAND ST	269.80	FALSE			9		TFA	Tap Factory Active	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	299.30	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	300.10	FALSE					AMH	Manhole	0	0	0	100	4.58	7.24	-4.44	-6.26		0				0		
99	100	99-100	LAKELAND ST	300.10	FALSE					STOP	Inspection stopped	0	0	0		4.58	7.24	-4.44	-6.26		0				0		
99A	99	99A-99	LAKELAND ST	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	0.00	TRUE					AMH	Manhole	0	0	0	99	#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	0.00	TRUE					MWL	Water Level	5	0	0		#N/A	4.58	#N/A	-4.44	N	0	1	3	1	5	PM	
99A	99	99A-99	LAKELAND ST	2.00	TRUE	YES	SL			MGP	General Photo	0	0	0	START OF LINE SEGMENT	#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	10.00	TRUE	YES	SL			MGP	General Photo	0	0	0	CAMERA SET	#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	40.90	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	44.20	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	54.90	TRUE	YES	SL	6		LFDL	Lining Failure Delaminating	4	0	0		#N/A	4.58	#N/A	-4.44	N	0	1	1	1	3	DA	
99A	99	99A-99	LAKELAND ST	65.30	TRUE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION	#N/A	4.58	#N/A	-4.44	P	0.25	3	3	2	8	FISP(1)	*CIPP(4)*
99A	99	99A-99	LAKELAND ST	66.70	TRUE	YES	SL			MWLS	Water Level Sag	5	0	0		#N/A	4.58	#N/A	-4.44	N	0	3	3	1	7	PM	
99A	99	99A-99	LAKELAND ST	95.50	TRUE	YES	SL			MWL	Water Level	5	0	0		#N/A	4.58	#N/A	-4.44	N	0	2	3	1	6	PM	
99A	99	99A-99	LAKELAND ST	100.00	TRUE	YES	SL			MGO	General Observation	0	0	0	POSSIBLE INFILTRATION	#N/A	4.58	#N/A	-4.44	P	0.25	3	3	2	8	FISP(1)	*CIPP(4)*
99A	99	99A-99	LAKELAND ST	102.00	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	105.30	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	138.30	TRUE	YES	SL	9		TFA	Tap Factory Active	0	0	0		#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	141.60	TRUE	YES	SL	3		TFA	Tap Factory Active	0	0	0		#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	152.70	TRUE					MMC	Material Change	0	0	0	PVC	#N/A	4.58	#N/A	-4.44	N	0				0		
99A	99	99A-99	LAKELAND ST	153.50	TRUE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	153.50	TRUE					AMH	Manhole	0	0	0	99A	#N/A	4.58	#N/A	-4.44		0				0		
99A	99	99A-99	LAKELAND ST	153.50	TRUE					STOP	Inspection stopped	0	0	0		#N/A	4.58	#N/A	-4.44		0				0		
9A	PS2	9A-PS2	ISLAND CIR	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		7.75	#N/A	-7.07	#N/A		0				0		
9A	PS2	9A-PS2	ISLAND CIR	0.00	FALSE					AMH	Manhole	0	0	0	9A	7.75	#N/A	-7.07	#N/A		0				0		
9A	PS2	9A-PS2	ISLAND CIR	0.00	FALSE					MWL	Water Level	5	0	0		7.75	#N/A	-7.07	#N/A	N	0	2	3	1	6	PM	
9A	PS2	9A-PS2	ISLAND CIR	2.00	FALSE					MGP	General Photo	0	0	0	START OF LINE SEGMENT	7.75	#N/A	-7.07	#N/A		0				0		
9A	PS2	9A-PS2	ISLAND CIR	4.70	FALSE					MWLS	Water Level Sag	5	0	0		7.75	#N/A	-7.07	#N/A	N	0	3	3	1	7	PM	
9A	PS2	9A-PS2	ISLAND CIR	10.00	FALSE					MGP	General Photo	0	0	0	CAMERA SET	7.75	#N/A	-7.07	#N/A		0				0		
9A	PS2	9A-PS2	ISLAND CIR	18.70	FALSE					MWL	Water Level	5	0	0		7.75	#N/A	-7.07	#N/A	N	0	2	3	1	6	PM	
9A	PS2	9A-PS2	ISLAND CIR	117.20	FALSE					MMC	Material Change	0	0	0	CAST IRON	7.75	#N/A	-7.07	#N/A		0				0		
9A	PS2	9A-PS2	ISLAND CIR	135.80	FALSE					MGP	General Photo	0	0	0	END OF LINE SEGMENT	7.75	#N/A	-7.07	#N/A		0				0		
9A	PS2	9A-PS2	ISLAND CIR	135.80	FALSE					AMH	Manhole	0	0	0	PS2	7.75	#N/A	-7.07	#N/A		0				0		
9A	PS2	9A-PS2	ISLAND CIR	135.80	FALSE					STOP	Inspection stopped	0	0	0		7.75	#N/A	-7.07	#N/A		0				0		

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CL F	CL T	CODE	CODE_DESC	DEFECT	SEVERITY	RATING	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2
C/O	C/O GOI	C/O-C/O GOING NC	OFF HWY 20 BETWEEN C	0.00	FALSE					START AGAINS	Start Inspection Against the Flow	0	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
C/O	C/O GOI	C/O-C/O GOING NC	OFF HWY 20 BETWEEN C	0.00	FALSE					AMH	Manhole	0	0	0	C/O GOING NORTH	#N/A	#N/A	#N/A	#N/A		0				0		
C/O	C/O GOI	C/O-C/O GOING NC	OFF HWY 20 BETWEEN C	0.00	FALSE					MWL	Water Level	5	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
C/O	C/O GOI	C/O-C/O GOING NC	OFF HWY 20 BETWEEN C	4.80	FALSE					MGP	General Photo	0	0	0	BOTTOM OF C/O	#N/A	#N/A	#N/A	#N/A		0				0		
C/O	C/O GOI	C/O-C/O GOING NC	OFF HWY 20 BETWEEN C	14.10	FALSE					MWL	Water Level	5	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
C/O	C/O GOI	C/O-C/O GOING NC	OFF HWY 20 BETWEEN C	89.40	FALSE			9		TFA	Tap Factory Active	0	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
C/O	C/O GOI	C/O-C/O GOING NC	OFF HWY 20 BETWEEN C	89.40	FALSE					AMH	Manhole	0	0	0	C/O GOING NORTH	#N/A	#N/A	#N/A	#N/A		0				0		
C/O	C/O GOI	C/O-C/O GOING NC	OFF HWY 20 BETWEEN C	89.40	FALSE					STOP	Inspection stopped	0	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT -CLEAN	OFF HWY 20 BETWEEN M	0.00	FALSE					START WITH FL	Start Inspection With the Flow	0	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT -CLEAN	OFF HWY 20 BETWEEN M	0.00	FALSE					AMH	Manhole	0	0	0	CLEANOUT BETWEEN MOTEL AND RESTAURANT	#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT -CLEAN	OFF HWY 20 BETWEEN M	0.00	FALSE					MWL	Water Level	5	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT -CLEAN	OFF HWY 20 BETWEEN M	85.00	FALSE			11		TFA	Tap Factory Active	0	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT -CLEAN	OFF HWY 20 BETWEEN M	94.40	FALSE					JOM	Joint Offset Medium	2	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT -CLEAN	OFF HWY 20 BETWEEN M	102.60	FALSE					MWL	Water Level	5	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT -CLEAN	OFF HWY 20 BETWEEN M	118.60	FALSE			11		TFA	Tap Factory Active	0	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT -CLEAN	OFF HWY 20 BETWEEN M	200.20	FALSE					AMH	Manhole	0	0	0	CLEANOUT BETWEEN RESTAURANT AND CHEVRON	#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT -CLEAN	OFF HWY 20 BETWEEN M	200.20	FALSE					STOP	Inspection stopped	0	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT-CLEAN(	OFF HWY 20 BETWEEN C	0.00	TRUE					START AGAINS	Start Inspection Against the Flow	0	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT-CLEAN(	OFF HWY 20 BETWEEN C	0.00	TRUE					AMH	Manhole	0	0	0	DOWNSTREAM CLEANOUT	#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT-CLEAN(	OFF HWY 20 BETWEEN C	0.00	TRUE					MWL	Water Level	5	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT-CLEAN(	OFF HWY 20 BETWEEN C	0.00	TRUE					STOP	Inspection stopped	0	0	0		#N/A	#N/A	#N/A	#N/A		0				0		
CLEANOUT	CLEANO	CLEANOUT-CLEAN(	OFF HWY 20 BETWEEN C	211.00	TRUE					AMH	Manhole	0	0	0	CLEANOUT AT CHEVRON	#N/A	#N/A	#N/A	#N/A		0				0		
				295388.80								**2692**									**212**					**1218**	

USMH	DSMH	SEGMENTID	ADDRESS	DIST	REVSET	PRI RHB	RHB TYP	CODE	CODE_DESC	COMMENT	USMH Depth	DSMH Depth	US Invert-Lake Level	DS Invert-Lake Level	SHED AREA	I/I	I/I Q	LOF	COF	Engr	Cumulative	Action 1	Action 2	Action 3	CDGB	SWQRCB
1	2	1-2	ISLAND DR	14.60	FALSE			RML	Roots Medium Lateral		5.06	8.7	-2.36	-3.07	2	P	0.25	2	2	2	6	RC			YES	
1	2	1-2	ISLAND DR	63.70	FALSE			RFL	Roots Fine Lateral		5.06	8.7	-2.36	-3.07	2	P	0.25	1	2	1	4	FM			YES	
2	3	2-3	ISLAND DR	79.60	FALSE			RML	Roots Medium Lateral	Possible Infiltration source in high ground water	8.7	9.19	-3.07	-6.29	2	P	0.25	2	2	1	5	RC	CIPP(2)		YES	
2	3	2-3	ISLAND DR	196.70	FALSE			RBL	Roots Ball Lateral	Severe roots in lateral , possible I & I	8.7	9.19	-3.07	-6.29	2	P	0.25	3	2	2	7	RC				
2	3	2-3	ISLAND DR	240.40	FALSE			TBD	Tap Break-in Defective	OFFSET	8.7	9.19	-3.07	-6.29	2	P	0.25	2	2	1	5				YES	
2	3	2-3	ISLAND DR	331.00	FALSE			TFD	Tap Factory Defective	OFFSET	8.7	9.19	-3.07	-6.29	2	P	0.25	2	3	2	7	DR				
2	3	2-3	ISLAND DR	331.00	FALSE			RML	Roots Medium Lateral		8.7	9.19	-3.07	-6.29	2	P	0.25	2	3	2	7	Drcomb			YES	
3	4	3-4	ISLAND DR EASMENT	100.50	FALSE			RML	Roots Medium Lateral		9.19	7.65	-6.29	-5.31	2	P	0.25	2	2	2	6	RC	CIPP(2)		YES	
3	4	3-4	ISLAND DR EASMENT	159.10	FALSE			RBL	Roots Ball Lateral	Appears completely blocked	9.19	7.65	-6.29	-5.31	2	P	0.25	3	3	2	8	RC	FM	CIPP (2)	YES	
64	65	64-65	ANCHOR VILLAGE	62.40	FALSE	Yes	SL	RML	Roots Medium Lateral		8.68	9.79	-8.15	-9.99	9	P	0.25	2	2	2	6	RC	CIPP(2)		YES	
65	66	65-66	ANCHOR VILLAGE	93.10	FALSE	Yes	SL	RML	Roots Medium Lateral	Type of roots may cause blockage,separate joint allowing I & I	9.79	11.54	-9.99	-11.13	9	P	0.25	2	2	2	6	RC	CIPP(2)		YES	
85A	85	85A-85	FIFTH ST	33.20	FALSE	N		RML	Roots Medium Lateral	may be abandoned	#N/A	8.02	#N/A	-5.9	7	P	0.25	2	1	2	5	RC	CIPP(2)		YES	
85A	85	85A-85	FIFTH ST	53.10	FALSE	N		TBD	Tap Break-in Defective	OFFSET,minor	#N/A	8.02	#N/A	-5.9	7	P	0.25	2	1	2	5	FISP(2)				
85A	85	85A-85	IPP(4)	96.00	FALSE	N		TBD	Tap Break-in Defective	OFFSET	#N/A	8.02	#N/A	-5.9	7	P	0.25	2	1	2	5	DR				
85A	85	85A-85	FIFTH ST	113.30	FALSE	N		TBD	Tap Break-in Defective	OFFSET,minor	#N/A	8.02	#N/A	-5.9	7	N	0	2	1	1	4	FISP(2)				
85A	85	85A-85	FIFTH ST	158.90	FALSE	N		TFD	Tap Factory Defective	OFFSET	#N/A	8.02	#N/A	-5.9	7	P	0.25	2	1	2	5	FISP(2)				
85A	85	85A-85	FIFTH ST	218.30	FALSE	N		TBD	Tap Break-in Defective	OFFSET	#N/A	8.02	#N/A	-5.9	7	P	0.25	2	2	2	6	DR				
85A	85	85A-85	FIFTH ST	312.10	FALSE	N		TBD	Tap Break-in Defective	OFFSET AT TAP	#N/A	8.02	#N/A	-5.9	7	P	0.25	3	2	2	7	DR				
106A	106	106A-106	ISLAND CIR	116.10	TRUE	YES	SL	TBD	Tap Break-in Defective	OFFSET, Minor, no I & I observed	#N/A	5.17	#N/A	-4.84	5	N	0	2	2	1	5	FISP(2)				
113	114	113-114	ISLAND CIR	13.00	FALSE			dr	Roots Medium Lateral		3.8	4.76	-3.14	-5	5	P	0.25	3	2	2	7	Drcomb	DR		YES	
113	114	113-114	ISLAND CIR	97.70	FALSE			RBL	Roots Ball Lateral	severe roots , RC and or DR	3.8	4.76	-3.14	-5	5	P	0.25	4	3	3	10	Drcomb			YES	
113	114	113-114	ISLAND CIR	127.00	FALSE			RFL	Roots Fine Lateral		3.8	4.76	-3.14	-5	5	P	0.25	2	2	1	5	FM			YES	
113	114	113-114	ISLAND CIR	160.50	FALSE			RFL	Roots Fine Lateral		3.8	4.76	-3.14	-5	5	P	0.25	2	2	1	5	FM				
113	114	113-114	ISLAND CIR	194.40	FALSE			RML	Roots Medium Lateral		3.8	4.76	-3.14	-5	5	P	0.25	3	2	2	7	RC	DR		YES	
113A	113	113A-113	ISLAND CIR	112.10	TRUE			TBD	Tap Break-in Defective	NOT SEALED AT POINT OF BREAK IN	#N/A	3.8	#N/A	-3.14	5	P	0.25	2	2	2	6	GRT				
114	115	114-115	ISLAND CIR	89.10	FALSE			RBL	Roots Ball Lateral		4.76	7.46	-5	-7.21	5	P	0.25	3	2	2	7	RC	CIPP(2)		YES	
114	115	114-115	ISLAND CIR	280.20	FALSE			RML	Roots Medium Lateral	growing into mainline	4.76	7.46	-5	-7.21	5	P	0.25	3	2	2	7	RC	DR	CIPP(2)	YES	
115	116	115-116	ISLAND CIR	164.70	FALSE			TFD	Tap Factory Defective	BROKEN IN TAP, lgtd crk in service	7.46	8.3	-7.21	-8.54	5	P	0.25	3	3	2	8	CIPP(2)				
119	LS 5	119-PS#5	ISLAND CIR	51.80	FALSE	YES	SL	TBD	Tap Break-in Defective	TAP NOT CUT PROPERLY	11.85	14.48	-11.87	-11.77	5	P	0.25	2	3	2	7	FISP(2)	CUT		YES	
119	LS 5	119-PS#5	ISLAND CIR	170.90	FALSE	YES	SL	TBD	Tap Break-in Defective	CRACK MULTIPLE IN TAP	11.85	14.48	-11.87	-11.77	5	P	0.25	3	3	3	9	CIPP(4)	CIPP(2)		YES	
6	2	6-2	ISLAND DR	97.10	FALSE			RFL	Roots Fine Lateral		5.85	8.7	17.43	-3.07	2	P	0.25	2	2	1	5	FM				
7	8	7-8	OAK KNOLL AVE	16.20	FALSE			TFD	Tap Factory Defective	OFFSET,minor	5	6.09	47.68	41.83	2	N	0	2	2	2	6	FISP(2)				
7	8	7-8	OAK KNOLL AVE	61.40	FALSE			TBD	Tap Break-in Defective	NOT SEALED AT TAP CONNECTION	5	6.09	47.68	41.83	2		0	1	1	1	3	GRT	DR		YES	
7	8	7-8	OAK KNOLL AVE	61.40	FALSE			RBL	Roots Ball Lateral	severe	5	6.09	47.68	41.83	2	P	0.25	4	3	3	10	RC	DR			
7	8	7-8	OAK KNOLL AVE	151.60	FALSE			TFD	Tap Factory Defective	OFFSET	5	6.09	47.68	41.83	2		0				0		DR		YES	
7	8	7-8	OAK KNOLL AVE	151.60	FALSE			RFL	Roots Fine Lateral	rod and camera for possible I & I	5	6.09	47.68	41.83	2	P	0.25	2	3	2	7	RC	FM			
7A	7	7A-7	OAK KNOLL AVE	92.20	TRUE			TBD	Tap Break-in Defective	OFFSET	7.5	5	50.18	47.68	2		0				0					
7A	7	7A-7	OAK KNOLL AVE	108.90	TRUE			RML	Roots Medium Lateral		7.5	5	50.18	47.68	2	P	0.25	3	3	2	8	RC	CIPP(2)		YES	
7A	7	7A-7	OAK KNOLL AVE	176.00	TRUE			TFD	Tap Factory Defective	OFFSET	7.5	5	50.18	47.68	2	P	0.25	3	3	2	8	RC	DR			
74	75	74-75	HOOVER ST	52.10	FALSE			TBD	Tap Break-in Defective		5.16	3.29	5.18	1.99	7	P	0.25	***4***	***3***	***2***	9	DR				
74	75	74-75	HOOVER ST	85.60	FALSE			RFL	Roots Fine Lateral		5.16	3.29	5.18	1.99	7	P	0.25	***2***	***3***	***1***	6	FM	RC	***strict C&C /foa***	YES	
74A	74	74A-74	HOOVER ST	58.80	TRUE			RFL	Roots Fine Lateral	possible I & I	2.01	5.16	10.93	5.18	7	P	0.25	***2***	***3***	***1***	6	***RC***	***FM***		YES	
74A	74	74A-74	HOOVER ST	106.50	TRUE			RFL	Roots Fine Lateral		2.01	5.16	10.93	5.18	7	P	0.25	***2***	***3***	***1***	6	***RC***	***FM***	***foam***	YES	
74A	74	74A-74	HOOVER ST	115.10	TRUE			TFD	Tap Factory Defective	OFFSET	2.01	5.16	10.93	5.18	7	P	0.25	***2***	***2***	***1***	5	***FISP(2)***	***CIPP(2)***		YES	
74A	74	74A-74	HOOVER ST	128.50	TRUE			RBL	Roots Ball Lateral	100%	2.01	5.16	10.93	5.18	7	P	0.25	***3***	***3***	***2***	8	***RC***	***DR***			
74A	74	74A-74	HOOVER ST	147.70	TRUE			TBD	Tap Break-in Defective	OFFSET	2.01	5.16	10.93	5.18	7	P	0.25	***2***	***3***	***1***	6	***FISP(2)***	***RC***	***roblem at this***	YES	
74A	74	74A-74	HOOVER ST	193.70	TRUE			RML	Roots Medium Lateral	30%	2.01	5.16	10.93	5.18	7	P	0.25	***2***	***3***	***2***	7	***RC***	***DR***			
74A	74	74A-74	HOOVER ST	262.30	TRUE			RBL	Roots Ball Lateral	100%	2.01	5.16	10.93	5.18	7	P	0.25	***4***	***3***	***2***	9	***RC***	***DR***			
74A	74	74A-74	HOOVER ST	264.10	TRUE			RML	Roots Medium Lateral	40%	2.01	5.16	10.93	5.18	7	P	0.25	***3***	***3***	***2***	8	***RC***	***FM***			
74A	74	74A-74	HOOVER ST	312.10	TRUE			RML	Roots Medium Lateral		2.01	5.16	10.93	5.18	7	P	0.25	***2***	***3***	***2***	7	***RC***	***FM***	***District C&C***		
74A	74	74A-74	HOOVER ST	355.10	TRUE			RML	Roots Medium Lateral	20%	2.01	5.16	10.93	5.18	7	P	0.25	***2***	***3***	***2***	7	***RC***	***FM***	***District C&C***		
74A	74	74A-74	HOOVER ST	362.00	TRUE			RML	Roots Medium Lateral	30%	2.01	5.16	10.93	5.18	7	P	0.25	***3***	***3***	***2***	8	***RC***	***FM***	***District C&C***		
75	76	75-76	FIRST ST	87.00	FALSE			RFL	Roots Fine Lateral		3.29	3.32	1.99	-1.43	7	P	0.25	***2***	***3***	***1***	6	***RC***	***FM***	***District C &C***	YES	
75	76	75-76	FIRST ST	135.00	FALSE			TFD	Tap Factory Defective	OFFSET	3.29	3.32	1.99	-1.43	7	P	0.25	***3***	***3***	***2***	8	***DR(10)***		***DR***		
75	76	75-76	FIRST ST	139.80	FALSE			TFD	Tap Factory Defective	OFFSET	3.29	3.32	1.99	-1.43	7	P	0.25	***2***	***3***	***2***	7	***Drcomb***		***place as one D&R***		
75	76	75-76	FIRST ST	139.80	FALSE			RFL	Roots Fine Lateral		3.29	3.32	1.99	-1.43	7	P	0.25	***2***	***3***	***1***	6	***Drcomb***		***place as one D&***	YES	
78	79	78-79	2ND ST	97.60	FALSE			RFL	Roots Fine Lateral		3.07	2.99	1.92	-2.46	7	P	0.25	***2***	***3***	***1***	6	***RC***	***FM***	***District C&C***	YES	
78	79	78-79	2ND ST	114.50	FALSE			TBD	Tap Break-in Defective	OFFSET IN TAP	3.07	2.99	1.92	-2.46	7	P	0.25	***2***	***3***	***1***	6	***RC***	***CIPP***	***District C&C***		
78	79	78-79	2ND ST	114.50	FALSE			RML	Roots Medium Lateral		3.07	2.99	1.92	-2.46	7	P	0.25	***2***	***3***	***1***	6	***RC***	***FM***	***District C&C***	YES	
78	79	78-79	2ND ST	127.10	FALSE			TBD	Tap Break-in Defective	OFFSET AT BREAK IN	3.07	2.99	1.92	-2.46	7	P	0.25	***2***	***3***	***1***	6	FISP(1)	DR	***problem apparent***		
78	79	78-79	2ND ST	171.90	FALSE			TBD	Tap Break-in Defective	OFFSET JOINT IN TAP	3.07	2.99	1.92	-2.46	7	P	0.25	***3***	***2***	***2***	7	***RC***	***CIPP***	***I & I , District camera***		
78	79	78-79	2ND ST	191.70	FALSE			TBD	Tap Break-in Defective	OFFSET IN TAP	3.07	2.99	1.92	-2.46	7	P	0.25	***2***	***3***	***1***	6	***FISP(2)***	***CIPP***	***problem apparent***		
78	79	78-79	2ND ST	257.80	FALSE			TBD	Tap Break-in Defective	OFFSET IN TAP	3.07	2.99	1.92	-2.46	7	P	0.25	***3***	***2***	***2***	7	***FISP(2)***	***DR***	***ble dig,District C&C***		
78	79	78-79	2ND ST	312.90	FALSE			TBD	Tap Break-in Defective	OFFSET AT TAP CONNECTION	3.07	2.99	1.92	-2.46	7	P	0.25	***2***	***2***	***2***	6	FISP(1)	CIPP(2)	***risk ,District c***	YES	
78	79	78-79	2ND ST	346.40	FALSE			TBD	Tap Break-in Defective	SEVERE OFFSET AT TAP CONNECTION	3.07	2.99	1.92	-2.46	7	P	0.25	***4***	***3***	***3***	10	***DR***		***Dig and repair***		
80	81	80-81	3rd St	5.00	FALSE			RML	Roots Medium Lateral	25	4.36	3.86	2.38	0.58	7	P	0.25	***2***	***3***	***2***	7	***RC***	***CIPP***	***District C&C***		
80	81	80-81	3rd St	37.10	FALSE			RBL	Roots Ball Lateral	60	4.36	3.86	2.38	0.58	7	P	0.25	***3***	***3***	***2***	8	***RC***	***DR***	***District C&C***		
80	81	80-81	3rd St	49.60	FALSE			TBD	Tap Break-in Defective	OFFSET	4.36	3.86	2.38	0.58	7	P	0.25	***2***	***2***	***2***	6	***Drcomb***	***CIPP***	***be D&R with above***		
80	81	80-81	3rd St	89.80	FALSE			RFL	Roots Fine Lateral		4.36	3.86	2.38	0.58	7	P	0.25	***2***	***3***	***2***	7	***RC***	***FM***			
80	81	80-81	3rd St	122.40	FALSE			TBD	Tap Break-in Defective	SEVERE OFFSET IN TAP	4.36	3.86	2.38	0.58	7	P	0.25	***4***	***3***	***2***	9	***RC***	***DR***	***VFIRM ACTIVE***	YES	
80	81	80-81	3rd St	122.40	FALSE			RBL	Roots Ball Lateral	80	4.36	3.86	2.38	0.58	7	P	0.25	***4***	***3***	***2***	9	***RC***	***DR***	***CIPP POSSIBLE***		
80	81	80-81	3rd St	202.70	FALSE			RFL	Roots Fine Lateral		4.36	3.86	2.38	0.58	7	P	0.25	***2***	***3***	***1***	6	***RC***	***FM***	***mechanically***	YES	
80	81	80-81	3rd St	261.30	FALSE			TBD	Tap Break-in Defective	OFFSET	4.36	3.86	2.38	0.58	7	P	0.25	***2***	***3***	***1***	6	FISP(1)	DR	***w up at later date***		
80A	80	80A-80	3rd St	34.10	TRUE			TBD	Tap Break-in Defective	OFFSET	2.78	4.36	4.18	2.38	7	P	0.25	***2***	***3***	***2***	7	***Drcomb***	***CIPP***		YES	
80A	80	80A-80	3rd St	51.00	TRUE			TBD	Tap Break-in Defective	OFFSET	2.78	4.36	4.18	2.38	7	P	0.25	***1***	***2***	***1***	4	***Drcomb***	***CIPP***	***CIPP or D&R***		
80A	80	80A-80	3rd St	103.30	TRUE			TBD	Tap Break-in Defective	OFFSET IN TAP	2.78	4.36	4.18	2.38	7	P	0.25	***2***	***3***	***2***	7	***RC***	***DR***			

Appendix G

Smoke Testing Results

Item Number	Document	Page Number
1	Smoke Testing Inspection Log	G-2
2	Photos of Defects	G-3
3	Prioritized Repairs Identified from Smoke Testing Letter	G-17
4	Prioritized Smoke Testing Repair List	G-19
5	Smoke Testing Plan w/Standard Operating Procedures	G-21

SMOKE TEST LOG

address/location	date	Inspected by	Mh setup	Defect observed	Marker #	Picture
12509 Shady ln	9.24.15	abc/mc eng	1	Smoke from defective plumbuing under deck	# 01	# 01
12510 Shady Ln	9.24.15	abc/mc eng	1	Smoke from cleanout ,cap missing	# 02	# 02
12595 hwy 20	9.24.15	abc/mc eng	1	Catfish coffee house ,inside floor drain	#03	# 03
12463 Widgeon wy	9.24.15	abc/mc eng	2	Manhole on Widgeon , needs sealing to prevent I & I	# 04	# 04
12463 Widgeon wy	9.24.15	abc/mc eng	2	Cleanout cap missing, allowing Infil	# 05	# 05
12448 Widgeon way	9.24.15	abc/mc eng	2	Abandoned service /lot exposed plumbing	# 06	# 06
12448 Widgeon way	9.24.15	abc/mc eng	2	Smoke from under house defective plumbing	# 07	# 07
12444 Widgeon wy	9.24.15	abc/mc eng	2	ABS cleanout is leaking	# 08	# 08
12498 Manzanita wy	9.24.15	abc/mc eng	3	cleanout open on vacant lot , 3 inches below grade	# 09	# 09
12416 Manzanita wy	9.24.15	abc/mc eng	3	Cleanout below grade, open and allowing infil	# 10	# 10
Plaza @ Widgeon	9.24.15	abc/mc eng	4	Open cleanout in yard, fenced and large dog	# 11	# 11
12327 Plaza	9.24.15	abc/mc eng	4	back porch smoke	none	# 12
12390 Plaza	9.24.15	abc/mc eng	4	broken cleanout , no cap	# 13	# 13
12487 Plaza	9.24.15	abc/mc eng	4	Leaking,cracked cleanout cap @ Thrift shop	# 14	# 14
Plaza park	9.24.15	abc/mc eng	4	Smoke coming from drain around center rock and bench	# 15	# 15
12548 Pine st	9.24.15	abc/mc eng	5	vacant lot,open exposed pipe emitting smoke	# 16	# 16
12451 Pine st (next door)	9.24.15	abc/mc eng	5	Smoke coming from side of gutters , may be tied in	none	# 17
empty lot ,no address	9.24.15	abc/mc eng	6	uncapped cleanout in vacant lot , Jason from district capped	# 18	# 18
12542 Oak st	9.24.15	abc/mc eng	6	Broken stand pipe, no cap	# 19	# 19
12534 Oak st.	9.24.15	abc/mc eng	6	complained of internal smoke	# 20	none
12381 Oak Grove	9.24.15	abc/mc eng	7	Broken cleanout lid and cap	# 21	# 21
12381 Oak Grove	9.24.15	abc/mc eng	7	Smoke coming from broken pipes outside shed	# 22	# 22
12371 Oak Grove	9.24.15	abc/mc eng	7	4 plex , broken pipe by gutter downspout , I & I source	# 23	# 23
12371 Oak Grove	9.24.15	abc/mc eng	7	4 plex , defective cleanout cap	# 24	# 24
Oak Grove mobile trailer	9.24.15	abc/mc eng	7	smoke emitting from under trailer and skirting	# 25	# 25
12638 Oak Grove (or hwy 20)	9.24.15	abc/mc eng	7	Smoke emitted from broken cleanout cap by suite # 2	# 26	# 26
12331 Oak Grove	9.24.15	abc/mc eng	7	Internal smoke complaint	none	none





Defect # 01 , Smoke coming from under the deck of this vacant house on Shady ln.

Defect # 02, Smoke coming from open cleanout under stairs on Shady Ln.





Defect # 03 , floor drain inside catfish coffee , on hwy 20. Recommended fill with water or cap.

Defect # 04, Manhole located in run off area of Widgeon dr. , Needs “ram neck” or other sealer.





Defect # 5, cleanout cap leaking from under box , may be I & I source.

Defect # 6, abandoned house site with exposed plumbing, behind existing home . May act as area drain.





Defect # 07 ,smoke coming from under house ,defective plumbing

Defect # 08, Cleanout leaking at house below deck.





Defect # 09 ,cleanout /standpipe buried in vacant lot below grade , significant source for I & I .





Defect # 10 ,cleanout and piping unfinished and open below grade allowing I & I .

Defect # 11, open cleanout at side of house , may have been used as RV dump .





Defects # 13 & 14. Open cleanouts subject to I & I .





Defect # 15 , smoke emitted from drain around rock and bench in Plaza park.





Defect # 17, House next to 12451 Pine st. appears to have smoke coming from side of house ,maybe connected to gutter. Defect # 18—Pine st. (no address) Cleanout cap missing in vacant lot . District staff capped with test plug.





Defect # 19 located at 12542 Oak St. Standpipe broken at ground level and may be I & I source . Needs repair & cap.





Defect # 21 & 22 located @ 12381 Oak Grove wy. # 21 broken cleanout lid and cap. # 22 Broken sewer pipe from shed , open to inflow and should be abandoned.





Defect # 23 & 24 . A 4 plex multi family unit located at 12371 Oak Grove . # 23 is broken pipe below downspout from gutter to serve as area drain. # 24 Is defective cleanout cap.





Located on Oak Grove (address not shown) appears to have defective plumbing connection under mobile home. May be lower than grade and be I & I source.



Defect # 26 , located at pizza parlor business center. Replace broken cleanout cap to avoid infil and leaking sewer gases. Downspout from drains located in same area so infil could be significant.

Alan , General Manager
CLOCWD

Subject: **Immediate Repair of Inflow Sources per Smoke Testing Conducted in August/September 2015**

Dear Alan,

As per our recent discussions, I'm sending to you a priority list of the recommended repairs for inflow sources found during the smoke testing program, as a part of the Wastewater Collection System I/I Analysis and Mapping Program (Project Report). It should be mentioned that it is anticipated the repairs will be performed by the District's wastewater field staff with some assistance from the office administration personnel.

The repairs vary in complexity and most of which can easily and quickly be completed. Our ranking of importance can vary, but it is imperative that those ranked 1- 10 should be "tackled" first. The cost for materials and repairs are minimal, except in those cases where follow-up inspection utilizing the hand held CCTV camera is required (ex: Plaza Park-Storm Drain). It is recommended in this case that the crews run the camera through the nearest cleanout or manhole adjacent to the storm drain to locate defect. And once found will require a dig-up and repair. We also recommend that, if possible, problematic and abandoned sewer services with exposed ends should be dup-up at the property line and plugged/capped.

Most of the repairs will include various materials including and not limited to:

- Cleanout caps (sizes vary).
- Couplings and SDR 35 pipe and misc. fittings (sizes vary).
- Letters to private property owners requesting permission to repair (by District).
- Letters to private property owners requesting that they make repairs and permission for the District to inspect once repairs are completed.

We've indicated on the attached priority ranking list where it is the private property owners' responsibility to repair the suspected inflow source. The Catfish Coffee House (Location No. 3) is considered a high priority and will require an enforcement letter to be sent by the District, requesting immediate repair by the property owner.

In conclusion, we highly recommend that these repairs be completed prior to significant rainfall this winter. We've also attached photos form the Project Report and study that illustrate the defect location.

Please don't hesitate in calling me or Doyle Champlain for additional information. We would also be available to draft the necessary repair letters to be sent to the listed property owners, as noted above.

Sincerely,

John E Pedri, P.E.
Project Manager

John Pedri

PRIORITY FOR
REPAIR SMOKE TESTING/INFLOW SOURCES

Map Location Number	Address/Location	Date	Inspected By	Defect observed	Mark	Priority
1	12509 Shady Ln	9.24.15	ABC/MC ENG	Smoke from defective plumbing under deck	# 01	Private
2	12510 Shady Ln	9.24.15	ABC/MC ENG	Smoke from cleanout - cap missing	# 02	15
3	12595 Hwy 20	9.24.15	ABC/MC ENG	Catfish coffee house ,inside floor drain	#03	Private 1
4/5	12463 Widgeon Way	9.24.15	ABC/MC ENG	Manhole on Widgeon , needs sealing to prevent I & I	# 04	21
4/5	12463 Widgeon Way	9.24.15	ABC/MC ENG	Smoke from cleanout - cap missing	# 05	16
6/7	Widgeon Way	9.24.15	ABC/MC ENG	Abandoned service /lot exposed plumbing	# 06	2
6/7	Widgeon Way	9.24.15	ABC/MC ENG	Smoke from under house defective plumbing	# 07	Private
8	12444 Widgeon Way	9.24.15	ABC/MC ENG	ABS cleanout is leaking	# 08	22
9	12498 Manzanita Way	9.24.15	ABC/MC ENG	Cleanout open on vacant lot , 3inch below grade	# 09	3
10	12416 Manzanita Way	9.24.15	ABC/MC ENG	Cleanout below grade, open and allowing infiltration	# 10	6
11	Plaza @ Widgeon	9.24.15	ABC/MC ENG	Open cleanout in yard, fenced and large dog	# 11	7
12	12327 Plaza	9.24.15	ABC/MC ENG	Back porch smoke	none	Private
13	12390 Plaza	9.24.15	ABC/MC ENG	Smoke from broken cleanout - cap missing	# 13	17
14	12487 Plaza	9.24.15	ABC/MC ENG	Smoke from broken cleanout - cap missing	# 14	8
15	Plaza Park	9.24.15	ABC/MC ENG	Smoke coming from drain around center rock and bench	# 15	1
16	12548 Pine St	9.24.15	ABC/MC ENG	Vacant lot, open exposed pipe emitting smoke	# 16	4

						RANK
			Table 5-4 Cont'd			
17	12451 Pine St (next door)	9.24.15	ABC/MC ENG	Smoke coming from side of gutters , may be tied in	none	9
18	empty lot ,no address	9.24.15	ABC/MC ENG	Smoke from broken cleanout -	# 18	18
19	12542 Oak St	9.24.15	ABC/MC ENG	Broken stand pipe, no cap	# 19	20
20	12534 Oak St.	9.24.15	ABC/MC ENG	Complained of internal smoke	# 20	Private
21/22	12381 Oak Grove	9.24.15	ABC/MC ENG	Broken cleanout lid and cap	# 21	19
21/22	12381 Oak Grove	9.24.15	ABC/MC ENG	Smoke coming from broken pipes outside shed	# 22	5
23/24	12371 Oak Grove	9.24.15	ABC/MC ENG	4 plex , broken pipe by gutter downspout , I & I source	# 23	11
23/24	12371 Oak Grove	9.24.15	ABC/MC ENG	4 plex , defective cleanout cap	# 24	12
25	Oak Grove mobile trailer	9.24.15	ABC/MC ENG	Smoke emitting from under trailer and skirting	# 25	13
26	12638 Oak Grove (or Hwy 20)	9.24.15	ABC/MC ENG	Smoke emitted from broken cleanout cap by suite # 2	# 26	10
27	12331 Oak Grove	9.24.15	ABC/MC ENG	Internal smoke complaint	none	Private
01	Lot # 122	9.15.15	ABC/MC ENG	Broken cleanout cap , above grade	# 01	Private
02	lot # 112	9.15.15	ABC/MC ENG	Smoke from broken cleanout - cap broken	# 02	Private
03/04	Lot # 8	9.15.15	ABC/MC ENG	Manhole frame not sealed , allowing infiltration	# 03	Private
03/04	lot # 8	9.15.15	ABC/MC ENG	Broken cleanout cap ,at grade	# 04	Private
05	Lot # 10	9.15.15	ABC/MC ENG	Smoke inside unit from defective plumbing fixtures	none	Private

Note: Highlighted to be highest priority

DRAFT

CLOCWD Inflow and Infiltration Study
Proposed CCTV and Smoke Testing Plan

June 24, 2015

Purpose

The documentation included herewith is intended to outline proposed CCTV and smoke testing work to be performed by a combination of District staff and outside contractors as part of the on-going Inflow and Infiltration study being prepared by MC Engineering, Inc. on behalf of the District. This package includes the following supporting information:

1) A summary of the proposed footages and timelines for areas that have been already documented with CCTV from 2011 to 2015
2) Proposed sections and timelines to be included for CCTV as a part of the initial study, referred to as Phase 1 (approx. 27,000 LF)
3) Proposed sections and timelines to be included as part of the Phase 2 expanded program currently being submitted for additional funding referred to as Phase 2 (approx. 20,000 additional feet)
4) A proposed schedule and breakdown of the work effort between outside contractors and District crews
5) Sections proposed for smoke testing and additional manhole inspections
6) Maps documenting the areas noted above (Attachments 1 through 4)
7) Proposed CCTV Best Management Practices (Attachment 5)
8) Proposed Smoke Testing Best Management Practices (Attachment 6)
9) CCTV Contractor Scope of Work (Attachment 7)

Overview

The recommended CCTV and smoke testing locations **(**see Attachment A**)**, including pipeline sizes and footages, are based upon recent flow metering and data collection, conducted from January through May of 2015. Review of operator logs from past peak flow events indicated relatively widespread Inflow and Infiltration (see Technical Memo No. 3 prepared as part of this study). Additional information was acquired from old CCTV videos and logs from 2011-2013 which indicated that a portion of the old pipeline rehabilitation projects (from 2002-2004) were deteriorating. Specifically, the pipe lining was eroding based on review of CCTV data. It should also be noted that not all of the 2002-2004 prescribed/recommended rehabilitation projects were completed. The incomplete projects

included a combination of point repairs and service lateral connections. These results are more clearly defined in Tech. Memo No. 2.

Another important factor that contributed to the recommended quantity and location(s) of the follow-up CCTV and smoke testing projects included the need to more thoroughly evaluate contributing I/I from pipeline segments that flow directly into lift stations no. 2 and 7. During the course of the study it was found that these two lift stations had serious surcharging issues that will require further evaluation. Due to lift station surcharging, it became quite difficult to quantify the I/I entering the wet-wells, including impacted upstream manholes.

The CCTV program will also take into account, a recent request to the SWRCB Planning Study Grant Program, for an additional $118,000 in grant funding, that will fund a portion of the CCTV inspection work and also provide funding for a more thorough evaluation and condition assessment of lift stations no. 2 and 7. For purposes of scheduling the CCTV work was broken into two (2) phases. Phase I will include 27,878 linear feet of 6-12 inch diameter sewer mains for CCTV inspection. This is within areas/sheds that indicated excessive I/I. Phase II will include 20,744 linear feet of 6-12 inch diameter sewer mains for CCTV inspection in those sheds that were identified and contributing identified to the surcharging of lift station 2 and 7. It is recognized that the additional CCTV inspection within the Phase II areas will require an amendment to the I/I Plan of Study, to be approved by the SWRCB.

The contracted CCTV inspection will require the cleaning of all sewer mains. This service will be performed by the CLOCWD field staff. The smoke testing work will be outsourced by the District. The timelines of past and proposed work are documented below in Table 1.

Table 1
Completed and Proposed CCTV and Smoke Testing Timelines

Completed and Proposed CCTV Timelines		
Dates	Pipe Size (in)	Length
2011-12	16	153
2011-12	15	988
2011-12	8	238
2011-12	6	13,014
2011-12	4	536
2011-12	Unknown	43
Total Inspected & Reviewed		**14,972**
2015	12	2,992
2015	10	994
2015	8	1,114
Total Inspected in 2015		**5,100**
Proposed	12	1,332
Proposed	10	1,642
Proposed	8	4,457
Proposed	6	37,839
Proposed	Unknown	3,370
Total Proposed		**48,640**
Proposed Smoke Test Timelines		
SMOKE	SY_SIZE	INSPECT_LEN
Proposed	16	153
Proposed	10	775
Proposed	8	1,742
Proposed	6	13,024
Proposed	Unknown	191
Total Proposed		**15,885**
Proposed Manhole to Inspect =		**18**

PROPOSED PROJECT SCHEDULE

This project schedule includes all of the required and contracted CCTV inspection and smoke testing. It also takes into account two phases of the CCTV inspection, with Phase I starting by July 6, 2015 and Phase II starting upon approval by the SWRCB, per the requested Plan of Study and Scope of Work revisions (Projected Phase II start date to be August 3, 2015.

Table 2
Proposed CCTV and Smoke Testing Schedule

PHASE I	TASK	Performed by	Start Date	End Date	Objective
	hydroflushing	CLOCWD	June 22,2015	July 10,2015	to clean approx 27000 ft of 6-12 " sewer line for CCTV evaluation.
	CCTV	Contractor	July 6 ,2015	july 21,2015	To CCTV inspect & evaluate approx 27000 ft of 6-12 " sewer line using PACP defect ratings.
PHASE II *	TASK	Performed by	Start Date	End Date	Objective
	Hydroflushing	CLOCWD	July 24,2015	August 5,2015	To clean approx 20000 ft of 6-12 " sewer line for CCTV evaluation
	CCTV	Contractor	August 3,2015	August 12,2015	to CCTV inspect & evaluate approx 20000 ft of 6-12 " sewer line using PACP defect ratings.
	Smoke testing	Contractor	July 23 ,2015	July 31,2015	Perform smoke testing of approx 14000 ft of sewer collection system to document sources of I&I.
	* Phase 2 is subject to SWRCB approval and work will not begin until funding is approved.				

Attachment 1

Proposed Phase 1 and Phase 2

CCTV Inspection Areas

Clearlake Oaks County Water District
Sewer System Master Plan

MC Engineering, Inc.
Carmichael, CA

Sewer System
Selected Inspection Area

Plot Title		
Plot By: kprins	Date: 06/23/2015	Map No: 1
Scale: 200 0 200 400 Feet		Plot File: plotfile.plt

Attachment 2

CCTV Inspection Areas

Clearlake Oaks County Water District
Sewer System Master Plan

LEGEND:
- 2011-12
- 2015
- Proposed
- No Data

MC Engineering, Inc.
Carmichael, CA

Sewer System CCTV Schedule

Plot Title		
Jacobus (Plot By)	06/09/2015 (Date)	1 (Map No)
400 0 400 800 Feet (Scale)		plotfile.plt (Plot File)

Attachment 3

Smoke Testing Areas

Clearlake Oaks County Water District
Sewer System Master Plan

LEGEND:
- Proposed
- None
- Smoke Test Focus Areas

MC Engineering, Inc.
Carmichael, CA

Sewer System Smoke Test Schedule

Plot Title		
Plot By: Jacobus	Date: 06/09/2015	Map No: 1
Scale: 300 0 300 600 Feet		Plot File: plotfile.plt

Attachment 4

Manhole Inspection Areas

Clearlake Oaks County Water District
Sewer System Master Plan

Manhole Inspection Focus Area

MC Engineering, Inc.
Carmichael, CA

Sewer System
Manhole Inspection Schedule

Plot Title

Plot By	Date	Map No
Jacobus	06/09/2015	1

Scale: 300 0 300 600 Feet

Plot File: plotfile.plt

Attachment 5

Proposed CCTV BMPs

CLEARLAKE OAKS COUNTY WATER DISTRICT
INFLOW AND INFILTRATION STUDY
STANDARD OPERATING PROCEDURES
for
SCHEDULED CCTV OPERATIONS

Implementing Best Management Practices (BMP'S) are a very critical component of the CCTV inspection(s) proposed for the CLOCWD I/I study. The intent of the BMP's is to acquire the most comprehensive data and along with an accurate visual of the internal pipeline. Care must be taken in assuring that the quality of the final recorded information can be used to clearly define pipeline defects and conditions. Once collected, the recorded information (videos) must be reviewed by qualified personnel to confirm consistency, accuracy, and to properly document those pipeline deficiencies in order for the analyst to prescribe the necessary protocols to develop plans and recommendations for repairs. All District safety procedures such as traffic control and personal protective equipment (PPE) must be thoroughly addressed and complied with while performing this operational task.

SPECIFIC GOALS

To utilize District crews and/or contractor/s to effectively evaluate conditions of system piping and identify defects for preventative maintenance, repairs and/or rehabilitation work. Once deficiencies are properly described and identified, engineers can then develop cost-effective measures and solutions to manage, repair, and rehabilitate sections of the system pipelines. This also includes the use of the most detailed and effective procedures to obtain quality inspection results utilizing state-of-the-art software and hardware for the most cost-effective and accurate results.

STANDARD OPERATIONAL PROCEDURES

1. PREPARATORY

- Prior to CCTV inspection(s), it is necessary to clean and flush all sewer lines to assure the best viewing results of all defects.
- A good communication system must be put in place between the cleaning crew and the camera operator to obtain the desired results. All defects must be properly identified and it is the responsibility of the camera operator to assure this.

- CCTV inspection is to be performed from upstream to downstream in most cases and all signage and safety equipment must be put in place prior to system cleaning.
- All equipment should be put in good working condition prior to starting work including related flushing and CCTV equipment.
- The footage counter is to be properly set at each manhole beginning at the center of manhole, with the cleaning to begin at the upstream manhole.
- The CCTV inspection is to be done from manhole to manhole, but in some cases may require running through another manhole due to access issues. Partial inspection of a section is not acceptable unless an obstruction exists that does not allow the survey to continue. In that case, the survey will continue from the downstream manhole up to the point of the previous end of survey.
- The exact length of pipeline sections (runs) must be established from accurate mapping.
- The monitor (screen) is to have the proper information (footage etc) displayed continuously throughout the inspection. Care should be taken to place footage and other data in a place on the screen that does not impede visibility of defects and the condition assessment.
- Data entered for each pipeline section inspection should include date, pipe type, size, and location, upstream and downstream manholes prior to survey. This also includes noting any manhole deficiencies.
- Outside contractors performing CCTV inspection for the District shall also adhere to all prescribed procedures and provide completed inspection results in the PACP compatible software format for district review and approval.
- The camera lens must be thoroughly cleaned prior to use.

2. OPERATIONS

- Defects observed are to be noted and entered into PACP compatible software program. It is important to note that defects must be viewed from varied angles and with sufficient lighting for proper evaluation. Magnification/zoom must be used, as needed.
- Care should be taken that the CCTV image shall be in focus, adequately lighted, not obscured by fats, oils or grease (FOG), or debris on the lens. Use of lens cleaning products is recommended (see ***PREPARATORY***, as noted above).
- Camera travel rate shall be uniform, with sufficient pauses to adequately document all joints, defects and connections. Size and condition of pipe will determine proper travel speed, but speed should never exceed 30 feet per minute.

- If necessary, laterals, end cleanouts etc. may be best observed using a "push camera" or smaller portable lateral camera. Depending on the system used, the inspection should be recorded onto a compatible media storage device and stored along with the mainline data.
- The field crew shall deliver DVD or other media along with a written log sheet with defects noted to the Operations Manager for review. Diligence and care must be taken in the logging of all deficiencies to avoid re-tests.

3. EQUIPMENT

The District operates 2 sewer cleaning trucks that are stored at the WWTP. One is a high pressure jet truck and the other is a combination jet cleaner and vacuum truck. Operators have access to these vehicles 24/7 for daily or after hour emergencies and prior to scheduled cleaning. Most sewer lines within the District are accessible with the available District trucks. Due to the small pipe sizes (4- 10 inch), the jet truck is the best choice for scheduled cleaning tasks as well as for emergency response.

4. PERSONNEL

When performing scheduled cleaning, the District must have at least 4 personnel to operate the cleaning and the CCTV equipment. It is also important that the District provide the necessary on-gong training for all of its employees on the use of all cleaning and CCTV equipment and procedures. Use of training manuals are also essential in order to conduct a cost-effective program. It is also important that the District have the necessary back-up of employees to be available to handle emergency call-outs during the CCTV program. Interruptions may create inaccurate and inefficient conditions while conducting the flushing and CCTV program. The District has limited staffing and requires "cross training" of employees in the water and wastewater fields for emergency operations.

5. SAFETY

The District must have all the necessary safety equipment available for the operators such as cones, signs, vests, hardhats, safety glasses, gloves etc. Some circumstances may require additional personnel for traffic control, observing upstream manhole(s), customer service requests, etc. Some circumstances may also require additional equipment such as lighting, bypass pumps, sandbags etc.. **Overflow of sewage into a storm drain or waterway is an immediate emergency that requires notification of the Operations Manager or other authority as described in the SSMP**. First responders are responsible for their own safety, as well as the public's safety. Crew is to make sure everything is documented for detailed reporting after any related events.

Attachment 6

Smoke Testing BMPs

CLOCWD INFLOW AND INFILTRATION STUDY
SMOKE TESTING

STANDARD OPERATING PROCEDURES

Smoke testing is a very cost effective tool to identify sources of Inflow Infiltration (I&I) and other collection system problems . These procedures provide a guide for a safe and effective means of performing related work.

NOTIFICATIONS

A very critical first step is notification informing the public and other departments & agencies of the purpose, location, dates, and procedures to be used.
The local Fire Department must be notified of the specific time and area to be tested to avoid any false alarms or other problems that may arise . A written notice to the Fire Chief is recommended.

Residents should be notified by door hangers, mass mailers etc. with at least a 3 day notice. It is important to include information about the product being used and the office number to call if they have any health related issues or questions and a number to call if they see smoke inside their homes during the test. Staff must verify that personnel are knowledgeable about the product they are going to use.

A notice on the District website is also advisable. A printed note can also be placed in Customers Bills to supplement the public notification flyer / mailer.

The District should provide notification to all parties when the smoke testing is complete. The Fire Department must be notified when testing is completed in each area or when it is terminated for any reason, This notification must be documented to avoid liability.
The District's Operations Manager shall be the sole source for communication with the Fire Department.

PREPARATION

- The test crew must have an accurate system map to work from and to document all results.
- Cleaning of the lines is recommended prior to smoke testing to provide maximum effectiveness for the testing . It may be necessary to CCTV prior to the test also.
- Verify that the crew has checked out the blower and has all supplies needed prior to start of project.
- Staff should review the product and procedures being used so each crew person has a good understanding of expectations.

SAFETY

Crews shall wear proper PPE . Crews shall also be responsible for setup and maintenance of traffic control to properly cover the approach, work zone and exit of the work area . CMS boards may be necessary. As an on-going project, traffic control must be constantly maintained and moved as needed. Each crew member must be familiar with the product being used as well as proper procedures. A pre-project meeting with all crew members must be held to discuss objectives and answer questions. A copy of the MSDS of the product must be provided to the crew and/or public. A copy of the MSDS must be provided to office staff who will be answering calls from the public.

No Confined Space Entry is to be performed as part of these procedures.

SET UP

- Setup shall be on every other manhole with smoke test no more than 400 ft both directions, or to next manhole from setup. This allows for maximum test efficiency and also allows crews time to observe and record each defect.
- Manhole setup changes and distances greater than 400 ft may be necessary as determined by the Operations Manager on a case by case basis.
- The smoke testing crew should consist of a minimum of four (4) people. One member to man the machine, two (2) to walk and observe, and one supervisor.
- The supervisor must assist in all functions with a primary responsibility work zone safety, proper data collection, and communication with the public.

SMOKE TESTING

It may be necessary to use sand bags, inflatable plugs or other devices to close off lines that are not being tested or to increase smoke volume in a particular line. These should be on site at the ready. Sufficient fuel, smoke, and other supplies should be staged on site also to avoid interruptions during the smoke test**.** Smoke will be started when the crew is ready and at the Operations Supervisor's direction. **The blower to manhole seal is critical and must be maintained through out the process**. It is important to verify that liquid or smoke "bombs" are actually emitting smoke during the entire run or the test for that setup must be repeated.

IDENTIFICATION OF DEFECTS

<u>Walking observations cannot begin until smoke appears from vents at far reaches of the test area</u>

There is a time lag from when the machine is started and when it fills the line with smoke **.** Crew persons will walk the test area to identify defect locations with flags or other markers . Markers shall be numbered or another numbered sign/stake provided. Water based utility marking paint can be used for sidewalks and paved areas. A report form describing the defect is also necessary. Crews must take digital pictures for each flagged and numbered defect.

Walkers shall observe the sidewalk, street, driveways, side and backyards of each property looking for unauthorized & illegal connections as well as defective piping. This includes RV connections, pool drains, roof drains, missing or damaged cleanout caps etc.

Staff should communicate with residents regarding any smoke inside their homes.

DEFECT PICTURES

A digital picture is needed for each defect showing the smoke coming from the defect with flag or marker and number. It is recommended to show two views (a close up & expanded view) to help with follow-up for each location.
Pictures without a smoke plume from the located defect or missing a visible unique number are unacceptable. Numbering shall be clearly visible in the picture and noted on the report form.

DEFECT REPORT

The report form shall include the following information at minimum : name of reporter, date, time, address of defect, description of defect, digital photograph, the specific number assigned to defect. Whenever possible it is advised to have GPS coordinates for these defects to allow for accurate defect locations and mapping of same.

PROJECT MANAGEMENT

The Supervisor will verify the procedures are being followed by the crew. The Supervisor will also communicate with the public on site as well as responding to calls to/from the office. The Supervisor or Project Manager shall be the sole source of communication with the Fire Department and shall document same.

A Supervisor Summary report should be provided to Management that includes all test data, public responses, test effectiveness, type and number of defects found, and recommendations for repairs.

Attachment 7

CCTV Contractor Scope of Work Requirements

Contractor Scope of Work for CCTV Services

1. GENERAL DESCRIPTION OF THE WORK

1.1 Contractor to perform CCTV inspection of approx 27,000 ft of sewer pipeline. CCTV inspection work must be completed by certified National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) trained operator(s) using established PACP coding and observations, as well as PACP compatible software.
1.2 Work shall be performed within normal daylight hours with no special conditions.
1.3 Contractor shall follow approved schedule provided by MC Engineering and CLOCWD

2. WORK AND MATERIALS PROVIDED BY THE CONTRACTOR

2.1 The Contractor shall provide necessary traffic control, including warning lights and traffic cones, as needed or required in accordance with CLOCWD guidelines and standard traffic control practices .
2.2 The Contractor shall obtain all permits required by the local jurisdiction (s).
2.3 All personnel shall wear appropriate PPE and perform work in a safe manner .
2.4 Communication with the public shall be the responsibility of the District

3. SEWER CLEANING

3.1 Sewers will be cleaned by District crews prior to CCTV inspection. District crews will remove grit, loose solids, grease, and any debris that are present to allow for proper inspection and defect coding.
3.2 Cleaning shall be completed by District crews within 72 hours prior to inspection..
3.3 Cleaning crews shall remain in communication with CCTV operator during inspection process and provide follow up cleaning as needed.

4. SEWER INSPECTION

4.1 Video inspection and defect coding shall be performed by a certified NASSCO PACP trained operator.
4.2 The Contractor's CCTV equipment shall include all equipment necessary to perform a CCTV inspection as outlined in this Technical Specification.
4.3 The cameras shall meet Cal-OSHA requirements for operating in the sanitary sewer environment.
4.4 The cameras shall have Pan-and-Tilt capabilities, and shall have a

minimum of 360 x 270 degree rotation with adequate illumination.
4.5 During CCTV inspection, lighting intensity shall be adjusted to minimize glare. Lighting and picture quality shall be adjusted to provide a clear, in focus picture of the entire periphery of the pipeline for all conditions.
4.6 The camera system shall be able to navigate 6 inch and larger diameter pipe, and shall be easily adjusted in the field for larger pipe inspection or minor repairs.
4.7 The camera and reel shall have a digital and manual footage counter. .
4.8 Distances shall be measured from center of access manhole.
4.9 The cable footage-counter shall be accurate to +/- 2 ft per 1,000 feet.
4.10 Video inspection and reporting shall be submitted in a NASSCO PACP format.
4.11 The camera lens shall be kept clear of condensation & debris during inspection. .

5. DOCUMENTATION

5.1 All observations and defects shall be documented in a database and shall include digital video recording and digital photographs..
5.2 Each video segment shall be designated using approved manhole numbers, pipe segments, street name or address.
5.3 All observations shall be selected from a standard table of descriptions incorporated in the inspection reporting software, as required by PACP. Any additional comments regarding the observation shall be indicated in the remarks box.
5.4 The severity of each defect or observation shall be recorded and rated according to the PACP method.
5.5 Video inspection will not exceed a travel rate of 30 ft per minute.
5.6 The Contractor shall pause the digital recording at any time there is a delay in the inspection and restart the digital video recording in the same digital file. The pause shall in no way affect, freeze, or interrupt the replay of the video and shall not close the video file during the inspection.
5.7 Each pipe segment (manhole to manhole) shall be identified with an initial text screen and completed in accordance with PACP's CCTV inspection form header Instructions and all mandatory fields completed.

6. COMPLETION /APPROVAL

6.1 Finished CCTV video logs will be reviewed for quality and proper defect identification by MC Engineering prior to acceptance and approval for payment.
6.2 Finished CCTV video logs shall be provided in a format for ease of storing, viewing and use without purchase of additional software or user license.

Appendix H

Lift Station 7 Information

Item Number	Document	Page Number
1	Lift Station Preliminary Design Parameters Overview	H-2
2	System Curve Development	H-3
3	Emergency Storage Development	H-4
4	Flyght 45 Hp Submersible Pump Cut Sheet	H-5
5	Godwin CD225M Portable Pump Cut Sheet	H-11

Lift Station 7 Design Parameters Overview

Wet Weather Flow Development

@7.56ft, Typ. Wet weater flow		
Ave Daily Inflow	0.73	MGD
P.F.	1.3	
Peak Daily Inflow	0.949	MGD
Inflow	0.12	MGD
Total Inflow	1.069	MGD
	742.361111	gpm
Total Outflow	2.138	MGD
	1485	gpm

Dry Weather Flow Development

@ 6ft, Dry weather flow		
Ave Daily Inflow	0.38	MGD
P.F.	1.6	
Peak Daily Inflow	0.608	MGD
Inflow		MGD
Total Inflow	0.608	MGD
	422.2222	gpm
Total Outflow	1.216	MGD
	844	gpm

Headloss and velocity at peak Wet Weather flow

Static Head	48	ft
Dynamic Head		
FM Dia	10	in
FM Length	4375	
C factor	110	
	76.7596958	ft
Total Dynamic Head	124.759696	
Forcemain Velocity	6.06547715	ft/sec

Elevation and Depth Details

Surface	1328
Lowest Invert	1314
Headworks	1348
Min pump depth	1.5
Dry Pit Invert	1309
Wet Pit Invert	1300
Total Depth	28
Wet Pit Depth	14
working Depth	7
Emergy bottom elev	1308.5

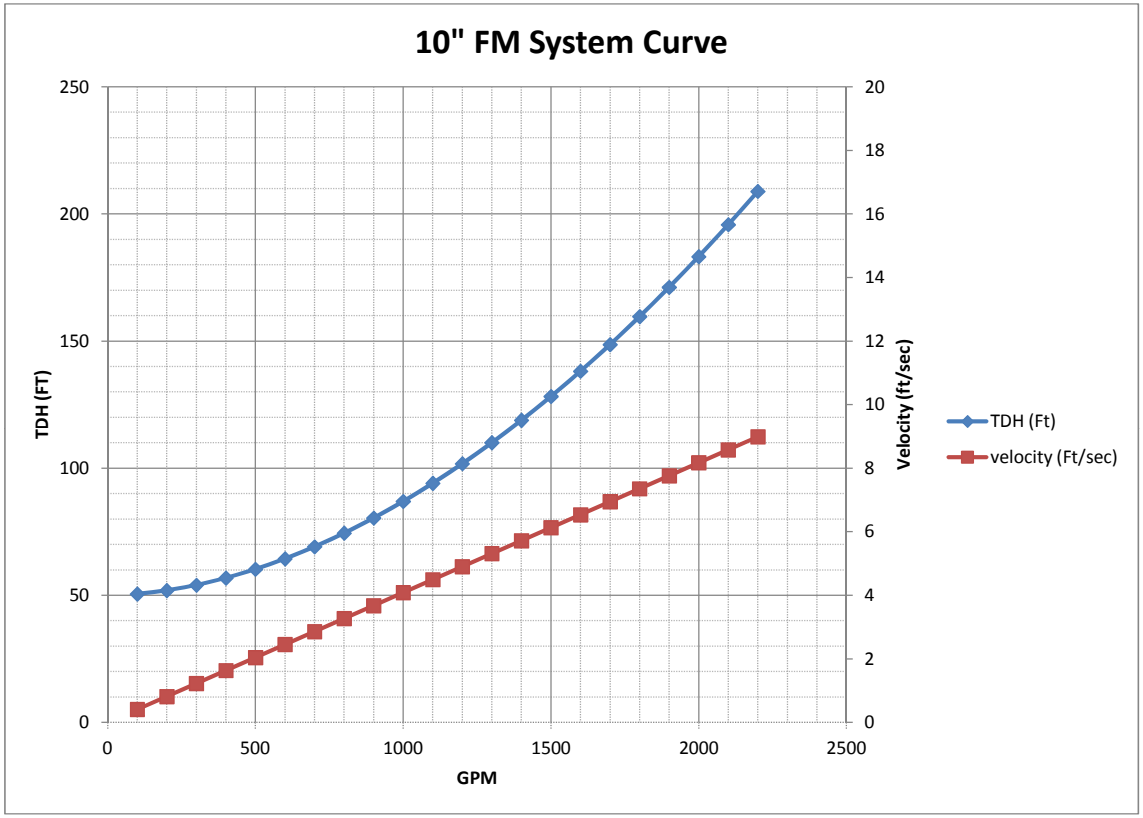
Wet well sizing

t	10	min
q	1485	gpm
V	3711.8	gal
	496.2	cu ft
Well dia	10	ft
well area	78.5	sqft
well depth	6.3	ft

System Curve Development

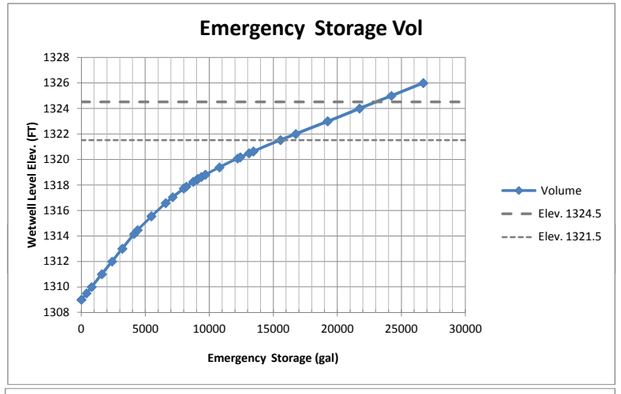
Static Head	50
FM Dia	10
FM Length	4375
C factor	110
Motor Eff.	75%

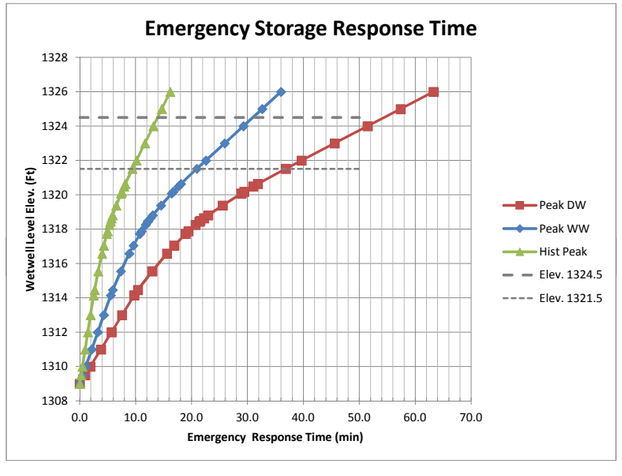
Flow		Dynamic Head (Ft)	TDH (Ft)	velocity (Ft/sec)	Break Hp
GPM	MGD				
100	0.144	0.521903	50.5219	0.408526	1.701074
200	0.288	1.88146	51.88146	0.817052	3.493701
300	0.432	3.983492	53.98349	1.225578	5.452878
400	0.576	6.782669	56.78267	1.634104	7.647497
500	0.72	10.24906	60.24906	2.04263	10.14294
600	0.864	14.3605	64.3605	2.451156	13.00212
700	1.008	19.09946	69.09946	2.859682	16.28607
800	1.152	24.45153	74.45153	3.268208	20.05428
900	1.296	30.40453	80.40453	3.676735	24.36501
1000	1.44	36.94789	86.94789	4.085261	29.27538
1100	1.584	44.07234	94.07234	4.493787	34.84161
1200	1.728	51.76961	101.7696	4.902313	41.11904
1300	1.872	60.03228	110.0323	5.310839	48.16228
1400	2.016	68.85357	118.8536	5.719365	56.02525
1500	2.16	78.22732	128.2273	6.127891	64.76127
1600	2.304	88.14782	138.1478	6.536417	74.42307
1700	2.448	98.60981	148.6098	6.944943	85.06285
1800	2.592	109.6084	159.6084	7.353469	96.73235
1900	2.736	121.1389	171.1389	7.761995	109.4828
2000	2.88	133.1972	183.1972	8.170521	123.3651
2100	3.024	145.7791	195.7791	8.579047	138.4297
2200	3.168	158.8809	208.8809	8.987573	154.7266



Emergency Storage Development

Location		Rim		Invert	Dia (ft)	Area (ft2)
LS N WW				1309	10	78.53982
LS O WW				1309	6	28.27433
	95	1327.85	1327.85	1317.73	4	12.56637
	94	1328.05	1328.05	1318.44	4	12.56637
	93	1327.67	1327.67	1318.25	4	12.56637
	86	1328.85	1328.85	1320.64	4	12.56637
	96	1328.34	1328.34	1318.81	4	12.56637
	97			1320.08	4	12.56637
	27	1328.32	1328.32	1314.15	4	12.56637
	26	1328.48	1328.48	1316.58	4	12.56637
	25	1328.38	1328.38	1318.48	4	12.56637
	24	1328.13	1328.13	1320.18	4	12.56637
20A		1328.88	1328.88	1314.46	4	12.56637
	20	1328.67	1328.67	1315.55	4	12.56637
	19	1328.45	1328.45	1317.05	4	12.56637
	18	1328.16	1328.16	1317.88	4	12.56637
	17	1329.17	1329.17	1318.64	4	12.56637
	16	1328.47	1328.47	1319.38	4	12.56637
	15	1328.75	1328.75	1320.49	4	12.56637
	14	1328.76	1328.76	1321.52	4	12.56637





Storage in cuft

Elevation (ft MSL)	LS N WW	LS O WW	27	20A	20	26	19	95	18	93	94	25	17	96	16	97	24	15	86	14	Total
1309	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1309.5	39.3	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.40708
1310	78.5	28.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106.8142
1311	157.1	56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	213.6283
1312	235.6	84.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	320.4425
1313	314.2	113.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	427.2566
1314.15	404.5	145.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	550.0929
1314.46	428.8	154.4	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	587.1008
1315.55	514.4	185.2	17.6	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	730.9229
1316.58	595.3	214.3	30.5	26.6	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	879.7716
1317.05	632.2	227.6	36.4	32.5	18.8	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	953.599
1317.73	685.7	246.8	45.0	41.1	27.4	14.5	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1068.958
1317.88	697.4	251.1	46.9	43.0	29.3	16.3	10.4	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1096.29
1318.25	726.5	261.5	51.5	47.6	33.9	21.0	15.1	6.5	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1168.358
1318.44	741.4	266.9	53.9	50.0	36.3	23.4	17.5	8.9	7.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1207.754
1318.48	744.6	268.0	54.4	50.5	36.8	23.9	18.0	9.4	7.5	2.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1216.55
1318.64	757.1	272.6	56.4	52.5	38.8	25.9	20.0	11.4	9.6	4.9	2.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1253.747
1318.81	770.5	277.4	58.6	54.7	41.0	28.0	22.1	13.6	11.7	7.0	4.6	4.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1295.404
1319.38	815.2	293.5	65.7	61.8	48.1	35.2	29.3	20.7	18.8	14.2	11.8	11.3	9.3	7.2	0.0	0.0	0.0	0.0	0.0	0.0	1442.242
1320.08	870.2	313.3	74.5	70.6	56.9	44.0	38.1	29.5	27.6	23.0	20.6	20.1	18.1	16.0	8.8	0.0	0.0	0.0	0.0	0.0	1631.366
1320.18	878.1	316.1	75.8	71.9	58.2	45.2	39.3	30.8	28.9	24.3	21.9	21.4	19.4	17.2	10.1	1.3	0.0	0.0	0.0	0.0	1659.641
1320.49	902.4	324.9	79.7	75.8	62.1	49.1	43.2	34.7	32.8	28.1	25.8	25.3	23.2	21.1	13.9	5.2	3.9	0.0	0.0	0.0	1751.187
1320.64	914.2	329.1	81.6	77.7	64.0	51.0	45.1	36.6	34.7	30.0	27.6	27.1	25.1	23.0	15.8	7.0	5.8	1.9	0.0	0.0	1797.368
1321.52	983.3	354.0	92.6	88.7	75.0	62.1	56.2	47.6	45.7	41.1	38.7	38.2	36.2	34.1	26.9	18.1	16.8	12.9	11.1	0.0	2079.357
1322	1021.0	367.6	98.6	94.8	81.1	68.1	62.2	53.7	51.8	47.1	44.7	44.2	42.2	40.1	32.9	24.1	22.9	19.0	17.1	6.0	2239.202
1323	1099.6	395.8	111.2	107.3	93.6	80.7	74.8	66.2	64.3	59.7	57.3	56.8	54.8	52.7	45.5	36.7	35.4	31.5	29.7	18.6	2572.21
1324	1178.1	424.1	123.8	119.9	106.2	93.2	87.3	78.8	76.9	72.3	69.9	69.4	67.4	65.2	58.1	49.3	48.0	44.1	42.2	31.2	2905.219
1325	1256.6	452.4	136.3	132.4	118.8	105.8	99.9	91.4	89.5	84.8	82.4	81.9	79.9	77.8	70.6	61.8	60.6	56.7	54.8	43.7	3238.228
1326	1335.2	480.7	148.9	145.0	131.3	118.4	112.5	103.9	102.0	97.4	95.0	94.5	92.5	90.4	83.2	74.4	73.1	69.2	67.4	56.3	3571.237

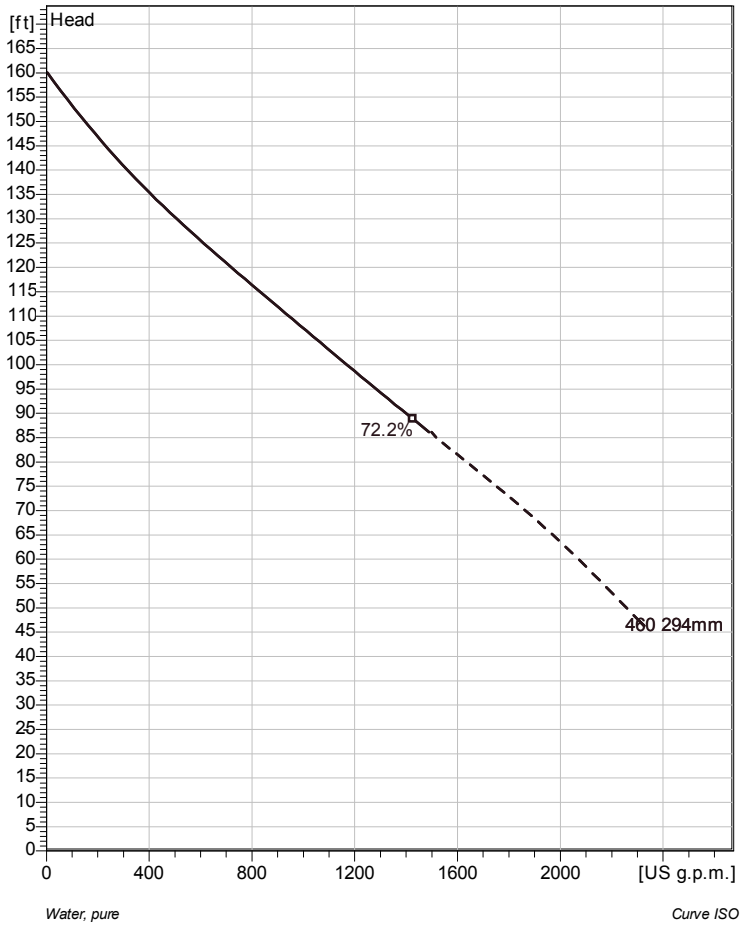
Volume 742.36 422.222 1650

Storage in gal

Elevation (ft MSL)	LS N WW	LS O WW	27	20A	20	26	19	95	18	93	94	25	17	96	16	97	24	15	86	14	Total (Gal)	Response Time (mins) Peak WW	Peak DW	Hist Peak
1309	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0
1309.5	293.7	105.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	399.4849	0.5	0.9	0.2
1310	587.5	211.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	798.9698	1.1	1.9	0.5
1311	1175.0	423.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1597.94	2.2	3.8	1.0
1312	1762.4	634.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2396.91	3.2	5.7	1.5
1313	2349.9	846.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3195.879	4.3	7.6	1.9
1314.15	3025.5	1089.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4114.695	5.5	9.7	2.5
1314.46	3207.6	1154.7	29.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4391.514	5.9	10.4	2.7
1315.55	3848.0	1385.3	131.6	102.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5467.304	7.4	12.9	3.3
1316.58	4453.1	1603.1	228.4	199.3	96.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6580.692	8.9	15.6	4.0
1317.05	4729.2	1702.5	272.6	243.5	141.0	44.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7132.921	9.6	16.9	4.3
1317.73	5128.7	1846.3	336.5	307.4	204.9	108.1	63.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7995.808	10.8	18.9	4.8
1317.88	5216.8	1878.0	350.6	321.5	219.0	122.2	78.0	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8200.25	11.0	19.4	5.0
1318.25	5434.2	1956.3	385.4	356.2	253.8	157.0	112.8	48.9	34.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8739.32	11.8	20.7	5.3
1318.44	5545.8	1996.5	403.2	374.1	271.6	174.8	130.7	66.7	52.6	17.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9033.999	12.2	21.4	5.5
1318.48	5569.3	2004.9	407.0	377.9	275.4	178.6	134.4	70.5	56.4	21.6	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9099.797	12.3	21.6	5.5
1318.64	5663.3	2038.8	422.0	392.9	290.4	193.6	149.5	85.5	71.4	36.7	18.8	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9378.026	12.6	22.2	5.7
1318.81	5763.2	2074.7	438.0	408.9	306.4	209.6	165.4	101.5	87.4	52.6	34.8	31.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9689.624	13.1	22.9	5.9
1319.38	6098.0	2195.3	491.6	462.5	360.0	263.2	219.0	155.1	141.0	106.2	88.4	84.6	69.6	53.6	0.0	0.0	0.0	0.0	0.0	0.0	10787.97	14.5	25.6	6.5
1320.08	6509.3	2343.3	557.4	528.3	425.8	329.0	284.8	220.9	206.8	172.0	154.2	150.4	135.4	119.4	65.8	0.0	0.0	0.0	0.0	0.0	12202.62	16.4	28.9	7.4
1320.18	6568.0	2364.5	566.8	537.7	435.2	338.4	294.2	230.3	216.2	181.4	163.6	159.8	144.8	128.8	75.2	9.4	0.0	0.0	0.0	0.0	12414.11	16.7	29.4	7.5
1320.49	6750.1	2430.0	595.9	566.8	464.3	367.5	323.3	259.4	245.3	210.6	192.7	188.9	173.9	157.9	104.3	38.5	29.1	0.0	0.0	0.0	13098.88	17.6	31.0	7.9
1320.64	6838.2	2461.8	610.0	580.9	478.4	381.6	337.4	273.5	259.4	224.7	206.8	203.0	188.0	172.0	118.4	52.6	43.2	14.1	0.0	0.0	13444.31	18.1	31.8	8.1
1321.52	7355.2	2647.9	692.8	663.6	561.2	464.3	420.2	356.2	342.1	307.4	289.5	285.7	270.7	254.7	201.2	135.4	126.0	96.8	82.7	0.0	15553.59	21.0	36.8	9.4
1322	7637.2	2749.4	737.9	708.7	606.3	509.5	465.3	401.4	387.3	352.5	334.6	330.9	315.8	299.8	246.3	180.5	171.1	141.9	127.8	45.1	16749.23	22.6	39.7	10.2
1323	8224.7	2960.9	831.9	802.7	700.3	603.5	559.3	495.4	481.3	446.5	428.6	424.9	409.8	393.8	340.3	274.5	265.1	235.9	221.8	139.1	19240.13	25.9	45.6	11.7
1324	8812.2	3172.4	925.9	896.7	794.3	697.5	653.3	589.4	575.3	540.5	522.6	518.9	503.8	487.8	434.3	368.5	359.1	329.9	315.8	233.1	21731.04	29.3	51.5	13.2
1325	9399.6	3383.9	1019.9	990.7	888.3	791.5	747.3	683.4	669.3	634.5	616.6	612.9	597.8	581.8	528.3	462.5	453.1	423.9	409.8	327.1	24221.95	32.6	57.4	14.7
1326	9987.1	3595.4	1113.9	1084.7	982.3	885.4	841.3	777.4	763.3	728.5	710.6	706.9	691.8	675.8	622.3	556.5	547.1	517.9	503.8	421.1	26712.85	36.0	63.3	16.2

NP 3202 HT 3~ 460

Technical specification

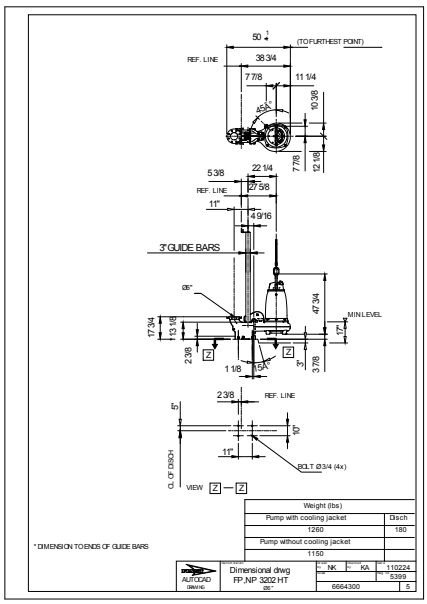


Water, pure *Curve ISO*



Note: Picture might not correspond to the current configuration.

Installation: P - Semi permanent, Wet



General

Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Possible to be upgraded with Guide-pin® for even better clogging resistance. Modular based design with high adaptation grade.

Impeller

Impeller material	Grey cast iron
Discharge Flange Diameter	5 7/8 inch
Inlet diameter	5 7/8 inch
Impeller diameter	294 mm
Number of blades	2

Motor

Motor #	N3202.180 30-19-4AA-W 45hp
Stator variant	4
Frequency	60 Hz
Rated voltage	230 V
Number of poles	4
Phases	3~
Rated power	45 hp
Rated current	102 A
Starting current	625 A
Rated speed	1770 rpm
Power factor	
1/1 Load	0.91
3/4 Load	0.89
1/2 Load	0.82
Efficiency	
1/1 Load	90.5 %
3/4 Load	91.5 %
1/2 Load	91.5 %

Configuration

Project	Project ID	Created by	Created on	Last update
			2015-10-22	

NP 3202 HT 3~ 460

Performance curve

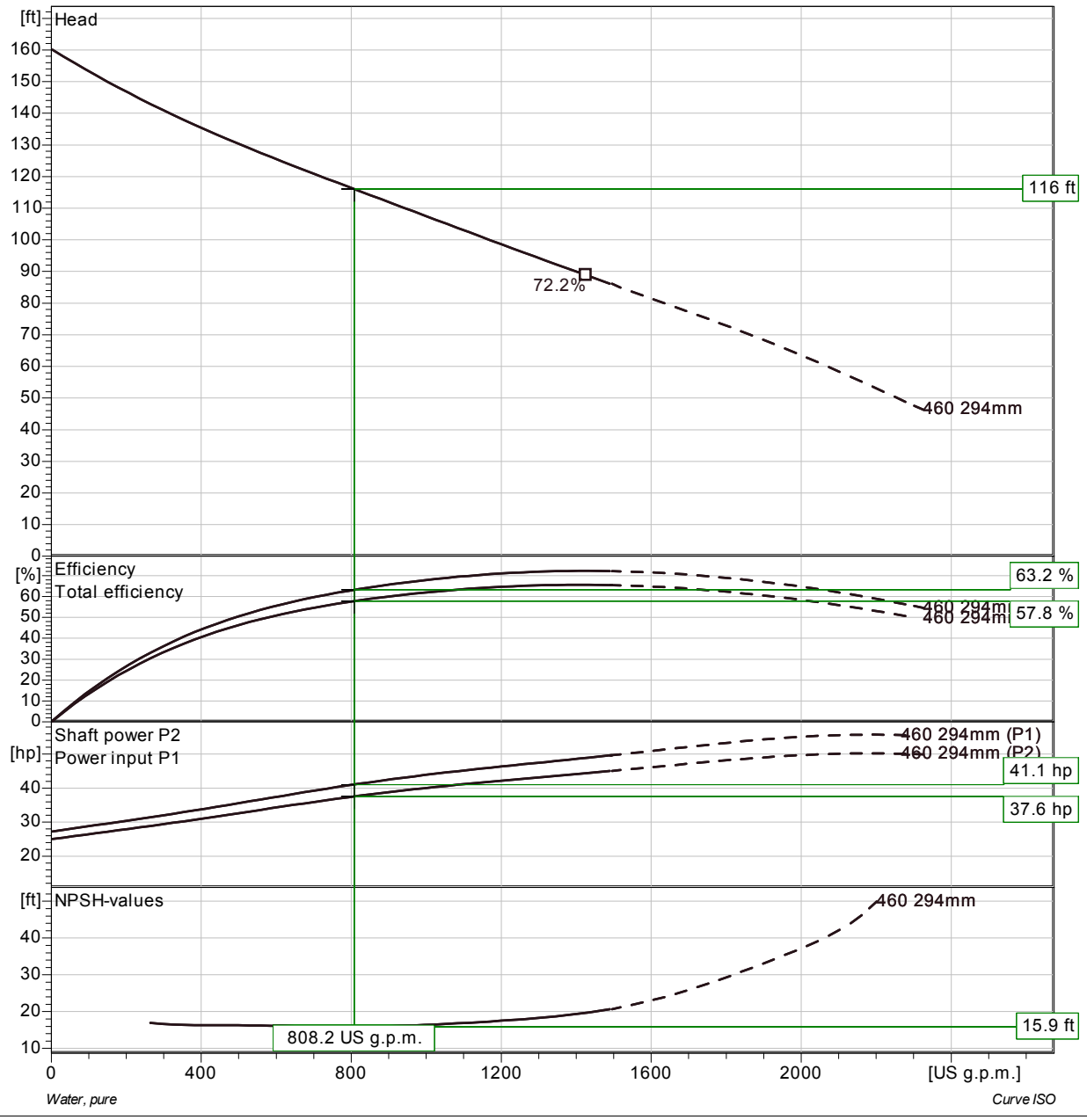
Pump

Discharge Flange Diameter	5 7/8 inch
Inlet diameter	150 mm
Impeller diameter	11 9/16"
Number of blades	2

Motor

Motor #	N3202.180 30-19-4AA-W 45hp
Stator variant	4
Frequency	60 Hz
Rated voltage	230 V
Number of poles	4
Phases	3~
Rated power	45 hp
Rated current	102 A
Starting current	625 A
Rated speed	1770 rpm

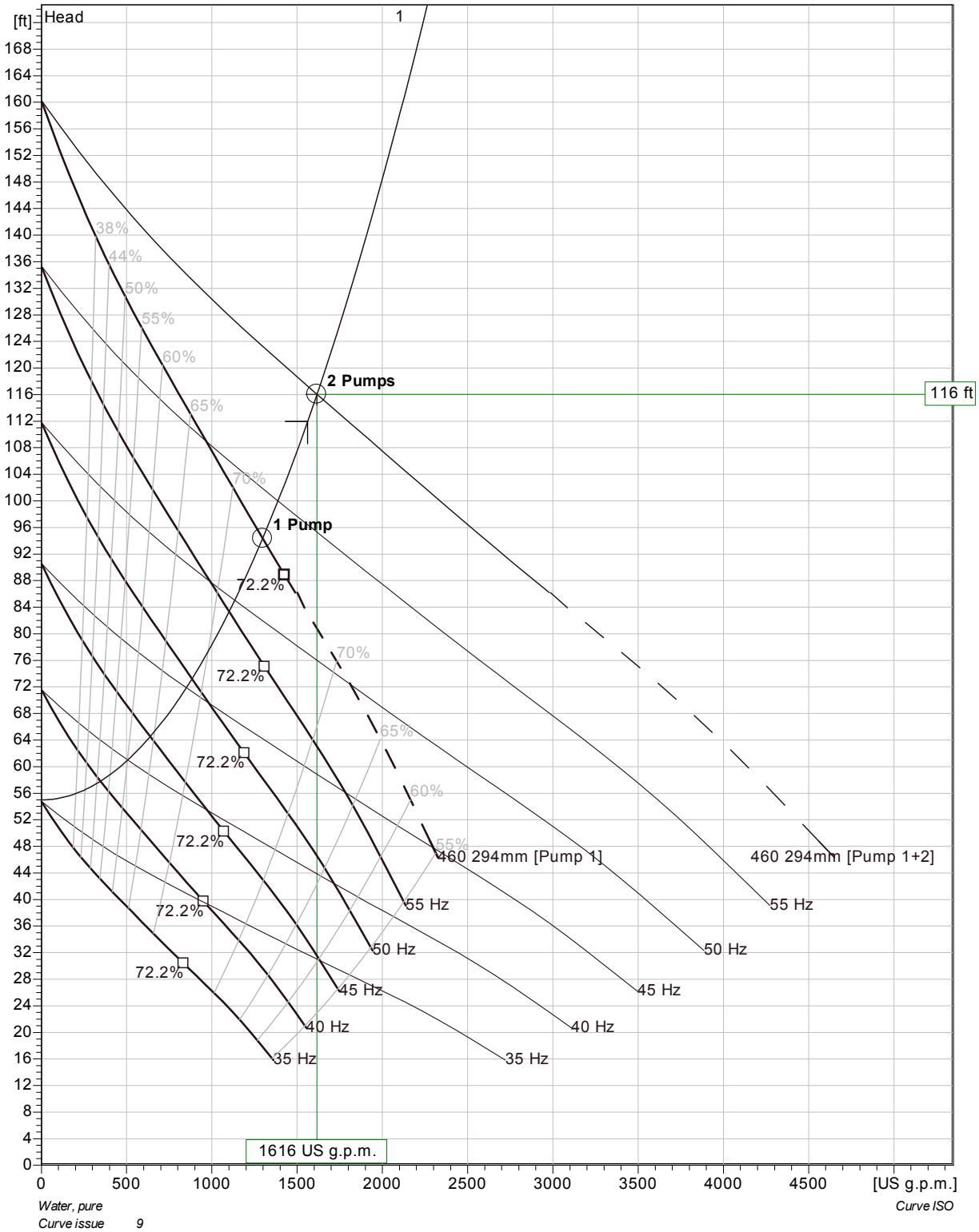
Power factor	
1/1 Load	0.91
3/4 Load	0.89
1/2 Load	0.82
Efficiency	
1/1 Load	90.5 %
3/4 Load	91.5 %
1/2 Load	91.5 %



Project	Project ID	Created by	Created on	Last update
			2015-10-22	

NP 3202 HT 3~ 460

Duty Analysis

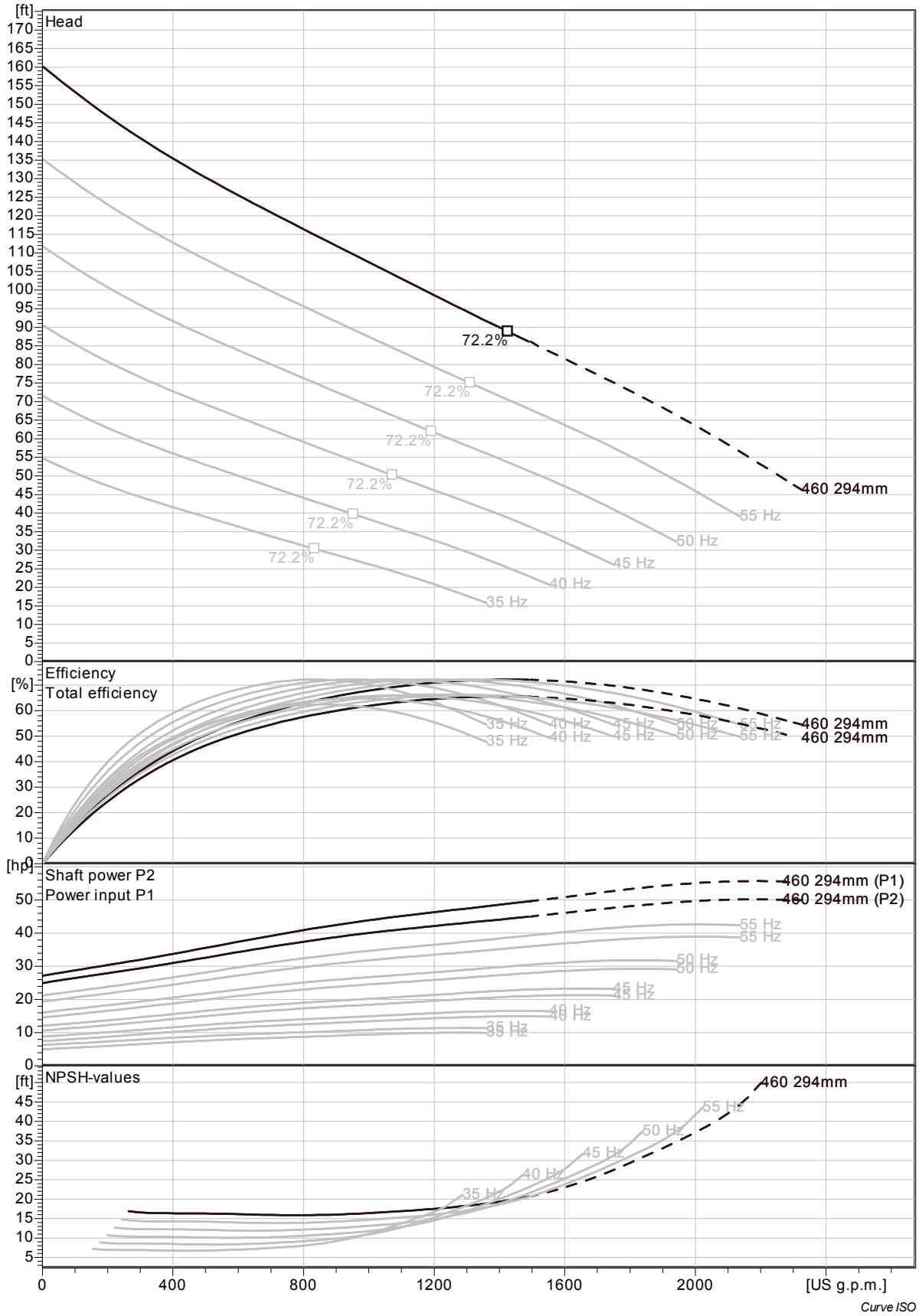


Pumps running /System	Individual pump Flow	Head	Shaft power	Total Flow	Head	Shaft power	Pump eff.	Specific energy	NPSHre
2 / 1	808 US g.p.m.	116 ft	37.6 hp	1620 US g.p.m.	116 ft	75.1 hp	63.2 %	631 kWh/US MG	15.9 ft
1 / 1	1300 US g.p.m.	94.4 ft	43.1 hp	1300 US g.p.m.	94.4 ft	43.1 hp	71.8 %	451 kWh/US MG	18.3 ft

Project	Project ID	Created by	Created on	Last update
			2015-10-22	

NP 3202 HT 3~ 460

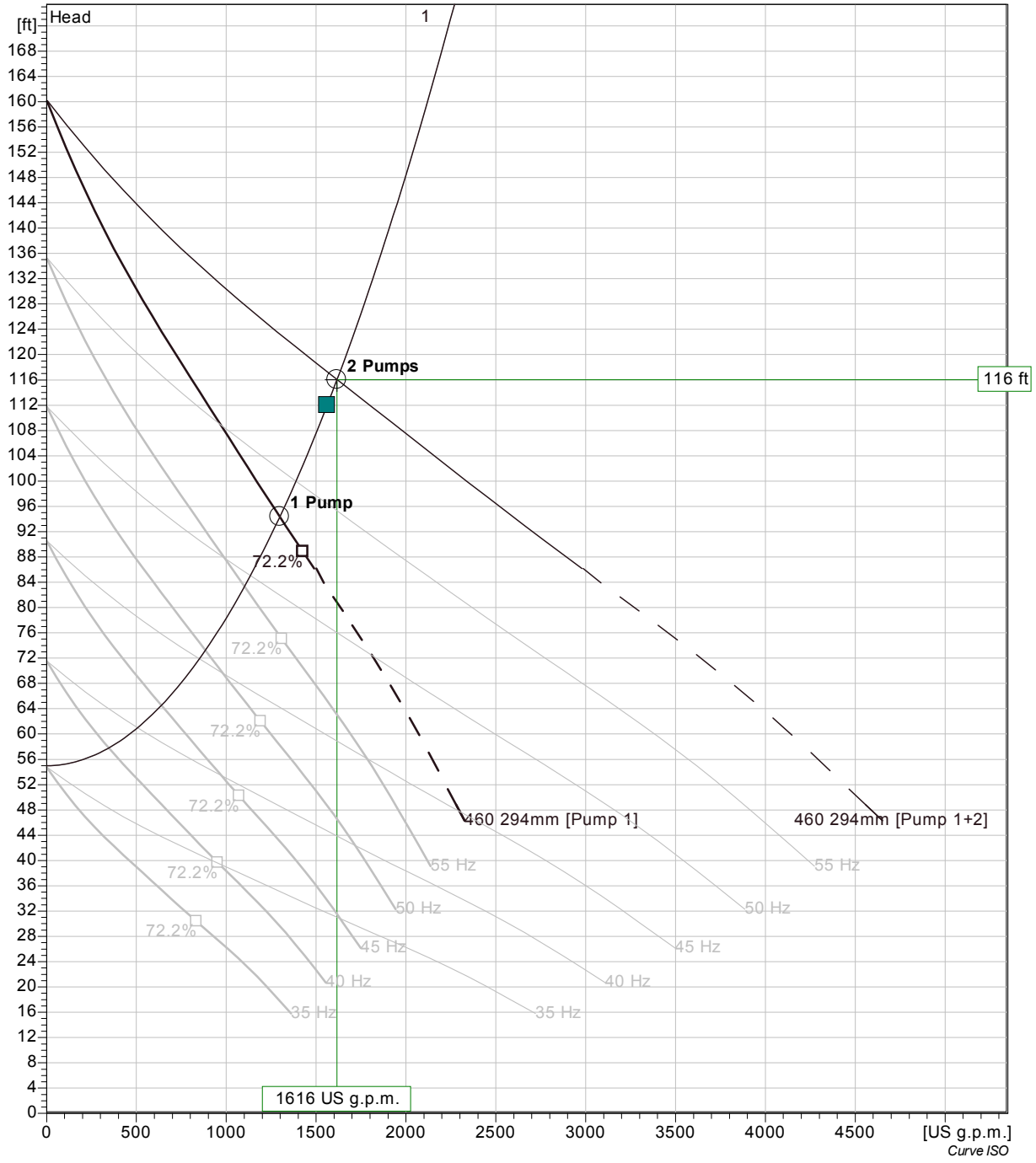
VFD Curve



Project	Project ID	Created by	Created on	Last update
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NP 3202 HT 3~ 460

VFD Analysis

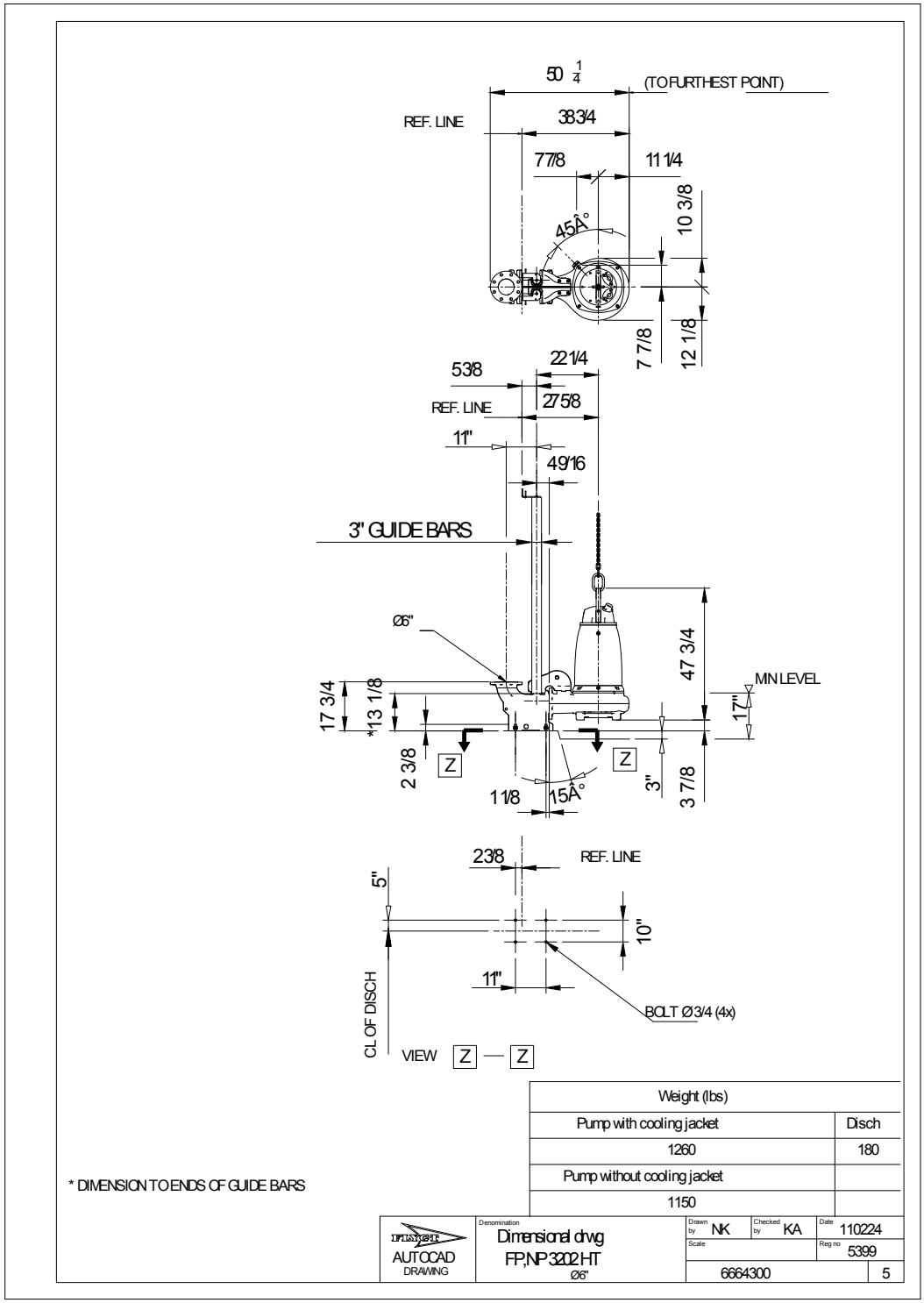


Pumps running /System	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hyd eff.	Specific energy	NPSHre
2 / 1	60 Hz	808 US g.p.m.	116 ft	37.6 hp	1620 US g.p.m.	116 ft	75.1 hp	63.2 %	631 kWh/US MG	15.9 ft
2 / 1	55 Hz	694 US g.p.m.	100 ft	28.5 hp	1390 US g.p.m.	100 ft	57 hp	61.5 %	556 kWh/US MG	13.9 ft
2 / 1	50 Hz	567 US g.p.m.	85.1 ft	20.7 hp	1130 US g.p.m.	85.1 ft	41.5 hp	58.8 %	496 kWh/US MG	12 ft
2 / 1	45 Hz	425 US g.p.m.	71.9 ft	14.3 hp	850 US g.p.m.	71.9 ft	28.7 hp	53.9 %	464 kWh/US MG	10.3 ft
2 / 1	40 Hz	253 US g.p.m.	61 ft	9.15 hp	506 US g.p.m.	61 ft	18.3 hp	42.7 %	518 kWh/US MG	8.58 ft
2 / 1	35 Hz									
1 / 1	60 Hz	1300 US g.p.m.	94.4 ft	43.1 hp	1300 US g.p.m.	94.4 ft	43.1 hp	71.8 %	451 kWh/US MG	18.3 ft
1 / 1	55 Hz	1100 US g.p.m.	83.3 ft	32.7 hp	1100 US g.p.m.	83.3 ft	32.7 hp	71 %	402 kWh/US MG	15.3 ft
1 / 1	50 Hz	883 US g.p.m.	73.2 ft	23.7 hp	883 US g.p.m.	73.2 ft	23.7 hp	69 %	365 kWh/US MG	12.5 ft
1 / 1	45 Hz	639 US g.p.m.	64.5 ft	16.2 hp	639 US g.p.m.	64.5 ft	16.2 hp	64.4 %	351 kWh/US MG	10.1 ft
1 / 1	40 Hz	346 US g.p.m.	57.8 ft	9.83 hp	346 US g.p.m.	57.8 ft	9.83 hp	51.5 %	410 kWh/US MG	8.54 ft
1 / 1	35 Hz									

Project	Project ID	Created by	Created on	Last update
			2015-10-22	

NP 3202 HT 3~ 460

Dimensional drawing



Project	Project ID	Created by	Created on	Last update
			2015-10-22	

CD225M Dri-Prime® Pump

The Godwin Dri-Prime CD225M pump offers flow rates to 3240 USGPM and has the capability of handling solids up to 3.0" in diameter.

The CD225M is able to automatically prime to 28' of suction lift from dry. Automatic or manual starting/stopping available through integral mounted control panel or optional wireless-remote access.

Indefinite dry-running is no problem due to the unique Godwin liquid bath mechanical seal design. Solids handling, dry-running, and portability make the CD225M the perfect choice for dewatering and bypass applications.



Features and Benefits

- Simple maintenance normally limited to checking fluid levels and filters.
- Dri-Prime (continuously operated Venturi air ejector priming device) requiring no periodic adjustment. Optional compressor clutch available.
- Extensive application flexibility handling sewage, slurries, and liquids with solids up to 3.0" in diameter.
- Dry-running high pressure liquid bath mechanical seal with high abrasion resistant solid silicon carbide faces.
- Close-coupled centrifugal pump with Dri-Prime system coupled to a diesel engine or electric motor.
- All cast iron construction (stainless steel construction option available) with cast steel impeller.
- Also available in a critically silenced unit which reduces noise levels to less than 70 dBA at 30'.
- Standard engine John Deere 4045TF285 (T3 Flex). Also available with John Deere 4045HFC92 (IT4).

Specification

Suction connection	8" 150# ANSI B16.5
Delivery connection	8" 150# ANSI B16.5
Max capacity	3240 USGPM †
Max solids handling	3.0"
Max impeller diameter	11.4"
Max operating temp	176°F*
Max pressure	73 psi
Max suction pressure	73 psi
Max casing pressure	110 psi
Max operating speed	2200 rpm

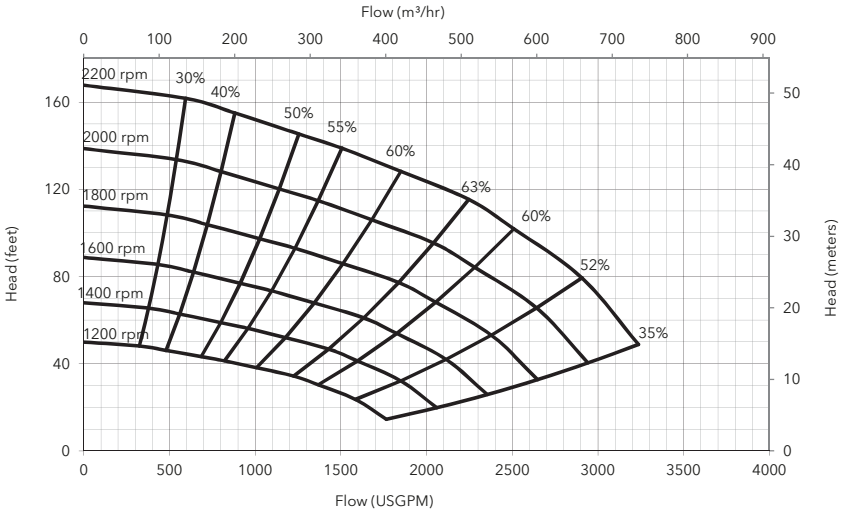
* Please contact our office for applications in excess of 176°F.

† Larger diameter pipes may be required for maximum flows.

PAC MACHINE CO., INC.
SACRAMENTO, CA (916) 387-1336
FAX (916) 387-1380
BENICIA (707) 746-4940
FAX (707) 746-1845
SPARKS, NV (775) 359-8500
FAX (775) 359-0818

Please contact the factory or office for further details. A typical picture of the pump is shown.
All information is approximate and for general guidance only.

Performance Curve



Materials

Pump casing & suction cover	Cast iron BS EN 1561 - 1997
Wearplates	High Chromium Cast Iron HC403:1977
Pump Shaft	Carbon steel BS 970 - 1991 817M40T
Impeller	Cast Steel BS3100 A5 Hardness to 200 HB Brinell
Non-return valve body	Cast iron BS EN 1561 - 1997
Mechanical seal	Silicon carbide face; Viton elastomers; Stainless steel body

Engine option 1

John Deere 4045TF285 (T3 Flex), 99 HP @ 2200 rpm

Impeller diameter 11.4"

Pump speed 2200 rpm

Suction Lift Table

Total Suction Head (feet)	Total Delivery Head (feet)				
	42	70	101	121	137
	Output (USGPM)				
10	3148	2906	2325	-	-
15	2906	2543	2058	1695	-
20	1695	1695	1695	1453	-
25	1211	1211	1211	969	387

Fuel capacity: 100 US Gal

Max Fuel consumption @ 2200 rpm: 5.8 US Gal/hr

Max Fuel consumption @ 1800 rpm: 5.0 US Gal/hr

Weight (Dry): 4,440 lbs

Weight (Wet): 5,160 lbs

Dimensions: (L) 155" x (W) 76" x (H) 93"

Performance data provided in tables is based on water tests at sea level and 20°C ambient. All information is approximate and for general guidance only. Please contact the factory or office for further details.

Engine option 2

John Deere 4045HFC92 (IT4), 99 HP @ 2200 rpm

Impeller diameter 11.4"

Pump speed 2200 rpm

Suction Lift Table

Total Suction Head (feet)	Total Delivery Head (feet)				
	42	70	101	121	137
	Output (USGPM)				
10	3148	2906	2325	-	-
15	2906	2543	2058	1695	-
20	1695	1695	1695	1453	-
25	1211	1211	1211	969	387

Fuel capacity: 100 US Gal

Max Fuel consumption @ 2200 rpm: 5.4 US Gal/hr

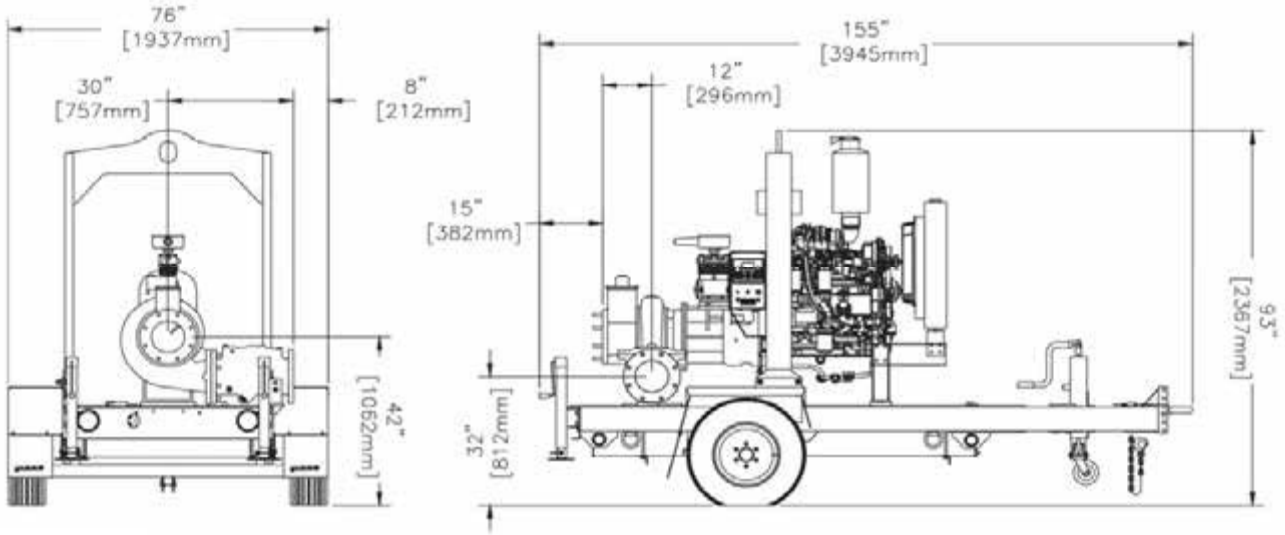
Max Fuel consumption @ 1800 rpm: 4.8 US Gal/hr

Weight (Dry): 4,680 lbs

Weight (Wet): 5,400 lbs

Dimensions: (L) 155" x (W) 76" x (H) 93"

Performance data provided in tables is based on water tests at sea level and 20°C ambient. All information is approximate and for general guidance only. Please contact the factory or office for further details.



xylem
Let's Solve Water

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Bridgeport, NJ 08014 USA
(856) 467-3636 . Fax (856) 467-4841
Email: sales@godwinpumps.com

Reference number : 95-1015-3000
Date of issue : November 22, 2013
Issue : 5

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Appendix I

Tech Memo No. 1 Mapping

Item Number	Document	Page Number
1	Technical Memo No. 1	I-2

CLOCWD I/I Study
Technical Memo No. 1
Mapping, Surveying and GIS

5/26/15

Tasks (Associated with Phase I)

Task 1.1 *GPS Network/Record of Survey*
Task 1.2 *Survey Sewer Manhole and Meter Horizontal Locations*
Task 1.3 *Survey Sewer Manhole Elevations*
Task 1.5 *Base Map Modeling and Preparation*

Objective

MC Engineering conducted a variety of surveying and mapping activities that form the foundation of the CLOCWD I/I study. CLOCWD's sanitary sewer system is an intricate patchwork of sanitary sewer manholes, gravity mains, force mains, laterals, and pump stations. Prior to this effort there were no pre-existing accurate representations of the entire sanitary sewer system in paper copy. No digital files were available depicting the sanitary sewer collection system within the District.

In addition to having accurate maps in accordance with State RWQCB requirements, it was determined that the best way to manage the large amount of defect data was to provide the District with an accurate digital map of the sanitary system map that could be used to build a database of past sewer rehabilitation projects that support an accurate data base for the implementation of the SSMP programs, an asset management and work order system, and documentation future recommended projects. MC Engineering developed data that was ultimately used to generate a Geographic Information System (GIS) based map and model of the pipes and manholes for the main system. The initial system map was prepared by digitizing existing maps, where available, into an Autocad drawing file. The team surveyor then relied on the initial schematic and field work to survey the related facilities both horizontally and vertically for future use.

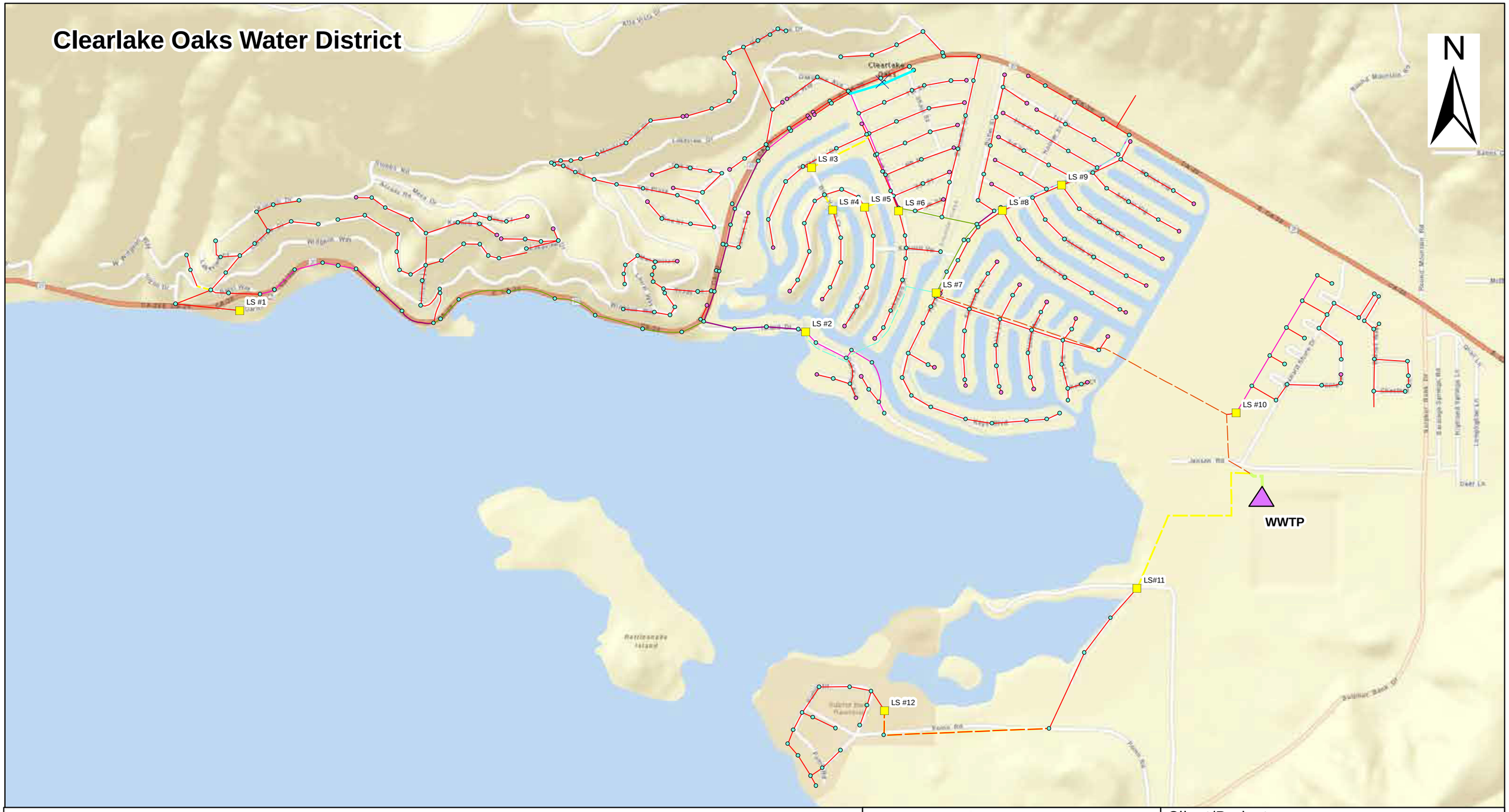
GIS provides an ideal tool to explore, analyze, and visualize the characteristics of the sewer system based on results of the investigations. Furthermore, the GIS database forms the basis of a hydraulic model developed to analyze system capacity, serve as a future planning tool, and identify related deficiencies. Results of the mapping efforts and initial GIS database are discussed in more detail below under the respective Scope of Work items for the Phase 1 tasks.

Mapping and System Model

As noted in the Scope of Work, this phase includes essential base mapping to facilitate the I/I evaluation and condition assessment. This mapping along with other system-wide information created and generated for the project will be utilized for on-going SSMP compliance, spill reporting, maintenance operations, and future asset management programs. A computerized hydraulic model (Hydra) will also be prepared and will be utilized to identify hydraulic bottlenecks and available system-wide pipeline and lift station capacity. This modeling will also include land use information as provided for by the Lake County Planning Department. Results are summarized below by sub-task. A preliminary map, based on the initial Autocad file is presented below in **Figure 1.**

Task 1.1- *GPS Network/ Record of Survey*: The team's surveyor, Geo Legal is in the process of finalizing a Record of Survey of the geodetic network (see **Figure2**), established to provide the horizontal and vertical California State Plane coordinates associated with all data collection. These points are set on the North American Datum of 1983 (NAD83) and are California State Plane Zone 2. The vertical datum was taken from four National Geodetic Survey Benchmarks found along the Highway 20 corridor and are based on North American Vertical Datum of 1929 NAVD29. The final Record of survey will consist of approximately 12 permanent brass discs, or comparable markers. Currently 7 of those permanent markers already exist in the field from previous work. The final 5 will be set as soon as verification of land and/or right-of-way can be determined. The Record of Survey generally takes several months to circulate through County agencies for checking prior to recordation. An example of the brass disc to be used for this project is presented in **Figure 3**, below.

Clearlake Oaks Water District



LEGEND

- Pump_Station
- cleanout
- Manholes
- WWTP
- 8_inch FM
- 15_inch SS
- 10_inch FM
- 8_inch SS
- 6_inch FM
- 4_inch FM
- 10_inch SS
- 12_inch SS
- 6_inch SS

December 2015

Final

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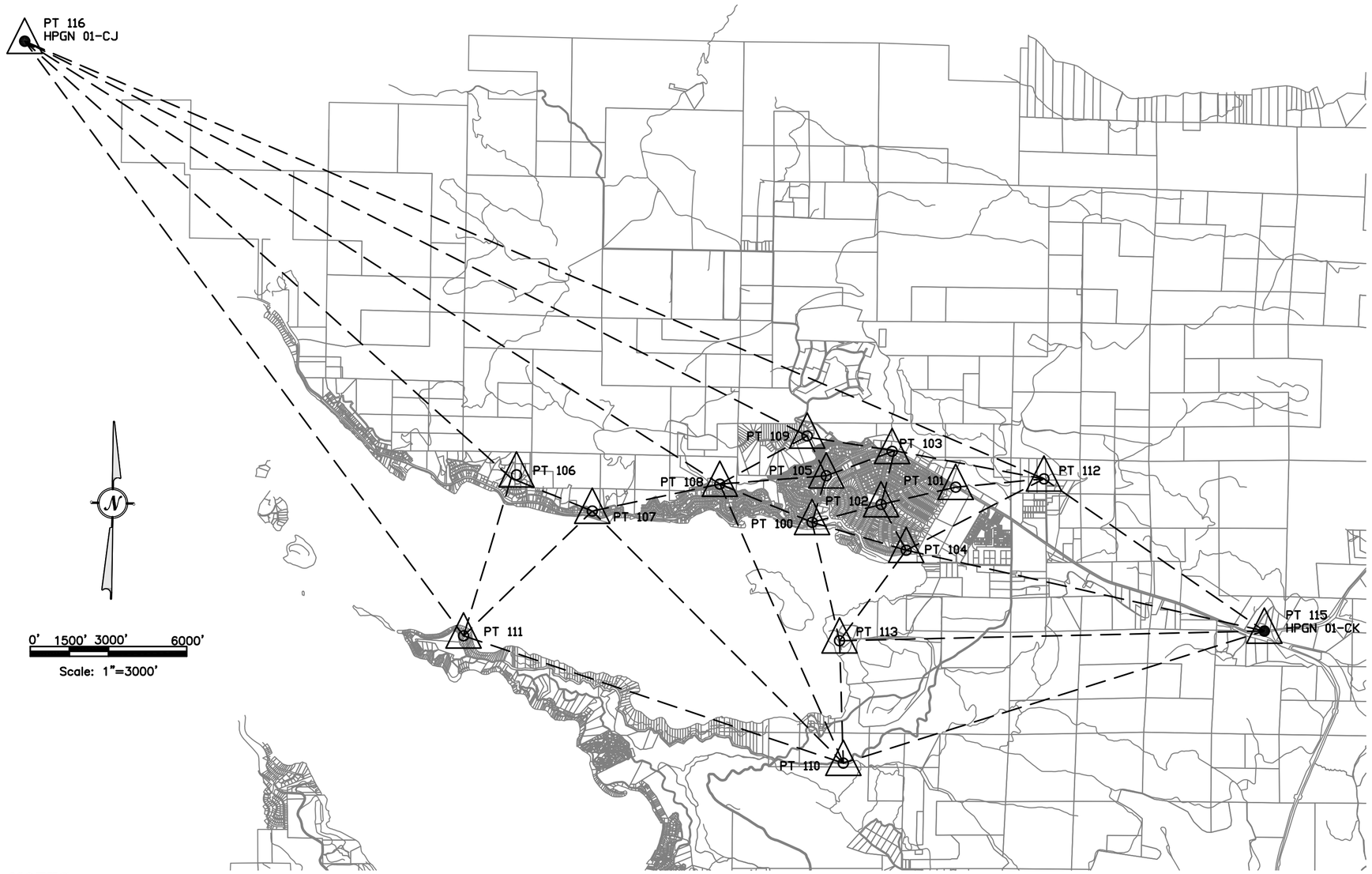
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Client/Project

CLEARLAKE OAKS, CA
SANITARY SEWER EVALUATION STUDY

Sheet Title:

FIGURE 1.1 - SYSTEM MAP



RECORD OF SURVEY

CITY OF CLEARLAKE

ROS #XXXX

BEING A RESUBDIVION OF PARCEL 2 AS SHOWN ON THAT CERTAIN PARCEL MAP RECORDED IN BOOK 48 OF PARCEL MAPS AT PAGE 101, EL DORADO COUNTY RECORDS, ALSO BEING PORTIONS OF THE S.W.1/4 OF SECTION 17, THE S.E. 1/4 OF SECTION 18 AND THE N.W.1/4 OF SECTION 20, T. 10 N. R. 9 E. M.D.M. EL DORADA RECORDS
COUNTY OF LAKE
STATE OF CALIFORNIA
MAY 2015

GEO LEGAL, INC.
SURVEYING • MAPPING • LAND LAW
8850 GREENBACK LANE, STE. C
CITRUS HEIGHTS, CA 95662
916.773.2202

NOTES

1. THE COORDINATES SHOWN ON THIS MAP ARE BASED ON THE 1194 CALIFORNIA HIGH PRECISION NETWORK(HPPGN)(EPOCH 1191.35) ADJUSTMENT OF THE NORTH AMERICAN DATUM OF 1983(NAD83). DISTANCES SHOWN ON THIS MA, OR COMPUTED FROM THE COORDINATES SHOWN HEREON ARE "GRID DISTANCES", AND SHOULD BE CONVERTED TO "GROUND" DISTANCES IN ORDER TO BE COMPATIBLE WITH MEASUREMENTS MADE ON THE GROUND USING CONVERTIONAL SURVEYING TECHINQUES. TO OBTAIN "GROUND" DISTANCES, DIVIDE THE "GRID" DISTANCE BY THE "COMBINATION FACTOR", TO OBTAIN "GRID" DISTANCES, MULTIPLY THE "GROUND" DISTANCE BY THE "COMBINATION FACTOR". COMBINATION FACTORS FOR EACH POINT ARE INCLUDED IN THE COORDINATE LISTINGS.

2. THIS RECORD OF SURVEY IN INTENEDE TO BE A MONUMENTATION MAP ONLY. IT DOES NOT DEFINE PROPERTY BOUNDARY LOCATIONS. THE SOLE PURPOSE IS TO ESTABLISH A PRIMARY HORIZONTAL AND VERTICAL CONTROL NETWORK FOR THE COUNTY OF LAKE COUNTY, CONSTRAINED TO THE CALIFORNIA HIGH PRECISION GEODETIC NETWORK, USING GLOBAL POSITIONING SURVEY TECHNIQUES, AND CONSTRAINED TO NATIONAL GEODETIC VERTICAL DATUM OF 1929(NVGD29), AND SHOW THE LOCATION AND DESCRIPTION OF THE MONUMENTS FOUND OR SET, ALONG WITH THE NAD83–1194 STATE PLANE COORDINATES DETERMINED FOR THE MONUMENTS.

3. THE VECTOR SOLUTION WERE POST PROCESSED USING TRIMBLE NAVIFGATION SOFTWARE GPSURVEY V2.35, THE LEAST SQUARES NETWORK ADJUSTMENT WAS PERFORMED USING TRIMBLE SOFTWARE TRIMNET PLUS V2.35, AND COSTRAINED TO THE 1992(EPOCH 1991.35) ADJUSTMENT OF THE CA HPGN NAD83 PUBLISHED COORDINATES.

4. A COMPLETE REPORT OF THE GPS SURVEY IS AVAILABLE FOR REVIEW AT THE COUNTY OF LAKE COUNTY, DEPARTMENT OF PUBLIC WORKS.

5. COORDINATES AND DESCRITONS FOR ALL POINTS SHOWN HEREON ARE LISTED IN TABLES ON SHEET 2.

BASIS OF BEARINGS & COORDINATES

THIS SURVEY ESTABLISHES THE BASIS OF BEARINGS FOR THE HORIZONTAL CONTROL NETWORK OF LAKE COUNTY IN THE XXXX HARBOUR AS DEFINED BY THE 1994(EPOCH 2010.00)ADJUSTMENT OF THE CA HPGN NAD83 HOLDING THE FOLLOWING STATIONS AS FIXED

NGS PID	STATION NAME	NORTHING(ft.)	EASTING(ft.)	NORTHING(m)	EASTING(m)	LATITUDE	LONGITUDE	CONVERGENCE	COMBINATION FACTOR
DF8951	HPGN D CA 01 CJ	2129809.343	6386999.942	−2684922.869	−4168961.217	39°04'11".58299N	122°46'57".43827W		
DF8952	HPGN D CA 01 CK	2152411.101	6339480.9	−2675033.684	−4180468.683	39°00'31".78582N	122°36'52".95329W		

LEGEND

- NEW GPS SURVEY MONUMENTS
- EXISTING GPS SURVEY MONUMENTS AS NOTED
- EXISTING CA HPGN CONTROL STATIONS AS NOTED
- INDEPENDENT BASELINE VECTORS OBSERVED
- TRIVIAL BASELINE VECTORS OBSERVED

COUNTY SURVEYOR'S STATEMENT

THIS MAP HAS BEEN EXAMINED IN ACCORDANCE WITH SECTION 8766 OF THE LAND SURVEYOR'S ACT THIS _____DAY OF MAY 2015.

_____
XXXXXXXXXX X. XXXXXXXXXXL.S. 5084
COUNTY SURVEYOR
COUNTY OF LAKE COUNTY, CALIFORNIA

BY: _____
DEPUTY

SURVEYOR'S STATEMENT

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN COMFORMACE WITH THE REQUIREMENTS OF THE PROFESSIONAL LAND SURVEYORS ACT AT THE REQUEST OF XXXXXXXXXXXXXXX IN 2014.

_____
CHRISTOPHER D. JOHNSON PLS 7576
LICENSE EXPIRES: DECEMBER 31, 2015

DATE:_____

PROFESSIONAL LAND SURVEYOR
CHRISTOPHER D. JOHNSON
LS 7576
EX. 12/31/15
STATE OF CALIFORNIA

COUNTY RECORDER'S STATEMENT

I, WILLIAM E. SCHULZ HEREBY CERTIFY THAT PLACER TITLE COMPANY PARCEL MAP GUARANTEE NO. _____ WAS FILED WITH THIS_____ OFFICE AND THAT THIS PARCEL MAP WAS ACCEPTED FOR RECORD AND FILED THIS ____ DAY OF_____ , 2014 AT_____M. IN BOOK ____ OF PARCEL MAPS AT PAGE_____AS THE REQUEST OF_____.

DOCUMENT NO.: _____

_____
WILLIAM E. SCHULTZ
COUNTY RECORDER, CLERK
COUNTY OF EL DORADO, STATE OF CALIFORNIA

BY:_____
DEPUTY

SHEET 1 OF 2 **1MCE0104**

RECORD OF SURVEY

CITY OF CLEARLAKE

ROS #XXXX

BEING A RESUBDIVION OF PARCEL 2 AS SHOWN ON THAT CERTAIN PARCEL MAP RECORDED IN BOOK 48 OF PARCEL MAPS AT PAGE 101, EL DORADO COUNTY RECORDS, ALSO BEING PORTIONS OF THE S.W.1/4 OF SECTION 17, THE S.E. 1/4 OF SECTION 18 AND THE N.W.1/4 OF SECTION 20, T. 10 N. R. 9 E. M.D.M. EL DORADA RECORDS

COUNTY OF LAKE

STATE OF CALIFORNIA

MAY 2015

GEO LEGAL, INC.

SURVEYING • MAPPING • LAND LAW
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CITRUS HEIGHTS, CA 95662
916.773.2202

LAKECOUNTY CONTROL NETWORK
STATION DESCRIPTIONS, LOCATIONS AND COORDINATES

STATION ID	MONUMENT LOCATION
100	FOUND REBAR & CAP
101	FOUND COTTON SPINDLE
102	FOUND PK & SHINNER
103	FOUND PK & SHINNER
104	FOUND PK & SHINNER
105	FOUND PK & sHINNER
106	FOUND REBAR & CAP
107	FOUND 20 LAK 25.89
108	FOUND REBAR & CAP
109	FOUND REBAR & CAP
110	FOUND REBAR & CAP
111	FOUND REBAR & CAP
112	FOUND REBAR & CAP
113	FOUND PK & SHINNER
115	FOUND ALUMINUM SURVEY DISK STAMPED 'CALIF DEPT OF TRANSPORTATION 1993, CA HPGN–DENSIFICATION STA 01–CK"
116	FOUND ALUMINUM SURVEY DISK STAMPED 'CALIF DEPT OF TRANSPORTATION 1993, CA HPGN–DENSIFICATION STA 01–CJ"
625	FOUND NGS BENCH MARK DISK STAMPED E 1061 1966, SET IN MASSIVE STRUCTURE, 3 MILES W FROM LEARLAKE OAKS, 3.05 MILE WEST ALONG STATE HIGHWAY 20 FROM POST OFFICE CLEARLAKE OAKS, ON THE NOTRTH SIDE OF CLEARLAKE, 0.4 MILE SOUTHEAST OF THE POST OFFICE AT GLENHAVEN, IN THE TOP OF THE SOUTHWEST END OF A CONCRETE AND ROCK RETAINING WALL, 17.5 FEET SOUTHWEST OF THE CENTERLINE OF THE HIGHWAY, 1.0 FOOT NORTHWEST OF THE SOUTHEST END OF THE WALL, AND ABOUT 3.5 FEET HIGHER THAN THE HIGHWAY. NGS PID KT0625

NAD83 (HPGN 1994) – NGVD29 BM A 625 (EL. = 1334.51)

CALIFORNIA STATE PLANE ZONE 2 METERS AND U.S. FEET

STATION NAME	LATITUDE	00(FT)	LONGITUDE	A0(FT)	HEIGHT(M)	NORTHING(FT)	EASTING(FT)	NORTHING(M)	EASTING(M)	HEIGHT(FT)	HEIGHT(M)	Ha(FT)	COMB. FACTOR	CONVERGENCE
100														
101														
102														
103														
104														
105														
106														
107														
108														
109														
110														
111														
112														
113														
115														
116														

SHEET 2 OF 2 1MCE0104

Figure 3

Typical Survey Control Monument



Over 100 individual control points have been set throughout the Keys and other areas to facilitate location of existing structures. These points have been tied into the Geodetic Network and are controlled vertically by digital levels. These points are being utilized for conventional survey needs where GPS work is unavailable or unacceptable. All control set will be available for future mapping needs. The vertical data will be used to calibrate the hydraulic model. An elevation on the top of the manhole rim was established by level control and the survey team then measured from the rim to the invert to establish flow-line elevations of each manhole run. This allows the system modeler to calculate an accurate slope of the sewer line. This slope, combined with the inside pipe diameter, can then be used to calculate the actual capacity of the sewer line.

Task 1.2- *Locate Sewer Manholes*

The Scope of Work included surveying an estimated 300 manholes. The total number of manholes was estimated at approximately 400, thus resulting in an additional work load that necessitated limited surveying of other utilities, while focusing on the manholes and related inverts. The additional manholes required an extension of the survey control area as depicted in the draft system map.

Task 1.3 – Sewer Manhole Elevations

Geo Legal Inc. has provided field measured horizontal and vertical data locations for the entire CLOCWD sewer system of record, and approximately 100 manholes not previously shown on provided as-built drawings. Manholes where dipped for inverts to facilitate a district wide GIS database and modeling component. MC Engineering relied on the invert elevations to build an

initial database using ESRI Arc View for subsequent model development. Please refer to Task 1.1, for additional information.

Task 1.4 - *Aerial Mapping/Ortho Photo*

This task was reduced to relying on pre-existing aerials available through ESRI maps. Costs for this item were re-allocated to an increase in the time spent reviewing and documenting historic conditions and building the base map for areas not previously included in any District maps. Google maps was used as the method to acquire aerial mapping.

Task 1.5- *Base Map and Hydraulic Modeling*

This task included importing data from the field surveys and mapping into an ESRI GIS mapping system. The GIS data includes incorporating pre-existing GIS shape files obtained from Lake County depicting land use areas, zoning, and parcel maps. This GIS information and pipeline mapping (horizontal and vertical) field data will then be used to develop the hydraulic model, which along with input from the flow metering can calculate the pipeline capacities at build-out and during peak flow periods. The model will include considerations for all parcels within the District with a distinction between developed and undeveloped lots. As of this writing, this effort was on-going.

Once all the historical data has been built into the GIS database and the current investigation effort has been set up to receive data as it is completed, maps can be produced for the purpose of reports, rehab studies and future rehabilitation projects. The resulting future maps can be used to graphically depict high priority items including critical portions of the following information:

1. Past pipeline rehabilitation projects that were performed in 2002/2003. This includes pipeline repairs, replacements, linings and other CIPP work.
2. The 5 underwater crossing projects that were completed in 2001/2002.
3. Sanitary sewer lateral repairs that were projected to be completed from 2003 and 2006. The map will include repairs that were completed and repairs that were not completed.
4. Pipe condition assessments of the past pipeline work from 1-3 above, using the 2011 CCTV logs.
5. Results of CCTV work from 2015, performed by CLOCWD crews. This will include comparative 2011 vs 2015 photos of the 2002-2003, and 2006 rehab projects.
6. Results of smoke testing to be performed by CLOCWD crews, as a part of Task 2.9.
7. Work orders and as-built information that can be plotted and/or submitted as a part of the mandatory RWQCB SSMP program.

Recommendations and Required Follow-up

This GIS mapping will be used for various types of infrastructure projects, maintenance and operation programs, potholing of other utilities, such as gas, water, electric, and cable. It will ultimately give the staff the opportunity to closely monitor its wastewater collection system and provide for cost-effective solutions for future projects. The following are recommendations that will need to be implemented to assure that the accurate base map and GIS system will be efficiently utilized in the future:

- Purchase appropriate computers with updated software
- Purchase of a cost-effective GIS software program that can be used to issue work orders and keep track of completed work projects.

Appendix J

TM 2 Record Search

Item Number	Document	Page Number
1	Technical Memo No. 2	J-2

CLOCWD I/I Study
Technical Memo No. 2
COLLECTION SYSTEM HISTORICAL OPERATING CONDITION REVIEW

5/26/2015

Associated Tasks: (Phase II)

Task 2.1 *Record Drawing Review*
Task 2.3 *Collection System Historical Operating Condition Review*

Objective

An integral component of the I/I study was to research and acquire necessary documentation from the District's files, mapping, and record keeping systems. The information attained was then used to more accurately define and understand the historical condition of the wastewater collection system, which provided the MC Engineering team (team) a platform for assessing the overall condition of the wastewater collection system. This assessment will allowed the team to prescribe the necessary field metering, testing, and evaluation programs that can cost-effectively pin-point and identify immediate, short term and long term system-wide collection system rehabilitation programs. The related follow-up programs are as defined within Tasks 2.2, 2.4, 2.5, 2.6, 2.8, 2.9, 2.10, and 2.11 of the Scope of Work for the project. If identified, structural defects and/or pipeline defects that appeared to have the potential to pose a risk to public health and safety were identified and listed so the District can make the necessary rehabilitation actions to eliminate those threats.

Pertinent information and documentation from the records search is listed below and will ultimately be utilized for preparing an overall deficiency map, a list of rehabilitation projects, and a final project report. The ultimate goal is apply to the SWRCB Revolving Loan Program for loan and grant funds to provide the necessary funding to design and construct those system-wide pipeline/manhole improvements to minimize excessive I/I and eliminate existing and future sewer overflows and collection system defects that could lead to more significant issues in the future if not addressed. These identified emergency/immediate, short and long term repairs are also required per the **CRWQCB CAO R5-2014-070** the **SWRCB I/I Study Guidelines.**

Historical Data Review Summary

Task 2.1 –*Record Drawing Review*: MC Engineering conducted a search for pertinent record drawings of the wastewater collection system. Various as-built wastewater drawings and maps were located and reviewed. These included plan and profile drawings, sketches, and other project specific information. It should be noted that the accuracy of the maps cannot be substantiated in all cases. A portion of the inverts and related information needed to map the system was taken from the record drawings with additional information gathered from the field the survey team.. This system-wide mapping is discussed in more detail within **Technical Memo No. 1**.

Task 2.3 –*Collection System Historical Operating Review*: **Table 1** below presents a historical overview and identification of important and relevant CLOCWD wastewater system operation and maintenance data from 1997 to date discovered through the search. It includes the following:

- Past RWQCB Clean-up and Abatement Order (COA) and other Correspondence.
- Past Technical Reports on the Condition of the Collection System
- Plans and Specifications for System Rehabilitation Projects.
- CLOCWD Board Project Approvals
- Historic WWTP Metered Flow Records.
- Historic Hour Meter Readings/Logs from the Wastewater Lift Stations.
- Review of Collection System CCTV Records and Logs

The data review uncovered various sewer system condition assessments that were performed by others. These past assessments/evaluations were cursory, and contained very little specific information, especially regarding rehabilitation work. Those system-wide defects that were found in prior pipeline evaluations occurred in 1983, 1993, 1996, and 2003. The focus of this effort is on those investigations that were conducted after 1999. This is for two reasons; first, the research did not reveal detailed information for investigations and studies conducted prior to 1999, and secondly, any data uncovered prior to 1999 would be considered old and outdated. Pipeline rehabilitation, specifically slip-lining and pipeline grouting, will typically last only 20 years. In this 2015 study, the goal was to pin-point specific areas of concern within the collection system through a combination of data review (post-1999), review of old CCTV tapes/logs (2011), flow metering (2015), manhole inspections (2015), and follow-up CCTV and smoke testing programs. Since 1999, there were three identified rehabilitation programs as noted below:

1. New and rehabilitated underwater crossings (2002-2003), as required by RWQCB CAO R5-2014-0707.
2. In-line sewer rehabilitation, including slip-lining and grouting (2002-2003).
3. Sewer service line replacements per CCTV (2003 and 2006)

Additional detail describing the past rehabilitation projects are more clearly defied in **Table 1**, below:

Table 1
Historical Summary of CLOCWD
Sewer System Rehabilitation Programs

Description of Work	Completed By	Date Completed	Compliance Action	% Complete
1983 I/I Study (all CCTV tapes/logs lost)	Dewante and Stowell	1983	Unknown	Unknown
1993 I/I Study w/ Report	Kennedy Jenks	1/28/1994	CRWQCB C&D Order No. 94-049	N/A
1999-2006 Collection System Corrective Action and Rehabilitation	CH2MHill (plan/design)	1999-2006	CRWQCB CAO Order No. 99-704	
Clean-up and Abatement Order Issued for CLOCWD Sewer Collection System	CRWQCB CAO	2/24/1999	CAO Order No. 99-704	N/A
Corrective Action Plan/Requirements	CH2MHill	1/01/2000	CAO Order No. 99-704	100%
Underwater Assessment Report of six (6) Water Crossings	CH2MHill North Coast Divers	1/24/2001	CAO Order No. 99-704	100%
Construction and Design of five (5) Crossings	(5) CH2MHill (design) Solidrock Construction	5/01/2003 5/01/2003	CAO Order No. 99-704	100%
2003-2006 CCTV, Smoke Testing and Collection System Rehabilitation	CH2MHill (plan/design)	2002-2006	N/A	
CCTV and Mainline Repairs (45 total repairs)	CH2MHill (bid Docs) Pacific Pipeline Repair	2002-2003	N/A	60-70%
Service Lateral Repairs (8 total)	CH2MHill (bid Docs) Pacific Pipeline Repair	2003	N/A	60-70%
CCTV & Service Lateral Repairs (20 total repairs)	CH2MHill (bid Docs) Pacific Pipeline Repair	2003	N/A	100%
Service Lateral Repairs (8 total)	CH2MHill (bid Docs) Pacific Liners (PO Issued)	2006	N/A	100%
2013 CCTV Inspections	CLOCWD Staff	2013	N/A	N/A

Table 1, above**,** includes detailed pipeline and service line rehabilitation projects from 1993 to 2006. This pertinent data and information includes planning, design, and construction documents and other District records necessary for evaluation of, and improvements to, the sewer collection system. A complete summary of those rehabilitation projects are found in **Attachment A** and include water body crossings, mainline and service line repairs. It cannot concluded that all that of the noted rehabilitation projects were completed. Follow-up CCTV inspection will confirm the completion of the past recommended rehabilitation projects (see **Recommendations**, below)

Per the review of old, 2013 CCTV tapes and logs, it was evident that some of the rehabilitation projects, per Attachment A are failing. **Figure 1,** clearly shows some of the past pipeline rehabilitation work (2003) is failing.









LS #3

LS #4

LS #5

LS #6

LS #7

LS #8

LS #9

Clearlake Oaks Water District

LEGEND

- PUMP STATION
- Manholes
- SANITARY SEWER PIPE
- EXCESSIVE ROOTS
- BROKEN PIPE
- MAINLINE PIPE CRACKED
- MANHOLE DEFECTIVE
- OFFSET JOINT

December 2015

Final

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Client/Project

CLEARLAKE OAKS, CA
SANITARY SEWER EVALUATION STUDY

Sheet Title:

FIGURE 2.1 - DEFECT MAP

The photos as noted in **Figure 1,** above clearly show that repairs (slip lining) performed in 2003 has been failing. The lining is failing to adhere to the pipe walls and is allowing groundwater influenced infiltration to enter manholes. Again, these photos (snapshots) were taken from the review of the District's 2013 CCTV videos/logs. A preliminary estimate indicates that approximately 30% of the old 2003-2006 pipeline liner is failing and must be re-CCTV (Task 3.1). All information found within the 2013 CCTV tapes and logs will be incorporated into the deficiency map and table (Task 4.1). This review of the 2013 CCTV tapes and logs is only a pre-cursor to the updated CCTV and smoke testing programs, as planned following the flow metering and manhole inspection work that is prescribed in Tasks 2.9, 2.10, and 2.11 and will be included within **Tech Memo No. 3.**

Recommendations and Required Follow-up

All flow data acquired from Tasks 2.2, 2.5, 2.6, 2.7, and 2.8, will be utilized for Tasks 2.9, 2.10 and 2.11, smoke testing, flow isolation and CCTV inspection, respectively. The data output in the form of flow hydrographs, will endeavor to locate and verify those sub-basins requiring necessary cost-effective follow-up and investigations through CCTV, smoke testing and flow isolation. This follow-up work which includes tasks 2.9, 2.10, and 2.11, will include identifying pipeline breaks, cracks, and off-set joint(s) that contribute to the identified infiltration. The work will also include identifying related inflow sources, including roof drains and storm drain cross-connections, and open manhole and cleanout covers. Recommendations in the form cost-effective rehabilitation projects will be identified and presented, along with a system-wide deficiency map, in a project report prepared per **SWRCB State Revolving Loan/Grant guidelines.** A preliminary list of recommendations are included that should be addressed later in the study and as follow-up work for the design and construction phase of the project are as follows:

1. Include within **Task 2.11,** additional follow-up CCTV inspections and evaluations of laterals, where repairs were made in 2003 and 2006, and as identified in **Attachment A.** This is for two reasons, one, **Figure 1**, above clearly indicates that completed pipeline rehabilitation, utilizing slip lining, has failed in certain pipe segments, and secondly, MC Engineering is not confident that all of the CH2MHill recommended (2002/2003) point and lateral repairs were made. This additional CCTV pipeline inspection maybe in addition to CCTV inspections, as recommended in Phase III of the study.
2. Identify past point repairs and lateral repairs, and include recommendations, with estimated costs, to repair and rehabilitate. This will be summarized in Tasks 3.1, 3.2, and 4.1, of this study.

During the course of the study, the District, with information submitted by MC Engineering, submitted required status reports to the CRWQCB in accordance with the **California Regional**

Water Quality Control Board Order (CAO Order R5-2014-0707). It is also important to note that during the course of the study certain immediate rehabilitations are identified. To date several areas of concern were identified that must be addressed in the near future. These are considered immediate and emergency problems that require the attention of the CLOCWD crews. These items are listed below in **Table 2**, and are only a preliminary list the list maybe expanded following the CCTV and smoke testing programs per Tasks 3.1 and 3.2. This emergency repair work can be cost-effectively performed by the District crews.

Table 2
Emergency/Immediate Repair Projects

MH Location	LS Zone	Problem Description (See **PACP Codes**, below)	Recommended Action
MH 511-PS5	5	T @ 50ft, tap @173 ft IG	Immediate repairs
MH 512-511	5	Surcharged w/ root at jt @ 143 ft	Immediate repairs
MH 521-522	5	RT @ 52 ft W/ I/I, OJ @ 96 ft, LT @ 127 I/I, RT @ 224 ft I/I w/ roots	Immediate repairs
MH411 @ 12762 Blue Heron Ct.	4	IG >8gpm 194' DS from AMH	Immediate repairs
MH 824- CO	8	RT and cracked main @ 133 ft, RT/OJ lateral w/ fractured main @ 143 ft	Immediate repairs
MH 921-PS9	9	Inflow at 10 gpm @ 127 ft to 192 ft	Immediate repairs

Abbreviations

PACP Codes

AMH--Access Manhole
B--Broken
C --Crack, Longitudinal, Circumferential
D--Deposits, Attached, Settled
F-Fracture, Hinged
H--Hole, Soil or Void observed
I--Infiltration, Weeper, Runner, Gusher
L--Liner, Fail, Detached
MCU--Camera Under- water
MWLS--Water Level , Sag
R--Roots, Fine, Medium, Ball
T--Tap. Factory, Break-in, Saddle
J—Joint, Offset, Separated

ATTACHMENT A

Previous Rehabilitation Projects

Sewer Main Repair Schedule [a]

Priority	Pump Station	Repair Number	Location	Date of Television Inspection	Tape No.	Run No.	Manhole No. (Upstream)	Manhole No. (Downstream)	Approx. Length Between Manholes[b] (feet)	Approx. Depth to Invert[b] (feet)	Approx Distance from Upstream Manhole[b] (feet)	Pipe Size[b] (Inches)	Pipe Material[b]	Description of Defect (s) [c]	Estimated I/I [d] (gpm)	Repair Method	Date Repaired	Liner Length (LF)	Video/Written Log	Paid
1	6	15	Lakeland Street	APR 03	61	606	105	PS6	265	9 - 11	231	6	AC	OPEN JOINT/GASKET EXPOSED	2	Point Repair	30-Jul-03	4	OK	X
1	6	50	Lake Street	MAY 03	709	7036	125	126	107	4	92.4	6	VCP	OPEN JOINT	MAJOR	Repair [NOT	[NOT DONE]	NA	NA	NA
1	6	17	Lake Street	APR 03	62	607	126	127	294	4 - 10	111.2	6	VCP	RADIAL CRACK - CLOSED	10 to 15	Point Repair	20-Nov-03		OK	X
1	6	18	Lake Street	APR 03	62	607	126	127	294	4 - 10	134.2	6	VCP	OPEN JOINT	MAJOR INFIL	Point Repair	30-Jul-03	4	OK	X
1	7	19	Keys Boulevard	APR 03	71/72	703	13	14	268.4	6 - 8	59.3	6	AC	JOINT RADIAL CRACK - OPEN	LIGHT	MH to MH Lining	14-15 Oct-03	NA	OK	
1	7	20	Keys Boulevard	APR 03	71/72	703	13	14	268.4	6 - 8	82.0	6	AC	JOINT RADIAL CRACK - OPEN	3	MH to MH Lining	14-15 Oct-03	NA	OK	
1	7	51	Keys Boulevard	APR 03	71/72	703	13	14	268.4	5-6	95.0	6	AC	JOINT RADIAL CRACK - OPEN - GASKET EXPOSED	MAJOR	MH to MH Lining	14-15 Oct-03	NA	OK	
1	7	52	Keys Boulevard	APR 03	71/72	703	13	14	268.4	5-6	105.0	6	AC	JOINT RADIAL CRACK - OPEN - GASKET EXPOSED	MAJOR	MH to MH Lining	14-15 Oct-03	NA	OK	
1	7	21	Keys Boulevard	APR 03	71/72	703	13	14	268.4	6 - 8	115	6	AC	JOINT RADIAL CRACK - OPEN - GASKET EXPOSED	LIGHT	MH to MH Lining	14-15 Oct-03	NA	OK	
1	7	22	Keys Boulevard	APR 03	71/72	703	13	14	268.4	6 - 8	127.9	6	AC	JOINT RADIAL CRACK - OPEN	LIGHT	MH to MH Lining	14-15 Oct-03	NA	OK	
1	7	23	Keys Boulevard	APR 03	71/72	703	13	14	268.4	6 - 8	225.4	6	AC	JOINT RADIAL CRACK - OPEN	1	MH to MH Lining	14-15 Oct-03	NA	OK	
1	7	53	Keys Boulevard	APR 03	71/72	703	13	14	268.4	5-6	267.4	6	AC	JOINT RADIAL CRACK - OPEN	MAJOR	MH to MH Lining	14-15 Oct-03	NA	OK	
1	7	54	Keys Boulevard	APR 03	72	705	15	16	299.4	6-7	44	8	AC	CRACK	MAJOR	Point Repair	17-Jul-03	4	OK	X
1	7	55	Keys Boulevard	APR 03	72	705	15	16	299.4	6-7	222.7	8	AC	LONGITUDINAL CRACK - OPEN	MODERATE	Point Repair	18-Jul-03	7	OK	X
1	7	24	Keys Boulevard	APR 03	73	707	17	18	208.3	7-8	50.8-53.6	8	AC	LONGITUDINAL CRACK - CLOSED / OPEN JOINT	<1	Point Repair	18-Jul-03	7	OK	X
1	7	56	Keys Boulevard	APR 03	75	711	19	20	329.2	11	37	8	AC	LONGINTUDINAL CRACK - 3 FT	MAJOR	Point Repair	21-Jul-03	6	OK	X
2	7	57	Keys Boulevard	APR 03	75	711	19	20	329.2	11	317.3-320.1	8	AC	LONGITUDINAL CRACK - OPEN	MODERATE	Point Repair	20-Nov-03		OK	X
~~2~~	~~7~~	~~58~~	~~Bass Lane~~	~~APR 03~~	~~79A~~	~~727~~	~~39~~	~~25~~	~~248~~	~~9~~	~~11.5~~	~~6~~	~~AC~~	OPEN JOINT [DELETED ALL GROUT JOINTS (7/22/03)]	~~MODERATE~~	~~Grout Joint [DELETED]~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~
~~1~~	~~7~~	~~59~~	~~Spinnaker Court~~	~~APR 03~~	~~79C~~	~~731~~	~~42~~	~~43~~	~~277.4~~	~~6~~	~~154.9~~	~~6~~	~~AC~~	OPEN JOINT [DELETED PER DARIN'S ASSESSMENT OF REPAIR (7/23/03)]	~~MAJOR~~	~~Point Repair [DELETED]~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~

Sewer Main Repair Schedule [a]

Priority	Pump Station	Repair Number	Location	Date of Television Inspection	Tape No.	Run No.	Manhole No. (Upstream)	Manhole No. (Downstream)	Approx. Length Between Manholes [b] (feet)	Approx. Depth to Invert [b] (feet)	Approx Distance from Upstream Manhole [b] (feet)	Pipe Size [b] (Inches)	Pipe Material [b]	Description of Defect (s) [c]	Estimated I/I [d] (gpm)	Repair Method	Date Repaired	Liner Length (LF)	Video/Written Log	Paid
2	7	60	Spinnaker Court	APR 03	79C	732	43	44	211	8	199.2	6	AC	OPEN JOINT	MODERATE	Grout Joint	17-Jul-03	NA	NA	X
1	7	61	Spinnaker Court	APR 03	79C	732	43	44	211	8	207.6	6	AC	OPEN JOINT	MAJOR	Point Repair	22-Jul-03	5	OK	X
1	7	62	Spinnaker Court	APR 03	79C	730	41	26	230.1	6	228.3	6	AC	OPEN JOINT	MAJOR	Point Repair	21-Jul-03	4	OK	X
1	7	63	Keys Boulevard	APR 03	700	7000	76	79	264.5	4	259.8	8	VCP	RADIAL CRACK - OPEN / OFFSET JOINT - MAJOR / OPEN JOINT	LIGHT	Point Repair	16-Jul-03	4	OK	X
1	7	38	Keys Boulevard	APR 03	700	7003	82A	84	196.7	6 - 9	2.9	8	VCP	OPEN JOINT (2 CRACKS - BOTH COVERED BY LINER)	MAJOR	Point Repair	16-Jul-03	5	OK	X
1	7	64	Butler Street	APR 03	85	821	88	89	309.8	7	68.5	6	VCP	OFFSET JOINT - MINOR	MAJOR	Point Repair	23-Jul-03	2.5	OK	X
1	7	64A	Butler Street	APR 03	85	821	88	89	309.8	7	65.1	6	VCP	OFFSET JOINT - MINOR [ADDED BY NELSON PER CIPP CREW CCTV]	MAJOR	Point Repair	23-Jul-03	2.5	OK	X
1	7	39	Butler Street	APR 03	86	822	89	90	307.3	5 - 6	162	6	VCP	RADIAL CRACK - CLOSED	<1; NONE	Point Repair	23-Jul-03	5	OK	X
1	7	65	6th Street	APR 03	87	824	91	92	262.5	5	230.8-231.3	6	VCP	LONGITUDINAL CRACK - OPEN	MAJOR	Point Repair	29-Jul-03	4	OK	X
~~1~~	~~8~~	~~11~~	~~Keys Boulevard~~	~~APR 03~~	~~83~~	~~808~~	~~47~~	~~PS 8~~	~~391~~	~~9-11~~	~~185~~	~~6~~	~~AC~~	OPEN JOINT - GASKET EXPOSED [DELETED ALL GROUT JOINTS (7/22/03)]	~~NO INFIL~~	~~Grout Joint [DELETED]~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~
1	8	12	Keys Boulevard	APR 03	83	808	47	PS 8	391	9-11	343.9 - 347.9	6	AC	OPEN JOINT (RUBBER REPAIR EXISTING - BULGES INTO PIPE)	LIGHT	Point Repair	25-Jul-03	3	OK	X
1	8	66	Keys Boulevard	APR 03	92	905	58	PS 8	335.5	5-6	2.3	6	AC	OPEN JOINT	MAJOR	Point Repair	22-Jul-03	4	OK	X
~~1~~	~~8~~	~~13~~	~~Venus Village~~	~~APR 03~~	~~82~~	~~805~~	~~52~~	~~PS 8~~	~~310~~	~~13~~	~~272~~	~~6~~	~~AC~~	OPEN JOINT - GASKET EXPOSED [DELETED ALL GROUT JOINTS (7/22/03)]	~~<5; NO INFIL~~	~~Grout Joint [DELETED]~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~
1	9	67	Keys Boulevard	APR 03	96	915	69	66	316.3	11	91.4	6	AC	OPEN JOINT	MAJOR	Point Repair	28-Jul-03	4	OK	X
~~2~~	~~9~~	~~4~~	~~Keys Boulevard~~	~~APR 03~~	~~96~~	~~916~~	~~66~~	~~PS 9~~	~~341~~	~~10~~	~~243~~	~~6~~	~~AC~~	OPEN JOINT - GASKET EXPOSED [DELETED ALL GROUT JOINTS (7/22/03)]	~~5; NO INFIL~~	~~Grout Joint [DELETED]~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~
1	9	5	Driftwood Village	APR 03	94	909	62	PS 9	241	14	228	6	AC	OFFSET JOINT - MINOR	<5; MODERATE	Point Repair	25-Jul-03	4	OK	X

Sewer Main Repair Schedule [a]

Priority	Pump Station	Repair Number	Location	Date of Television Inspection	Tape No.	Run No.	Manhole No. (Upstream)	Manhole No. (Downstream)	Approx. Length Between Manholes[b] (feet)	Approx. Depth to Invert[b] (feet)	Approx Distance from Upstream Manhole[b] (feet)	Pipe Size [b] (Inches)	Pipe Material[b]	Description of Defect (s) [c]	Estimated I/I [d] (gpm)	Repair Method	Date Repaired	Liner Length (LF)	Video/Written Log	Paid
1	**9**	**6**	**Driftwood Village**	**APR 03**	**94**	**909**	**62**	**PS 9**	**241**	**14**	**238.2**	**6**	**AC**	**OPEN JOINT**	**15; MAJOR**	**Point Repair**	**25-Jul-03**	**4**	**OK**	**X**
TOTAL POINT REPAIRS =					21															
TOTAL MH TO MH LINING =					8	TOTAL LENGTH (LF) = 265														
TOTAL GROUT JOINTS =					1															
TOTAL PRIORITY 1[e] =					32															
TOTAL PRIORITY 2[e] =					4															

REPAIRS TO BE ADDED IN LIEU OF WORK ON SERVICES:

2	6	100	Lake Street	APR 03	709	7036	125	126	107	4	37	6	PVC	JOINT DEFECT	MODERATE	Point Repair [DELETED]	TOO CLOSE TO LATERAL, DELETED	NA	NA	NA
3	7	101	Flying Jib Court	APR 03	74	709	21	19	243	6.5	234	8	PVC	RADIAL CRACK - OPEN	<5	Point Repair	03-Oct-03	4	OK	
2	7	58	Bass Lane	APR 03	79A	727	39	25	248	9	11	6	PVC	OPEN JOINT	MODERATE	Point Repair	02-Oct-03	3	OK	
2	8	11	Keys Boulevard	APR 03	83	808	47	PS 8	391	11	187	6	PVC	OPEN JOINT - GASKET EXPOSED	NO INFIL	Point Repair	06-Oct-03	3	OK	
2	8	13	Venus Village	APR 03	82	805	52	PS 8	310	10	272	6	PVC	OPEN JOINT	<5; NO INFIL	Point Repair	03-Oct-03	3	OK	

Sewer Main Repair Schedule [a]

Priority	Pump Station	Repair Number	Location	Date of Television Inspection	Tape No.	Run No.	Manhole No. (Upstream)	Manhole No. (Downstream)	Approx. Length Between Manholes[b] (feet)	Approx. Depth to Invert[b] (feet)	Approx Distance from Upstream Manhole[b] (feet)	Pipe Size[b] (Inches)	Pipe Material[b]	Description of Defect (s) [c]	Estimated I/I [d] (gpm)	Repair Method	Date Repaired	Liner Length (LF)	Video/Written Log	Paid
2	9	68	Keys Boulevard	APR 03	96	916	66	PS 9	341	10	169	6	PVC	OPEN JOINT	MODERATE	Point Repair	01-Oct-03	3	OK	
2	9	4	Keys Boulevard	APR 03	96	916	66	PS 9	341	10	241.5	6	PVC	OPEN JOINT - GASKET EXPOSED	5; NO INFIL	Point Repair	02-Oct-03	3	OK	
3	9	105	Keys Boulevard	APR 03	97	919	58	PS 9	341.2	15	329.2	6	AC	OPEN JOINT	10; NO INFIL	Point Repair	30-Sep-03	3	OK	
2	9	106	Driftwood Village	APR 03	94	909	62	PS 9	241	11	213.5	6	AC	OFFSET JOINT	NO INFIL	Point Repair	30-Sep-03	3	OK	
TOTAL ADDITIONAL POINT REPAIRS =					**8**															

[a] Repairs confirmed repairs per 2003 CCTV. Descriptions or other notes shown in all capital letters are notes per 2003 CCTV.

[b] Length between manholes, depth to invert, distance from upstream manhole, pipe size and material have been determined from maps and 1983, 1993, 1996, and 2003 CCTV. Where discrepancies exist, 2003 CCTV results only are listed.

[c] Defects determined from 1983,1993, 1996, and 2003 CCTV logs and map and table of defects.

[d] Estimated Infiltration/inflow (I/I) from review of previous CCTV records. The amount of I/I will vary depending on lake levels and joint deterioration over time.

[e] Priority ratings are based on observed infiltration rates or determined potential for infiltration.

[f] Changes shown in yellow were made post-Change Order No.1.

Service Connection Repairs

Service Connection Replacement Schedule[a]

Priority	Pump Station	Repair Number	Location	Date of Television Inspection	order	Tape No.	Run No.	Manhole No. (Upstream)	Manhole No. (Downstream)	Approx. Length between Manholes[b] (feet)	Approx. Depth to Invert[b] (feet)	Approx Distance from Upstream Manhole[b] (feet)	Pipe Size[b] (inches)	Main Line Pipe Material[b]	Description of Defect (s)[c]	Quadrant Clock Position	Cleanout (Y/N)	Estimated I/I[d] (gpm)	Repair Method	Date Repaired	Video/Written Log	Paid
2	6	53	LAKELAND ST.	APR 03		61	605	104	105	168.9	12	67.8	6	AC	LATERAL INFIL	9	Y	MODERATE	CIPP	15-Aug-03	OK	X
1	7	7	KEYS BLVD.	APR 03	77	71/72	703	13	14	268.4	6 - 8	69.8	6	AC	LATERAL INFIL (L-2)	9	Y	20	CIPP	5-Aug-03	OK	X
1	7	58	KEYS BLVD.	APR 03		72	704	14	15	281.3	6	144.3	6	AC	LATERAL INFIL	9	Y	MAJOR	CIPP	6-Aug-03	OK	X
2	7	9	KEYS BLVD.	APR 03	89	73	708	18	19	229	12	74.2	8	AC	LATERAL INFIL		Y	MODERATE	CIPP	13-Aug-03	OK	X
1	7	60	KEYS BLVD.	APR 03		74	710	19	20	329.2	11	215.7	6	AC	LATERAL INFIL - OFFSET JOINTS	12	Y	MAJOR	CIPP [DELETED]	Deleted	NA	NA
1	7	63	PEBBLE WAY	APR 03		79	722	35	24	257	9	11.9	6	AC	LATERAL INFIL	3	Y	MAJOR	CIPP	12-Aug-03	OK	X
1	8	68	KEYS BLVD.	APR 03		83	807	46	47	276.8	6	191.6	6	AC	LATERAL INFIL	1	Y	MAJOR	CIPP	13-Aug-03	OK	X
2	8	70	VENUS VILLAGE	APR 03		81	802	50	51	308.3	6.5	116.6	6	AC	LATERAL INFIL	9	Y	MAJOR	CIPP	8-Aug-03	OK	X
2	8	71	VENUS VILLAGE	APR 03		81	802	50	51	308.3	6.5	193.1	6	AC	LATERAL INFIL	3	Y	MAJOR	CIPP	8-Aug-03	OK	X
1	8	75	VENUS VILLAGE	APR 03		81	803	51	52	334.5	7.5	27.0	6	AC	LATERAL INFIL	3	Y	MAJOR	CIPP	12-Aug-03	OK	X
1	9	80	EBBTIDE VILLAGE	APR 03		90	900	53	54	301.3	4	120.5	6	AC	LATERAL INFIL	3	Y	MAJOR	CIPP	11-Aug-03	OK	X
1	9	81	EBBTIDE VILLAGE	APR 03		92	904	57	58	251	11	57.6	6	AC	LATERAL INFIL	3	Y	MAJOR	CIPP	4-Aug-03	OK	X
1	9	84	DRIFTWOOD VILLAGE	APR 03		93	907	60	61	299.5	6	71.9	6	AC	LATERAL INFIL - OFFSET JOINT	9	Y	MAJOR	CIPP [DELETED]	Deleted	NA	NA
1	9	86	DRIFTWOOD VILLAGE	APR 03		93	908	61	62	248.3	6	111.9	6	AC	LATERAL INFIL	3	Y	MAJOR	CIPP [DELETED]	Not Done	NA	NA
1	6	56	LAKE ST.	APR 03		62	607	126	127	294.2	5	111.2	6	VCP	LATERAL INFIL	3	Y	MAJOR	CIPP	20-Nov-03	OK	

Service Repaired

TOTAL CIPP = 12

NOTES:

[a] Repairs confirmed repairs per 2003 CCTV. Descriptions or other notes shown in all capital letters are notes per 2003 CCTV.

[b] Length between manholes, depth to invert, distance from upstream manhole, pipe size and material have been determined from maps and 1983, 1993, 1996, and 2003 CCTV. Where discrepancies exist, 2003 CCTV results only are listed.

[c] Defects determined from 1983,1993, 1996, and 2003 CCTV logs and map and table of defects.

[d] Estimated Infiltration/inflow (I/I) from review of previous CCTV records. The amount of I/I will vary depending on lake levels and joint deterioration over time.

[e] Priority ratings are based on observed infiltration rates or determined potential for infiltration.

Appendix K

TM 3 Flow Metering

Item Number	Document	Page Number
1	Technical Memo No. 3	K-2

Technical Memo No. 3
Flow and Rain Monitoring Data Reporting

Associated Tasks: (Phase II)

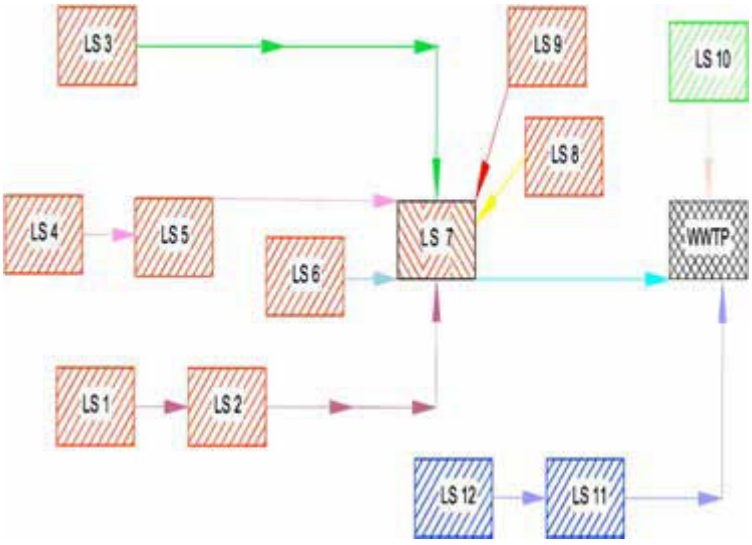
The work associated with this effort are described in the Scope of Work under the following sub-tasks:

Task 2.2 *Metering Plan and Sub-Basin Identification*
Task 2.5 *Flow Meter Installation*
Task 2.6 *Rainfall Gage Installation*
Task 2.7 *Groundwater Monitoring Well Installation*
Task 2.8 *Flow and Rain Monitoring Data Reporting* Objective

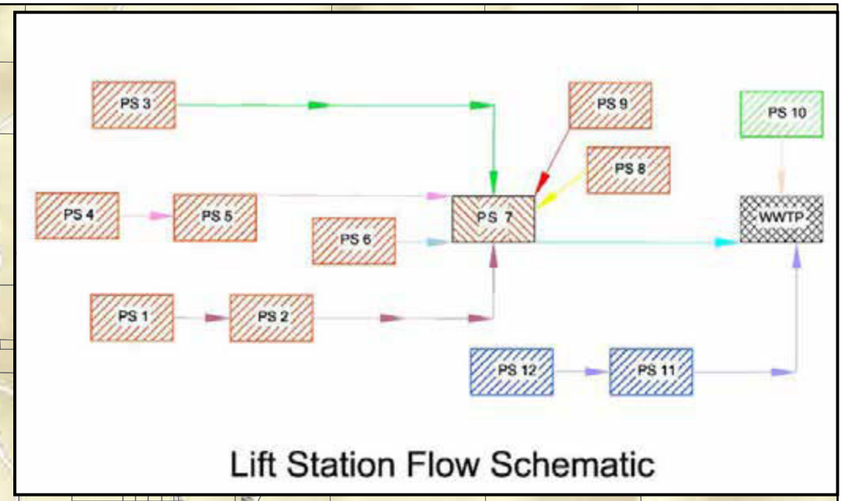
Background

An integral component of the I/I study is to isolate wastewater collection system problem areas, through the utilization of both temporary and permanent flow meters and related equipment used to monitor basin and lift station flows, respectively. The District's collection system is comprised of 12 main sewer sheds/basins, each of which routes flows to a corresponding lift station(s) where the raw sewage is ultimately lifted and pumped to the wastewater treatment plant through pressurized force mains. A schematic representation of the overall collection system is presented below in **Figure 3.1**. The corresponding sewer shed for each lift station service area is presented below in **Figure 3.2.**

Figure 3.1
Collection System Lift Station Flow Schematic



Clearlake Oaks Water District



Lift Station Flow Schematic

LS #1
LS #2
LS #3
LS #4
LS #5
LS #6
LS #7
LS #8
LS #9
LS #10
LS#11
LS #12

WWTP

Cerrito Dr
Stubbs Rd
Rattlesnake Island
Soda Bay Rd
Lakeshore Dr
Lakeport Blvd
Main St
Old Bradley Rd
Saratoga Springs Rd
Lamplighter Ln
Merritt Ct
McBride Ct
Rey Rock Rd
Whisnel Ct
Peninsula Dr
Pentair Rd
CA-29
N

LEGEND

- Lift Station

Pump Station Shed Area

- LS 1 Shed Area
- LS 2 Shed Area
- LS 3 Shed Area
- LS 4 Shed Area
- LS 5 Shed Area
- LS 6 Shed Area
- LS 7 Shed Area
- LS 8 Shed Area
- LS 9 Shed Area
- LS 10 Shed Area
- LS 11 Shed Area
- LS 12 Shed Area
- Lakes

December 2015

Final

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Client/Project

CLEARLAKE OAKS, CA
SANITARY SEWER EVALUATION STUDY

Sheet Title:

FIGURE 3.1 - LIFT STATION SHED MAP

Peak storm events provide the best opportunity for capturing critical flow data that can be used in the subsequent I/I study to identify those shed areas where excessive I/I is present as a result of system defects. Flow correlations are then drawn between rainfall episodes, groundwater levels, and metering results. The following are the methods were used to collect flow data during the peak storm events:

- Installation of nine (8) computerized flow meters and two (2) rain gages
- Installation of 8 lift station data loggers
- Accumulation of flow records from the WWTP
- Hour meter readings from lift stations used to estimate flows from each shed area during historic peak events

The accumulated metering data was reviewed and tabulated after which flow hydrographs were developed that provide essential wet-weather flow data, such as instantaneous peaks flows which are typically associated with inflow, along with extended high peak flows, associated with infiltration from groundwater. Preliminary flow metering and associated data (lift station flows) are used to identify specific shed areas that show excessive inflow. Those early identified shed areas showing excessive inflow may require follow-up flow isolation inspections at key manholes. The manhole inspections may or may not require entries.

Once flow data and associated hydrographs were evaluated, the team and CLOCWD staff were able to isolate those shed areas that contribute the highest amounts of I/I for further cost-effective follow-up studies, which include a combination of smoke testing and CCTV inspections of identified pipe-line segments along with additional flow isolation testing through manholes. The resulting data is used develop immediate, short and long term sewer system rehabilitation and replacement projects. (Refer to **Tasks 3.1, 3.2 and 3.3.)**

Summary Tasks and Initial Flow Metering Results

Task 2.2 - Metering Plan and Sub-Basin Identification

A detailed metering and sub-basin identification plan was prepared using existing system wide mapping, along with field investigations to verify the validity and accuracy of the maps. Metering manholes were also identified which would allow for a compatible type of flow metering equipment to be installed. ADS Company was chosen as the sub-contractor to provide and install the approved flow metering equipment. The basin size, contributing flow, and depth were key factors in the choosing of the metering manholes. Figure 3.3 presents the shed areas that were monitored using the ADS flow meters.

Clearlake Oaks County Water District

LS 7W
LS 7N8
LS 1,2
LS 2E
LS 7S
LS 10
WWTP

N

LEGEND

- Flow Meter Locations

Flow Meter Shed Area

- LS 1,2-North
- LS 1,2-West
- Lakes
- LS 10 - North
- LS 10 - South
- LS 2E
- LS 7N8
- LS 7S
- LS 7W

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SANITARY SEWER EVALUATION STUDY

Sheet Title:

FIGURE 3.2 - FLOW METER SHED MAP

Task 2.5 - Flow Meter Installation (w/Lift Station Data Loggers)

Flow meters were installed on January 15, 2015, by ADS Company as described in Attachment A. The data loggers were installed in February, 2015 by Southport Controls. A report on the data logger(s) installation and status are found within **Attachment B**. Photographs of the flow recording unit, sensor, and confined space entry equipment used in the project are presented below in figure 3.4.

Figure 3.4
ADS Flowmeter Installation



In order to account for the lack of flow meters at each lift station, the approach included relying in part on historical operating times for each respective lift station serving the various sewer sheds noted above in Figure 3.2. MC Engineering staff conducted pump draw down tests at each lift station in order to determine the corresponding flow rate using volumetric methods based on recording the time between pump cycles and the change in in each respective wet well level during the pumping period. A summary of the estimated operating capacity for each pump, as determined by the pump drawdown tests conducted on January 21, 2015, is presented below in Table 3.4. A photo of a typical data logger installation is presented below in Figure 3.5.

Table 1
Pump Station Drawdown Test Results

LOCATION	P 1	P2	COMMENTS
STA # 1	105 gpm	no flow	pump 2 is out of service
STA # 2	150 gpm	140 gpm	appears to have faulty check valve or entrained air
STA # 3	90 gpm	no flow	pump 2 is out of service
STA # 4	no flow	250 gpm	pump 1 is out of service
STA # 5	200 gpm	no flow	pump 2 is out of service
STA # 6	205 gpm	217 gpm	
STA # 7	no data	no data	this station consistently operates in a surcharged condition
STA # 8	320 gpm	NA	new pump rehab , only has one pump
STA # 9	315 gpm	290 gpm	
STA #10	95 gpm	no flow	pump 2 is out of service
STA # 11	NA	NA	pump test could not be performed without wet well draw down
STA # 12	75 gpm	75 gpm	

Figure 3.5
Typical Data Logger Installation



The Hobo dataloggers pictured above will remain indefinitely in each lift station panel so the District can essentially obtain hourly flow data by relying on the estimated flows in Table 1 and time stamped run times computed for each pump. It should be noted that lift station No. 7 contains variable speed pumps so the dataloggers would not be able to record representative flows like what is possible using a constant speed pump. As a result, the team recommended installing a temporary strap-on flow meter to monitor flows at lift station 7.

The daily historical kWh and pump run times will be referred to in subsequent sections of the report in order to estimate the flows in each respective portion of the sewer shed serving each lift station. Additional analysis was performed in order to investigate the wet weather portion of the pumped flows from each lift station during peak wet weather events in 2010 and 2011. A more detailed discussion of that analysis is presented below in the results section.

Task 2.6 - Rainfall Gauge Installation

The rain gages were installed by the ADS Team at two locations. The first was at the WWTP and the second was located at the District's water treatment facility. These gages were installed to acquire the necessary rainfall data to correctly correlate the contribution of rainfall with the metered wastewater flow results at each of the sub-basins. Data from the rain gauges is also summarized in **Attachment A**.

Task 2.7 - Groundwater Well Monitoring

A key decision was made early in the flow metering period not to install groundwater wells since it was apparent after reviewing the preliminary results of the flow metering, along with information acquired reviewing lift station hour meter reading data, that the lake levels had a direct effect and play a significant role in the infiltration associated with groundwater. Lake levels were subsequently correlated directly with infiltration as discussed further below.

Task 2.8 - Flow and Rainfall Data Reporting

A variety of metering related tasks were conducted to provide a comprehensive picture of flows throughout the collection system. As noted above, MC Engineering contracted with ADS Environmental to install temporary insert flow meters on the gravity lines connected to each major lift station basins. The temporary meters relied on cellular phone service to communicate the flow readings to ADS headquarters in real time. As recommended within **Task 2.2 and Task 2.5**, flow meters were installed at (8) eight manhole locations throughout the collection system and within those basins as identified within **Task 2.2**.

Temporary Manhole Metering

Manhole metering data was recorded between January 15, 2015 and April 15, 2015 by ADS. Attachment included a summary of their results. MC Engineering prepared an independent analysis of the data which is summarized in the form of individual flow reports for each meter. The flow reports were entered into an Excel spreadsheet to isolate the various I/I flow components based on algorithms developed by the MC Engineering team. A detailed report on each meter was prepared, samples of which are included as **Attachment B.**

Temporary Datalogging

The manhole flow monitoring commenced on January 15, 2015 and was scheduled for a two month period. It was also decided that Data loggers were to be installed to provide continuous

power monitoring at each lift station that could also be used by the district to continuously collect flow records, due in part, to the relatively high cost of installing and maintaining the temporary meters recognizing the fact that the lift station run times provide valuable insights on the relative amount of flow contributed by each basin, during wet and non-wet periods.

To supplement data from the installed flow meters and prior to installation of data loggers, MC Engineering made a decision to utilize electrical data from lift stations once pump flow test were conducted and acquire. This provided a fairly accurate means of calculating the wastewater flow rates entering each of the District's twelve (12) lift stations.

Plant Influent Flow Monitoring

All wastewater flowing into the plant from three force mains is measured in a pre-existing parshall flume. This flume was reportedly out of calibration due to a faulty installation. Since accurate flow readings are critical to the overall I/I study effort, MC Engineering retained Oratech controls to re-calibrate the existing meter. The meter was found to be a maximum of 8.9% out of calibration (lower than actual) by the Oratech technician at the highest flow rate tested as presented below in Table 2. This was reportedly due to deflections in the weir sidewalls due to a sub-standard installation. Figure X below illustrates how the actual width is closer to 8.25" rather than the required 9" due to sidewall deformation. The ramifications of this, and potentially other errors, are that the actual historic flows on peak days are likely higher than the recorded values. In the future the District can use the information in Table 2 below to adjust daily flow readings by developing a flow correction curve from the calibration data.

Table 2, Influent Flow Meter Calibration Data

Manual Measurement	OCM 3 reading	Table for 9" Flume
0.1"	1	1
2.5" +/- 0.25	127	125
3.5" +/- 0.25	196	209
9.0" +/- 0.25	808	887

Lift Station Historical Data Analysis

The wastewater treatment facility monthly report includes the daily influent flows, rainfall, and lake level data. Data from January 2010 through March 2015 was analyzed to determine the average dry weather flow (ADWF) and peak weather flow (PWWF) from historical events. Staff record pump elapsed time values manually on printed forms, ideally on a daily basis but often only once every few days (i.e. weekends). Data from the operator logs were entered into an Excel spreadsheet and analyzed to identify problem sewer sheds. These sheds included areas served by lift stations 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

Plant influent flow values were used to identify two historic wet weather events that resulted in excessive I/I at the WWTP. The largest peak flow in the period under consideration occurred on March 24, 2011 during which plant influent flows reach an estimated 2.7 MGD. During a second event, which occurred in April 11, 2010, plant influent flows reached an estimated peak of 1.3 MGD.

The average daily flow was calculated in gallons per day (gpd) using each pumps elapsed run time from the operator logs was based on the pump draw down test data acquired by MC Engineering, as noted above. Average flows were estimated for each station using the operator logs during dry weather conditions in the summer months of July through September of 2013. In order to estimate the I/I related flow in each shed the ADWF was subtracted from the PWWF in each respective lift station shed. The analysis, the contribution from the upstream lift station(s) was subtracted from the estimated peak flow for each respective lift station in order to isolate shed specific quantities.

The method used is to analyze the flow rates is considered approximate only, due in large to inconsistent daily recordings and the inability to measure lift station 7 flow rates which vary based on the speed of the VFD on each pump. Averages flow rates over the log period were calculated to determine the missing data within the operator logs. The lift station 7 pumps flow rate was back calculated by subtracting lift station 10 and 11 from the WWTP influent flow with the remaining flow belonging to lift station 7. To ensure the previous method was calculated within reason, parcels within shed area 7 were counted and used to calculate the average flow rate per residence during ADWF in 2013. Comparing both methods the difference was within 4%. Results from this analysis indicate that the highest percentage of the I/I is emanating from the shed feeding lift stations 7 and 9. A summary of the results from this analysis and accompanying graphics can be found in **Attachment C.**

Recommendations and Required Follow-up

The flow data acquired from **Tasks 2.2, 2.5, 2.6, 2.7, and 2.8**, will be utilized for **Tasks 2.9, 2.10 and 2.11**, smoke testing, flow isolation and CCTV inspection, respectively. The data output in the form of flow hydrographs, will help identify those sub-basins requiring necessary cost-effective follow-up and investigations through CCTV, smoke testing and flow isolation. These follow-up tasks **2.9, 2.10**, and **2.11**, will be used to help locate those pipeline breaks, cracks, and off-set joint(s) that contribute to the identified infiltration. This will include identifying various inflow sources, including roof drains and storm drain cross-connections, and open manhole and cleanout covers. The results of the CCTV and smoke testing programs will identify pipeline cracks, sags, joint separations, and other potential structural and I/I problems. These identified problems will then be noted on the deficiency map and analyzed on a cost-effective basis for the type of rehabilitation. Once a cost-effective rehabilitation program is identified, the rehabilitation projects will be incorporated into a project report to be submitted to the SWRCB for potential loan/grant funding.

Attachment A
ADS Flow Metering Report

FLOWVIEW™

UNDERGROUND INTELLIGENCE®

FOR ENHANCED COLLECTION SYSTEM PERFORMANCE

ADS ENVIRONMENTAL SERVICES

Clearlake Oaks Wet Weather Sewer Flow Study

Prepared for: MC Engineering

January 23, 2015 – April 15, 2015

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Clearlake Oaks Temp January - April 2015 2
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Clearlake Oaks Wet Weather Sewer Flow Study

January 23, 2015 - April 15, 2015

Prepared for:

Mark Carey, Principal
MC Engineering
6917 Ohana Place
Orangevale, CA 95662

Prepared by:

ADS, LLC
15205 Springdale Street
Huntington Beach, CA 92649

Letter of Transmittal





A Division of ADS LLC

15205 Springdale Street
Huntington Beach, CA 92649-1156
www.adsenv.com

May 12, 2015
MC Engineering
6917 Ohana Place
Orangvale, CA 95662

Dear Mr. Carey,

ADS is pleased to submit the Report - Clearlake Oaks Wet Weather Sewer Study, Clearlake, CA conducted on behalf of MC Engineering. Metering was performed at eight (8) locations for the period of January 23, 2015 through April 15, 2015 . The report contains hourly averaged depth, velocity, and quantity hydrographs as well as daily long tables for the metering period in pdf format. An Excel file containing depth, quantity, and velocity entities for the flow monitoring locations in 5-minute format is also provided.

In addition, we would be happy to further explain any details about the report that may seem unclear. Should you have any questions or comments, I can be reached at (256) 759-2575. You may also contact the Project Manager, Paul Mitchell at (714) 379-9778 ext 223.
Thank you for choosing ADS products and services to meet your flow monitoring needs.

Sincerely,
ADS ENVIRONMENTAL SERVICES

KaTonya Sledge
Sr. Data Analyst

Scope and Methodology

Introduction

MC Engineering entered into an agreement with ADS Environmental Services to conduct flow monitoring at (8) eight metering points within the Clearlake Oak Sewer System. The study was conducted over a 10 week period. The primary objective was to quantify wet weather flow contributions from various system tributary basins.

Project Scope

The scope of this study involved using flow monitors to quantify wastewater flows at the designated locations for the 10 week time period. Specifically, the study included the following key components.

- Investigate the proposed flow-monitoring sites for adequate hydraulic conditions.
- Flow monitor installations.
- Flow monitor confirmations and data collections.
- Flow data analysis.

Equipment installation was accomplished on January 22, 2015. The monitoring period began on January 23, 2015 and was completed on April 15, 2015 .

Flow Monitoring Equipment





The ***ADS FlowShark Triton*** monitor was selected for this project. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow.

The ADS FlowShark Triton monitor consists of data acquisition sensors and a battery-powered microcomputer. The microcomputer includes a processor unit, data storage, and an on-board clock to control and synchronize the sensor recordings. The monitor was programmed to acquire and store depth of flow and velocity readings at 5-minute intervals.

The FS Triton monitor features cross-checking using multiple technologies in each sensor for continuous running of comparisons and tolerances. The FS Triton monitor can support two (2) sets of sensors. The sensor option used for this project was: **The Peak Combo Sensor** installed at the bottom of the pipe includes three types of data acquisition technologies.

The ***up looking ultrasonic depth*** uses sound waves from two independent transceivers to measure the distance from the sensor upward toward the flow surface; applying the speed of sound in the water and the temperature measured by sensor to calculate depth.

The ***pressure depth*** is calculated by using a piezo-resistive crystal to determine the difference between hydrostatic and atmospheric pressure. The pressure sensor is temperature compensated and vented to the atmosphere through a desiccant filled breather tube.

To obtain ***peak velocity*****,** the sensor sends an ultrasonic signal at an angle upward through the widest cross-section of the oncoming flow. The signal is reflected by suspended particles, air bubbles, or organic matter with a frequency shift proportional to the velocity of the reflecting objects. The reflected signal is received by the sensor and processed using digital spectrum analysis to determine the peak flow velocity.

Installation

Installation of flow monitoring equipment typically proceeds in four steps. First, the site is investigated for safety and to determine physical and hydraulic suitability for the flow monitoring equipment. Second, the equipment is physically installed at the selected location. Third, the monitor is tested to assure proper operation of the velocity and depth of flow sensors and verify that the monitor clock is operational and synchronized to the master computer clock. Fourth, the depth and velocity sensors are confirmed and line confirmations are performed.

In pipes up to 42 inches in diameter, the sensors were mounted on expandable stainless steel rings, inserted at least a foot upstream into influent pipes and tightened against the inside walls of the pipes. Influent pipe installations reduce the influences of turbulence and backwater often caused by changes in channel geometry in manholes.





Data Collection, Confirmation, and Quality Assurance

Data collects were done remotely via wireless connect on a weekly basis via ADS Field Representatives. During the monitoring period, field crews visit each monitoring location to verify proper monitor operation and document field conditions. The following quality assurance steps are taken to assure the integrity of the collected data:

Measure power supplies: monitors were powered by dry cell battery packs. Voltages were recorded and battery packs replaced, as necessary. Separate batteries provided back-up power to memory allowing primary batteries to be replaced without loss of data.

Clock synchronization: Field crews synchronized monitor clocks to master clocks.

Confirm depth and velocity readings: Field crews descended into meter manholes to manually measure depths and velocities and compare them meter readings to confirm that they agreed. They also measured silt levels, if any, in the inverts of the pipes. Silt areas were subtracted from flow areas to compute true areas of flow.

Confirm average velocities through cross-sectional velocity profiles: Since ADS velocity sensors measure peak velocity, field crews collected cross-sectional velocity profiles in order to develop a relationship between peak and average velocity in lines that meet the hydraulic criteria.

Upload and Review Data: Data collected from the monitors were uploaded and reviewed by a Data Analyst for completeness, outliers and deviations in the flow patterns, which indicate system anomalies or equipment failure.

Flow Quantification Methods

There are two main equations used to measure open channel flow: the ***Continuity Equation*** and the ***Manning Equation.*** The Continuity Equation, which is considered

the most accurate, can be used if both depth of flow and velocity are available. In cases where velocity measurements are not available or not practical to obtain, the Manning Equation can be used to estimate velocity from the depth data based on certain physical characteristics of the pipe (i.e. the slope and roughness of the pipe being measured). However, the Manning equation assumes uniform, steady flow hydraulic conditions with non-varying roughness, which are typically invalid assumptions in most sanitary sewers. The Continuity Equation was used exclusively for this study.

Continuity Equation

The Continuity Equation states that the flow quantity (Q) is equal to the wetted area (A) multiplied by the average velocity (V) of the flow.

$$Q = A * V$$

This equation is applicable in a variety of conditions including backwater, surcharge, and reverse flow.

Data Analysis and Presentation

Data Analysis

A flow monitor is typically programmed to collect data at either 15-minute or 5-minute intervals throughout the monitoring period. The monitor stores raw data consisting of (1) the ultrasonic depth, (2) the peak velocity and (3) the pressure depth. The data is imported into ADS's proprietary software and is examined by a data analyst to verify its integrity. The data analyst also reviews the daily field reports and site visit records to identify conditions that would affect the collected data.

Velocity profiles and the line confirmation data developed by the field personnel are reviewed by the data analyst to identify inconsistencies and verify data integrity. Velocity profiles are reviewed and an average to peak velocity ratio is calculated for the site. This ratio is used in converting the peak velocity measured by the sensor to the average velocity used in the Continuity equation. The data analyst selects which depth sensor entity will be used to calculate the final depth information. Silt levels present at each site visit are reviewed and representative silt levels established.

Occasionally the velocity sensor's performance may be compromised resulting in invalid readings sporadically during the monitoring period. This is generally caused by excessive debris (silt) blocking the sensor's crystals, shallow flows (~< 2") that may drop below the top of the sensor or very clear flows lacking the particles needed to measure rate. In order to use the Continuity equation to quantify the flow during these periods, a Data Analyst and/or Engineer will use the site's historical pipe curve (depth vs. velocity) data along with valid field confirmations to reconstitute and replace the false velocity recordings with expected velocity readings for a given historical depth along the curve.

Selections for the above parameters can be constant or can change during the monitoring period. While the data analysis process is described in a linear manner, it often requires an iterative approach to accurately complete.

Data Presentation

This type of flow monitoring project generates a large volume of data. To facilitate review of the data, results have been provided in graphical and tabular formats. The flow data is presented graphically in the form of scattergraphs and hydrographs. Hydrographs are based on hourly averaging. Tables are provided in daily average format. These tables show the flow rate for each day, along with the daily minimum and maximums, the times they were observed, the total daily flow, and total flow for the month (or monitoring period). The following explanation of terms may aid in interpretation of the tables and hydrographs.

DEPTH - Final calculated depth measurement (in inches)

QUANTITY - Final calculated flow rate (in MGD)

VELOCITY - Final calculated flow velocity (in feet per second)

REPORT TOTAL - Total volume of flow recorded for the indicated time period (in MG)

Site Commentary

Site Information

LS10-EAST	
Pipe Dimensions	6"x6"
Silt Level	0.00"

Overview

Site LS10-EAST functioned under normal conditions during the period Friday, January 23, 2015 to Wednesday, April 15, 2015 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Friday, January 23, 2015 to Wednesday, April 15, 2015 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at approximately 28% full at its recorded 5-minute peak of 1.70 inches and approximately 7% full during the typical average depth of 0.45 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	0.45	0.80	0.004
Minimum	0.04	0.16	0.000
Maximum	1.70	3.37	0.094
Time of Minimum	3/7/2015 8:15 PM	2/15/2015 12:45 AM	3/7/2015 8:15 PM
Time of Maximum	3/11/2015 9:15 PM	3/18/2015 11:00 AM	3/11/2015 9:15 PM

Data Quality

Data uptime observed during the Friday, January 23, 2015 to the Wednesday, April 15, 2015 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

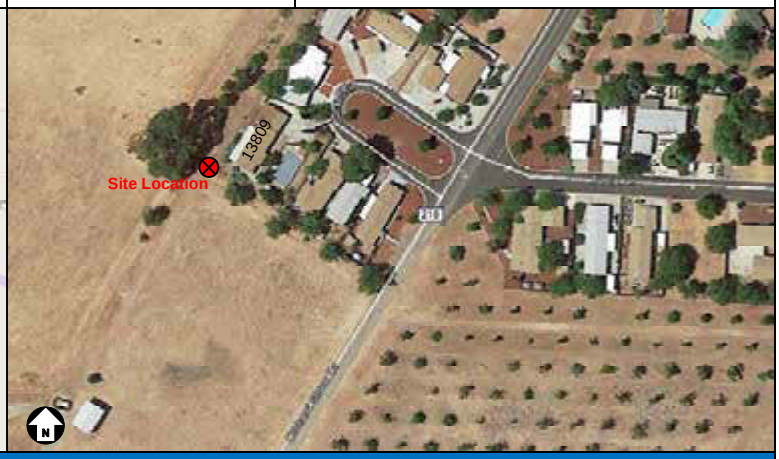
Quality Form

Project Name: ClearLake.MCEng.TFM.CA15	**Project No.** 22002	**City:** Clearlake Oaks, CA	**FM Initials:** SW
Site Name: LS10 – East	**Investigate Date:** 1/21/15		
Address/Location: 13809 Grape Circle (located behind residence along easement.) Access through gate on Orchard Shore Dr.			

Access: Drive	**Type of System:**	Sanitary [X]	Storm [ ]	Combined [ ]

Monitor Type	Peak Doppler
Monitor Model	ADS Triton+
Data Acquisition	Wireless
Manhole ID	MH LS10
Pipe Height:	6.00" (East Inlet)
Pipe Width:	6.00" (East Inlet)





Investigation Information:

Date/Time of Install:	1/21/15 @ 15:10
Site Hydraulics:	Low depth, ripples, moderate velocity
Upstream Input: (L/S, P/S)	N/A
Upstream Manhole:	1 inlet / 1 outlet
Downstream Manhole:	LS Wet Well
Depth of Flow (DOF):	0.75" +/- 0.25"
Range (Air DOF):	5.25" +/- 0.25"
Peak Velocity:	1.25 fps
Silt:	0.00 Inches

Manhole Information:

Manhole Material / Condition	Precast / Fair
Pipe Material / Condition:	Concrete / Fair

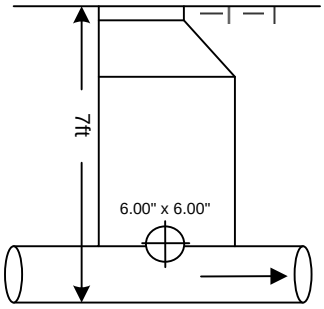
Land Use:	Residential [X]	Commercial [ ]	Industrial [ ]	Trunk [ ]

Safety Notes

No Traffic Control Needed

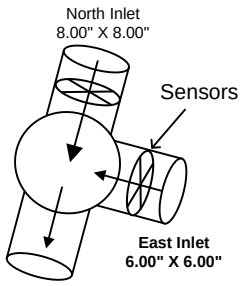
Other Information:





Cross Section





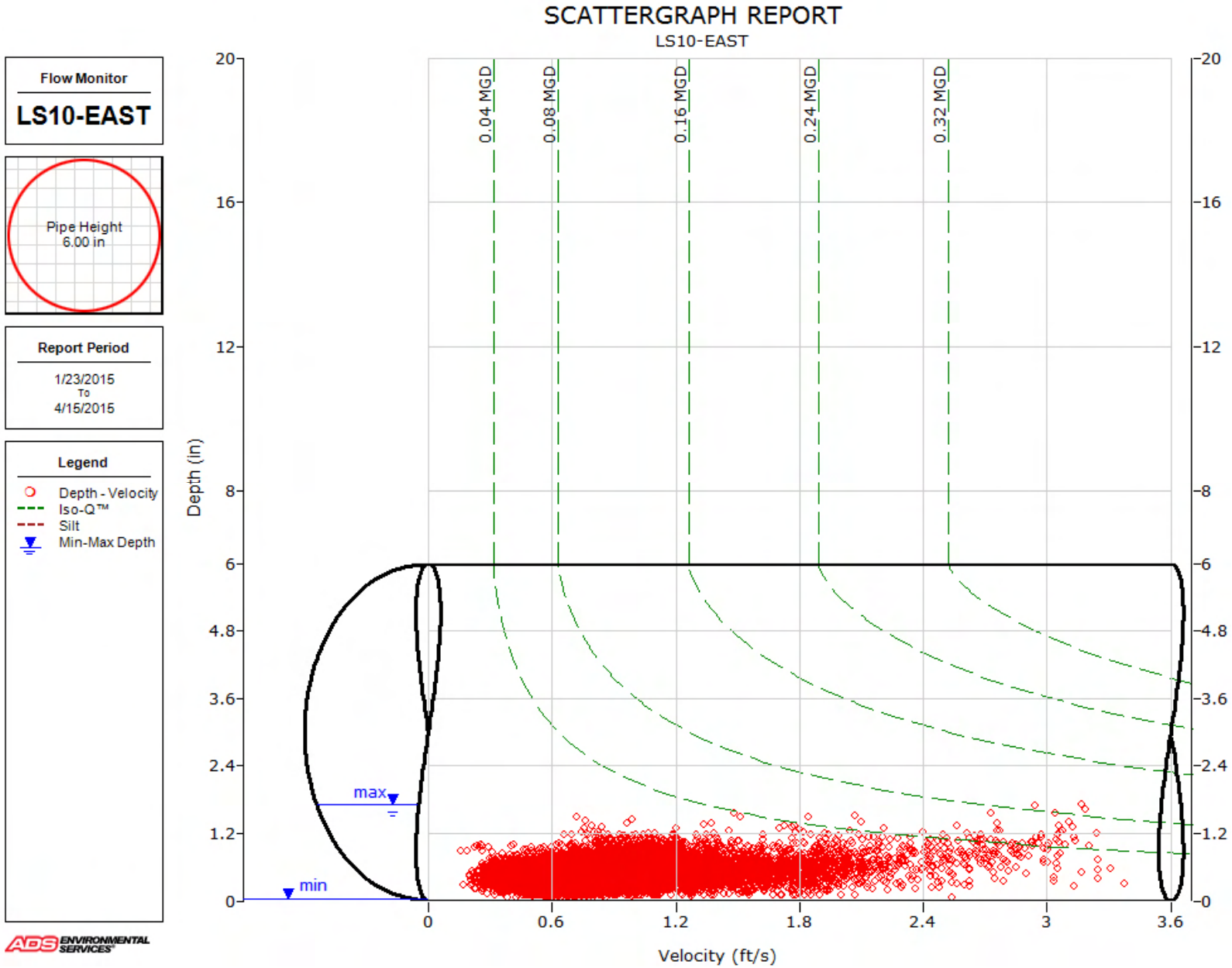
Plan

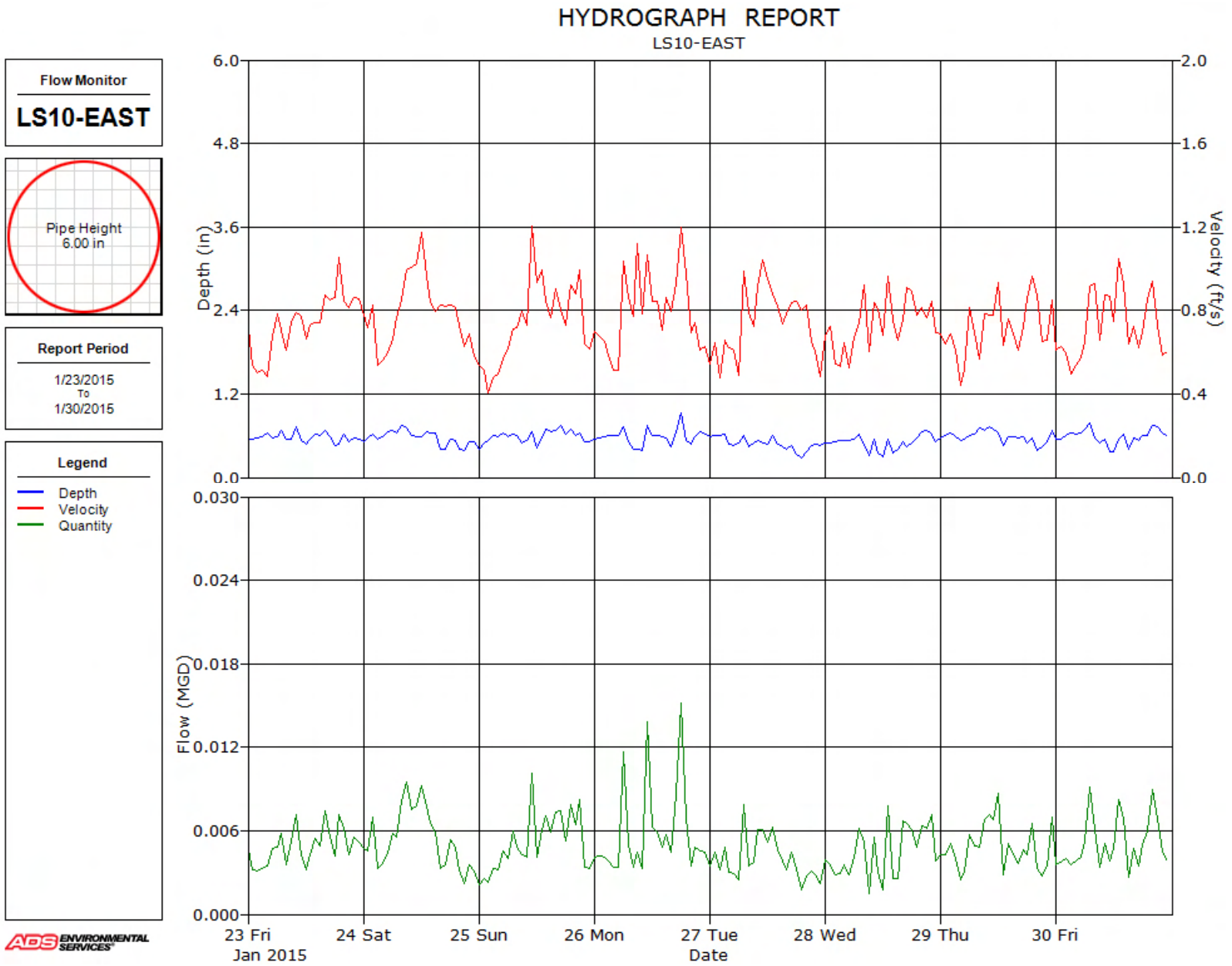
Installation Information	
Installation Type:	Ring
Sensors Devices:	Water Ultrasonic/ Pressure/ Velocity
Surcharge Height:	0
Rain Gauge Zone:	RG-WWTP

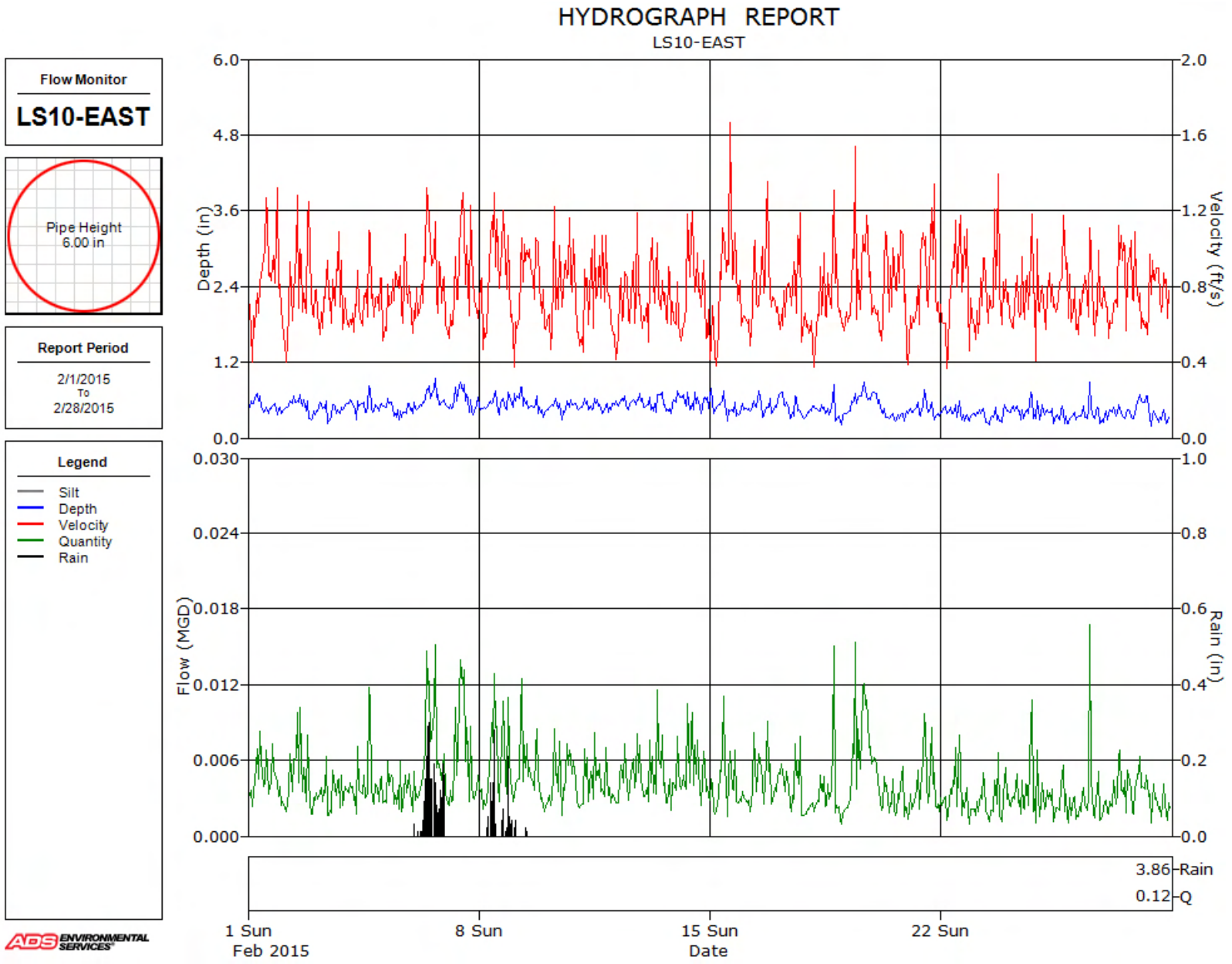
Backup	Yes	No	?	Distance
Trunk	[ ]	[X]	[ ]	
Lift / Pump Station	[ ]	[X]	[ ]	
WWTP	[ ]	[X]	[ ]	
Other	[ ]	[X]	[ ]	

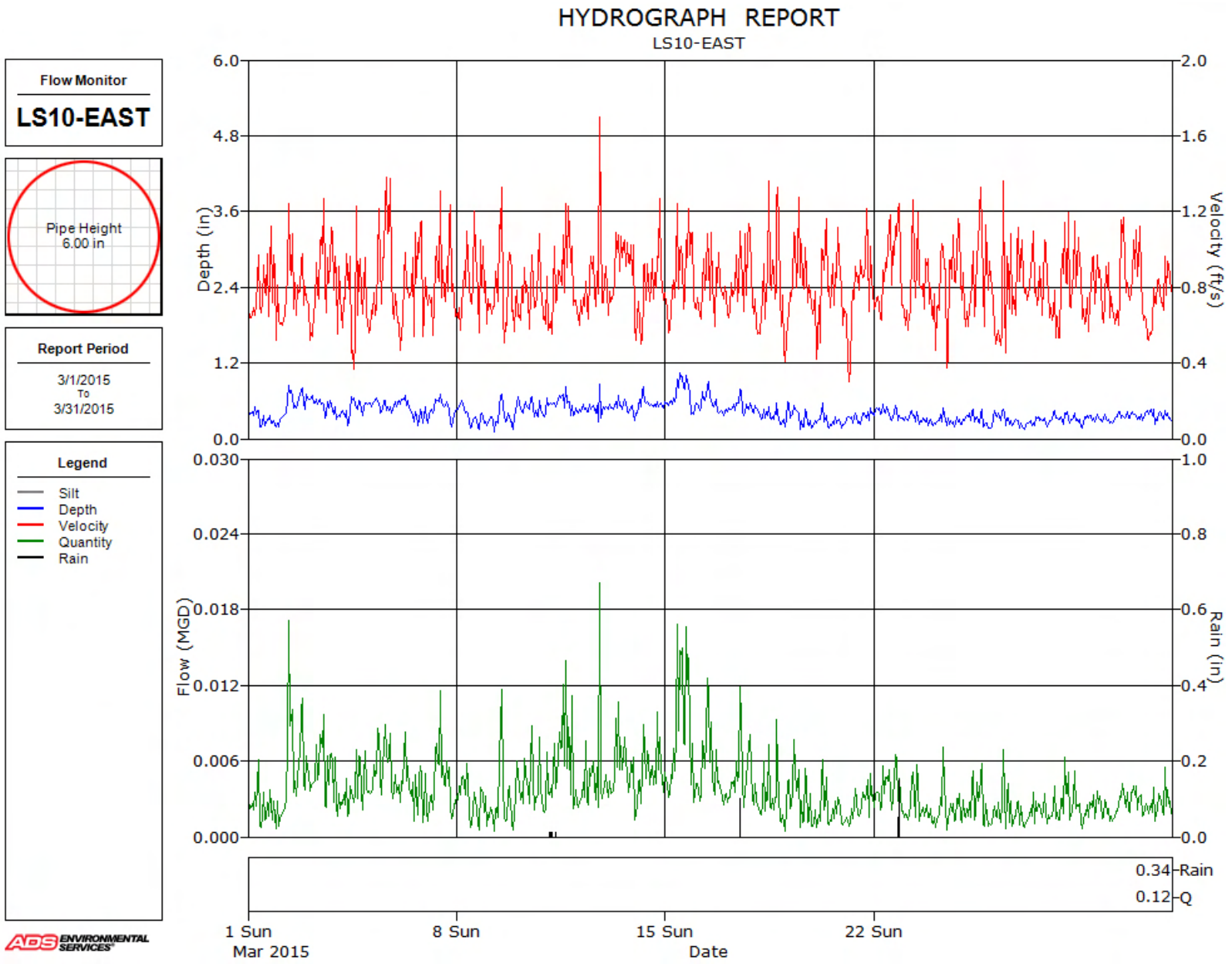
Additional Site Information / Comments:

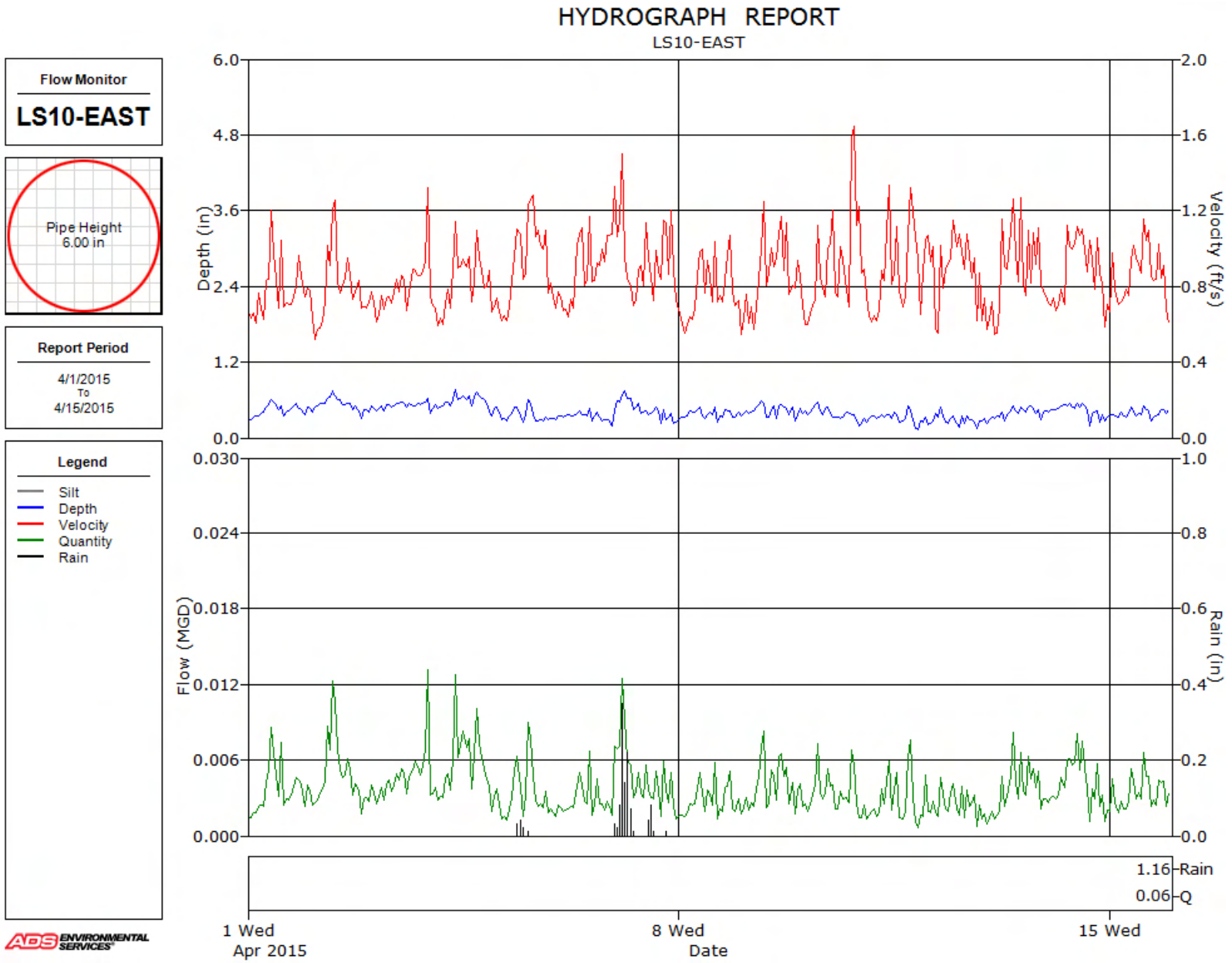
Need to contact Dan Hodem, CLOCWD Ops Mgr. 707-350-1093 for access


SCATTERGRAPH REPORT
LS10-EAST
Flow Monitor
LS10-EAST
Pipe Height
6.00 in
Report Period
1/23/2015
To
4/15/2015
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.04 MGD
0.08 MGD
0.16 MGD
0.24 MGD
0.32 MGD
max
min
Depth (in)
Velocity (ft/s)
0
0.6
1.2
1.8
2.4
3
3.6
1.2
2.4
3.6
4.8
6
8
12
16
20
ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS10-EAST
Flow Monitor
LS10-EAST
Pipe Height
6.00 in
Report Period
1/23/2015
To
1/30/2015
Legend
Depth
Velocity
Quantity
Depth (in)
Velocity (ft/s)
Flow (MGD)
6.0
4.8
3.6
2.4
1.2
0.0
2.0
1.6
1.2
0.8
0.4
0.0
0.030
0.024
0.018
0.012
0.006
0.000
23 Fri
Jan 2015
24 Sat
25 Sun
26 Mon
27 Tue
28 Wed
29 Thu
30 Fri
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS10-EAST
Flow Monitor
LS10-EAST
Pipe Height
6.00 in
Report Period
2/1/2015
To
2/28/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
3.86 Rain
0.12 Q
1 Sun
Feb 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS10-EAST
Flow Monitor
LS10-EAST
Pipe Height
6.00 in
Report Period
3/1/2015
To
3/31/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.34 Rain
0.12 Q
1 Sun
Mar 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS10-EAST
Flow Monitor
LS10-EAST
Pipe Height
6.00 in
Report Period
4/1/2015
To
4/15/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
1.16 Rain
0.06 Q
1 Wed
Apr 2015
8 Wed
15 Wed
Date
ADS ENVIRONMENTAL SERVICES

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/23/2015	18:35	0.24	16:35	1.17	0.57	02:40	0.26	19:40	2.79	0.74	09:40	0.001	19:40	0.041	0.005	0.005	
1/24/2015	16:45	0.08	06:15	1.13	0.57	04:10	0.32	12:50	2.59	0.79	17:10	0.000	12:50	0.029	0.005	0.005	
1/25/2015	12:05	0.14	08:35	1.17	0.59	03:40	0.27	21:10	2.41	0.74	12:05	0.001	07:40	0.031	0.005	0.005	
1/26/2015	08:55	0.09	11:30	1.69	0.58	04:30	0.41	06:40	3.06	0.80	08:55	0.000	11:30	0.086	0.006	0.006	
1/27/2015	18:25	0.14	07:40	0.95	0.49	23:55	0.37	07:40	2.44	0.74	18:25	0.000	07:40	0.032	0.004	0.004	
1/28/2015	17:25	0.10	17:35	1.52	0.50	16:45	0.37	16:10	2.56	0.74	11:25	0.000	16:10	0.053	0.004	0.004	
1/29/2015	12:55	0.25	09:35	1.11	0.58	05:15	0.29	12:35	2.52	0.72	20:40	0.001	12:35	0.036	0.005	0.005	
1/30/2015	12:00	0.14	13:55	1.07	0.59	03:35	0.32	12:40	2.75	0.73	12:00	0.000	12:40	0.041	0.005	0.005	
1/31/2015	20:05	0.11	02:50	1.31	0.56	14:10	0.27	18:50	2.66	0.76	19:30	0.000	18:50	0.036	0.005	0.005	
2/1/2015	14:30	0.16	18:40	1.14	0.52	03:30	0.30	18:40	2.97	0.83	15:40	0.000	18:40	0.050	0.005	0.005	
2/2/2015	20:30	0.11	14:10	1.17	0.49	03:45	0.20	07:30	2.72	0.78	20:30	0.000	14:10	0.047	0.004	0.004	
2/3/2015	10:45	0.07	00:40	1.05	0.44	04:00	0.33	10:20	2.16	0.75	10:45	0.000	14:20	0.016	0.003	0.003	
2/4/2015	07:15	0.11	08:25	1.24	0.52	04:00	0.27	16:45	1.90	0.72	07:15	0.000	08:25	0.028	0.004	0.004	
2/5/2015	11:35	0.14	15:50	0.98	0.46	02:15	0.27	18:25	3.25	0.75	11:35	0.001	15:50	0.040	0.004	0.004	
2/6/2015	08:20	0.33	10:50	1.11	0.61	01:25	0.32	10:10	3.05	0.87	01:25	0.001	10:10	0.047	0.007	0.007	2.55
2/7/2015	20:25	0.22	10:15	1.16	0.60	10:10	0.26	15:10	2.79	0.82	10:10	0.001	11:20	0.041	0.006	0.006	
2/8/2015	15:15	0.17	21:20	1.55	0.54	03:20	0.26	09:40	3.24	0.87	15:15	0.001	11:45	0.065	0.006	0.006	1.18
2/9/2015	23:45	0.17	07:10	1.18	0.55	02:45	0.30	07:10	2.50	0.82	23:45	0.001	07:10	0.044	0.005	0.005	0.13
2/10/2015	18:15	0.16	08:10	1.17	0.50	04:45	0.34	18:20	3.25	0.79	13:20	0.001	16:10	0.039	0.004	0.004	
2/11/2015	18:25	0.20	07:05	1.42	0.51	00:25	0.20	10:20	3.17	0.77	00:25	0.001	20:20	0.028	0.004	0.004	
2/12/2015	12:35	0.32	08:40	1.05	0.57	04:40	0.21	16:30	3.31	0.71	13:05	0.001	21:00	0.021	0.005	0.005	
2/13/2015	05:45	0.14	10:45	1.56	0.53	03:40	0.24	10:45	2.73	0.76	05:45	0.001	10:45	0.071	0.005	0.005	
2/14/2015	10:15	0.10	11:55	1.37	0.59	05:55	0.30	10:55	2.97	0.77	10:15	0.000	11:55	0.060	0.005	0.005	
2/15/2015	13:45	0.05	10:50	1.24	0.49	00:45	0.16	10:50	2.77	0.81	13:45	0.000	10:50	0.052	0.004	0.004	
2/16/2015	14:10	0.13	11:30	1.21	0.49	05:05	0.38	08:55	3.06	0.79	14:45	0.001	08:55	0.045	0.004	0.004	
2/17/2015	10:55	0.10	14:25	1.23	0.49	20:05	0.39	18:10	2.83	0.74	10:55	0.000	18:10	0.040	0.004	0.004	
2/18/2015	20:05	0.08	18:45	1.32	0.44	04:15	0.30	11:35	2.75	0.73	20:05	0.000	18:20	0.048	0.004	0.004	
2/19/2015	00:05	0.12	10:45	1.24	0.58	02:55	0.42	18:45	3.13	0.84	00:05	0.000	10:45	0.058	0.006	0.006	
2/20/2015	08:25	0.14	00:40	1.07	0.41	12:15	0.21	20:00	2.58	0.79	08:25	0.000	20:00	0.032	0.003	0.003	
2/21/2015	20:00	0.05	02:20	0.96	0.45	01:20	0.30	19:30	3.00	0.80	20:00	0.000	19:30	0.036	0.004	0.004	
2/22/2015	17:55	0.08	13:00	0.90	0.39	21:40	0.29	11:10	3.05	0.79	17:55	0.000	13:15	0.033	0.003	0.003	
2/23/2015	11:25	0.05	22:20	1.49	0.37	01:35	0.33	15:45	3.25	0.79	11:25	0.000	23:30	0.032	0.003	0.003	
2/24/2015	10:10	0.15	18:15	1.25	0.44	20:30	0.24	18:15	2.76	0.75	10:10	0.001	18:15	0.053	0.004	0.004	
2/25/2015	14:40	0.11	16:15	0.90	0.36	11:50	0.27	17:50	2.68	0.78	14:40	0.000	17:50	0.023	0.003	0.003	
2/26/2015	09:25	0.08	12:25	1.56	0.39	04:40	0.40	12:25	3.04	0.74	09:25	0.000	12:25	0.080	0.003	0.003	
2/27/2015	14:00	0.13	22:45	1.17	0.40	06:50	0.34	10:55	3.21	0.82	14:00	0.001	10:55	0.043	0.003	0.003	
2/28/2015	20:20	0.05	01:20	0.92	0.42	10:15	0.28	09:00	2.48	0.75	09:10	0.000	01:20	0.014	0.003	0.003	
3/1/2015	11:50	0.08	09:55	0.99	0.32	23:45	0.37	18:50	3.05	0.77	11:50	0.000	09:55	0.039	0.002	0.002	
3/2/2015	00:55	0.04	09:10	1.61	0.54	00:30	0.30	09:10	3.18	0.79	00:55	0.000	09:10	0.087	0.005	0.005	
3/3/2015	23:15	0.15	11:10	1.01	0.54	03:15	0.26	11:10	3.01	0.84	23:15	0.001	11:10	0.042	0.005	0.005	
3/4/2015	08:20	0.10	07:35	0.91	0.46	13:45	0.35	15:10	2.75	0.75	08:20	0.000	15:10	0.031	0.004	0.004	
3/5/2015	10:55	0.05	08:25	1.01	0.52	01:55	0.35	19:35	3.00	0.87	10:55	0.000	08:25	0.042	0.005	0.005	
3/6/2015	17:20	0.09	18:55	0.99	0.47	21:25	0.33	18:55	3.09	0.79	21:25	0.000	18:55	0.043	0.004	0.004	
3/7/2015	20:15	0.04	18:30	0.91	0.46	20:10	0.39	11:35	2.63	0.84	20:15	0.000	11:35	0.026	0.004	0.004	
3/8/2015	17:40	0.04	08:05	0.88	0.37	00:50	0.37	08:05	2.74	0.82	17:40	0.000	08:05	0.031	0.003	0.003	
3/9/2015	21:00	0.04	12:10	0.92	0.33	14:10	0.28	19:50	2.60	0.78	21:00	0.000	12:10	0.030	0.003	0.003	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/10/2015	18:20	0.13	13:25	1.22	0.48	22:40	0.41	00:20	2.19	0.76	18:20	0.001	13:25	0.033	0.004	0.004	
3/11/2015	21:45	0.25	21:15	1.70	0.56	03:15	0.40	21:15	3.17	0.84	21:45	0.001	21:15	0.094	0.006	0.006	0.04
3/12/2015	18:20	0.11	08:05	1.34	0.47	02:55	0.24	19:45	3.14	0.82	18:20	0.000	08:05	0.065	0.005	0.005	
3/13/2015	22:45	0.15	08:50	1.13	0.50	23:30	0.40	22:15	2.98	0.90	22:45	0.000	08:50	0.049	0.005	0.005	
3/14/2015	22:15	0.16	18:50	1.40	0.56	00:50	0.25	18:50	3.11	0.80	22:15	0.001	18:50	0.070	0.005	0.005	
3/15/2015	21:35	0.18	17:50	1.49	0.70	05:15	0.29	22:35	3.05	0.87	21:35	0.001	22:35	0.053	0.008	0.008	
3/16/2015	18:50	0.22	11:15	1.17	0.56	04:40	0.40	19:20	2.44	0.81	18:50	0.001	10:25	0.033	0.005	0.005	
3/17/2015	23:10	0.21	12:00	1.17	0.50	06:25	0.48	19:55	2.93	0.84	15:00	0.001	19:55	0.042	0.005	0.005	0.10
3/18/2015	08:20	0.14	07:25	0.99	0.38	04:15	0.31	11:00	3.37	0.82	08:00	0.000	07:25	0.030	0.003	0.003	
3/19/2015	16:45	0.11	02:55	1.03	0.34	01:25	0.29	08:05	2.57	0.80	01:25	0.000	08:05	0.028	0.003	0.003	
3/20/2015	22:40	0.11	07:15	0.96	0.28	02:45	0.32	10:50	2.70	0.81	22:40	0.000	10:50	0.021	0.002	0.002	
3/21/2015	13:20	0.13	19:25	0.76	0.34	05:10	0.22	18:30	2.30	0.78	01:10	0.001	09:40	0.012	0.002	0.002	
3/22/2015	16:15	0.12	18:35	1.09	0.41	12:50	0.45	09:40	2.26	0.90	16:15	0.000	18:35	0.026	0.004	0.004	0.20
3/23/2015	15:15	0.12	11:50	0.83	0.31	11:30	0.36	11:50	2.86	0.81	15:15	0.000	11:50	0.030	0.002	0.002	
3/24/2015	13:20	0.12	08:30	0.93	0.28	11:15	0.23	09:40	2.11	0.83	11:05	0.000	08:30	0.026	0.002	0.002	
3/25/2015	13:05	0.12	08:35	0.80	0.30	03:50	0.27	13:45	2.53	0.86	13:05	0.000	13:45	0.022	0.002	0.002	
3/26/2015	22:35	0.13	12:30	0.90	0.31	04:25	0.21	12:30	2.70	0.77	13:35	0.000	12:30	0.032	0.002	0.002	
3/27/2015	07:50	0.11	12:55	0.80	0.26	23:45	0.17	08:50	2.53	0.82	08:40	0.000	08:50	0.018	0.002	0.002	
3/28/2015	23:20	0.15	18:25	0.82	0.33	05:05	0.36	13:10	2.85	0.82	09:20	0.001	10:05	0.025	0.003	0.003	
3/29/2015	00:05	0.13	14:00	0.82	0.31	11:10	0.27	14:00	2.04	0.77	00:20	0.000	14:00	0.021	0.002	0.002	
3/30/2015	22:30	0.17	15:15	0.96	0.36	05:25	0.29	17:50	2.22	0.85	08:05	0.001	15:15	0.016	0.003	0.003	
3/31/2015	10:15	0.13	18:25	0.91	0.37	08:05	0.28	21:40	2.02	0.72	10:30	0.000	18:25	0.024	0.003	0.003	
4/1/2015	14:05	0.21	13:15	0.95	0.44	05:40	0.46	13:30	2.50	0.78	14:05	0.001	13:15	0.030	0.004	0.004	
4/2/2015	20:20	0.19	11:50	1.17	0.52	02:35	0.41	09:30	2.42	0.79	20:20	0.001	11:50	0.036	0.005	0.005	
4/3/2015	23:30	0.29	22:55	1.13	0.51	03:00	0.52	21:55	2.77	0.80	23:35	0.002	22:45	0.042	0.005	0.005	
4/4/2015	23:30	0.26	09:25	1.23	0.57	04:25	0.50	09:25	2.40	0.82	23:30	0.001	09:25	0.045	0.006	0.006	
4/5/2015	19:50	0.14	00:35	0.90	0.36	04:10	0.46	17:05	2.62	0.90	19:50	0.001	09:15	0.024	0.003	0.003	0.10
4/6/2015	21:00	0.10	13:55	0.79	0.34	16:30	0.41	08:45	2.63	0.90	22:25	0.000	16:40	0.023	0.003	0.003	0.03
4/7/2015	09:25	0.10	03:05	0.96	0.45	12:25	0.52	18:55	2.49	0.94	09:25	0.000	03:05	0.026	0.005	0.005	1.03
4/8/2015	09:35	0.10	14:35	0.80	0.38	02:40	0.31	20:50	2.30	0.78	09:35	0.000	20:50	0.021	0.003	0.003	
4/9/2015	09:55	0.10	08:10	0.84	0.43	20:15	0.45	18:15	3.03	0.86	10:00	0.000	12:35	0.025	0.004	0.004	
4/10/2015	12:40	0.10	19:10	0.77	0.38	18:20	0.31	19:10	2.88	0.92	15:40	0.000	19:10	0.028	0.003	0.003	
4/11/2015	09:00	0.10	10:25	0.84	0.31	23:05	0.32	18:55	2.91	0.88	22:00	0.000	10:25	0.030	0.003	0.003	
4/12/2015	01:40	0.10	19:40	0.83	0.28	04:10	0.43	00:50	3.05	0.90	20:00	0.000	00:50	0.030	0.003	0.003	
4/13/2015	07:25	0.15	10:25	0.94	0.39	17:35	0.29	20:55	2.90	0.88	07:30	0.001	10:25	0.032	0.004	0.004	
4/14/2015	16:15	0.10	11:55	1.03	0.43	22:35	0.47	11:55	2.88	0.88	20:30	0.000	11:55	0.042	0.004	0.004	
4/15/2015	16:40	0.10	19:25	0.89	0.39	23:45	0.28	08:00	2.80	0.86	16:40	0.000	01:30	0.024	0.003	0.003	

Report Summary For The Period 1/23/2015 - 4/15/2015

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			0.336	5.36
Avg	0.45	0.80	0.004	

Site Commentary

Site Information

LS10-NORTH	
Pipe Dimensions	8"x8"
Silt Level	0.00"

Overview

Site LS10-NORTH functioned under normal conditions during the period Friday, January 23, 2015 to Wednesday, April 15, 2015 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Friday, January 23, 2015 to Wednesday, April 15, 2015 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at approximately 45% full at its recorded 5-minute peak of 3.68 inches and approximately 16% full during the typical average depth of 1.32 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.32	0.68	0.018
Minimum	0.64	0.25	0.003
Maximum	3.68	1.92	0.195
Time of Minimum	2/25/2015 6:00 AM	4/12/2015 5:15 AM	4/4/2015 10:50 PM
Time of Maximum	3/2/2015 10:25 AM	3/2/2015 10:25 AM	3/2/2015 10:25 AM

Data Quality

Data uptime observed during the Friday, January 23, 2015 to the Wednesday, April 15, 2015 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

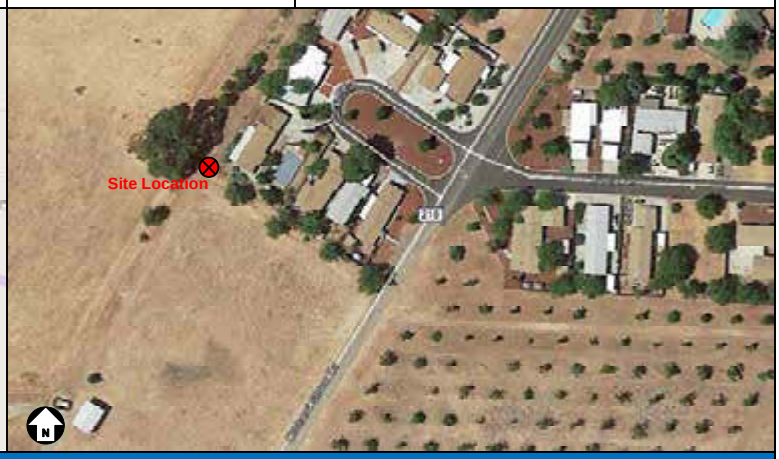
Quality Form

Project Name: ClearLake.MCEng.TFM.CA15	**Project No.** 22002	**City:** Clearlake Oaks, CA	**FM Initials:** SW
Site Name: LS10 – North	**Investigate Date:** 1/21/15		
Address/Location:	13809 Grape Circle (located behind residence along easement.) Access through gate on Orchard Shore Dr.		

Access: Drive	**Type of System:**	Sanitary [X]	Storm [ ]	Combined [ ]

Monitor Type	Peak Doppler
Monitor Model	ADS Triton+
Data Acquisition	Wireless
Manhole ID	MH LS10
Pipe Height:	8.00" (North Inlet)
Pipe Width:	8.00" (North Inlet)





Investigation Information:

Date/Time of Install:	1/21/15 @ 15:10
Site Hydraulics:	Low depth, smooth, slow velocity
Upstream Input: (L/S, P/S)	N/A
Upstream Manhole:	2 inlets / 1 outlet
Downstream Manhole:	LS Wet Well
Depth of Flow (DOF):	1.00" +/- 0.25"
Range (Air DOF):	7.00" +/- 0.25"
Peak Velocity:	1.00 fps
Silt:	0.00 Inches

Manhole Information:

Manhole Material / Condition	Precast / Fair
Pipe Material / Condition:	Concrete / Fair

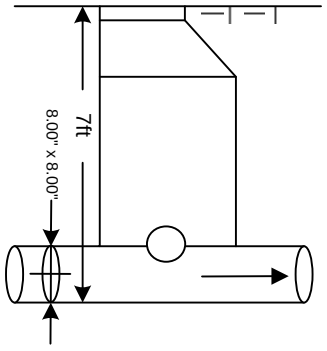
Land Use:	Residential	Commercial	Industrial	Trunk
	[X]	[ ]	[ ]	[ ]

Safety Notes

No Traffic Control Needed

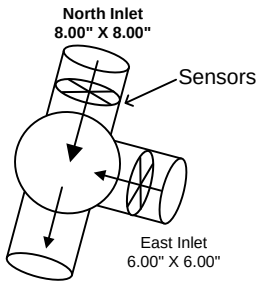
Other Information:





Cross Section





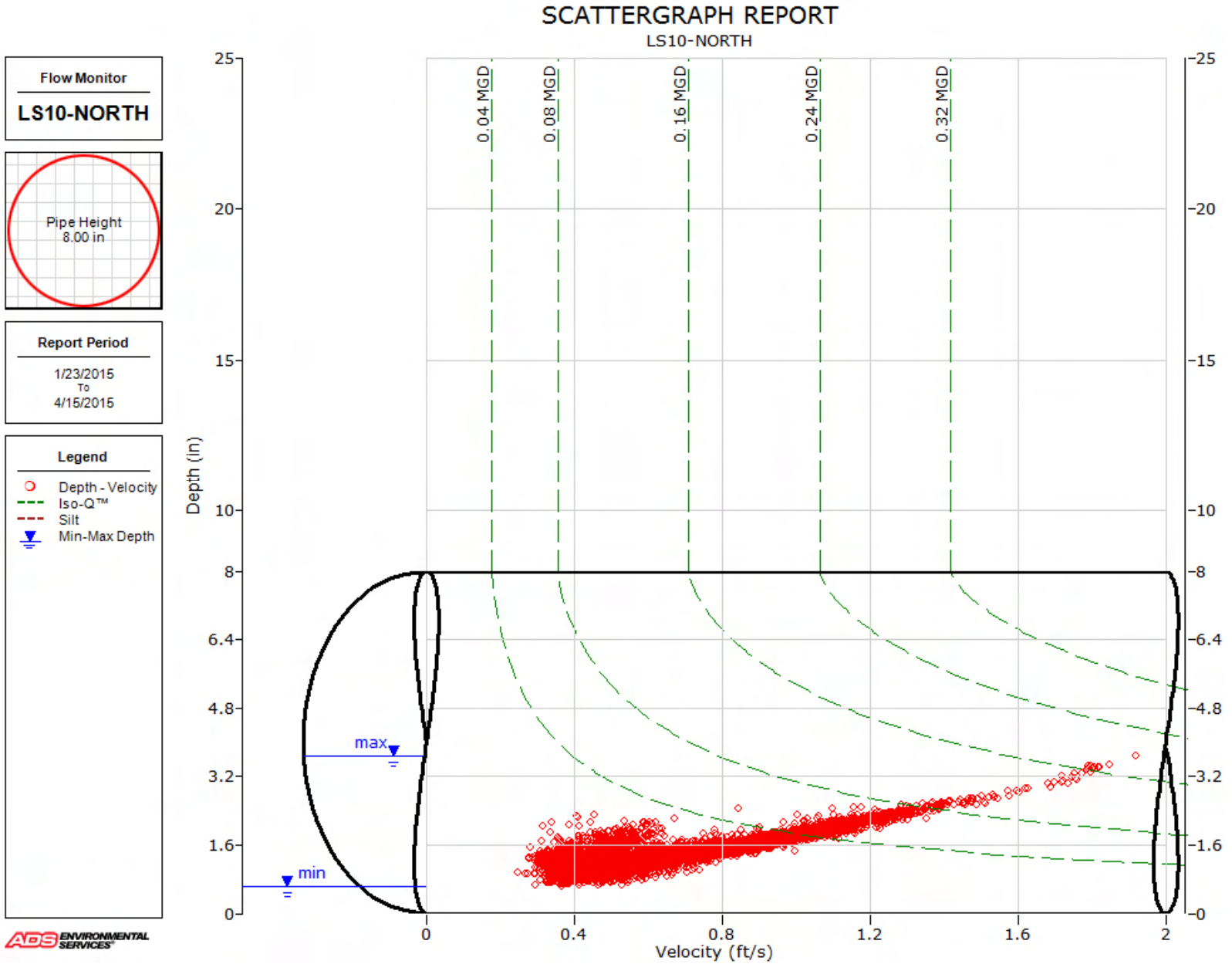
Plan

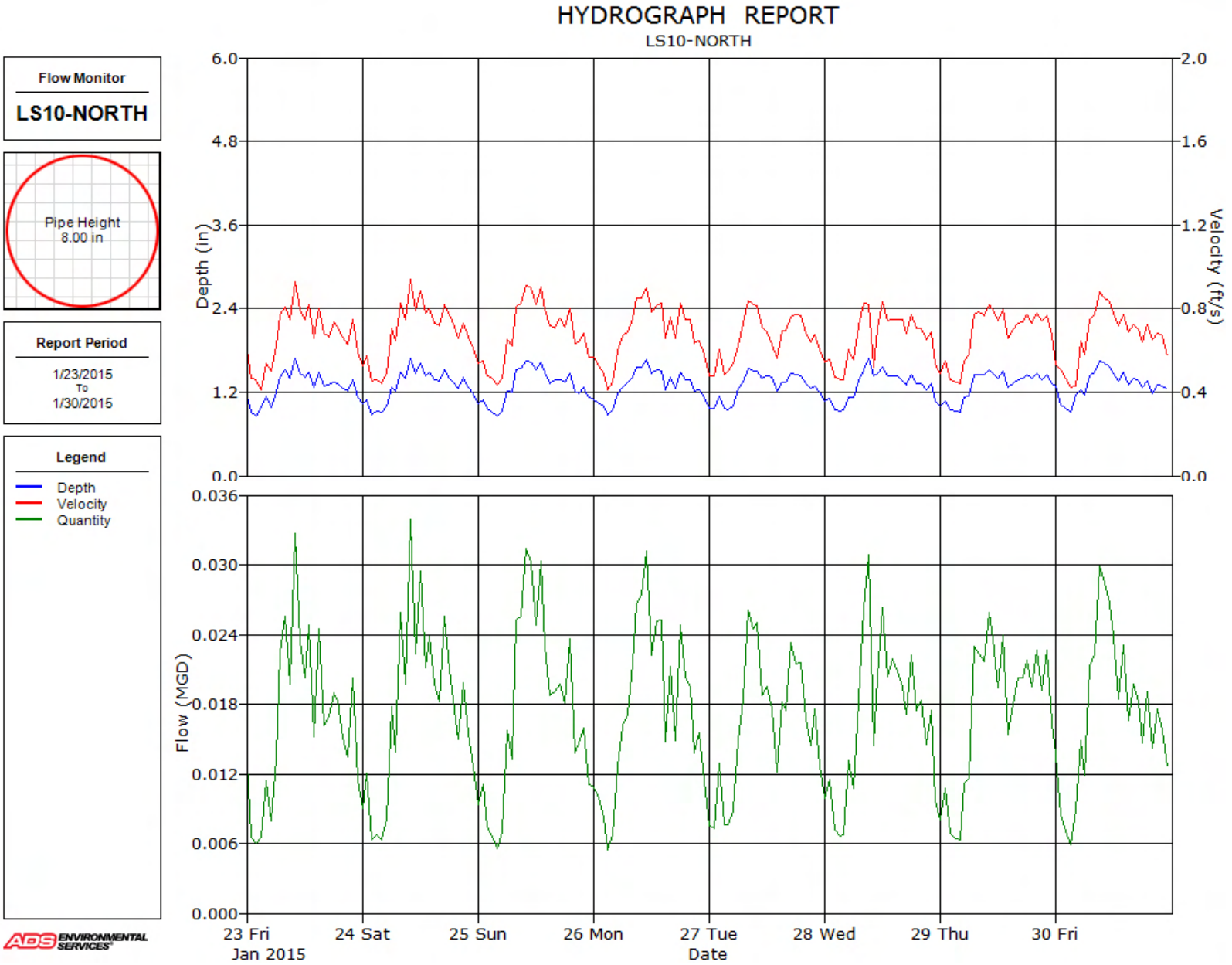
Installation Information	
Installation Type:	Ring
Sensors Devices:	Water Ultrasonic/ Pressure/ Velocity
Surcharge Height:	0
Rain Gauge Zone:	RG-WWTP

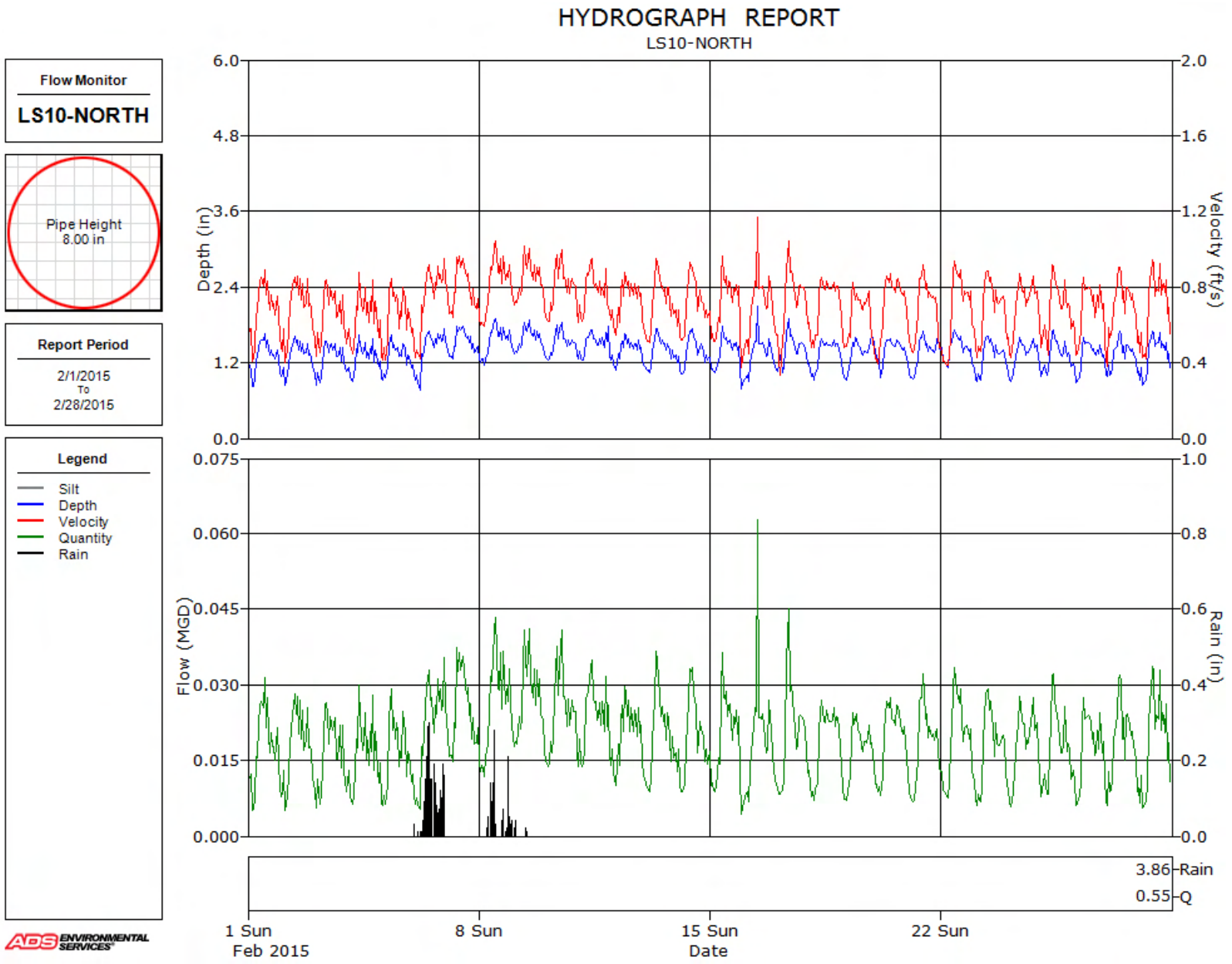
Backup	Yes	No	?	Distance
Trunk	[ ]	[X]	[ ]	
Lift / Pump Station	[ ]	[X]	[ ]	
WWTP	[ ]	[X]	[ ]	
Other	[ ]	[X]	[ ]	

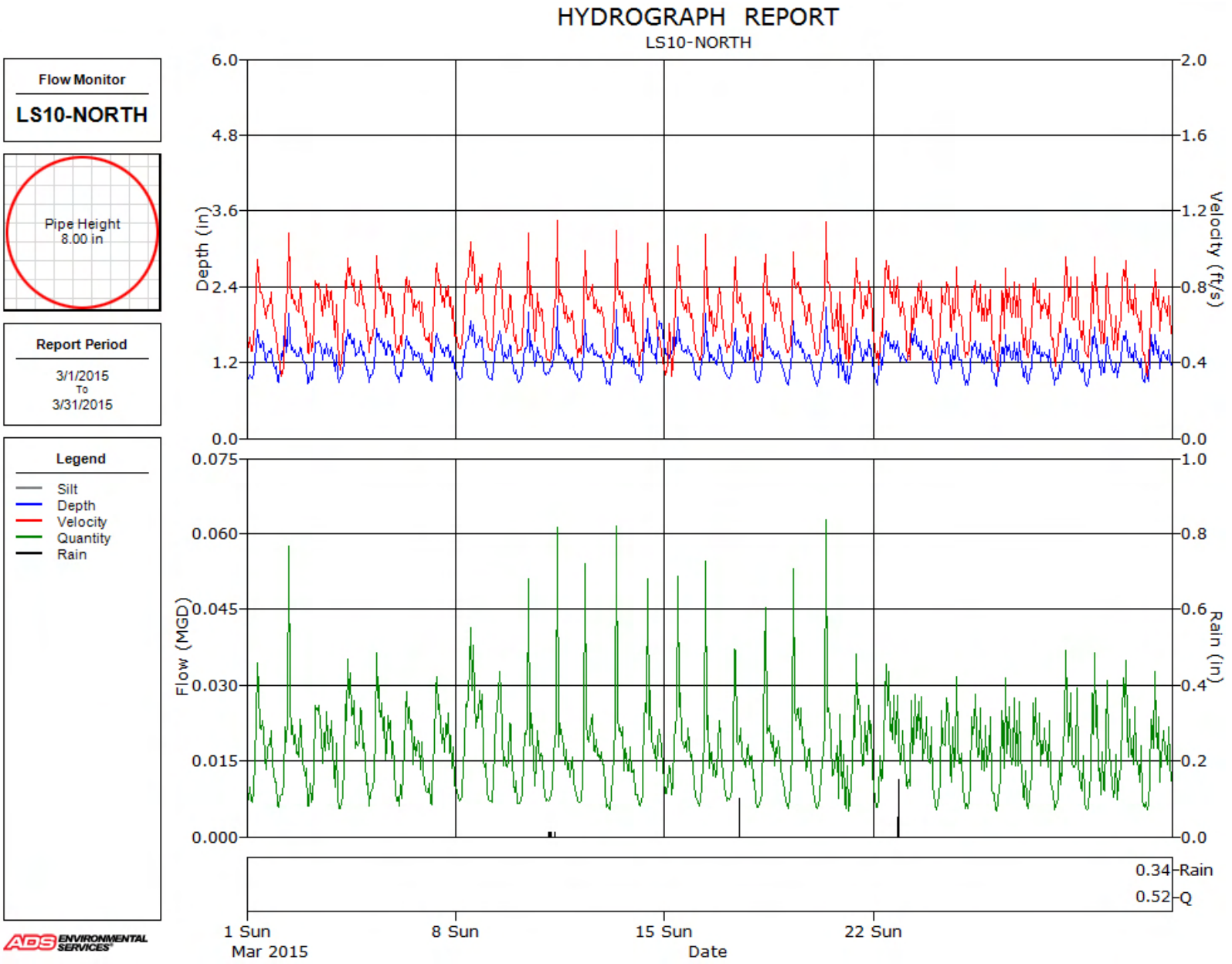
Additional Site Information / Comments:

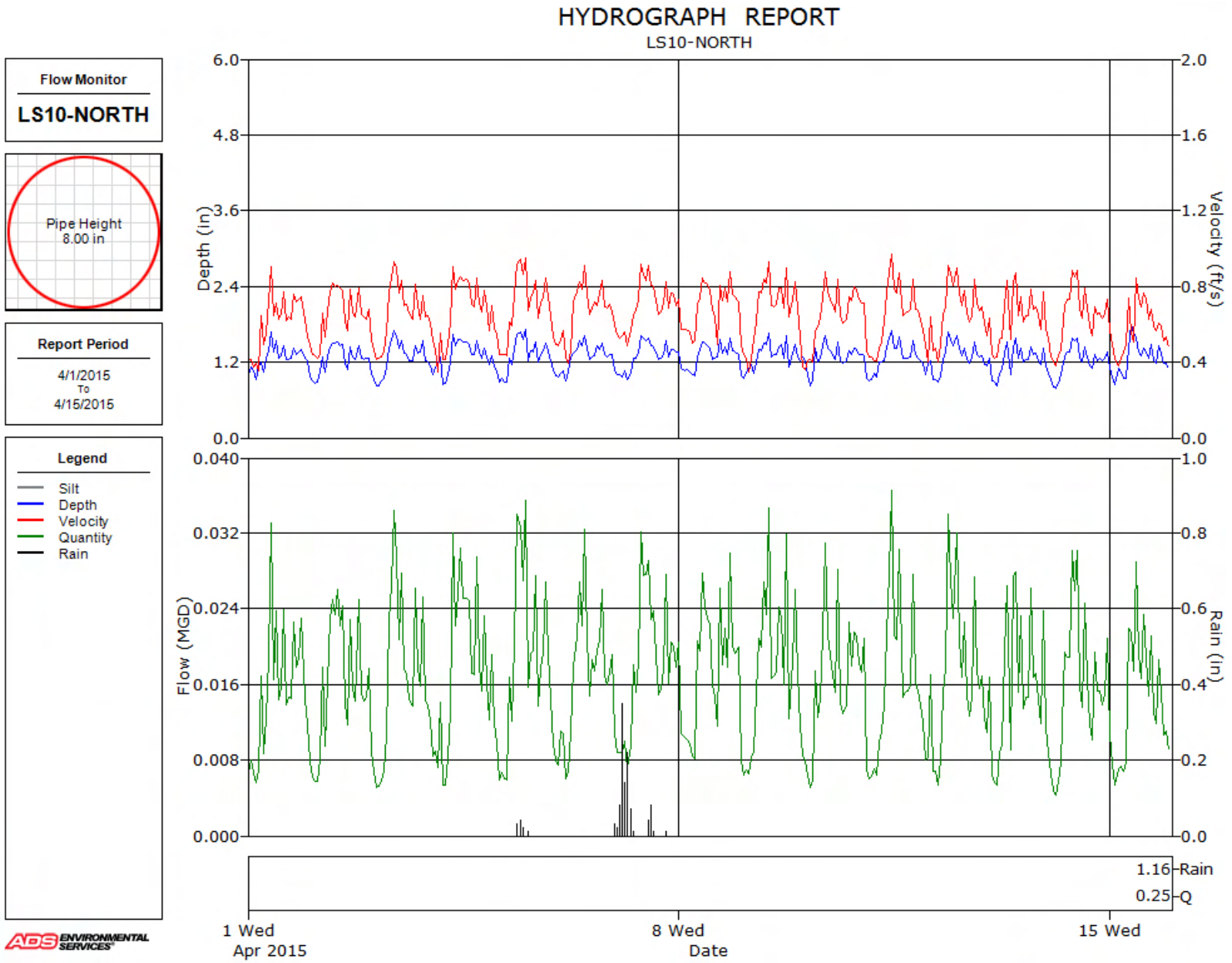
Need to contact Dan Hodem, CLOCWD Ops Mgr. 707-350-1093


SCATTERGRAPH REPORT
LS10-NORTH
Flow Monitor
LS10-NORTH
Pipe Height
8.00 in
Report Period
1/23/2015
To
4/15/2015
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.04 MGD
0.08 MGD
0.16 MGD
0.24 MGD
0.32 MGD
max
min
Depth (in)
Velocity (ft/s)
0
0.4
0.8
1.2
1.6
2
1.6
3.2
4.8
6.4
8
10
15
20
25
ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS10-NORTH
Flow Monitor
LS10-NORTH
Pipe Height
8.00 in
Report Period
1/23/2015
To
1/30/2015
Legend
Depth
Velocity
Quantity
Depth (in)
Velocity (ft/s)
Flow (MGD)
6.0
4.8
3.6
2.4
1.2
0.0
2.0
1.6
1.2
0.8
0.4
0.0
0.036
0.030
0.024
0.018
0.012
0.006
0.000
23 Fri
Jan 2015
24 Sat
25 Sun
26 Mon
27 Tue
28 Wed
29 Thu
30 Fri
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS10-NORTH
Flow Monitor
LS10-NORTH
Pipe Height
8.00 in
Report Period
2/1/2015
To
2/28/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
3.86 Rain
0.55 Q
1 Sun
Feb 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS10-NORTH
Flow Monitor
LS10-NORTH
Pipe Height
8.00 in
Report Period
3/1/2015
To
3/31/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.34 Rain
0.52 Q
1 Sun
Mar 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS10-NORTH
Flow Monitor
LS10-NORTH
Pipe Height
8.00 in
Report Period
4/1/2015
To
4/15/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
1.16 Rain
0.25 Q
1 Wed
Apr 2015
8 Wed
15 Wed
Date
ADS ENVIRONMENTAL SERVICES

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/23/2015	02:50	0.79	15:35	2.14	1.27	04:00	0.36	07:15	1.18	0.67	02:50	0.005	15:35	0.057	0.017	0.017	
1/24/2015	04:35	0.79	10:30	2.39	1.29	02:45	0.40	10:30	1.34	0.69	02:45	0.005	10:30	0.076	0.018	0.018	
1/25/2015	21:50	0.79	10:05	2.32	1.29	06:05	0.37	10:05	1.24	0.68	06:05	0.005	10:05	0.067	0.018	0.018	
1/26/2015	03:25	0.82	10:15	2.30	1.30	03:25	0.38	10:15	1.25	0.68	03:25	0.005	10:15	0.067	0.018	0.018	
1/27/2015	00:35	0.89	17:40	2.22	1.28	03:15	0.43	17:40	1.21	0.66	00:40	0.006	17:40	0.062	0.016	0.016	
1/28/2015	05:05	0.82	09:00	2.38	1.29	10:55	0.39	09:00	1.30	0.66	02:40	0.005	09:00	0.073	0.017	0.017	
1/29/2015	03:55	0.84	07:50	2.20	1.30	04:55	0.40	07:50	1.21	0.68	03:55	0.005	07:50	0.061	0.017	0.017	
1/30/2015	20:45	0.83	11:15	2.22	1.31	04:35	0.35	11:15	1.21	0.67	03:50	0.005	11:15	0.062	0.017	0.017	
1/31/2015	07:35	0.76	10:30	2.17	1.31	03:15	0.32	10:30	1.21	0.66	07:35	0.004	10:30	0.060	0.017	0.017	
2/1/2015	04:00	0.78	14:30	2.28	1.30	06:00	0.37	14:30	1.26	0.68	04:00	0.005	14:30	0.067	0.017	0.017	
2/2/2015	05:05	0.75	09:00	2.21	1.30	05:20	0.37	09:00	1.19	0.68	05:05	0.004	09:00	0.060	0.018	0.018	
2/3/2015	04:20	0.80	10:45	2.25	1.28	04:25	0.41	10:45	1.24	0.66	04:25	0.005	10:45	0.065	0.017	0.017	
2/4/2015	03:35	0.83	19:15	2.33	1.27	00:15	0.41	19:15	1.24	0.64	04:30	0.005	19:15	0.067	0.016	0.016	
2/5/2015	04:00	0.84	10:15	2.19	1.27	04:25	0.34	08:35	1.22	0.63	04:30	0.005	08:35	0.060	0.016	0.016	
2/6/2015	05:25	0.69	23:05	2.37	1.41	05:50	0.33	23:05	1.28	0.74	05:50	0.003	23:05	0.072	0.022	0.022	2.55
2/7/2015	05:35	1.23	16:55	2.40	1.53	18:50	0.59	16:55	1.30	0.80	05:40	0.013	16:55	0.074	0.025	0.025	
2/8/2015	03:05	1.12	16:00	2.55	1.55	03:15	0.51	16:00	1.37	0.82	03:05	0.011	16:00	0.085	0.026	0.026	1.18
2/9/2015	02:45	1.28	09:45	2.43	1.59	03:10	0.68	09:45	1.35	0.85	03:00	0.016	09:45	0.078	0.028	0.028	0.13
2/10/2015	03:05	1.20	12:05	2.51	1.50	03:05	0.59	12:05	1.35	0.80	03:05	0.013	12:05	0.082	0.024	0.024	
2/11/2015	03:45	1.16	15:55	2.39	1.50	22:35	0.56	10:05	1.31	0.77	03:45	0.012	10:05	0.073	0.023	0.023	
2/12/2015	04:10	1.07	13:25	2.13	1.41	06:20	0.48	13:25	1.16	0.74	04:55	0.010	13:25	0.056	0.021	0.021	
2/13/2015	04:15	1.00	09:35	2.39	1.39	04:15	0.47	09:35	1.37	0.72	04:15	0.008	09:35	0.078	0.020	0.020	
2/14/2015	20:30	0.76	09:00	2.27	1.36	20:55	0.45	09:00	1.26	0.70	20:30	0.005	09:00	0.067	0.019	0.019	
2/15/2015	23:55	0.75	11:05	2.23	1.36	23:55	0.35	13:55	1.20	0.71	23:55	0.004	13:55	0.062	0.020	0.020	
2/16/2015	04:10	0.74	11:30	3.14	1.34	04:10	0.34	11:30	1.76	0.71	04:10	0.004	11:30	0.144	0.019	0.019	
2/17/2015	02:25	0.87	09:10	2.38	1.39	04:15	0.31	09:10	1.32	0.70	02:25	0.005	09:10	0.074	0.020	0.020	
2/18/2015	04:55	0.90	09:40	1.70	1.36	04:55	0.44	14:05	0.92	0.72	04:55	0.006	09:40	0.032	0.019	0.019	
2/19/2015	06:30	0.82	10:50	1.83	1.35	06:40	0.42	11:00	0.86	0.66	06:30	0.005	10:50	0.033	0.017	0.017	
2/20/2015	06:35	0.82	10:45	1.77	1.39	02:55	0.36	14:20	0.93	0.70	03:50	0.005	09:10	0.033	0.019	0.019	
2/21/2015	02:40	0.90	08:30	1.86	1.36	00:30	0.41	08:35	0.99	0.68	05:10	0.006	08:35	0.039	0.018	0.018	
2/22/2015	05:20	1.05	08:15	1.91	1.44	05:20	0.36	10:50	1.01	0.68	05:20	0.006	10:50	0.040	0.019	0.019	
2/23/2015	05:50	0.72	08:55	1.83	1.30	05:50	0.33	08:55	0.97	0.68	05:50	0.003	08:55	0.038	0.017	0.017	
2/24/2015	04:10	0.84	19:20	1.80	1.33	02:55	0.37	19:20	0.95	0.70	03:00	0.005	19:20	0.036	0.018	0.018	
2/25/2015	06:00	0.64	11:35	1.82	1.33	01:35	0.34	09:05	0.95	0.69	06:00	0.003	09:40	0.035	0.018	0.018	
2/26/2015	05:25	0.81	22:25	2.09	1.30	02:55	0.42	22:25	1.17	0.68	02:55	0.006	22:25	0.055	0.017	0.017	
2/27/2015	01:40	0.89	11:05	2.39	1.32	01:35	0.35	11:05	1.30	0.69	01:40	0.005	11:05	0.074	0.018	0.018	
2/28/2015	05:00	0.73	15:05	2.40	1.34	05:10	0.33	15:05	1.31	0.70	05:10	0.003	15:05	0.075	0.019	0.019	
3/1/2015	03:35	0.82	10:20	2.31	1.26	04:25	0.36	10:20	1.31	0.66	03:00	0.005	10:20	0.071	0.016	0.016	
3/2/2015	02:30	0.81	10:25	3.68	1.35	03:45	0.29	10:25	1.92	0.64	02:25	0.005	10:25	0.195	0.018	0.018	
3/3/2015	01:45	0.82	10:55	2.31	1.27	12:10	0.33	10:55	1.29	0.67	02:00	0.005	10:55	0.070	0.017	0.017	
3/4/2015	04:30	0.82	09:05	2.49	1.34	04:05	0.32	09:05	1.39	0.70	03:10	0.005	09:05	0.084	0.019	0.019	
3/5/2015	02:20	0.84	08:45	2.23	1.35	02:25	0.38	08:00	1.23	0.69	02:25	0.005	08:45	0.063	0.019	0.019	
3/6/2015	04:40	0.82	09:20	2.22	1.26	03:00	0.41	09:20	1.19	0.66	03:05	0.005	09:20	0.061	0.016	0.016	
3/7/2015	00:15	0.83	09:40	2.17	1.29	04:30	0.39	11:40	1.19	0.69	00:15	0.005	09:40	0.058	0.017	0.017	
3/8/2015	03:25	0.79	08:55	2.37	1.39	06:15	0.36	08:55	1.33	0.74	03:30	0.005	08:55	0.075	0.021	0.021	
3/9/2015	05:20	0.88	12:10	2.27	1.28	05:20	0.41	10:55	1.20	0.66	05:20	0.006	12:10	0.063	0.017	0.017	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/10/2015	06:20	0.76	11:50	2.85	1.26	16:00	0.39	11:45	1.60	0.64	06:20	0.004	11:45	0.115	0.016	0.016	
3/11/2015	06:00	0.75	10:35	3.41	1.27	15:55	0.34	10:35	1.81	0.63	06:00	0.004	10:35	0.166	0.016	0.016	0.04
3/12/2015	04:20	0.82	08:45	3.39	1.28	05:50	0.36	08:45	1.80	0.66	04:20	0.006	08:45	0.164	0.017	0.017	
3/13/2015	21:20	0.65	09:20	3.44	1.25	04:25	0.38	09:20	1.80	0.64	05:15	0.004	09:20	0.167	0.016	0.016	
3/14/2015	03:55	0.82	11:20	3.48	1.38	23:15	0.35	11:20	1.85	0.62	03:55	0.004	11:20	0.174	0.017	0.017	
3/15/2015	23:35	1.12	11:45	3.40	1.44	06:25	0.31	11:45	1.80	0.62	06:25	0.007	11:45	0.164	0.018	0.018	
3/16/2015	04:15	0.81	09:10	3.31	1.26	05:05	0.34	09:10	1.80	0.62	04:15	0.005	09:10	0.158	0.016	0.016	
3/17/2015	06:10	0.88	08:55	3.42	1.28	23:35	0.35	08:55	1.82	0.62	02:35	0.005	08:55	0.167	0.016	0.016	0.10
3/18/2015	06:30	0.76	09:00	3.41	1.27	06:35	0.31	09:00	1.82	0.65	06:25	0.004	09:00	0.167	0.017	0.017	
3/19/2015	04:15	0.78	08:50	3.41	1.28	14:45	0.36	08:50	1.81	0.66	04:15	0.005	08:50	0.166	0.017	0.017	
3/20/2015	03:30	0.78	10:25	3.28	1.23	04:05	0.36	10:25	1.77	0.64	03:40	0.005	10:25	0.154	0.016	0.016	
3/21/2015	00:00	0.77	12:55	2.52	1.29	04:50	0.36	12:55	1.36	0.68	04:50	0.004	12:55	0.083	0.018	0.018	
3/22/2015	03:50	0.74	16:25	2.52	1.33	04:40	0.33	23:40	1.37	0.68	02:10	0.005	23:40	0.081	0.018	0.018	0.20
3/23/2015	23:05	1.03	15:45	2.54	1.39	06:00	0.32	15:45	1.41	0.65	06:05	0.007	15:45	0.087	0.018	0.018	
3/24/2015	03:20	0.80	12:55	2.41	1.25	03:10	0.36	12:55	1.39	0.65	03:15	0.004	12:55	0.079	0.016	0.016	
3/25/2015	04:30	0.79	10:45	2.61	1.23	04:30	0.40	10:45	1.42	0.64	04:30	0.005	10:45	0.091	0.015	0.015	
3/26/2015	04:05	0.75	07:10	2.61	1.26	04:25	0.31	07:10	1.41	0.64	04:05	0.004	07:10	0.090	0.016	0.016	
3/27/2015	07:20	0.74	10:30	2.54	1.24	04:20	0.39	10:30	1.39	0.65	04:20	0.005	10:30	0.085	0.016	0.016	
3/28/2015	03:00	0.79	20:35	2.69	1.23	03:50	0.34	20:35	1.48	0.64	03:10	0.005	20:35	0.099	0.016	0.016	
3/29/2015	06:10	0.74	20:35	2.68	1.22	17:25	0.40	20:35	1.47	0.63	06:10	0.005	20:35	0.097	0.015	0.015	
3/30/2015	04:20	0.88	09:00	2.66	1.28	01:25	0.33	09:00	1.44	0.67	04:25	0.006	09:00	0.095	0.017	0.017	
3/31/2015	06:40	0.73	10:15	2.73	1.25	04:25	0.27	10:15	1.50	0.62	04:25	0.004	10:15	0.102	0.015	0.015	
4/1/2015	00:10	0.78	11:40	2.55	1.27	04:55	0.29	21:25	1.35	0.61	03:05	0.004	11:40	0.080	0.015	0.015	
4/2/2015	15:20	0.71	11:50	2.40	1.25	15:20	0.33	11:50	1.33	0.65	15:20	0.003	11:50	0.075	0.016	0.016	
4/3/2015	02:25	0.76	17:15	2.62	1.26	04:05	0.33	17:15	1.48	0.66	04:05	0.004	17:15	0.095	0.017	0.017	
4/4/2015	22:50	0.65	11:50	2.70	1.30	02:35	0.28	11:50	1.53	0.67	22:50	0.003	11:50	0.103	0.018	0.018	
4/5/2015	02:30	0.80	09:45	2.78	1.28	06:50	0.36	09:45	1.53	0.68	05:20	0.005	09:45	0.107	0.018	0.018	0.10
4/6/2015	04:25	0.77	11:15	2.53	1.27	06:30	0.34	11:15	1.43	0.66	04:25	0.004	11:15	0.087	0.017	0.017	0.03
4/7/2015	01:30	0.76	11:55	2.59	1.30	01:30	0.35	11:55	1.48	0.70	01:30	0.004	11:55	0.094	0.018	0.018	1.03
4/8/2015	07:05	0.80	20:25	2.57	1.31	07:25	0.39	20:25	1.39	0.69	07:25	0.005	20:25	0.087	0.018	0.018	
4/9/2015	01:25	0.82	11:40	2.85	1.29	03:00	0.32	11:40	1.57	0.67	00:45	0.005	11:40	0.113	0.017	0.017	
4/10/2015	04:30	0.74	14:35	2.68	1.29	05:20	0.28	14:35	1.47	0.64	04:30	0.004	14:35	0.098	0.016	0.016	
4/11/2015	04:20	0.78	00:10	2.56	1.27	04:40	0.32	00:10	1.40	0.65	04:20	0.004	00:10	0.087	0.016	0.016	
4/12/2015	01:35	0.72	09:20	2.55	1.27	05:15	0.25	09:20	1.49	0.66	01:55	0.004	09:20	0.092	0.017	0.017	
4/13/2015	09:55	0.67	17:30	2.60	1.23	01:50	0.34	17:30	1.51	0.64	09:55	0.004	17:30	0.096	0.016	0.016	
4/14/2015	04:30	0.73	11:35	2.54	1.22	05:05	0.33	11:35	1.46	0.64	03:50	0.004	11:35	0.089	0.016	0.016	
4/15/2015	08:05	0.72	13:50	2.47	1.26	07:20	0.31	13:50	1.37	0.58	06:20	0.004	13:50	0.081	0.014	0.014	

Report Summary For The Period 1/23/2015 - 4/15/2015

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			1.478	5.36
Avg	1.32	0.68	0.018	

Site Commentary

Site Information

LS1-2N-NORTH	
Pipe Dimensions	10.38"x10.38"
Silt Level	0.00"

Overview

Site LS1-2N-NORTH functioned under normal conditions during the period Friday, January 23, 2015 to Wednesday, April 15, 2015 . Review of the scattergraph shows surcharge and backwater conditions were experienced multiple times at this location.
Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Friday, January 23, 2015 to Wednesday, April 15, 2015 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at approximately 214% full at its recorded 5-minute peak of 22.25 inches and approximately 7% full during the typical average depth of 0.79 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	0.79	2.27	0.032
Minimum	0.00	0.13	0.000
Maximum	22.25	4.53	0.413
Time of Minimum	4/10/2015 8:05 AM	3/12/2015 9:05 AM	4/10/2015 7:55 AM
Time of Maximum	3/20/2015 8:45 AM	4/11/2015 12:45 PM	4/5/2015 1:05 PM

Data Quality

Data uptime observed during the Friday, January 23, 2015 to the Wednesday, April 15, 2015 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: ClearLake.MCEng.TFM.CA15	**Project No.** 22002	**City:** Clearlake Oaks, CA	**FM Initials:** SW
Site Name: LS1-2N – North	**Investigate Date:** 1/21/15		
Address/Location:	Intersection of Island Drive and Hwy 20 (In front of WTP)		

Access:	**Type of System:**	Sanitary	Storm	Combined
Drive		X		

Monitor Type	Peak Doppler
Monitor Model	ADS Triton+
Data Acquisition	Wireless
Manhole ID	MH LS1,2
Pipe Height:	10.38" (North Inlet)
Pipe Width:	10.38" (North Inlet)





Investigation Information:

Date/Time of Install:	1/21/15 @ 09:55
Site Hydraulics:	Ripples, very low depth, moderate velocity
Upstream Input: (L/S, P/S)	N/A
Upstream Manhole:	1 inlet / 1 outlet (located on Hwy)
Downstream Manhole:	1 inlet / 1 outlet
Depth of Flow (DOF):	1.00" +/- 0.25"
Range (Air DOF):	9.38" +/- 0.25"
Peak Velocity:	2.50 fps
Silt:	0.00 Inches

Manhole Information:

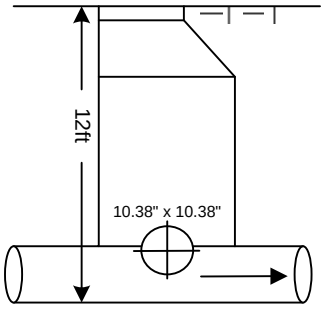
Manhole Material / Condition	Precast / Good				
Pipe Material / Condition:	VCP / Good				
Land Use:	Residential	Commercial	Industrial	Trunk	
	X				

Safety Notes

Located just off Hwy on Island Drive, standard traffic control. Low volume traffic

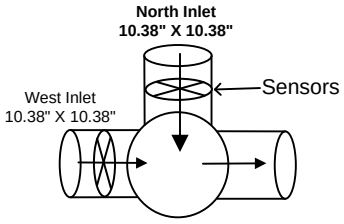
Other Information:





Cross Section



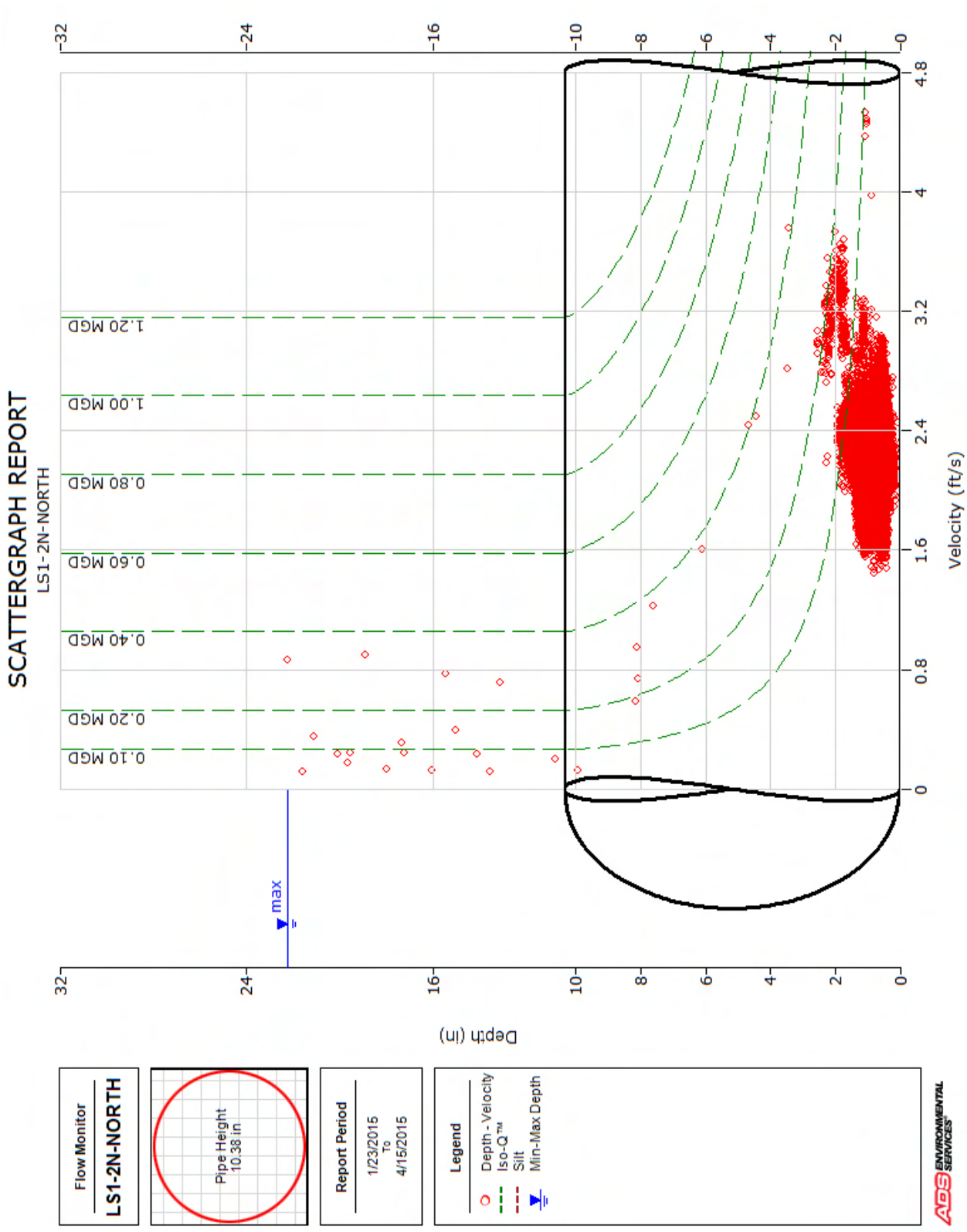


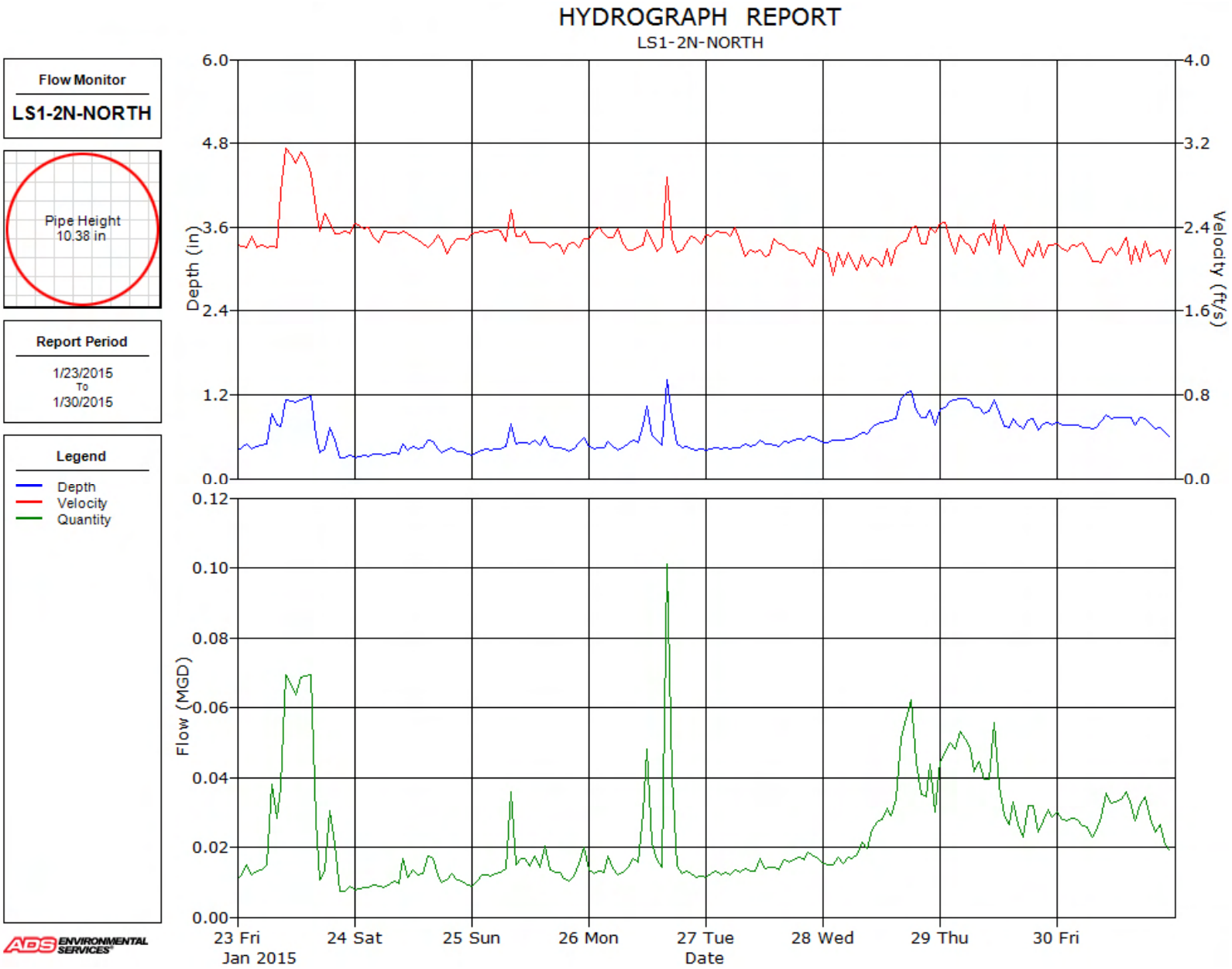
Plan

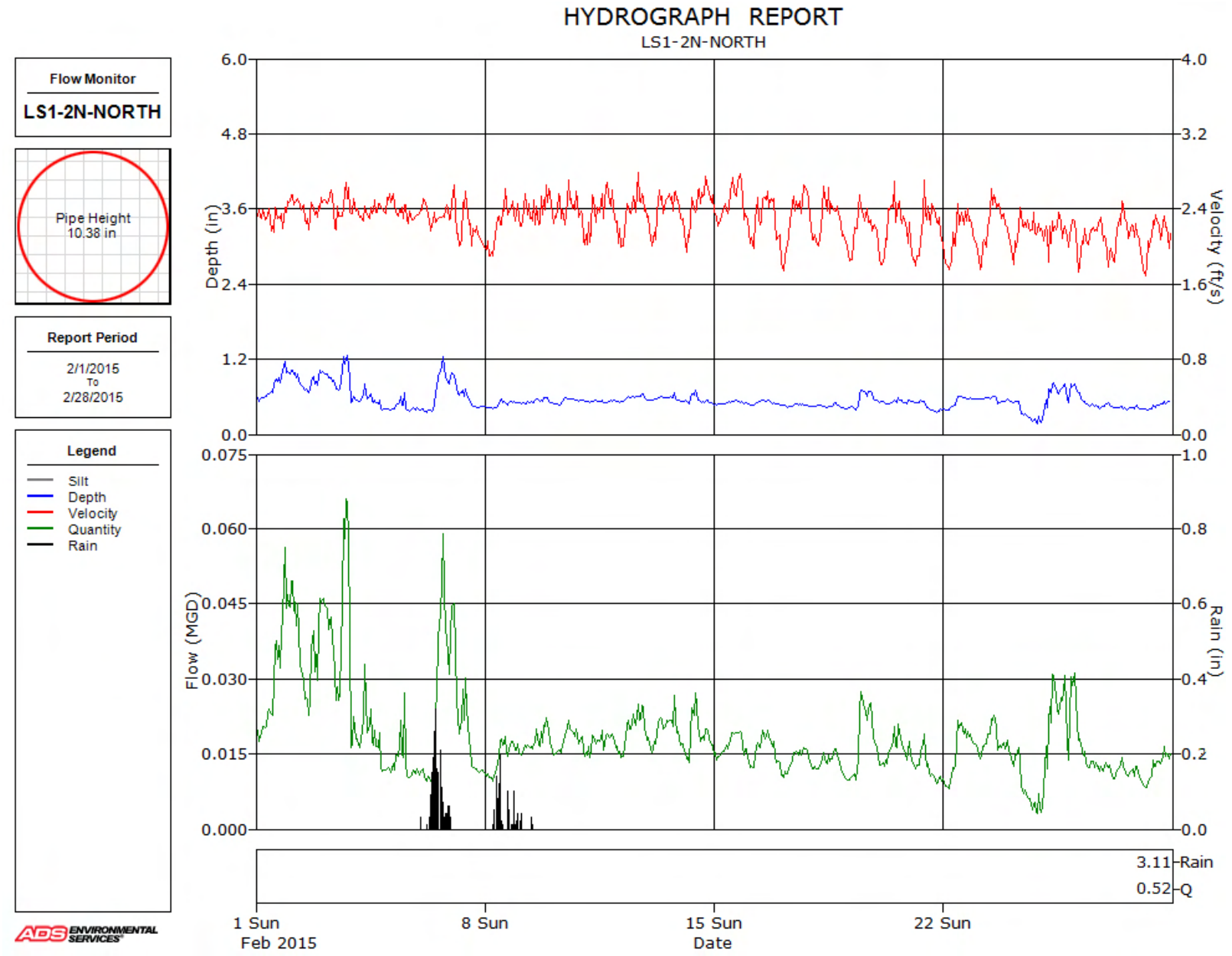
Installation Information	
Installation Type:	Ring
Sensors Devices:	Water Ultrasonic/ Pressure/ Velocity
Surcharge Height:	0
Rain Gauge Zone:	RG-WTP

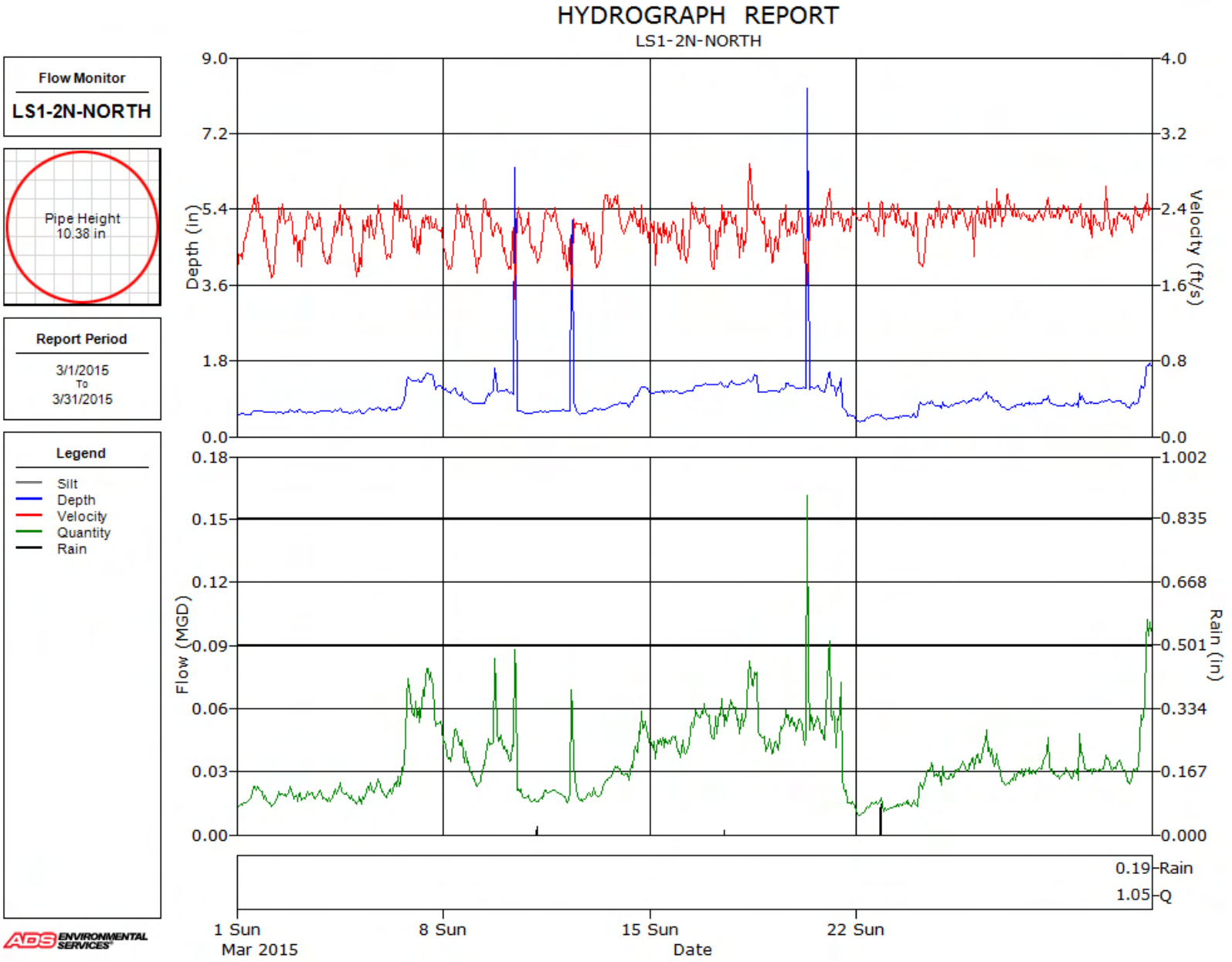
Backup	Yes	No	?	Distance
Trunk		X		
Lift / Pump Station		X		
WWTP		X		
Other		X		

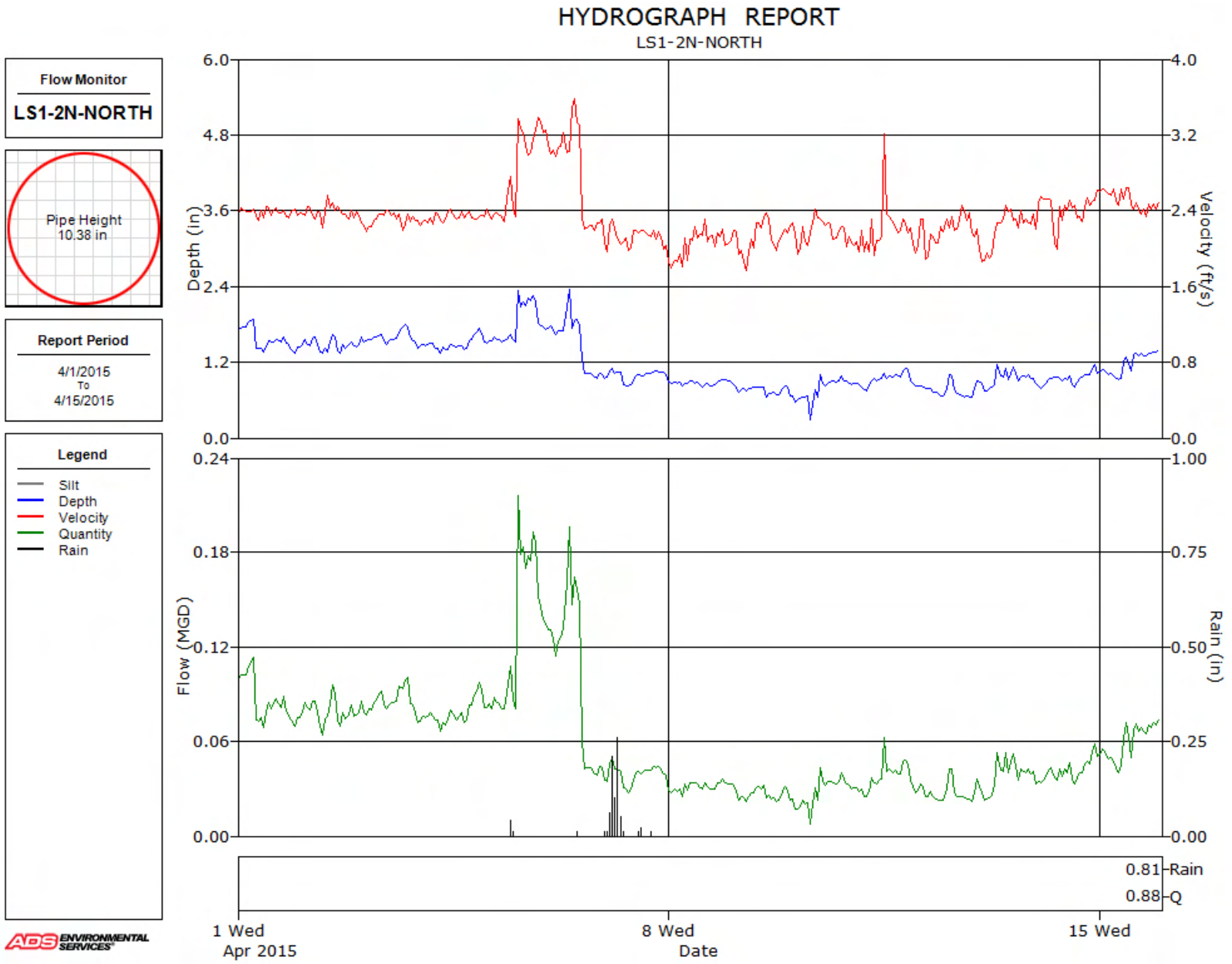
Additional Site Information / Comments:


SCATTERGRAPH REPORT
LS1-2N-NORTH
Flow Monitor
LS1-2N-NORTH
Pipe Height
10.38 in
Report Period
1/23/2015
To
4/15/2015
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
Depth (in)
Velocity (ft/s)
0.10 MGD
0.20 MGD
0.40 MGD
0.60 MGD
0.80 MGD
1.00 MGD
1.20 MGD
max
ABS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS1-2N-NORTH
Flow Monitor
LS1-2N-NORTH
Pipe Height
10.38 in
Report Period
1/23/2015
To
1/30/2015
Legend
Depth
Velocity
Quantity
Depth (in)
Velocity (ft/s)
Flow (MGD)
6.0
4.8
3.6
2.4
1.2
0.0
4.0
3.2
2.4
1.6
0.8
0.0
0.12
0.10
0.08
0.06
0.04
0.02
0.00
23 Fri
Jan 2015
24 Sat
25 Sun
26 Mon
27 Tue
28 Wed
29 Thu
30 Fri
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS1-2N-NORTH
Flow Monitor
LS1-2N-NORTH
Pipe Height
10.38 in
Report Period
2/1/2015
To
2/28/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
3.11 Rain
0.52 Q
1 Sun
Feb 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS1-2N-NORTH
Flow Monitor
LS1-2N-NORTH
Pipe Height
10.38 in
Report Period
3/1/2015
To
3/31/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.19 Rain
1.05 Q
1 Sun
Mar 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS1-2N-NORTH
Flow Monitor
LS1-2N-NORTH
Pipe Height
10.38 in
Report Period
4/1/2015
To
4/15/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.81 Rain
0.88 Q
1 Wed
Apr 2015
8 Wed
15 Wed
Date
ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 1/23/2015 - 4/15/2015

LS1-2N-NORTH, Pipe Height: 10.38 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/23/2015	22:35	0.28	20:05	1.33	0.67	02:30	2.03	11:20	3.28	2.52	22:30	0.007	10:30	0.077	0.030	0.030	
1/24/2015	00:55	0.24	10:40	0.96	0.39	19:15	1.99	08:40	2.75	2.31	02:55	0.006	10:40	0.042	0.011	0.011	
1/25/2015	00:20	0.32	08:20	0.95	0.47	17:15	1.93	08:20	3.16	2.30	00:20	0.008	08:20	0.055	0.015	0.015	
1/26/2015	22:10	0.37	17:00	1.88	0.56	13:55	1.81	16:35	3.32	2.29	18:50	0.010	17:00	0.149	0.021	0.021	
1/27/2015	00:15	0.38	11:20	0.65	0.49	13:55	1.78	06:30	2.75	2.22	00:15	0.010	16:15	0.021	0.015	0.015	
1/28/2015	00:55	0.49	17:45	1.44	0.78	06:55	1.73	23:45	2.77	2.17	00:55	0.013	17:45	0.083	0.029	0.029	
1/29/2015	20:55	0.64	11:15	1.41	0.92	19:50	1.80	13:35	2.89	2.25	17:30	0.020	11:15	0.085	0.038	0.038	
1/30/2015	23:55	0.53	17:00	1.29	0.79	07:20	1.68	10:45	2.66	2.17	23:55	0.016	17:00	0.056	0.029	0.029	
1/31/2015	04:25	0.54	12:00	1.13	0.65	07:45	1.79	17:05	2.71	2.21	15:25	0.016	12:00	0.049	0.022	0.022	
2/1/2015	02:20	0.51	20:55	1.39	0.75	11:40	1.88	17:15	2.84	2.33	02:20	0.016	20:55	0.071	0.029	0.029	
2/2/2015	15:20	0.65	18:25	1.16	0.86	15:15	1.80	08:10	2.81	2.40	15:20	0.018	02:50	0.058	0.036	0.036	
2/3/2015	22:25	0.47	20:10	1.54	0.91	11:30	1.84	06:50	3.08	2.45	22:50	0.014	20:10	0.104	0.041	0.041	
2/4/2015	21:40	0.35	12:10	1.01	0.55	09:20	1.95	08:30	2.90	2.38	22:40	0.009	12:10	0.047	0.019	0.019	
2/5/2015	11:45	0.34	13:00	1.92	0.44	19:55	2.09	14:00	2.93	2.39	17:15	0.009	13:00	0.115	0.013	0.013	
2/6/2015	04:25	0.33	17:00	1.35	0.66	10:30	1.74	11:55	2.82	2.34	10:30	0.008	17:00	0.068	0.025	0.025	2.04
2/7/2015	20:45	0.41	00:05	1.05	0.60	06:35	1.76	00:35	3.21	2.22	20:00	0.010	00:35	0.056	0.020	0.020	
2/8/2015	06:35	0.40	11:35	0.63	0.48	06:05	1.68	14:05	2.97	2.23	06:25	0.009	14:05	0.022	0.014	0.014	0.93
2/9/2015	06:50	0.47	19:50	0.62	0.53	03:45	1.89	20:45	3.02	2.39	03:45	0.012	19:40	0.026	0.018	0.018	0.14
2/10/2015	07:05	0.45	11:00	0.65	0.53	01:55	1.94	14:45	3.01	2.43	03:55	0.013	12:20	0.026	0.018	0.018	
2/11/2015	16:50	0.49	14:40	0.64	0.53	03:40	1.72	18:55	3.02	2.36	05:30	0.013	14:45	0.024	0.017	0.017	
2/12/2015	03:20	0.50	09:25	0.71	0.58	05:10	1.70	11:55	3.02	2.35	05:10	0.012	16:30	0.028	0.020	0.020	
2/13/2015	23:30	0.51	19:55	0.70	0.58	02:40	1.90	11:40	3.04	2.40	02:40	0.014	19:55	0.030	0.020	0.020	
2/14/2015	06:05	0.47	10:40	1.01	0.55	04:55	1.80	11:10	3.17	2.41	05:35	0.012	10:40	0.044	0.019	0.019	
2/15/2015	02:40	0.44	09:45	0.58	0.50	04:15	2.08	18:35	3.02	2.47	02:40	0.012	16:40	0.023	0.017	0.017	
2/16/2015	04:05	0.42	16:20	0.58	0.51	04:55	1.81	14:45	3.04	2.32	04:05	0.010	14:45	0.024	0.016	0.016	
2/17/2015	07:00	0.42	10:20	0.55	0.46	03:00	1.52	18:50	2.88	2.28	03:00	0.009	10:20	0.021	0.014	0.014	
2/18/2015	23:10	0.40	16:15	0.58	0.45	04:05	1.77	09:00	3.00	2.30	23:25	0.010	16:15	0.019	0.013	0.013	
2/19/2015	08:20	0.36	12:45	0.79	0.54	05:15	1.68	12:40	2.78	2.19	08:10	0.009	12:40	0.034	0.017	0.017	
2/20/2015	21:40	0.46	15:10	0.62	0.52	05:25	1.61	12:10	2.93	2.21	05:25	0.010	15:10	0.025	0.016	0.016	
2/21/2015	19:25	0.34	09:50	0.55	0.45	04:30	1.65	10:00	2.96	2.19	19:05	0.008	10:10	0.021	0.013	0.013	
2/22/2015	04:05	0.36	12:15	0.63	0.51	01:30	1.55	11:00	2.90	2.13	04:05	0.007	11:00	0.025	0.015	0.015	
2/23/2015	16:55	0.47	23:45	0.63	0.56	03:20	1.51	11:15	2.86	2.22	03:20	0.012	13:45	0.025	0.018	0.018	
2/24/2015	20:05	0.14	00:00	0.57	0.36	02:45	1.64	18:25	2.76	2.16	21:05	0.002	08:25	0.020	0.009	0.009	
2/25/2015	01:25	0.15	09:55	1.11	0.64	04:55	1.65	14:05	2.78	2.16	01:25	0.002	08:45	0.046	0.022	0.022	
2/26/2015	19:25	0.39	00:10	0.84	0.53	04:15	1.55	20:25	2.73	2.10	19:25	0.010	00:00	0.032	0.015	0.015	
2/27/2015	15:35	0.38	00:50	0.52	0.44	05:00	1.55	11:35	2.85	2.14	05:00	0.009	11:35	0.016	0.012	0.012	
2/28/2015	06:00	0.38	18:30	0.63	0.45	04:25	1.48	18:15	2.72	2.09	04:25	0.007	18:30	0.021	0.012	0.012	
3/1/2015	00:45	0.51	14:15	0.63	0.56	01:35	1.57	17:20	2.85	2.20	01:35	0.011	15:35	0.026	0.018	0.018	
3/2/2015	14:10	0.54	19:05	0.65	0.58	06:25	1.51	13:10	2.80	2.12	04:35	0.012	19:55	0.024	0.018	0.018	
3/3/2015	15:40	0.54	04:35	0.65	0.59	05:25	1.57	09:45	2.83	2.15	07:15	0.014	13:45	0.025	0.019	0.019	
3/4/2015	19:15	0.44	12:40	0.68	0.60	23:35	1.60	12:20	2.86	2.13	22:45	0.013	12:20	0.028	0.019	0.019	
3/5/2015	07:25	0.55	19:00	0.71	0.63	01:40	1.53	19:30	2.81	2.11	06:50	0.013	19:30	0.029	0.020	0.020	
3/6/2015	01:55	0.60	19:30	1.45	0.86	02:35	1.56	14:35	2.91	2.21	02:30	0.015	19:20	0.082	0.035	0.035	
3/7/2015	18:15	1.10	11:25	1.53	1.34	05:00	1.65	07:40	2.90	2.18	18:55	0.046	11:30	0.087	0.063	0.063	
3/8/2015	22:30	0.79	12:45	1.32	1.00	05:30	1.56	18:55	2.80	2.13	23:45	0.027	12:45	0.061	0.040	0.040	
3/9/2015	00:25	0.76	18:30	2.25	0.96	03:10	1.62	13:45	2.73	2.16	03:00	0.021	18:30	0.133	0.039	0.039	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/10/2015	18:55	0.53	11:00	19.67	1.17	10:45	0.13	19:55	2.68	2.07	23:25	0.013	10:30	0.387	0.033	0.033	
3/11/2015	00:05	0.55	18:10	0.62	0.59	05:55	1.62	19:45	2.79	2.16	00:40	0.013	19:45	0.024	0.019	0.019	0.03
3/12/2015	15:20	0.51	09:05	21.61	0.96	09:05	0.13	15:05	2.62	2.07	04:00	0.014	08:40	0.373	0.023	0.023	
3/13/2015	00:50	0.61	23:45	0.84	0.69	07:50	1.48	14:00	2.99	2.25	07:50	0.015	20:35	0.037	0.025	0.025	
3/14/2015	08:00	0.67	17:25	1.20	0.95	18:30	1.79	17:25	2.62	2.24	08:00	0.023	17:25	0.064	0.039	0.039	
3/15/2015	02:35	1.02	15:30	1.11	1.06	04:40	1.58	19:45	2.59	2.16	04:40	0.032	13:50	0.056	0.044	0.044	
3/16/2015	02:40	1.01	21:45	1.26	1.14	06:10	1.62	10:35	2.74	2.19	00:45	0.032	20:10	0.070	0.050	0.050	
3/17/2015	15:55	1.16	18:45	1.43	1.24	03:55	1.62	10:15	2.91	2.17	01:30	0.042	10:15	0.085	0.056	0.056	0.01
3/18/2015	16:55	1.02	15:25	1.65	1.23	22:15	1.66	09:20	3.29	2.29	22:15	0.033	09:35	0.096	0.059	0.059	
3/19/2015	09:35	1.05	16:45	1.47	1.14	02:55	1.58	06:15	2.65	2.15	03:25	0.034	16:45	0.070	0.049	0.049	
3/20/2015	22:50	1.03	08:45	22.25	1.58	09:00	0.24	20:15	2.85	2.20	06:15	0.037	08:30	0.404	0.057	0.057	
3/21/2015	23:45	0.44	11:35	1.69	0.90	13:50	1.84	09:50	2.76	2.33	23:35	0.013	11:10	0.098	0.040	0.040	
3/22/2015	03:45	0.35	15:35	0.54	0.44	15:25	1.86	11:55	2.86	2.30	03:05	0.009	20:30	0.019	0.013	0.013	0.15
3/23/2015	00:55	0.40	23:25	0.62	0.47	12:45	1.84	09:00	2.82	2.30	00:35	0.011	23:25	0.019	0.014	0.014	
3/24/2015	01:10	0.44	14:45	0.89	0.73	03:20	1.60	17:05	2.73	2.19	03:05	0.012	22:55	0.039	0.026	0.026	
3/25/2015	03:20	0.68	23:40	0.92	0.79	16:15	1.77	13:05	2.87	2.32	07:35	0.023	22:05	0.041	0.031	0.031	
3/26/2015	23:05	0.68	10:55	1.06	0.88	00:35	1.61	18:05	3.21	2.33	22:00	0.022	10:45	0.054	0.036	0.036	
3/27/2015	15:20	0.62	20:00	0.82	0.73	10:50	2.05	08:30	2.95	2.36	15:20	0.022	21:25	0.036	0.028	0.028	
3/28/2015	21:35	0.71	12:15	1.11	0.80	09:10	1.96	12:25	2.87	2.36	21:45	0.022	12:25	0.061	0.032	0.032	
3/29/2015	12:20	0.59	13:15	1.42	0.80	16:45	1.87	14:30	2.89	2.33	12:20	0.020	13:15	0.077	0.032	0.032	
3/30/2015	01:55	0.79	13:50	0.90	0.83	07:25	1.73	11:15	2.98	2.28	07:25	0.023	11:15	0.044	0.033	0.033	
3/31/2015	06:50	0.67	22:35	1.75	1.04	08:05	1.88	20:20	2.77	2.34	07:00	0.021	20:20	0.111	0.049	0.049	
4/1/2015	22:15	1.26	06:45	1.93	1.57	08:40	2.10	14:40	2.63	2.38	22:15	0.060	06:20	0.123	0.086	0.086	
4/2/2015	16:55	1.21	20:10	1.69	1.47	09:50	1.95	11:45	2.88	2.39	09:50	0.056	13:05	0.106	0.079	0.079	
4/3/2015	22:05	1.30	18:30	1.87	1.59	22:10	1.99	11:20	2.58	2.31	22:10	0.056	17:30	0.114	0.085	0.085	
4/4/2015	07:10	1.28	22:40	1.78	1.49	23:15	2.00	15:35	2.77	2.33	07:25	0.060	22:40	0.107	0.078	0.078	
4/5/2015	07:15	1.42	13:10	3.48	1.79	11:15	2.07	13:05	3.76	2.77	07:30	0.070	13:05	0.413	0.126	0.126	0.05
4/6/2015	20:20	0.81	09:40	2.55	1.48	23:40	1.75	11:00	3.69	2.78	23:40	0.028	09:35	0.218	0.101	0.101	0.02
4/7/2015	07:00	0.74	02:30	1.15	0.99	09:15	1.75	02:45	2.64	2.13	07:00	0.025	02:45	0.058	0.039	0.039	0.74
4/8/2015	12:50	0.75	00:00	1.01	0.87	05:40	1.45	08:40	2.69	2.05	05:40	0.020	08:40	0.045	0.031	0.031	
4/9/2015	14:15	0.34	01:05	0.93	0.77	06:50	1.54	14:35	3.01	2.12	14:15	0.009	13:05	0.042	0.027	0.027	
4/10/2015	08:05	-0.06	11:45	1.08	0.76	17:25	1.65	08:45	2.71	2.18	07:55	0.000	11:45	0.052	0.028	0.028	
4/11/2015	00:00	0.38	20:45	1.14	0.92	08:55	1.49	12:45	4.53	2.19	00:00	0.009	12:45	0.091	0.037	0.037	
4/12/2015	20:05	0.61	13:40	1.10	0.76	05:00	1.48	21:35	2.80	2.19	21:50	0.017	13:30	0.051	0.027	0.027	
4/13/2015	04:05	0.72	11:10	1.31	0.93	02:05	1.68	08:05	2.94	2.21	03:40	0.021	08:05	0.071	0.038	0.038	
4/14/2015	14:40	0.74	22:20	1.23	0.94	06:25	1.70	19:55	2.90	2.42	14:45	0.026	22:15	0.063	0.041	0.041	
4/15/2015	08:35	0.85	16:55	1.45	1.18	18:05	2.10	08:30	2.97	2.51	07:05	0.038	10:15	0.091	0.060	0.060	

Report Summary For The Period 1/23/2015 - 4/15/2015

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			2.665	4.11
Avg	0.79	2.27	0.032	

Site Commentary

Site Information

LS1-2N-WEST	
Pipe Dimensions	11.75"x11.88"
Silt Level	0.00"

Overview

Site LS1-2N-WEST functioned under normal conditions during the period Friday, January 23, 2015 to Wednesday, April 15, 2015 . Review of the scattergraph shows surcharge and backwater conditions were experienced multiple times at this location.
Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Friday, January 23, 2015 to Wednesday, April 15, 2015 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at approximately 218% full at its recorded 5-minute peak of 25.73 inches and approximately 18% full during the typical average depth of 2.03 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.03	0.52	0.031
Minimum	0.00	0.16	0.011
Maximum	25.73	1.68	0.826
Time of Minimum	4/10/2015 7:20 AM	3/20/2015 8:35 AM	4/10/2015 7:20 AM
Time of Maximum	3/20/2015 8:45 AM	3/20/2015 9:10 AM	3/20/2015 9:10 AM

Data Quality

Data uptime observed during the Friday, January 23, 2015 to the Wednesday, April 15, 2015 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: ClearLake.MCEng.TFM.CA15	**Project No.** 22002	**City:** Clearlake Oaks, CA	**FM Initials:** SW
Site Name: LS1-2N – West	**Investigate Date:** 1/21/15		
Address/Location:	Intersection of Island Drive and Hwy 20 (In front of WTP)		
Access: Drive	**Type of System:** Sanitary [X] Storm [ ] Combined [ ]		

Monitor Type	Peak Doppler
Monitor Model	ADS Triton+
Data Acquisition	Wireless
Manhole ID	MH LS1,2
Pipe Height:	11.75" (West Inlet)
Pipe Width:	11.88" (West Inlet)





Investigation Information:

Date/Time of Install:	1/21/15 @ 09:55
Site Hydraulics:	Smooth, low depth, slow velocity
Upstream Input: (L/S, P/S)	N/A
Upstream Manhole:	1 inlet / 1 outlet (Located on Hwy)
Downstream Manhole:	1 inlet / 1 outlet
Depth of Flow (DOF):	2.00" +/- 0.25"
Range (Air DOF):	9.75" +/- 0.25"
Peak Velocity:	0.50 fps
Silt:	0.00 Inches

Manhole Information:

Manhole Material / Condition	Precast / Good
Pipe Material / Condition:	PVC / Good

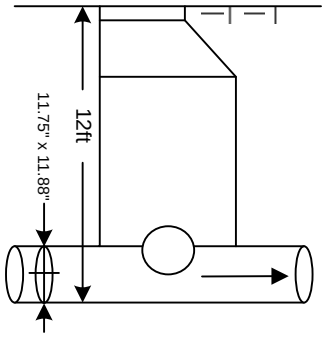
Land Use:	Residential	Commercial	Industrial	Trunk
	[X]	[ ]	[ ]	[ ]

Safety Notes

Located just off Hwy on Island Drive, standard traffic control. Low volume traffic

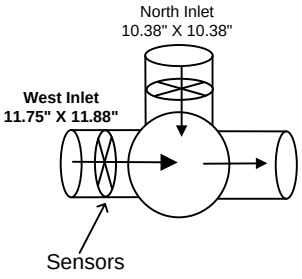
Other Information:





Cross Section



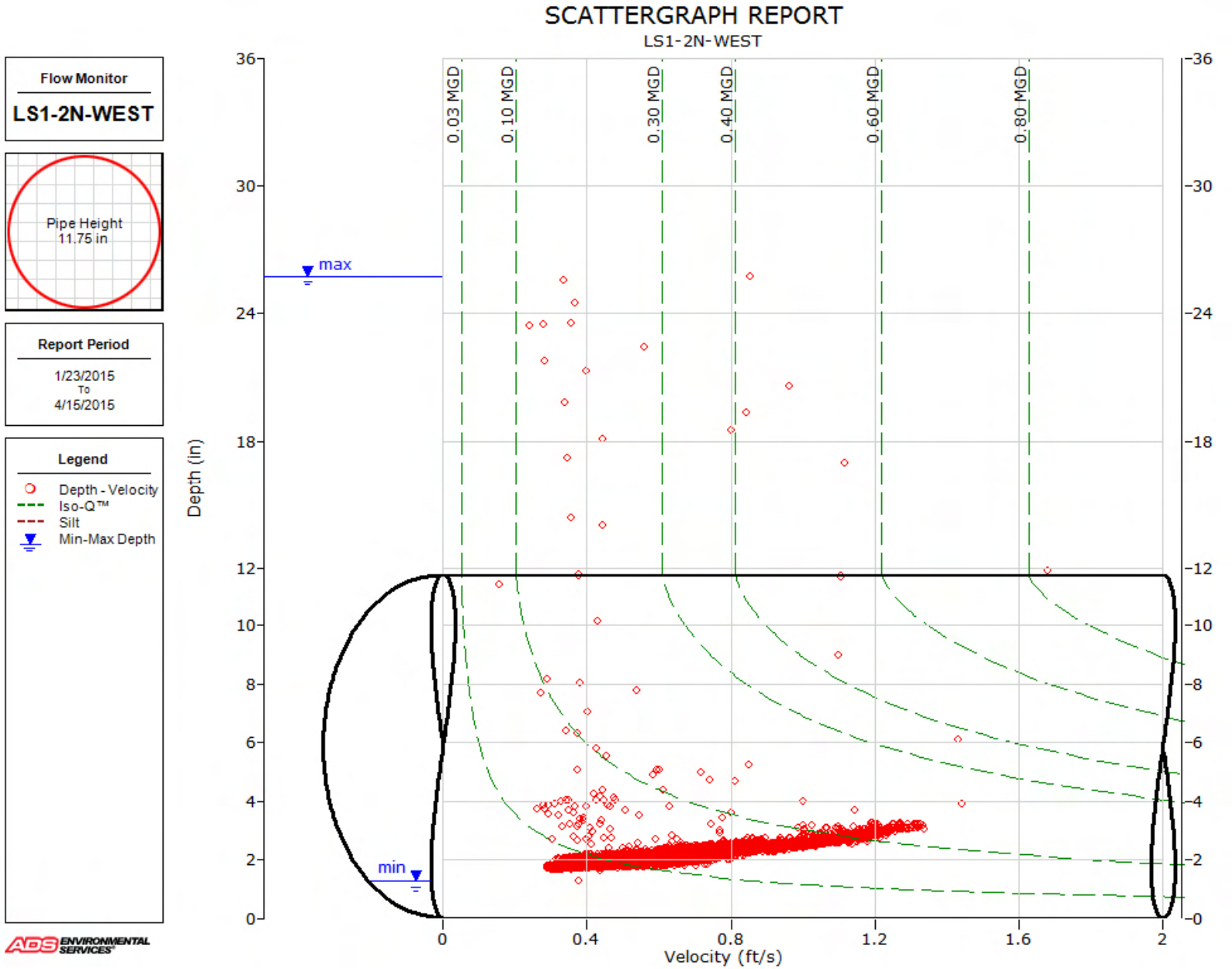


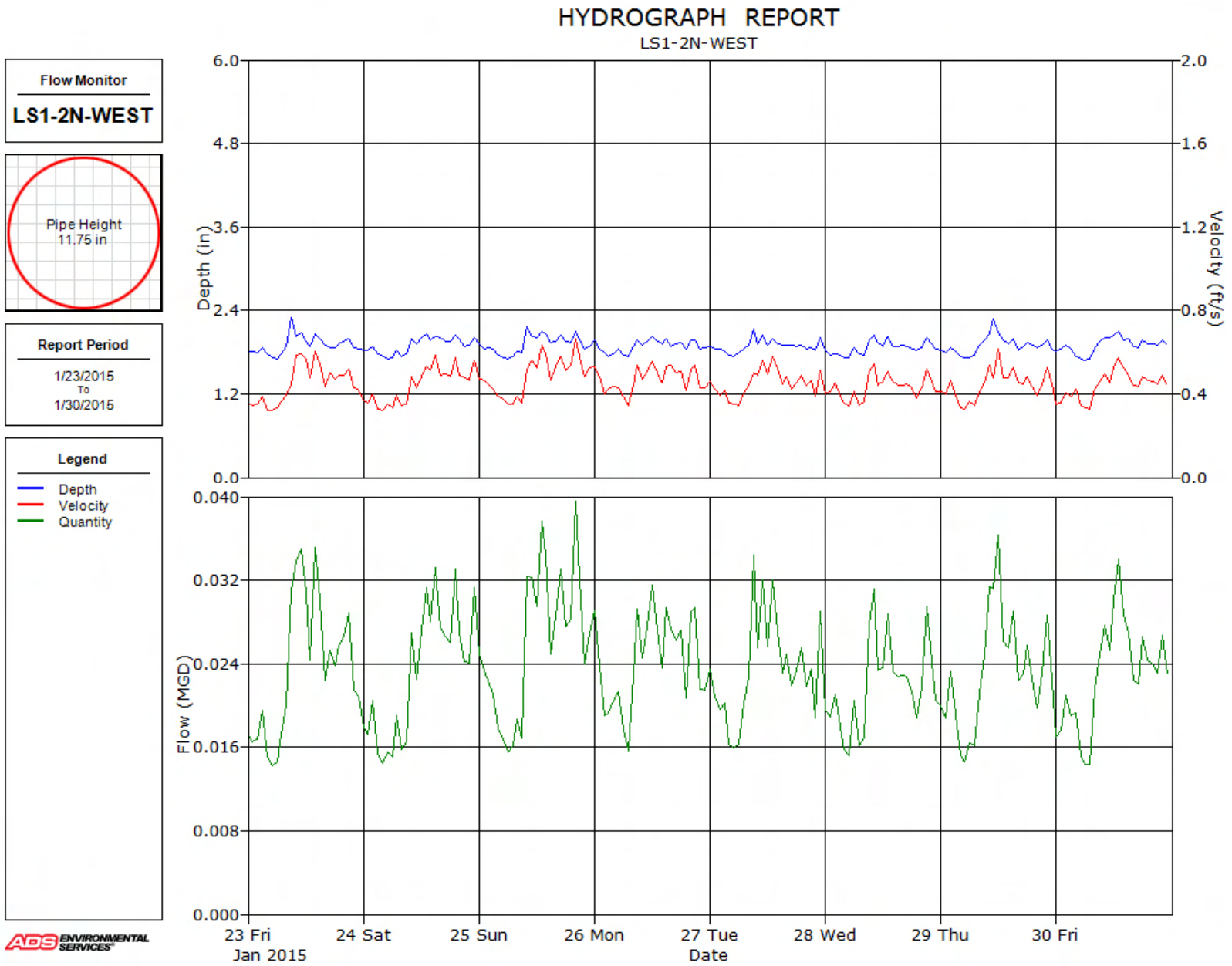
Plan

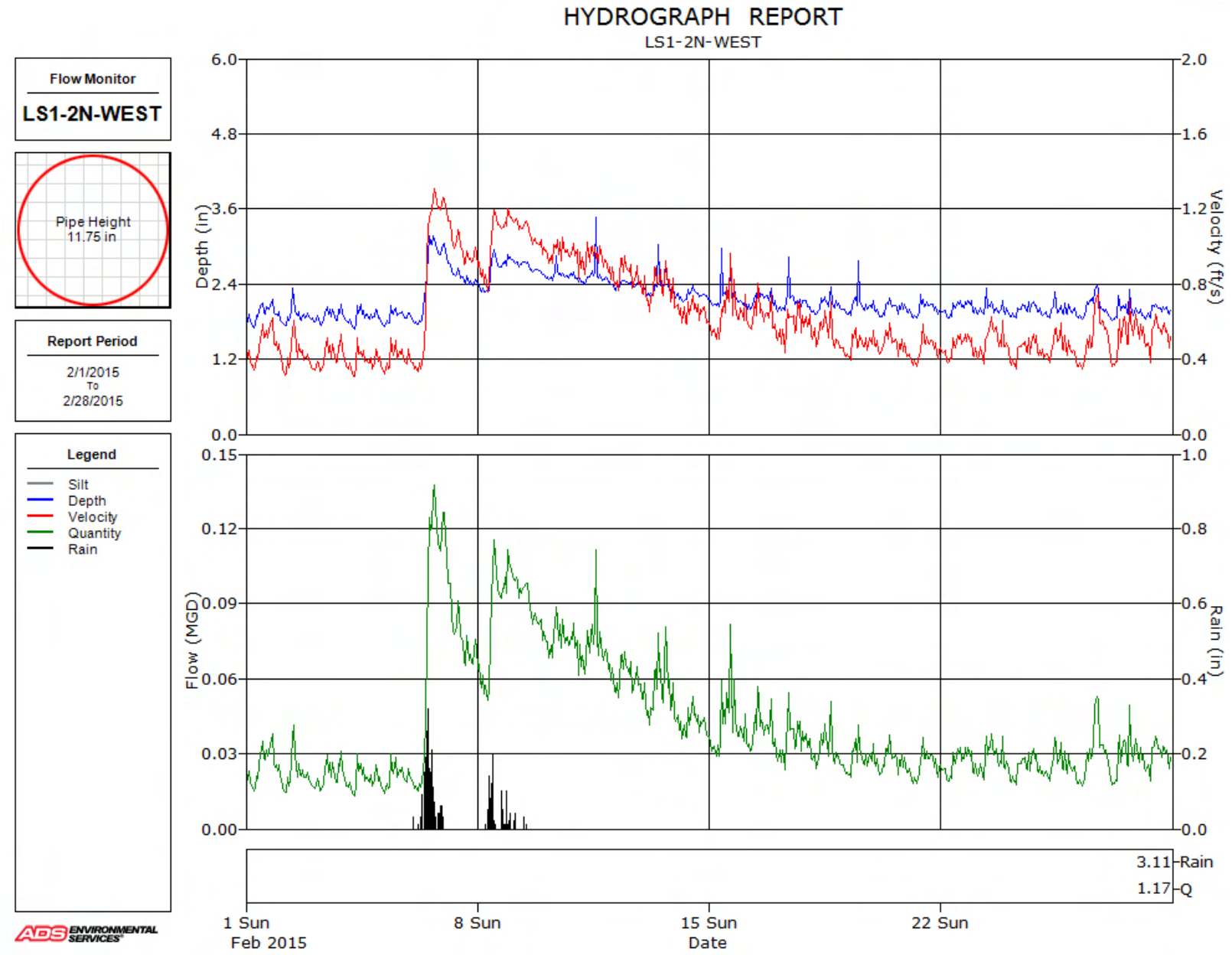
Installation Information	
Installation Type:	Ring
Sensors Devices:	Water Ultrasonic/ Pressure/ Velocity
Surcharge Height:	0
Rain Gauge Zone:	RG-WTP

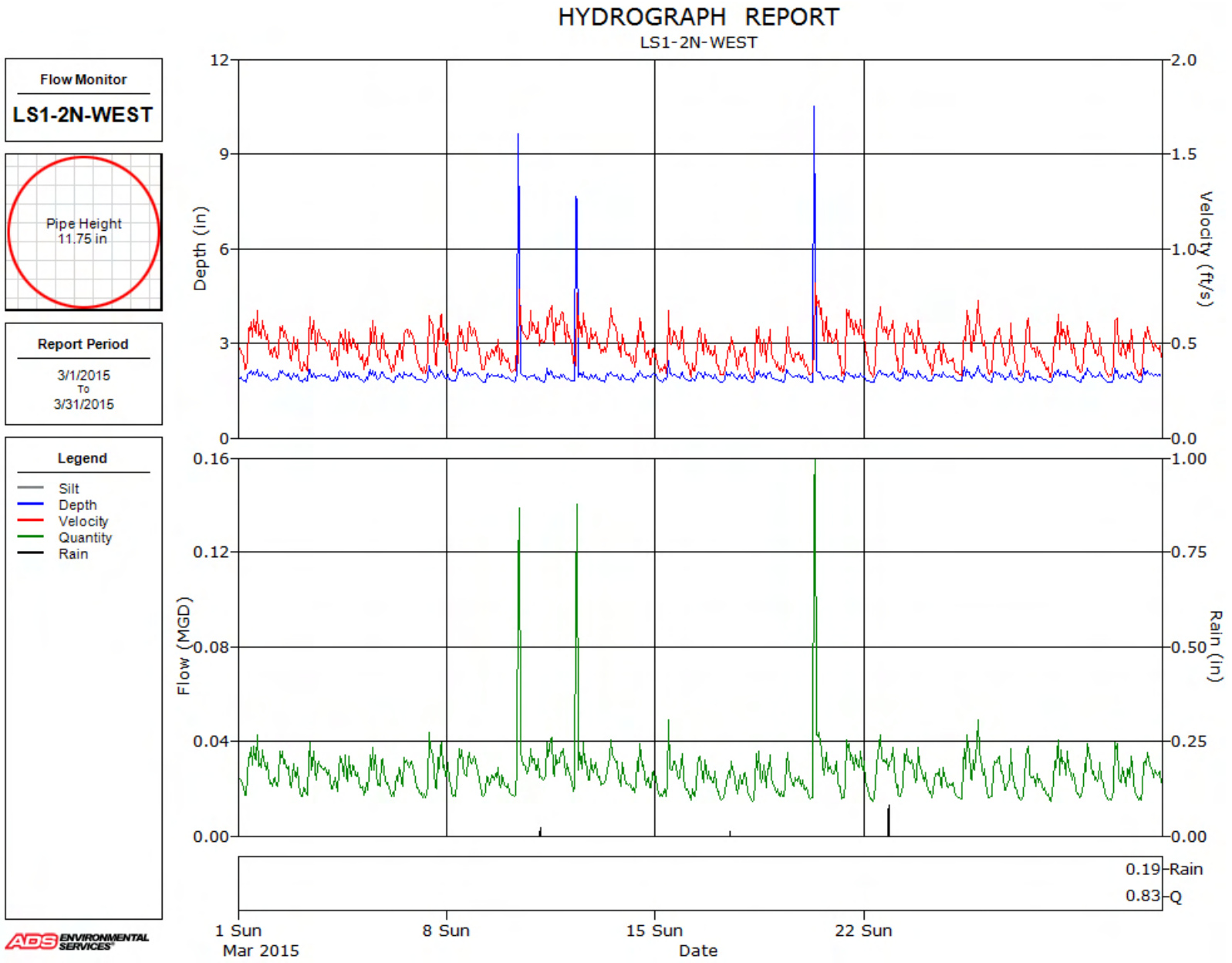
Backup	Yes	No	?	Distance
Trunk	[ ]	[X]	[ ]	
Lift / Pump Station	[ ]	[X]	[ ]	
WWTP	[ ]	[X]	[ ]	
Other	[ ]	[X]	[ ]	

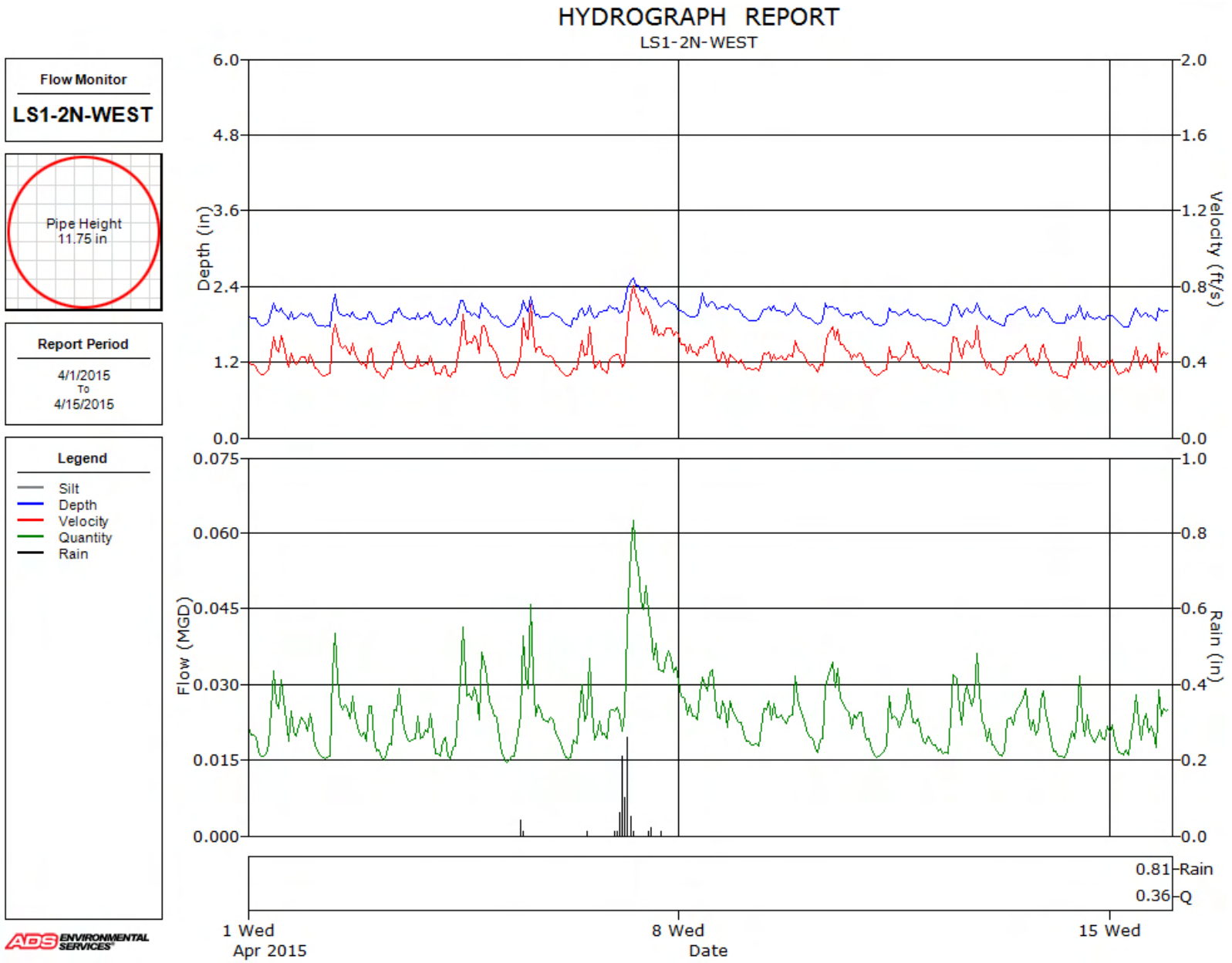
Additional Site Information / Comments:


SCATTERGRAPH REPORT
LS1-2N-WEST
Flow Monitor
LS1-2N-WEST
Pipe Height
11.75 in
Report Period
1/23/2015
To
4/15/2015
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.03 MGD
0.10 MGD
0.30 MGD
0.40 MGD
0.60 MGD
0.80 MGD
max
min
Depth (in)
Velocity (ft/s)
0
0.4
0.8
1.2
1.6
2
0
2
4
6
8
10
12
18
24
30
36
ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS1-2N-WEST
Flow Monitor
LS1-2N-WEST
Pipe Height
11.75 in
Report Period
1/23/2015
To
1/30/2015
Legend
Depth
Velocity
Quantity
Depth (in)
Velocity (ft/s)
Flow (MGD)
6.0
4.8
3.6
2.4
1.2
0.0
2.0
1.6
1.2
0.8
0.4
0.0
0.040
0.032
0.024
0.016
0.008
0.000
23 Fri
Jan 2015
24 Sat
25 Sun
26 Mon
27 Tue
28 Wed
29 Thu
30 Fri
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS1-2N-WEST
Flow Monitor
LS1-2N-WEST
Pipe Height
11.75 in
Report Period
2/1/2015
To
2/28/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
3.11 Rain
1.17 Q
1 Sun
Feb 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS1-2N-WEST
Flow Monitor
LS1-2N-WEST
Pipe Height
11.75 in
Report Period
3/1/2015
To
3/31/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.19 Rain
0.83 Q
1 Sun
Mar 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS1-2N-WEST
Flow Monitor
LS1-2N-WEST
Pipe Height
11.75 in
Report Period
4/1/2015
To
4/15/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.81 Rain
0.36 Q
1 Wed
Apr 2015
8 Wed
15 Wed
Date
ADS ENVIRONMENTAL SERVICES

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/23/2015	07:05	1.69	09:40	4.13	1.90	05:10	0.29	10:30	0.80	0.45	05:10	0.013	09:35	0.073	0.024	0.024	
1/24/2015	05:20	1.63	12:50	2.16	1.90	04:25	0.30	15:50	0.83	0.44	06:15	0.013	15:50	0.049	0.023	0.023	
1/25/2015	06:55	1.70	10:15	3.22	1.92	07:15	0.33	14:00	0.77	0.49	07:15	0.015	10:15	0.048	0.026	0.026	
1/26/2015	03:45	1.71	20:45	2.16	1.89	06:40	0.31	16:45	0.73	0.47	06:40	0.014	20:45	0.039	0.024	0.024	
1/27/2015	05:30	1.72	09:30	4.73	1.89	02:05	0.30	09:30	0.74	0.45	05:10	0.014	09:30	0.138	0.024	0.024	
1/28/2015	04:50	1.70	10:00	2.14	1.86	05:35	0.31	10:05	0.64	0.43	05:35	0.014	10:05	0.039	0.022	0.022	
1/29/2015	06:35	1.71	11:20	4.02	1.90	05:00	0.31	12:50	0.68	0.44	05:00	0.014	11:20	0.052	0.023	0.023	
1/30/2015	06:15	1.67	13:15	2.13	1.90	06:05	0.32	12:05	0.64	0.44	06:05	0.014	12:05	0.039	0.023	0.023	
1/31/2015	05:20	1.74	08:30	3.14	1.89	07:35	0.31	11:30	0.71	0.45	07:35	0.014	11:30	0.043	0.023	0.023	
2/1/2015	06:40	1.66	10:50	2.24	1.92	06:35	0.31	12:20	0.77	0.47	06:35	0.013	12:20	0.046	0.025	0.025	
2/2/2015	05:15	1.73	10:55	4.39	1.90	05:40	0.30	11:00	1.00	0.43	05:40	0.013	11:00	0.147	0.022	0.022	
2/3/2015	07:35	1.70	10:55	2.16	1.90	08:25	0.30	21:15	0.58	0.42	08:25	0.013	11:00	0.036	0.022	0.022	
2/4/2015	07:50	1.66	11:00	3.34	1.87	06:20	0.29	09:25	0.55	0.39	06:20	0.013	11:00	0.051	0.020	0.020	
2/5/2015	05:25	1.71	09:30	2.18	1.88	05:20	0.31	09:25	0.58	0.41	05:20	0.014	09:25	0.036	0.021	0.021	
2/6/2015	04:55	1.75	09:55	3.57	2.47	09:55	0.29	23:25	1.34	0.83	05:00	0.014	17:15	0.144	0.073	0.073	2.04
2/7/2015	21:30	2.35	00:45	3.09	2.57	14:55	0.75	00:35	1.30	1.02	14:55	0.055	00:40	0.132	0.083	0.083	
2/8/2015	06:10	2.25	10:15	3.80	2.59	06:10	0.61	22:00	1.23	1.02	06:10	0.040	12:20	0.119	0.084	0.084	0.93
2/9/2015	23:55	2.53	00:10	2.86	2.69	21:10	0.84	04:00	1.19	1.08	23:25	0.066	00:05	0.109	0.092	0.092	0.14
2/10/2015	06:40	2.45	09:40	5.05	2.55	09:40	0.59	14:30	1.13	0.98	19:40	0.052	09:40	0.120	0.077	0.077	
2/11/2015	06:25	2.39	14:45	8.97	2.53	14:40	0.34	08:35	1.18	0.93	01:00	0.047	14:45	0.443	0.073	0.073	
2/12/2015	04:35	2.29	10:00	2.56	2.39	23:00	0.59	11:10	1.14	0.85	23:00	0.040	11:10	0.088	0.061	0.061	
2/13/2015	07:45	2.20	11:55	7.78	2.37	11:55	0.54	16:35	1.11	0.78	05:05	0.036	11:55	0.186	0.056	0.056	
2/14/2015	05:20	2.08	12:20	2.42	2.22	22:25	0.47	12:05	0.92	0.65	22:25	0.030	12:05	0.064	0.042	0.042	
2/15/2015	07:55	2.03	09:45	7.68	2.23	09:45	0.27	15:35	1.15	0.65	03:10	0.026	09:40	0.142	0.043	0.043	
2/16/2015	07:05	1.96	11:15	2.42	2.15	04:10	0.42	11:10	0.89	0.64	04:10	0.023	11:20	0.065	0.040	0.040	
2/17/2015	05:05	1.95	10:20	7.04	2.12	05:00	0.40	12:25	0.82	0.58	05:00	0.021	10:20	0.124	0.036	0.036	
2/18/2015	06:30	1.90	16:20	2.57	2.06	23:55	0.37	16:15	0.89	0.55	23:55	0.020	16:15	0.071	0.032	0.032	
2/19/2015	05:35	1.88	12:35	6.30	2.06	05:15	0.37	10:15	0.62	0.48	05:15	0.019	12:30	0.103	0.028	0.028	
2/20/2015	05:30	1.85	11:45	2.26	2.01	05:20	0.34	11:35	0.69	0.49	05:20	0.017	11:35	0.045	0.027	0.027	
2/21/2015	04:55	1.84	09:45	3.88	2.00	09:45	0.31	11:35	0.61	0.45	07:05	0.017	09:45	0.044	0.025	0.025	
2/22/2015	04:30	1.85	18:40	2.23	2.01	05:55	0.34	13:50	0.61	0.47	05:55	0.017	18:40	0.039	0.027	0.027	
2/23/2015	23:50	1.90	09:45	4.87	2.01	03:20	0.36	14:00	0.75	0.49	03:20	0.019	09:45	0.112	0.028	0.028	
2/24/2015	08:00	1.82	19:25	2.16	1.99	07:55	0.32	20:30	0.60	0.45	07:55	0.016	19:35	0.035	0.025	0.025	
2/25/2015	08:10	1.83	11:15	3.68	1.98	08:05	0.35	15:10	0.68	0.47	08:05	0.017	11:15	0.046	0.026	0.026	
2/26/2015	07:35	1.83	14:00	3.80	2.03	05:15	0.33	16:50	0.90	0.50	07:45	0.017	16:50	0.078	0.029	0.029	
2/27/2015	04:20	1.80	09:35	3.80	1.97	04:25	0.34	17:25	0.92	0.52	04:25	0.016	17:25	0.072	0.029	0.029	
2/28/2015	05:40	1.84	09:45	2.14	1.97	08:30	0.36	18:35	0.74	0.54	08:30	0.018	12:50	0.043	0.029	0.029	
3/1/2015	07:55	1.78	08:50	3.22	1.97	06:30	0.32	16:20	0.81	0.52	06:30	0.015	08:50	0.082	0.029	0.029	
3/2/2015	03:35	1.81	12:35	2.19	1.95	19:15	0.36	12:55	0.72	0.49	19:15	0.018	12:55	0.044	0.027	0.027	
3/3/2015	04:35	1.78	09:25	3.38	1.94	04:35	0.33	10:45	0.72	0.49	04:35	0.016	10:25	0.046	0.026	0.026	
3/4/2015	08:00	1.77	17:25	2.15	1.95	08:30	0.35	14:10	0.62	0.49	08:30	0.017	14:10	0.038	0.026	0.026	
3/5/2015	06:25	1.77	10:10	2.67	1.95	05:15	0.33	20:30	0.71	0.47	06:15	0.015	20:30	0.044	0.026	0.026	
3/6/2015	07:00	1.77	14:50	2.21	1.93	04:40	0.33	14:40	0.70	0.47	04:40	0.016	14:40	0.044	0.025	0.025	
3/7/2015	06:40	1.78	10:30	3.69	1.95	02:45	0.32	10:25	0.83	0.48	07:50	0.015	10:30	0.067	0.026	0.026	
3/8/2015	08:10	1.79	12:40	2.26	1.98	07:35	0.33	21:40	0.70	0.50	07:35	0.016	17:50	0.044	0.028	0.028	
3/9/2015	08:00	1.73	09:25	2.73	1.93	05:20	0.33	15:05	0.58	0.44	05:20	0.015	09:25	0.039	0.023	0.023	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/10/2015	08:00	1.77	11:00	23.52	2.43	11:00	0.28	11:15	1.15	0.50	08:00	0.015	11:10	0.544	0.034	0.034	
3/11/2015	06:35	1.77	09:40	3.90	1.93	09:40	0.31	13:10	0.80	0.59	06:40	0.016	13:10	0.047	0.031	0.031	0.03
3/12/2015	06:20	1.79	09:05	25.59	2.38	08:25	0.26	09:15	1.43	0.54	06:20	0.016	09:10	0.550	0.036	0.036	
3/13/2015	07:50	1.77	09:05	2.69	1.93	09:05	0.30	12:35	0.77	0.52	07:35	0.017	12:35	0.047	0.028	0.028	
3/14/2015	06:10	1.76	12:40	2.30	1.92	07:05	0.36	12:40	0.71	0.46	07:05	0.017	12:40	0.048	0.025	0.025	
3/15/2015	06:25	1.78	11:00	3.44	1.95	04:55	0.32	11:05	0.78	0.46	06:40	0.015	11:05	0.092	0.025	0.025	
3/16/2015	05:45	1.79	10:50	2.22	1.93	05:05	0.31	12:30	0.65	0.44	05:10	0.015	12:35	0.040	0.024	0.024	
3/17/2015	05:40	1.75	09:50	3.50	1.92	09:50	0.32	13:40	0.59	0.42	05:25	0.015	09:50	0.039	0.022	0.022	0.01
3/18/2015	06:50	1.75	09:00	2.21	1.94	06:10	0.30	09:00	0.70	0.44	06:10	0.014	09:00	0.045	0.024	0.024	
3/19/2015	08:20	1.76	10:30	3.51	1.92	07:50	0.33	11:55	0.64	0.42	07:50	0.015	10:30	0.067	0.022	0.022	
3/20/2015	08:20	1.76	08:45	25.73	2.47	08:35	0.16	09:10	1.68	0.53	05:20	0.015	09:10	0.826	0.038	0.038	
3/21/2015	06:45	1.78	09:55	3.84	1.94	06:55	0.32	10:35	0.77	0.53	06:55	0.015	09:55	0.064	0.029	0.029	
3/22/2015	07:00	1.75	12:55	2.26	1.94	07:55	0.29	13:00	0.75	0.51	07:55	0.014	13:00	0.050	0.028	0.028	0.15
3/23/2015	07:05	1.79	09:00	4.22	1.96	06:10	0.33	20:05	0.71	0.49	06:10	0.016	09:00	0.066	0.027	0.027	
3/24/2015	06:15	1.79	16:40	2.11	1.93	08:10	0.32	13:05	0.62	0.43	08:10	0.016	13:05	0.037	0.023	0.023	
3/25/2015	06:20	1.78	09:45	4.37	1.99	07:10	0.32	20:00	0.82	0.50	07:10	0.015	09:45	0.102	0.028	0.028	
3/26/2015	07:05	1.77	08:45	2.24	1.94	05:05	0.32	10:55	0.77	0.46	04:25	0.015	10:55	0.045	0.025	0.025	
3/27/2015	06:50	1.76	10:10	2.94	1.91	06:20	0.31	12:35	0.75	0.45	06:20	0.014	10:15	0.050	0.024	0.024	
3/28/2015	07:20	1.76	13:00	2.27	1.95	05:10	0.30	13:05	0.74	0.47	05:10	0.014	13:05	0.049	0.026	0.026	
3/29/2015	07:35	1.76	08:45	3.21	1.95	08:40	0.33	14:20	0.68	0.46	06:35	0.015	12:45	0.044	0.025	0.025	
3/30/2015	08:45	1.75	10:25	2.33	1.93	05:30	0.31	11:00	0.75	0.45	05:30	0.014	10:55	0.047	0.024	0.024	
3/31/2015	07:20	1.75	09:40	3.59	1.95	07:10	0.31	10:05	0.65	0.46	07:10	0.014	09:40	0.046	0.025	0.025	
4/1/2015	06:05	1.78	10:35	2.20	1.92	06:05	0.32	13:50	0.62	0.41	06:05	0.015	10:35	0.038	0.022	0.022	
4/2/2015	06:15	1.75	10:50	3.01	1.91	02:55	0.31	10:50	0.77	0.43	02:55	0.015	10:50	0.077	0.023	0.023	
4/3/2015	06:25	1.77	11:20	2.08	1.90	05:25	0.29	11:55	0.55	0.39	05:25	0.014	11:55	0.031	0.020	0.020	
4/4/2015	07:15	1.78	11:30	4.01	1.94	07:15	0.31	12:30	0.70	0.45	07:15	0.015	11:30	0.067	0.025	0.025	
4/5/2015	06:10	1.75	11:05	2.30	1.93	05:45	0.30	14:55	0.75	0.44	05:45	0.014	14:50	0.050	0.024	0.024	0.05
4/6/2015	06:45	1.76	13:05	2.19	1.95	05:20	0.31	13:10	0.65	0.40	05:20	0.015	13:10	0.041	0.022	0.022	0.02
4/7/2015	02:10	1.93	06:05	2.57	2.22	02:15	0.37	05:45	0.83	0.59	02:15	0.019	06:00	0.065	0.039	0.039	0.74
4/8/2015	04:55	1.90	09:45	3.98	2.05	09:45	0.33	00:50	0.65	0.46	15:55	0.019	09:45	0.048	0.026	0.026	
4/9/2015	06:20	1.84	21:15	2.17	1.98	03:25	0.30	22:45	0.56	0.42	03:25	0.015	21:35	0.034	0.023	0.023	
4/10/2015	07:20	1.27	09:50	2.80	1.95	07:00	0.33	07:15	0.74	0.45	07:20	0.011	09:55	0.052	0.025	0.025	
4/11/2015	07:20	1.78	10:45	2.09	1.91	05:20	0.31	17:20	0.57	0.40	05:20	0.015	17:20	0.033	0.021	0.021	
4/12/2015	07:35	1.77	10:15	2.41	1.94	07:00	0.32	20:25	0.67	0.43	07:00	0.015	20:40	0.041	0.023	0.023	
4/13/2015	07:00	1.78	15:35	2.11	1.94	05:45	0.33	22:35	0.63	0.41	06:30	0.015	22:35	0.037	0.022	0.022	
4/14/2015	07:50	1.77	07:55	3.70	1.91	07:55	0.28	12:20	0.55	0.38	08:25	0.014	07:55	0.037	0.020	0.020	
4/15/2015	07:10	1.75	19:35	2.12	1.92	03:30	0.32	19:40	0.54	0.40	06:55	0.015	19:40	0.032	0.021	0.021	

Report Summary For The Period 1/23/2015 - 4/15/2015

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			2.567	4.11
Avg	2.03	0.52	0.031	

Site Commentary

Site Information

LS2E	
Pipe Dimensions	8"x8"
Silt Level	0.00"

Overview

Site LS2E functioned under normal conditions during the period Friday, January 23, 2015 to Wednesday, April 15, 2015 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Friday, January 23, 2015 to Wednesday, April 15, 2015 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at approximately 38% full at its recorded 5-minute peak of 3.08 inches and approximately 12% full during the typical average depth of 1.01 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.01	0.53	0.009
Minimum	0.59	0.09	0.001
Maximum	3.08	2.12	0.123
Time of Minimum	2/3/2015 1:30 AM	4/15/2015 3:20 AM	3/3/2015 5:30 AM
Time of Maximum	2/10/2015 8:55 AM	4/12/2015 12:30 PM	2/10/2015 8:55 AM

Data Quality

Data uptime observed during the Friday, January 23, 2015 to the Wednesday, April 15, 2015 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

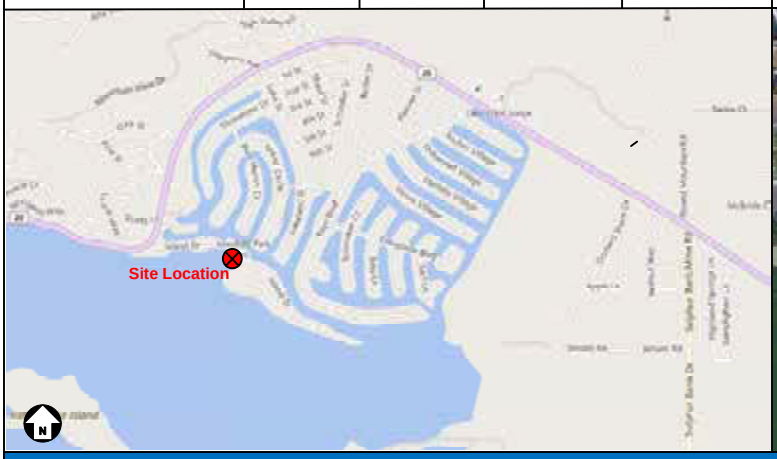
ADS Site Report

Quality Form

Project Name: ClearLake.MCEng.TFM.CA15	**Project No.** 22002	**City:** Clearlake Oaks, CA	**FM Initials:** SW
Site Name: LS2E	**Investigate Date:** 1/21/15		
Address/Location: 12840 Island Dr (Island RV Park)			

Access:	**Type of System:**	Sanitary	Storm	Combined
Drive		X		

Monitor Type	Peak Doppler
Monitor Model	ADS Triton+
Data Acquisition	Wireless
Manhole ID	MH LS2E
Pipe Height:	8.00"
Pipe Width:	8.00"





Investigation Information:

Date/Time of Install:	1/21/15 @ 10:30
Site Hydraulics:	Low depth, smooth, slow velocity
Upstream Input: (L/S, P/S)	N/A
Upstream Manhole:	2 inlets / 1 outlet
Downstream Manhole:	1 inlet / 1 outlet (90 degree bend)
Depth of Flow (DOF):	1.13" +/- 0.25"
Range (Air DOF):	6.88" +/- 0.25"
Peak Velocity:	1.00 fps
Silt:	0.00 Inches

Manhole Information:

Manhole Material / Condition	Precast / Good
Pipe Material / Condition:	VCP / Good

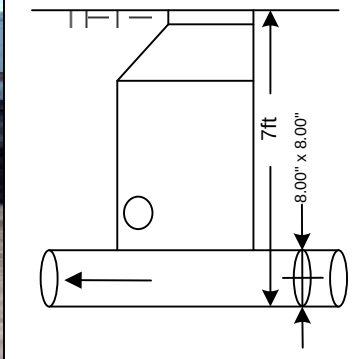
Land Use:	Residential	Commercial	Industrial	Trunk
	X			

Safety Notes

Standard Traffic Control

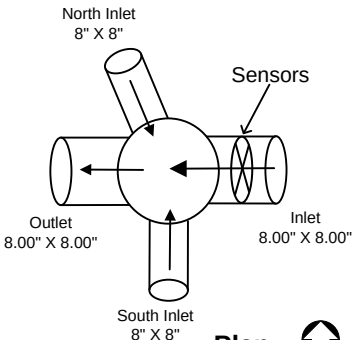
Other Information:





Cross Section



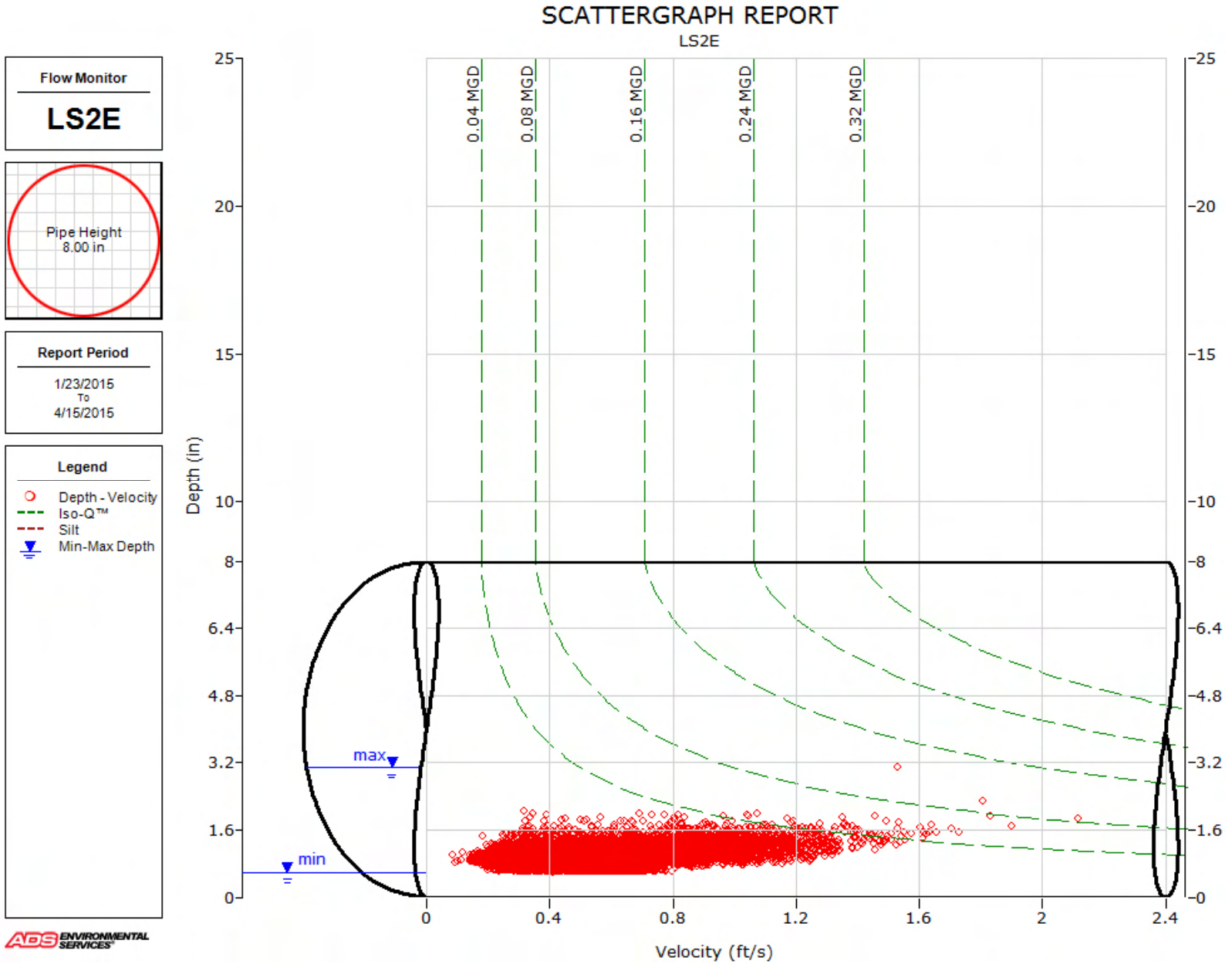


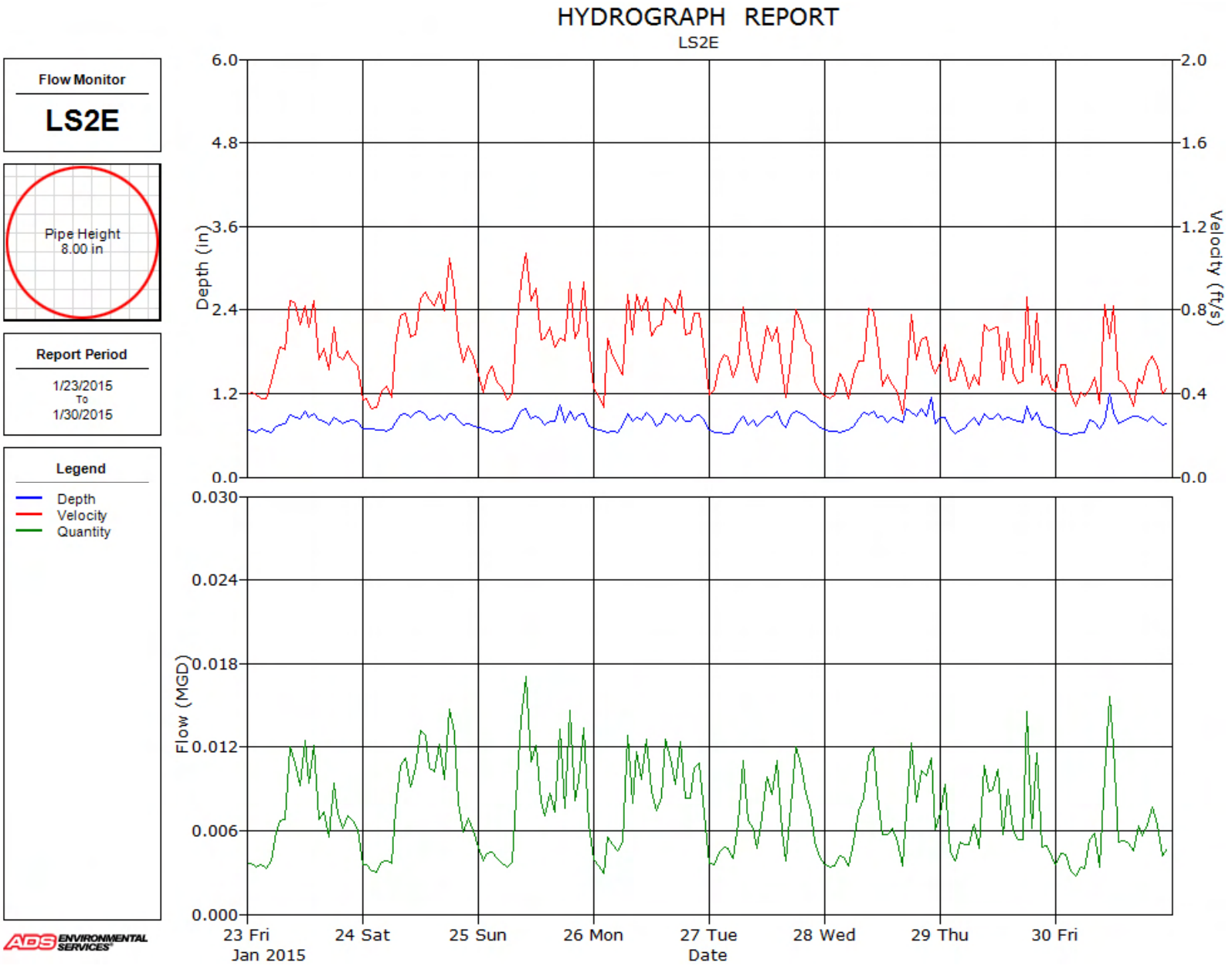
Plan

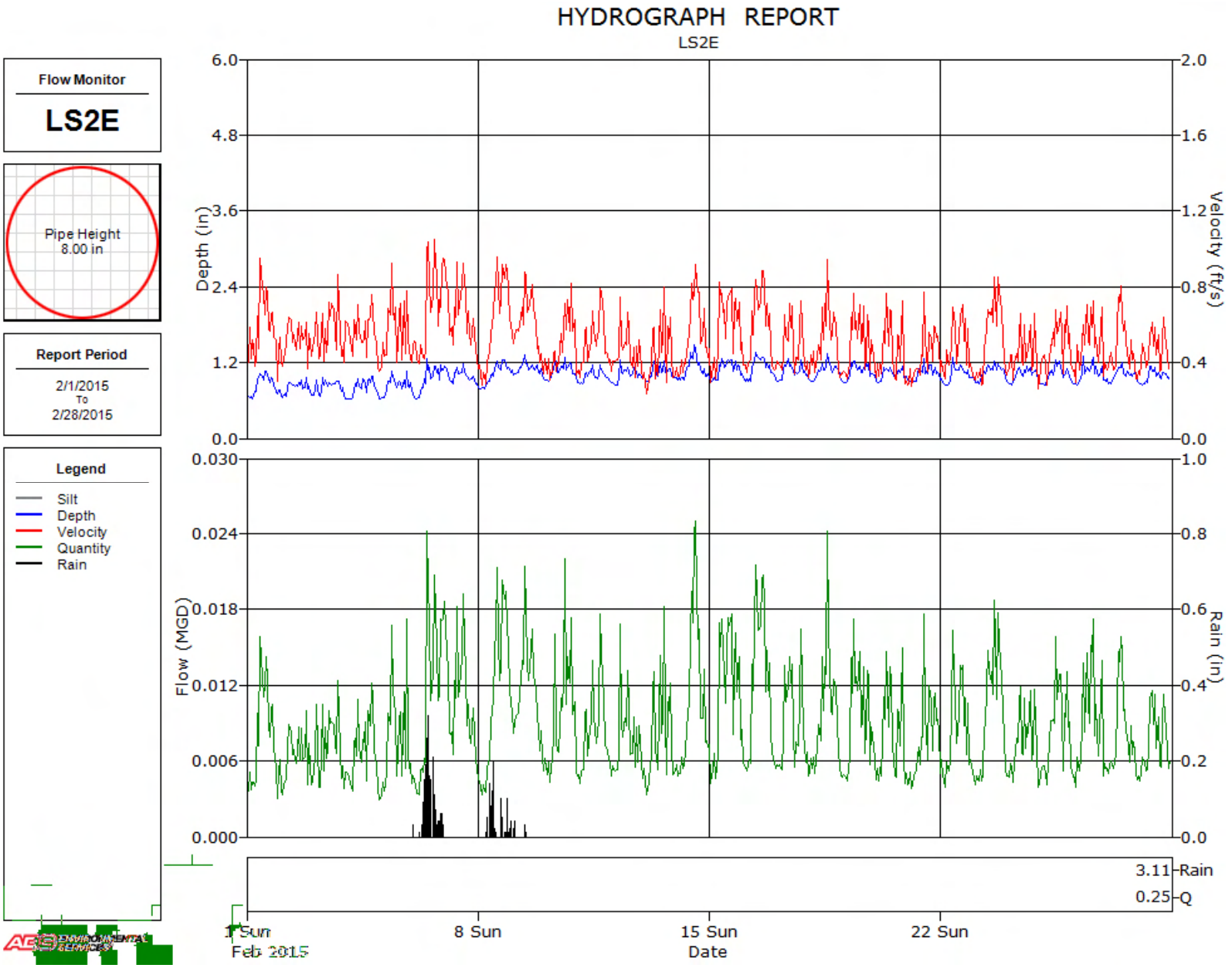
Installation Information	
Installation Type:	Ring
Sensors Devices:	Water Ultrasonic/ Pressure/ Velocity
Surcharge Height:	0
Rain Gauge Zone:	RG-WTP

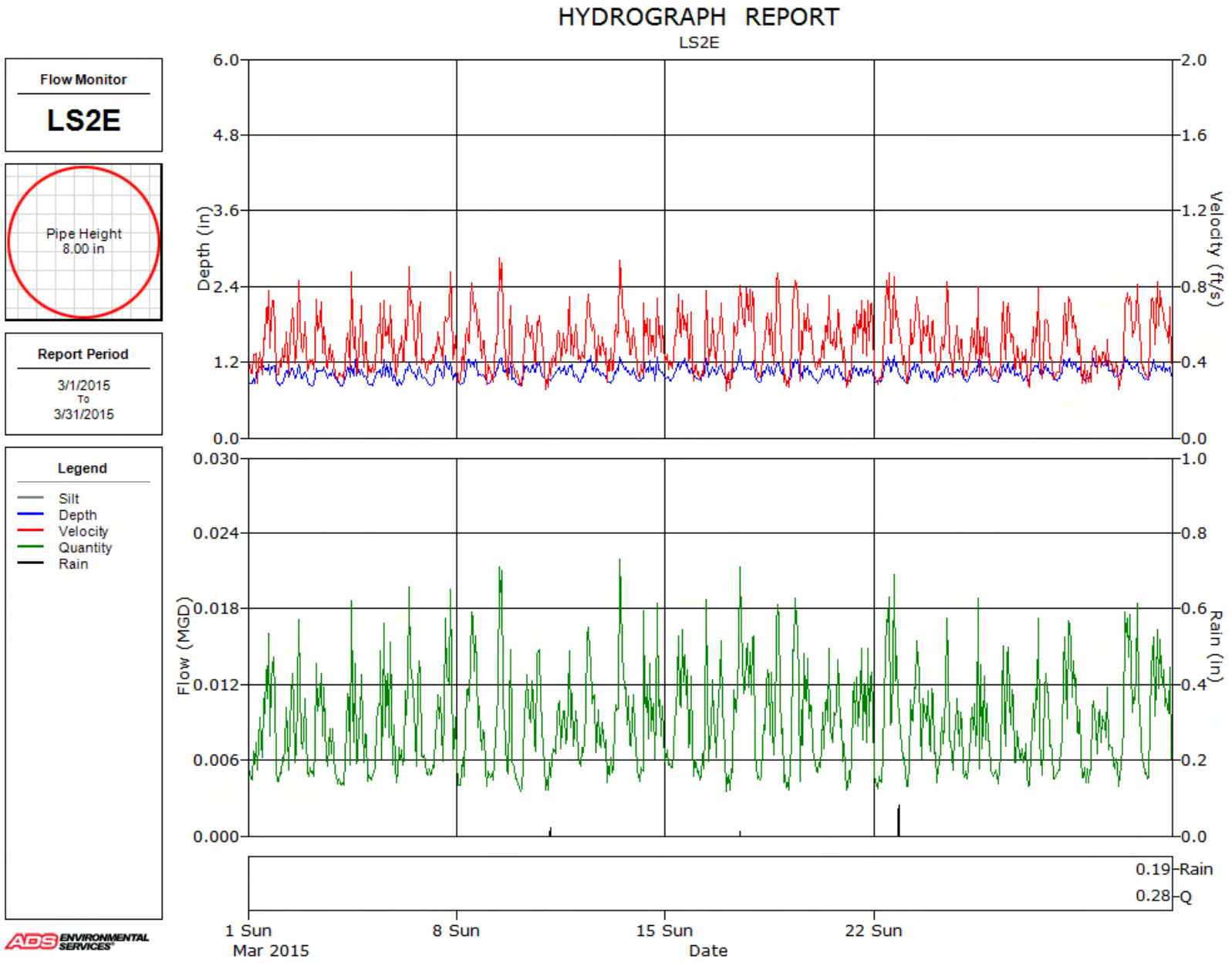
Backup	Yes	No	?	Distance
Trunk		X		
Lift / Pump Station		X		
WWTP		X		
Other		X		

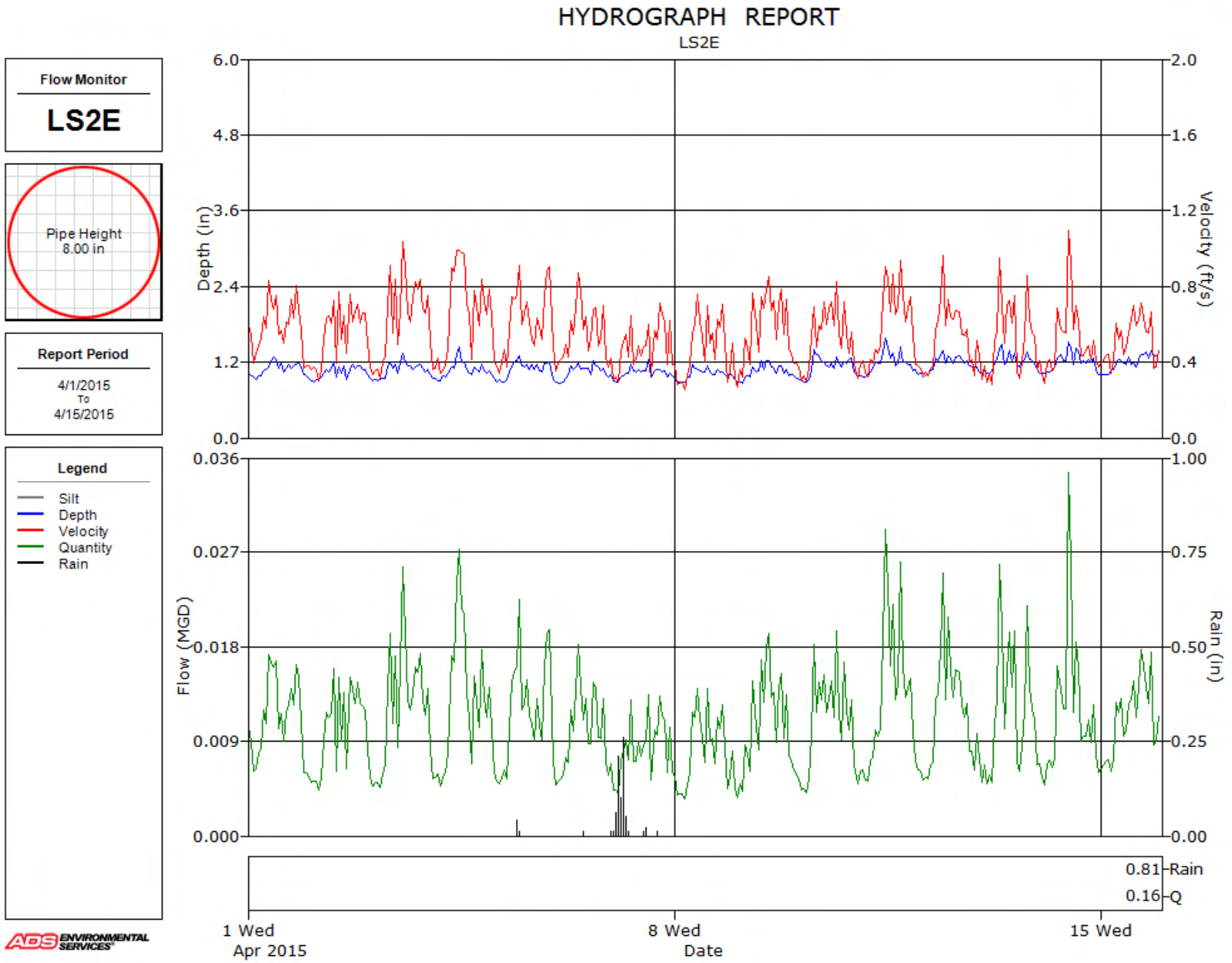
Additional Site Information / Comments:


SCATTERGRAPH REPORT
LS2E
Flow Monitor
LS2E
Pipe Height
8.00 in
Report Period
1/23/2015
To
4/15/2015
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.04 MGD
0.08 MGD
0.16 MGD
0.24 MGD
0.32 MGD
max
min
Depth (in)
Velocity (ft/s)
0
0.4
0.8
1.2
1.6
2
2.4
1.6
3.2
4.8
6.4
8
10
15
20
25
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS2E
Flow Monitor
LS2E
Pipe Height
8.00 in
Report Period
1/23/2015
To
1/30/2015
Legend
Depth
Velocity
Quantity
Depth (in)
Velocity (ft/s)
Flow (MGD)
6.0
4.8
3.6
2.4
1.2
0.0
2.0
1.6
1.2
0.8
0.4
0.0
0.030
0.024
0.018
0.012
0.006
0.000
23 Fri
Jan 2015
24 Sat
25 Sun
26 Mon
27 Tue
28 Wed
29 Thu
30 Fri
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS2E
Flow Monitor
LS2E
Pipe Height
8.00 in
Report Period
2/1/2015
To
2/28/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
3.11 Rain
0.25 Q
1 Sun
Feb 2015
8 Sun
15 Sun
22 Sun
Date


HYDROGRAPH REPORT
LS2E
Flow Monitor
LS2E
Pipe Height
8.00 in
Report Period
3/1/2015
To
3/31/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.19 Rain
0.28 Q
1 Sun
Mar 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS2E
Flow Monitor
LS2E
Pipe Height
8.00 in
Report Period
4/1/2015
To
4/15/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.81 Rain
0.16 Q
1 Wed
Apr 2015
8 Wed
15 Wed
Date
ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 1/23/2015 - 4/15/2015

LS2E, Pipe Height: 8 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/23/2015	05:30	0.63	12:45	1.01	0.78	04:30	0.24	12:35	1.22	0.59	04:30	0.002	12:35	0.019	0.007	0.007	
1/24/2015	05:05	0.65	11:50	1.21	0.80	04:35	0.24	13:30	1.31	0.65	04:35	0.002	12:05	0.025	0.008	0.008	
1/25/2015	03:00	0.62	17:05	1.61	0.80	06:05	0.25	09:20	1.32	0.66	06:05	0.002	17:10	0.034	0.008	0.008	
1/26/2015	04:00	0.62	11:55	1.14	0.79	12:00	0.20	15:40	1.34	0.69	02:30	0.002	15:40	0.025	0.008	0.008	
1/27/2015	03:55	0.60	14:45	1.03	0.78	15:50	0.26	14:45	1.21	0.57	05:20	0.002	14:45	0.021	0.007	0.007	
1/28/2015	23:55	0.61	22:20	1.60	0.83	17:00	0.18	18:05	1.34	0.52	17:00	0.002	22:40	0.031	0.007	0.007	
1/29/2015	00:05	0.59	01:40	1.17	0.80	17:40	0.26	01:40	1.38	0.56	02:30	0.003	01:40	0.028	0.007	0.007	
1/30/2015	03:05	0.60	11:45	1.81	0.77	00:50	0.22	10:40	1.25	0.48	00:50	0.002	11:25	0.035	0.006	0.006	
1/31/2015	04:50	0.61	16:30	1.65	0.83	16:05	0.21	16:30	1.60	0.53	01:55	0.002	16:30	0.054	0.007	0.007	
2/1/2015	04:50	0.62	13:50	1.49	0.84	22:20	0.20	10:05	1.19	0.57	22:35	0.002	13:55	0.028	0.008	0.008	
2/2/2015	03:05	0.63	19:05	1.13	0.80	02:00	0.23	19:05	1.33	0.51	02:50	0.002	19:05	0.026	0.006	0.006	
2/3/2015	01:30	0.59	03:50	1.58	0.82	23:40	0.26	18:20	1.25	0.56	00:50	0.002	03:50	0.031	0.007	0.007	
2/4/2015	03:45	0.60	20:15	1.38	0.80	23:40	0.21	16:35	1.34	0.57	03:05	0.002	20:15	0.029	0.007	0.007	
2/5/2015	01:50	0.62	20:25	1.99	0.83	17:30	0.19	20:35	1.50	0.55	01:35	0.002	20:35	0.042	0.008	0.008	
2/6/2015	04:40	0.60	21:05	1.80	0.92	21:30	0.20	12:25	1.55	0.67	05:40	0.002	21:05	0.057	0.011	0.011	2.04
2/7/2015	23:00	0.81	13:40	1.39	1.00	21:50	0.27	09:55	1.30	0.67	21:50	0.004	09:55	0.027	0.011	0.011	
2/8/2015	05:25	0.76	18:55	1.71	1.01	03:45	0.19	14:05	1.26	0.61	05:10	0.002	14:05	0.033	0.011	0.011	0.93
2/9/2015	23:55	0.95	09:55	1.98	1.10	22:20	0.25	10:10	1.09	0.61	22:20	0.005	09:55	0.047	0.012	0.012	0.14
2/10/2015	14:25	0.87	08:55	3.08	1.07	00:50	0.16	15:20	1.81	0.49	04:35	0.002	08:55	0.123	0.010	0.010	
2/11/2015	04:35	0.85	17:55	1.54	0.98	02:05	0.17	17:55	1.21	0.50	02:05	0.002	17:55	0.037	0.008	0.008	
2/12/2015	04:15	0.83	07:05	1.40	1.01	18:35	0.15	07:00	1.16	0.46	03:35	0.002	07:00	0.029	0.008	0.008	
2/13/2015	03:40	0.89	08:40	1.61	1.04	02:30	0.18	15:05	1.16	0.44	02:30	0.003	15:40	0.031	0.008	0.008	
2/14/2015	06:50	0.90	13:40	1.91	1.11	04:30	0.16	13:40	1.83	0.55	04:30	0.003	13:40	0.076	0.011	0.011	
2/15/2015	03:25	0.87	21:35	1.43	1.09	05:15	0.20	22:15	1.19	0.59	05:15	0.003	14:20	0.029	0.012	0.012	
2/16/2015	13:40	0.89	11:10	1.80	1.12	03:10	0.15	13:50	1.30	0.59	03:10	0.002	11:00	0.037	0.012	0.012	
2/17/2015	01:55	0.89	09:25	1.60	1.05	03:00	0.14	12:45	1.21	0.48	02:40	0.002	12:45	0.028	0.009	0.009	
2/18/2015	04:30	0.89	14:25	1.62	1.06	01:25	0.15	14:25	1.70	0.52	01:25	0.002	14:25	0.056	0.010	0.010	
2/19/2015	03:30	0.88	07:30	1.64	1.06	02:25	0.14	12:50	1.73	0.50	02:25	0.002	12:50	0.052	0.009	0.009	
2/20/2015	03:30	0.87	20:30	1.28	1.01	03:10	0.16	09:25	1.30	0.45	03:10	0.002	20:25	0.024	0.008	0.008	
2/21/2015	14:05	0.87	16:55	1.63	1.03	01:50	0.16	16:30	1.38	0.44	03:05	0.002	16:30	0.027	0.008	0.008	
2/22/2015	05:25	0.83	09:05	1.61	1.01	03:50	0.16	08:55	1.32	0.49	03:50	0.002	09:05	0.041	0.009	0.009	
2/23/2015	01:55	0.86	10:30	1.41	1.05	01:45	0.16	10:40	1.16	0.53	01:45	0.002	10:35	0.030	0.010	0.010	
2/24/2015	04:35	0.83	08:05	1.41	1.00	01:45	0.18	10:10	1.20	0.44	01:45	0.002	10:10	0.023	0.007	0.007	
2/25/2015	04:25	0.83	12:05	1.53	1.01	06:05	0.14	12:10	1.26	0.49	01:35	0.002	12:05	0.037	0.008	0.008	
2/26/2015	04:00	0.83	15:10	1.88	1.02	00:55	0.19	13:50	1.90	0.49	00:55	0.002	13:50	0.066	0.009	0.009	
2/27/2015	02:30	0.84	12:25	1.55	1.00	00:30	0.18	09:15	1.40	0.48	00:30	0.002	12:25	0.039	0.008	0.008	
2/28/2015	03:50	0.84	12:00	1.40	0.98	02:00	0.16	10:00	1.17	0.46	02:00	0.002	10:00	0.027	0.008	0.008	
3/1/2015	04:50	0.83	09:05	1.57	1.03	03:30	0.15	15:55	1.25	0.48	03:30	0.002	15:55	0.029	0.009	0.009	
3/2/2015	01:55	0.81	16:55	1.41	0.99	00:25	0.16	16:55	1.17	0.50	00:25	0.002	16:55	0.031	0.008	0.008	
3/3/2015	03:40	0.82	13:00	1.37	0.98	05:30	0.09	13:00	0.96	0.46	05:30	0.001	13:00	0.025	0.008	0.008	
3/4/2015	03:20	0.82	14:15	1.96	0.99	02:55	0.16	11:10	1.48	0.46	02:55	0.002	11:10	0.036	0.008	0.008	
3/5/2015	04:15	0.82	14:30	1.79	0.99	03:40	0.16	11:40	1.62	0.49	03:40	0.002	11:40	0.048	0.009	0.009	
3/6/2015	01:45	0.81	18:45	1.38	0.99	01:20	0.15	17:55	1.53	0.54	00:35	0.002	18:05	0.035	0.009	0.009	
3/7/2015	04:35	0.81	11:50	1.92	1.01	08:15	0.17	11:50	1.46	0.51	08:15	0.002	11:50	0.061	0.009	0.009	
3/8/2015	04:05	0.84	10:10	1.98	1.03	06:40	0.16	13:30	1.63	0.52	06:40	0.002	13:30	0.050	0.009	0.009	
3/9/2015	03:25	0.86	09:20	1.53	1.02	00:55	0.16	10:20	1.18	0.49	00:55	0.002	12:25	0.026	0.009	0.009	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/10/2015	04:55	0.83	19:30	1.90	1.02	04:50	0.14	17:30	1.54	0.47	04:50	0.002	18:45	0.055	0.009	0.009	
3/11/2015	04:50	0.86	15:05	1.49	1.02	04:50	0.17	19:25	1.05	0.46	04:50	0.002	19:25	0.021	0.008	0.008	0.03
3/12/2015	03:30	0.86	12:40	1.69	1.05	04:10	0.21	09:50	1.22	0.52	04:10	0.003	09:50	0.033	0.009	0.009	
3/13/2015	04:30	0.85	11:15	1.34	1.04	03:35	0.17	11:45	1.28	0.54	03:35	0.002	11:45	0.030	0.010	0.010	
3/14/2015	04:35	0.88	07:35	1.80	1.05	04:00	0.20	07:45	1.53	0.50	04:20	0.003	07:45	0.051	0.009	0.009	
3/15/2015	05:25	0.89	16:15	1.64	1.05	23:35	0.20	11:05	1.48	0.50	04:20	0.003	11:05	0.033	0.009	0.009	
3/16/2015	18:15	0.90	09:30	1.64	1.04	05:30	0.15	21:10	1.66	0.47	05:30	0.002	21:10	0.050	0.009	0.009	
3/17/2015	03:20	0.87	12:20	1.64	1.08	01:05	0.20	18:35	1.44	0.57	01:25	0.003	18:35	0.042	0.011	0.011	0.01
3/18/2015	05:05	0.88	11:55	1.54	1.04	15:40	0.15	11:55	1.36	0.53	15:40	0.002	11:55	0.041	0.010	0.010	
3/19/2015	17:10	0.85	17:20	1.66	1.04	14:00	0.14	16:30	1.45	0.53	14:00	0.002	16:30	0.042	0.010	0.010	
3/20/2015	03:55	0.84	19:45	1.49	1.01	03:55	0.19	19:45	1.05	0.50	03:55	0.002	19:45	0.031	0.009	0.009	
3/21/2015	03:40	0.84	14:15	1.50	1.02	15:00	0.10	14:15	1.51	0.53	15:00	0.001	14:15	0.044	0.009	0.009	
3/22/2015	03:05	0.85	11:05	1.72	1.04	03:35	0.17	10:10	1.42	0.53	03:35	0.002	10:10	0.033	0.010	0.010	0.15
3/23/2015	23:55	0.84	09:50	1.48	1.02	04:10	0.20	23:30	1.28	0.51	04:10	0.003	23:30	0.037	0.009	0.009	
3/24/2015	01:55	0.85	10:00	1.58	1.02	03:45	0.20	11:35	1.47	0.49	03:45	0.003	11:40	0.038	0.008	0.008	
3/25/2015	03:40	0.88	14:20	1.74	1.03	03:35	0.14	17:30	1.35	0.45	03:35	0.002	17:30	0.048	0.008	0.008	
3/26/2015	04:25	0.87	15:45	1.55	1.02	04:25	0.17	15:50	1.05	0.46	04:25	0.002	15:45	0.031	0.008	0.008	
3/27/2015	01:10	0.89	09:20	1.51	1.04	16:45	0.17	12:20	1.28	0.47	16:45	0.003	12:20	0.033	0.008	0.008	
3/28/2015	04:35	0.88	09:45	1.49	1.08	00:40	0.19	10:30	1.04	0.50	01:20	0.003	10:30	0.026	0.010	0.010	
3/29/2015	02:35	0.89	13:45	1.60	1.09	02:30	0.12	20:25	0.77	0.39	02:30	0.002	13:45	0.022	0.007	0.007	
3/30/2015	14:25	0.90	12:50	1.74	1.09	01:35	0.20	14:10	1.62	0.52	14:25	0.003	14:10	0.049	0.010	0.010	
3/31/2015	23:50	0.90	13:45	1.46	1.06	05:30	0.20	16:55	1.21	0.56	05:20	0.003	08:45	0.030	0.010	0.010	
4/1/2015	01:20	0.89	10:30	1.55	1.09	22:55	0.23	08:50	1.48	0.59	01:20	0.003	08:50	0.041	0.011	0.011	
4/2/2015	15:20	0.86	17:30	1.66	1.04	01:35	0.21	16:30	1.41	0.55	01:35	0.003	17:30	0.045	0.010	0.010	
4/3/2015	02:00	0.89	12:50	1.58	1.08	01:50	0.20	13:30	1.29	0.63	01:50	0.003	12:30	0.035	0.012	0.012	
4/4/2015	04:10	0.87	10:10	1.60	1.07	04:45	0.18	12:20	1.54	0.66	04:45	0.003	12:20	0.036	0.013	0.013	
4/5/2015	05:10	0.87	10:45	1.58	1.08	04:50	0.20	11:45	1.45	0.61	04:50	0.003	11:45	0.041	0.012	0.012	0.05
4/6/2015	04:35	0.83	16:45	1.54	1.04	02:55	0.16	16:10	1.18	0.54	02:55	0.002	16:10	0.027	0.010	0.010	0.02
4/7/2015	01:15	0.87	14:05	1.55	1.03	15:50	0.18	18:05	1.46	0.48	02:10	0.002	18:05	0.028	0.008	0.008	0.74
4/8/2015	03:00	0.87	12:50	1.55	1.01	01:30	0.15	19:05	1.18	0.48	01:30	0.002	07:50	0.024	0.008	0.008	
4/9/2015	03:20	0.84	12:35	1.56	1.05	03:40	0.16	13:50	1.47	0.56	03:40	0.002	13:50	0.044	0.010	0.010	
4/10/2015	03:55	0.87	09:50	1.97	1.13	04:30	0.16	09:25	1.32	0.53	04:30	0.002	19:50	0.042	0.011	0.011	
4/11/2015	02:55	0.95	12:55	1.97	1.17	01:55	0.18	11:10	1.38	0.58	01:55	0.003	11:10	0.048	0.013	0.013	
4/12/2015	03:25	0.98	13:05	1.86	1.17	03:30	0.17	12:30	2.12	0.53	03:30	0.003	12:30	0.084	0.011	0.011	
4/13/2015	04:15	1.00	09:35	1.84	1.20	03:10	0.15	19:30	1.61	0.52	03:10	0.003	14:05	0.044	0.012	0.012	
4/14/2015	23:40	0.98	14:55	2.06	1.20	11:55	0.12	11:25	1.53	0.52	11:55	0.002	11:25	0.057	0.012	0.012	
4/15/2015	02:50	0.99	08:20	1.81	1.20	03:20	0.09	07:15	1.43	0.52	03:20	0.001	07:15	0.038	0.011	0.011	

Report Summary For The Period 1/23/2015 - 4/15/2015

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			0.760	4.11
Avg	1.01	0.53	0.009	

Site Commentary

Site Information

LS7-N8	
Pipe Dimensions	10.5"x10.5"
Silt Level	0.00"

Overview

Site LS7-N8 functioned under normal conditions during the period Friday, January 23, 2015 to Wednesday, April 15, 2015 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Friday, January 23, 2015 to Wednesday, April 15, 2015 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at approximately 41% full at its recorded 5-minute peak of 4.35 inches and approximately 14% full during the typical average depth of 1.51 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.51	2.50	0.091
Minimum	0.95	0.31	0.009
Maximum	4.35	4.05	0.359
Time of Minimum	1/31/2015 4:50 AM	1/28/2015 1:00 AM	1/25/2015 4:30 AM
Time of Maximum	4/12/2015 8:30 PM	3/7/2015 4:30 PM	2/8/2015 1:50 PM

Data Quality

Data uptime observed during the Friday, January 23, 2015 to the Wednesday, April 15, 2015 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

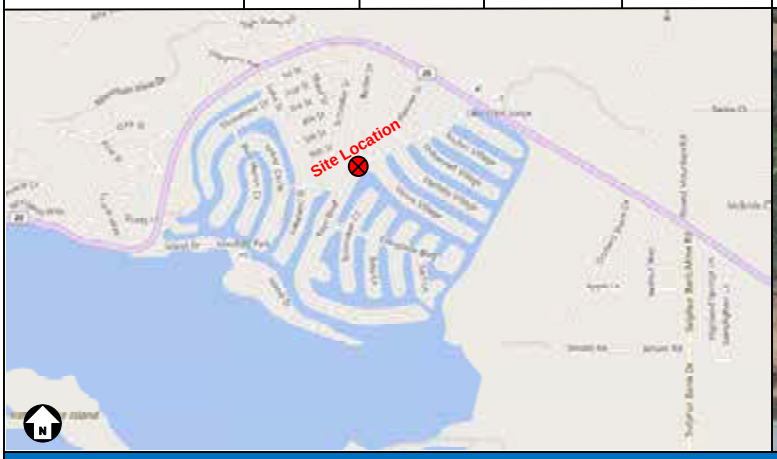
ADS Site Report

Quality Form

Project Name: ClearLake.MCEng.TFM.CA15	**Project No.** 22002	**City:** Clearlake Oaks, CA	**FM Initials:** SW
Site Name: LS7-N8	**Investigate Date:** 1/21/15		
Address/Location: 544 Keys Blvd			

Access: Drive	**Type of System:**	Sanitary [X]	Storm [ ]	Combined [ ]

Monitor Type	Peak Doppler
Monitor Model	ADS Triton+
Data Acquisition	Wireless
Manhole ID	MH LS7-N8
Pipe Height:	10.50"
Pipe Width:	10.50"





Investigation Information:

Date/Time of Install:	1/21/15 @ 12:55
Site Hydraulics:	Choppy flow, moderate velocity
Upstream Input: (L/S, P/S)	L/S
Upstream Manhole:	2 inlets / 1 outlet
Downstream Manhole:	2 inlets / 1 outlet
Depth of Flow (DOF):	1.75" +/- 0.25"
Range (Air DOF):	8.75" +/- 0.25"
Peak Velocity:	3.50 fps
Silt:	0.00 Inches

Manhole Information:

Manhole Material / Condition	Precast / Good
Pipe Material / Condition:	VCP / Good

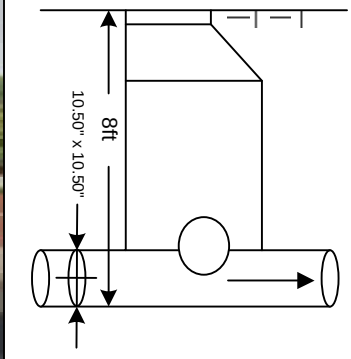
Land Use:	Residential [X]	Commercial [ ]	Industrial [ ]	Trunk [ ]

Safety Notes

Standard Traffic Control

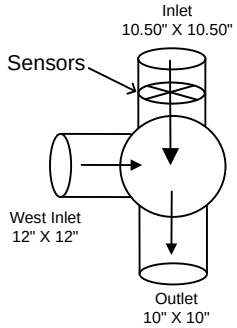
Other Information:





Cross Section

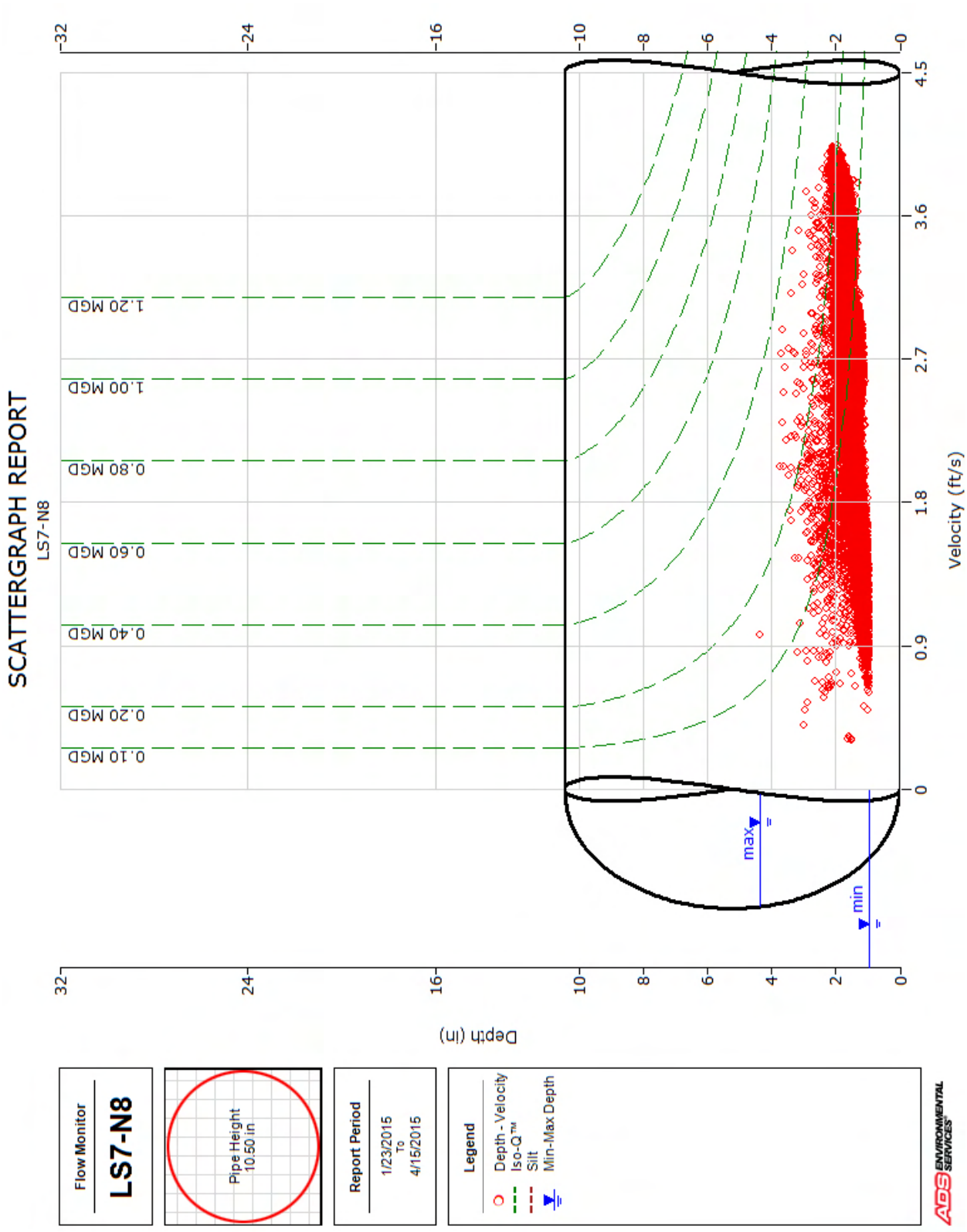


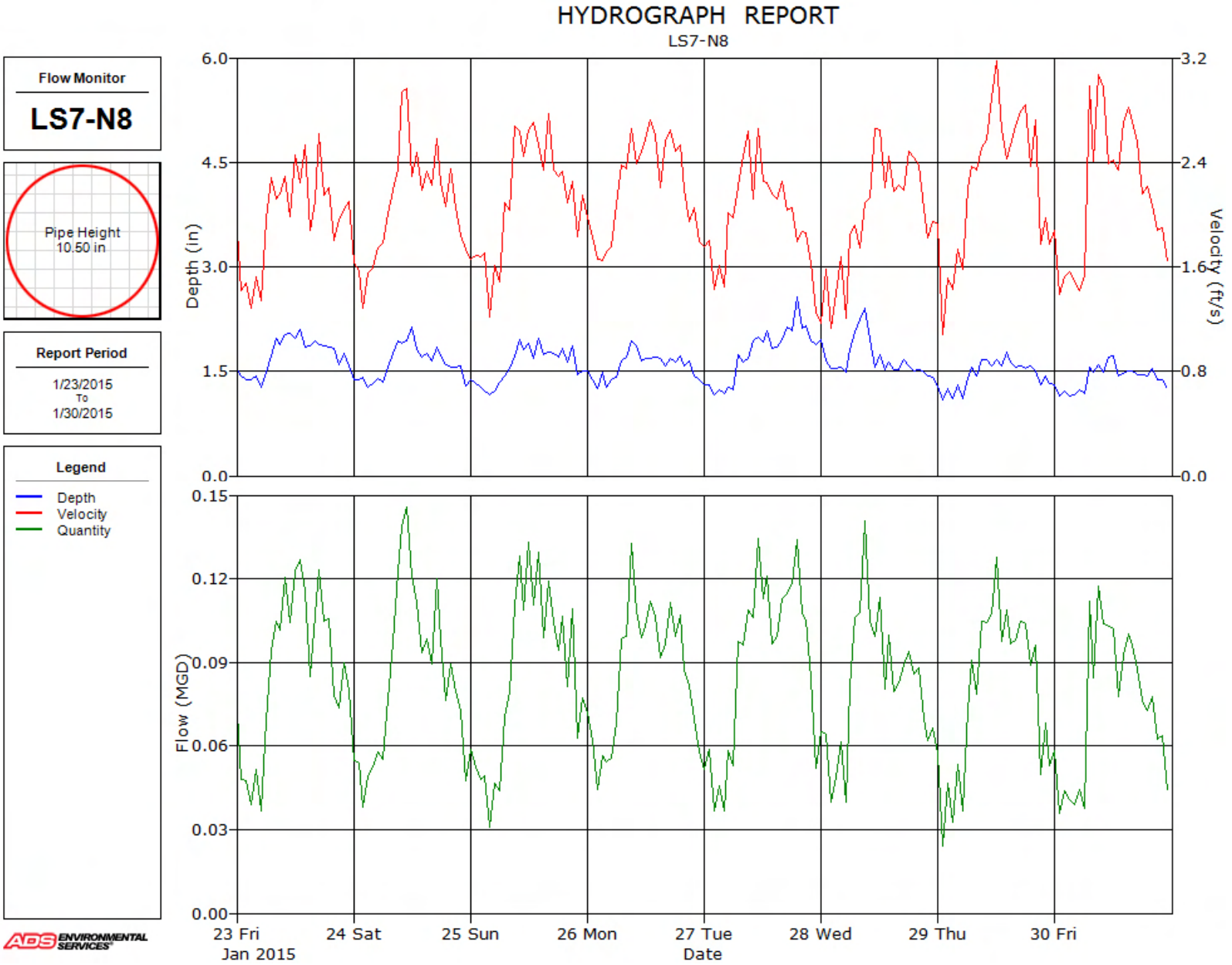


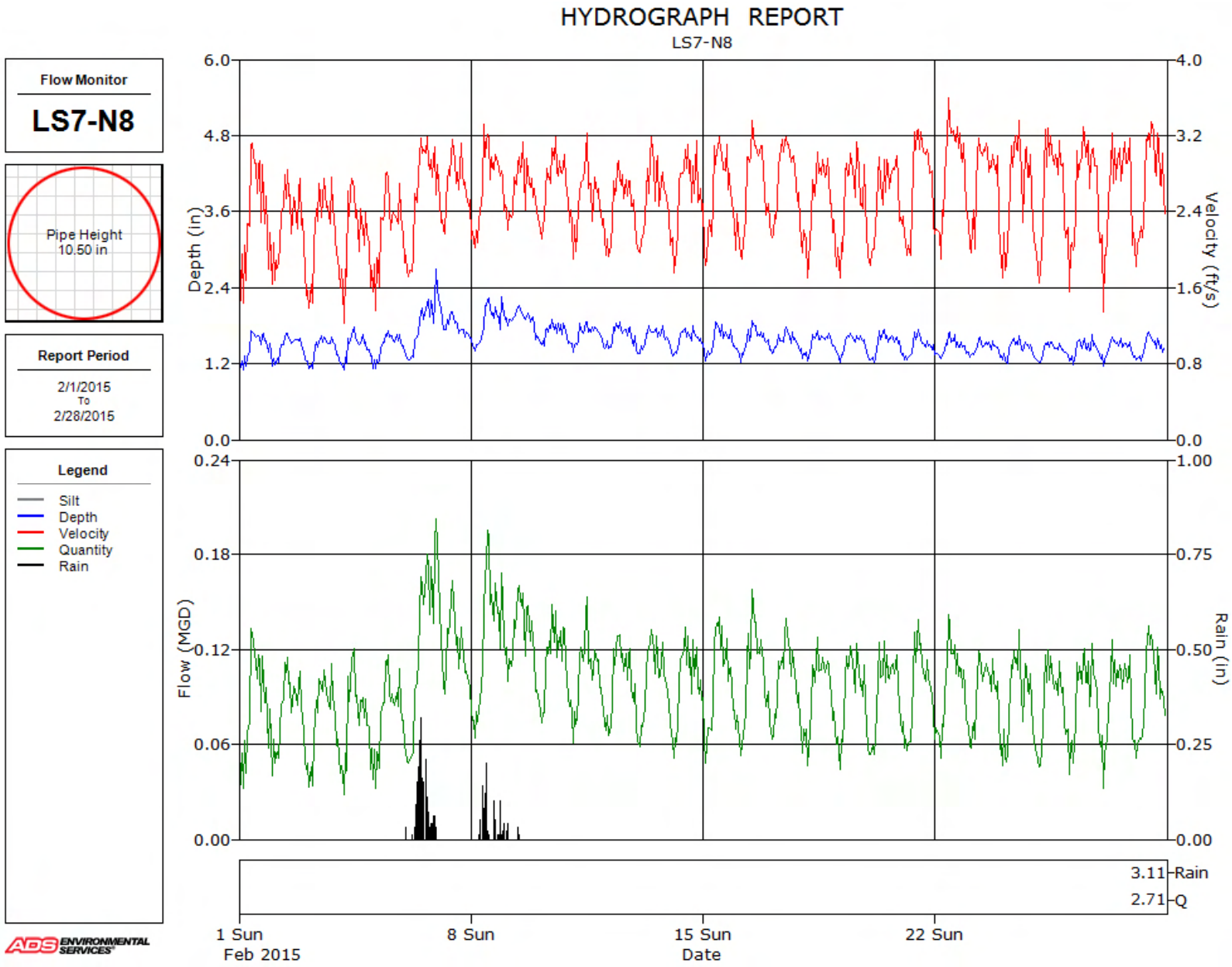
Plan

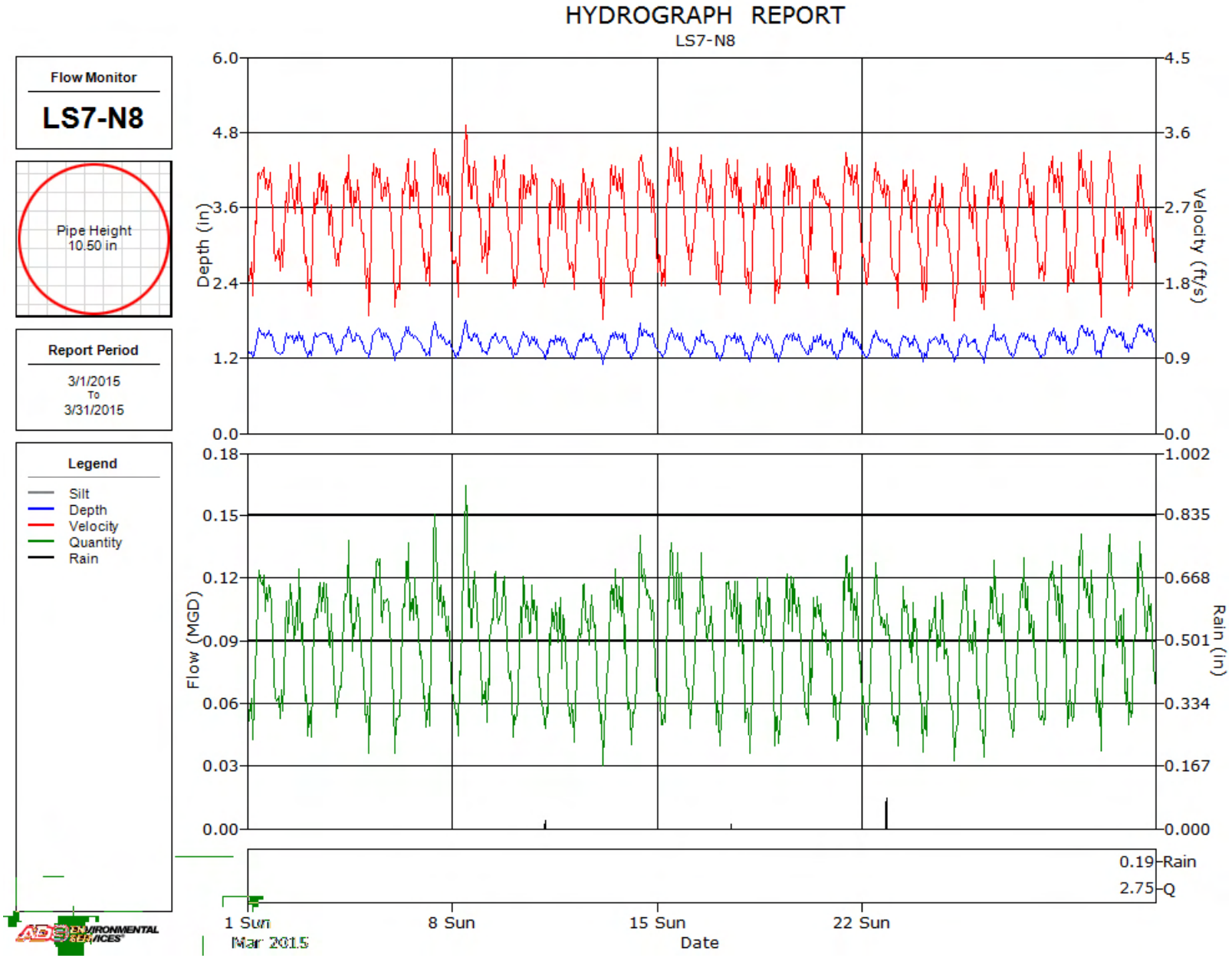
Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Ring	Trunk	[ ]	[X]	[ ]	
Sensors Devices:	Water Ultrasonic/ Pressure/ Velocity	Lift / Pump Station	[ ]	[X]	[ ]	
Surcharge Height:	0	WWTP	[ ]	[X]	[ ]	
Rain Gauge Zone:	RG-WTP	Other	[ ]	[X]	[ ]	

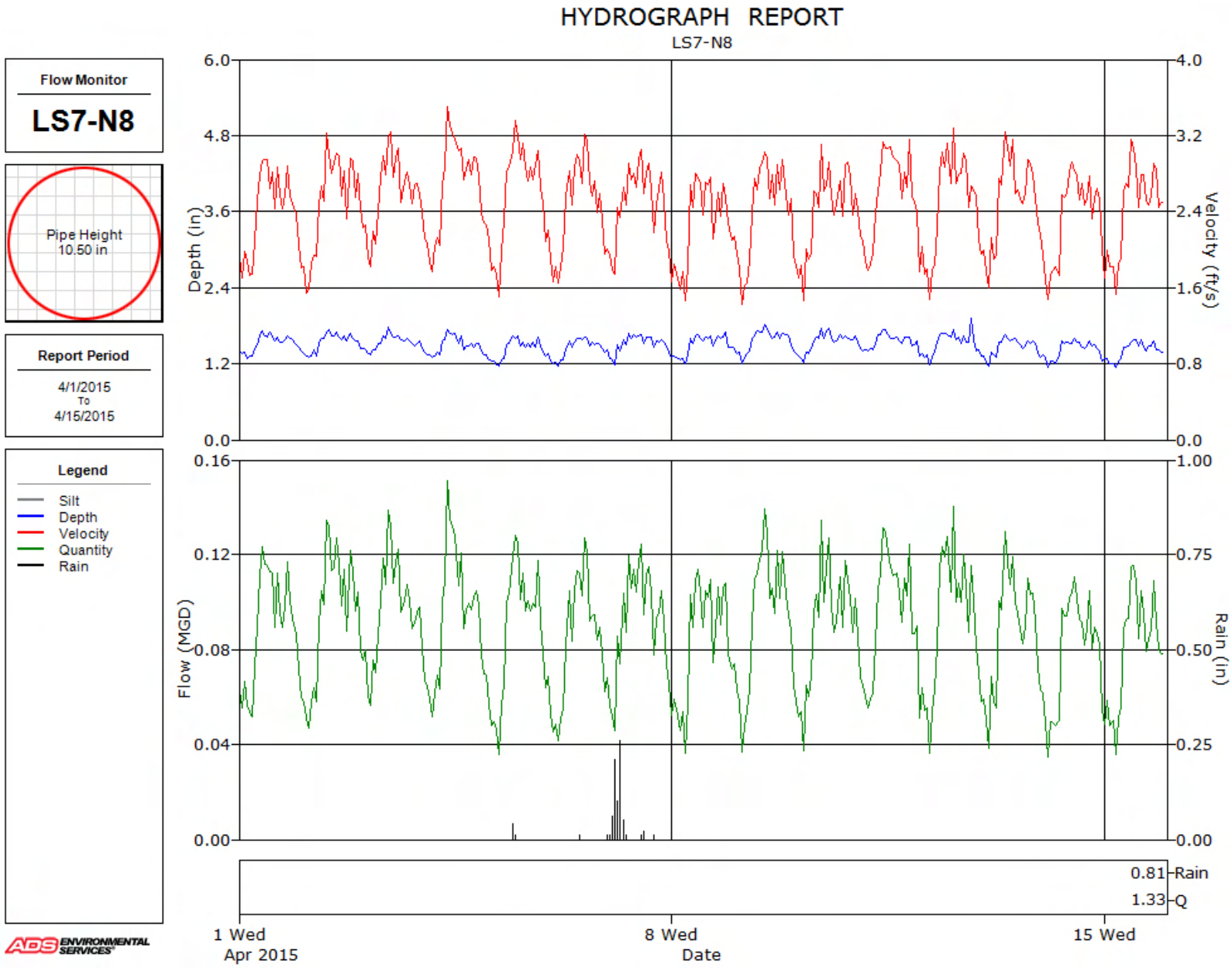
Additional Site Information / Comments:


SCATTERGRAPH REPORT
LS7-N8
Flow Monitor
LS7-N8
Pipe Height
10.50 in
Report Period
1/23/2015
To
4/15/2015
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
ADS ENVIRONMENTAL SERVICES
Depth (in)
Velocity (ft/s)
0.10 MGD
0.20 MGD
0.40 MGD
0.60 MGD
0.80 MGD
1.00 MGD
1.20 MGD
max
min


HYDROGRAPH REPORT
LS7-N8
Flow Monitor
LS7-N8
Pipe Height
10.50 in
Report Period
1/23/2015
To
1/30/2015
Legend
Depth
Velocity
Quantity
Depth (in)
Velocity (ft/s)
Flow (MGD)
6.0
4.5
3.0
1.5
0.0
3.2
2.4
1.6
0.8
0.0
0.15
0.12
0.09
0.06
0.03
0.00
23 Fri
Jan 2015
24 Sat
25 Sun
26 Mon
27 Tue
28 Wed
29 Thu
30 Fri
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS7-N8
Flow Monitor
LS7-N8
Pipe Height
10.50 in
Report Period
2/1/2015
To
2/28/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
3.11 Rain
2.71 Q
1 Sun
Feb 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS7-N8
Flow Monitor
LS7-N8
Pipe Height
10.50 in
Report Period
3/1/2015
To
3/31/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.19 Rain
2.75 Q
1 Sun
Mar 2015
8 Sun
15 Sun
22 Sun
Date


HYDROGRAPH REPORT
LS7-N8
Flow Monitor
LS7-N8
Pipe Height
10.50 in
Report Period
4/1/2015
To
4/15/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.81 Rain
1.33 Q
1 Wed
Apr 2015
8 Wed
15 Wed
Date
ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 1/23/2015 - 4/15/2015

LS7-N8, Pipe Height: 10.5 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/23/2015	02:45	1.03	11:50	3.40	1.74	04:35	0.76	09:20	3.85	1.99	04:35	0.015	13:20	0.264	0.088	0.088	
1/24/2015	03:55	0.98	09:30	3.65	1.62	02:45	0.65	10:40	3.90	2.08	04:00	0.013	09:30	0.348	0.085	0.085	
1/25/2015	03:20	0.99	17:55	3.20	1.59	04:30	0.50	19:50	3.84	2.13	04:30	0.009	12:00	0.257	0.086	0.086	
1/26/2015	05:05	0.99	10:10	2.94	1.58	10:10	0.50	20:30	3.89	2.22	04:35	0.014	10:35	0.252	0.086	0.086	
1/27/2015	04:20	0.98	18:15	3.54	1.76	23:50	0.41	11:00	3.74	1.98	03:20	0.013	19:00	0.300	0.089	0.089	
1/28/2015	03:35	1.02	08:10	3.26	1.68	01:00	0.31	14:00	3.80	1.98	01:00	0.011	08:05	0.239	0.082	0.082	
1/29/2015	04:00	0.97	15:00	2.31	1.45	01:20	0.70	11:25	3.87	2.24	01:20	0.014	09:50	0.222	0.079	0.079	
1/30/2015	01:50	1.03	11:45	3.06	1.41	04:20	0.70	09:55	3.91	2.17	04:20	0.015	12:25	0.244	0.074	0.074	
1/31/2015	04:50	0.95	19:40	2.83	1.44	05:30	0.67	13:35	3.92	2.30	05:30	0.012	13:35	0.235	0.082	0.082	
2/1/2015	05:40	0.99	13:45	2.45	1.46	02:40	0.83	09:55	3.99	2.35	02:40	0.016	09:55	0.245	0.084	0.084	
2/2/2015	02:25	0.96	09:10	2.12	1.46	23:30	0.79	09:10	3.87	2.29	04:20	0.017	09:10	0.216	0.082	0.082	
2/3/2015	05:45	0.95	12:40	2.86	1.44	01:45	0.65	22:45	3.85	2.18	01:45	0.012	22:45	0.207	0.076	0.076	
2/4/2015	04:05	0.96	23:35	2.40	1.45	04:00	0.61	11:20	3.85	2.12	04:00	0.011	11:20	0.222	0.075	0.075	
2/5/2015	02:00	0.95	12:35	2.45	1.48	04:00	0.82	10:05	3.85	2.21	04:00	0.014	10:05	0.213	0.079	0.079	
2/6/2015	03:20	1.05	17:35	3.75	1.78	05:30	0.97	16:40	3.95	2.57	05:30	0.021	22:00	0.342	0.121	0.121	2.04
2/7/2015	05:50	1.21	09:15	3.61	1.84	05:10	0.86	14:05	3.88	2.67	05:50	0.036	00:35	0.265	0.124	0.124	
2/8/2015	04:00	1.19	10:40	3.70	1.84	00:25	1.23	12:50	3.94	2.68	03:35	0.035	13:50	0.359	0.128	0.128	0.93
2/9/2015	03:45	1.33	20:00	3.47	1.93	05:50	0.87	12:40	3.89	2.64	03:45	0.053	20:00	0.311	0.130	0.130	0.14
2/10/2015	03:40	1.29	11:10	2.92	1.69	04:30	1.07	06:55	3.94	2.67	03:40	0.043	19:15	0.277	0.111	0.111	
2/11/2015	02:55	1.25	11:55	2.58	1.67	02:30	1.17	12:25	3.89	2.52	02:55	0.033	12:25	0.231	0.104	0.104	
2/12/2015	04:10	1.23	09:50	2.67	1.64	02:50	0.99	14:40	3.89	2.49	02:50	0.026	12:15	0.229	0.101	0.101	
2/13/2015	01:35	1.17	09:50	3.58	1.61	00:05	1.32	14:50	3.92	2.54	03:50	0.036	09:50	0.310	0.100	0.100	
2/14/2015	03:30	1.12	17:10	2.89	1.57	04:15	1.02	11:55	3.97	2.55	04:25	0.027	11:55	0.219	0.096	0.096	
2/15/2015	03:45	1.11	09:10	3.43	1.58	03:20	1.10	15:30	3.93	2.61	03:20	0.025	12:35	0.231	0.100	0.100	
2/16/2015	03:50	1.08	12:20	2.75	1.57	04:15	1.05	12:05	3.94	2.66	04:15	0.027	20:05	0.222	0.101	0.101	
2/17/2015	23:45	1.23	07:50	2.55	1.55	23:25	1.15	11:55	3.92	2.70	23:25	0.031	12:00	0.205	0.098	0.098	
2/18/2015	04:10	1.10	14:40	2.69	1.53	04:00	0.97	11:20	3.91	2.51	04:00	0.022	10:25	0.206	0.092	0.092	
2/19/2015	03:20	1.13	18:00	2.10	1.51	02:20	0.96	12:10	3.96	2.51	02:20	0.023	15:45	0.210	0.091	0.091	
2/20/2015	02:05	1.08	17:45	2.40	1.51	00:35	1.09	12:15	3.91	2.54	02:00	0.027	19:10	0.203	0.092	0.092	
2/21/2015	04:10	1.09	09:30	2.60	1.48	05:00	1.10	12:05	3.98	2.71	05:00	0.024	12:05	0.211	0.094	0.094	
2/22/2015	06:35	1.19	11:20	2.55	1.47	04:35	1.28	11:40	3.93	2.83	04:35	0.032	10:00	0.201	0.096	0.096	
2/23/2015	23:50	1.16	09:05	2.50	1.45	01:35	1.13	18:50	3.99	2.70	01:35	0.028	18:50	0.228	0.091	0.091	
2/24/2015	04:10	1.09	09:15	2.44	1.44	00:30	1.06	11:55	4.01	2.63	04:10	0.023	13:05	0.225	0.090	0.090	
2/25/2015	04:45	1.08	13:20	2.41	1.41	03:45	0.97	11:20	3.96	2.63	03:45	0.022	19:25	0.221	0.086	0.086	
2/26/2015	01:30	1.08	18:05	2.32	1.43	02:25	0.97	15:15	3.99	2.65	02:25	0.022	18:00	0.229	0.088	0.088	
2/27/2015	04:00	1.09	15:45	2.47	1.45	02:35	0.91	19:35	3.96	2.63	02:35	0.020	15:45	0.238	0.090	0.090	
2/28/2015	05:25	1.10	12:40	2.18	1.46	05:25	0.90	11:25	4.02	2.67	05:25	0.019	13:05	0.224	0.092	0.092	
3/1/2015	01:35	1.09	16:50	2.07	1.46	01:55	0.96	15:30	3.99	2.60	01:55	0.021	16:50	0.214	0.090	0.090	
3/2/2015	00:50	1.12	20:45	2.01	1.45	05:25	1.00	18:50	3.95	2.59	05:25	0.023	18:50	0.197	0.088	0.088	
3/3/2015	02:55	1.08	17:20	2.08	1.47	04:05	0.97	17:55	3.97	2.53	04:15	0.022	17:20	0.214	0.088	0.088	
3/4/2015	02:55	1.12	17:30	2.32	1.48	03:05	1.01	11:45	4.01	2.63	03:05	0.023	11:45	0.231	0.091	0.091	
3/5/2015	03:05	1.07	16:50	2.37	1.48	04:30	0.82	12:05	4.02	2.62	04:35	0.018	13:10	0.227	0.093	0.093	
3/6/2015	03:20	1.08	10:10	2.37	1.47	03:00	0.93	17:30	3.95	2.57	03:00	0.021	10:10	0.235	0.090	0.090	
3/7/2015	03:40	1.10	10:10	2.15	1.47	04:50	0.96	16:30	4.05	2.66	04:50	0.022	09:05	0.223	0.093	0.093	
3/8/2015	03:10	1.07	11:15	2.17	1.48	01:50	0.94	09:10	4.02	2.72	01:55	0.021	11:15	0.209	0.096	0.096	
3/9/2015	03:00	1.11	21:35	1.95	1.44	06:05	0.97	18:35	4.00	2.70	06:05	0.022	17:15	0.191	0.090	0.090	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/10/2015	04:20	1.09	19:45	2.08	1.43	05:25	0.90	19:45	4.03	2.62	05:25	0.020	19:45	0.220	0.088	0.088	
3/11/2015	04:25	1.06	20:30	2.20	1.41	04:15	0.85	14:30	3.98	2.49	03:10	0.018	14:30	0.197	0.082	0.082	0.03
3/12/2015	04:50	1.09	09:40	2.46	1.42	04:15	0.88	12:50	4.01	2.57	04:15	0.020	09:40	0.239	0.085	0.085	
3/13/2015	03:55	1.08	12:45	2.44	1.44	04:45	0.84	14:55	4.00	2.59	04:50	0.018	16:55	0.211	0.088	0.088	
3/14/2015	04:40	1.08	15:45	2.37	1.46	01:55	0.99	14:05	4.00	2.60	01:55	0.022	11:30	0.225	0.091	0.091	
3/15/2015	02:45	1.08	10:20	1.99	1.46	03:50	0.90	17:35	4.02	2.73	06:10	0.022	10:20	0.202	0.095	0.095	
3/16/2015	03:05	1.13	12:00	2.11	1.43	00:00	0.98	12:00	4.04	2.66	05:00	0.024	12:00	0.226	0.089	0.089	
3/17/2015	04:40	1.05	16:35	2.09	1.43	05:05	0.87	16:35	4.02	2.67	05:05	0.018	16:35	0.221	0.090	0.090	0.01
3/18/2015	03:00	1.08	17:05	2.14	1.42	03:00	0.77	06:25	3.99	2.55	03:00	0.016	09:35	0.199	0.085	0.085	
3/19/2015	04:50	1.06	12:35	2.05	1.44	04:20	0.85	12:35	3.99	2.62	03:10	0.018	12:35	0.213	0.090	0.090	
3/20/2015	03:05	1.08	22:05	2.43	1.42	04:45	0.93	10:55	3.98	2.60	04:45	0.020	14:30	0.213	0.086	0.086	
3/21/2015	04:25	1.07	08:45	2.12	1.44	04:20	0.71	08:45	3.99	2.66	04:20	0.015	08:45	0.224	0.091	0.091	
3/22/2015	06:00	1.09	12:15	2.08	1.42	04:00	0.53	12:15	3.95	2.63	04:00	0.011	12:15	0.216	0.087	0.087	0.15
3/23/2015	04:00	1.08	10:05	2.45	1.40	04:20	0.84	12:45	3.95	2.51	04:00	0.019	12:45	0.205	0.082	0.082	
3/24/2015	04:35	1.06	17:00	2.44	1.42	04:10	0.85	21:20	3.94	2.46	04:10	0.018	11:20	0.207	0.081	0.081	
3/25/2015	03:45	1.02	13:55	2.11	1.40	03:45	0.71	13:35	3.95	2.49	03:45	0.014	13:35	0.212	0.082	0.082	
3/26/2015	04:25	1.04	20:25	2.35	1.44	02:05	0.75	17:05	3.99	2.51	02:05	0.016	13:30	0.212	0.086	0.086	
3/27/2015	03:50	1.04	12:10	2.13	1.44	05:00	0.90	15:00	3.99	2.59	03:50	0.018	12:10	0.222	0.088	0.088	
3/28/2015	03:00	1.06	13:35	2.21	1.46	03:25	0.85	12:45	3.99	2.64	03:00	0.018	16:10	0.205	0.091	0.091	
3/29/2015	04:25	1.05	12:05	2.26	1.49	00:20	0.83	12:50	3.98	2.56	04:00	0.020	12:05	0.228	0.092	0.092	
3/30/2015	03:50	1.05	19:30	2.11	1.51	02:40	0.90	12:10	3.99	2.51	02:40	0.019	12:10	0.216	0.092	0.092	
3/31/2015	02:50	1.08	13:15	2.18	1.55	03:15	0.97	18:15	3.96	2.41	02:50	0.021	18:15	0.217	0.092	0.092	
4/1/2015	02:50	1.05	13:15	2.17	1.52	04:40	1.00	08:10	3.99	2.41	03:10	0.025	13:15	0.225	0.090	0.090	
4/2/2015	04:00	1.05	17:55	2.39	1.53	02:40	0.77	10:20	3.96	2.48	02:40	0.018	17:55	0.229	0.093	0.093	
4/3/2015	04:35	1.08	09:45	2.50	1.53	04:35	1.05	12:30	3.94	2.59	04:35	0.022	09:45	0.250	0.096	0.096	
4/4/2015	04:00	0.98	14:35	2.53	1.48	02:25	1.00	09:40	3.94	2.65	02:25	0.020	09:40	0.213	0.094	0.094	
4/5/2015	04:05	0.99	12:15	2.37	1.42	03:20	0.79	11:40	3.96	2.55	03:20	0.016	11:40	0.217	0.086	0.086	0.05
4/6/2015	04:05	0.98	13:25	2.17	1.43	02:35	0.91	14:00	3.96	2.42	02:35	0.020	13:25	0.227	0.082	0.082	0.02
4/7/2015	01:30	1.01	07:35	2.23	1.52	01:55	0.98	15:10	3.94	2.51	01:30	0.021	15:10	0.226	0.092	0.092	0.74
4/8/2015	06:00	1.01	20:55	2.15	1.50	06:25	0.99	18:45	3.89	2.28	01:00	0.020	20:55	0.219	0.084	0.084	
4/9/2015	04:55	1.02	11:35	2.27	1.56	03:30	0.93	11:35	3.89	2.40	03:30	0.019	11:35	0.240	0.092	0.092	
4/10/2015	02:25	1.06	19:25	2.23	1.54	00:55	0.98	19:25	3.90	2.40	01:00	0.023	19:25	0.236	0.090	0.090	
4/11/2015	23:40	1.22	10:10	2.40	1.55	03:30	1.06	20:40	3.88	2.57	03:30	0.030	17:50	0.216	0.094	0.094	
4/12/2015	06:00	1.05	20:30	4.35	1.52	20:30	0.98	15:20	3.91	2.46	05:55	0.023	11:45	0.221	0.091	0.091	
4/13/2015	03:35	1.00	13:00	2.13	1.46	02:10	0.90	11:05	3.97	2.48	02:10	0.018	11:05	0.211	0.086	0.086	
4/14/2015	04:00	0.99	12:45	2.07	1.42	06:10	0.94	12:45	3.99	2.35	06:10	0.021	12:45	0.216	0.079	0.079	
4/15/2015	05:00	0.99	13:25	2.03	1.41	00:30	0.77	12:30	3.93	2.44	00:30	0.017	12:30	0.206	0.081	0.081	

Report Summary For The Period 1/23/2015 - 4/15/2015

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			7.548	4.11
Avg	1.51	2.50	0.091	

Site Commentary

Site Information

LS7S	
Pipe Dimensions	6"x6"
Silt Level	0.00"

Overview

Site LS7S functioned under normal conditions during the period Friday, January 23, 2015 to Wednesday, April 15, 2015 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Friday, January 23, 2015 to Wednesday, April 15, 2015 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at approximately 45% full at its recorded 5-minute peak of 2.68 inches and approximately 14% full during the typical average depth of 0.85 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	0.85	0.36	0.004
Minimum	0.25	0.11	0.000
Maximum	2.68	1.01	0.041
Time of Minimum	2/3/2015 9:30 PM	2/24/2015 12:20 AM	2/24/2015 12:20 AM
Time of Maximum	3/28/2015 10:15 AM	3/26/2015 6:10 PM	3/26/2015 6:10 PM

Data Quality

Data uptime observed during the Friday, January 23, 2015 to the Wednesday, April 15, 2015 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

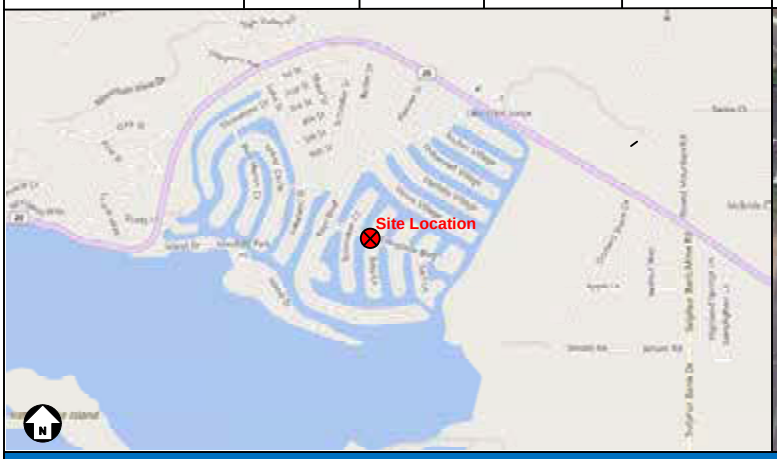
ADS Site Report

Quality Form

Project Name: ClearLake.MCEng.TFM.CA15	**Project No.** 22002	**City:** Clearlake Oaks, CA	**FM Initials:** SW
Site Name: LS7S	**Investigate Date:** 1/21/15		
Address/Location: Intersection of Bass Ln and Everglade Blvd			

Access:	**Type of System:**	Sanitary	Storm	Combined
Drive		X		

Monitor Type	Peak Doppler
Monitor Model	ADS Triton+
Data Acquisition	Wireless
Manhole ID	MH LS7S
Pipe Height:	6.00"
Pipe Width:	6.00"





Investigation Information:

Date/Time of Install:	1/21/15 @ 11:50
Site Hydraulics:	Low depth, smooth, slow velocity
Upstream Input: (L/S, P/S)	N/A
Upstream Manhole:	3 inlets / 1 outlet
Downstream Manhole:	3 inlets / 1 outlet (backwater from PS d/s)
Depth of Flow (DOF):	1.13" +/- 0.25"
Range (Air DOF):	5.50" +/- 0.25"
Peak Velocity:	0.50 fps
Silt:	0.00 Inches

Manhole Information:

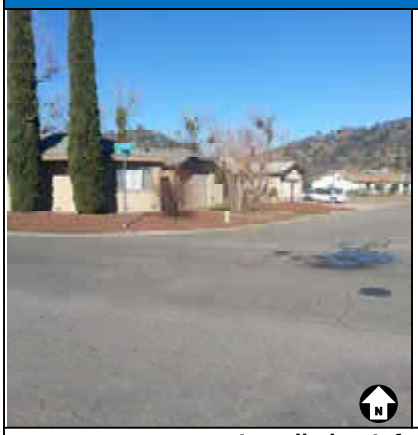
Manhole Material / Condition	Precast / Fair
Pipe Material / Condition:	VCP / Fair

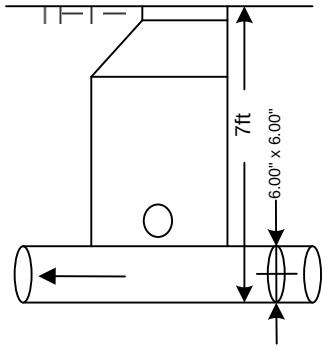
Land Use:	Residential	Commercial	Industrial	Trunk
	X			

Safety Notes

Standard Traffic Control low volume road

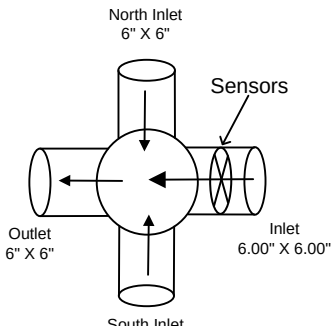
Other Information:





Cross Section



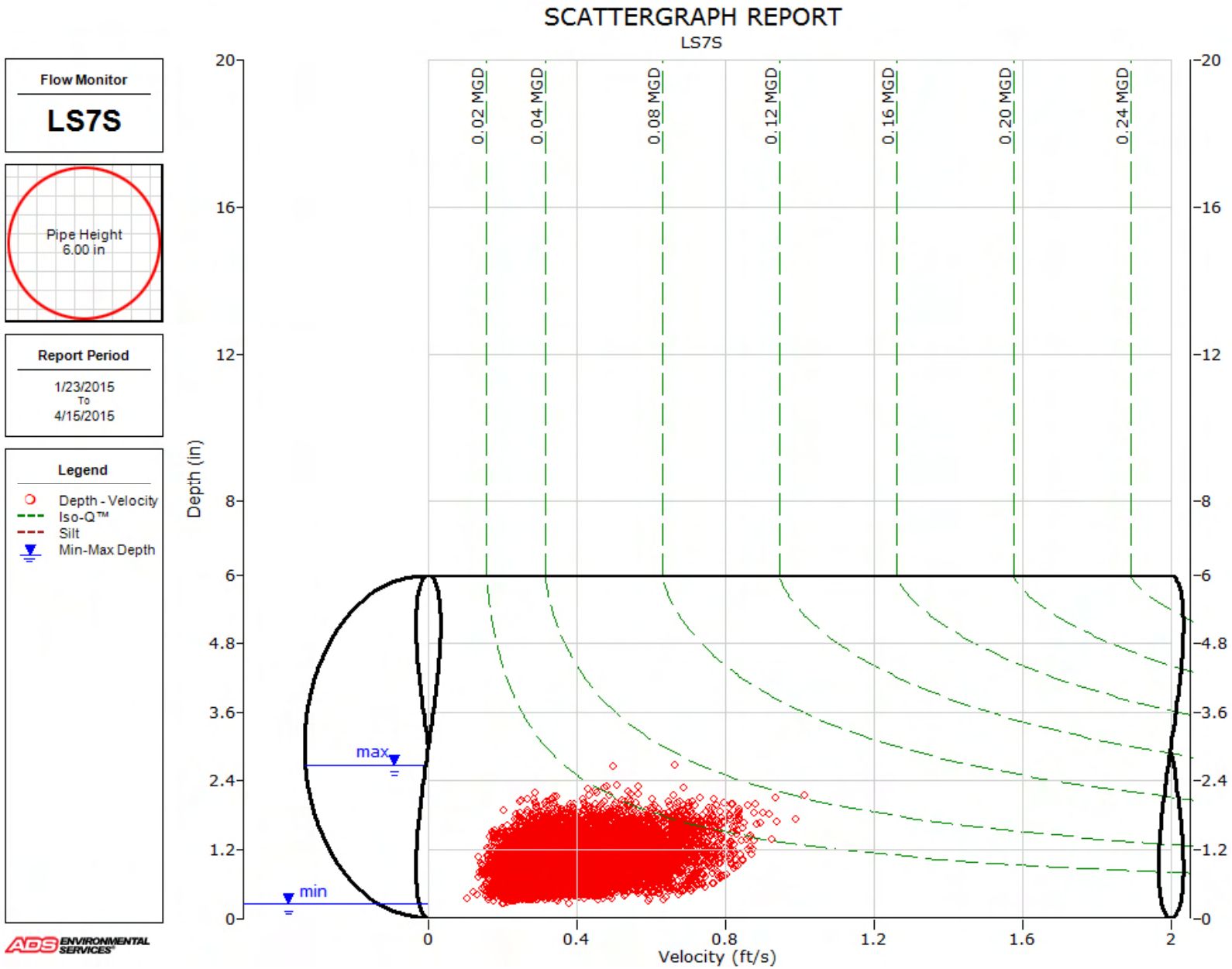


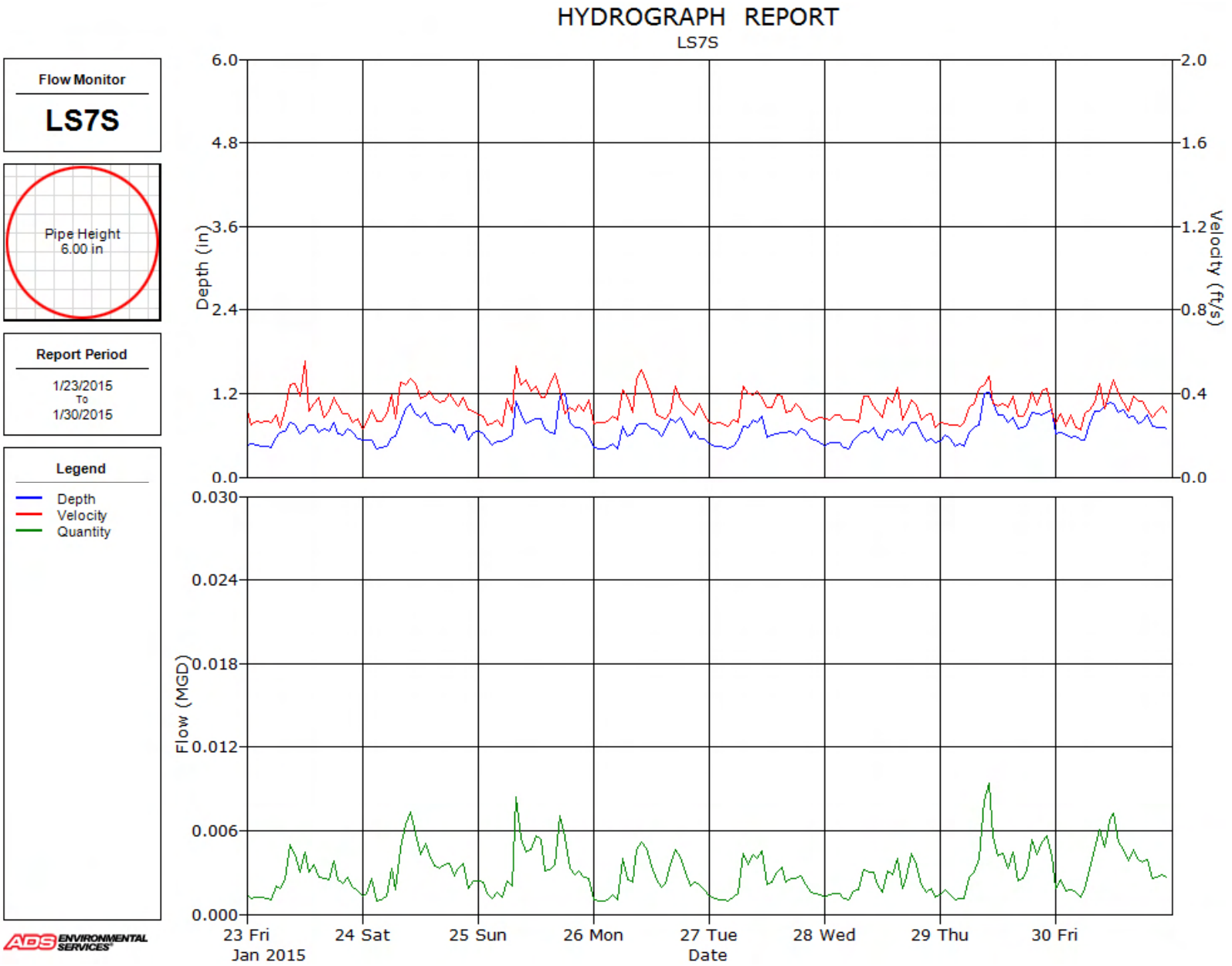
Plan

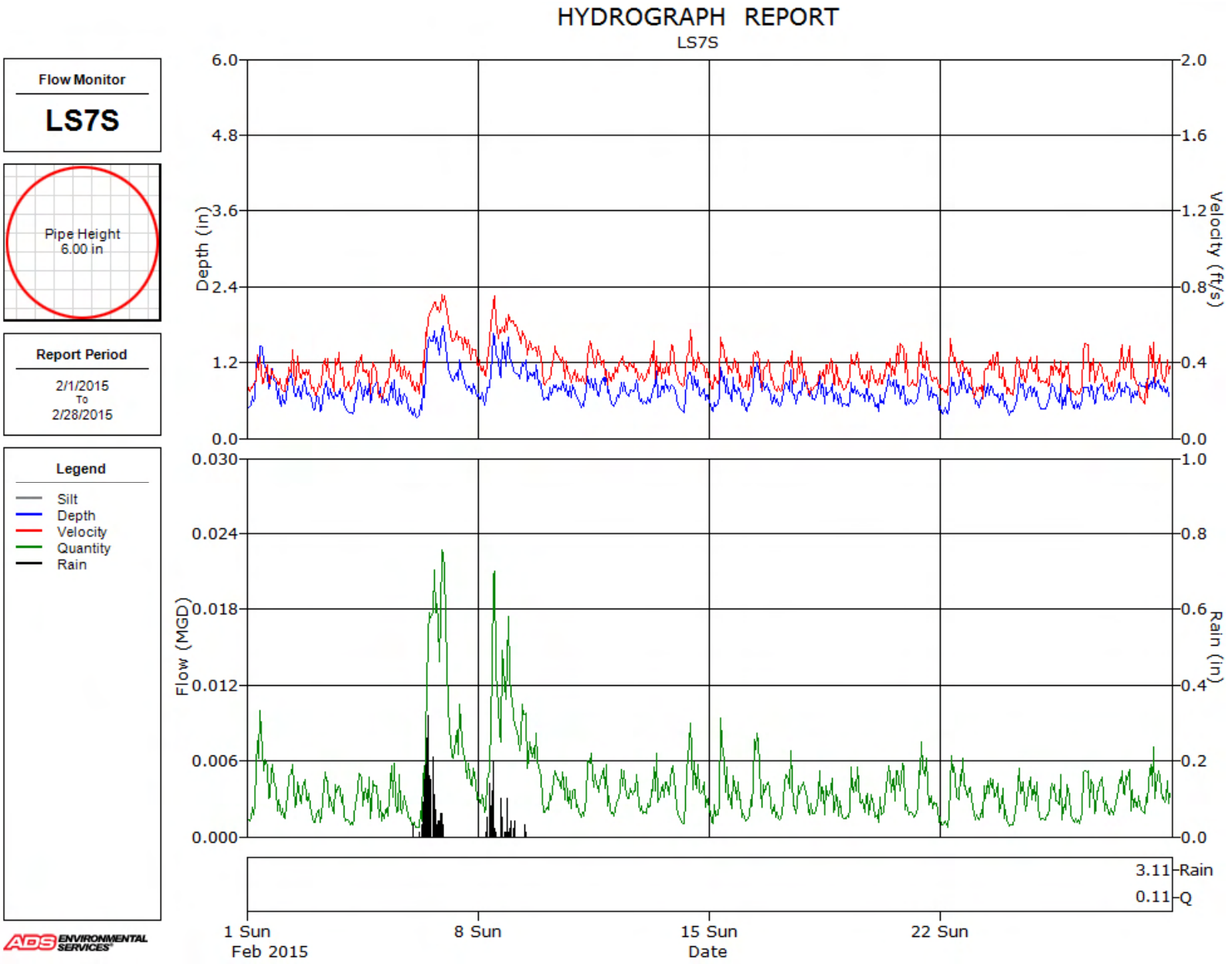
Installation Information	
Installation Type:	Ring
Sensors Devices:	Water Ultrasonic/ Pressure/ Velocity
Surcharge Height:	0
Rain Gauge Zone:	RG-WTP

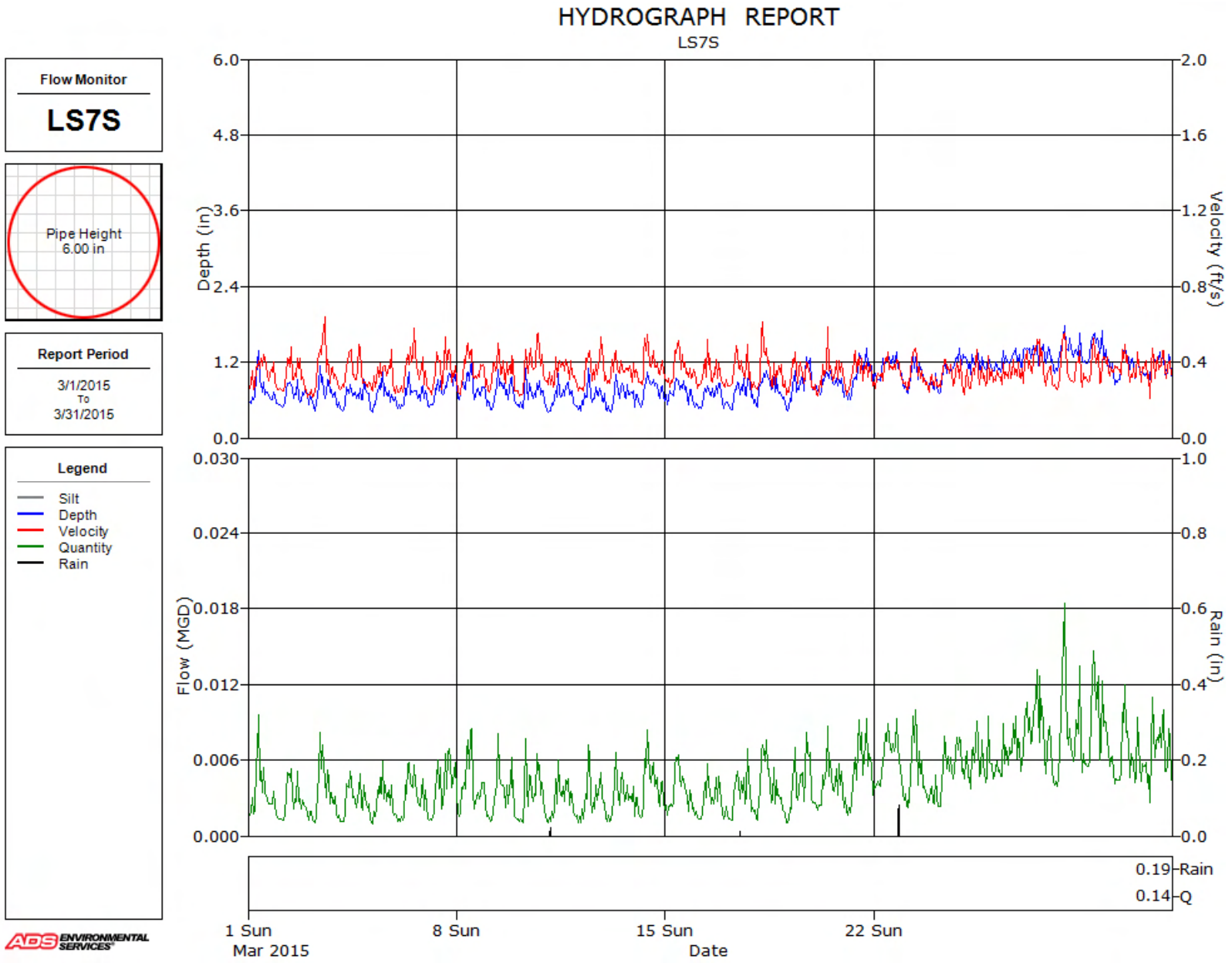
Backup	Yes	No	?	Distance
Trunk		X		
Lift / Pump Station			X	PS d/s, ~800'
WWTP		X		
Other		X		

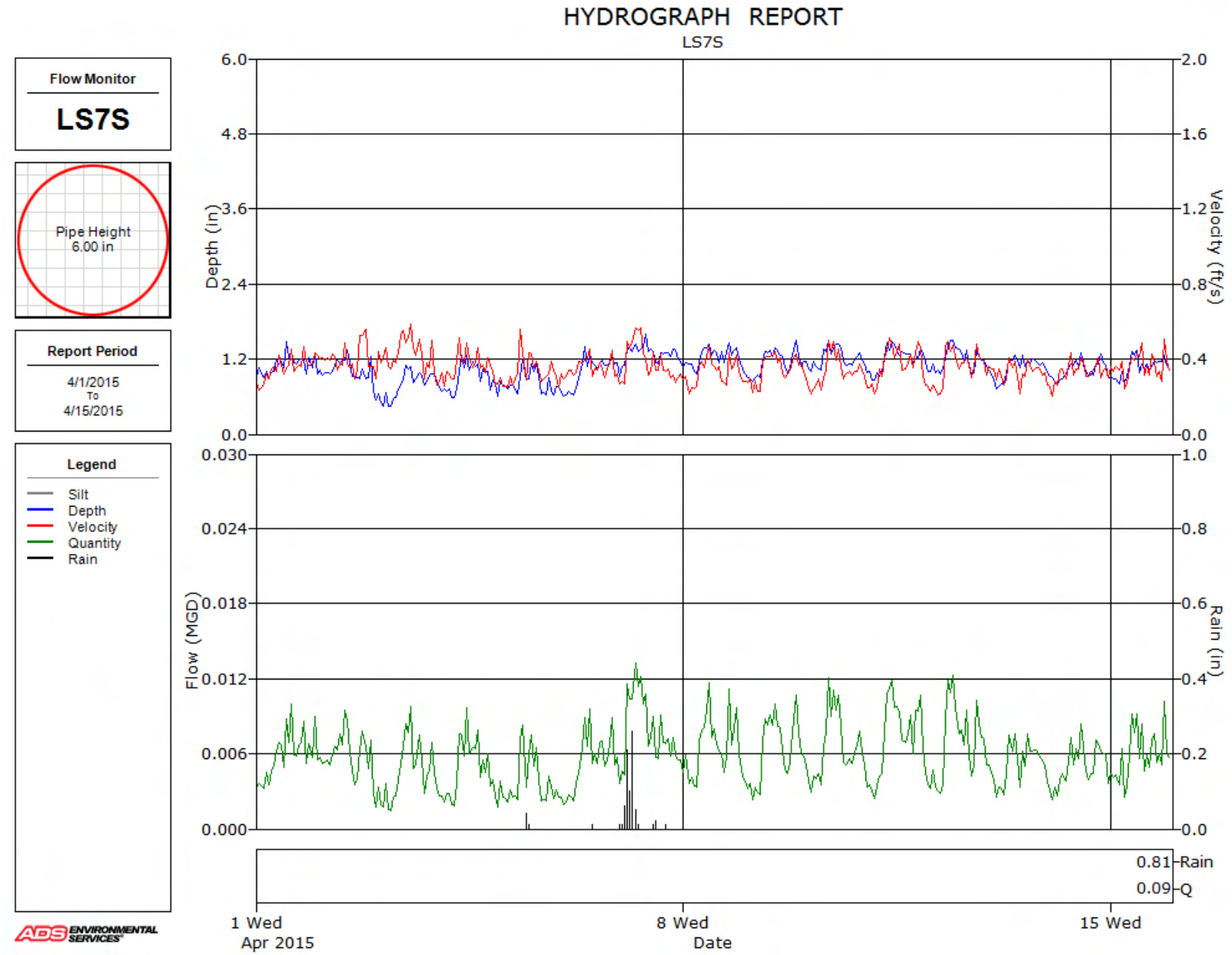
Additional Site Information / Comments:


SCATTERGRAPH REPORT
LS7S
Flow Monitor
LS7S
Pipe Height
6.00 in
Report Period
1/23/2015
To
4/15/2015
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.02 MGD
0.04 MGD
0.08 MGD
0.12 MGD
0.16 MGD
0.20 MGD
0.24 MGD
max
min
Depth (in)
Velocity (ft/s)
0
0.4
0.8
1.2
1.6
2
1.2
2.4
3.6
4.8
6
8
12
16
20


HYDROGRAPH REPORT
LS7S
Flow Monitor
LS7S
Pipe Height
6.00 in
Report Period
1/23/2015
To
1/30/2015
Legend
Depth
Velocity
Quantity
Depth (in)
Velocity (ft/s)
Flow (MGD)
6.0
4.8
3.6
2.4
1.2
0.0
2.0
1.6
1.2
0.8
0.4
0.0
0.030
0.024
0.018
0.012
0.006
0.000
23 Fri
Jan 2015
24 Sat
25 Sun
26 Mon
27 Tue
28 Wed
29 Thu
30 Fri
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS7S
Flow Monitor
LS7S
Pipe Height
6.00 in
Report Period
2/1/2015
To
2/28/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
3.11 Rain
0.11 Q
1 Sun
Feb 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS7S
Flow Monitor
LS7S
Pipe Height
6.00 in
Report Period
3/1/2015
To
3/31/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.19 Rain
0.14 Q
1 Sun
Mar 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS7S
Flow Monitor
LS7S
Pipe Height
6.00 in
Report Period
4/1/2015
To
4/15/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.81 Rain
0.09 Q
1 Wed
Apr 2015
8 Wed
15 Wed
Date

Daily Tabular Report For The Period 1/23/2015 - 4/15/2015

LS7S, Pipe Height: 6 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/23/2015	19:20	0.32	09:35	1.55	0.62	07:35	0.15	12:20	0.72	0.33	19:20	0.001	09:35	0.014	0.002	0.002	
1/24/2015	02:45	0.29	13:05	1.67	0.69	02:40	0.16	08:45	0.79	0.36	02:40	0.000	11:05	0.015	0.003	0.003	
1/25/2015	04:20	0.33	13:05	1.83	0.73	02:25	0.17	13:05	0.90	0.36	04:20	0.001	13:05	0.030	0.004	0.004	
1/26/2015	12:55	0.30	10:30	1.82	0.62	05:00	0.20	10:05	0.72	0.34	12:55	0.001	10:30	0.016	0.003	0.003	
1/27/2015	15:10	0.33	07:20	1.55	0.60	05:35	0.18	11:35	0.78	0.32	05:35	0.001	07:20	0.017	0.002	0.002	
1/28/2015	14:35	0.33	18:50	1.29	0.59	23:50	0.17	18:50	0.81	0.31	14:35	0.001	18:50	0.016	0.002	0.002	
1/29/2015	05:55	0.34	09:10	1.81	0.78	00:10	0.20	10:50	0.84	0.34	05:55	0.001	10:50	0.025	0.004	0.004	
1/30/2015	06:00	0.39	10:00	1.74	0.78	05:45	0.18	16:40	0.69	0.33	05:45	0.001	12:10	0.015	0.004	0.004	
1/31/2015	15:50	0.40	16:45	1.83	0.84	05:45	0.15	13:50	0.74	0.30	15:50	0.001	09:00	0.016	0.004	0.004	
2/1/2015	23:45	0.34	10:05	2.12	0.90	20:40	0.18	08:45	0.83	0.32	23:40	0.001	09:00	0.015	0.004	0.004	
2/2/2015	21:25	0.30	02:05	1.52	0.73	21:35	0.15	13:25	0.77	0.33	21:25	0.001	10:25	0.013	0.003	0.003	
2/3/2015	21:30	0.25	09:25	1.75	0.65	04:55	0.16	18:45	0.70	0.34	21:30	0.000	09:25	0.017	0.003	0.003	
2/4/2015	01:20	0.32	17:05	1.51	0.66	20:45	0.17	20:50	0.85	0.33	03:45	0.001	20:50	0.012	0.003	0.003	
2/5/2015	14:40	0.31	01:45	1.69	0.64	02:20	0.16	11:00	0.75	0.33	14:30	0.001	11:00	0.015	0.003	0.003	
2/6/2015	06:00	0.30	23:05	2.03	1.08	05:20	0.21	22:45	0.84	0.52	06:00	0.001	23:55	0.028	0.011	0.011	2.04
2/7/2015	23:10	0.56	00:15	1.80	0.96	23:50	0.25	17:05	0.86	0.53	23:10	0.002	00:15	0.025	0.007	0.007	
2/8/2015	05:30	0.42	11:25	2.15	1.08	04:40	0.27	12:20	0.85	0.53	05:30	0.001	12:30	0.030	0.009	0.009	0.93
2/9/2015	23:40	0.60	10:15	1.76	1.03	23:55	0.28	23:20	0.78	0.51	23:40	0.002	10:15	0.022	0.008	0.008	0.14
2/10/2015	15:45	0.40	13:55	1.53	0.75	15:45	0.21	14:30	0.69	0.37	15:45	0.001	22:10	0.013	0.004	0.004	
2/11/2015	06:15	0.39	21:20	1.44	0.76	09:35	0.25	09:40	0.74	0.38	06:15	0.001	09:40	0.014	0.004	0.004	
2/12/2015	11:35	0.42	08:35	1.70	0.70	16:45	0.22	11:30	0.61	0.36	11:35	0.001	08:35	0.017	0.003	0.003	
2/13/2015	06:30	0.44	13:10	1.56	0.74	11:35	0.21	22:25	0.82	0.38	11:25	0.001	22:25	0.017	0.004	0.004	
2/14/2015	20:35	0.28	11:50	1.82	0.72	21:05	0.20	08:15	0.82	0.37	20:35	0.000	13:45	0.018	0.004	0.004	
2/15/2015	01:40	0.26	08:40	1.88	0.73	20:10	0.19	08:30	0.72	0.37	01:40	0.000	08:35	0.019	0.004	0.004	
2/16/2015	03:45	0.36	23:20	1.84	0.75	05:45	0.16	09:15	0.79	0.35	05:45	0.001	09:15	0.022	0.004	0.004	
2/17/2015	19:35	0.42	09:35	1.75	0.73	23:55	0.14	10:50	0.81	0.33	05:05	0.001	11:00	0.014	0.003	0.003	
2/18/2015	09:40	0.34	02:05	1.36	0.72	00:55	0.20	16:30	0.79	0.32	09:40	0.001	21:10	0.012	0.003	0.003	
2/19/2015	12:25	0.38	07:10	1.71	0.66	20:00	0.16	12:50	0.75	0.34	12:25	0.001	12:35	0.017	0.003	0.003	
2/20/2015	03:25	0.34	16:20	1.64	0.70	21:35	0.21	20:30	0.77	0.37	03:25	0.001	21:00	0.015	0.003	0.003	
2/21/2015	23:55	0.37	10:50	1.85	0.72	02:20	0.19	10:05	0.78	0.34	23:55	0.001	10:50	0.017	0.003	0.003	
2/22/2015	06:20	0.34	13:05	1.58	0.71	19:40	0.19	15:30	0.79	0.35	05:40	0.001	10:05	0.018	0.003	0.003	
2/23/2015	11:45	0.33	10:35	1.71	0.67	01:05	0.17	15:05	0.82	0.33	01:50	0.001	21:05	0.019	0.003	0.003	
2/24/2015	00:25	0.32	13:45	1.49	0.65	00:20	0.11	07:20	0.66	0.33	00:20	0.000	22:40	0.014	0.003	0.003	
2/25/2015	14:20	0.30	22:05	1.57	0.64	16:50	0.19	21:35	0.68	0.33	14:20	0.001	15:50	0.012	0.003	0.003	
2/26/2015	17:50	0.40	11:50	1.68	0.68	04:35	0.20	13:50	0.77	0.34	04:10	0.001	21:15	0.017	0.003	0.003	
2/27/2015	11:45	0.29	15:15	1.56	0.71	14:45	0.19	12:00	0.79	0.35	11:55	0.000	12:00	0.018	0.003	0.003	
2/28/2015	10:45	0.46	00:15	1.62	0.82	04:25	0.16	11:45	0.75	0.34	10:45	0.001	11:45	0.015	0.004	0.004	
3/1/2015	04:00	0.33	09:45	2.06	0.73	00:45	0.19	04:30	0.80	0.34	04:00	0.001	09:15	0.021	0.003	0.003	
3/2/2015	15:25	0.31	08:20	1.94	0.68	19:10	0.18	10:55	0.75	0.32	15:25	0.001	08:20	0.015	0.003	0.003	
3/3/2015	06:40	0.35	10:40	1.56	0.71	00:40	0.17	13:25	0.84	0.36	06:40	0.001	13:25	0.018	0.003	0.003	
3/4/2015	06:25	0.36	07:35	1.53	0.66	02:00	0.21	18:05	0.83	0.34	13:00	0.001	12:00	0.011	0.003	0.003	
3/5/2015	04:20	0.34	10:50	1.45	0.67	22:25	0.21	20:05	0.79	0.33	04:20	0.001	17:05	0.012	0.003	0.003	
3/6/2015	22:45	0.42	10:25	1.69	0.68	07:25	0.12	09:20	0.83	0.36	07:25	0.001	14:35	0.014	0.003	0.003	
3/7/2015	06:00	0.41	09:40	1.94	0.77	06:00	0.13	15:40	0.90	0.35	06:00	0.001	15:40	0.026	0.004	0.004	
3/8/2015	14:50	0.39	20:05	1.68	0.82	22:50	0.14	21:30	0.80	0.35	15:05	0.001	22:20	0.015	0.004	0.004	
3/9/2015	17:35	0.33	09:25	1.54	0.72	02:35	0.16	20:15	0.87	0.35	17:45	0.001	20:15	0.020	0.003	0.003	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/10/2015	15:50	0.43	08:10	1.76	0.69	05:05	0.17	16:55	0.80	0.36	05:35	0.001	08:10	0.014	0.003	0.003	
3/11/2015	09:15	0.32	10:20	1.74	0.65	01:00	0.20	08:45	0.84	0.35	09:15	0.001	08:45	0.013	0.003	0.003	0.03
3/12/2015	22:40	0.33	10:05	1.75	0.65	05:10	0.16	18:35	0.78	0.35	05:10	0.001	11:15	0.017	0.003	0.003	
3/13/2015	05:20	0.38	13:40	1.65	0.66	16:05	0.25	13:15	0.82	0.36	05:20	0.001	13:15	0.017	0.003	0.003	
3/14/2015	00:05	0.25	14:10	1.62	0.76	17:45	0.20	10:55	0.76	0.39	00:05	0.001	11:00	0.020	0.004	0.004	
3/15/2015	23:20	0.38	21:45	1.72	0.73	04:20	0.14	10:15	0.72	0.36	23:20	0.001	09:45	0.015	0.003	0.003	
3/16/2015	13:55	0.39	14:20	1.50	0.65	06:35	0.17	10:00	0.71	0.34	06:35	0.001	10:05	0.010	0.003	0.003	
3/17/2015	02:00	0.40	15:40	1.66	0.70	23:15	0.19	18:45	0.83	0.34	23:55	0.001	18:45	0.020	0.003	0.003	0.01
3/18/2015	00:15	0.38	11:55	1.71	0.81	04:05	0.14	09:35	0.85	0.36	00:10	0.001	09:35	0.022	0.004	0.004	
3/19/2015	03:15	0.36	18:15	1.85	0.84	02:10	0.17	19:30	0.77	0.33	02:10	0.001	17:00	0.013	0.004	0.004	
3/20/2015	05:00	0.62	13:20	1.45	0.88	02:45	0.16	11:05	0.82	0.34	04:55	0.001	20:40	0.019	0.004	0.004	
3/21/2015	08:45	0.57	11:30	2.07	0.99	02:25	0.18	09:50	0.84	0.34	03:50	0.001	11:30	0.021	0.005	0.005	
3/22/2015	09:15	0.73	12:25	2.23	1.11	08:00	0.16	08:25	0.74	0.36	13:10	0.002	08:25	0.021	0.006	0.006	0.15
3/23/2015	03:10	0.66	10:45	1.89	0.96	21:30	0.16	09:15	0.74	0.33	21:30	0.001	10:45	0.018	0.005	0.005	
3/24/2015	05:15	0.68	21:55	1.92	1.04	20:55	0.18	22:15	0.85	0.33	05:15	0.001	21:55	0.026	0.005	0.005	
3/25/2015	11:00	0.89	20:30	1.94	1.19	16:20	0.18	20:30	0.70	0.33	06:45	0.002	20:30	0.025	0.006	0.006	
3/26/2015	23:10	0.90	18:10	2.14	1.20	21:15	0.17	18:10	1.01	0.34	11:35	0.003	18:10	0.041	0.006	0.006	
3/27/2015	12:35	0.95	11:10	2.31	1.36	01:20	0.16	12:45	0.77	0.40	07:20	0.003	11:10	0.023	0.009	0.009	
3/28/2015	02:35	0.98	10:15	2.68	1.36	02:30	0.19	08:50	0.84	0.36	02:30	0.003	10:15	0.036	0.008	0.008	
3/29/2015	23:55	0.92	11:00	2.66	1.36	21:50	0.16	13:35	0.82	0.37	21:05	0.003	07:00	0.030	0.008	0.008	
3/30/2015	17:40	0.73	11:05	1.92	1.12	01:45	0.19	18:05	0.79	0.37	05:25	0.002	10:15	0.027	0.006	0.006	
3/31/2015	20:30	0.78	08:35	2.17	1.14	00:00	0.16	17:30	0.88	0.38	00:00	0.002	17:30	0.029	0.007	0.007	
4/1/2015	00:15	0.81	12:35	1.93	1.12	07:15	0.15	10:05	0.69	0.35	07:15	0.002	14:20	0.018	0.006	0.006	
4/2/2015	23:45	0.41	11:25	1.98	1.00	08:30	0.16	09:45	0.92	0.40	23:10	0.001	09:45	0.030	0.006	0.006	
4/3/2015	05:15	0.39	11:50	2.01	0.79	23:45	0.18	16:25	0.85	0.43	04:55	0.001	11:50	0.025	0.005	0.005	
4/4/2015	23:55	0.50	11:00	1.88	0.89	23:15	0.18	08:10	0.82	0.36	23:40	0.001	08:35	0.021	0.005	0.005	
4/5/2015	16:45	0.37	09:25	1.99	0.83	19:45	0.17	08:30	0.78	0.33	16:45	0.001	12:10	0.019	0.004	0.004	0.05
4/6/2015	01:40	0.59	16:20	1.85	0.99	01:25	0.16	19:20	0.82	0.35	01:25	0.001	16:20	0.026	0.005	0.005	0.02
4/7/2015	00:30	0.76	09:40	2.18	1.30	00:55	0.20	02:20	0.94	0.38	00:55	0.002	02:20	0.037	0.008	0.008	0.74
4/8/2015	23:55	0.72	12:00	2.08	1.23	05:55	0.20	01:55	0.88	0.33	05:55	0.002	18:10	0.028	0.007	0.007	
4/9/2015	00:00	0.74	20:20	2.04	1.14	01:05	0.16	21:45	0.99	0.34	01:35	0.002	21:45	0.030	0.006	0.006	
4/10/2015	19:10	0.77	12:55	2.16	1.21	05:10	0.17	12:15	0.73	0.33	05:10	0.002	12:55	0.023	0.006	0.006	
4/11/2015	01:50	0.69	22:30	2.26	1.20	08:10	0.16	20:30	0.93	0.37	01:50	0.002	17:05	0.030	0.007	0.007	
4/12/2015	18:30	0.70	10:10	2.07	1.19	05:40	0.18	19:45	0.87	0.35	01:50	0.002	15:10	0.029	0.007	0.007	
4/13/2015	02:45	0.65	15:05	2.05	1.05	03:40	0.14	15:15	0.94	0.33	03:40	0.001	15:15	0.027	0.005	0.005	
4/14/2015	01:55	0.70	18:55	1.99	1.03	04:10	0.16	18:55	0.88	0.33	04:10	0.002	18:55	0.032	0.005	0.005	
4/15/2015	00:20	0.74	21:05	2.03	1.07	05:30	0.16	21:15	0.87	0.36	05:30	0.001	04:30	0.031	0.006	0.006	

Report Summary For The Period 1/23/2015 - 4/15/2015

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			0.366	4.11
Avg	0.85	0.36	0.004	

Site Commentary

Site Information

LS7W	
Pipe Dimensions	12"x12.13"
Silt Level	0.00"

Overview

Site LS7W functioned under normal conditions during the period Friday, January 23, 2015 to Wednesday, April 15, 2015 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

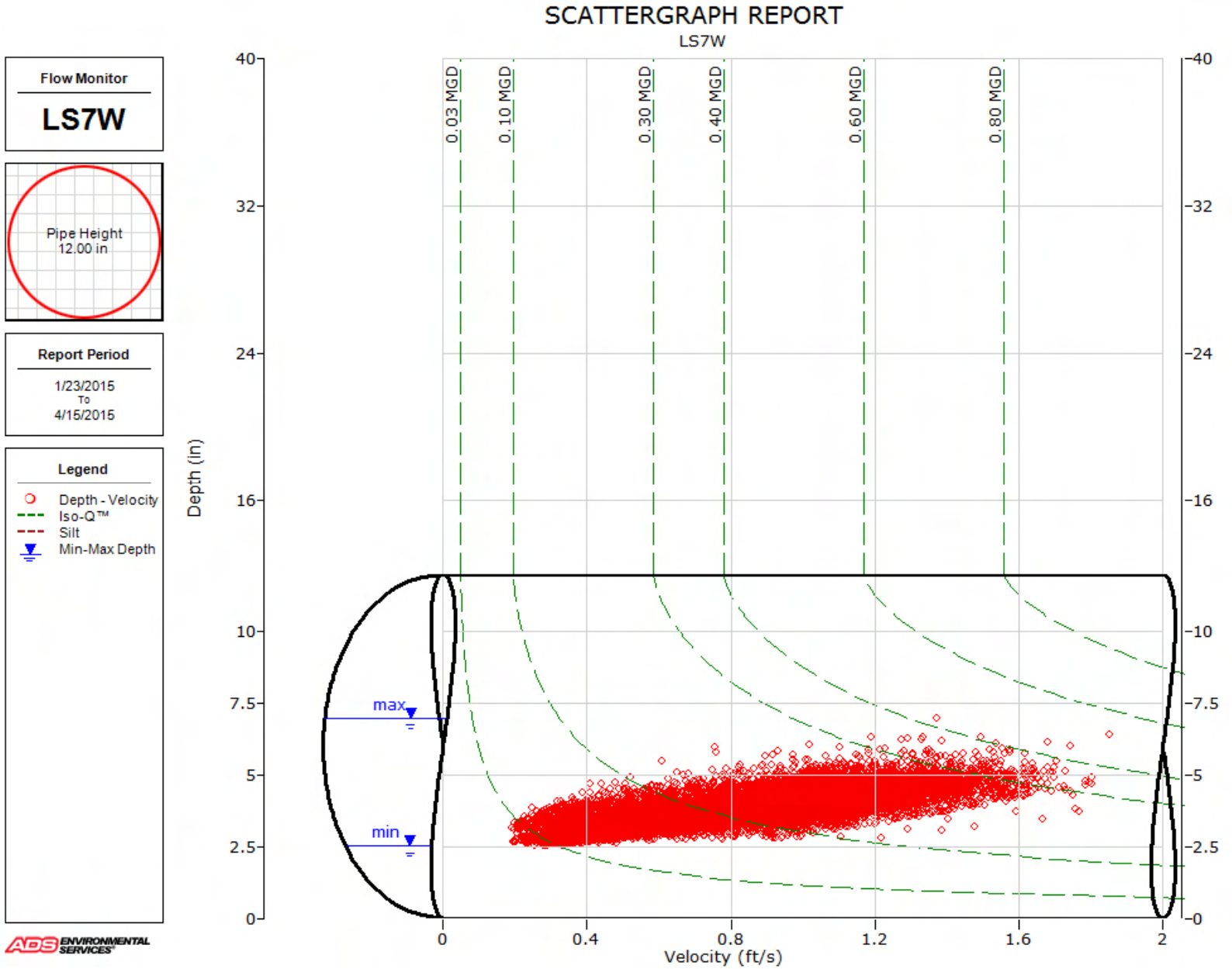
Average flow depth, velocity, and quantity data observed during Friday, January 23, 2015 to Wednesday, April 15, 2015 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at approximately 58% full at its recorded 5-minute peak of 6.99 inches and approximately 30% full during the typical average depth of 3.63 inches.

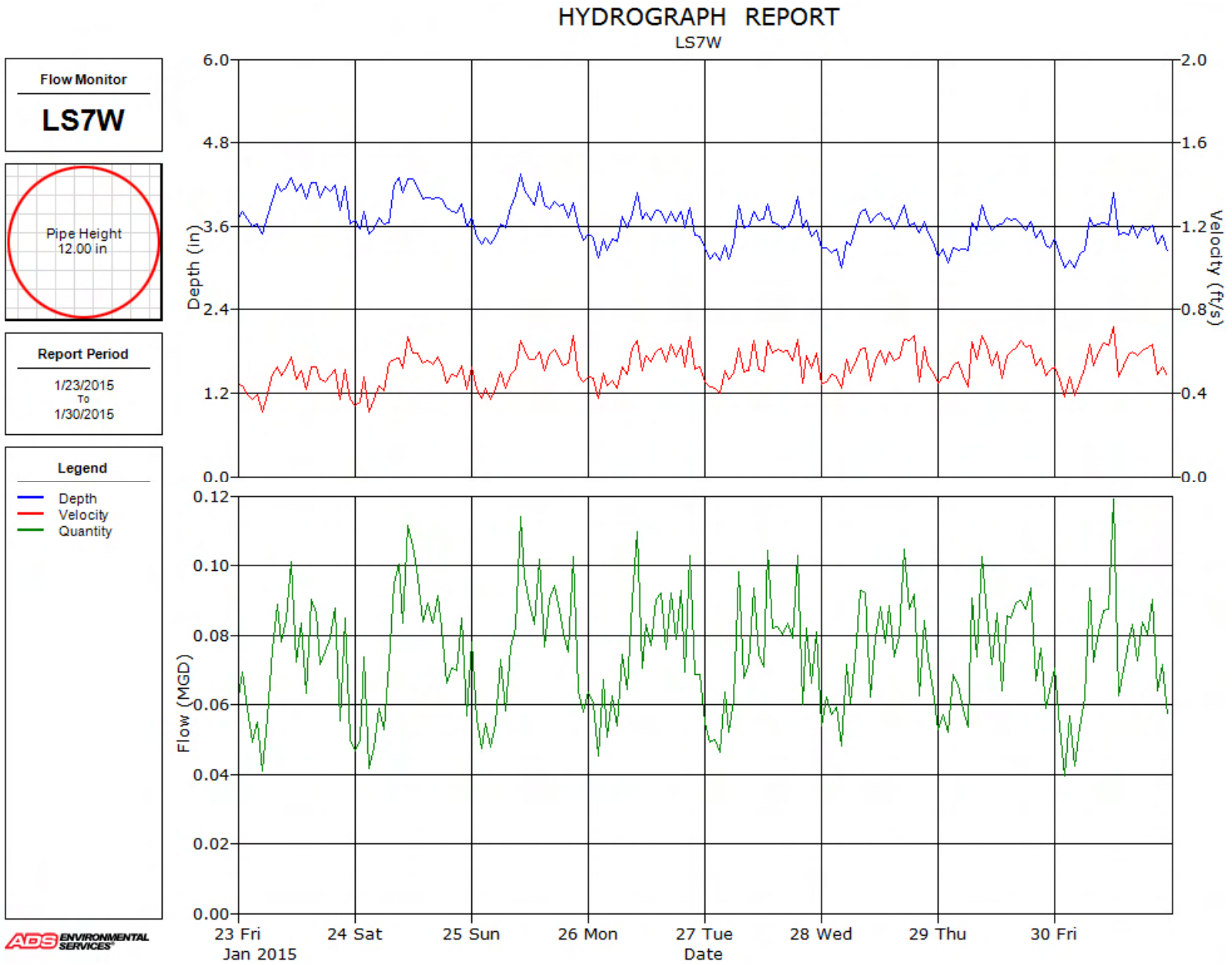
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.63	0.74	0.105
Minimum	2.52	0.19	0.017
Maximum	6.99	1.85	0.515
Time of Minimum	2/4/2015 4:05 AM	1/24/2015 3:05 AM	1/30/2015 4:15 AM
Time of Maximum	4/12/2015 8:30 PM	4/12/2015 8:25 PM	4/12/2015 8:25 PM

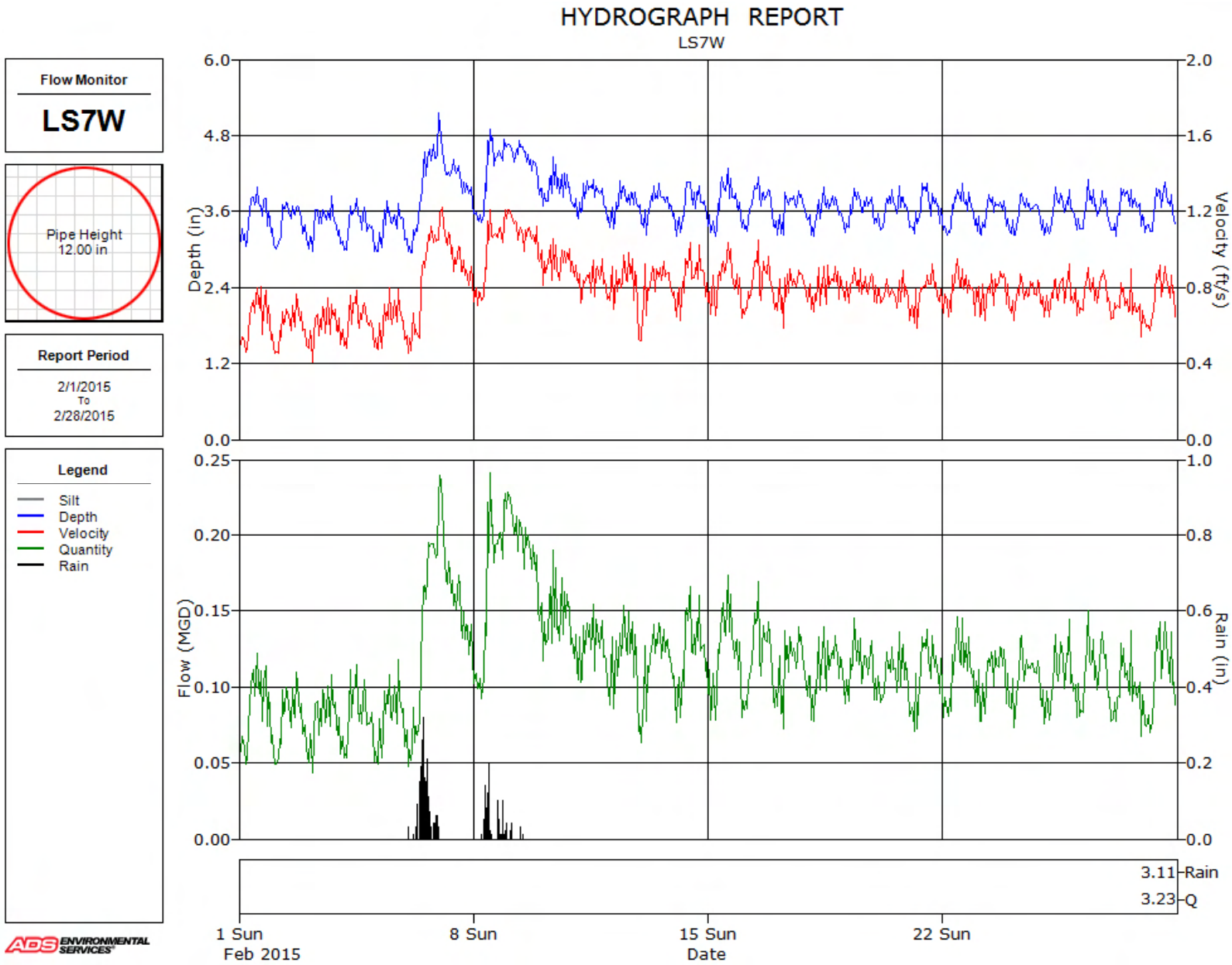
Data Quality

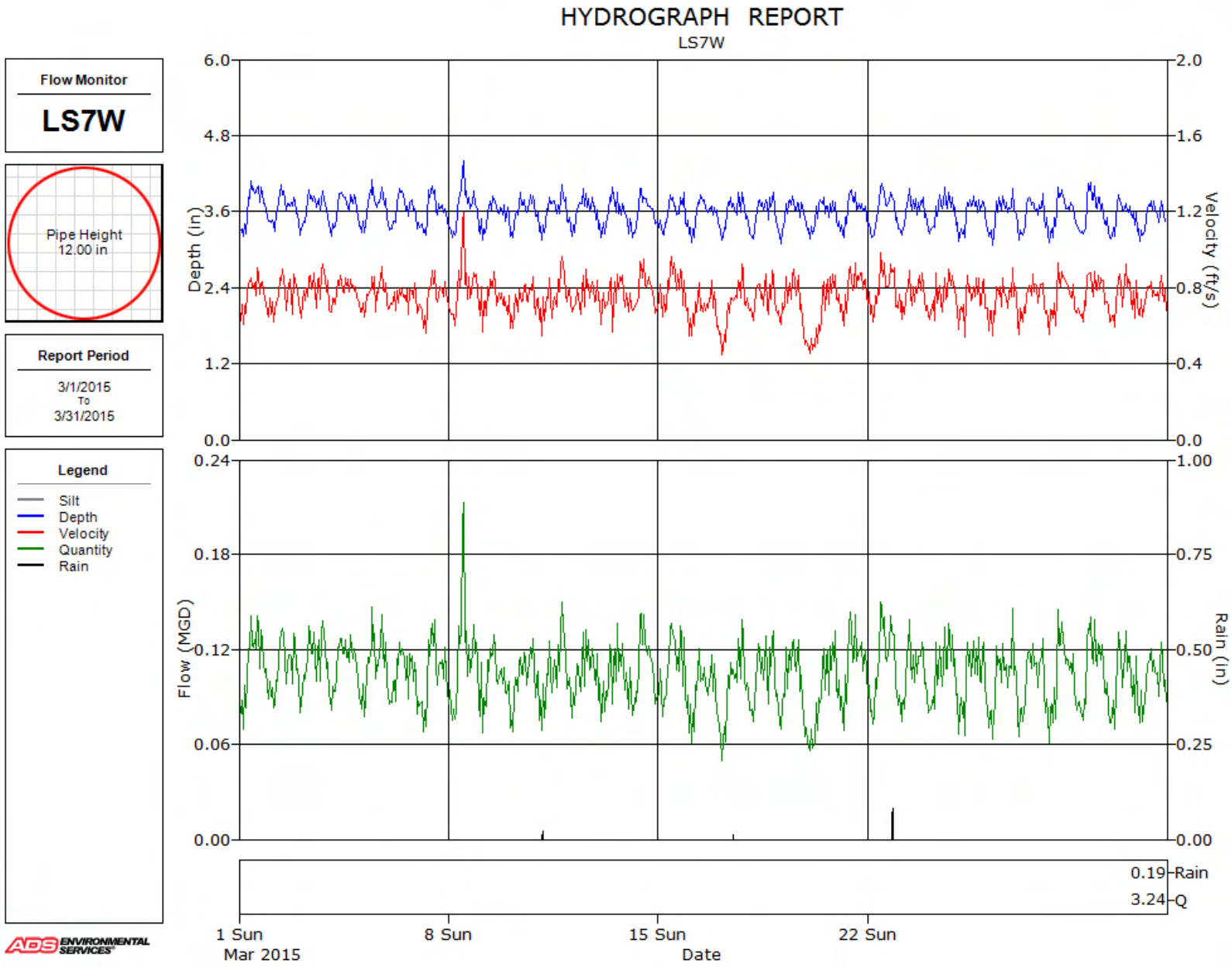
Data uptime observed during the Friday, January 23, 2015 to the Wednesday, April 15, 2015 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

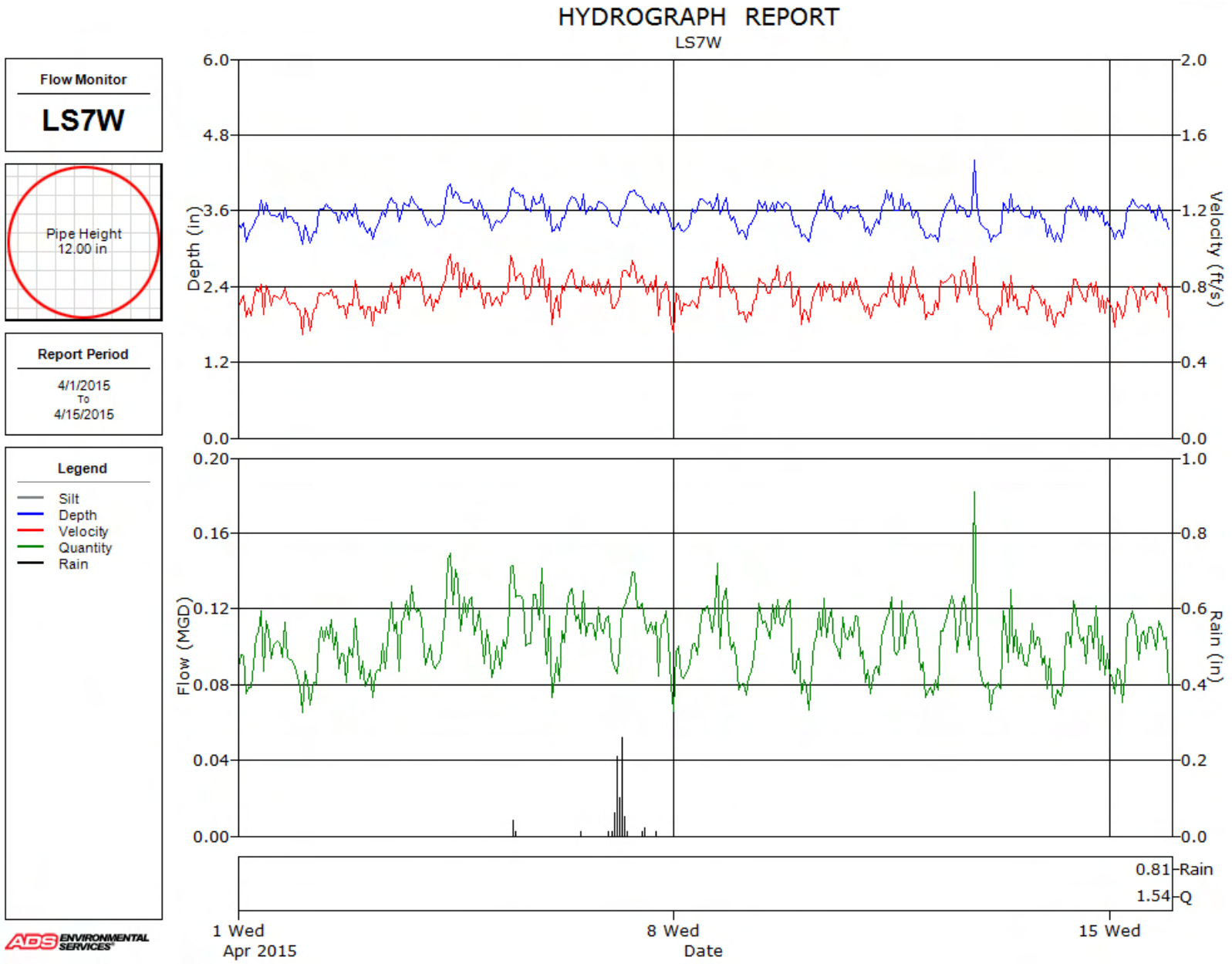
Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100


SCATTERGRAPH REPORT
LS7W
Flow Monitor
LS7W
Pipe Height
12.00 in
Report Period
1/23/2015
To
4/15/2015
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.03 MGD
0.10 MGD
0.30 MGD
0.40 MGD
0.60 MGD
0.80 MGD
max
min
Depth (in)
Velocity (ft/s)
0
0.4
0.8
1.2
1.6
2
2.5
5
7.5
10
16
24
32
40


HYDROGRAPH REPORT
LS7W
Flow Monitor
LS7W
Pipe Height
12.00 in
Report Period
1/23/2015
To
1/30/2015
Legend
Depth
Velocity
Quantity
Depth (in)
Velocity (ft/s)
Flow (MGD)
6.0
4.8
3.6
2.4
1.2
0.0
2.0
1.6
1.2
0.8
0.4
0.0
0.12
0.10
0.08
0.06
0.04
0.02
0.00
23 Fri
Jan 2015
24 Sat
25 Sun
26 Mon
27 Tue
28 Wed
29 Thu
30 Fri
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS7W
Flow Monitor
LS7W
Pipe Height
12.00 in
Report Period
2/1/2015
To
2/28/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
3.11 Rain
3.23 Q
1 Sun
Feb 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS7W
Flow Monitor
LS7W
Pipe Height
12.00 in
Report Period
3/1/2015
To
3/31/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.19 Rain
3.24 Q
1 Sun
Mar 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
LS7W
Flow Monitor
LS7W
Pipe Height
12.00 in
Report Period
4/1/2015
To
4/15/2015
Legend
Silt
Depth
Velocity
Quantity
Rain
Depth (in)
Velocity (ft/s)
Flow (MGD)
Rain (in)
0.81 Rain
1.54 Q
1 Wed
Apr 2015
8 Wed
15 Wed
Date
ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 1/23/2015 - 4/15/2015

LS7W, Pipe Height: 12 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/23/2015	02:35	3.19	11:45	5.63	3.97	02:00	0.20	11:45	1.15	0.46	02:35	0.023	11:45	0.273	0.072	0.072	
1/24/2015	04:30	3.09	09:30	5.82	3.89	03:05	0.19	12:40	1.28	0.49	03:05	0.020	12:40	0.308	0.075	0.075	
1/25/2015	04:00	2.95	10:55	5.63	3.77	02:15	0.20	16:10	1.27	0.52	02:15	0.020	08:05	0.249	0.077	0.077	
1/26/2015	05:00	2.78	10:05	5.45	3.62	05:00	0.22	10:05	1.32	0.54	05:00	0.020	10:05	0.300	0.075	0.075	
1/27/2015	03:50	2.75	19:05	5.28	3.55	05:15	0.23	16:55	1.25	0.54	05:15	0.020	19:05	0.232	0.073	0.073	
1/28/2015	04:15	2.69	17:35	5.80	3.54	04:50	0.22	17:35	1.34	0.54	04:50	0.019	17:35	0.330	0.074	0.074	
1/29/2015	03:40	2.71	09:45	4.95	3.49	02:50	0.21	10:45	1.48	0.55	02:50	0.019	07:00	0.251	0.074	0.074	
1/30/2015	03:40	2.60	12:25	5.55	3.45	04:15	0.20	11:40	1.32	0.55	04:15	0.017	12:25	0.255	0.072	0.072	
1/31/2015	02:20	2.65	09:45	5.42	3.45	05:30	0.20	14:00	1.32	0.57	05:30	0.018	14:00	0.295	0.075	0.075	
2/1/2015	00:50	2.70	09:15	5.20	3.51	16:40	0.25	22:45	1.37	0.63	01:30	0.024	10:40	0.276	0.085	0.085	
2/2/2015	04:40	2.62	07:05	5.08	3.46	04:00	0.22	17:55	1.44	0.61	04:00	0.020	07:05	0.281	0.080	0.080	
2/3/2015	05:20	2.67	12:40	5.09	3.41	05:15	0.25	21:00	1.39	0.60	05:15	0.021	21:00	0.264	0.077	0.077	
2/4/2015	04:05	2.52	18:25	5.34	3.40	05:10	0.28	23:30	1.47	0.63	04:05	0.022	08:30	0.281	0.081	0.081	
2/5/2015	03:50	2.61	18:05	4.94	3.37	04:30	0.28	09:30	1.59	0.62	04:30	0.023	09:30	0.269	0.079	0.079	
2/6/2015	03:20	2.54	23:15	6.06	3.91	00:00	0.23	23:30	1.64	0.81	04:45	0.020	23:30	0.351	0.131	0.131	2.04
2/7/2015	23:45	3.05	00:20	6.16	4.20	23:45	0.33	07:40	1.65	0.98	23:45	0.034	01:30	0.385	0.164	0.164	
2/8/2015	03:40	2.82	14:40	6.33	4.18	01:10	0.32	17:25	1.68	0.97	01:15	0.031	17:25	0.444	0.165	0.165	0.93
2/9/2015	23:15	3.16	09:50	6.24	4.45	23:00	0.52	04:45	1.74	1.10	23:00	0.056	04:45	0.449	0.196	0.196	0.14
2/10/2015	02:25	3.00	15:00	5.87	3.99	02:25	0.41	01:20	1.62	0.94	02:25	0.041	15:00	0.393	0.147	0.147	
2/11/2015	04:45	2.85	07:00	5.62	3.83	06:10	0.37	22:25	1.63	0.85	04:45	0.034	16:45	0.326	0.128	0.128	
2/12/2015	01:10	2.80	15:35	5.45	3.72	23:40	0.33	15:35	1.70	0.81	23:40	0.033	15:35	0.386	0.117	0.117	
2/13/2015	05:40	2.78	13:20	5.73	3.69	00:00	0.31	05:20	1.69	0.82	05:15	0.030	21:20	0.350	0.118	0.118	
2/14/2015	04:35	2.76	21:40	5.47	3.70	05:00	0.28	08:15	1.62	0.84	05:00	0.026	09:15	0.344	0.122	0.122	
2/15/2015	06:05	2.71	09:10	6.32	3.73	06:05	0.33	18:05	1.67	0.84	06:05	0.028	11:40	0.390	0.124	0.124	
2/16/2015	04:10	2.72	12:20	5.32	3.71	00:55	0.34	07:45	1.68	0.82	00:55	0.031	07:45	0.312	0.118	0.118	
2/17/2015	03:25	2.70	11:55	5.28	3.64	03:00	0.32	17:00	1.80	0.79	03:00	0.028	07:45	0.344	0.112	0.112	
2/18/2015	03:20	2.75	17:30	5.42	3.62	04:10	0.37	00:55	1.58	0.80	04:10	0.034	22:15	0.314	0.112	0.112	
2/19/2015	05:25	2.74	18:00	5.33	3.64	03:45	0.35	21:00	1.79	0.81	03:45	0.032	21:00	0.336	0.113	0.113	
2/20/2015	04:10	2.73	17:40	5.89	3.65	05:00	0.33	19:40	1.45	0.78	05:00	0.030	17:40	0.338	0.109	0.109	
2/21/2015	03:45	2.78	09:25	5.90	3.65	20:40	0.33	23:45	1.63	0.76	00:10	0.030	09:25	0.390	0.107	0.107	
2/22/2015	04:50	2.67	14:05	5.07	3.63	23:50	0.27	14:05	1.69	0.79	23:50	0.026	14:05	0.348	0.110	0.110	
2/23/2015	03:40	2.68	15:10	5.11	3.59	06:30	0.35	20:10	1.53	0.79	02:45	0.032	14:20	0.275	0.108	0.108	
2/24/2015	02:25	2.69	14:40	5.48	3.57	01:55	0.29	08:35	1.53	0.76	01:55	0.026	14:40	0.310	0.105	0.105	
2/25/2015	01:35	2.71	19:10	5.27	3.61	01:30	0.38	13:15	1.54	0.77	01:35	0.033	19:10	0.328	0.106	0.106	
2/26/2015	05:50	2.75	08:55	5.43	3.63	05:50	0.34	09:10	1.73	0.78	05:50	0.031	01:00	0.319	0.109	0.109	
2/27/2015	02:25	2.72	08:35	5.05	3.65	23:50	0.34	10:35	1.42	0.70	23:50	0.031	10:35	0.266	0.098	0.098	
2/28/2015	05:45	2.74	23:40	5.15	3.64	02:45	0.29	12:35	1.79	0.75	02:45	0.026	12:35	0.326	0.106	0.106	
3/1/2015	05:40	2.66	14:45	5.48	3.69	23:25	0.34	10:20	1.54	0.76	05:40	0.030	10:20	0.348	0.110	0.110	
3/2/2015	04:40	2.69	00:20	5.22	3.66	00:15	0.30	21:50	1.67	0.76	00:15	0.026	21:50	0.295	0.109	0.109	
3/3/2015	03:00	2.67	08:45	5.24	3.66	04:50	0.28	21:05	1.52	0.79	04:50	0.025	10:40	0.292	0.113	0.113	
3/4/2015	02:00	2.62	17:30	5.43	3.65	02:00	0.31	16:45	1.54	0.78	02:00	0.025	16:45	0.326	0.111	0.111	
3/5/2015	03:50	2.64	12:35	5.33	3.68	22:20	0.32	13:05	1.56	0.77	03:50	0.027	12:35	0.330	0.110	0.110	
3/6/2015	04:35	2.63	09:50	5.24	3.63	04:30	0.27	05:50	1.41	0.75	04:30	0.024	15:10	0.266	0.104	0.104	
3/7/2015	06:35	2.73	08:30	4.95	3.61	06:35	0.32	10:00	1.62	0.75	06:35	0.028	10:00	0.298	0.104	0.104	
3/8/2015	02:15	2.64	09:45	5.15	3.67	05:25	0.30	08:25	1.59	0.81	05:25	0.026	20:30	0.307	0.116	0.116	
3/9/2015	03:15	2.67	13:40	5.05	3.55	07:00	0.28	16:45	1.47	0.75	07:00	0.026	13:40	0.279	0.101	0.101	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/10/2015	05:45	2.71	16:30	5.04	3.61	05:45	0.32	16:30	1.55	0.73	05:45	0.028	16:30	0.317	0.102	0.102	
3/11/2015	03:55	2.65	09:10	4.94	3.62	03:30	0.32	21:15	1.73	0.75	03:30	0.027	09:10	0.318	0.105	0.105	0.03
3/12/2015	04:50	2.77	16:15	5.24	3.61	17:50	0.28	12:25	1.42	0.76	17:50	0.026	16:15	0.258	0.105	0.105	
3/13/2015	02:55	2.71	09:45	5.00	3.58	03:15	0.36	12:40	1.66	0.75	01:35	0.032	12:40	0.311	0.103	0.103	
3/14/2015	03:05	2.68	11:25	5.16	3.57	20:50	0.32	15:40	1.65	0.77	06:15	0.029	15:40	0.325	0.107	0.107	
3/15/2015	06:35	2.69	20:50	5.47	3.57	20:00	0.35	18:00	1.71	0.80	06:35	0.033	18:00	0.304	0.108	0.108	
3/16/2015	03:10	2.66	12:50	4.96	3.57	01:35	0.27	07:10	1.33	0.69	01:35	0.023	07:10	0.241	0.094	0.094	
3/17/2015	04:50	2.65	12:15	5.36	3.57	04:50	0.20	20:50	1.37	0.69	04:50	0.017	12:15	0.274	0.095	0.095	0.01
3/18/2015	03:50	2.65	08:45	5.13	3.58	03:50	0.32	08:45	1.58	0.75	03:50	0.027	08:45	0.331	0.104	0.104	
3/19/2015	03:05	2.66	00:55	4.71	3.56	23:25	0.26	07:45	1.52	0.72	23:25	0.023	07:45	0.268	0.098	0.098	
3/20/2015	02:55	2.65	10:15	5.29	3.56	02:30	0.22	22:00	1.80	0.66	02:30	0.019	22:00	0.353	0.091	0.091	
3/21/2015	05:35	2.72	09:45	4.84	3.60	07:10	0.33	23:40	1.58	0.79	04:20	0.030	06:15	0.287	0.109	0.109	
3/22/2015	05:00	2.64	11:05	5.22	3.63	06:50	0.33	06:55	1.59	0.80	06:50	0.028	06:55	0.326	0.112	0.112	0.15
3/23/2015	03:40	2.69	10:05	5.32	3.59	05:40	0.23	09:05	1.65	0.76	05:40	0.022	09:05	0.336	0.104	0.104	
3/24/2015	06:10	2.76	22:40	5.11	3.61	06:10	0.28	07:50	1.59	0.76	06:10	0.025	11:30	0.288	0.105	0.105	
3/25/2015	04:15	2.66	17:30	5.38	3.56	22:25	0.31	13:50	1.64	0.74	04:15	0.029	17:30	0.340	0.102	0.102	
3/26/2015	04:15	2.60	20:20	5.75	3.57	01:40	0.27	20:20	1.56	0.74	01:40	0.023	20:20	0.380	0.101	0.101	
3/27/2015	04:15	2.62	21:30	4.90	3.56	04:15	0.28	08:50	1.48	0.74	04:15	0.024	12:05	0.274	0.101	0.101	
3/28/2015	03:40	2.63	11:20	5.03	3.59	03:40	0.28	17:40	1.42	0.75	03:40	0.023	12:55	0.285	0.103	0.103	
3/29/2015	02:25	2.67	14:20	5.36	3.61	02:00	0.29	20:40	1.69	0.77	02:00	0.025	20:40	0.349	0.107	0.107	
3/30/2015	05:00	2.62	09:20	5.09	3.53	04:35	0.32	17:10	1.44	0.75	04:35	0.026	09:55	0.276	0.101	0.101	
3/31/2015	02:10	2.61	13:15	4.97	3.51	01:45	0.33	20:30	1.55	0.75	02:10	0.028	12:45	0.273	0.100	0.100	
4/1/2015	01:50	2.65	09:00	4.97	3.47	13:05	0.33	01:55	1.54	0.73	03:05	0.030	08:10	0.268	0.096	0.096	
4/2/2015	04:35	2.57	14:45	5.08	3.47	04:35	0.27	14:45	1.65	0.71	04:35	0.021	14:45	0.341	0.094	0.094	
4/3/2015	04:10	2.58	09:45	5.06	3.55	06:50	0.28	22:10	1.54	0.76	06:50	0.024	22:10	0.299	0.103	0.103	
4/4/2015	03:25	2.81	12:15	5.23	3.65	23:55	0.35	18:30	1.58	0.80	23:55	0.034	12:15	0.312	0.113	0.113	
4/5/2015	01:40	2.82	18:40	5.07	3.64	04:25	0.36	04:55	1.55	0.80	04:25	0.033	10:15	0.269	0.112	0.112	0.05
4/6/2015	04:05	2.80	13:05	4.89	3.61	11:00	0.35	11:30	1.63	0.79	04:05	0.033	13:05	0.275	0.109	0.109	0.02
4/7/2015	23:05	2.76	07:35	5.09	3.65	23:00	0.34	09:30	1.78	0.79	23:05	0.031	09:30	0.339	0.111	0.111	0.74
4/8/2015	02:30	2.64	07:45	4.96	3.56	01:40	0.31	01:45	1.76	0.77	01:40	0.026	20:50	0.333	0.105	0.105	
4/9/2015	04:15	2.59	14:20	5.02	3.53	02:40	0.30	09:05	1.74	0.76	04:15	0.026	14:20	0.329	0.103	0.103	
4/10/2015	03:45	2.59	23:10	5.22	3.54	01:10	0.33	00:50	1.67	0.76	03:20	0.029	23:10	0.314	0.102	0.102	
4/11/2015	04:55	2.78	10:10	5.14	3.57	02:10	0.32	11:20	1.61	0.75	03:00	0.030	11:20	0.266	0.102	0.102	
4/12/2015	04:10	2.62	20:30	6.99	3.52	01:35	0.31	20:25	1.85	0.77	01:35	0.027	20:25	0.515	0.104	0.104	
4/13/2015	04:30	2.53	10:45	4.94	3.49	06:25	0.28	12:55	1.56	0.72	06:25	0.024	10:45	0.294	0.095	0.095	
4/14/2015	00:55	2.60	07:50	5.12	3.49	06:20	0.30	14:00	1.57	0.72	06:20	0.027	07:50	0.307	0.097	0.097	
4/15/2015	03:20	2.56	19:15	5.05	3.50	02:30	0.31	21:15	1.56	0.73	02:30	0.025	18:10	0.287	0.099	0.099	

Report Summary For The Period 1/23/2015 - 4/15/2015

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			8.676	4.11
Avg	3.63	0.74	0.105	

Site Commentary

Site Information

WTP-RG01
Rain Gauge with Tipping Bucket

Observations

Rainfall observed during January 23, 2015 through April 15, 2015 equaled 4.11 inches.

ADS Site Report

Quality Form

Project Name: ClearLake.MCEng.TFM.CA15	**Project No.** 22002	**City:** Clearlake Oaks, CA	**FM Initials:** SW
Site Name: WTP_RG01	**Install Date:** 1/22/15	**Monitor Type**	Rain Gauge Data Logger
Address/Location: Intersection of Island Drive and Hwy 20 Inside WTP		**Monitor Model**	FlowShark AG
		Tipping Bucket Model	Hydrological Services TB06
Access: Drive	**Type of System:** Sanitary [X] Storm [ ] Combined [ ]	**Tipping Bucket Dia.**	8"
		Data Acquisition	Wireless



Rain Gauge Area

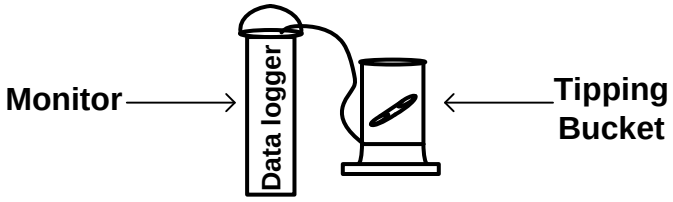


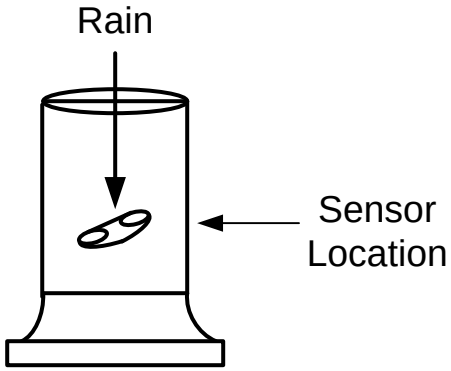
Rain Gauge Photo





Other Information:

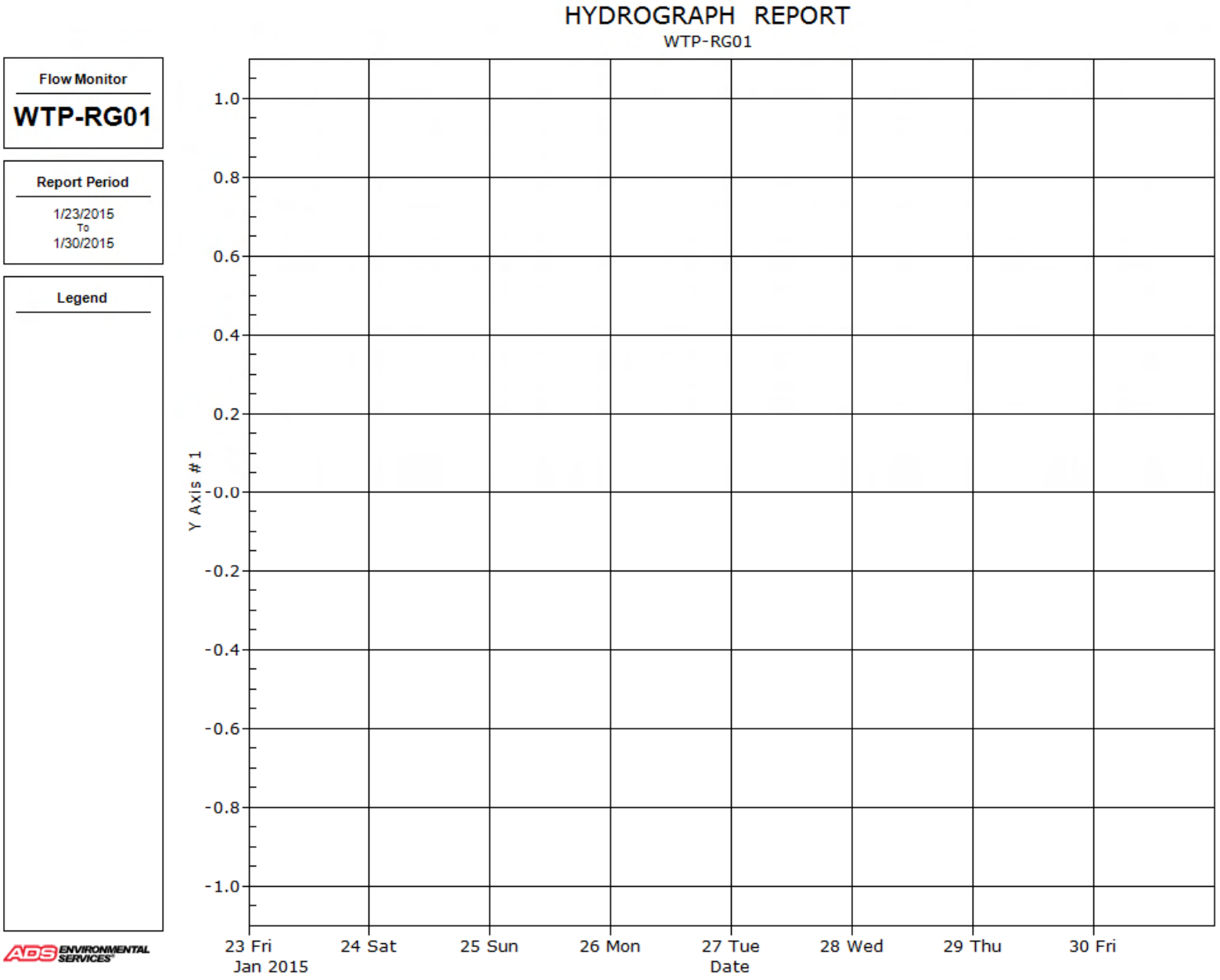


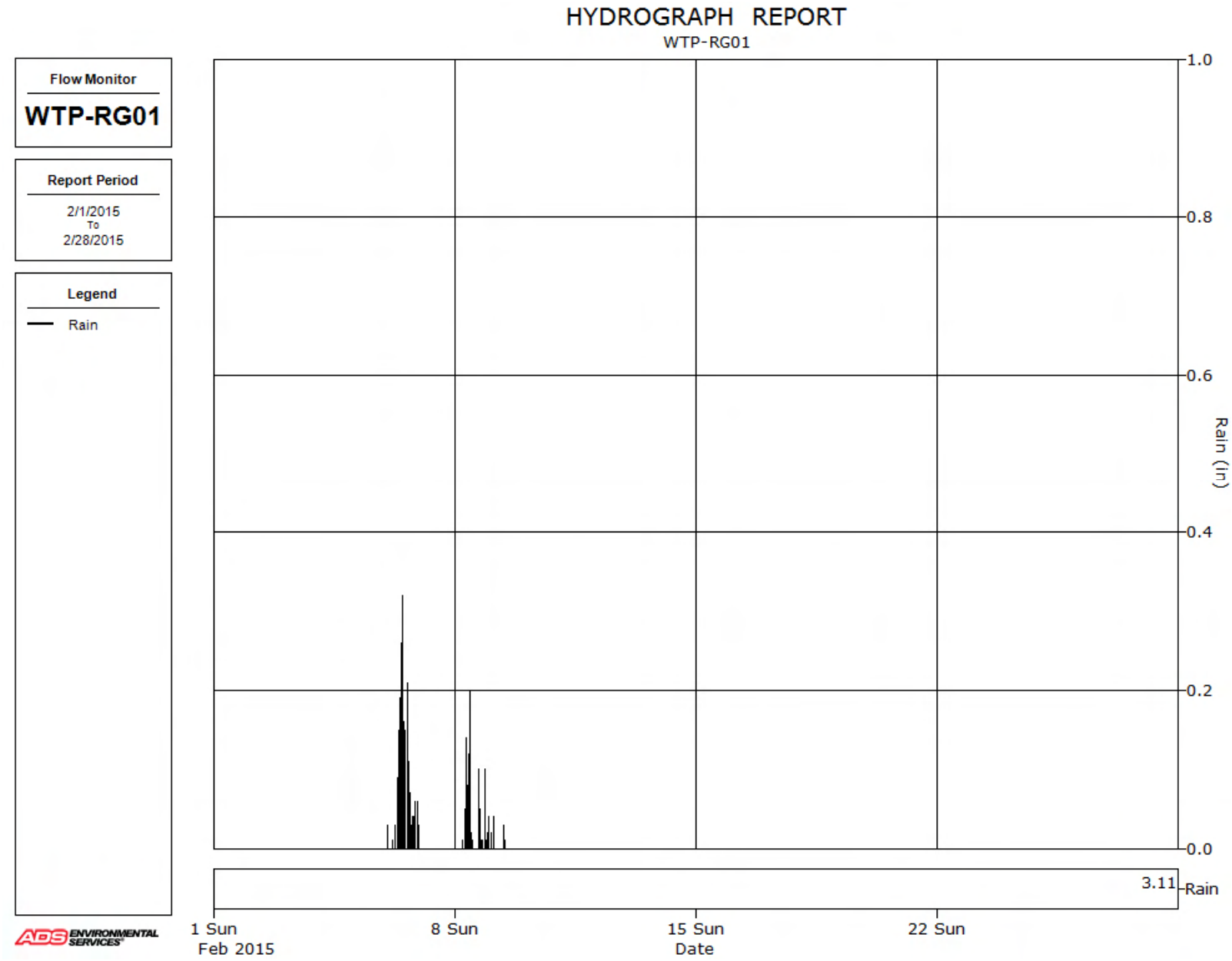


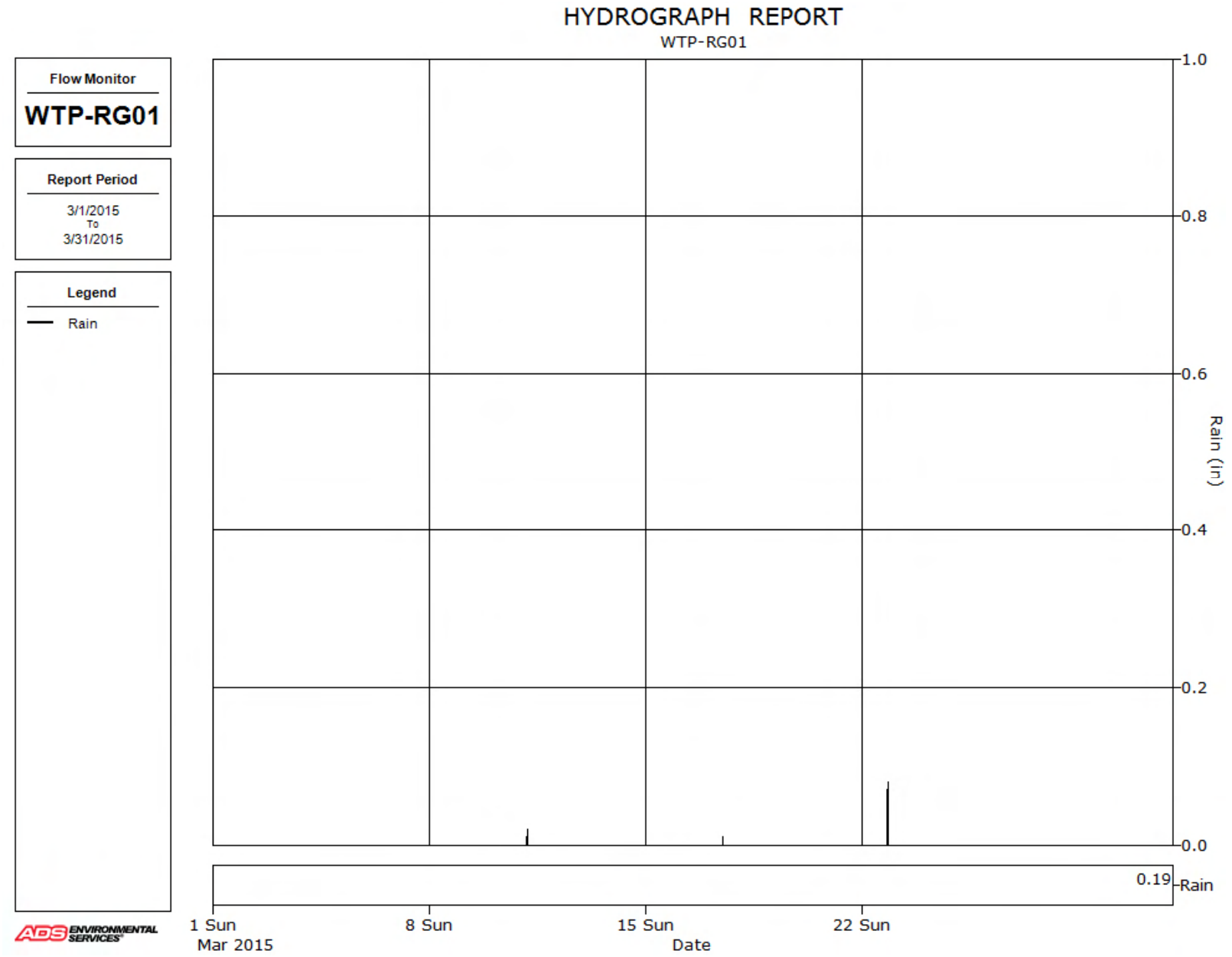
Installation Information	
Installation Type:	Rain Gauge
Monitoring Period:	1/23/15 – 4/15/15
Increments of Rain Fall:	0.01"
Test Tips:	10 tips on 1/22/15

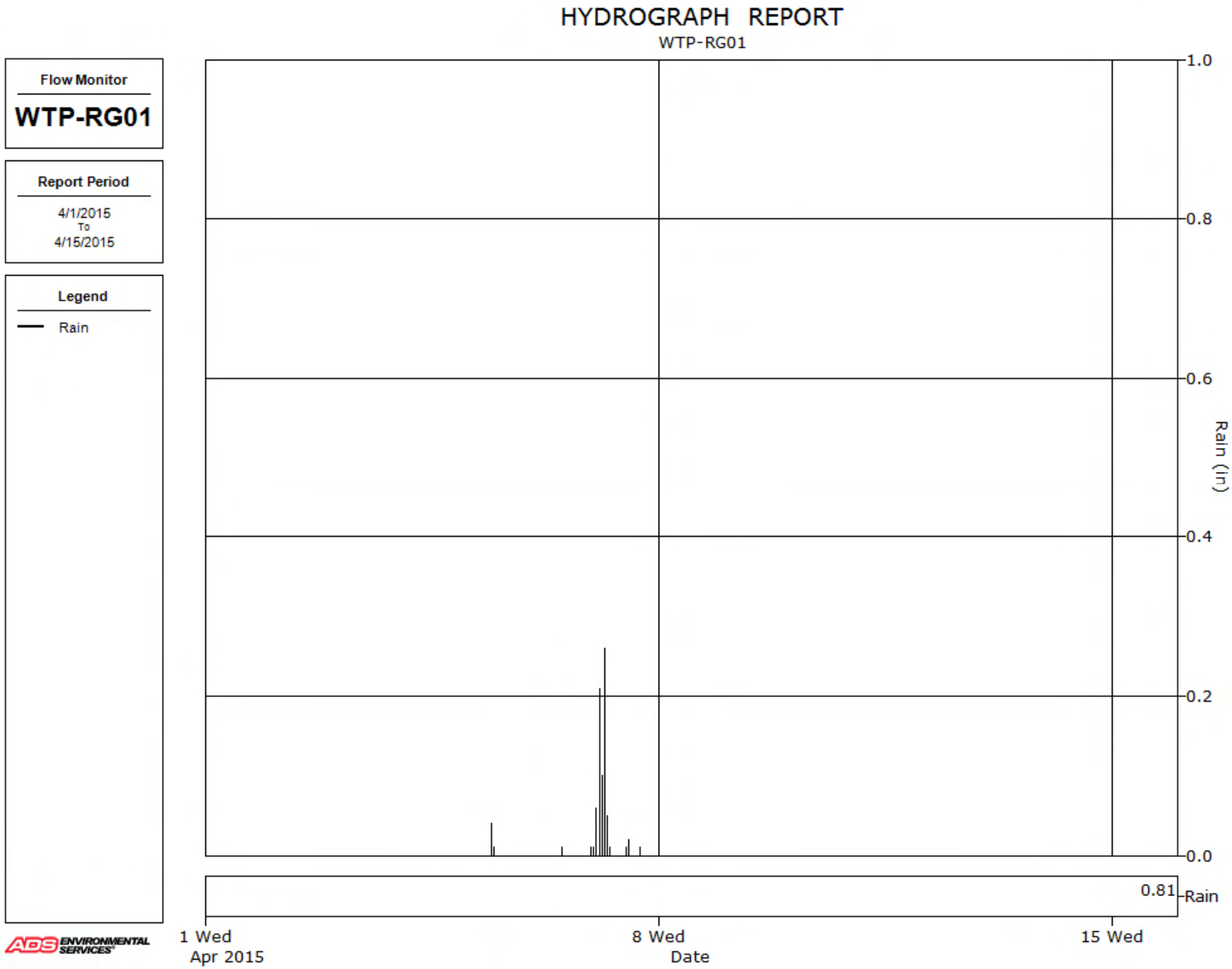
Additional Site Information / Comments:

Need to contact Dan Hodem, CLOCWD Ops Mgr. 707-350-1093 for access


HYDROGRAPH REPORT
WTP-RG01
Flow Monitor
WTP-RG01
Report Period
1/23/2015
To
1/30/2015
Legend
Y Axis #1
1.0
0.8
0.6
0.4
0.2
-0.0
-0.2
-0.4
-0.6
-0.8
-1.0
23 Fri
Jan 2015
24 Sat
25 Sun
26 Mon
27 Tue
28 Wed
29 Thu
30 Fri
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
WTP-RG01
Flow Monitor
WTP-RG01
Report Period
2/1/2015
To
2/28/2015
Legend
Rain
1.0
0.8
0.6
0.4
0.2
0.0
Rain (in)
3.11
Rain
1 Sun
Feb 2015
8 Sun
15 Sun
Date
22 Sun
ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
WTP-RG01
Flow Monitor
WTP-RG01
Report Period
3/1/2015
To
3/31/2015
Legend
Rain
1.0
0.8
0.6
0.4
0.2
0.0
Rain (in)
0.19
Rain
1 Sun
Mar 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
WTP-RG01
Flow Monitor
WTP-RG01
Report Period
4/1/2015
To
4/15/2015
Legend
Rain
1.0
0.8
0.6
0.4
0.2
0.0
Rain (in)
0.81
Rain
1 Wed
Apr 2015
8 Wed
15 Wed
Date
ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 1/23/2015 - 4/15/2015

WTP-RG01, Pipe Height:

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/23/2015																	
1/24/2015																	
1/25/2015																	
1/26/2015																	
1/27/2015																	
1/28/2015																	
1/29/2015																	
1/30/2015																	
1/31/2015																	
2/1/2015																	
2/2/2015																	
2/3/2015																	
2/4/2015																	
2/5/2015																	
2/6/2015																	2.04
2/7/2015																	
2/8/2015																	0.93
2/9/2015																	0.14
2/10/2015																	
2/11/2015																	
2/12/2015																	
2/13/2015																	
2/14/2015																	
2/15/2015																	
2/16/2015																	
2/17/2015																	
2/18/2015																	
2/19/2015																	
2/20/2015																	
2/21/2015																	
2/22/2015																	
2/23/2015																	
2/24/2015																	
2/25/2015																	
2/26/2015																	
2/27/2015																	
2/28/2015																	
3/1/2015																	
3/2/2015																	
3/3/2015																	
3/4/2015																	
3/5/2015																	
3/6/2015																	
3/7/2015																	
3/8/2015																	
3/9/2015																	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/10/2015																	
3/11/2015																	0.03
3/12/2015																	
3/13/2015																	
3/14/2015																	
3/15/2015																	
3/16/2015																	
3/17/2015																	0.01
3/18/2015																	
3/19/2015																	
3/20/2015																	
3/21/2015																	
3/22/2015																	0.15
3/23/2015																	
3/24/2015																	
3/25/2015																	
3/26/2015																	
3/27/2015																	
3/28/2015																	
3/29/2015																	
3/30/2015																	
3/31/2015																	
4/1/2015																	
4/2/2015																	
4/3/2015																	
4/4/2015																	
4/5/2015																	0.05
4/6/2015																	0.02
4/7/2015																	0.74
4/8/2015																	
4/9/2015																	
4/10/2015																	
4/11/2015																	
4/12/2015																	
4/13/2015																	
4/14/2015																	
4/15/2015																	

Report Summary For The Period 1/23/2015 - 4/15/2015

	Rain (in)
Total	4.11
Avg	

Site Commentary

Site Information

WWTP-RG02
Rain Gauge with Tipping Bucket

Observations

Rainfall observed during January 23, 2015 through April 15, 2015 equaled 5.36 inches.

ADS Site Report

Quality Form

Project Name: ClearLake.MCEng.TFM.CA15	**Project No.** 22002	**City:** Clearlake Oaks, CA	**FM Initials:** SW
Site Name: WWTP_RG02	**Install Date:** 1/22/15	**Monitor Type**	Rain Gauge Data Logger
Address/Location: Intersection of Orchard Shore Dr and Jensen Rd (Inside WWTP)		**Monitor Model**	FlowShark AG
		Tipping Bucket Model	Hydrological Services TB06
Access: Drive	**Type of System:** Sanitary [X] Storm [ ] Combined [ ]	**Tipping Bucket Dia.**	8"
		Data Acquisition	Wireless



Rain Gauge Area

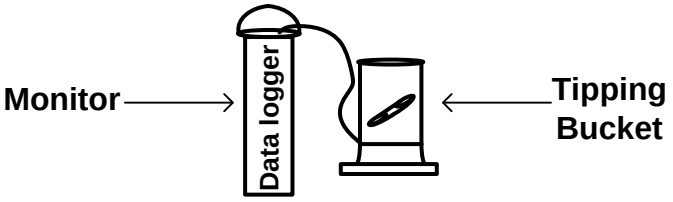


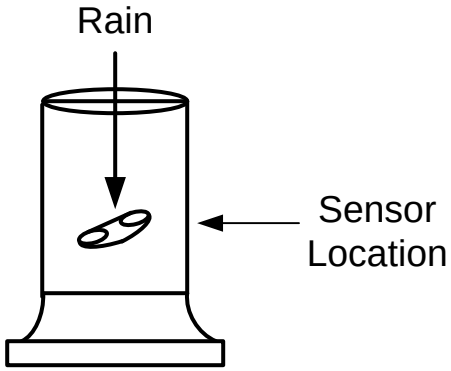
Rain Gauge Photo





Other Information:

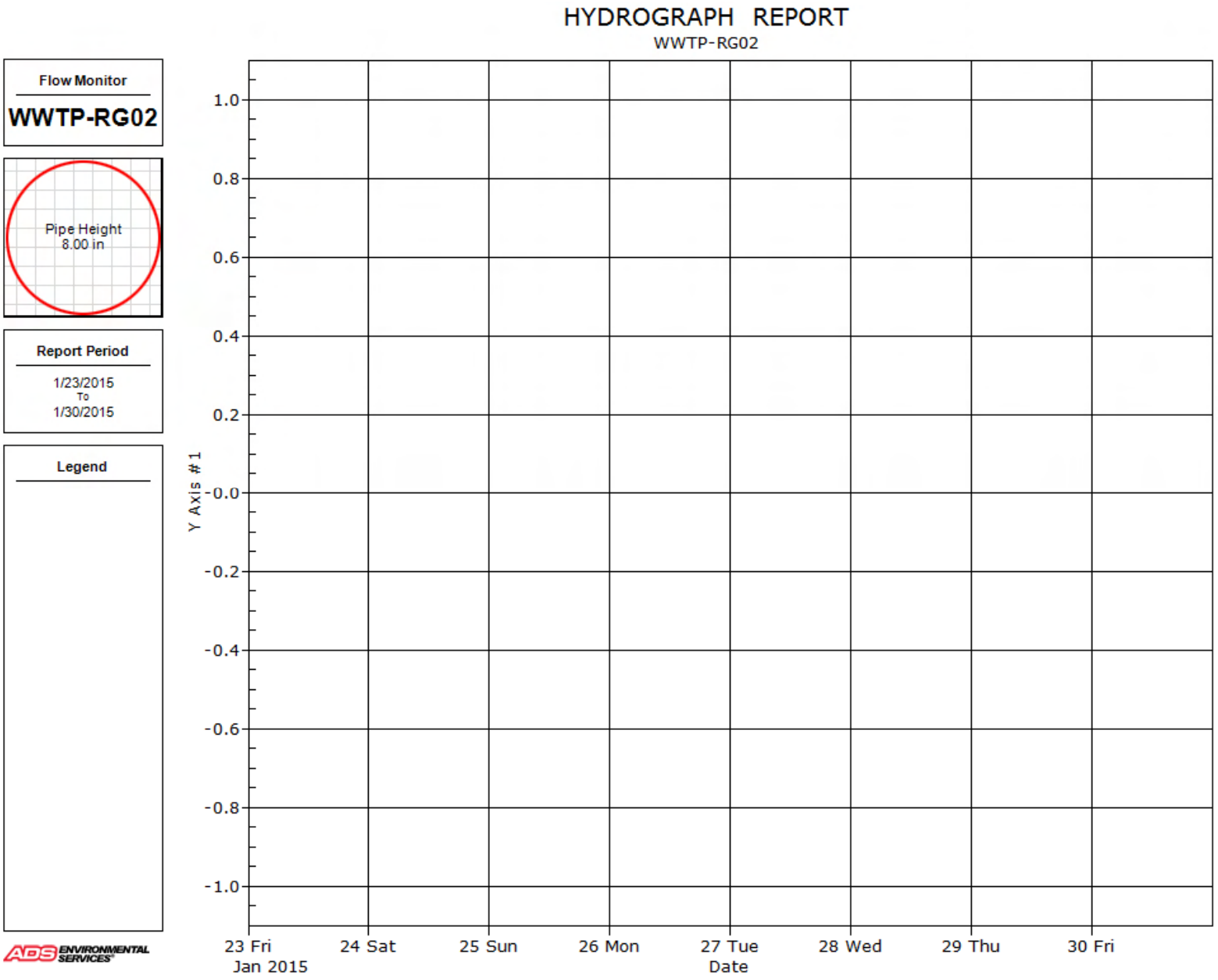


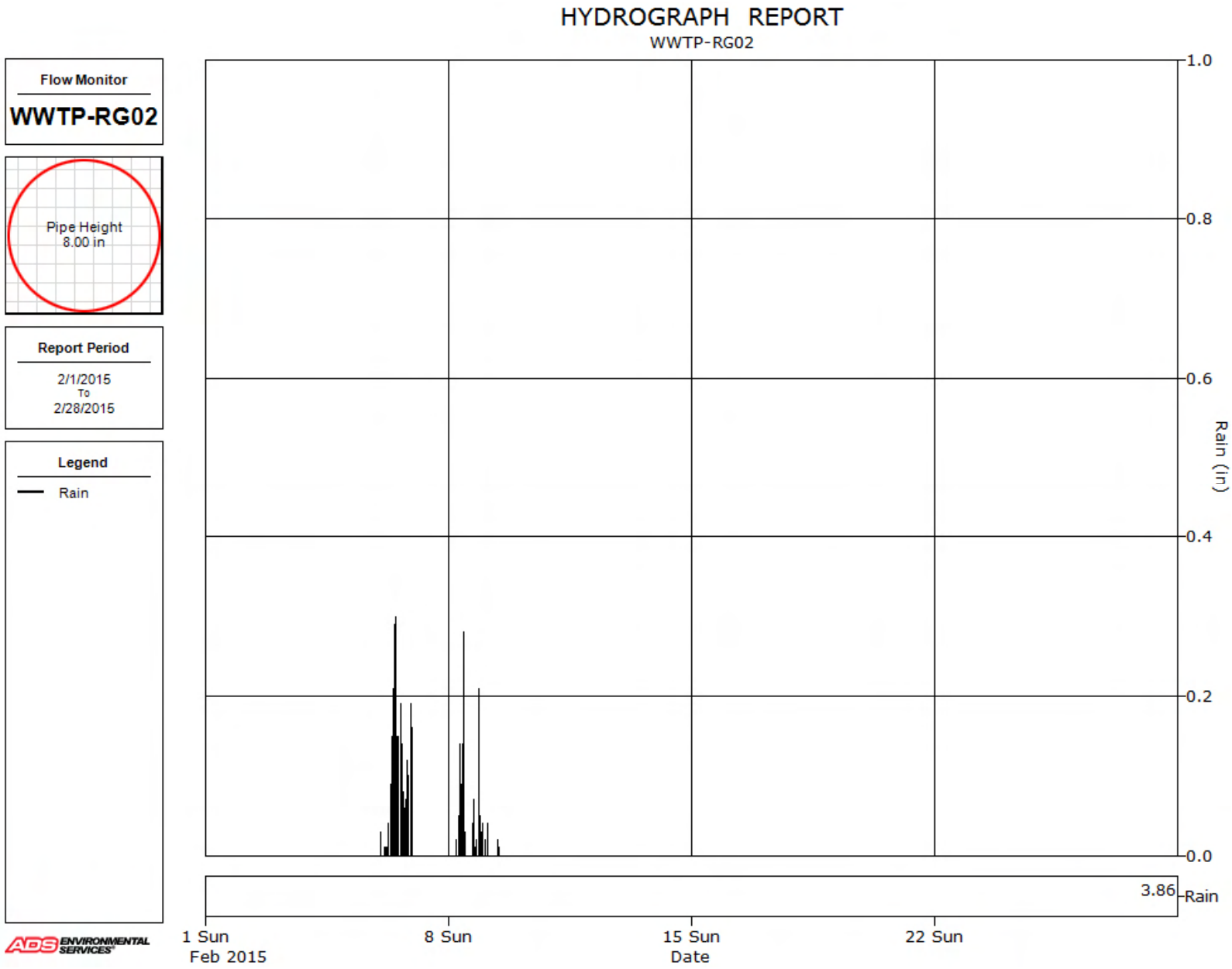


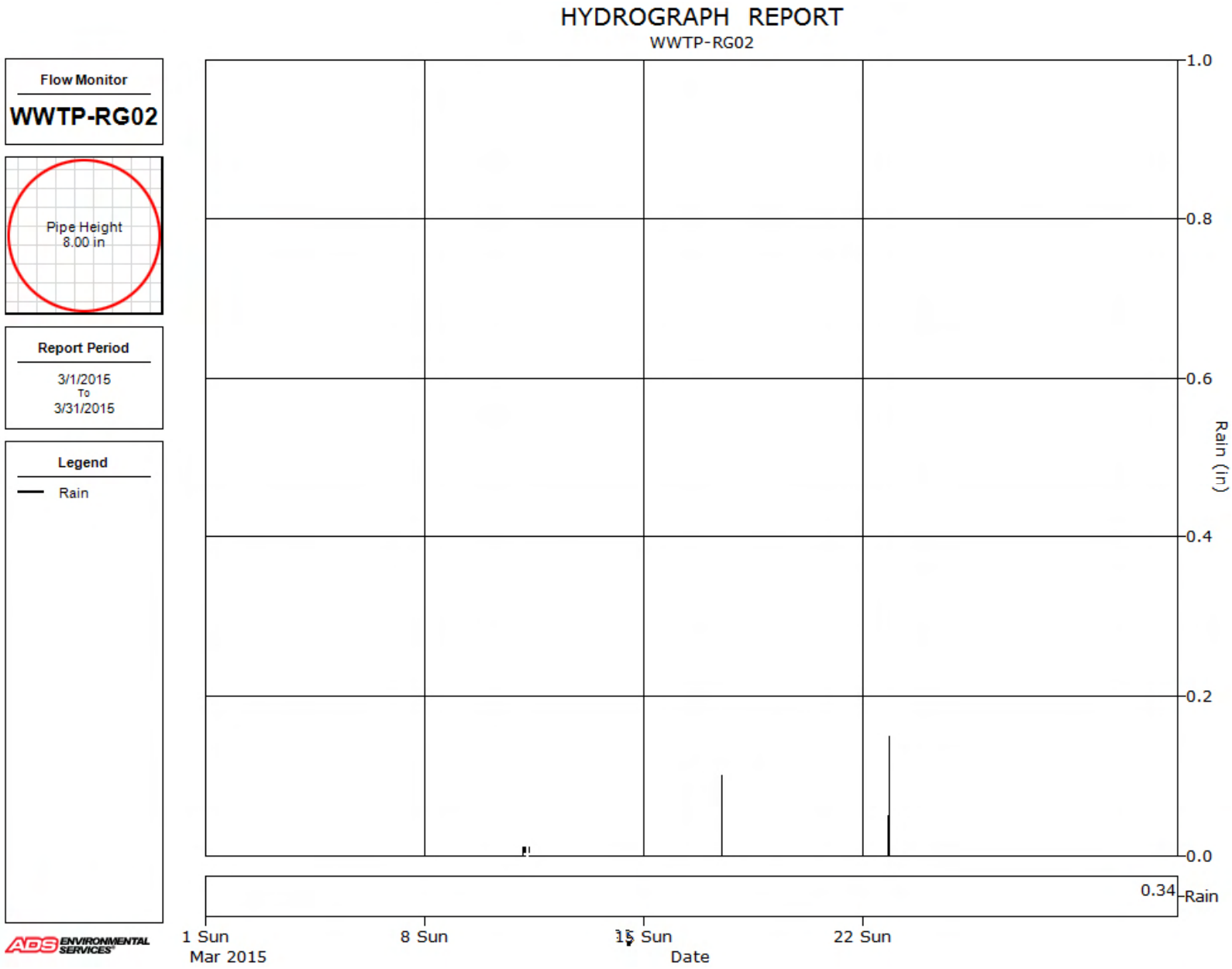
Installation Information	
Installation Type:	Rain Gauge
Monitoring Period:	1/23/15 – 4/15/15
Increments of Rain Fall:	0.01"
Test Tips:	10 tips on 1/22/15

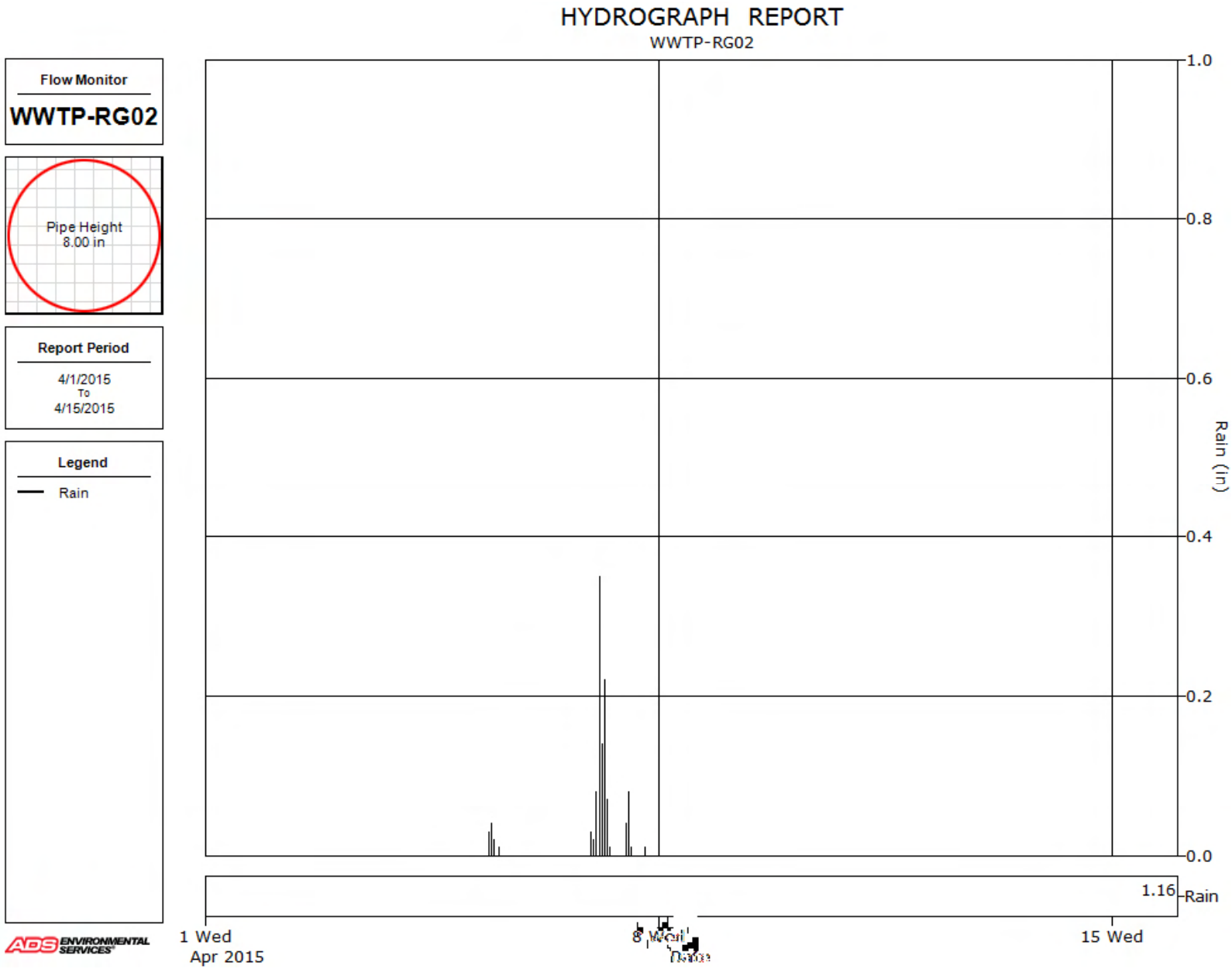
Additional Site Information / Comments:

Need to contact Dan Hodem, CLOCWD Ops Mgr. 707-350-1093 for access


HYDROGRAPH REPORT
WWTP-RG02
Flow Monitor
WWTP-RG02
Pipe Height
8.00 in
Report Period
1/23/2015
To
1/30/2015
Legend
ADS ENVIRONMENTAL SERVICES
Y Axis #1
1.0
0.8
0.6
0.4
0.2
-0.0
-0.2
-0.4
-0.6
-0.8
-1.0
23 Fri
Jan 2015
24 Sat
25 Sun
26 Mon
27 Tue
28 Wed
29 Thu
30 Fri
Date


HYDROGRAPH REPORT
WWTP-RG02
Flow Monitor
WWTP-RG02
Pipe Height
8.00 in
Report Period
2/1/2015
To
2/28/2015
Legend
Rain
1.0
0.8
0.6
0.4
0.2
0.0
Rain (in)
3.86
Rain
1 Sun
Feb 2015
8 Sun
15 Sun
Date
22 Sun
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
WWTP-RG02
Flow Monitor
WWTP-RG02
Pipe Height
8.00 in
Report Period
3/1/2015
To
3/31/2015
Legend
Rain
1.0
0.8
0.6
0.4
0.2
0.0
Rain (in)
0.34
Rain
1 Sun
Mar 2015
8 Sun
15 Sun
22 Sun
Date
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
WWTP-RG02
Flow Monitor
WWTP-RG02
Pipe Height
8.00 in
Report Period
4/1/2015
To
4/15/2015
Legend
Rain
1.0
0.8
0.6
0.4
0.2
0.0
Rain (in)
1.16
Rain
1 Wed
Apr 2015
15 Wed
ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 1/23/2015 - 4/15/2015

WWTP-RG02, Pipe Height: 8 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/23/2015																	
1/24/2015																	
1/25/2015																	
1/26/2015																	
1/27/2015																	
1/28/2015																	
1/29/2015																	
1/30/2015																	
1/31/2015																	
2/1/2015																	
2/2/2015																	
2/3/2015																	
2/4/2015																	
2/5/2015																	
2/6/2015																	2.55
2/7/2015																	
2/8/2015																	1.18
2/9/2015																	0.13
2/10/2015																	
2/11/2015																	
2/12/2015																	
2/13/2015																	
2/14/2015																	
2/15/2015																	
2/16/2015																	
2/17/2015																	
2/18/2015																	
2/19/2015																	
2/20/2015																	
2/21/2015																	
2/22/2015																	
2/23/2015																	
2/24/2015																	
2/25/2015																	
2/26/2015																	
2/27/2015																	
2/28/2015																	
3/1/2015																	
3/2/2015																	
3/3/2015																	
3/4/2015																	
3/5/2015																	
3/6/2015																	
3/7/2015																	
3/8/2015																	
3/9/2015																	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/10/2015																	
3/11/2015																	0.04
3/12/2015																	
3/13/2015																	
3/14/2015																	
3/15/2015																	
3/16/2015																	
3/17/2015																	0.10
3/18/2015																	
3/19/2015																	
3/20/2015																	
3/21/2015																	
3/22/2015																	0.20
3/23/2015																	
3/24/2015																	
3/25/2015																	
3/26/2015																	
3/27/2015																	
3/28/2015																	
3/29/2015																	
3/30/2015																	
3/31/2015																	
4/1/2015																	
4/2/2015																	
4/3/2015																	
4/4/2015																	
4/5/2015																	0.10
4/6/2015																	0.03
4/7/2015																	1.03
4/8/2015																	
4/9/2015																	
4/10/2015																	
4/11/2015																	
4/12/2015																	
4/13/2015																	
4/14/2015																	
4/15/2015																	

Report Summary For The Period 1/23/2015 - 4/15/2015

	Rain (in)
Total	5.36
Avg	

Attachment B
MC Engineering Flow Analysis Worksheets

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS1-2N (North)

Date: May 15, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	10.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23893

Basin Size	144.00 acres

Selected Flows: Q_FlowTote

RAINFALL RECORDS

Rainfall / Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.32 in
Max Event Precipitation	2.01 in
Max Event Duration	17.8 hrs
Total Precipitation	4.11 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

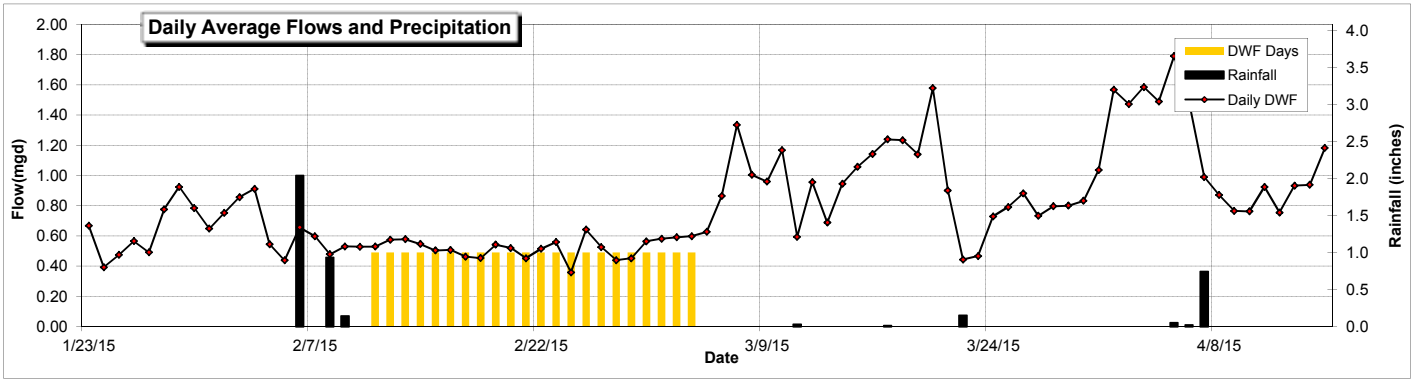
Manhole: LS1-2N (North)

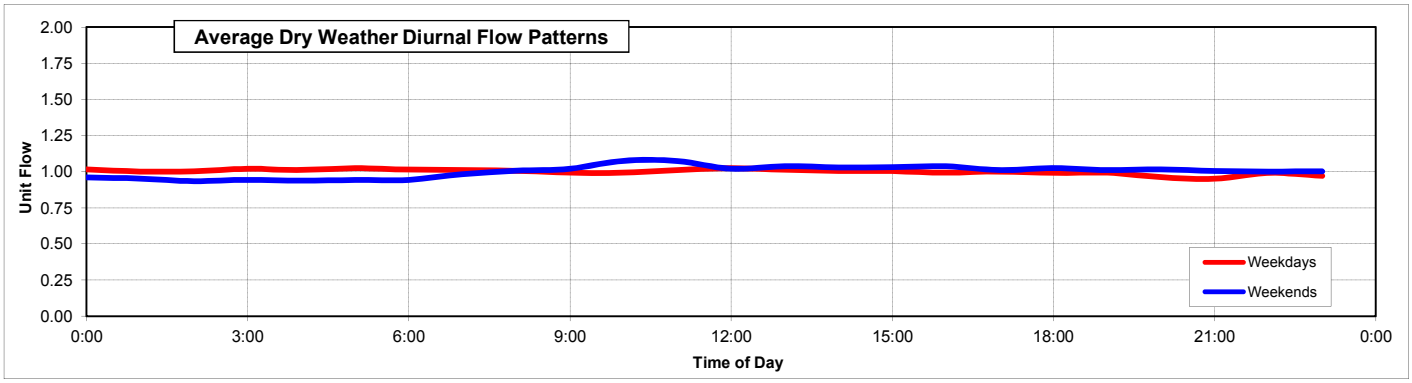
Date: May 15, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.480 mgd	0.074 mgd	15.41%	0.456 mgd	0.042 mgd	9.31%	-0.050 mgd
- Peaking Factors	1.1854	0.1574	13.27%	1.1604	0.0771	6.64%	
- Num Records	15	15		7	7		





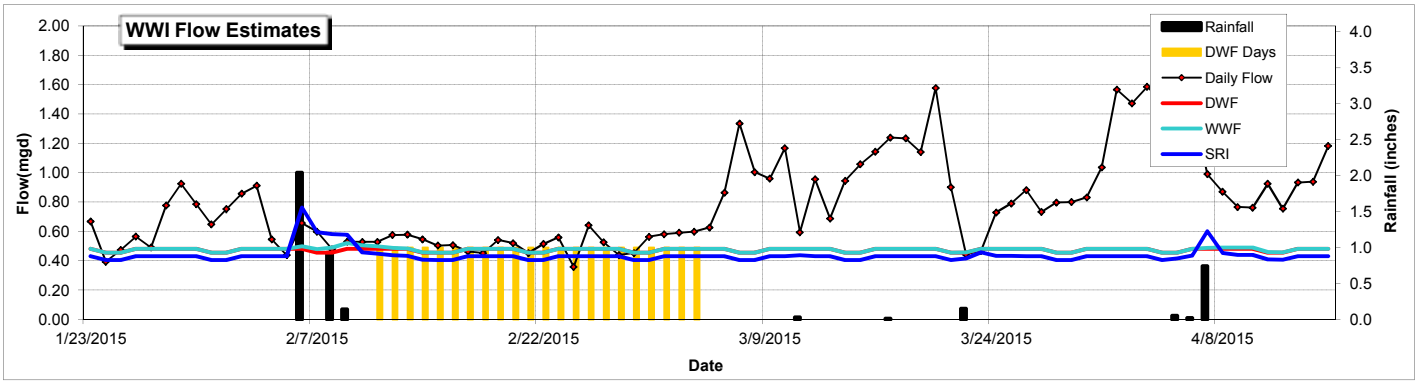
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	1.00%
WWI Inflow Period (Tn)	3 days
WWI Recession Coeff. (Kn)	1
Storm Limit	0.001 in/day
WWI @ Start of Simulation	0.000 mgd

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.002 mgd	0.040 mgd	0.20 MG
WWI Rate	16.4 gpad	276.4 gpad	1,357 gpa
Perc og DWF			0.50%
Perc of Precip.			1.22%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS1-2N (North)

Date: May 15, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	35.00%	60.00%	5.00%
Tn	2	4	4
Kn	4	6	6

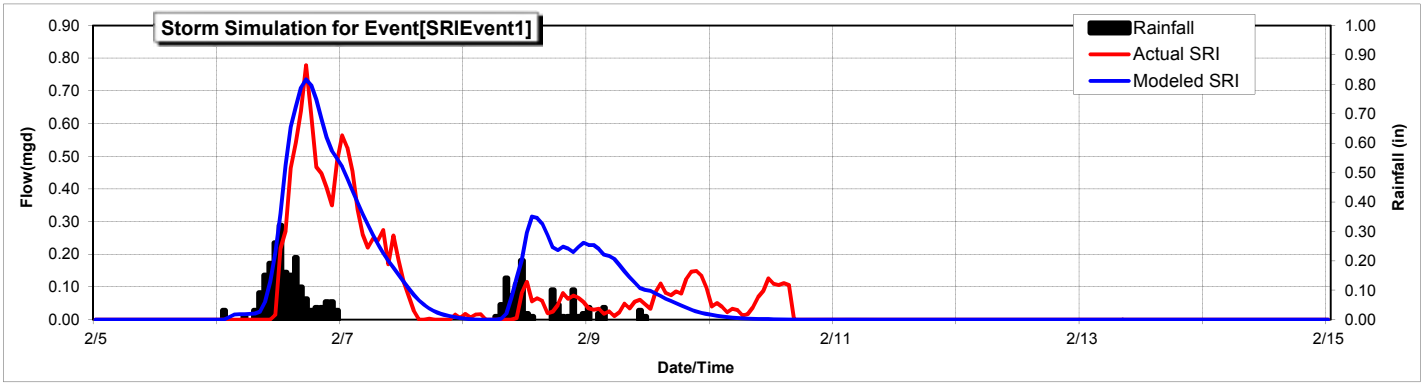
SRI/I Volume Parameters

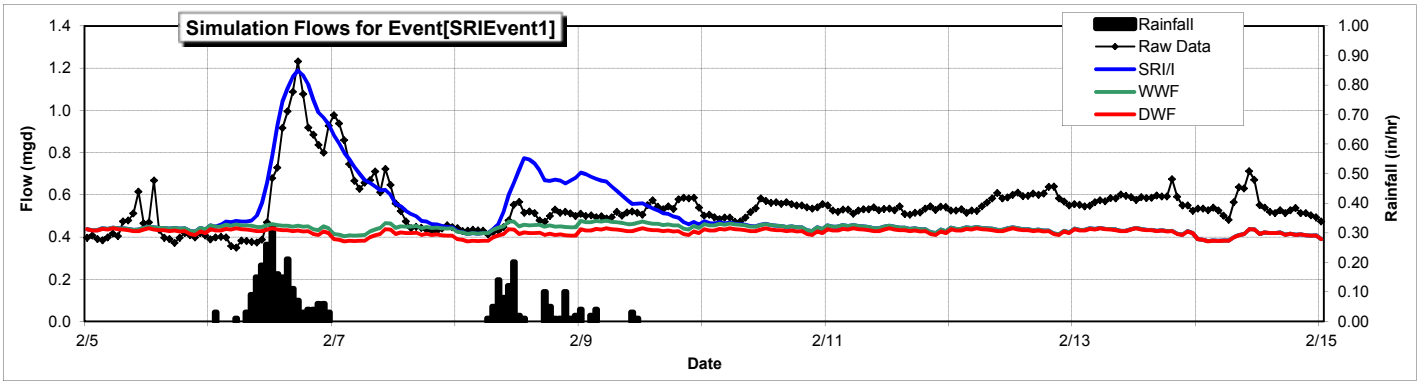
SRI Retention Coeff. (Rt)	6.00%
Total SRI Volume	0.96 MG
Perc. of DWF	2.457%
Perc. of Rainfall	6.002%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/15/15 00:00	276.4	5,108.8	0.730	12.163	6.000%	0.7016
All WWF Days			276.4	5,108.8	0.964	16.070	6.002%	-0.0125

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS2E

Date: May 15, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	6.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23893

Basin Size	16.70 acres

Selected Flows: Q_FlowTote

RAINFALL RECORDS

Rainfall / Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

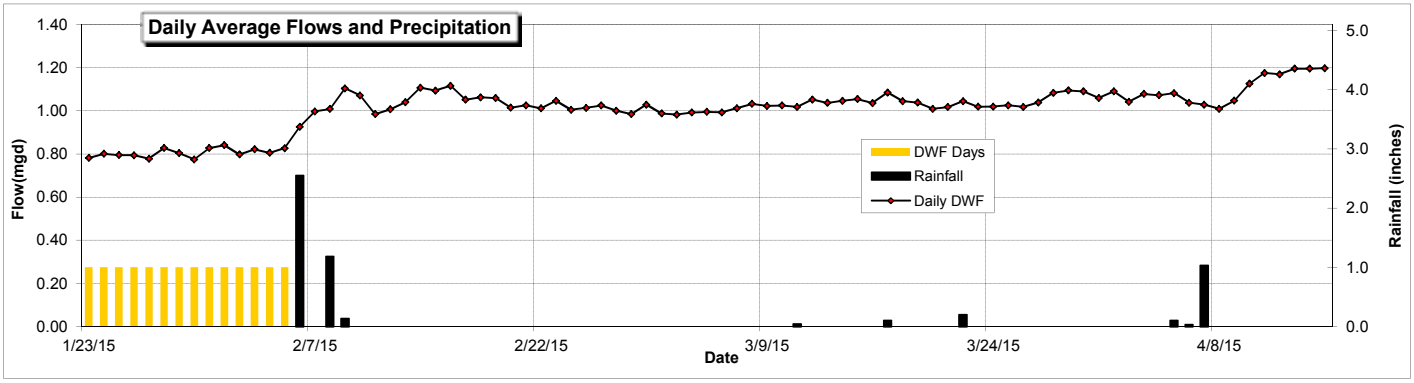
Manhole: LS2E

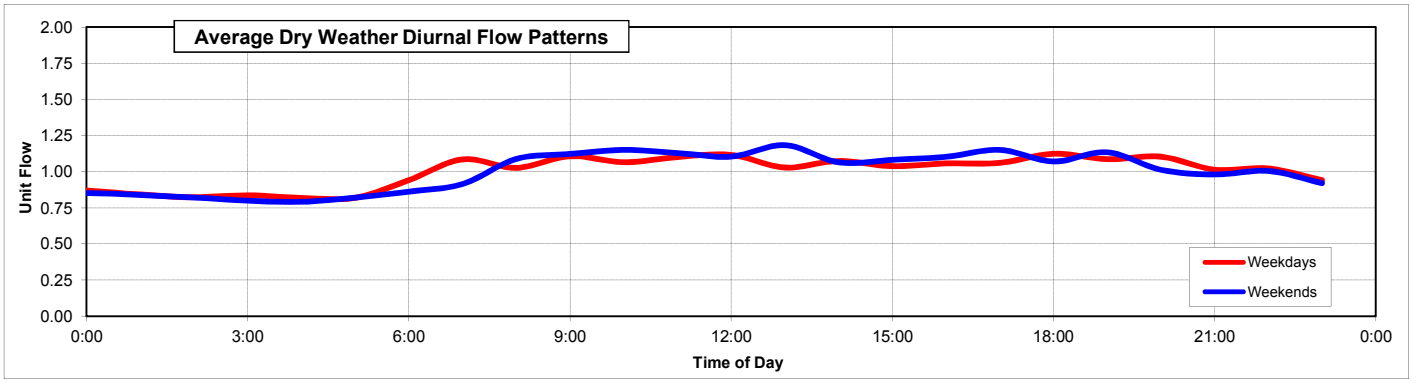
Date: May 15, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.801 mgd	0.020 mgd	2.46%	0.816 mgd	0.022 mgd	2.65%	
- Peaking Factors	1.2687	0.1129	8.90%	1.2667	0.0578	4.56%	
- Num Records	10	10		4	4		





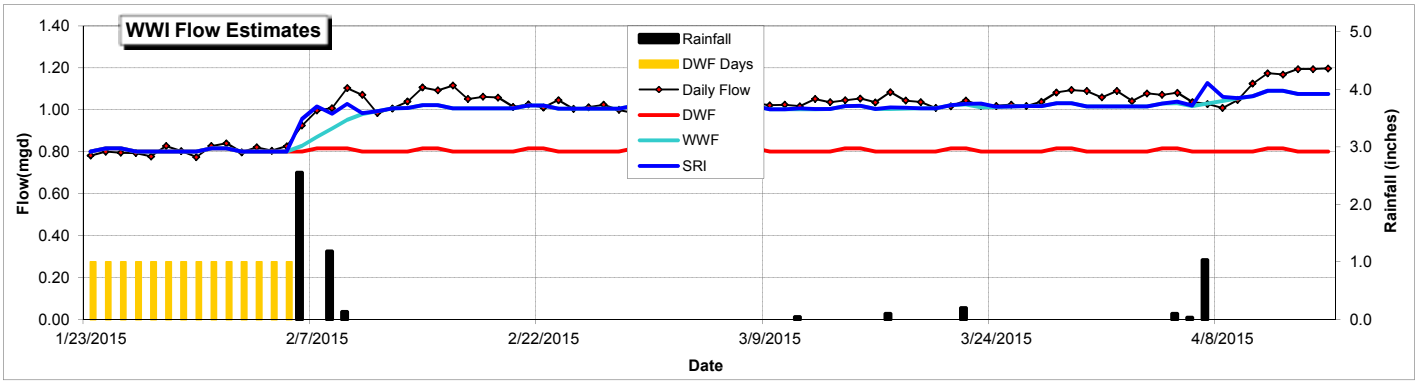
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	9500.00%
WWI Inflow Period (Tn)	4 days
WWI Recession Coeff. (Kn)	0.001
Storm Limit	0.000 in/day
WWI @ Start of Simulation	

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.172 mgd	0.276 mgd	14.25 MG
WWI Rate	10,279.2 gpad	16,508.1 gpad	853,173 gpa
Perc og DWF			21.31%
Perc of Precip.			586.22%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS2E

Date: May 15, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	20.00%	70.00%	10.00%
Tn	3	6	8
Kn	2	4	12

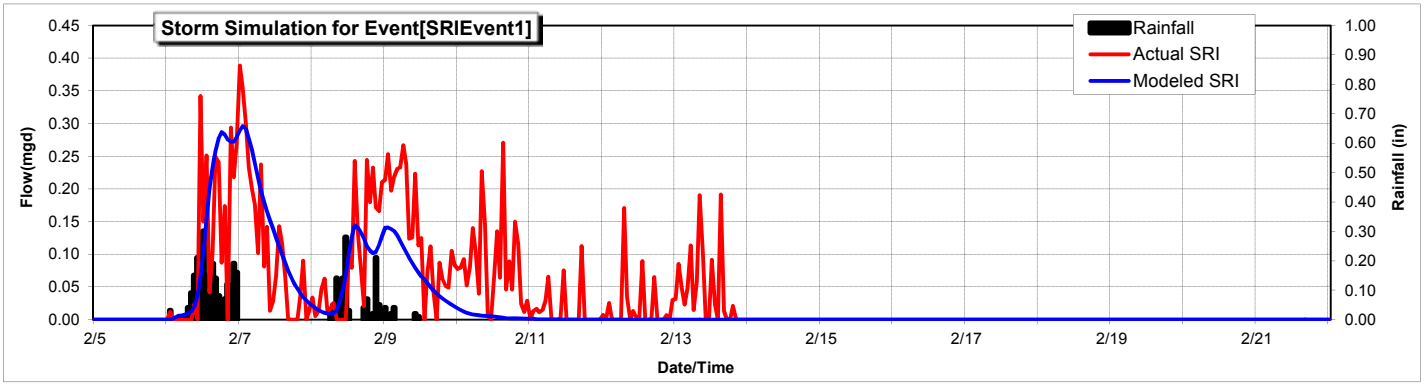
SRI/I Volume Parameters

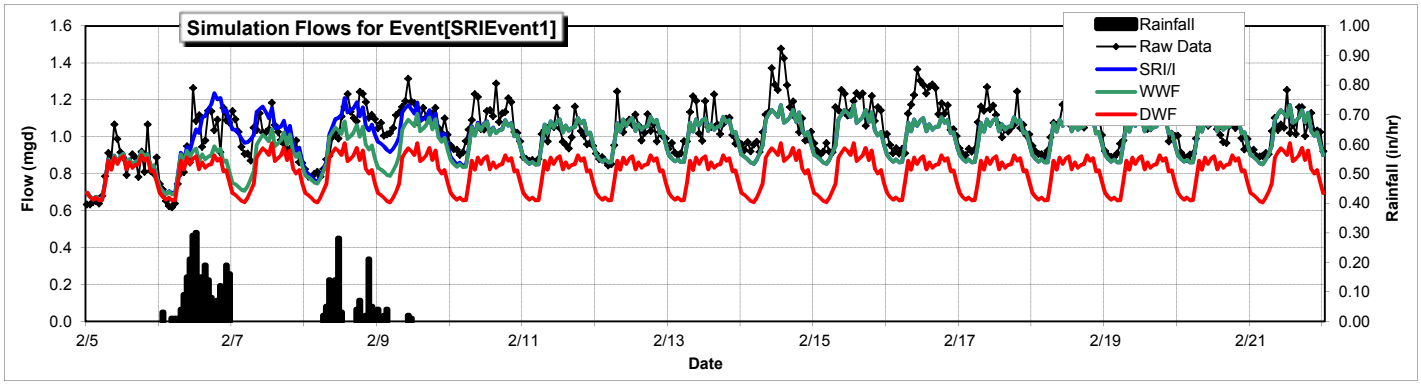
SRI Retention Coeff. (Rt)	25.00%
Total SRI Volume	0.59 MG
Perc. of DWF	0.885%
Perc. of Rainfall	24.342%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	12,389.9	17,723.8	0.426	1.751	24.336%	0.8054
SRIEvent2	04/06/15 00:00	04/11/15 00:00	16,508.1	10,131.2	0.121	0.481	25.110%	0.6630
All WWF Days			16,508.1	17,723.8	0.592	2.430	24.342%	0.8566

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS2E

Date: May 15, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	20.00%	70.00%	10.00%
Tn	3	6	8
Kn	2	4	12

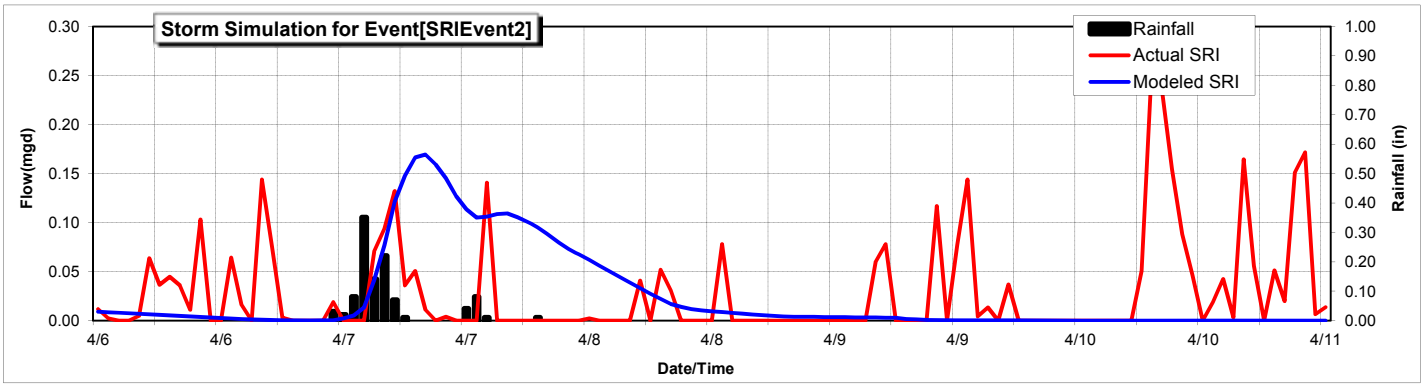
SRI/I Volume Parameters

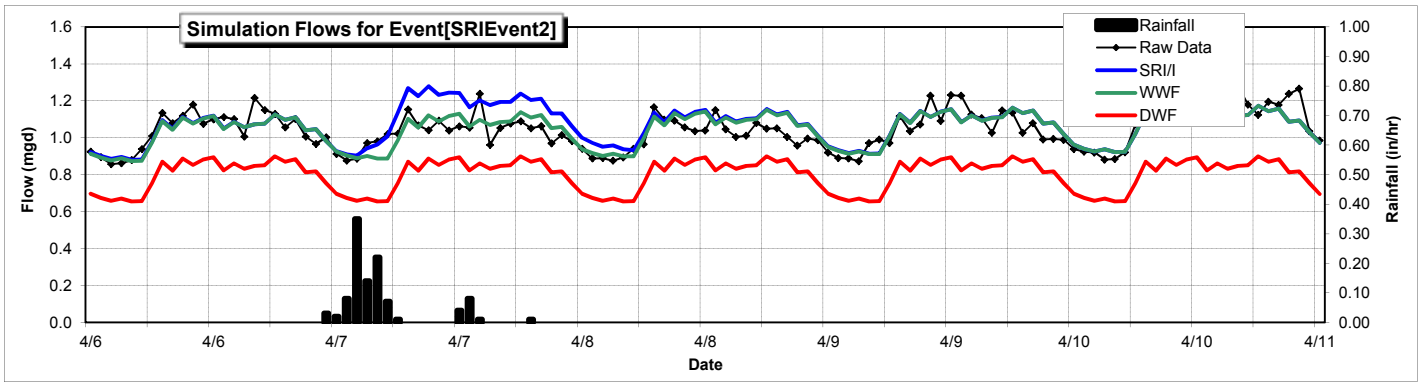
SRI Retention Coeff. (Rt)	25.00%
Total SRI Volume	0.59 MG
Perc. of DWF	0.885%
Perc. of Rainfall	24.342%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	12,389.9	17,723.8	0.426	1.751	24.336%	0.8054
SRIEvent2	04/06/15 00:00	04/11/15 00:00	16,508.1	10,131.2	0.121	0.481	25.110%	0.6630
All WWF Days			16,508.1	17,723.8	0.592	2.430	24.342%	0.8566

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7-South

Date: May 15, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	6.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23893

Basin Size	38.00 acres

Selected Flows: Q_FlowTote

RAINFALL RECORDS

Rainfall / Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

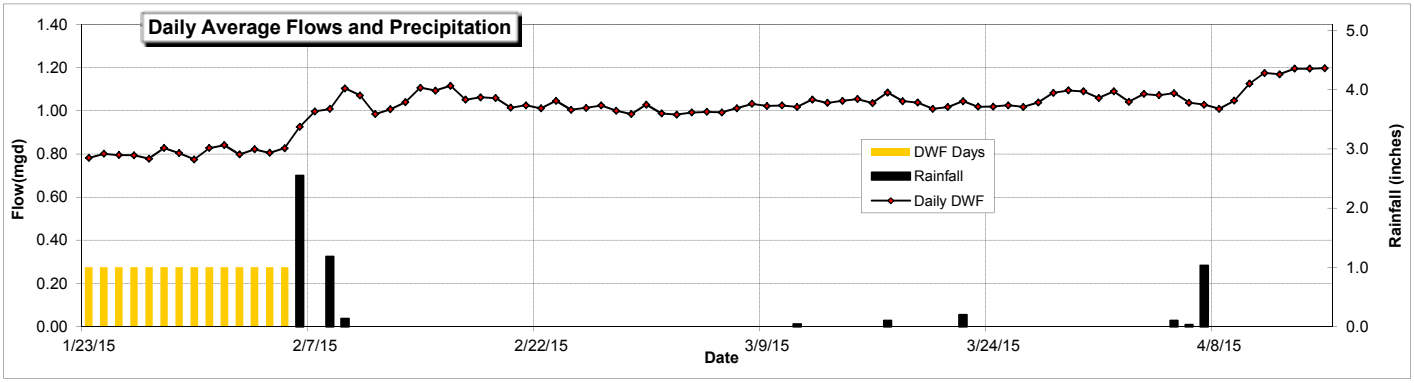
Manhole: LS7-South

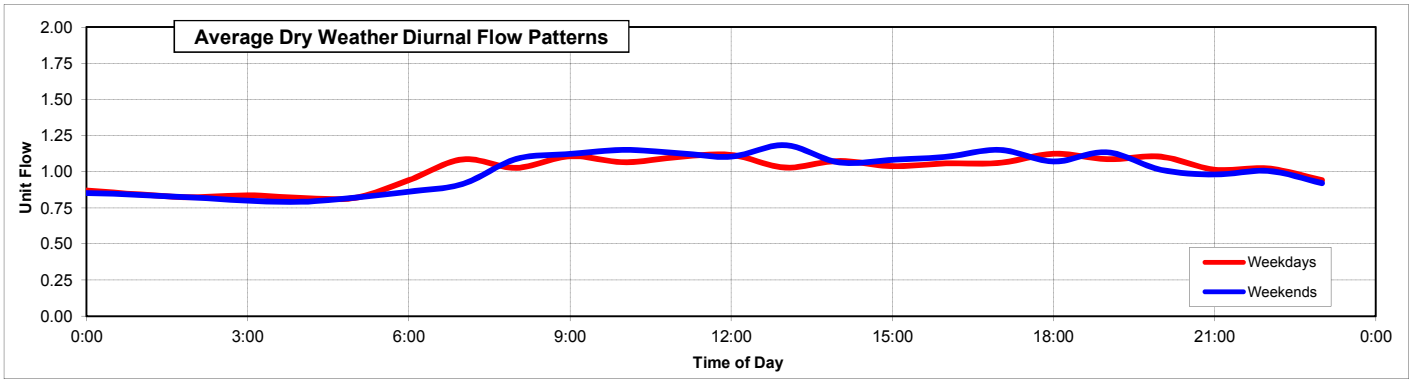
Date: May 15, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	0.801 mgd	0.020 mgd	2.46%	0.816 mgd	0.022 mgd	2.65%	
- Peaking Factors	1.2687	0.1129	8.90%	1.2667	0.0578	4.56%	
- Num Records	10	10		4	4		





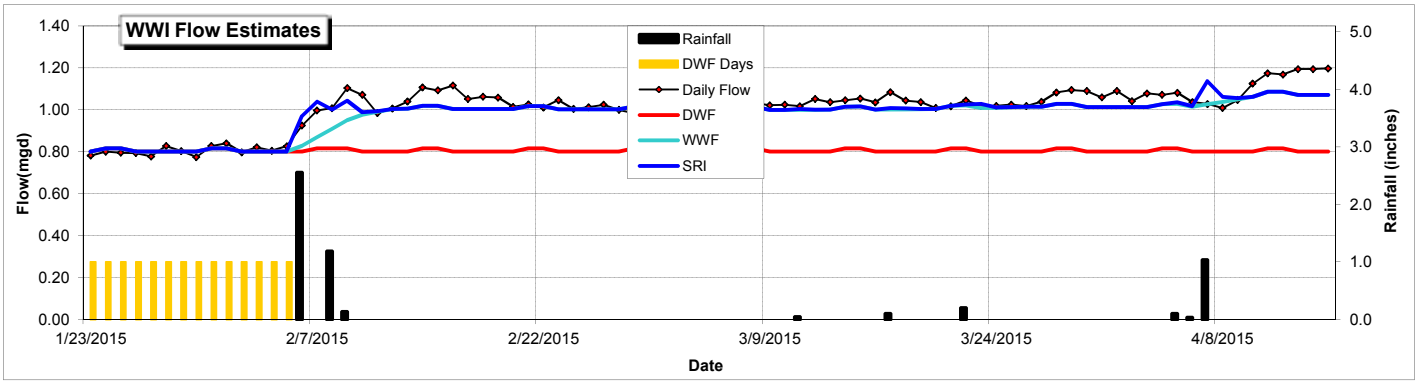
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	3750.00%
WWI Inflow Period (Tn)	4 days
WWI Recession Coeff. (Kn)	0.0011
Storm Limit	0.001 in/day
WWI @ Start of Simulation	

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.169 mgd	0.271 mgd	14.03 MG
WWI Rate	4,449.4 gpad	7,135.3 gpad	369,302 gpa
Perc og DWF			20.99%
Perc of Precip.			253.75%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7-South

Date: May 15, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	10.00%	70.00%	20.00%
Tn	3	4	8
Kn	2	6	10

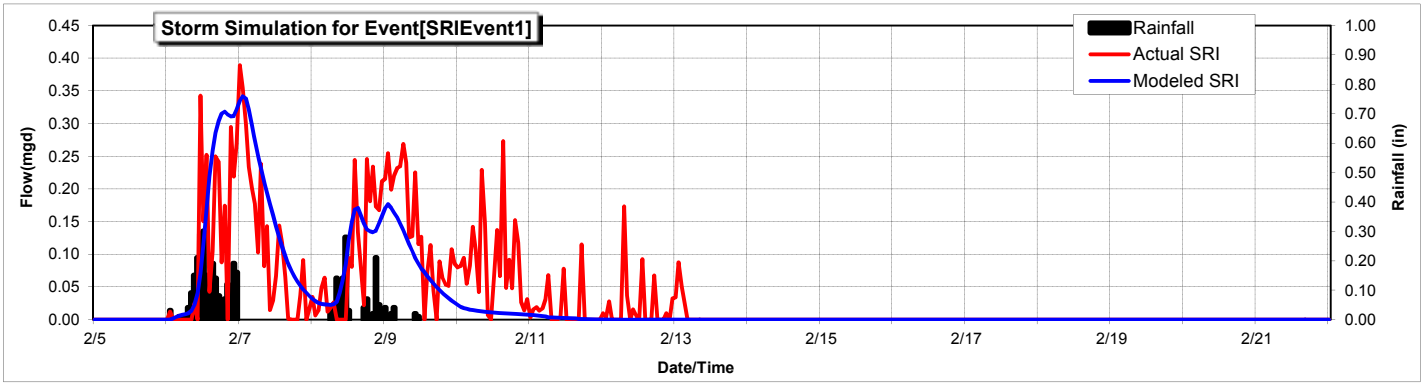
SRI/I Volume Parameters

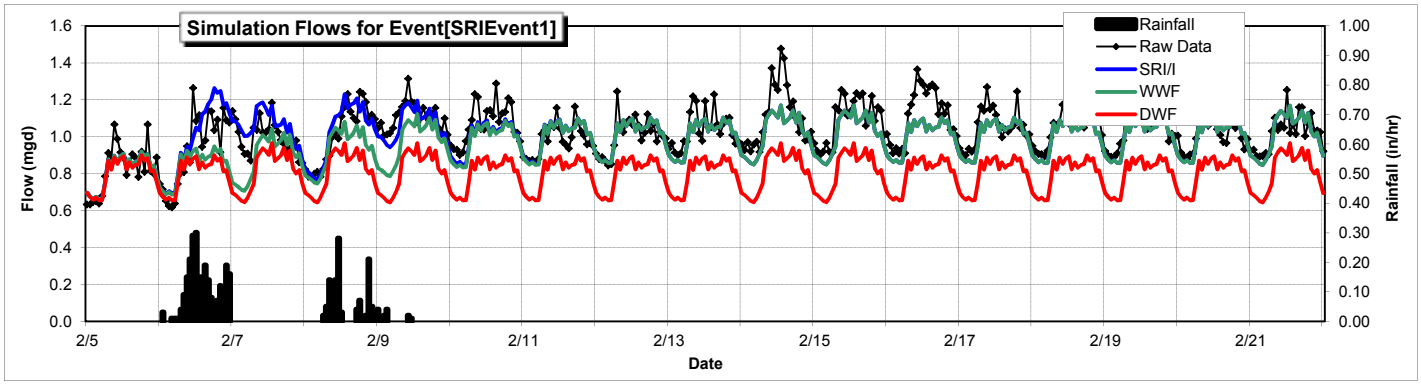
SRI Retention Coeff. (Rt)	13.00%
Total SRI Volume	0.71 MG
Perc. of DWF	1.062%
Perc. of Rainfall	12.833%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	5,377.2	8,990.5	0.511	3.984	12.829%	0.7931
SRIEvent2	04/06/15 00:00	04/11/15 00:00	7,135.3	4,877.4	0.145	1.094	13.285%	0.6399
All WWF Days			7,135.3	8,990.5	0.710	5.530	12.833%	0.8521

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7-South

Date: May 15, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	10.00%	70.00%	20.00%
Tn	3	4	8
Kn	2	6	10

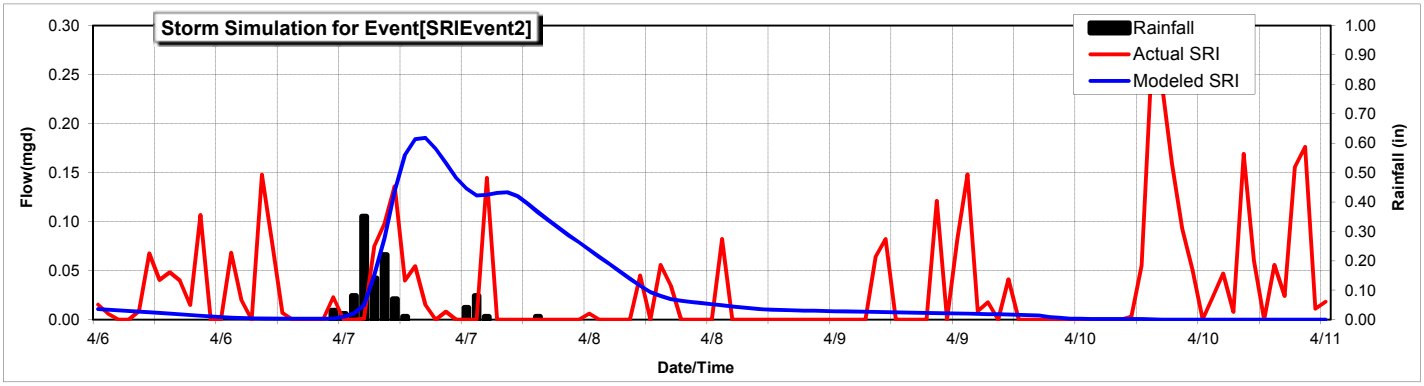
SRI/I Volume Parameters

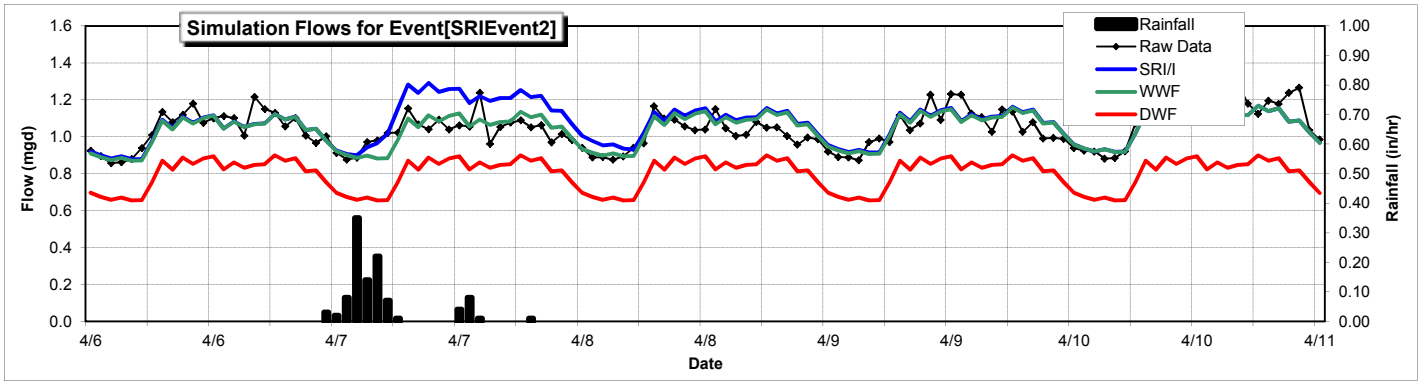
SRI Retention Coeff. (Rt)	13.00%
Total SRI Volume	0.71 MG
Perc. of DWF	1.062%
Perc. of Rainfall	12.833%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	5,377.2	8,990.5	0.511	3.984	12.829%	0.7931
SRIEvent2	04/06/15 00:00	04/11/15 00:00	7,135.3	4,877.4	0.145	1.094	13.285%	0.6399
All WWF Days			7,135.3	8,990.5	0.710	5.530	12.833%	0.8521

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7W

Date: May 15, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	12.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23893

Basin Size	136.00 acres
Selected Flows	Q_FlowTote

RAINFALL RECORDS

Rainfall / Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

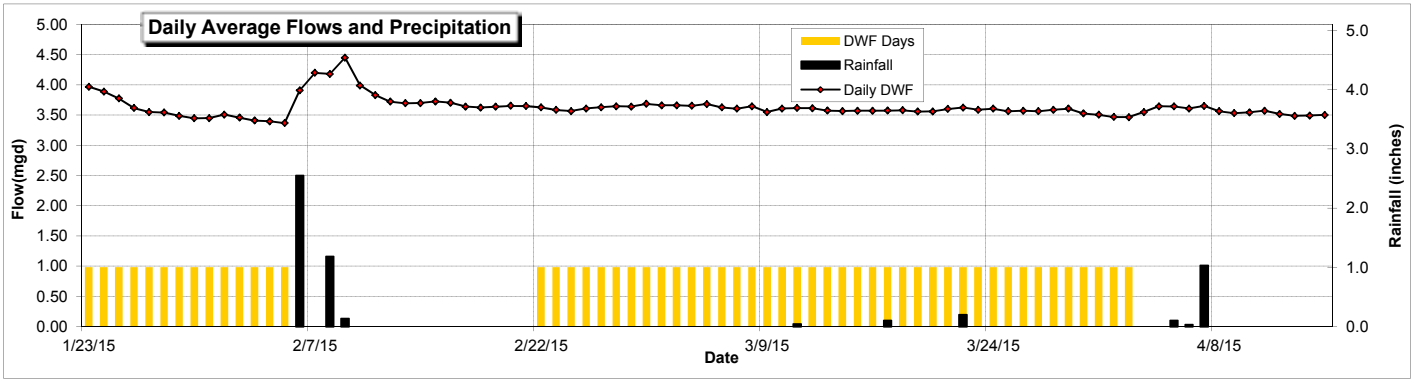
Manhole: LS7W

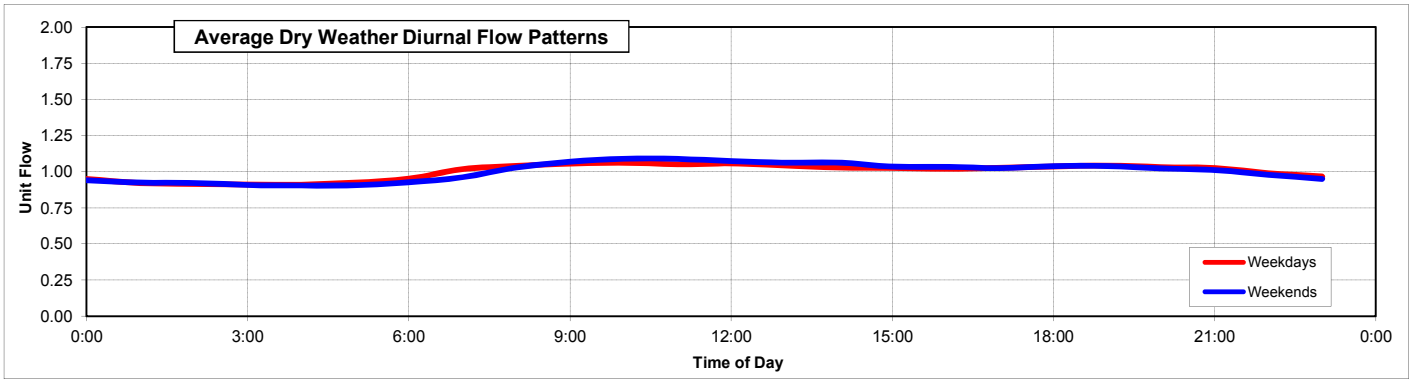
Date: May 15, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	3.570 mgd	0.100 mgd	2.80%	3.626 mgd	0.104 mgd	2.86%	
- Peaking Factors	1.0988	0.0226	2.06%	1.1155	0.0153	1.37%	
- Num Records	39	39		15	15		





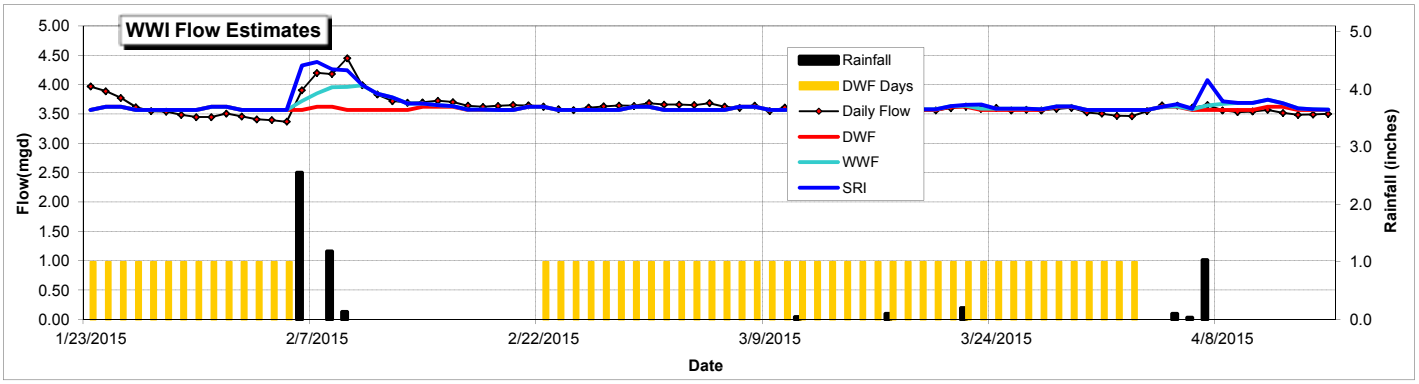
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	12.00%
WWI Inflow Period (Tn)	4.0 days
WWI Recession Coeff. (Kn)	0.75
Storm Limit	0.001 in/day
WWI @ Start of Simulation	0.000 mgd

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.035 mgd	0.418 mgd	2.87 MG
WWI Rate	254.2 gpad	3,071.6 gpad	21,102 gpa
Perc og DWF			0.96%
Perc of Precip.			14.50%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7W

Date: May 15, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	5.00%	70.00%	25.00%
Tn	2	4	6
Kn	4	4	6

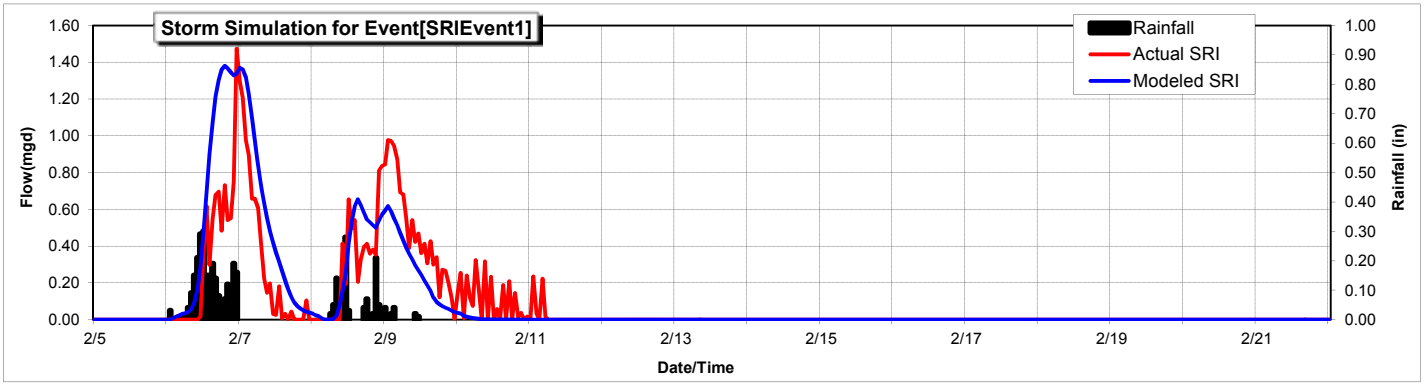
SRI/I Volume Parameters

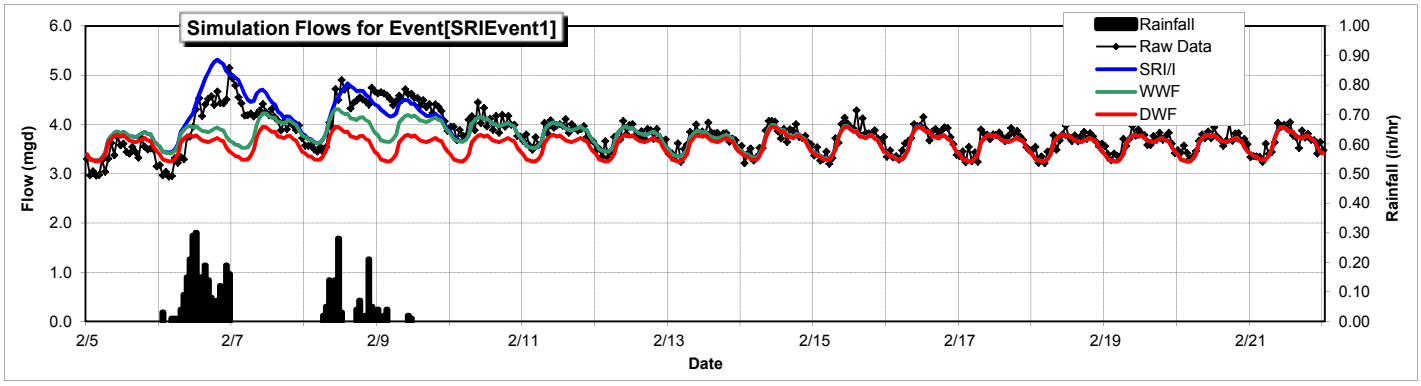
SRI Retention Coeff. (Rt)	12.50%
Total SRI Volume	2.25 MG
Perc. of DWF	0.755%
Perc. of Rainfall	12.127%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	3,071.6	10,146.6	1.729	14.258	12.124%	0.8702
SRIEvent2	04/06/15 00:00	04/11/15 00:00	887.9	5,842.4	0.484	3.915	12.368%	0.7343
All WWF Days			3,071.6	10,146.6	2.248	18.537	12.127%	0.8366

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS7W

Date: May 15, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	5.00%	70.00%	25.00%
Tn	2	4	6
Kn	4	4	6

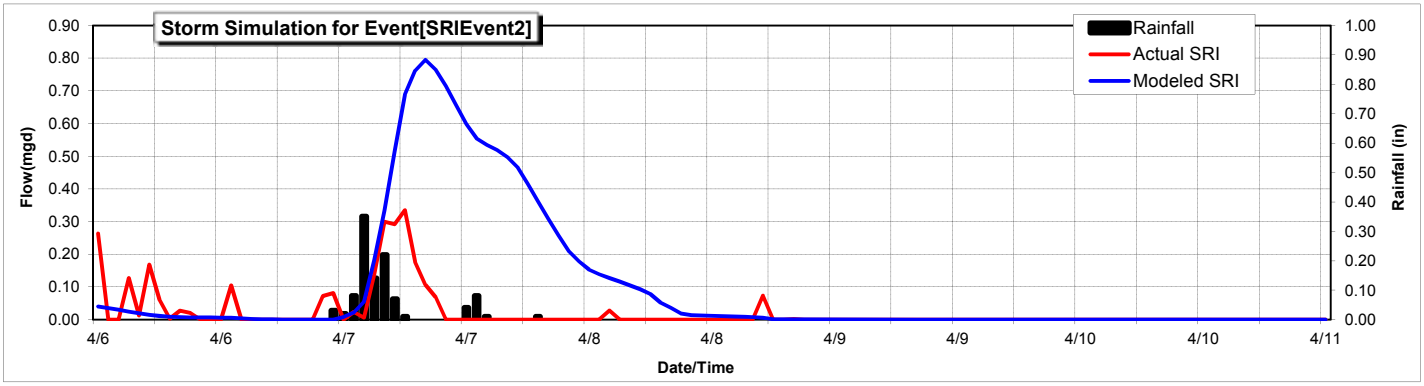
SRI/I Volume Parameters

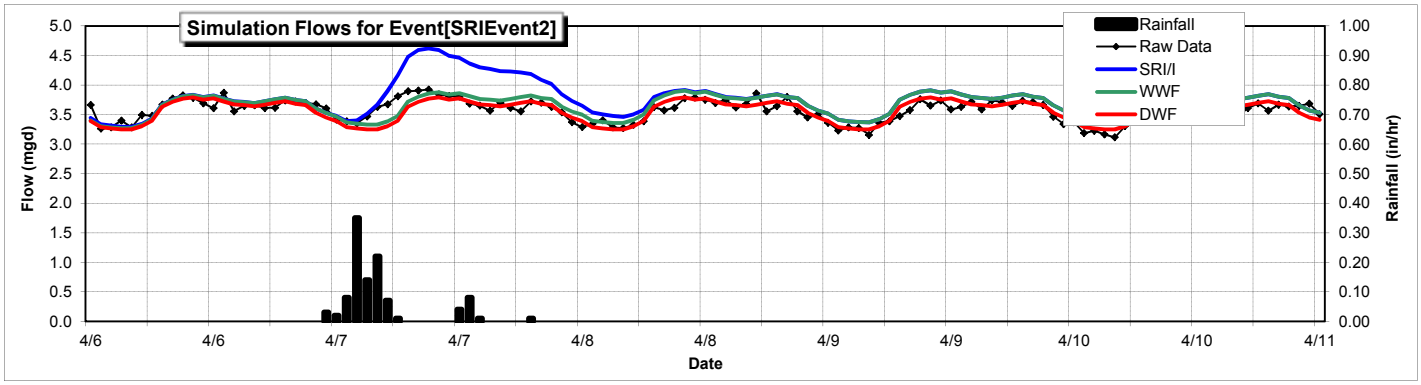
SRI Retention Coeff. (Rt)	12.50%
Total SRI Volume	2.25 MG
Perc. of DWF	0.755%
Perc. of Rainfall	12.127%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/22/15 00:00	3,071.6	10,146.6	1.729	14.258	12.124%	0.8702
SRIEvent2	04/06/15 00:00	04/11/15 00:00	887.9	5,842.4	0.484	3.915	12.368%	0.7343
All WWF Days			3,071.6	10,146.6	2.248	18.537	12.127%	0.8366

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-NORTH

Date: May 15, 2015

FLOW MONITOR AND BASIN DATA

Flow Monitoring Site Data

Pipe Diameter	8.0 inches
Slope	0.0175
Manning	0.0130
Depth Offset	1.0 inches

Flow Record Summary

Start Date	1/23/2015 0:00
End Date	4/15/2015 23:50
Time Step	0.08 hrs
Num Records	23892

Basin Size	51.00 acres
Selected Flows	Q_FlowTote

RAINFALL RECORDS

Rainfall / Runnoff Parameters

Duration Limit	12.0 hrs
Inter-storm Duration	24.0 hrs
Time Shift (hrs)	0 hrs

Rainfall Data Statistics

Start Date	1/23/15 0:00
End Date	4/15/15 23:50
Time Step	0.08 hrs
Num Records	23893
Max Hourly Precipitation	0.35 in
Max Event Precipitation	2.52 in
Max Event Duration	19.6 hrs
Total Precipitation	5.36 in

Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

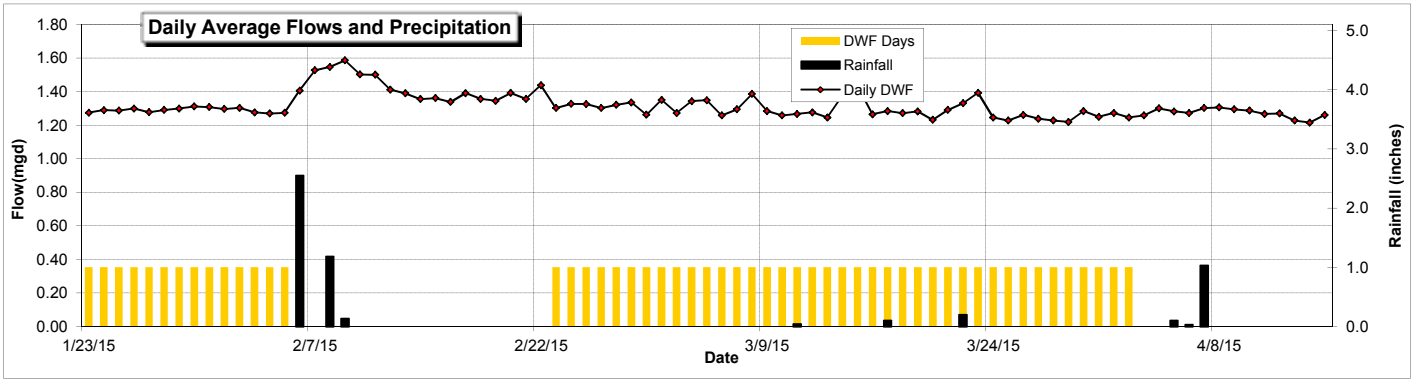
Manhole: LS10-NORTH

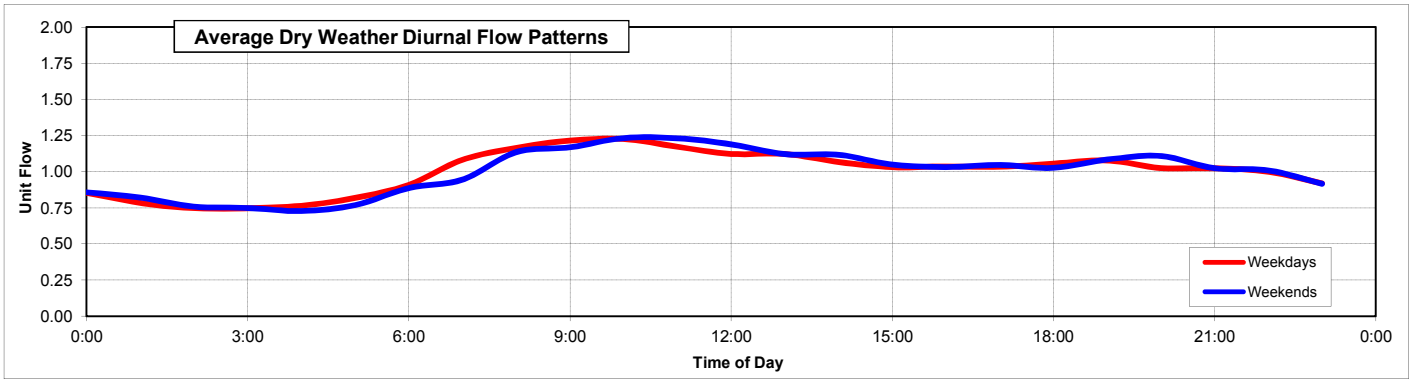
Date: May 15, 2015

DRY WEATHER FLOW DATA ANALYSIS RESULTS

Dry Weather Flow Statistics:

Parameters	Weekday			Weekend			Avg Flow Adjust.
	Avg.	Stdev.	COV	Avg.	Stdev.	COV	
- Flows	1.285 mgd	0.036 mgd	2.77%	1.310 mgd	0.059 mgd	4.54%	
- Peaking Factors	1.3335	0.1331	9.98%	1.3257	0.0591	4.46%	
- Num Records	39	39		14	14		





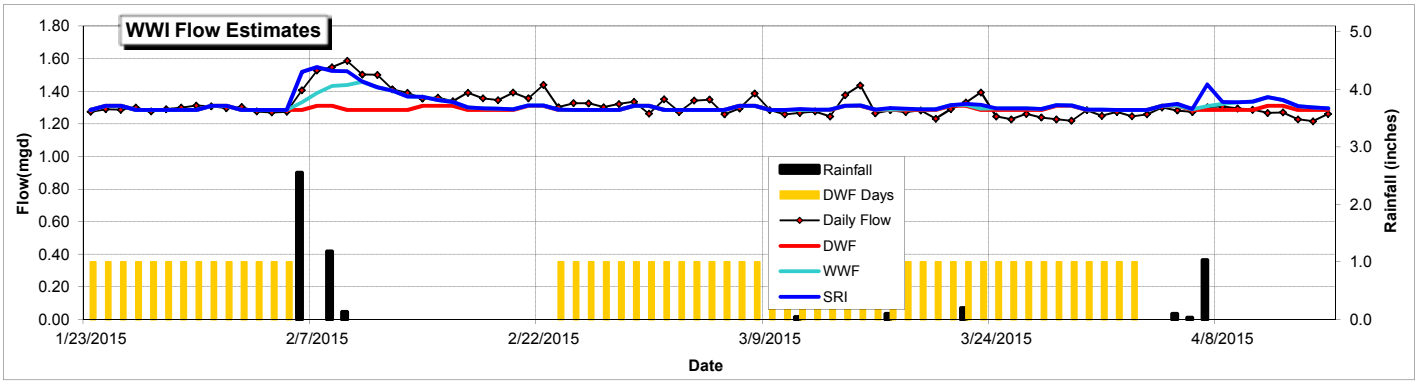
WET WEATHER INFILTRATION ANALYSIS RESULTS

WWI Parameters

Rainfall Retention Coeff. (Rt)	18.00%
WWI Inflow Period (Tn)	4.5 days
WWI Recession Coeff. (Kn)	0.4
Storm Limit	0.001 in/day
WWI @ Start of Simulation	

WWI Statistics

Parameter	Average	Maximum	Total
WWI Flow	0.017 mgd	0.174 mgd	1.38 MG
WWI Rate	326.3 gpad	3,406.3 gpad	27,079 gpa
Perc og DWF			1.29%
Perc of Precip.			18.61%



Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-NORTH

Date: May 15, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	10.00%	60.00%	30.00%
Tn	3	4	5
Kn	2	4	6

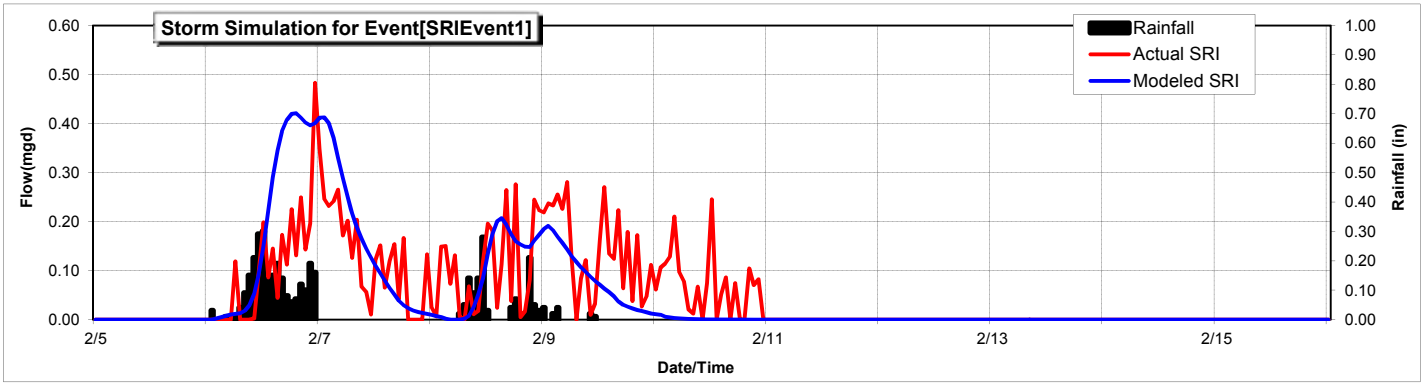
SRI/I Volume Parameters

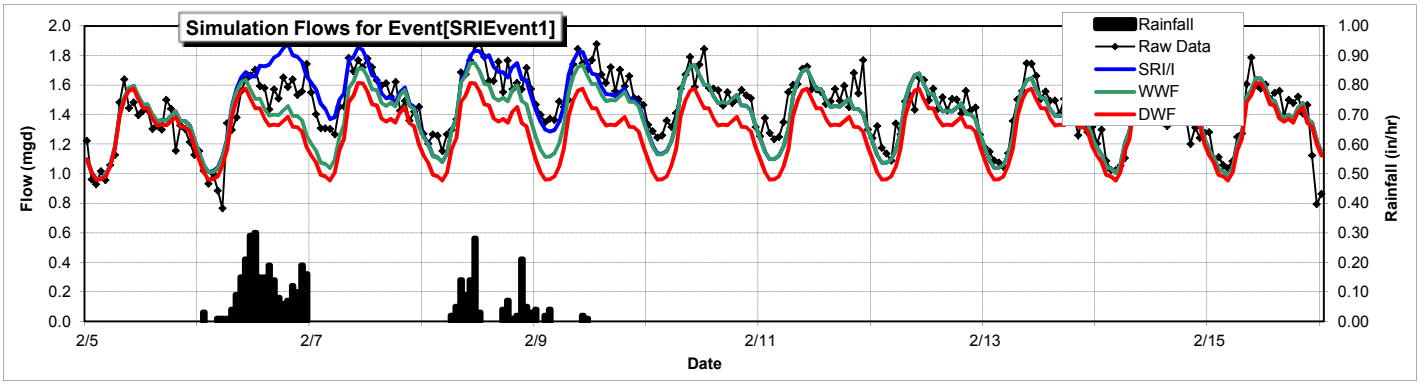
SRI Retention Coeff. (Rt)	10.00%
Total SRI Volume	0.69 MG
Perc. of DWF	0.641%
Perc. of Rainfall	9.883%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/16/15 00:00	3,406.3	8,256.3	0.528	5.347	9.880%	0.8717
SRIEvent2	04/06/15 00:00	04/11/15 00:00	1,040.4	4,913.8	0.148	1.468	10.077%	0.7845
All WWF Days			3,406.3	8,256.3	0.687	6.952	9.883%	0.8549

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Flow Monitoring Data Analysis Report

Project: Clearlake Oaks Sewer System

Basin:

Addin Version: v2.0.3

Manhole: LS10-NORTH

Date: May 15, 2015

STORM RELATED I/I ANALYSIS RESULTS

SRI/I Hydrograph Parameters

	Triangle#1	Triangle#2	Triangle#3
Rt	10.00%	60.00%	30.00%
Tn	3	4	5
Kn	2	4	6

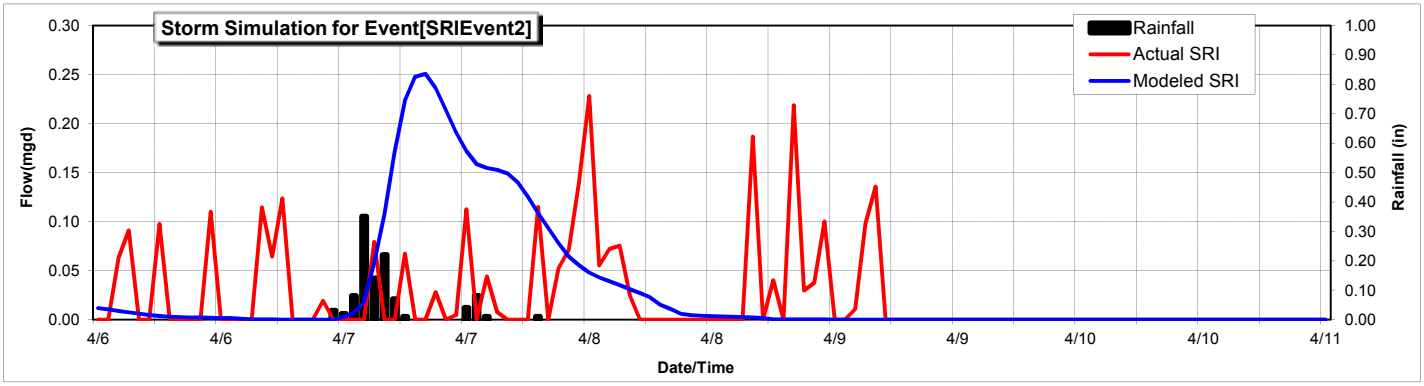
SRI/I Volume Parameters

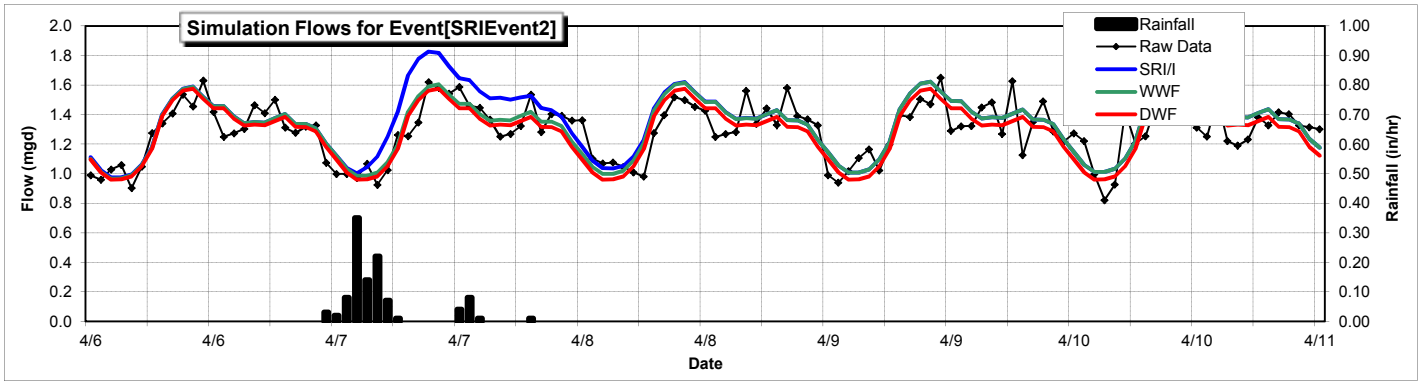
SRI Retention Coeff. (Rt)	10.00%
Total SRI Volume	0.69 MG
Perc. of DWF	0.641%
Perc. of Rainfall	9.883%

SRI/I Event Parameter List

Event Name	Start Date/Time	End Date/Time	WWImax (gpad)	SRI/Imax (gpad)	SRI/I (MG)	Rainfall (MG)	Rt-Ratio	Correl. Coeff.
SRIEvent1	02/05/15 00:00	02/16/15 00:00	3,406.3	8,256.3	0.528	5.347	9.880%	0.8717
SRIEvent2	04/06/15 00:00	04/11/15 00:00	1,040.4	4,913.8	0.148	1.468	10.077%	0.7845
All WWF Days			3,406.3	8,256.3	0.687	6.952	9.883%	0.8549

ACTUAL vs. SIMULATED FLOWS FOR SELECTED SRI/I EVENT





Attachment C
Historical Lift Station Flow Analysis

Appendix L

CLOCWD Financial Audit Information

Item Number	Document	Page Number
1	2012 Financial Audit	L-2
2	2013 Financial Audit	L-18
3	2014 Financial Audit	L-35

CLEARLAKE OAKS COUNTY WATER DISTRICT

FINANCIAL STATEMENTS

AUDIT REPORT

June 30, 2012

Pehling & Pehling, CPAs
An Accountancy Corporation

January 4, 2013

Clearlake Oaks County Water District
PO Box 709
Clearlake Oaks, CA 95423

INDEPENDENT AUDITOR'S REPORT

We have audited the accompanying financial statements of the governmental activities and the aggregate fund information of Clearlake Oaks County Water District as of and for the year then ended, June 30, 2012, which collectively comprise the District's basic financial statements, as listed in the table of contents. These financial statements are the responsibility of Clearlake Oaks County Water District's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and the significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinions.

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the governmental activities and the aggregate remaining fund information of the Clearlake Oaks County Water District as of June 30, 2012, and the respective changes in financial position for the year then ended, in conformity with accounting principles generally accepted in the United States of America.

In accordance with *Government Auditing Standards*, we have also issued our report dated January 4, 2013, on our consideration of the Clearlake Oaks County Water District's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* and should be considered in assessing the results of our audit.

Management has omitted the management's discussion and analysis information that Accounting principles generally accepted in the United States of America require be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context. Our opinion on the basic financial statements is not affected by this missing information.

Pehling & Pehling, CPA's
An Accountancy Corporation

Certified Public Accountant | Zachary Pehling | Master of Business Administration
2888 Marina View Drive | Kelseyville, CA 95451 | Phone: 707-279-4259 | www.PehlingCPA.com | Zach@PehlingCPA.com

CLEARLAKE OAKS COUNTY WATER DISTRICT

Audit Report
June 30, 2012

TABLE OF CONTENTS

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Financial Statements	
Statement of Net Assets	3
Statement of Activities	4
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Notes to Financial Statements	6
Supplemental Information	
Report on Compliance and on Internal Control Over Financial Reporting Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*	13
Schedule of Findings and Recommendations	15

CLEARLAKE OAKS COUNTY WATER DISTRICT

Statement of Net Assets
June 30, 2012

	Enterprise Funds		
	Water	Sewer	Totals
ASSETS			
Current Assets:			
Cash	$ 265,879	$ 136,210	$ 402,089
Pre-paid Expenses	17,669	14,931	32,601
Accounts Receivable	62,532	110,799	173,331
Total Current Assets	346,081	261,940	608,021
Fixed Assets:			
CIP	-	-	-
Land	255,717	6,573	262,290
Buildings and Improvements	5,340,958	6,753,457	12,094,416
Equipment	592,771	446,884	1,039,654
Less: Accumulated Depreciation	(3,674,355)	(3,212,136)	(6,886,491)
Total Fixed Assets	2,515,091	3,994,777	6,509,868
TOTAL ASSETS	2,861,172	4,256,718	7,117,889
LIABILITIES			
Current Liabilities:			
Notes Payable - Current Portion	60,518	33,418	93,936
Accounts Payable	34,278	25,605	59,883
Accrued Liabilities	27,579	14,449	42,028
Total Current Liabilities	122,375	73,472	195,846
Long-Term Liabilites:			
Notes Payable	145,368	133,818	279,186
Total Long-Term Liabilities	145,368	133,818	279,186
TOTAL LIABILITIES	267,743	207,290	475,033
NET ASSETS			
Investment in Capital Assets, net of related debt	2,369,723	3,860,959	6,230,682
Restricted	6,022	6,000	12,022
Unrestricted	217,685	182,468	400,153
TOTAL NET ASSETS	$ 2,593,429	$ 4,049,427	$ 6,642,856

The accompanying notes are an integral part of these financial statements.

CLEARLAKE OAKS COUNTY WATER DISTRICT

Statement of Activities
For the Year Ended
June 30, 2012

	Enterprise Funds		
	Water	Sewer	Totals
OPERATING REVENUES			
Charges for Services	$ 962,617	$ 848,055	$ 1,810,672
Total Operating Revenues	962,617	848,055	1,810,672
OPERATING EXPENSES			
Water Treatment	385,731	-	385,731
Water Transmission & Distribution	135,410	-	135,410
Sewer Collection	-	233,282	233,282
Sewer Treatment & Disposal	-	308,340	308,340
Administrative	376,702	368,473	745,174
Depreciation	187,672	174,006	361,678
TOTAL OPERATING EXPENSES	1,085,515	1,084,099	2,169,615
NON-OPERATING REVENUES/EXPENSES			
Property Assessment	51,378	-	51,378
Interest Expense	(4,932)	(4,932)	(9,865)
Taxes and Intergovernmental	97,830	97,830	195,659
Use of Money and Property	561	561	1,122
Total Non-Operating Revenues/Expenses	144,837	93,459	238,295
NET CHANGE IN NET ASSETS	21,938	(142,585)	(120,647)
NET ASSETS, BEGINNING OF YEAR	2,571,491	4,192,013	6,763,504
NET ASSETS, END OF YEAR	$ 2,593,429	$ 4,049,427	$ 6,642,856

The accompanying notes are an integral part of these financial statements.

CLEARLAKE OAKS COUNTY WATER DISTRICT
Statement of Cash Flow
For the Year-Ended
June 30, 2012

	Enterprise Funds		
	Water	Sewer	Total
CASH FLOWS FROM OPERATING ACTIVITIES:			
Cash Received from Charges for Service	$ 955,306	$ 846,705	$ 1,802,011
Deduct: Cash paid for Operating Expenses	(892,486)	(937,738)	(1,830,224)
NET CASH FLOWS FROM OPERATING ACTIVITIES	62,820	(91,033)	(28,213)
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES			
Tax Assessment	51,378	-	51,378
Interest Expense	(4,932)	(4,932)	(9,865)
Payment on Principle on Notes Payable	(28,350)	-	(28,350)
Loan acquisition	167,236	167,236	334,472
Purchase of Capital Assets	(260,918)	(207,235)	(468,153)
NET CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES	(75,586)	(44,931)	(120,518)
CASH FLOWS FROM NONCAPITAL FINANCING ACTIVITIES			
Property Tax Receipts	97,830	97,830	195,659
NET CASH FLOWS FROM NONCAPITAL FINANCING ACTIVITIES	97,830	97,830	195,659
CASH FLOWS FROM INVESTING ACTIVITIES			
Interest Receipts	561	561	1,122
NET CASH FLOWS FROM INVESTING ACTIVITIES	561	561	1,122
NET INCREASE (DECREASE) IN CASH	85,625	(37,573)	48,052
CASH, BEGINNING OF YEAR	161,029	193,738	354,767
CASH, END OF YEAR	$ 246,654	$ 156,165	$ 402,819
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES			
Operating Income (Loss)	$ (122,898)	$ (236,044)	$ (358,942)
Adjustments to reconcile operating income to net cash provided by operating activities			
Add back depreciation	187,672	174,006	361,678
(Increase) Decrease in Accounts Receivable	4,876	(16,068)	(11,192)
(Increase) Decrease in Prepaid	(8,031)	(5,293)	(13,324)
Increase (Decrease) in Accounts Payable	4,751	368	5,119
Increase (Decrease) in Accrued Liabilities	(3,550)	(8,002)	(11,552)
Net Cash Provided by Operating Activities	$ 62,820	$ (91,033)	$ (28,213)

The accompanying notes to the financial statements are an integral part of this statement.

NOTE 1: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Clearlake Oaks County Water District (the District) have been prepared in conformity with generally accepted accounting principles (GAAP) as applied to government units. The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for establishing governmental accounting and financial reporting principles. The more significant of the District's accounting policies are described below.

A. Description of the Reporting Entity

The District was established in 1960, under the California State Government Code. The District currently provides water and sewer services throughout the un-incorporated area of the Clearlake Oaks Community in Lake County.

The District is a governed entity administered by a Board of Directors (Board) that acts as the authoritative and legislative body of the entity. The Board is comprised of five board members who are elected by voters living within the District's boundaries. Elections are held within the Board to appoint the President. The President's responsibilities are to preside at all meetings of the Board; be the chief officer of the District; perform all duties commonly incident to the position of presiding officer of a board, commission, or business organization; and exercise supervision over the business of the District, its officers, and its employees.

The accompanying general-purpose financial statements comply with the provisions of GASB Statement No. 14, *"The Financial Reporting Entity,"* in that the financial statements include all organizations, activities, and functions that comprise the District. Component units are legally separate entities for which the District (the primary entity) is financially accountable. Financial accountability is defined as the ability to appoint a voting majority of the organization's governing body and either (1) the District's ability to impose its will over the organization or (2) the potential that the organization will provide a financial benefit to, or impose a financial burden on, the District. Using these criteria, the District has no component units.

B. Basis of Accounting/Measurement Focus

The accounts of the District are organized on the basis of funds, each of which is considered a separate accounting entity. The operations of each fund are accounted for with a separate set of self-balancing accounts that comprise its assets, liabilities, fund equity, revenues, expenses, as appropriate. Governmental resources are allocated to and accounted for in individual funds based upon the purposes for which they are to be spent and the means by which spending activities are controlled.

C. Government-Wide Financial Statements

The District Government-Wide Financial Statements include a Statement of Net Assets and a Statement of Activities and Changes in Net Assets. These statements present summaries of Governmental and Business-Type Activities for the District accompanied by a total column. These statements are presented on an "economic resources" measurement focus and the accrual basis of accounting. Accordingly, all of the District's assets and liabilities, including capital assets as well as

infrastructure assets and long-term liabilities, are included in the accompanying Statement of Net Assets. The Statement of Activities presents changes in net assets. Under the accrual basis of accounting, revenues are recognized in the period in which they are earned while expenses are recognized in the period in which the liability is incurred. The types of transactions reported as operating revenues for the District are reported as charges for services.

Certain eliminations have been made as prescribed by GASB Statement No. 34 in regards to interfund activities, payables and receivables. All internal balances in the Statement of Net Assets have been eliminated except those representing balances between the governmental activities and the business-type activities, which are presented as internal balances and eliminated in the total primary government column. In the Statement of Activities, internal service fund transactions have been eliminated; however, those transactions between governmental and business-type activities have not been eliminated.

The statement of activities presents a comparison between direct expenses and program revenues for each function of the District's governmental activities demonstrating the degree to which the direct expenses of a given project are offset by project revenues. Direct expenses are those that are specifically associated with a program or function and therefore, are clearly identifiable to a particular function or segment. Operating revenues include (1) charges paid by the recipients of services offered by the program and (2) grants and contributions that are restricted to meeting the operational or capital requirements if a particular program. Revenues that are not classified as program revenues, including taxes are presented instead as non-operating revenues.

Enterprise Funds – The enterprises funds are used to account for all the financial resources of the District. The enterprise net assets is available to the District for any purpose, provided it is expended or transferred according to the general laws of California and the bylaws of the District. The District maintains separate funds for Water, and Sewer.

Exchange and Non-Exchange Transactions of Revenues – Revenue resulting from exchange transactions, in which each party gives and receives essentially equal value, is recorded on the accrual basis when the exchange takes place. Non-exchange transactions, in which the District receives value without directly giving value in return, include taxes and donations. Revenues are recognized when susceptible to accrual, when they become both measurable and available. Measurable means the amount of the transaction can be determined and available means collectible within the current period or soon enough thereafter to be used to pay liabilities of the current period. The District considers property taxes as available if they are collected within 60 days after year-end. The assessor of the County determines the assessed valuations of such property and the tax collector of the County collects the taxes. On an accrual basis, revenue from grants and donations is recognized in the fiscal year in which all eligibility requirements have been satisfied. Eligibility requirements include timing requirements, which specify the year when the resources are required to be used or the fiscal year when use is first permitted, matching requirements, in which the District must provide local resources to be used for a specific purpose, and expenditure requirements, in which the resources are provided to the District on a reimbursement basis.

Expenses - On an accrual basis of accounting, expenses are recognized at the time they are incurred.

E. Funds on Deposit, County and Bank

The District maintains its cash in a pool managed by the County Treasury. The County Treasury, in turn, invests its cash with the State of California in the local agency investment fund as well as other banking institutions. The District does not own any specific identifiable investments in the pool. The risk of loss is minimal.

As of June 30, 2012, the primary government had the following investments:

	Fair Value	Rating	Rating Agency
Cash in County Treasury	45,255	Unrated	NA
Cash in Local Bank	33,028	FDIC ins.	NA
Cash in LAIF	323,506	Unrated	NA
Cash on Hand	300	Unrated	NA
Total Cash	$402,089		

Interest rate risk. - The District does not currently have a policy regarding interest rate risk.

Credit risk. - The District does not have a formal policy regarding credit risk

Custodial credit risk. -The District's investment in the State and County Treasurer's investment pools represents a proportionate interest in the pool's portfolio; however, the District's portion is not identified with specific investments and is not subject to custodial credit risk. Cash in local bank is covered by federal depository insurance.

Concentration of credit risk. - The District does not have a policy for concentration of credit risk.

F. Accounts Receivable

Accounts receivable are recorded at their gross value, where appropriate are reduced by the portion that is considered uncollectable. Accounts receivable consists primarily of service fees that have been billed but not paid as of year-end. Management believes its receivables to be fully collectable due to the ability to place a lien against property for unpaid receivables and, accordingly no allowance for doubtful accounts is necessary.

G. Prepaid Expenses

Certain payments to vendors reflect costs applicable to future accounting periods are recorded as prepaid items.

H. Fixed Assets

Capital assets, which include property, plant, and equipment, infrastructure assets and intangible are reported in the applicable governmental -type activities columns in the government-wide financial statements. Capital assets are defined by the government as assets with an estimated useful life in excess of one year. Property, plant and equipment purchased or acquired is carried at

historical cost or estimated historical cost. Donated or contributed capital assets are recorded at their estimated fair value on the date received. The current capitalization threshold is $2,500 for an individual item.

The costs of normal maintenance and repairs are charged to operations as incurred. Improvements are capitalized and depreciated over the remaining useful lives of the related fixed assets, as applicable.

I. Accounts Payable

On an accrual basis, expenses are recognized in the fiscal year in which the goods or services are received. Payables are liabilities of the District based upon current year charges for goods or services received but not paid in the current year.

J. Accrued Expenses

The District allows it employees to accumulate up to 200 hours of sick leave and no limit on the number of vacation hours. Any accumulated sick/vacation leave is paid-out to employees at their most recent rate of pay upon termination. The District records a liability for compensated absences based upon total accumulated vacation and sick leave hours.

K. Long-Term Debt

All long-term liabilities to be repaid from the governmental resources are reported as liabilities in the government-wide statements.

Clearlake Oaks County Water District has an obligation to Berkadia in the amount of $38,650 for water system upgrade bonds. The loan is set to be paid off in December of 2013. Current amount of $ 27,100 is due in December 2012.

Clearlake Oaks County Water District has an obligation to Kansas State Bank bearing interest at 4.40%. The loan is payable in monthly installments of $6,519.87, including interest, and is collateralized by Vacon Truck. Principal and interest payments for the years following June 30, 2012, are as follows:

	Principal	Interest
2013	65,036	13,203
2014	67,956	10,283
2015	71,007	7,232
2016	74,195	4,044
2017	51,443	854
	329,637	35,616

Funding Policy: Participants are required to contribute 7% of their annual covered salary, which is paid by the District for employees hired before May 17, 2012. Future employees are required to contribute the 7% themselves. The District makes the contributions required of District employees on their behalf and for their account. The District is required to contribute at an actuarially determined rate; the current rate is 6.589% for safety employees of annual covered payroll. The contribution requirements of plan members and the District are established and may be amended by PERS.

Annual Pension Cost: For June 30, 2012, the District's annual pension cost of $75,376 for PERS was equal to the District's required and actual contributions.

NOTE 3: USE OF RESTRICTED/UNRESTRICTED NET ASSETS

When an expense is incurred for purposes for which both restricted and unrestricted net assets are available, the District's policy is to apply restricted net assets first.

NOTE 4: COMPARATIVE DATA AND RECLASSIFICATIONS

Comparative data for the prior year have been presented in certain sections of the accompanying financial statements in order to provide an understanding of changes in the District's financial position and operations. Also, certain amounts presented in the prior year data have been reclassified in order to be consistent with current year's presentation.

NOTE 5 JOINT POWERS INSURANCE AUTHORITY

The District participates in a joint venture under a joint agreement (JPA) with the Association of California Water Agencies (ACWA). The relationship between the District and the JPA is such that is not a component unit of the District and the JPA is not a component unit of the District for financial reporting purposes.

The JPA'S purpose is to jointly fund and develop programs to provide comprehensive and economical funding of property, workers compensation and employers liability coverage's for bodily injury by accident or by disease, including resulting from death, arising out of and in the course of an employee's employment with the District. This program is provided through collective self-insurance; the purchase of insurance benefit's; or a combination thereof. Copies of ACWA annual financial reports may be obtained from their executive office at 25620 Birdcage Street, Suite 200, Citrus Heights, CA.

NOTE 6: CONTIGENCIES

As of June 30, 2012, the District did not have any pending litigation or potential nondisclosed liabilities that management believes would have a material effect on the financial statements.

NOTE 7 : DATE OF MANAGEMENT'S REVIEW

Subsequent events have been evaluated through January 4, 2013, which is the date the financial statements were available to be issued.

CLEARLAKE OAKS COUNTY WATER DISTRICT

Supplemental Information

June 30, 2012

January 4, 2013

Board of Directors
Clearlake Oaks County Water District
PO Box 709
Clearlake Oaks, CA 95423

REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

We have audited the financial statements of Clearlake Oaks County Water District as of and for the year ended June 30, 2012, and have issued our report thereon dated January 4, 2013. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States.

Internal Control Over Financial Reporting

Management of Clearlake Oaks County Water District is responsible for establishing and maintaining effective internal control over financial reporting. In planning and performing our audit, we considered Clearlake Oaks County Water District's internal control over financial reporting as a basis for designing our auditing procedures for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of Clearlake Oaks County Water District's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of the Organization's internal control over financial reporting.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal controls such there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis.

Our consideration of the internal controls over financial reporting was for the limited purpose described in the first paragraph of this section and was designed to identify all deficiencies in internal control over financial

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REPORT ON COMPLIANCE AND ON INTERNAL CONTROL OVER FINANCIAL REPORTING BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS* *(continued)*

reporting that might be deficiencies, significant deficiencies, or material weaknesses. We did not identify and deficiencies in internal control over financial reporting that we consider to be material weaknesses as defined above. However, we identified certain deficiencies in internal control over financial reporting, described in the accompanying schedule of findings and recommendations that we consider to be significant deficiencies in internal control over financial reporting. 12-01. A *significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less* severe than a material weakness, yet important enough to merit attention by those charged with governance.

Clearlake Oaks County Water District's response to the findings identified in our audit is described in the accompanying schedule of findings are questioned costs. We did not audit Clearlake Oaks County Water District's response and, accordingly, we express no opinion on it.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether Clearlake Oaks County Water District's general-purpose financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts and grants, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance that are required to be reported under *Government Auditing Standards.*

This report is intended solely for the information and use of the audit committee, management, others within the organization, and pass-through entities and is not intended to be and should not be used by anyone other than these specified parties.

Pehling & Pehling CPAs
An Accountancy Corporation
January 4, 2013

L. Property Tax Revenue

The County, through the Auditor-Controller's Office and the Treasury-Tax Collector, is responsible for collecting and distributing property taxes according to the alternative method of distributing known as the Teeter Plan. Under the Teeter Plan, the current year's secured property tax levy is distributed to participating agencies with the County without consideration of whether the tax has been collected.

M. Net Assets

The District's net assets represent the difference between its assets and liabilities in the statement of net assets. Net assets are reported as restricted when there are legal limitations imposed on their use by their source. Portions of the unreserved net assets or fund balance may be designated to indicate tentative plans for financial resources utilization in a future period, such as for general contingencies, purchase of capital assets, or debt service. Such plans or intent are subject to change and may never be legally authorized or result in expenditures.

N. Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results may differ from those estimates.

NOTE 2: RISK MANAGEMENT

The District is exposed to various risks of loss related to torts; damage to, and theft or destruction of assets; errors and omissions; injuries to employees; and natural disasters. During 2012, the District contracted with private insurance agencies for liability, property, crime damage, and employee and director insurances.

NOTE 3: DEFINED BENEFIT PENSION PLAN

The District entered into the Public Employees Retirement System (PERS). Qualified employees are covered under a multiple-employer defined benefit pension plan maintained by an agency of the State of California. Employees are members of the Public Employees' Retirement System.

Plan Description: The District contributes to the PERS, an agent multiple- employer public employee defined benefit plan. PERS provides retirement and disability benefits, annual cost-of-living adjustments, and death benefits to plan members and beneficiaries. PERS acts as a common investment and administrative agent for participating public entities within the State of California. Benefit provisions and all other requirements are established by state statute and district ordinance. Copies of PERS' annual financial report may be obtained from their Executive Office, 400 P Street, Sacramento, CA 95814.

CLEARLAKE OAKS COUNTY WATER DISTRICT

Schedule of Findings and Recommendations
June 30, 2012

PRIOR YEAR AUDIT FINDINGS AND RECOMMENDATIONS:

Same as Current Year.

CURRENT YEARS AUDIT FINDINGS AND RECOMMENDATIONS:

Reportable Conditions – Material Weaknesses

Reportable Conditions – Significant Deficiency

Finding 12-01:

We noted that management failed to review and approve the financials at Clearlake Oaks County Water District. Failure to review the financials may lead to the failure of management to detect fraud or misstatements.

Recommendation:

Additional training of managerial staff to review and sign off on financials statements would eliminate the deficiency. We recommend that management review and initial the financial to prove oversight on at least a monthly basis.

Management's Response to the Findings:

Management is aware of the deficiency and will make sure that oversight is applied to the financials on at least a monthly basis.

Non-Compliance with Laws and Regulations

CLEARLAKE OAKS COUNTY WATER DISTRICT

FINANCIAL STATEMENTS

AUDIT REPORT

June 30, 2013

September 4, 2013

Clearlake Oaks County Water District
PO Box 709
Clearlake Oaks, CA 95423

INDEPENDENT AUDITOR'S REPORT

We have audited the accompanying financial statements of Clearlake Oaks County Water District as of and for the years ended June 30, 2013, as listed in the Table of Contents. These financial statements are the responsibility of Clearlake Oaks County Water District's management. Our responsibility is to express an opinion on these financial statements based on our audit.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and far presentation of financial statements that are free of material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America applicable to financial audits contained in Governmental Auditing Standards issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements

We believe that our audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Clearlake Oaks County Water District as of June 30, 2013, and the respective changes in financial position, and cash flows for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

Other Matters

The District has not presented Management's Discussion and Analysis or budgetary comparison information that accounting principles generally accepted in the United States of America require be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated September 4, 2013, on our consideration of the Clearlake Oaks County Water District's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* and should be considered in assessing the results of our audit.

Pehling & Pehling, CPA's
An Accountancy Corporation

CLEARLAKE OAKS COUNTY WATER DISTRICT

Audit Report
June 30, 2013

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CLEARLAKE OAKS COUNTY WATER DISTRICT

Statement of Net Assets
June 30, 2013

	Enterprise Funds		
	Water	Sewer	Totals
ASSETS			
Current Assets:			
Cash	$ 354,193	$ 208,214	$ 562,407
Pre-paid Expenses	9,131	6,986	16,117
Accounts Receivable	100,112	88,312	188,424
Total Current Assets	463,437	303,512	766,949
Fixed Assets:			
CIP	-	-	-
Land	255,717	6,573	262,290
Buildings and Improvements	5,452,976	6,753,457	12,206,433
Equipment	592,771	544,379	1,137,149
Less: Accumulated Depreciation	(3,850,294)	(3,376,681)	(7,226,976)
Total Fixed Assets	2,451,169	3,927,727	6,378,897
TOTAL ASSETS	2,914,606	4,231,239	7,145,845
LIABILITIES			
Current Liabilities:			
Notes Payable - Current Portion	45,458	52,111	97,569
Accounts Payable	64,077	39,493	103,570
Accrued Liabilities	27,094	15,652	42,746
Total Current Liabilities	136,629	107,256	243,885
Long-Term Liabilites:			
Notes Payable	99,961	159,362	259,322
Total Long-Term Liabilities	99,961	159,362	259,322
TOTAL LIABILITIES	236,590	266,618	503,207
NET ASSETS			
Investment in Capital Assets, net of related debt	2,351,209	3,768,365	6,119,574
Restricted	12,337	6,000	18,337
Unrestricted	314,471	190,256	504,727
TOTAL NET ASSETS	$ 2,678,017	$ 3,964,621	$ 6,642,638

The accompanying notes are an integral part of these financial statements

CLEARLAKE OAKS COUNTY WATER DISTRICT

Statement of Activities
For the Year Ended
June 30, 2013

	Enterprise Funds		
	Water	Sewer	Totals
OPERATING REVENUES			
Charges for Services	$ 1,100,324	$ 962,890	$ 2,063,214
Total Operating Revenues	1,100,324	962,890	2,063,214
OPERATING EXPENSES			
Water Treatment	492,969	-	492,969
Water Transmission & Distribution	97,209	-	97,209
Sewer Collection	-	166,113	166,113
Sewer Treatment & Disposal	-	412,578	412,578
Administrative	422,206	368,013	790,219
Depreciation	180,158	164,545	344,703
TOTAL OPERATING EXPENSES	1,192,542	1,111,249	2,303,790
NON-OPERATING REVENUES/EXPENSES			
Property Assessment	110,267	-	110,267
Interest Expense	(5,710)	(7,741)	(13,451)
Taxes and Intergovernmental	71,292	71,292	142,584
Use of Money and Property	957	-	957
Total Non-Operating Revenues/Expenses	176,808	63,551	240,358
NET CHANGE IN NET ASSETS	84,589	(84,807)	(218)
NET ASSETS, BEGINNING OF YEAR	2,593,428	4,049,428	6,642,856
NET ASSETS, END OF YEAR	$ 2,678,017	$ 3,964,621	$ 6,642,638

The accompanying notes are an integral part of these financial statements

CLEARLAKE OAKS COUNTY WATER DISTRICT
Statement of Cash Flow
For the Year-Ended
June 30, 2013

	Enterprise Funds		
	Water	Sewer	Total
CASH FLOWS FROM OPERATING ACTIVITIES:			
Cash Received from Charges for Service	$ 1,100,723	$ 956,079	$ 2,056,802
Deduct: Cash paid for Operating Expenses	(989,541)	(914,802)	(1,904,343)
NET CASH FLOWS FROM OPERATING ACTIVITIES	111,182	41,277	152,459
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES			
Tax Assessment	110,267	-	110,267
Interest Expense	(5,710)	(7,741)	(13,451)
Payment on Principle on Notes Payable	(60,510)	(53,258)	(113,768)
Loan acquisition	-	97,495	97,495
Purchase of Capital Assets	(119,462)	(97,495)	(216,957)
NET CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES	(75,415)	(60,999)	(136,414)
CASH FLOWS FROM NONCAPITAL FINANCING ACTIVITIES			
Property Tax Receipts	71,292	71,292	142,584
NET CASH FLOWS FROM NONCAPITAL FINANCING ACTIVITIES	71,292	71,292	142,584
CASH FLOWS FROM INVESTING ACTIVITIES			
Interest Receipts	479	479	957
NET CASH FLOWS FROM INVESTING ACTIVITIES	479	479	957
NET INCREASE (DECREASE) IN CASH	107,539	52,049	159,588
CASH, BEGINNING OF YEAR	246,654	156,165	402,819
CASH, END OF YEAR	$ 354,193	$ 208,214	$ 562,407
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES			
Operating Income (Loss)	$ (92,218)	$ (148,359)	$ (240,577)
Adjustments to reconcile operating income to net cash provided by operating activities			
Add back depreciation	180,158	164,545	344,703
(Increase) Decrease in Accounts Receivable	(14,611)	2,055	(12,556)
(Increase) Decrease in Prepaid	8,538	7,945	16,483
Increase (Decrease) in Accounts Payable	29,799	13,888	43,687
Increase (Decrease) in Accrued Liabilities	(484)	1,203	719
Net Cash Provided by Operating Activities	$ 111,182	$ 41,277	$ 152,459

The accompanying notes to the financial statements are an integral part of this statement

NOTE 1: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Clearlake Oaks County Water District (the District) have been prepared in conformity with generally accepted accounting principles (GAAP) as applied to government units. The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for establishing governmental accounting and financial reporting principles. The more significant of the District's accounting policies are described below.

A. Description of the Reporting Entity

The District was established in 1960, under the California State Government Code. The District currently provides water and sewer services throughout the un-incorporated area of the Clearlake Oaks Community in Lake County.

The District is a governed entity administered by a Board of Directors (Board) that acts as the authoritative and legislative body of the entity. The Board is comprised of five board members who are elected by voters living within the District's boundaries. Elections are held within the Board to appoint the President. The President's responsibilities are to preside at all meetings of the Board; be the chief officer of the District; perform all duties commonly incident to the position of presiding officer of a board, commission, or business organization; and exercise supervision over the business of the District, its officers, and its employees.

The accompanying general-purpose financial statements comply with the provisions of GASB Statement No. 14, *"The Financial Reporting Entity,"* in that the financial statements include all organizations, activities, and functions that comprise the District. Component units are legally separate entities for which the District (the primary entity) is financially accountable. Financial accountability is defined as the ability to appoint a voting majority of the organization's governing body and either (1) the District's ability to impose its will over the organization or (2) the potential that the organization will provide a financial benefit to, or impose a financial burden on, the District. Using these criteria, the District has no component units.

B. Basis of Accounting/Measurement Focus

The accounts of the District are organized on the basis of funds, each of which is considered a separate accounting entity. The operations of each fund are accounted for with a separate set of self-balancing accounts that comprise its assets, liabilities, fund equity, revenues, expenses, as appropriate. Governmental resources are allocated to and accounted for in individual funds based upon the purposes for which they are to be spent and the means by which spending activities are controlled.

C. Government-Wide Financial Statements

The District Government-Wide Financial Statements include a Statement of Net Assets and a Statement of Activities and Changes in Net Assets. These statements present summaries of Governmental and Business-Type Activities for the District accompanied by a total column. These statements are presented on an "economic resources" measurement focus and the accrual basis of accounting. Accordingly, all of the District's assets and liabilities, including capital assets as well as

infrastructure assets and long-term liabilities, are included in the accompanying Statement of Net Assets. The Statement of Activities presents changes in net assets. Under the accrual basis of accounting, revenues are recognized in the period in which they are earned while expenses are recognized in the period in which the liability is incurred. The types of transactions reported as operating revenues for the District are reported as charges for services.

Certain eliminations have been made as prescribed by GASB Statement No. 34 in regards to interfund activities, payables and receivables. All internal balances in the Statement of Net Assets have been eliminated except those representing balances between the governmental activities and the business-type activities, which are presented as internal balances and eliminated in the total primary government column. In the Statement of Activities, internal service fund transactions have been eliminated; however, those transactions between governmental and business-type activities have not been eliminated.

The statement of activities presents a comparison between direct expenses and program revenues for each function of the District's governmental activities demonstrating the degree to which the direct expenses of a given project are offset by project revenues. Direct expenses are those that are specifically associated with a program or function and therefore, are clearly identifiable to a particular function or segment. Operating revenues include (1) charges paid by the recipients of services offered by the program and (2) grants and contributions that are restricted to meeting the operational or capital requirements if a particular program. Revenues that are not classified as program revenues, including taxes are presented instead as non-operating revenues.

Enterprise Funds – The enterprises funds are used to account for all the financial resources of the District. The enterprise net assets is available to the District for any purpose, provided it is expended or transferred according to the general laws of California and the bylaws of the District. The District maintains separate funds for Water, and Sewer.

Exchange and Non-Exchange Transactions of Revenues – Revenue resulting from exchange transactions, in which each party gives and receives essentially equal value, is recorded on the accrual basis when the exchange takes place. Non-exchange transactions, in which the District receives value without directly giving value in return, include taxes and donations. Revenues are recognized when susceptible to accrual, when they become both measurable and available. Measurable means the amount of the transaction can be determined and available means collectible within the current period or soon enough thereafter to be used to pay liabilities of the current period. The District considers property taxes as available if they are collected within 60 days after year-end. The assessor of the County determines the assessed valuations of such property and the tax collector of the County collects the taxes. On an accrual basis, revenue from grants and donations is recognized in the fiscal year in which all eligibility requirements have been satisfied. Eligibility requirements include timing requirements, which specify the year when the resources are required to be used or the fiscal year when use is first permitted, matching requirements, in which the District must provide local resources to be used for a specific purpose, and expenditure requirements, in which the resources are provided to the District on a reimbursement basis.

Expenses - On an accrual basis of accounting, expenses are recognized at the time they are incurred.

E. Funds on Deposit, County and Bank

The District maintains its cash in a pool managed by the County Treasury. The County Treasury, in turn, invests its cash with the State of California in the local agency investment fund as well as other banking institutions. The District does not own any specific identifiable investments in the pool. The risk of loss is minimal.

As of June 30, 2013, the primary government had the following investments:

	Fair Value	Rating	Rating Agency
Cash in County Treasury	36,113	Unrated	NA
Cash in Local Bank	188,530	FDIC ins.	NA
Cash in LAIF	337,464	Unrated	NA
Cash on Hand	300	Unrated	NA
Total Cash	$562,407		

Interest rate risk. - The District does not currently have a policy regarding interest rate risk.

Credit risk. - The District does not have a formal policy regarding credit risk

Custodial credit risk. -The District's investment in the State and County Treasurer's investment pools represents a proportionate interest in the pool's portfolio; however, the District's portion is not identified with specific investments and is not subject to custodial credit risk. Cash in local bank is covered by federal depository insurance.

Concentration of credit risk. - The District does not have a policy for concentration of credit risk.

F. Accounts Receivable

Accounts receivable are recorded at their gross value, where appropriate are reduced by the portion that is considered uncollectable. Accounts receivable consists primarily of service fees that have been billed but not paid as of year-end. Management believes its receivables to be fully collectable due to the ability to place a lien against property for unpaid receivables and, accordingly no allowance for doubtful accounts is necessary.

G. Prepaid Expenses

Certain payments to vendors reflect costs applicable to future accounting periods are recorded as prepaid items.

H. Fixed Assets

Capital assets, which include property, plant, and equipment, infrastructure assets and intangible are reported in the applicable governmental type activities columns in the government wide financial statements. Capital assets are defined by the government as assets with an estimated useful life in excess of one year. Property, plant and equipment purchased or acquired is carried at

historical cost or estimated historical cost. Donated or contributed capital assets are recorded at their estimated fair value on the date received. The current capitalization threshold is $2,500 for an individual item.

The costs of normal maintenance and repairs are charged to operations as incurred. Improvements are capitalized and depreciated over the remaining useful lives of the related fixed assets, as applicable.

I. Accounts Payable

On an accrual basis, expenses are recognized in the fiscal year in which the goods or services are received. Payables are liabilities of the District based upon current year charges for goods or services received but not paid in the current year.

J. Accrued Expenses

The District allows it employees to accumulate up to 200 hours of sick leave and no limit on the number of vacation hours. Any accumulated sick/vacation leave is paid-out to employees at their most recent rate of pay upon termination. The District records a liability for compensated absences based upon total accumulated vacation and sick leave hours.

K. Long-Term Debt

All long-term liabilities to be repaid from the governmental resources are reported as liabilities in the government-wide statements.

Clearlake Oaks County Water District has an obligation to Berkadia in the amount of $11,550 for water system upgrade bonds. The loan is set to be paid off in December of 2013. Current amount of $ 11,550 is due in December 2013.

Clearlake Oaks County Water District has an obligation to Kansas State Bank bearing interest at 4.40%.
The loan is collateralized by Vacon Truck.

Principal and interest payments for the years following June 30, 2013, are as follows:

	Principal	Interest
2014	67,817	10,422
2015	70,862	7,377
2016	74,043	4,195
2017	54,973	959
	$267,695	$ 22,953

Clearlake Oaks County Water District has an obligation to Kansas State Bank bearing interest at 4.96%.

The loan is collateralized by Camera Truck.

Principal and interest payments for the years following June 30, 2013, are as follows:

	Principal	Interest
2014	18,030	3,851
2015	18,924	2,957
2016	19,863	2,018
2017	20,829	1,033
	$ 77,646	$ 9,859

L. Property Tax Revenue

The County, through the Auditor-Controller's Office and the Treasury-Tax Collector, is responsible for collecting and distributing property taxes according to the alternative method of distributing known as the Teeter Plan. Under the Teeter Plan, the current year's secured property tax levy is distributed to participating agencies with the County without consideration of whether the tax has been collected.

M. Net Assets

The District's net assets represent the difference between its assets and liabilities in the statement of net assets. Net assets are reported as restricted when there are legal limitations imposed on their use by their source. Portions of the unreserved net assets or fund balance may be designated to indicate tentative plans for financial resources utilization in a future period, such as for general contingencies, purchase of capital assets, or debt service. Such plans or intent are subject to change and may never be legally authorized or result in expenditures.

N. Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results may differ from those estimates.

NOTE 2: RISK MANAGEMENT

The District is exposed to various risks of loss related to torts; damage to, and theft or destruction of assets; errors and omissions; injuries to employees; and natural disasters. During 2013, the District contracted with private insurance agencies for liability, property, crime damage, and employee and director insurances

NOTE 3: DEFINED BENEFIT PENSION PLAN

The District entered into the Public Employees Retirement System (PERS). Qualified employees are covered under a multiple-employer defined benefit pension plan maintained by an agency of the State of California. Employees are members of the Public Employees' Retirement System.

Plan Description: The District contributes to the PERS, an agent multiple- employer public employee defined benefit plan. PERS provides retirement and disability benefits, annual cost-of-living adjustments, and death benefits to plan members and beneficiaries. PERS acts as a common investment and administrative agent for participating public entities within the State of California. Benefit provisions and all other requirements are established by state statute and district ordinance. Copies of PERS' annual financial report may be obtained from their Executive Office, 400 P Street, Sacramento, CA 95814.

Funding Policy: Participants are required to contribute 7% of their annual covered salary, which is paid by the District for employees hired before May 17, 2012. Future employees are required to contribute the 7% themselves. The District makes the contributions required of District employees on their behalf and for their account. The District is required to contribute at an actuarially determined rate; the current rate is 7.205% for safety employees of annual covered payroll. The rate for 2012 was 6.589%. The contribution requirements of plan members and the District are established and may be amended by PERS.

Annual Pension Cost: For June 30, 2013, the District's annual pension cost of $52,685 for PERS was equal to the District's required and actual contributions.

NOTE 3: USE OF RESTRICTED/UNRESTRICTED NET ASSETS

When an expense is incurred for purposes for which both restricted and unrestricted net assets are available, the District's policy is to apply restricted net assets first.

NOTE 4: COMPARATIVE DATA AND RECLASSIFICATIONS

Comparative data for the prior year have been presented in certain sections of the accompanying financial statements in order to provide an understanding of changes in the District's financial position and operations. Also, certain amounts presented in the prior year data have been reclassified in order to be consistent with current year's presentation.

NOTE 5 JOINT POWERS INSURANCE AUTHORITY

The District participates in a joint venture under a joint agreement (JPA) with the Association of California Water Agencies (ACWA). The relationship between the District and the JPA is such that is not a component unit of the District and the JPA is not a component unit of the District for financial reporting purposes.

The JPA'S purpose is to jointly fund and develop programs to provide comprehensive and economical funding of property, workers compensation and employers liability coverage s for bodily

injury by accident or by disease, including resulting from death, arising out of and in the course of an employee's employment with the District. This program is provided through collective self-insurance; the purchase of insurance benefit's; or a combination thereof. Copies of ACWA annual financial reports may be obtained from their executive office at 25620 Birdcage Street, Suite 200, Citrus Heights, CA.

NOTE 6: CONTIGENCIES

As of June 30, 2013, the District did not have any pending litigation or potential nondisclosed liabilities that management believes would have a material effect on the financial statements.

NOTE 7 : DATE OF MANAGEMENT'S REVIEW

Subsequent events have been evaluated through September 4, 2013, which is the date the financial statements were available to be issued.

September 4, 2013

Board of Directors
Clearlake Oaks County Water District
PO Box 709
Clearlake Oaks, CA 95423

REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

We have audited the financial statements of Clearlake Oaks County Water District as of and for the year ended June 30, 2013, and have issued our report thereon dated September 4, 2013. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States.

Internal Control Over Financial Reporting

Management of Clearlake Oaks County Water District is responsible for establishing and maintaining effective internal control over financial reporting. In planning and performing our audit, we considered Clearlake Oaks County Water District's internal control over financial reporting as a basis for designing our auditing procedures for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of Clearlake Oaks County Water District's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of the Organization's internal control over financial reporting.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal controls such there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis.

Our consideration of the internal controls over financial reporting was for the limited purpose described in the first paragraph of this section and was designed to identify all deficiencies in internal control over financial reporting that might be deficiencies, significant deficiencies, or material weaknesses. We did not identify any deficiencies in internal control over financial reporting that we consider to be material weaknesses as defined above.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether Clearlake Oaks County Water District's general-purpose financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts and grants, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on

CLEARLAKE OAKS COUNTY WATER DISTRICT

Supplemental Information

June 30, 2013

REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*
(continued)

compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance that are required to be reported under *Government Auditing Standards*.

This report is intended solely for the information and use of the audit committee, management, others within the organization, and pass-through entities and is not intended to be and should not be used by anyone other than these specified parties.

Pehling & Pehling CPAs
An Accountancy Corporation
September 4, 2013

CLEARLAKE OAKS COUNTY WATER DISTRICT

FINANCIAL STATEMENTS

AUDIT REPORT

June 30, 2014

August 7, 2014

Clearlake Oaks County Water District
PO Box 709
Clearlake Oaks, CA 95423

INDEPENDENT AUDITOR'S REPORT

We have audited the accompanying financial statements of Clearlake Oaks County Water District as of and for the years ended June 30, 2014, as listed in the Table of Contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and far presentation of financial statements that are free of material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America applicable to financial audits contained in Governmental Auditing Standards issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that our audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Clearlake Oaks County Water District as of June 30, 2014, and the respective changes in financial position, and cash flows for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

Other Matters

The District has not presented Management's Discussion and Analysis or budgetary comparison information that accounting principles generally accepted in the United States of America require be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated August 7, 2014, on our consideration of the Clearlake Oaks County Water District's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* and should be considered in assessing the results of our audit.

Pehling & Pehling, CPA's
An Accountancy Corporation

CLEARLAKE OAKS COUNTY WATER DISTRICT

Statement of Net Position
June 30, 2014

	Enterprise Funds		
	Water	Sewer	Totals
ASSETS			
Current Assets:			
Cash	$ 520,059	$ 155,843	$ 675,902
Pre-paid Expenses	9,087	6,986	16,073
Accounts Receivable	104,026	75,012	179,038
Total Current Assets	633,173	237,841	871,014
Fixed Assets:			
CIP	41,955	44,626	86,581
Land	262,717	13,573	276,290
Buildings and Improvements	5,645,901	6,772,419	12,418,320
Equipment	445,995	468,675	914,670
Less: Accumulated Depreciation	(3,971,651)	(3,442,999)	(7,414,651)
Total Fixed Assets	2,424,917	3,856,293	6,281,210
TOTAL ASSETS	3,058,090	4,094,134	7,152,224
LIABILITIES			
Current Liabilities:			
Notes Payable - Current Portion	45,458	52,111	97,569
Accounts Payable	123,275	28,325	151,600
Accrued Liabilities	32,750	22,547	55,297
Total Current Liabilities	201,483	102,984	304,467
Long-Term Liabilites:			
Notes Payable	53,676	106,639	160,314
Total Long-Term Liabilities	53,676	106,639	160,314
TOTAL LIABILITIES	255,158	209,623	464,781
NET POSITION	(64,027)	64,028	2
Net Investment in Capital Assets	2,371,241	3,749,655	6,120,896
Restricted	12,337	6,000	18,337
Unrestricted	483,380	64,829	548,209
TOTAL NET POSITION	$ 2,866,958	$ 3,820,484	$ 6,687,442

The accompanying notes are an integral part of these financial statements

CLEARLAKE OAKS COUNTY WATER DISTRICT

Statement of Activities
For the Year Ended
June 30, 2014

	Enterprise Funds		
	Water	Sewer	Totals
OPERATING REVENUES			
Charges for Services	$ 1,126,443	$ 959,462	$ 2,085,905
Total Operating Revenues	1,126,443	959,462	2,085,905
OPERATING EXPENSES			
Water Treatment	462,043	-	462,043
Water Transmission & Distribution	135,918	-	135,918
Sewer Collection	-	135,918	135,918
Sewer Treatment & Disposal	-	643,010	643,010
Administrative	233,705	233,705	467,410
Depreciation	194,168	165,786	359,954
TOTAL OPERATING EXPENSES	1,025,834	1,178,420	2,204,254
NON-OPERATING REVENUES/EXPENSES			
Interest Expense	(4,426)	(14,596)	(19,022)
Other Income/Expenses	(6,954)	(8,596)	(15,550)
Taxes and Intergovernmental	99,712	98,012	197,725
Total Non-Operating Revenues/Expenses	88,332	74,820	163,152
NET CHANGE IN NET POSITION	188,941	(144,137)	44,804
NET POSITION, BEGINNING OF YEAR	2,678,017	3,964,621	6,642,638
NET POSITION, END OF YEAR	$ 2,866,958	$ 3,820,484	$ 6,687,442
	$ (0)		

The accompanying notes are an integral part of these financial statements

CLEARLAKE OAKS COUNTY WATER DISTRICT
Statement of Cash Flow
For the Year-Ended
June 30, 2014

	Enterprise Funds		
	Water	Sewer	Total
CASH FLOWS FROM OPERATING ACTIVITIES:			
Cash Received from Charges for Service	$ 1,128,048	$ 966,264	$ 2,094,312
Deduct: Cash paid for Operating Expenses	(837,080)	(1,019,125)	(1,856,205)
NET CASH FLOWS FROM OPERATING ACTIVITIES	290,968	(52,861)	238,107
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES			
Tax Assessment	-	-	-
Cash Received from Other	90,802	32,876	123,678
Interest Expense	(4,426)	(14,596)	(19,022)
Payment on Principle on Notes Payable	(46,285)	(52,723)	(99,008)
Loan acquisition	-	-	-
Purchase of Capital Assets	(265,414)	(63,588)	(329,002)
NET CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES	(225,323)	(98,031)	(323,354)
CASH FLOWS FROM NONCAPITAL FINANCING ACTIVITIES			
Property Tax Receipts	99,712	98,012	197,725
NET CASH FLOWS FROM NONCAPITAL FINANCING ACTIVITIES	99,712	98,012	197,725
CASH FLOWS FROM INVESTING ACTIVITIES			
Interest Receipts	509	509	1,017
NET CASH FLOWS FROM INVESTING ACTIVITIES	509	509	1,017
NET INCREASE (DECREASE) IN CASH	165,866	(52,371)	113,495
CASH, BEGINNING OF YEAR	354,193	208,214	562,407
CASH, END OF YEAR	$ 520,059	$ 155,843	$ 675,902
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES			
Operating Income (Loss)	$ 100,609	$ (218,958)	$ (118,349)
Adjustments to reconcile operating income to net cash provided by operating activities			
Add back depreciation	194,168	165,786	359,954
Add back asset impairment	(56,076)	-	(56,076)
(Increase) Decrease in Accounts Receivable	(3,914)	13,300	9,386
(Increase) Decrease in Prepaid	44	-	44
Increase (Decrease) in Accounts Payable	50,481	(19,884)	30,597
Increase (Decrease) in Accrued Liabilities	5,656	6,895	12,551
Net Cash Provided by Operating Activities	$ 290,968	$ (52,861)	$ 238,107

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E. Funds on Deposit, County and Bank

The District maintains its cash in a pool managed by the County Treasury. The County Treasury, in turn, invests its cash with the State of California in the local agency investment fund as well as other banking institutions. The District does not own any specific identifiable investments in the pool. The risk of loss is minimal.

As of June 30, 2014, the primary government had the following investments:

	Fair Value	Rating	Rating Agency
Cash in County Treasury	36,113	Unrated	NA
Cash in Local Bank	112,007	FDIC ins.	NA
Cash in LAIF	527,481	Unrated	NA
Cash on Hand	300	Unrated	NA
Total Cash	$675,902		

Interest rate risk. - The District does not currently have a policy regarding interest rate risk.

Credit risk. - The District does not have a formal policy regarding credit risk

Custodial credit risk. -The District's investment in the State and County Treasurer's investment pools represents a proportionate interest in the pool's portfolio; however, the District's portion is not identified with specific investments and is not subject to custodial credit risk. Cash in local bank is covered by federal depository insurance.

Concentration of credit risk. - The District does not have a policy for concentration of credit risk.

F. Accounts Receivable

Accounts receivable are recorded at their gross value, where appropriate are reduced by the portion that is considered uncollectable. Accounts receivable consists primarily of service fees that have been billed but not paid as of year-end. Management believes its receivables to be fully collectable due to the ability to place a lien against property for unpaid receivables and, accordingly no allowance for doubtful accounts is necessary.

G. Prepaid Expenses

Certain payments to vendors reflect costs applicable to future accounting periods are recorded as prepaid items.

H. Fixed Assets

Capital assets, which include property, plant, and equipment, infrastructure assets and intangible are reported in the applicable governmental -type activities columns in the government-wide financial statements. Capital assets are defined by the government as assets with an estimated useful life in excess of one year. Property, plant and equipment purchased or acquired is carried at historical cost or estimated historical cost. Donated or contributed capital assets are recorded at

their estimated fair value on the date received. The current capitalization threshold is $2,500 for an individual item.

The costs of normal maintenance and repairs are charged to operations as incurred. Improvements are capitalized and depreciated over the remaining useful lives of the related fixed assets, as applicable.

I. Accounts Payable

On an accrual basis, expenses are recognized in the fiscal year in which the goods or services are received. Payables are liabilities of the District based upon current year charges for goods or services received but not paid in the current year.

J. Accrued Expenses

The District allows it employees to accumulate up to 200 hours of sick leave and no limit on the number of vacation hours. Any accumulated sick/vacation leave is paid-out to employees at their most recent rate of pay upon termination. The District records a liability for compensated absences based upon total accumulated vacation and sick leave hours.

K. Long-Term Debt

All long-term liabilities to be repaid from the governmental resources are reported as liabilities in the government-wide statements.

Clearlake Oaks County Water District has an obligation to Kansas State Bank bearing interest at 4.96%.

The loan is collateralized by Camera Truck.

Principal and interest payments for the years following June 30, 2014, are as follows:

	Principal	Interest
2015	18,924	2,957
2016	19,863	2,018
2017	20,829	1,033
	59,616	6,008

Clearlake Oaks County Water District has an obligation to Kansas State Bank bearing

interest at 4.40%.

The loan is collateralized by Vacon Truck.

Principal and interest payments for the years following June 30, 2014, are as follows:

	Principal	Interest
2015	70,862	7,377
2016	74,043	4,195
2017	54,973	959
	199,878	12,531

L. Property Tax Revenue

The County, through the Auditor-Controller's Office and the Treasury-Tax Collector, is responsible for collecting and distributing property taxes according to the alternative method of distributing known as the Teeter Plan. Under the Teeter Plan, the current year's secured property tax levy is distributed to participating agencies with the County without consideration of whether the tax has been collected.

M. Net Position

The District's net position represents the difference between its assets and liabilities in the statement of net assets. Net position is reported as restricted when there are legal limitations imposed on their use by their source.

N. Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results may differ from those estimates.

NOTE 2: RISK MANAGEMENT

The District is exposed to various risks of loss related to torts, damage to, and theft or destruction of assets; errors and omissions; injuries to employees; and natural disasters. During 2014, the District contracted with private insurance agencies for liability, property, crime damage, and employee and director insurances.

NOTE 3: DEFINED BENEFIT PENSION PLAN

The District entered into the Public Employees Retirement System (PERS). Qualified employees are covered under a multiple-employer defined benefit pension plan maintained by an agency of the State of California. Employees are members of the Public Employees' Retirement System.

Plan Description: The District contributes to the PERS, an agent multiple- employer public employee defined benefit plan. PERS provides retirement and disability benefits, annual cost-of-living adjustments, and death benefits to plan members and beneficiaries. PERS acts as a common investment and administrative agent for participating public entities within the State of California. Benefit provisions and all other requirements are established by state statute and district ordinance. Copies of PERS' annual financial report may be obtained from their Executive Office, 400 P Street, Sacramento, CA 95814.

Funding Policy: Participants are required to contribute 7% of their annual covered salary, which is paid by the District for employees hired before May 17, 2012. Future employees are required to contribute the 6.25% themselves with the District paying 6.25% as well. The District makes the contributions required of District employees on their behalf and for their account. The District is required to contribute at an actuarially determined rate; the current rate is 8.010% for safety employees of annual covered payroll. The rate for 2013 was 7.205% and for 2012 was 6.589%. The contribution requirements of plan members and the District are established and may be amended by PERS.

Annual Pension Cost: For June 30, 2014, the District's annual pension cost of $69,959 for PERS was equal to the District's required and actual contributions.

NOTE 3: USE OF RESTRICTED/UNRESTRICTED NET POSITIOM

When an expense is incurred for purposes for which both restricted and unrestricted net position is available, the District's policy is to apply restricted net position first.

NOTE 4: COMPARATIVE DATA AND RECLASSIFICATIONS

Comparative data for the prior year have been presented in certain sections of the accompanying financial statements in order to provide an understanding of changes in the District's financial position and operations. Also, certain amounts presented in the prior year data have been reclassified in order to be consistent with current year's presentation.

NOTE 5 JOINT POWERS INSURANCE AUTHORITY

The District participates in a joint venture under a joint agreement (JPA) with the Association of California Water Agencies (ACWA). The relationship between the District and the JPA is such that is not a component unit of the District and the JPA is not a component unit of the District for financial reporting purposes.

The JPA'S purpose is to jointly fund and develop programs to provide comprehensive and economical funding of property, workers compensation and employers liability coverage's for bodily injury by accident or by disease, including resulting from death, arising out of and in the course of an employee's employment with the District This program is provided through collective self-insurance; the purchase of insurance benefit's, or a combination thereof. Copies of ACWA annual financial reports may be obtained from their executive office at 25620 Birdcage Street, Suite 200, Citrus Heights, CA.

NOTE 6: CONTIGENCIES

As of June 30, 2014, the District did not have any pending litigation or potential nondisclosed liabilities that management believes would have a material effect on the financial statements.

NOTE 7 : DATE OF MANAGEMENT'S REVIEW

Subsequent events have been evaluated through August 7, 2014, which is the date the financial statements were available to be issued.

CLEARLAKE OAKS COUNTY WATER DISTRICT

Supplemental Information

June 30, 2014

August 7, 2014

Board of Directors
Clearlake Oaks County Water District
PO Box 709
Clearlake Oaks, CA 95423

REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

We have audited the financial statements of Clearlake Oaks County Water District as of and for the year ended June 30, 2014, and have issued our report thereon dated August 7, 2014. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States.

Internal Control Over Financial Reporting

Management of Clearlake Oaks County Water District is responsible for establishing and maintaining effective internal control over financial reporting. In planning and performing our audit, we considered Clearlake Oaks County Water District's internal control over financial reporting as a basis for designing our auditing procedures for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of Clearlake Oaks County Water District's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of the Organization's internal control over financial reporting.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal controls such there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis.

Our consideration of the internal controls over financial reporting was for the limited purpose described in the first paragraph of this section and was designed to identify all deficiencies in internal control over financial reporting that might be deficiencies, significant deficiencies, or material weaknesses. We did not identify any deficiencies in internal control over financial reporting that we consider to be material weaknesses as defined above.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether Clearlake Oaks County Water District's general-purpose financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts and grants, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on

REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*
(continued)

compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance that are required to be reported under *Government Auditing Standards*.

This report is intended solely for the information and use of the audit committee, management, others within the organization, and pass-through entities and is not intended to be and should not be used by anyone other than these specified parties.

Pehling & Pehling CPAs
An Accountancy Corporation
August 7, 2014

Appendix M

Sewer Rate Ordinance Information

Item Number	Document	Page Number
1	Sewer Rate Ordinance No. 81	M-2

CLEARLAKE OAKS COUNTY WATER DISTRICT
COUNTY OF LAKE, STATE OF CALIFORNIA

ORDINANCE NO. 81

An ordinance to amend Water and Sewer Rate Ordinance(s) 73, 74 and 75

BE IT ORDAINED by the Clearlake Oaks County Water District Board of Directors hereby rescinds, repeals and revokes Ordinance(s) 73, 74, and 75 along with all authorizations empowered by the adoption and enactment of said ordinance(s) and all other ordinances, or parts of ordinances, in conflict herewith are, to the extent of such conflict, hereby repealed.

WHEREAS, Clearlake Oaks County Water District ("District") was formed pursuant to the County Water District Law ("Act"), California Water Code section 30000, et seq., under which it is authorized to provide water and sewer service to land within the District; and

WHEREAS, the Act authorizes the District to fix and collect from its customers fees and charges for the provision of water and sewer services; and

WHEREAS, the District retained the California Rural Water Association ("CRWA") to perform a water and sewer rate study, which considered the existing systems and rates, and provided the basis for rates to be fixed to adequately cover the cost of operating and capital needs of the District's systems; and

WHEREAS, the Board has reviewed the CRWA study and determined that existing rates will not be sufficient to generate revenue necessary for prudent operation of the District's systems; and

WHEREAS, the CRWA study recommends various water and sewer rates based upon expenses and customer classes of service; and

WHEREAS, the District has given notice of the proposed new and increased rates that was mailed to each land owner and District customer not less than 45 days prior to a public hearing held on April 16th, 2015, in accordance with California Constitution Article XIIID; and

WHEREAS, the District held public workshops on March 9th, 2015 and March 12th, 2015 concerning the proposed rate change, and a public hearing at a regular Board meeting held on April 16th, 2015; and

WHEREAS, following public comment at the public hearing, the Board considered all comments, verbal and written, and the CRWA study; and

WHEREAS, the General Manager advised the Board that 49 written protests out of a total of 2001 water and sewer connections were received, and the Board determined that a majority protest to the proposed water rates did not exist; and

NOW, THEREFORE, BE IT ORDAINED, by the Clearlake Oaks County Water District Board of Directors as follows:

SECTION 1. FINDINGS

After hearing testimony, considering the evidence offered, and duly deliberating the matters presented, the Board of Directors finds and determines that:

A. The above recitals are true and correct.

B. The Board is authorized and empowered to set and fix fees and charges to operate and maintain the District's water and sewer systems.

C. The proceedings related to the proposed change in water and sewer rates have been duly noticed in compliance with applicable law.

D. The water and sewer rates set forth in the attached Appendix A - C are not discriminatory.

E. The rates set forth in the attached Appendix A – C are not excessive, but will provide revenue that does not exceed the costs of providing water and sewer service.

SECTION 2. WATER AND SEWER RATES

Based upon these findings, the Board approves and directs the General Manager to implement the water and sewer rates for fiscal years 2015, 2016, 2017, and 2018, as set forth in Appendix A – C of this Ordinance. All connections for which service is actually used or immediately available will be billed a monthly base rate. If the owner of record wishes to make the connection inactive, a waiver must be signed and notarized, at the sole cost of the customer, and delivered to the General Manager.

SECTION 3. EFFECTIVE DATE

This Ordinance shall become effective 30 days from the date of its enactment, and prior thereto shall be posted and published as required by law. The water and sewer rates shall be applied to the July 2015 billing period.

SECTION 4. ANNUAL REVIEW OF WATER RATE

Annually, the Board will review the expenses, costs, and revenue of the District as compared to the projections used in the CRWA study. The Board will then determine if the rates for the coming year will be modified in accordance with the study. The Board cannot authorize rates that exceed the rates presented for any specific year as provided in the notice and hearing in accordance with California Constitution Article XIIID.

The foregoing Ordinance was introduced before the Board of Directors on the 16th day of April 2015, and passed by the following vote on the 21th day of May, 2015.

AYES: Hudson/Heeszel/Barron/Kiser
NOES: None
ABSTAIN: None
ABSENT: Kuehn

CLEARLAKE OAKS COUNTY WATER DISTRICT

By: Iris R. Hudson
Iris R. Hudson, President

Attest:
Richard Kuehn, Vice President

- All physically connected properties, parcels and/or lots are to be billed a monthly base rate whether service is on or off. If owner of record wishes to forfeit their right to said physical service connection(s) a waiver must be signed and notarized at the sole cost of the customer. Customer is required to pay a service disconnection fee. To reconnect the customer will be required to pay the current rate for service connection(s) to the District, excluding capital expansion fees as per the current Billable Fees Resolution. (ie: Inspection fees)

Definitions:

- Residential: a property, parcel and/or lot with a service connection to the District with or without a structure. Said property, parcel and/or lot will be billed a monthly residential base rate regardless of meter size as per the current enacted rate ordinance. Residential includes: Single Family, Multi Family and RV / Mobile Home Parks that service multiple single family residence with one (1) large meter. Classification when in question is to be determined at the discretion of the Board of Directors.

- Commercial: any property, parcel and/or lot with a service connection to the District with or without a structure. Said property, parcel and/or lot will be billed a monthly commercial base rate according to meter size as per the current enacted rate ordinance. Commercial includes: all uses of property excluding Single Family, Multi Family and RV / Mobile Home Parks. Classification when in question is to be determined at the discretion of the Board of Directors.

- Dwelling: a structure with livable space, a restroom and a kitchen.

- Active (on): a property, parcel and/or lot with a service connection to the District with a meter physically present and turned on. Said property, parcel and/or lot will be billed a monthly base rate as per the current enacted rate ordinance.

- Active (off): a property, parcel and/or lot with a service connection to the District with a meter physically present and turned off or physically removed due to nonpayment or tampering. Said property, parcel and/or lot will be billed a monthly base rate as per the current enacted rate ordinance.

- Inactive: a property, parcel and/or lot with water and/or sewer services available but no water meter installed and physically disconnected from the Districts sewer system. In the event the owner of record has forfeited rights to said service connection(s) and after physical disconnection and inspection by District staff, services will no longer be billed to account on a monthly basis. At the time of connection forfeit current District equipment will be either repurposed or disposed of. Upon reconnection the customer is required to install new District equipment at current cost of time and material.

-Capital Improvement/Replacement Fund: All revenue collected for the capital improvement/replacement fund are to be retained and accounted for in a bank account separate from revenue collected for normal operating expenses. Said revenue is only to be spent on Board approved capital improvement/replacement projects.

- SFD: Revenue Class for Single Family Dwelling. Classification = Residential

- MFD: Revenue Class for Multi Family Dwelling. Classification = Residential

- MHD: Revenue Class for Mobile Home Dwelling. Classification = Residential

- CF: Cubic Feet. All usage is calculated in Cubic Feet, however shown on account in gallons and billed per100cf or prorated for actual usage and service dates. (7.48 gallons = 1 CF / 748 gallons = 100CF)

- Physical Disconnection: The verifiable removal of service tie-in to District infrastructure at the property line. With this, the water meter will be indefinitely removed from property/parcel and/or lot and service line is to be capped. For sewer disconnections the sewer lateral is to be excavated and capped at the customer's expense.

Water Rates

Residential

Classification: Residential	Base Rate
*Revenue Class: SFD/MFD/MHD	$37.87

Commercial

Classification: Commercial	Base Rate
Revenue Class: Commercial	
5/8" x 3/4"	$37.87
1"	$118.63
1 1/2"	$237.08
2"	$379.22
3"	$711.08
4"	$1,185.17
6"	$2,370.23

Usage Rates

Tier 1 (Up to 1,500 CF)	$1.30 / 100 cf
Tier 2 (1,501 to 2,000 CF)	$1.50 / 100 cf
Tier 3 (2,001 and Over)	$2.00 / 100 cf

Billable usage is based on actual consumption
All usage is billed per 100 cf or prorated for actual usage and service dates

*SFD: Single Family Dwelling
*MFD: Multifamily Dwelling
*MHD: Mobilehome Dwelling

Annual Increase Beginning July 2016 of 3% and $2.00 for CIP

Sewer Rates

Residential

Classification: Residential	Base Rate
*Revenue Class: SFD/MFD/MHD	$53.30

Commercial

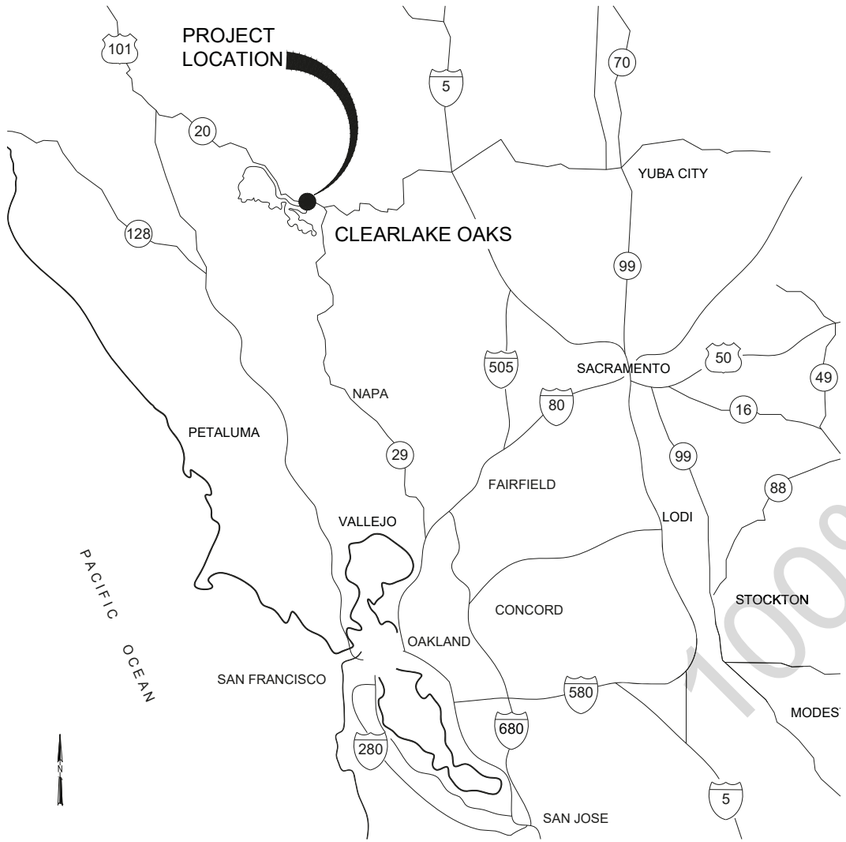
Classification: Commercial	Base Rate
Revenue Class: Commercial	
School - Per Student	$1.68
RV/Campsite - Per Space	$15.23
Hotel/Motel-Per Unit	$24.71
Laundromat-Per Machine	$33.84
Church	$52.28
Service/Gas Station- Per Restroom	$33.84
Beauty/Barber Shop	$52.28
Restaurant	$78.69
Restaurant w/Bar	$133.34
Bar	$76.18
Bar w/Kitchen/Food Service	$73.61
Service Club	$52.28
Service Club w/Kitchen/Food Service	$73.61
Commercial Office Space	$52.28
Community Beach - Per Restroom	$52.28
Fire Protection	$52.28

*SFD: Single Family Dwelling
*MFD: Multifamily Dwelling
*MHD: Mobilehome Dwelling

Annual Increase Beginning July 2016 of 3% and $2.00 for CIP

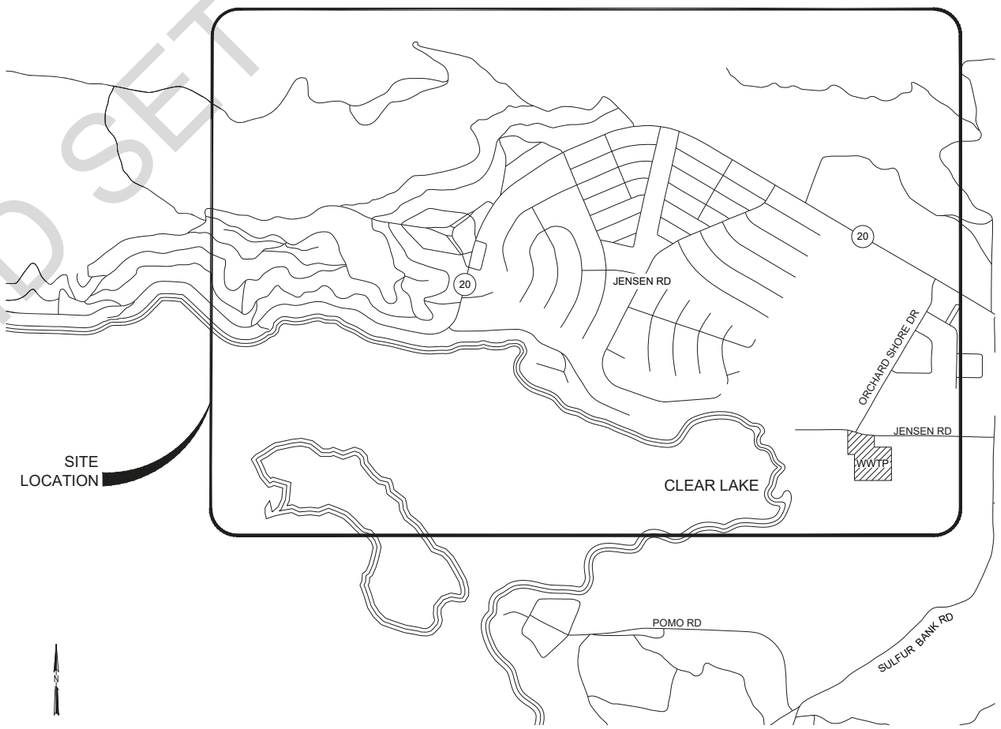
CLEARLAKE OAKS COUNTY WATER DISTRICT
WASTEWATER SYSTEM IMPROVEMENTS

VICINITY MAP



NO SCALE

LOCATION MAP



NO SCALE

100% BID SET

VOLUME 2 OF 2
COLLECTION SYSTEM LIFT STATION IMPROVEMENTS

PREPARED BY:

MC ENGINEERING, INC.

4-10-17

SUBMITTED:

Mark A. Carey, Principal / Project Manager — CE 50754

John E. Pedri, Project Engineer / Reviewer — CE 35266

DISTRICT APPROVAL:

Alan Gardner, General Manager

NO.	DATE	REVISION	BY	APVD

INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	DRAWING TITLE
1	G001	TITLE SHEET, VICINITY MAP AND LOCATION MAP
2	G002	INDEX OF DRAWINGS, GENERAL NOTES, AND DRAWING DESIGNATION
3	G501	OVERALL SITE PLAN AND BASIS OF BEARINGS
4	C001	CIVIL ABBREVIATIONS, LEGEND, AND SYMBOLS
5	CE101	LIFT STATION 1 SITE PLAN
6	CE103	LIFT STATION 3 SITE PLAN
7	CE104	LIFT STATION 4 SITE PLAN
8	CE105	LIFT STATION 5 SITE PLAN
9	CE106	LIFT STATION 6 SITE PLAN
10	CE108	LIFT STATION 8 SITE PLAN
11	CE109	LIFT STATION 9 SITE PLAN
12	CE110	LIFT STATION 10 SITE PLAN--NAPOTP
13	C301	LIFT STATION 1 ELEVATIONS
14	C303	LIFT STATION 3 ELEVATIONS
15	C304	LIFT STATION 4 ELEVATIONS
16	C305	LIFT STATION 5 ELEVATIONS
17	C306	LIFT STATION 6 ELEVATIONS
18	C308	LIFT STATION 8 ELEVATIONS
19	C309	LIFT STATION 9 ELEVATIONS
20	C310	LIFT STATION NO. 1 ACCESS ROAD PLAN AND PROFILE
21	C311	LIFT STATION NO. 1 CROSS SECTIONS
22	C401	CIVIL DETAILS – 1
23	C402	CIVIL DETAILS – 2
24	C403	CIVIL DETAILS – 3
25	C404	CIVIL DETAILS – 4
26	E001	ELECTRICAL LEGEND AND ABBREVIATIONS
27	E101	ELECTRICAL PANEL ELEVATION ARRANGEMENT 1
28	E102	PANEL ELEVATION ARRANGEMENT 2
29	E103	PANEL ELEVATION ARRANGEMENT 3
30	E104	PANEL ELEVATION ARRANGEMENT 4
31	E105	TYPICAL SINGLE LINE DIAGRAM
32	E110	CONTROL DIAGRAM
33	E300	ELECTRICAL DETAILS – 1
34	E301	ELECTRICAL DETAILS – 2
35	E400	SCADA BLOCK DIAGRAM

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL AND SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
2. UNLESS DETAILED, SPECIFIED, OR OTHERWISE INDICATED ON THE DRAWINGS, CONSTRUCTION SHALL BE AS INDICATED IN THE APPLICABLE TYPICAL DETAILS AND GENERAL NOTES. TYPICAL DETAILS SHALL APPLY EVEN THOUGH NOT REFERENCED AT SPECIFIC LOCATIONS ON DRAWINGS.
3. WHERE NO CONSTRUCTION DETAILS ARE SHOWN OR NOTED FOR ANY PART OF WORK, DETAILS SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WORKING WITH DISTRICT STAFF TO LOCATE ALL UNDERGROUND UTILITIES FAR ENOUGH IN ADVANCE OF HIS OPERATIONS SO THAT HIS CONSTRUCTION SCHEDULE WILL NOT BE AFFECTED SHOULD THE RELOCATION OR MOVING OF AN EXISTING UTILITY BE REQUIRED. LOCATION AND DEPTH OF EXISTING UTILITIES, WHERE SHOWN ON THE PLANS, ARE BASED ON THE BEST AVAILABLE INFORMATION. NO GUARANTEE IS MADE AS TO THE ACCURACY OF THE INFORMATION OR THAT ALL UTILITIES ARE SHOWN. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE, PROTECT AND MAINTAIN ALL EXISTING UTILITIES.
5. THE CONTRACTOR SHALL EXPOSE ALL EXISTING UTILITIES INCLUDING SEWER, STORM, WATER, ELECTRIC, COMMUNICATIONS, AND GAS PRIOR TO ANY TRENCHING TO ALLOW THE ENGINEER TO VERIFY THE GRADE AND ALIGNMENT OF THE UTILITIES, AND TO VERIFY DESIGN ASSUMPTIONS AND EXACT FIELD LOCATION. EXISTING UTILITIES MAY REQUIRE RELOCATION AND/OR PROPOSED IMPROVEMENTS MAY REQUIRE RELOCATION AND/OR PROPOSED IMPROVEMENTS MAY REQUIRE GRADE OR ALIGNMENT REVISION DUE TO FIELD CONDITIONS.
6. THE CONTRACTOR SHALL ACQUIRE ALL REQUIRED PRECISE MEASUREMENTS OF EXISTING VAULTS, STRUCTURES, INCLUDING LENGTH, HEIGHT, RADIUS, AND DEPTH PRIOR TO MATERIAL PURCHASE, SUBMITTALS, AND INSTALLATION.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL EXISTING MONUMENTS AND ANY OTHER SURVEY MARKERS DURING CONSTRUCTION, INCLUDING STAKING BY THE DISTRICT'S SURVEYOR. ALL SUCH MONUMENTS OR MARKERS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
8. ALL EXCESS MATERIAL FROM THE PROJECT IS TO BE REMOVED FROM THE SITE AND DISPOSED UNDER THE DISTRICT'S APPROVAL. COST FOR THE REMOVAL AND DISPOSAL OF EXCESS MATERIAL SHALL BE INCLUDED IN THE CONTRACTOR'S BID.
9. CONTRACTOR SHALL SCHEDULE AND STAGE HIS OPERATIONS ON-SITE WHILE COORDINATING WITH DISTRICT PLANT OPERATIONS PERSONNEL TO KEEP THE TREATMENT PLANT ON-LINE AND OPERATING THROUGHOUT CONSTRUCTION, TESTING TRAINING AND CLEANUP, AS REQUIRED IN THE SPECIFICATIONS. CONTRACTOR'S ACTIVITIES SHALL NOT PREVENT DISTRICT PERSONNEL FROM COMPLETING REQUIRED OPERATIONS PROCEDURES, SUCH AS TESTING, ACCESSING VALVES OR PUMPS OR ANY OTHER ACTIVITY REQUIRED TO EFFICIENTLY OPERATE THE WASTEWATER TREATMENT PLANT.
10. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING, RESTORING OR REPLACING PAVEMENT AND GRAVEL ACCESS ROUTES WHICH ARE DAMAGED BY CONSTRUCTION ACTIVITIES AND TRAFFIC, AND SHALL INCLUDE ALL SUCH COSTS IN CONTRACTOR'S BID.
11. THE CONTRACTOR SHALL INSPECT THE SITE PRIOR TO BIDDING THE PROJECT TO SEE THE EXTENT OF THE DEMOLITION WORK INVOLVED AND TO INCLUDE THE NECESSARY WORK IN CONTRACTOR'S BID.
12. THE CONTRACTOR, WITH PERMISSION AND PROPER PERMITS FROM EITHER THE DISTRICT AND/OR COUNTY SHALL CONDUCT AND/OR PROVIDE SUBSURFACE INVESTIGATIONS AT ITS OWN EXPENSE AT AGREED TO LOCATIONS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING EACH PERMIT ISSUING AGENCY WITHIN THE TIME PERIOD SPECIFIED BY THAT AGENCY PRIOR TO BEGINNING CONSTRUCTION.
14. THE CONTRACTOR SHALL REFER TO THE SPECIFICATIONS FOR EROSION AND DUST CONTROL REQUIREMENTS DURING CONSTRUCTION.
15. THE CONTRACTOR SHALL REFER TO PREVIOUS RECORD DRAWINGS FOR ADDITIONAL INFORMATION RELEVANT TO STRUCTURE, SLAB, FOUNDATION, AND UTILITY DEMOLITION AND MODIFICATIONS.
16. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN FACILITY ACCESS AT ALL TIMES DURING THE COURSE OF THE PROJECT. CONTRACTOR TO COORDINATE VEHICLE AND EQUIPMENT ACCESS, PARKING, AND HAUL ROUTES WITH THE CLOCWD CONSTRUCTION REPRESENTATIVE.
17. ACCESS FOR EMERGENCY VEHICLES SHALL BE MAINTAINED AT ALL TIMES.
18. CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY.
19. THE CONTRACTOR SHALL OBTAIN A TRENCH SAFETY PERMIT FROM THE CALIFORNIA DIVISION OF INDUSTRIAL SAFETY PRIOR TO EXCAVATION OF ANY TRENCH OR CUT WITH VERTICAL OR NEAR VERTICAL WALLS GREATER THAN 5 FEET DEEP.
20. ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN SUCH A MANNER AS TO COMPLY WITH THE STANDARDS ESTABLISHED BY THE LOCAL AIR QUALITY MANAGEMENT DISTRICT FOR AIRBORNE PARTICULATE MATTER.
21. IN THE EVENT THAT ANY REMAINS OF PREHISTORIC OR HISTORIC HUMAN ACTIVITIES ARE ENCOUNTERED DURING PROJECT-RELATED ACTIVITIES, WORK IN THE IMMEDIATE VICINITY OF THE FINDS SHALL HALT AND THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT SUPERINTENDENT AND THE LAKE COUNTY SPECIAL DISTRICTS INSPECTOR. WORK SHALL NOT RESUME UNTIL A QUALIFIED ARCHAEOLOGIST OR HISTORIC ARCHAEOLOGIST, AS APPROPRIATE, APPROVED BY LAKE COUNTY SPECIAL DISTRICTS, HAS EVALUATED THE SITUATION AND MADE RECOMMENDATIONS FOR TREATMENT OF THE RESOURCE, AND WHOSE RECOMMENDATIONS ARE CARRIED OUT. IF HUMAN BURIAL REMAINS ARE ENCOUNTERED, THE CONTRACTOR MUST ALSO CONTACT THE COUNTY CORONER.

APPLICABLE CODES

ALL WORK SHALL COMPLY WITH THE CURRENT EDITION OF THE FOLLOWING LISTED CODES AND ALL OTHERS HAVING JURISDICTION OVER THE WORK.

- 2016 EDITION OF THE CALIFORNIA FIRE CODE.
- 2016 EDITION OF THE CALIFORNIA ELECTRICAL CODE.
- 2016 EDITION OF THE CALIFORNIA MECHANICAL CODE.
- 2016 EDITION OF THE CALIFORNIA PLUMBING CODE.
- CALIFORNIA WATERWORKS STANDARDS

SCOPE OF WORK

GENERAL DESCRIPTION OF WORK TO BE PERFORMED (VOLUME 2)

THE WORK WILL CONSIST OF MODIFYING AND CONSTRUCTING EXISTING LIFT STATIONS AS PER PLAN AND SPECIFICATIONS. THIS WORK WILL INCLUDE THE INSTALLATION OF NEW WET-WELL BARREL SECTIONS, VALVES, BYPASS PIPING, METAL VALVE VAULTS, LIDS/HATCHES FOR VAULTS, CONTROL PANELS AND ELECTRICAL CONDUITS, NEW PUMPS, GUIDE RAILS, DISCHARGE PIPING, CONNECTING TO EXISTING DISCHARGE PIPING, PULLING AND INSTALLATION OF LINING, NEW SCADA CONTROL ROAD WAY CONSTRUCTION AND REHABILITATION AND STARTUP.

DRAWING DESIGNATION

G002

DISCIPLINE
SHEET TYPE
INDIVIDUAL DRAWING NUMBER

LETTER	DISCIPLINE
G	GENERAL
C	CIVIL
CE	CIVIL ELECTRICAL
E	ELECTRICAL
I	PROCESS & INSTRUMENTATION
EC	EROSION CONTROL

NUMBER	SHEET TYPE
0	GENERAL
1	PLANS
2	SECTIONS
3	ELEVATIONS
4	DETAILS
5	LARGE SCALE VIEWS
6	SCHEDULES AND DIAGRAMS
7	USER DEFINED
8	USER DEFINED

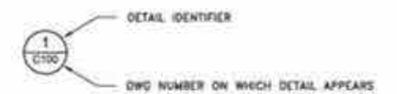
ANNOTATION

SECTION IDENTIFICATION





DETAIL IDENTIFICATION





"--" INDICATES THAT DETAIL IS REFERENCED FROM SAME SHEET
"VAR" INDICATES THAT DETAIL IS REFERENCED FROM MULTIPLE SHEETS

(1) KEYNOTE

REVISION
DESN
DRW
CHK
APV

1-18-17

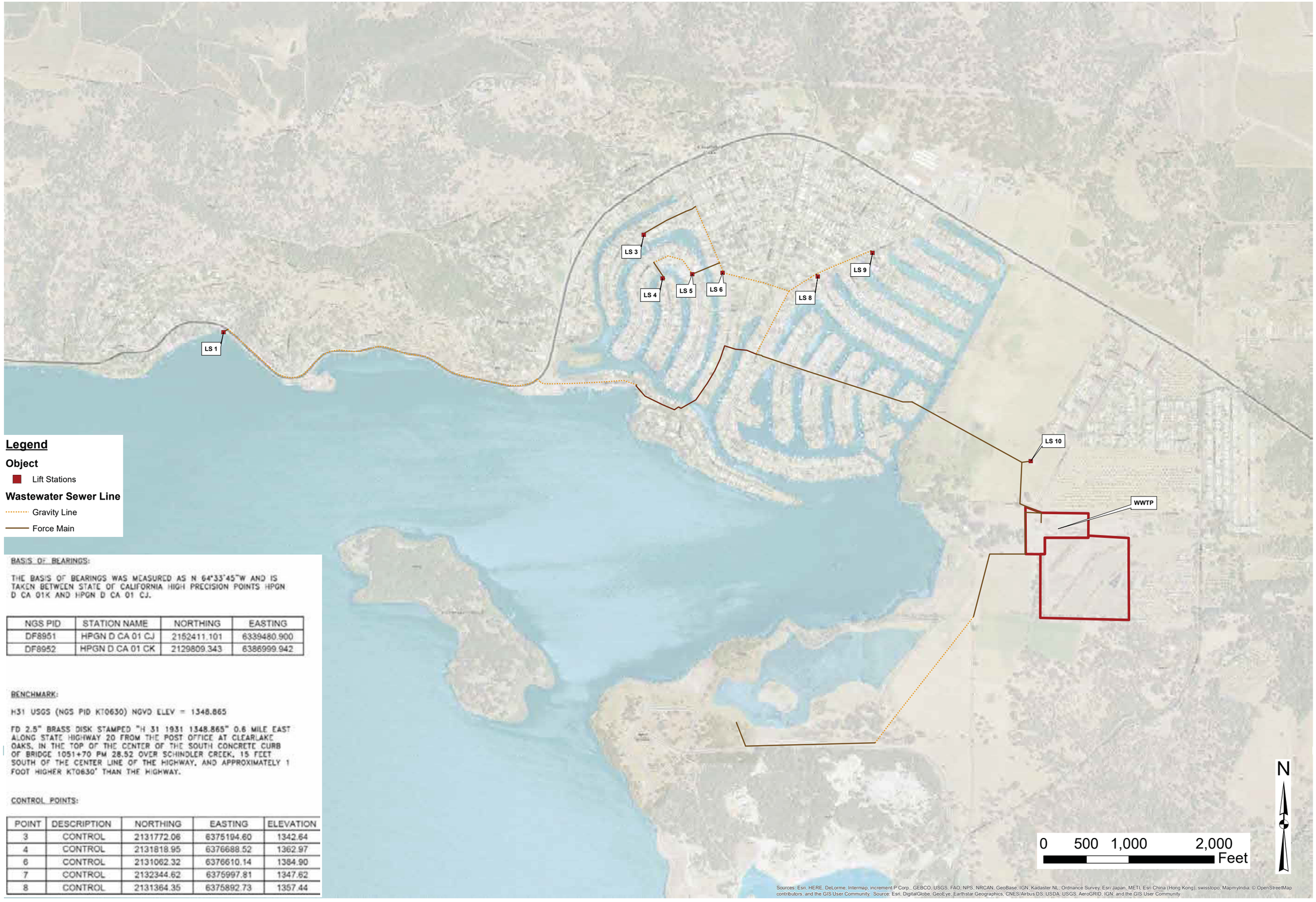
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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS
DRAWING INDEX, GENERAL NOTES, AND DRAWING DESIGNATION

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004
DATE: APRIL 10, 2017
DRAWING NUMBER
G002
2 OF 35 SHEETS

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BASIS OF BEARINGS:

THE BASIS OF BEARINGS WAS MEASURED AS N 64°33'45"W AND IS TAKEN BETWEEN STATE OF CALIFORNIA HIGH PRECISION POINTS HPGN D CA 01K AND HPGN D CA 01 CJ.

NGS PID	STATION NAME	NORTHING	EASTING
DF8951	HPGN D CA 01 CJ	2152411.101	6339480.900
DF8952	HPGN D CA 01 CK	2129809.343	6386999.942

BENCHMARK:

H31 USGS (NGS PID KT0630) NGVD ELEV = 1348.865

FD 2.5" BRASS DISK STAMPED "H 31 1931 1348.865" 0.6 MILE EAST ALONG STATE HIGHWAY 20 FROM THE POST OFFICE AT CLEARLAKE OAKS, IN THE TOP OF THE CENTER OF THE SOUTH CONCRETE CURB OF BRIDGE 1051+70 PM 28.52 OVER SCHINDLER CREEK, 15 FEET SOUTH OF THE CENTER LINE OF THE HIGHWAY, AND APPROXIMATELY 1 FOOT HIGHER KT0630' THAN THE HIGHWAY.

CONTROL POINTS:

POINT	DESCRIPTION	NORTHING	EASTING	ELEVATION
3	CONTROL	2131772.06	6375194.60	1342.64
4	CONTROL	2131818.95	6376688.52	1362.97
6	CONTROL	2131062.32	6376610.14	1384.90
7	CONTROL	2132344.62	6375997.81	1347.62
8	CONTROL	2131364.35	6375892.73	1357.44

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

REVISION

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VOLUME 2 OF 2
COLLECTION SYSTEM LIFT STATION IMPROVEMENTS

OVERALL SITE PLAN AND BASIS OF BEARINGS

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

DATE: April 11, 2017

DRAWING NUMBER

C501

3 OF 35 SHEETS

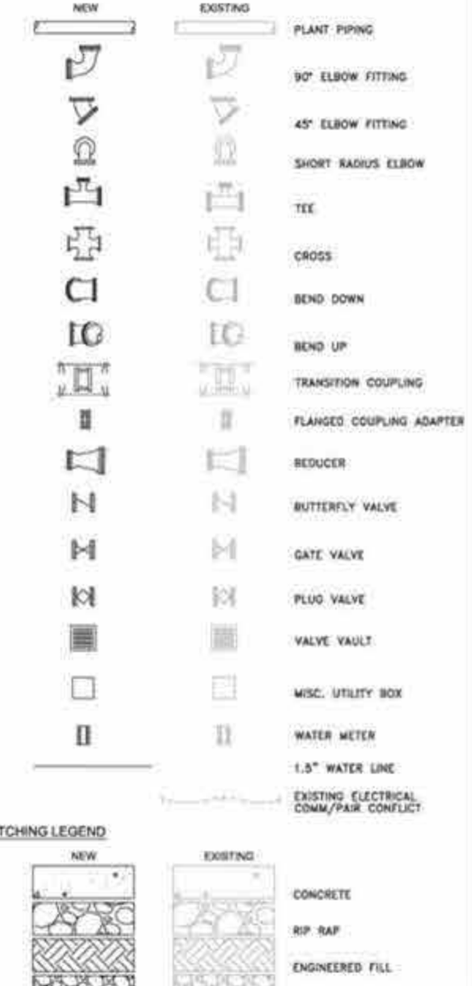
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ABBREVIATIONS

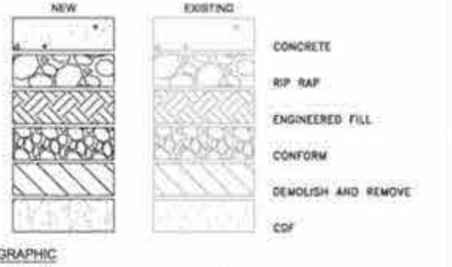
TW	POTABLE WATER
SW	TREATED EFFLUENT
@	AT
AB	AGGREGATE BASE, ANCHOR BOLT
AC	ASPHALT CONCRETE
ACI	AMERICAN CONCRETE INSTITUTE
ADD	ADDITIONAL
ADH AB	ADHESIVE ANCHOR BOLT
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AGG	AGGREGATE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AL	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ARV	AIR RELEASE VALVE
AUTO	AUTOMATIC
AUX	AUXILIARY
AWG	AMERICAN WIRE GAGE
AWWA	AMERICAN WATER WORKS ASSOCIATION
BC	BEGIN CURVE
BF	BLIND FLANGE
BFV	BUTTERFLY VALVE
BLDG	BUILDING
BM	BENCH MARK, BEAM
BO	BLOW OFF
BOP	BOTTOM OF PIPE
BTM	BOTTOM
BV	BALL VALVE
BVC	BEGINNING OF VERTICAL CURVE
BW	BOTTOM OF WALL
C	CHANNEL
CCC	CHLORINE CONTACT CHANNEL
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CI	CAST IRON
CIP	CAST IRON PIPE
CIRJ	CAST IRON RESTRAINED JOINT
CJ	CONSTRUCTION JOINT
CLR	CLEAR
CL	CENTERLINE
CMLCSP	CONCRETE MORTAR STEEL PIPE
CMLSP	CEMENT MORTAR LINED STEEL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COL	COLUMN
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUOUS, CONTINUATION
COORD	COORDINATE
COP	COPPER
CPLG	COUPLING
CTD	CENTERED
CTR	CENTER
CU FT	CUBIC FOOT
CU IN	CUBIC INCH
CU YD	CUBIC YARD
CV	CHECK VALVE
DR	DRAIN
DBL	DOUBLE
DI	DROP INLET, DUCTILE IRON
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
E	EAST
EA	EACH
EC	END CURVE
ED	ERB DRAIN
EF	EACH FACE, EXHAUST FAN
EG	EXISTING GRADE
EL	ELEVATION
ELB, ELL	ELBOW
ELC	ELECTRICAL LOAD CENTER
ELEC	ELECTRIC, ELECTRICAL
EP	EDGE OF PAVEMENT
ENGR	ENGINEER
EQL SP	EQUALLY SPACED
EQPT	EQUIPMENT
ERB	EMERGENCY RETENTION BASIN
EVC	END OF VERTICAL CURVE
EXC	EXCAVATE
EXP	EXPOSED, EXPANSION, EXPORT
EXP JT	EXPANSION JOINT
(E)	EXISTING
FC	FLEXIBLE COUPLING
FCA	FLANGED COUPLING ADAPTER
FCO	FLOOR CLEAN OUT
FE	FINAL EFFLUENT
FD	FLOOR DRAIN
FDN	FOUNDATION
FEPS	FINAL EFFLUENT PUMP STATION
FEXT	FIRE EXTINGUISHER
FF	FINISH FLOOR
FG	FINISH GRADE
FLTE	FILTER EFFLUENT
FLTI	FILTER INFLUENT
FIG	FIGURE
FL	FLANGE, FLOOR, FLOWLINE
FLTR	FILTER
FOC	FACE OF CONCRETE
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FOOT OR FEET
FTG	FOOTING
FWD	FORWARD
°F	DEGREE FAHRENHEIT
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GB	GRADE BREAK
GC	GROOVED COUPLING
GCF	GROOVED COUPLING FITTINGS
GE	GROOVED END
GL	GLASS
GPM	GALLONS PER MINUTE
GSM	GALVANIZED SHEET METAL
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
GVL	GRAVEL
HDR	HEADER
HDW	HARDWARE
HGT	HEIGHT
HORIZ	HORIZONTAL
HP	HORSEPOWER, HIGH POINT
HR	HANDRAIL
HV	HOSE VALVE, HIGH VOLTAGE
I&C	INSTRUMENTATION & CONTROL
ID	INSIDE DIAMETER
IF	INSIDE FACE
IN	INCH
INFL	INFLUENT
INV	INVERT
IP	IRON PIPE
JT	JOINT
KIP	THOUSAND POUNDS
KW	KILOWATT
L	LEFT, ANGLE, LENGTH
LAB	LABORATORY
LB	POUNDS
LB/CU FT	POUNDS PER CUBIC FOOT
LF	LINEAR FEET
LG	LONG
LH	LEFT HAND
LONG	LONGITUDINAL
LR	LONG RADIUS
M	MEASURE
MAX	MAXIMUM
MB	MACHINE BOLT
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFR	MANUFACTURER
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN	MINIMUM, MINUTE
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
ML	MIXED LIQUOR
MSNRY	MASONRY
MTL	MATERIAL
MWS	MAXIMUM WATER SURFACE
N	NEW, NORTH
NG	NATURAL GROUND
NIC	NOT IN CONTRACT
NO	NUMBER, NUMBERING
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER, OVERFLOW DRAIN
OF	OUTSIDE FACE, OVERFLOW
PC	POINT OF CURVE
PCC	PORTLAND CONCRETE CEMENT
PD	POND DRAIN
PI	POINT OF INTERSECTION
PL	PLATE, PROPERTY LINE
POC	POINT OF CONNECTION
PP	POWER POLE
PPM	PARTS PER MILLION
PRC	POINT OF REVERSE CURVE
PRCST	PRECAST
PREFAB	PREFABRICATED
PRESS	PRESSURE
PROP	PROPERTY
PSF	POUNDS PER SQUARE FOOT
PS	PUMP STATION
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH, GAUGE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE PLASTIC
PVMT	PAVEMENT
R	RADIUS
RAS	RETURN ACTIVATED SLUDGE
RC	REINFORCED CONCRETE
RDCR	REDUCER
REF	REFER OR REFERENCE
REINF	REINFORCED, REINFORCING, REINFORCE
REQD	REQUIRED
RFCA	RESTRAINED FLANGED COUPLING ADAPTER
RMJ	RESTRAINED MECHANICAL JOINT
RS	RAW SEWAGE
RST	REINFORCING STEEL
RTN	RETURN
RW	RAW WATER, RECLAIMED WATER, RESERVOIR WATER
S	SOUTH
SCFH	STANDARD CUBIC FEET PER HOUR
SCFM	STANDARD CUBIC FEET PER MINUTE
SCH	SCHEDULE
SE	SECONDARY EFFLUENT
SECT	SECTION
SEPS	SECONDARY EFFLUENT PUMP STATION
SFE	SAMPLE FINAL EFFLUENT
SH	SODIUM HYPOCHLORITE
SIM	SIMILAR
SLP	SLOPE
SPEC	SPECIFICATIONS
SQ	SQUARE
SQ FT	SQUARE FOOT
SQ IN	SQUARE INCH
SSC	SECONDARY SCUM
SSE	SAMPLE FINAL EFFLUENT
SSR	SLUDGE SUPERNATANT RETURN
SST, SS	STAINLESS STEEL
SSMH	SANITARY SEWER MANHOLE
STA	STATION
STD	STANDARD
STL	STEEL, STEEL PIPE
STR	STRAIGHT
STRL	STRUCTURAL
STRUCT	STRUCTURE
T	TANGENT
TBD	TO BE DETERMINED
TBG	TUBING
T&B	TOP AND BOTTOM
TDH	TOTAL DYNAMIC HEAD
TECH	TECHNICAL
TEL	TELEPHONE
TEMP	TEMPERATURE
TR	TOP FACE
THD	THREAD
THK	THICK
TP	TURNING POINT
TT	THRUST TIE
TOW	TOP OF WALL
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UNK	UNKNOWN
V	VENT, VOLT, VALVE
VAC	VACUUM
VC	VERTICAL CURVE
VERT	VERTICAL
VPI	VERTICAL POINT OF INTERSECTION
W	WATER, WEST
W/	WITH
WAS	WASTE ACTIVATED SLUDGE
WM	WATER METER
WS	WATER SURFACE, WATER STOP
WSP	WELDED STEEL PIPE
XFMR	TRANSFORMER
YD	YARD

LEGEND

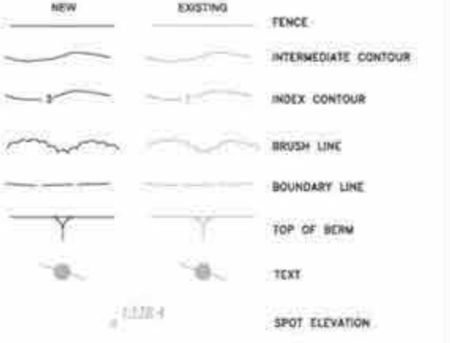
UTILITY



HATCHING LEGEND



TOPOGRAPHIC



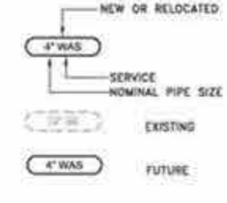
GENERAL CIVIL NOTES

1. NOISE SHALL BE REDUCED BY THE MANDATORY USE OF MUFFLERS ON ALL CONSTRUCTION VEHICLES AND EQUIPMENT. WHERE FEASIBLE, SOLENOIDAL PAVEMENT BREAKERS WILL BE USED IN LIEU OF AIR POWERED JACK HAMMERS.
2. THE CONTRACTOR SHALL PROVIDE A WATER TRUCK TO WATER AREAS AS NECESSARY TO CONTROL DUST.
3. CONTRACTOR SHALL PROVIDE CRUSHED ROCK IN AREAS OF TEMPORARY CONSTRUCTION ACCESS TO MINIMIZE MIGRATION OF SEDIMENT, IF SO DIRECTED BY ENGINEER.
4. DURING CONSTRUCTION, ENVIRONMENTAL PROTECTION DEVICES, SUCH AS EROSION CONTROL BMPs, DUST CONTROL AND VEGETATION PROTECTION DEVICES SHALL BE MAINTAINED AT ALL TIMES.
5. LOOSE SOIL MOUNDS OR SURFACES SHALL BE PROTECTED FROM WIND OR WATER EROSION BY BEING APPROPRIATELY COVERED WHEN CONSTRUCTION IS NOT IN ACTIVE PROGRESS.
6. EXCAVATED MATERIAL SHALL BE STORED UPGRADE FROM THE EXCAVATED AREA WHENEVER POSSIBLE.
7. NO WASHING OF VEHICLES OR HEAVY EQUIPMENT, INCLUDING CEMENT MIXERS, SHALL BE PERMITTED ANYWHERE ON THE SUBJECT PROPERTY UNLESS AUTHORIZED BY THE DISTRICT.
8. PRIOR TO WET WEATHER EVENTS THE FOLLOWING BMPS SHALL BE PREPARED:
   1. TEMPORARY EROSION CONTROLS SHALL BE INSTALLED
   2. TEMPORARY VEGETATION PROTECTION FENCING SHALL BE INSTALLED
   3. DISTURBED AREAS SHALL BE STABILIZED
   4. ONSITE CONSTRUCTION SLASH AND DEBRIS SHALL BE CLEANED UP AND REMOVED
   5. WHERE FEASIBLE, MECHANICAL STABILIZATION AND DRAINAGE IMPROVEMENTS SHALL BE INSTALLED
   6. SPOIL PILES SHALL BE REMOVED FROM THE SITE
9. ALL BURIED PIPING ON CIVIL DRAWINGS ARE SHOWN AS SOLID LINE. FOR PIPE DEPTH INFORMATION REFER TO PROFILE DRAWINGS.
10. ALL NEW PIPING SHALL BE INSTALLED IN THE HORIZONTAL AND VERTICAL ALIGNMENT SHOWN HEREIN. ADJUSTMENTS TO HORIZONTAL AND VERTICAL ALIGNMENT SHALL BE ACCEPTED BY THE ENGINEER PRIOR TO INSTALLATION. THE DISTRICT SHALL ASSUME NO LIABILITY FOR ANY WORK OF THIS NATURE COMPLETED PRIOR TO ENGINEER NOTIFICATION AND ACCEPTANCE.

PROCESS PIPING IDENTIFICATION

BYP	BYPASS
CIP	CAST IRON PIPE
CPLG	COUPLING
FL	FLOW LINE
INV	INVERT
RAS	RETURN ACTIVATED SLUDGE
RAW	RAW SEWAGE
SE	SECONDARY EFFLUENT
VCP	VITRIFIED CLAY PIPE
WAS	WASTE ACTIVATED SLUDGE

PIPING IDENTIFICATION SYTEM



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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

CIVIL ABBREVIATIONS, LEGENDS, AND NOTES

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

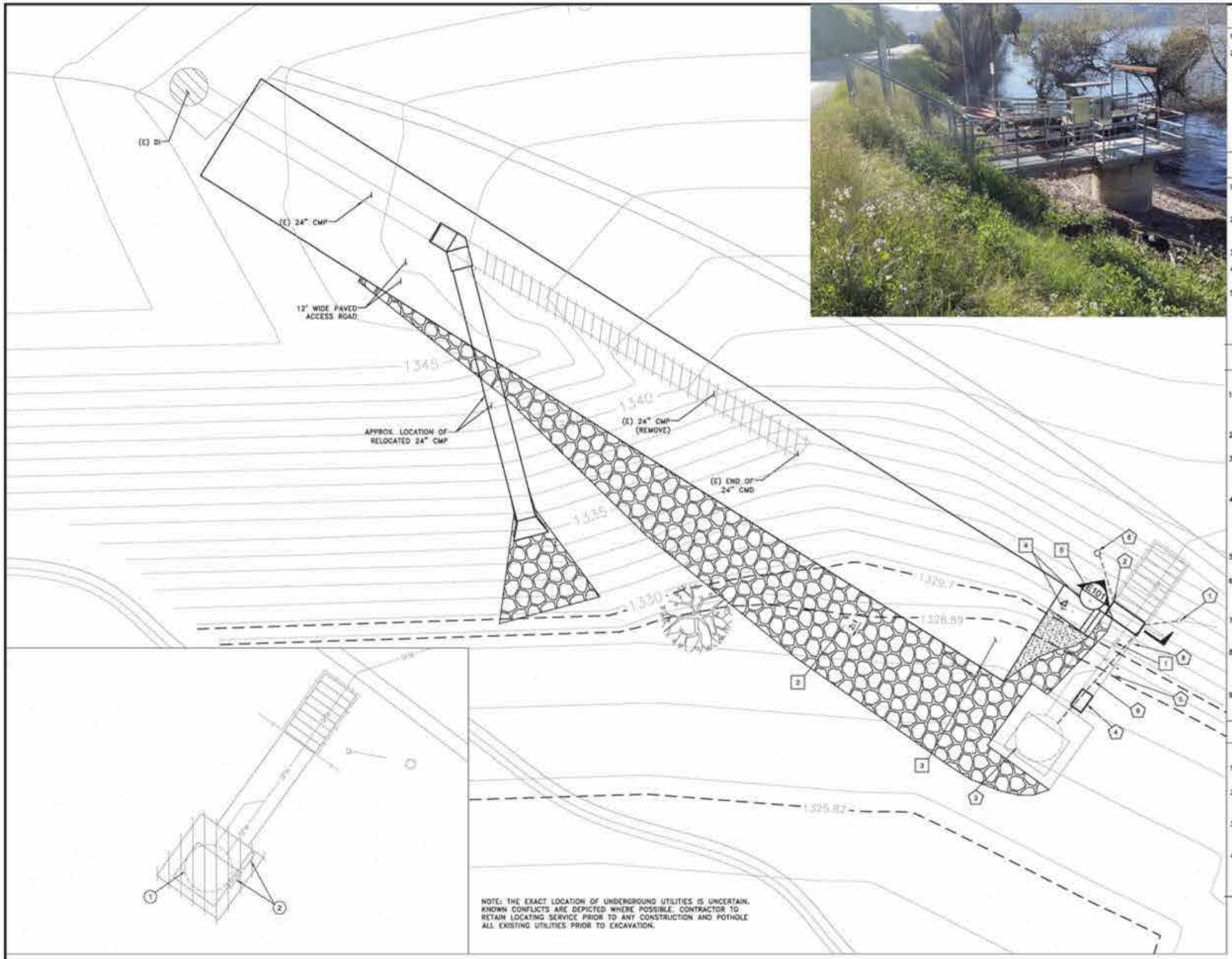
DATE: APRIL 10, 2017

DRAWING NUMBER

C001

4 OF 35 SHEETS

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DEMOLITION KEYNOTES

1. PUMPS NOT INCLUDED.
2. REMOVE (E) PANEL AND CONTROLS. SALVAGE PANEL COMPONENTS PER ELECTRICAL DESIGN. SEE SHEET C301.

IMPROVEMENT KEYNOTES

1. (N) FLOW METER AND SEWAGE BYPASS CONNECTION. SEE DETAIL 4 ON SHEET C201.
2. (N) AC ACCESS ROAD SEE SHEET C301 AND C511 FOR PROFILE AND SECTION.
3. (N) 10' BY 14' LANDING THIS LOCATION.
4. (N) CONCRETE LANDING & ALUMINUM STAIRS. SEE SHEET C403.
5. CUT, BAND, AND MODIFY EXISTING RAILING AND TOE KICK. INSTALL (N) MANGATE. PROVIDE SHOP DRAWING FOR DISTRICT APPROVAL PIOR TO FABRICATING.

ELECTRICAL KEYNOTES

1. EXISTING MAIN CIRCUIT BREAKER AND PG&E METER PANEL. REMOVE EXISTING CONDUCTORS, INSTALL 2'e, 3#2, 1#6(G) TO MTS.
2. SEE DETAIL DWG E101 FOR ELEVATION OF ELECTRICAL PANELS.
3. REPLACE PUMPS 1 AND 2, INSTALL LEVEL TRANSMITTER, LSHH AND LSLL, INSTALL PUMP CABLE AND LIT/LSH/LSL CABLES IN EXISTING CONDUIT TO PULLBOX.
4. INSTALL A 2'X3' NEW 4SS PULLBOX 18" ABOVE EXISTING CONDUITS. SPLICE PUMP CABLES IN PULLBOX TO CONDUCTORS. MOUNT PULLBOX TO RAILING AT 24" ABOVE GRADING WITH UNISTRUT MOUNTING EXTEND CONDUITS AS REQUIRED.
5. 1"c, FE CABLE. MOUNT TO EXISTING STRUCTURE WITH CLAMPS.
6. INSTALL BARE #2 TO GROUND ROD, BOND TO CONTROL PANEL, MTS, GENERATOR CIRCUIT BREAKER AND PUMP TERMINATION PANEL.
7. GENERAL – SEE TYPICAL PUMP STATION CONDUIT AND CABLE DIAGRAM FOR CONNECTIONS.
8. INSTALL CONDUITS SURFACE MOUNTED FROM PULLBOX TO CONTROL PANEL. 1–1"c, 3#10, X_G (a), 4#14 (PUMP 2), 1–2"c, 4 #14, 1–TSP (LSHH, LIT).
9. INSTALL 2"c, TSP, 4#14 FROM PULLBOX TO WETWELL.

NOTES

1. ZERO RUMSEY IS EQUAL TO 1318.26–FEET ABOVE MEAN SEA LEVEL.
2. A "FULL LAKE" IS MEASURED AT 1325.82–FEET ABOVE MEAN SEA LEVEL ON THE RUMSEY GAUGE.
3. MAXIMUM RUMSEY GAUGE WAS MEASURED AT 1329.7–FEET AND OCCURRED ON FEBRUARY 24, 1998.
4. THE RUMSEY GAUGE WAS MEASURED AT 1328.89–FEET ON FEBRUARY 22, 2017.

NOTE: THE EXACT LOCATION OF UNDERGROUND UTILITIES IS UNCERTAIN. KNOWN CONFLICTS ARE DEPICTED WHERE POSSIBLE. CONTRACTOR TO RETAIN LOCATING SERVICE PRIOR TO ANY CONSTRUCTION AND POTHOLE ALL EXISTING UTILITIES PRIOR TO EXCAVATION.

(E) SITE PLAN (DEMO)
SCALE: 1"=5'

(N) SITE PLAN
SCALE: 1"=5'

N

1"=5' 0 5' 10'

REVISION

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1-18-13

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

LIFT STATION 1
SITE PLAN

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO. 001-004

DATE: APRIL 10, 2017

DRAWING NUMBER

CE101

5 OF 35 SHEETS



DEMOLITION KEYNOTES

1. DEMOLISH AND REMOVE CONCRETE AND (E) FORCE MAIN THIS AREA.

   REMOVE AND REPLACE (E) PUMPS, RAILS, PUMP MOUNTS, VALVES AND APPURTENANCES AS SHOWN ON SHEET C303 & c401.
2. REMOVE (E) CONTROL PANEL AND COMPONENTS. SALVAGE AND REUSE SELECT PANEL COMPONENTS PER ELECTRICAL DESIGN. LEAVE EXISTING PG&E SERVICE PANEL. SEE DETAIL # ON SHEET E###.
3. REMOVE EXISTING PORTION OF FENCE

IMPROVEMENT KEYNOTES

1. (N) SEWAGE BYPASS AND FLOW METER VAULT. CONNECTION SEE DETAIL 1 ON SHEET C201.
2. (N) TRAFFIC BOLLARD THIS LOCATION.
3. (N) PANEL THIS LOCATION.
4. (N) RAILINGS, BAF, AND MOUNT FLOATS.
5. (N) CONNECTION TO EXISTING FM.
6. POTHOLE TO VERIFY EXISTING STM LOCATION.
7. RELOCATE EXISTING FENCE
8. DECIDUOUS TREE – AVOID TAP ROOT

ELECTRICAL KEYNOTES

1. EXISTING MAIN CIRCUIT BREAKER AND PG&E METER PANEL. REMOVE EXISTING CONDUCTORS, INSTALL 5#2, 1#6(G) TO MTS IN EXISTING CONDUIT. SEE ELEVATION FOR CONDUIT MODIFICATION.
2. SEE DETAIL DWG 301 FOR ELEVATION OF ELECTRICAL PANELS.
3. REPLACE PUMPS 1 AND 2, INSTALL LEVEL TRANSMITTER, LSHH AND LSLL. INSTALL NEW CONDUITS (3–2" CONDUITS) FROM PUMP TERMINATION CABINET TO WETWELL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO CABINET. SEE DETAIL DWG XX.
4. PUMP TERMINATION CABINET, SEE DETAIL DWG 301.
5. INSTALL BARE #2 TO GROUND ROD. BOND TO CONTROL PANEL, MTS, GENERATOR CIRCUIT BREAKER AND PUMP TERMINATION PANEL.
6. GENERAL – SEE TYPICAL PUMP STATION CONDUIT AND CABLE DIAGRAM FOR CONNECTIONS.
7. 1" C, FE CABLE

SHOREVIEW DR

(E) OH POWER/PGE

BLUE

ON CT

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(E) SITE PLAN (DEMO)
SCALE: 1"=5'

(N) SITE PLAN
SCALE: 1"=5'

1"=5' 0 5' 10'

REVISION

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

LIFT STATION 3 SITE PLAN

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO. 001-004

DATE APRIL 10, 2017

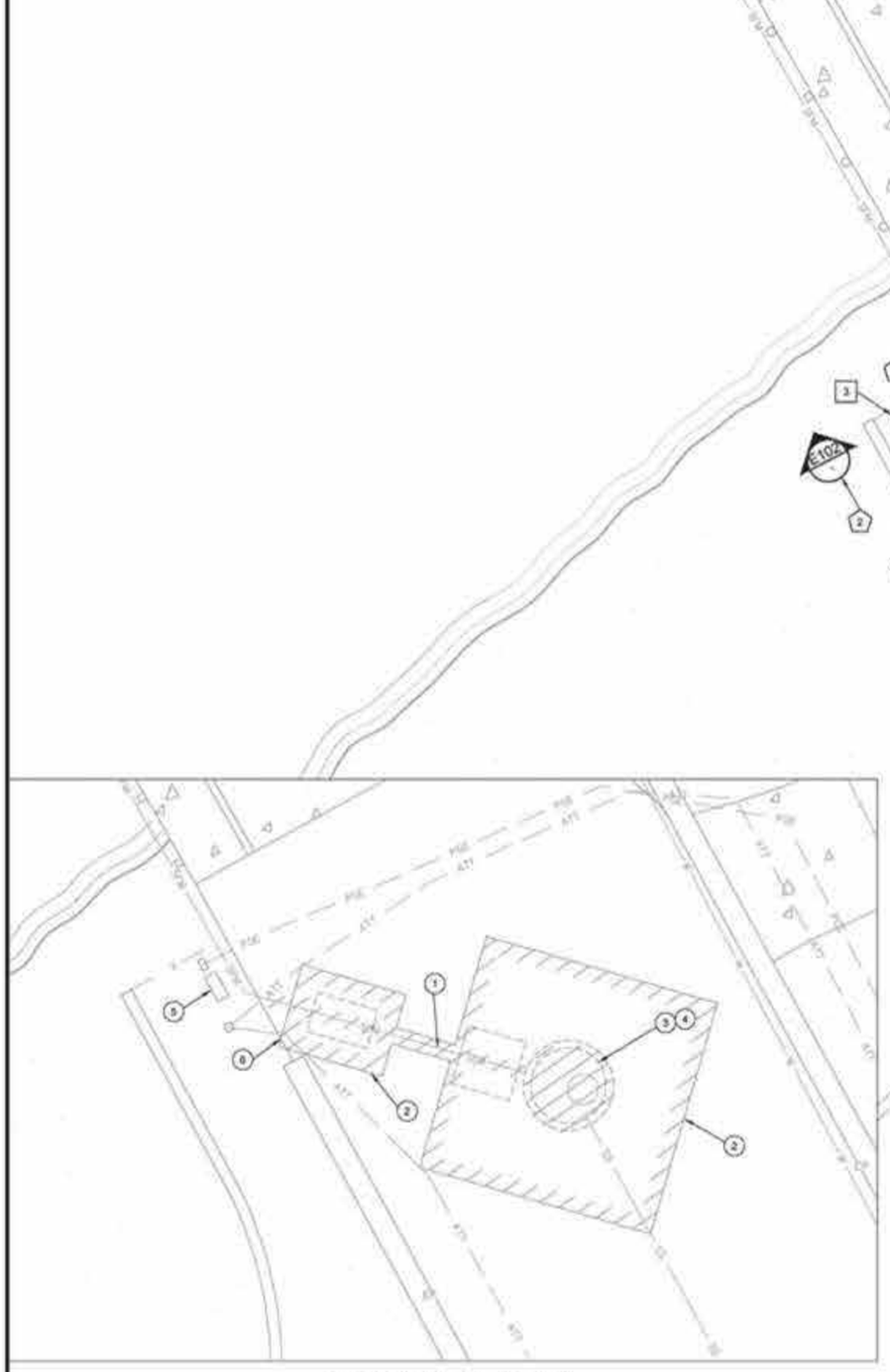
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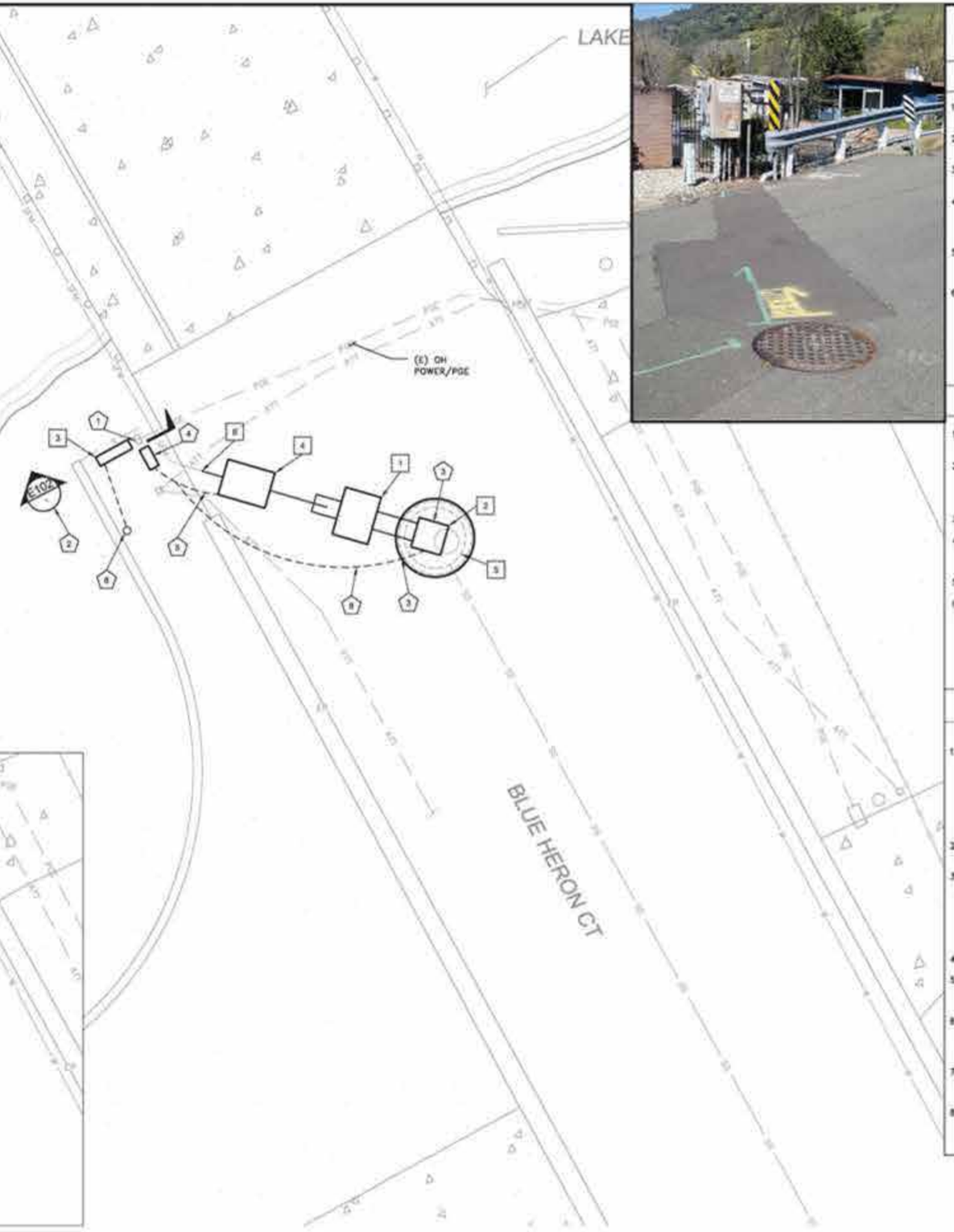
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(E) SITE PLAN (DEMO)
SCALE: 1"=5'



(N) SITE PLAN
SCALE: 1"=5'

DEMOLITION KEYNOTES

1. DEMOLISH AND REMOVE APPROXIMATELY 18 LF OF (E) PIPE.
2. APPROXIMATE EXTENT OF AC DEMOLITION AND REMOVAL.
3. PARTIALLY DEMOLISH AND REMOVE MANHOLE STRUCTURE. SEE DETAIL C304
4. REMOVE AND REPLACE (E) PUMPS, RAILS, PUMP MOUNTS, VALVES AND APPURTENANCES AS SHOWN ON SHEET C304.
5. REMOVE AND SALVAGE EXISTING CONTROL PANEL. REMOVE CONDUITS TO 1 FOOT BELOW SURFACE AND PLUG.
6. POTHOLE AND AVOID CONDUIT WITH (N) FTG.

IMPROVEMENT KEYNOTES

1. (N) 3' BY 4' VALVE VAULT. SEE DETAIL 3 ON SHEET C
2. (N) MANHOLE TOP BARREL ACCESS HATCH, (N) SUBMERSIBLE SEWAGE PUMPS, AND RCP MODIFICATION SEE DETAIL B-C304.
3. (N) PANEL THIS LOCATION
4. (N) SEWAGE BYPASS CONNECTION AND FLOW METER VAULT THIS LOCATION. SEE DETAIL 3 ON C304.
5. (N) RAILINGS, BAF, AND MOUNTS.
6. (N) CONNECTION TO EXISTING FM. SEE DETAIL 3 ON C304

ELECTRICAL KEYNOTES

1. EXISTING MAIN CIRCUIT BREAKER AND PG&E METER PANEL. REMOVE EXISTING CONDUCTORS, INSTALL 1-1/2" c, 3#2, 1#6(G) TO MTS UNDERGROUND. CONDUIT AND CONDUCTORS FROM PG&E TO REMAIN. SERVICE PANEL TO REMAIN, PROTECT IN PLACE.
2. SEE DETAIL DWG E102 FOR ELEVATION OF ELECTRICAL PANELS.
3. REPLACE PUMPS 1 AND 2, INSTALL LEVEL TRANSMITTER, LSHH AND LSLL. INSTALL NEW CONDUITS (3-2" CONDUITS) FROM PUMP TERMINATION CABINET TO WETWELL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO CABINET.
4. PULLBOX, SEE DETAIL DWG E02.
5. 1"c, FE CABLE, UNDERGROUND. INSTALL TO FIT ADJACENT TO CONTROL PANEL. REPLACE PAVEMENT AFTER INSTALLATION.
6. INSTALL BARE #2 TO GROUND ROD. BOND TO CONTROL PANEL, MTS, GENERATOR CIRCUIT BREAKER AND PUMP TERMINATION PANEL.
7. GENERAL – SEE TYPICAL PUMP STATION CONDUIT AND CABLE DIAGRAM FOR CONNECTIONS.
8. INSTALL UNDER CURB – DO NOT CUT CURB

N

1"=5' 0 5' 10'

REVISION

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

LIFT STATION 4
SITE PLAN

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

DATE: APRIL 10, 2017

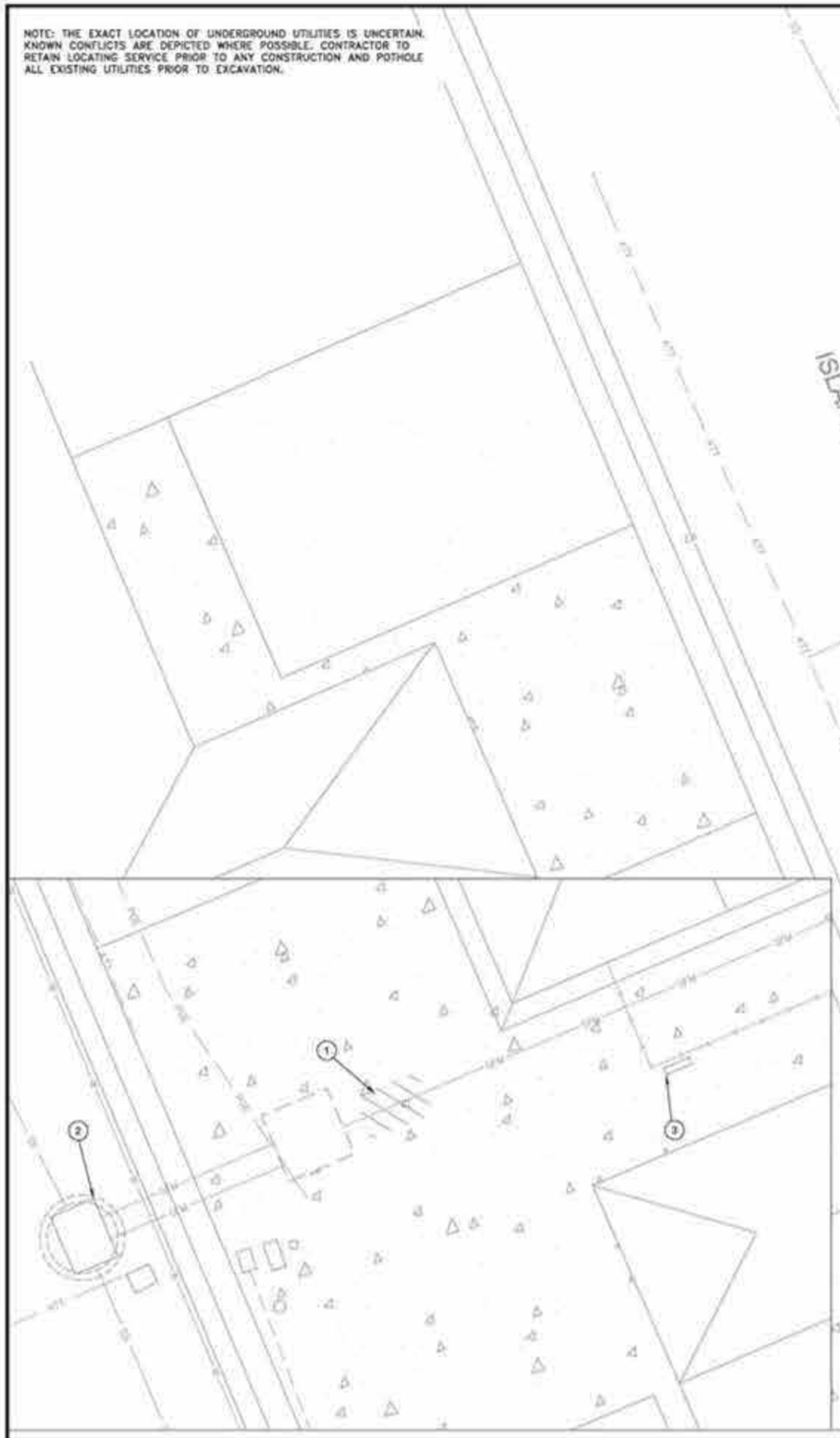
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(E) SITE PLAN (DEMO)
SCALE: 1"=5'



(N) SITE PLAN
SCALE: 1"=5'

DEMOLITION KEYNOTES

1. DEMOLISH AND REMOVE CONCRETE, AND (E) 4" FORCE MAIN THIS AREA.
2. REMOVE AND REPLACE (E) PUMPS, RAILS, PUMP MOUNTS, VALVES, AND APPURTENANCES AS SHOWN ON SHEET C305.
3. REMOVE (E) PANEL AND COMPONENTS. SALVAGE AND REUSE SELECT PANEL COMPONENTS PER ELECTRICAL DESIGN. SEE SHEET C305.

IMPROVEMENT KEYNOTES

1. (N) VAULT AND SEWAGE BYPASS CONNECTION SEE DETAIL 1 ON SHEET C305 & C401.
2. (N) PANEL THIS LOCATION. SEE ELECTRICAL DESIGN.
3. (N) RAILINGS, PUMPS, FLOATS, BAF, AND MOUNTS.
4. (N) VAULT COVER, ONLY
5. (N) REPLACE EXISTING 4" LINES WITH CHECK AND GATE VALVES. REPLACE EXISTING MANIFOLD.

ELECTRICAL KEYNOTES

1. EXISTING MAIN CIRCUIT BREAKER AND PG&E METER PANEL. REMOVE EXISTING CONDUCTORS, INSTALL 1-1/2" c, 3#2, 1#6(G) TO MTS UNDERGROUND. CONDUIT AND CONDUCTORS FROM PG&E TO REMAIN. SERVICE PANEL TO REMAIN. PROTECT IN PLACE.
2. SEE DETAIL DWG E102 FOR ELEVATION OF ELECTRICAL PANELS.
3. REPLACE PUMPS 1 AND 2, INSTALL LEVEL TRANSMITTER, LSHH AND LSLL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO PULLBOX.
4. INSTALL 3#10, 4#4, 1/12(c)(PUMP 1), 4# 14, 1-TSP (LIT, LSHH, LSll IN EXISTING CONDUIT FROM PULLBOX TO CONTROL PANEL.
5. 1"c, FE CABLE, UNDERGROUND. INSTALL TO FIT ADJACENT TO CONTROL PANEL. REPLACE PAVEMENT AFTER INSTALLATION.
6. REMOVE AND SALVAGE EXISTING CONTROL PANEL.
7. INSTALL BARE #2 TO GROUND ROD. BOND TO CONTROL PANEL, MTS, GENERATOR CIRCUIT BREAKER AND PUMP TERMINATION PANEL.
8. GENERAL – SEE TYPICAL PUMP STATION CONDUIT AND CABLE DIAGRAM FOR CONNECTIONS.
9. SPLICE CABLES IN PULLBOX (EXISTING).
10. INSTALL CONTROL PANEL OVER EXISTING CONDUITS.

N

0 5' 10'
1"=5'

REVISION

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

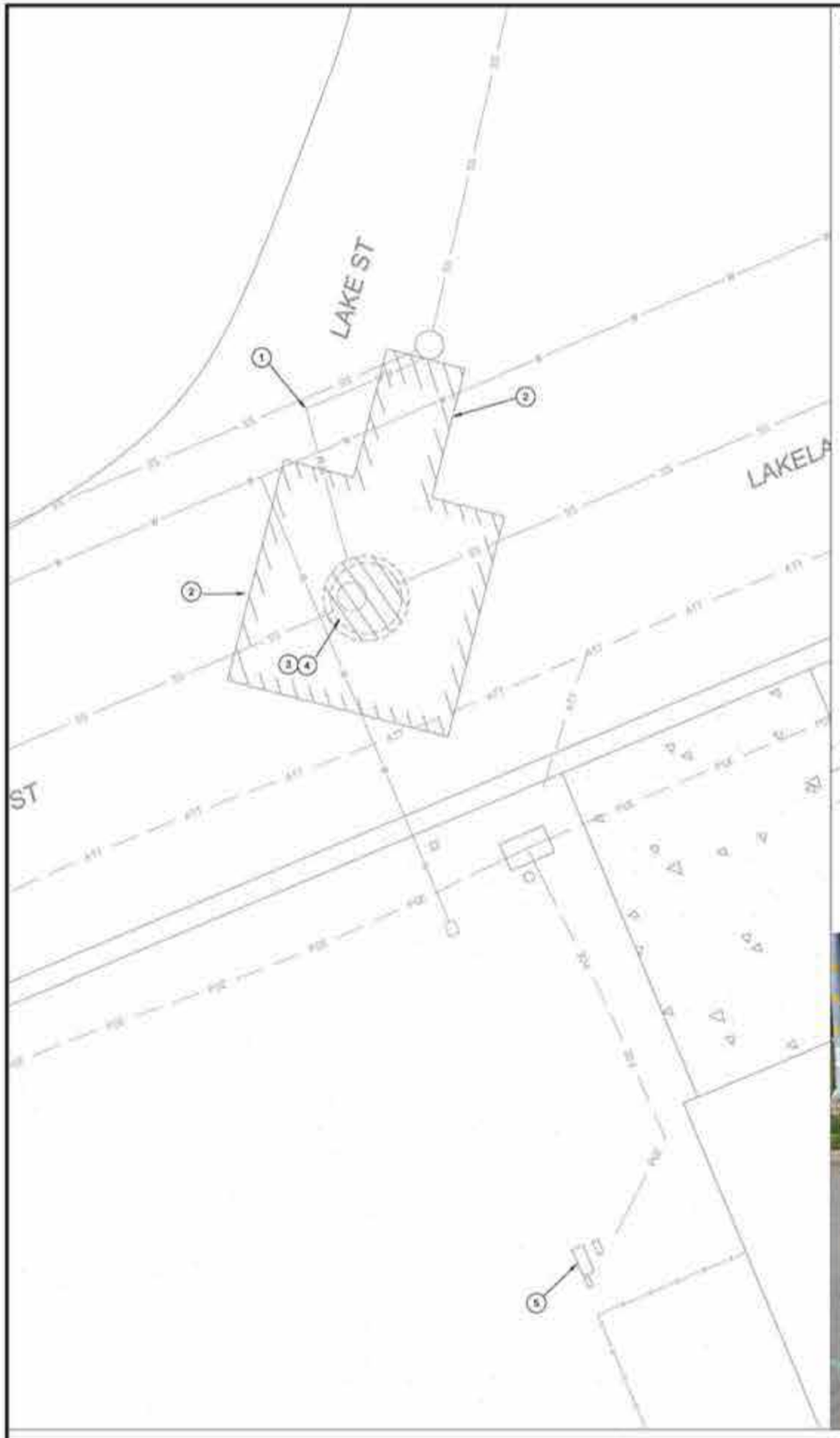
LIFT STATION 5
SITE PLAN

CLEARLAKE OAKS COUNTY WATER DISTRICT

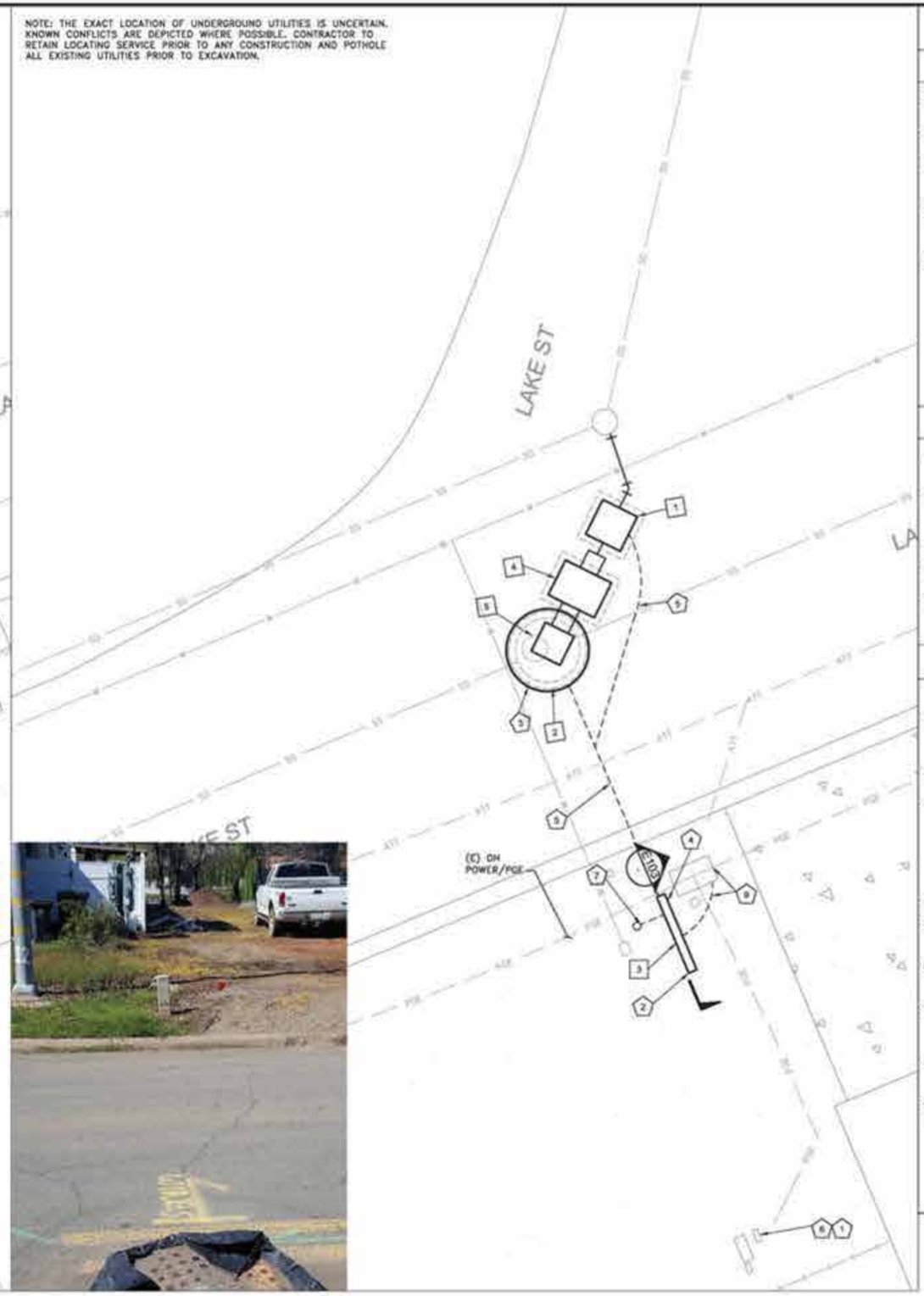
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(E) SITE PLAN (DEMO)
SCALE: 1"=5'



(N) SITE PLAN
SCALE: 1"=5'

DEMOLITION KEYNOTES

1. ABANDON IN PLACE AND PLUG AT MANHOLE.
2. APPROXIMATE EXTENT OF AC DEMOLITION AND REMOVAL.
3. PARTIALLY DEMOLISH AND REMOVE MANHOLE STRUCTURE. SEE DETAIL C306 THIS SHEET.
4. REMOVE AND REPLACE (E) PUMPS, RAILS, PUMP MOUNTS, VALVES AND APPURTENANCES AS SHOWN ON SHEET C306.
5. REMOVE (E) PANEL AND CONTROLS. SALVAGE PANEL COMPONENTS PER ELECTRICAL DESIGN. SEE DETAIL C306.

IMPROVEMENT KEYNOTES

1. (N) MAGNETIC FLOW METER AND VAULT SEE C308 & C401
2. (N) MANHOLE TOP BARREL ACCESS HATCH, RCP MODIFICATIONS, AND (N) SUBMERSIBLE SEWAGE PUMPS SEE SHEET C308 DETAIL 8-C306.
3. (N) PANEL THIS LOCATION.
4. (N) VALVE VAULT THIS LOCATION. SEE SHEET C306.
5. (N) RAILINGS, BAF, AND MOUNTS.

ELECTRICAL KEYNOTES

1. EXISTING MAIN CIRCUIT BREAKER AND PG&E METER PANEL. REMOVE EXISTING CONDUCTORS.
2. SEE DETAIL DWG E501 FOR ELEVATION OF ELECTRICAL PANELS.
3. REPLACE PUMPS 1 AND 2, INSTALL LEVEL TRANSMITTER, LSHH AND LSLL. INSTALL NEW CONDUITS (3-2" CONDUITS) FROM PULLBOX CABINET TO WETWELL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO CABINET. REPLACE CONCRETE AND PAVEMENT AFTER INSTALLATION.
4. PULLBOX. SEE DETAIL DWG E401.
5. 1"c, FE CABLE, UNDERGROUND. INSTALL TO FIT ADJACENT TO CONTROL PANEL. REPLACE PAVEMENT AFTER INSTALLATION.
6. REMOVE AND SALVAGE EXISTING CONTROL PANEL. REMOVE CONDUITS TO 1 FOOT BELOW SURFACE AND PLUG.
7. INSTALL BARE #2 TO GROUND ROD. BOND TO CONTROL PANEL, MTS, GENERATOR CIRCUIT BREAKER AND PUMP TERMINATION PANEL.
8. GENERAL – SEE TYPICAL PUMP STATION CONDUIT AND CABLE DIAGRAM FOR CONNECTIONS.
9. INSTALL 2"c, PW TO PG&E PULLBOX. INSTALL PER PG&E REQUIREMENTS.

N

1"=5' 0 5' 10'

REVISION	
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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

LIFT STATION 6
SITE PLAN

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

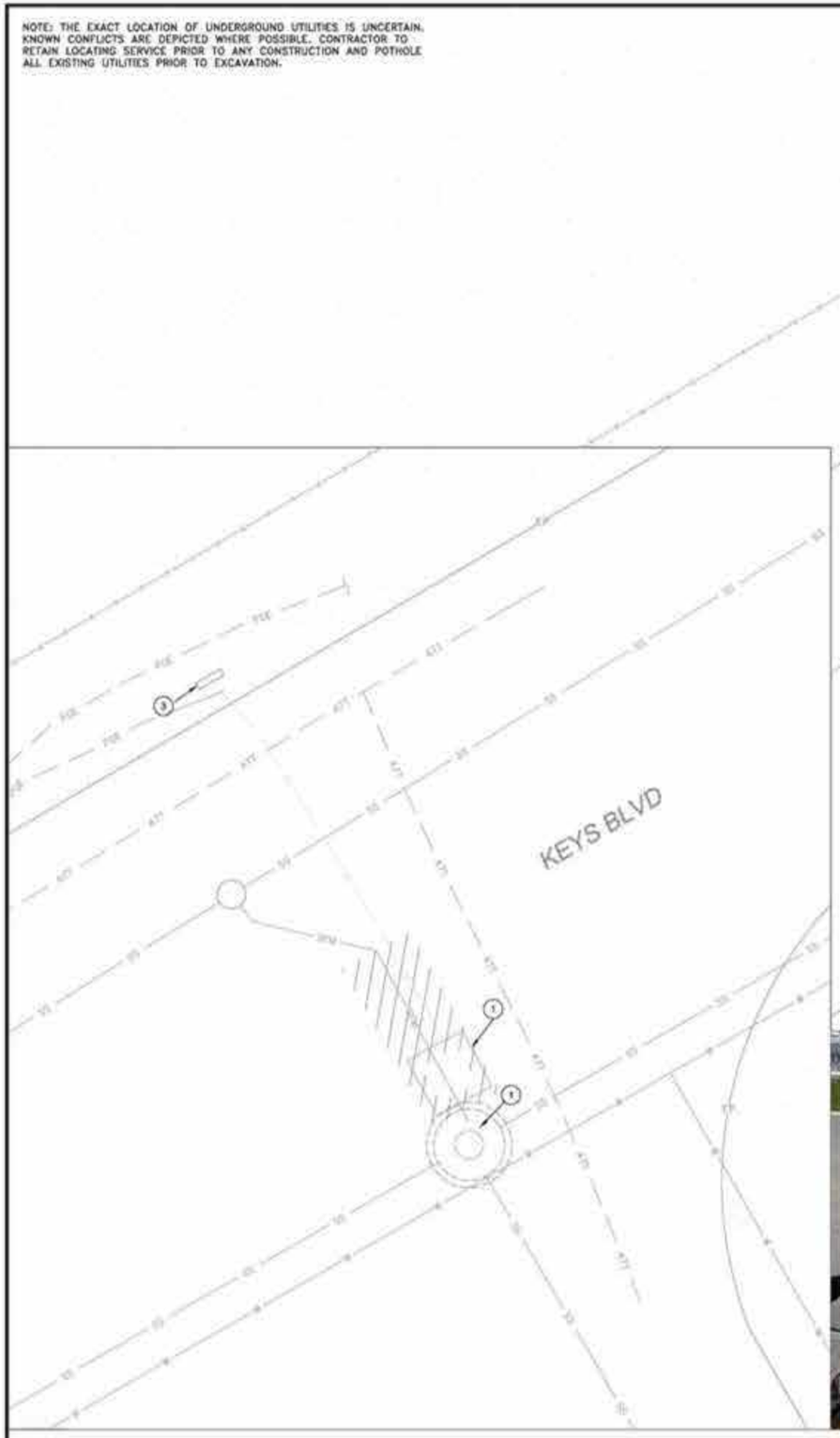
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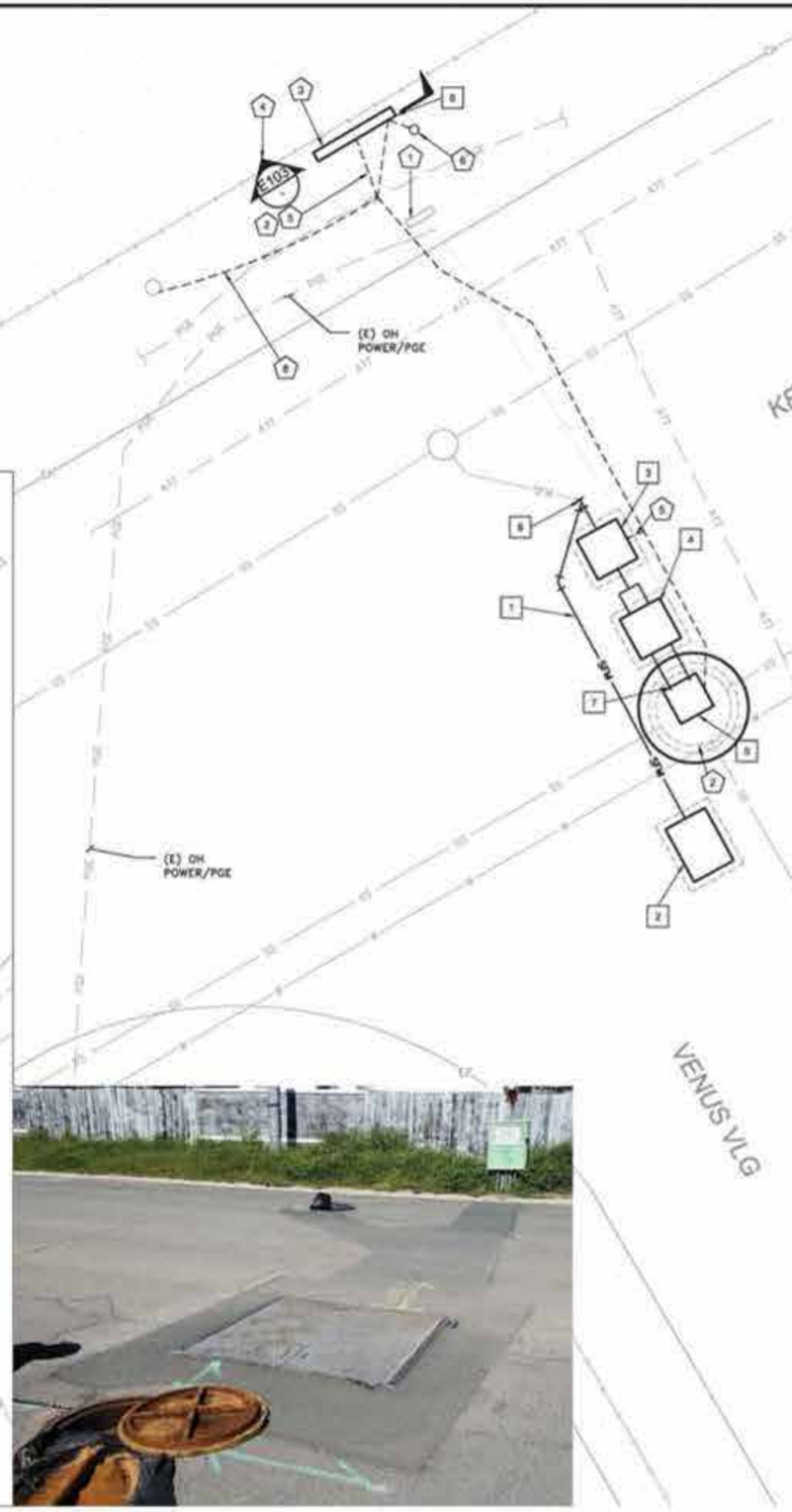
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(E) SITE PLAN (DEMO)
SCALE: 1"=5'



(N) SITE PLAN
SCALE: 1"=5'

DEMOLITION KEYNOTES

1. DEMOLISH AND REMOVE CONCRETE AND (E) FORCE MAIN THIS AREA.
2. REMOVE AND REPLACE (E) PUMPS AND APPURTENANCES. SEE SHEET C308.
3. REMOVE (E) PANEL AND COMPONENTS. SALVAGE AND REUSE SELECT PANEL COMPONENTS PER ELECTRICAL DESIGN. SEE SHEET C308.

IMPROVEMENT KEYNOTES

1. (N) APPROXIMATELY 22 LF OF 4" PVC SEWAGE BYPASS FORCE MAIN.
2. (N) SEWAGE BYPASS CONNECTION VAULT.
3. (N) MAGNETIC FLOW METER AND VAULT SEE SHEET C308 AND C401.
4. (N) VALVE VAULT SEE SHEET C308 AND C401.
5. (N) MANHOLE TOP BARREL ACCESS HATCH MODIFICATIONS, AND (N) SUBMERSIBLE SEWAGE PUMPS SEE SHEET C308 DETAIL B308.
6. (N) PANEL THIS LOCATION. SEE ELECTRICAL PLAN ON SHEET E103.
7. (N) RAILINGS, FLOATS, BAF, AND MOUNTS.
8. (N) CONNECTION TO EXISTING FM.

ELECTRICAL KEYNOTES

1. EXISTING MAIN CIRCUIT BREAKER, PG&E METER PANEL AND CONTROL PANEL. REMOVE ALL EXISTING CONDUIT AND CONDUCTORS. REMOVE AND SALVAGE METER PANEL AND CONTROL PANEL. REMOVE CONDUITS TO 1 FOOT BELOW SURFACE AND PLUG.
2. REPLACE PUMPS 1 AND 2, INSTALL LEVEL TRANSMITTER, LSHH AND LSLL. INSTALL NEW CONDUITS (3-2" CONDUITS) FROM PULLBOX TO WETWELL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO CABINET. REPLACE CONCRETE AND PAVEMENT AFTER INSTALLATION.
3. PULLBOX, SEE DETAIL DWG E301.
4. SEE DETAIL DWG E301 FOR ELEVATION OF ELECTRICAL PANELS.
5. 1"c, FE CABLE, UNDERGROUND. INSTALL TO FIT ADJACENT TO CONTROL PANEL. REPLACE PAVEMENT AFTER INSTALLATION.
6. INSTALL BARE #2 TO GROUND ROD. BOND TO CONTROL PANEL, MTS, GENERATOR CIRCUIT BREAKER AND PUMP TERMINATION PANEL.
7. INSTALL 2", PW TO PG&E PULLBOX TO PG&E STANDARDS AND REQUIREMENTS. COORDINATE INSTALLATION WITH PG&E.
8. GENERAL – SEE TYPICAL PUMP STATION CONDUIT AND CABLE DIAGRAM FOR CONNECTIONS.

N

0 5' 10'
1"=5'

REVISION

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

LIFT STATION 8
SITE PLAN

CLEARLAKE OAKS COUNTY WATER DISTRICT

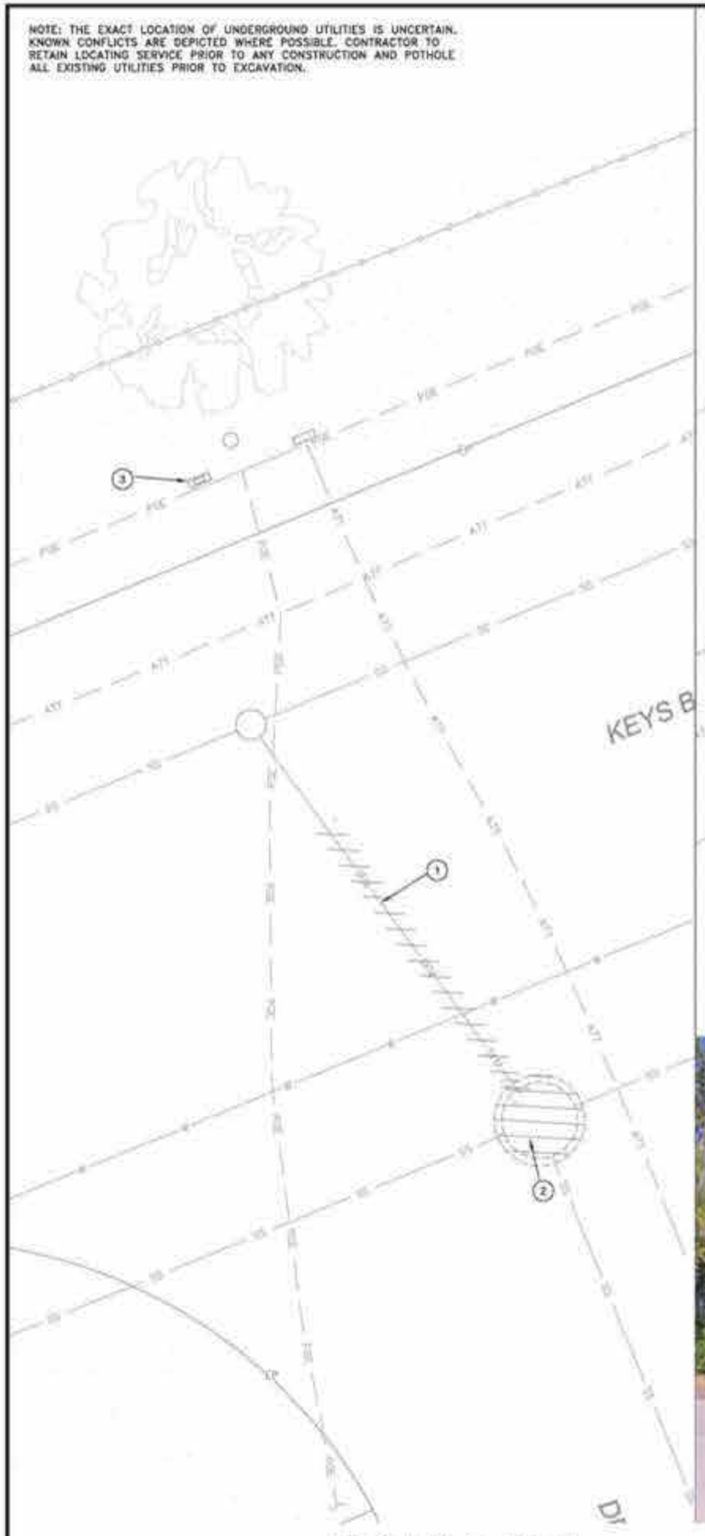
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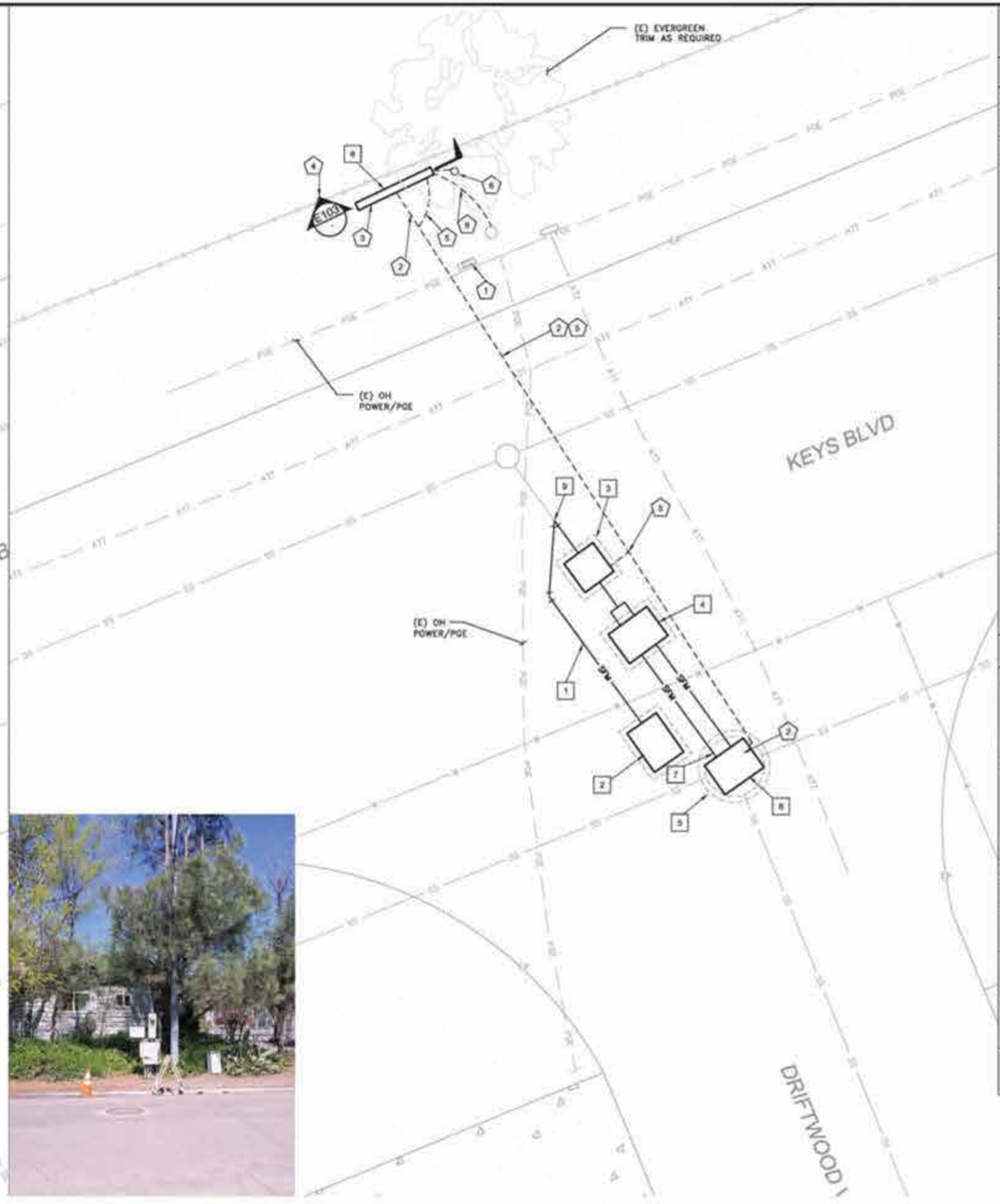
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(E) SITE PLAN (DEMO)
SCALE: 1"=5'



(N) SITE PLAN
SCALE: 1"=5'

DEMOLITION KEYNOTES

1. DEMOLISH AND REMOVE APPROXIMATELY 22 LF OF (E) PIPE.
2. PARTIALLY DEMOLISH AND REMOVE MANHOLE STRUCTURE. SEE SHEET C309.
3. REMOVE (E) PANEL AND CONTROLS. SALVAGE PANEL COMPONENTS PER ELECTRICAL DESIGN. SEE SHEET C308.

IMPROVEMENT KEYNOTES

1. APPROXIMATELY 20 LF OF 4" PVC SEWAGE BYPASS FORCE MAIN.
2. (N) SEWAGE BYPASS CONNECTION VAULT.
3. (N) MAGNETIC FLOW METER AND VAULT SEE SHEET C309 DETAIL B309.
4. (N) VALVE VAULT.
5. (N) MANHOLE ACCESS HATCH, RCP MODIFICATIONS, AND (N) SUBMERSIBLE SEWAGE PUMPS SEE SHEET C309, C401.
6. (N) PANEL THIS LOCATION. SEE ELECTRICAL DESIGN.
7. UTILITY CROSSING.
8. (N) RAILINGS, FLOATS, BAF, AND MOUNTS.
9. (N) CONNECTION TO EXISTING FM.

ELECTRICAL KEYNOTES

1. EXISTING MAIN CIRCUIT BREAKER, PG&E METER PANEL AND CONTROL PANEL. REMOVE ALL EXISTING CONDUIT AND CONDUCTORS. REMOVE AND SALVAGE METER PANEL AND CONTROL PANEL. REMOVE CONDUITS TO 1 FOOT BELOW SURFACE AND PLUG.
2. REPLACE PUMPS 1 AND 2, INSTALL LEVEL TRANSMITTER, LSHH AND LSLL. INSTALL NEW CONDUITS (3-2" CONDUITS) FROM PULLBOX TO WETWELL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO CABINET. REPLACE CONCRETE AND PAVEMENT AFTER INSTALLATION.
3. PULLBOX. SEE DETAIL DWG E301.
4. SEE DETAIL DWG E301 FOR ELEVATION OF ELECTRICAL PANELS.
5. 1"c, FE CABLE, UNDERGROUND. INSTALL TO FIT ADJACENT TO CONTROL PANEL. REPLACE PAVEMENT AFTER INSTALLATION.
6. INSTALL BARE #2 TO GROUND ROD. BOND TO CONTROL PANEL, MTS, GENERATOR CIRCUIT BREAKER AND PUMP TERMINATION PANEL.
7. GENERAL - SEE TYPICAL PUMP STATION CONDUIT AND CABLE DIAGRAM FOR CONNECTIONS.
8. INSTALL 2", PW TO PG&E POLE PER STANDARDS AND REQUIREMENTS. COORDINATE INSTALLATION WITH PG&E.

N

1"=5' 0 5' 10'

REVISION

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

LIFT STATION 9
SITE PLAN

CLEARLAKE OAKS COUNTY WATER DISTRICT

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DEMOLITION KEYNOTES

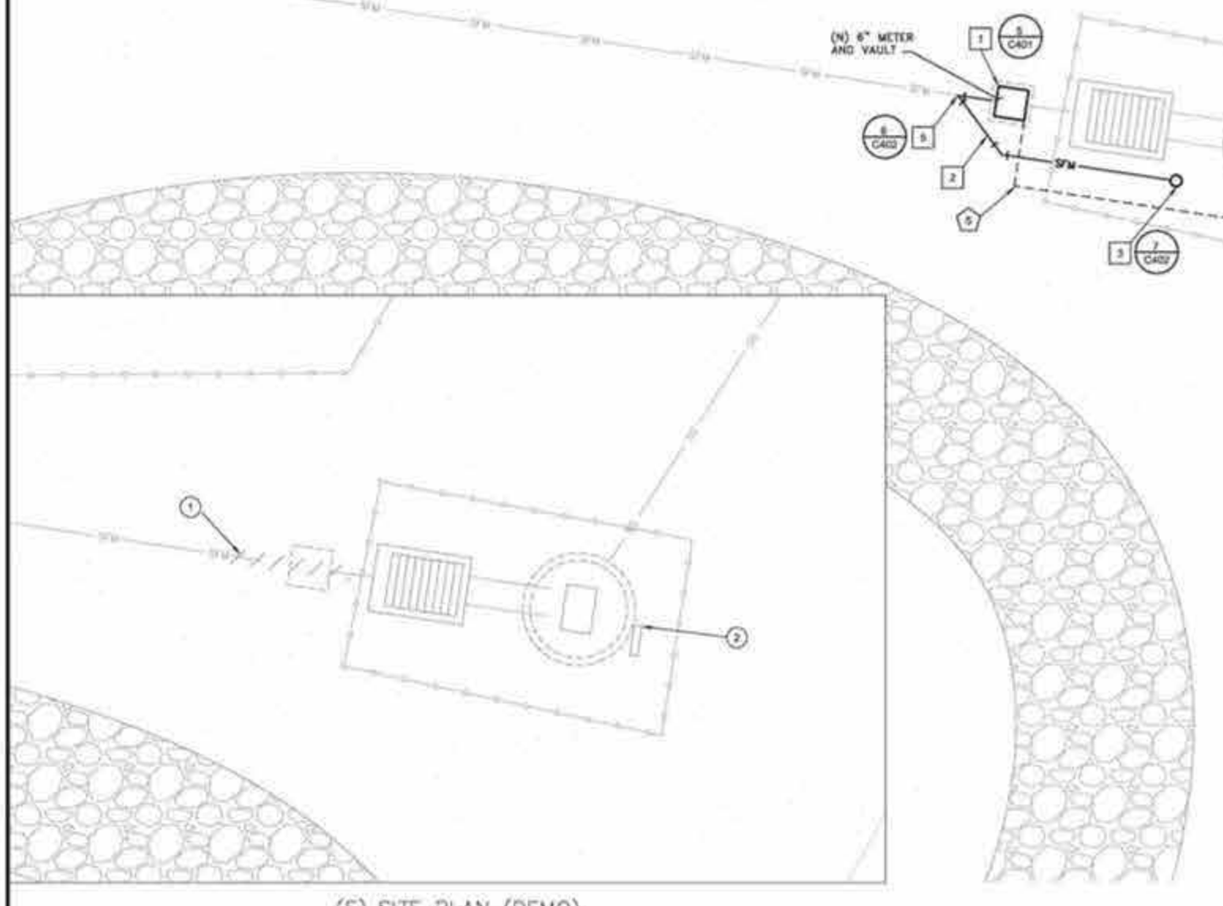
1. DEMOLISH AND REMOVE APPROXIMATELY 12 LF OF (E) 6" AC PIPE.
2. REMOVE (E) PANEL AND CONTROLS. SALVAGE PANEL COMPONENTS PER ELECTRICAL DESIGN. SEE SHEET C310.

IMPROVEMENT KEYNOTES

1. (N) 6-INCH MAGNETIC FLOW METER AND VAULT THIS LOCATION SEE SHEET C310 DETAIL 5-C401.
2. APPROXIMATELY 18 LF OF 4" PVC SEWAGE BYPASS FM.
3. (N) SEWAGE BYPASS CONNECTION THIS LOCATION SEE SHEET C310 DETAIL 5-C401.
4. (N) PANEL THIS LOCATION.

ELECTRICAL KEYNOTES

1. EXISTING CONTROL PANEL, MTS AND GEN CB. REMOVE AND SALVAGE CONTROL PANEL. REMOVE CONDUITS TO 1 FOOT BELOW SURFACE AND PLUG.
2. SEE DETAIL DWG E104 FOR ELEVATION OF ELECTRICAL PANELS.
3. REPLACE PUMPS 1 AND 2. INSTALL LEVEL TRANSMITTER, LSHH AND LSLL. INSTALL NEW CONDUIT (2" CONDUIT) FROM PULLBOX TO CONTROL PANEL. INSTALL LIT, LSHH, AND LSLL CABLES TO CABINET. REPLACE CONCRETE AND PAVEMENT AFTER INSTALLATION. INSTALL SEAL IN CONDUIT.
4. BLANK
5. 1"c, FE CABLE, UNDERGROUND, INSTALL TO FIT ADJACENT TO CONTROL PANEL. REPLACE PAVEMENT AFTER INSTALLATION.
6. INSTALL BARE #2 TO GROUND ROD. BOND TO CONTROL PANEL, MTS, GENERATOR CIRCUIT BREAKER AND PUMP TERMINATION PANEL.
7. INSTALL 2"c, 4#2, ½(e), FROM EXISTING MAIN CB TO CONTROL PANEL LENGTH IS ~100' AND ROUTE TO BE FIELD DETERMINED.
8. GENERAL – SEE TYPICAL PUMP STATION CONDUIT AND CABLE DIAGRAM FOR CONNECTIONS.



(E) SITE PLAN (DEMO)
SCALE: 1"=5'

(N) SITE PLAN
SCALE: 1"=5'

N
0 5' 10'
1"=5'

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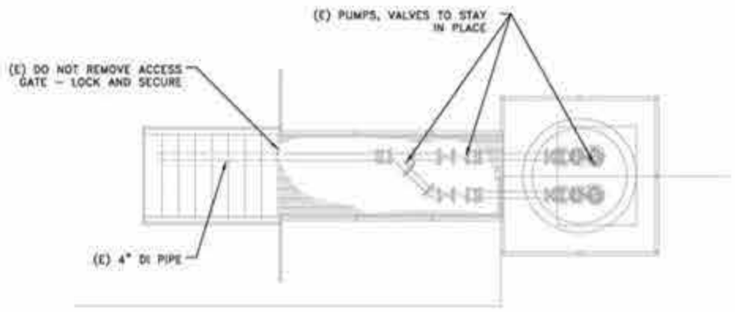
VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

LIFT STATION 10
SITE PLAN

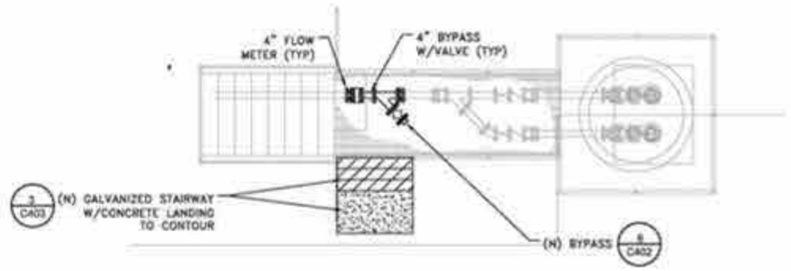
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JOB NO. 001-004
DATE APRIL 10, 2017
DRAWING NUMBER
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12 OF 35 SHEETS

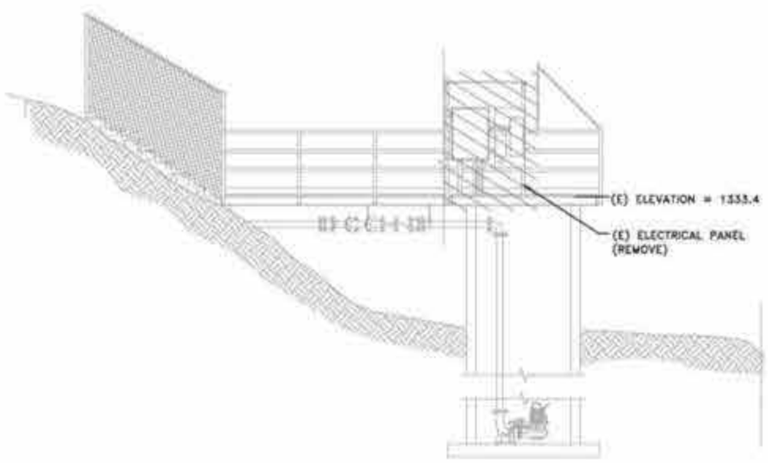
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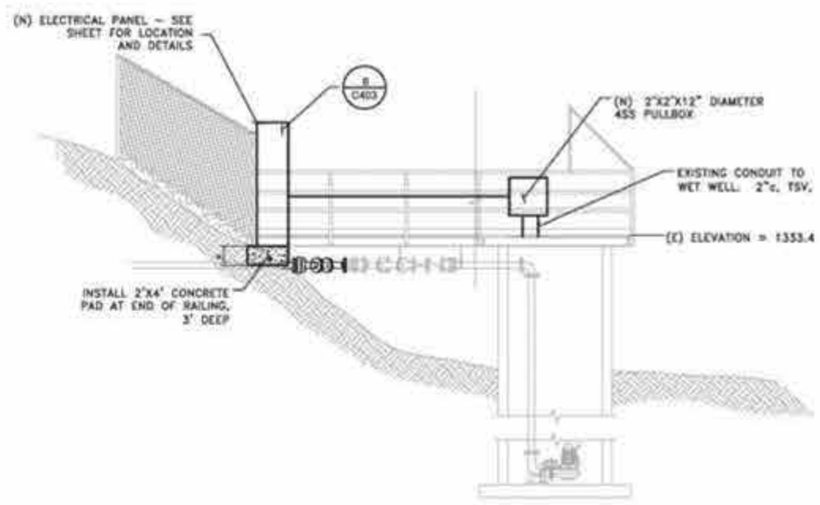
(E) LIFT STATION PLAN
SCALE: 1/4"=1'-0"



(N) LIFT STATION PLAN
SCALE: 1/4"=1'-0"



(E) LIFT STATION SECTION
SCALE: 1/4"=1'-0"



(N) LIFT STATION SECTION
SCALE: 1/4"=1'-0"

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WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

LIFT STATION 1 ELEVATIONS

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO. 001-004

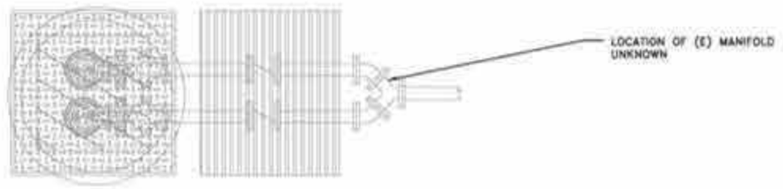
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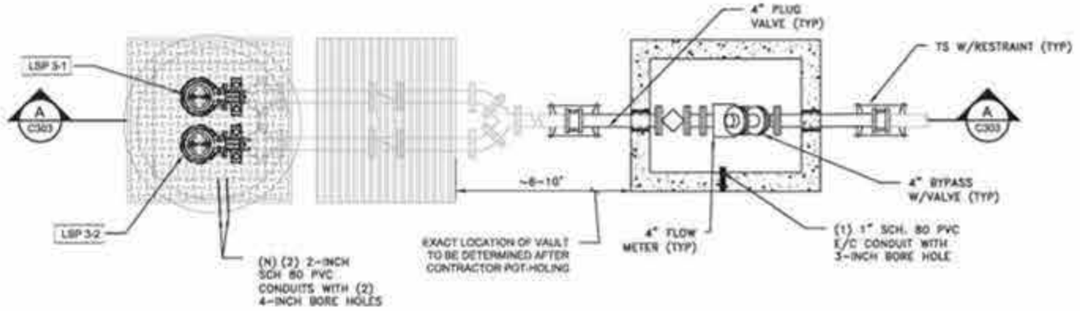
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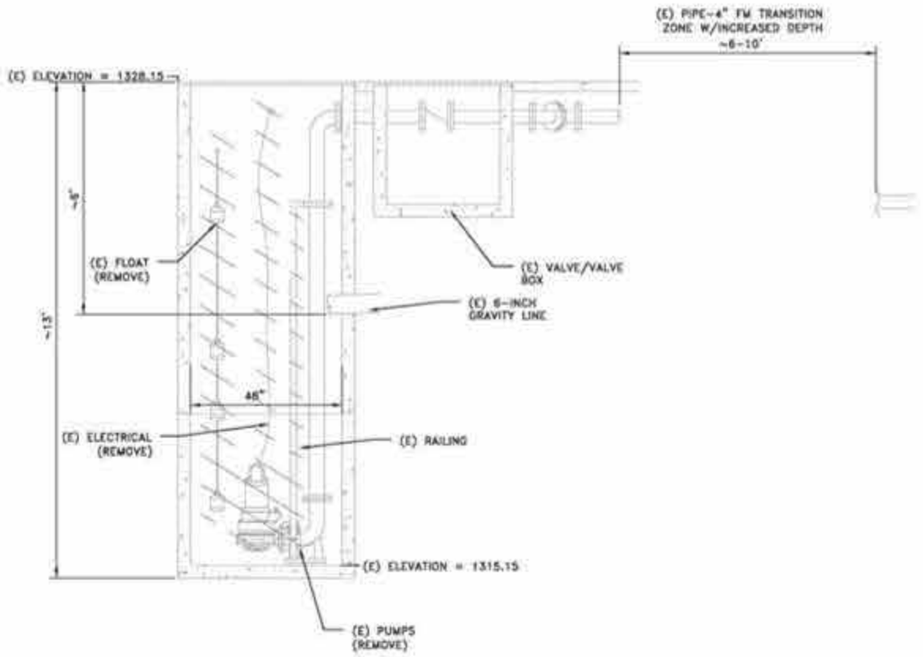
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SCALE: 1/2"=1'-0"



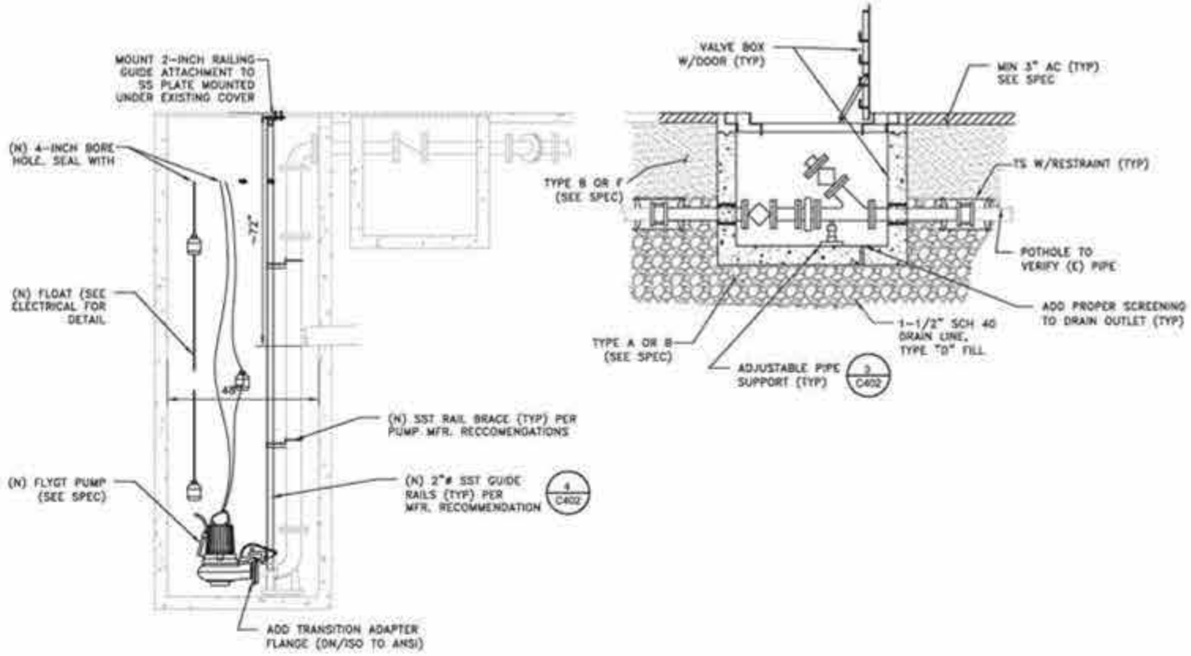
(N) LIFT STATION PLAN

SCALE: 1/2"=1'-0"



(E) LIFT STATION SECTION

SCALE: 1/2"=1'-0"



(N) LIFT STATION SECTION

SCALE: 1/2"=1'-0"

A
C303

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LIFT STATION IMPROVEMENTS

PUMP STATION 3 ELEVATIONS

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

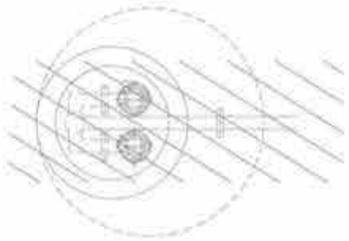
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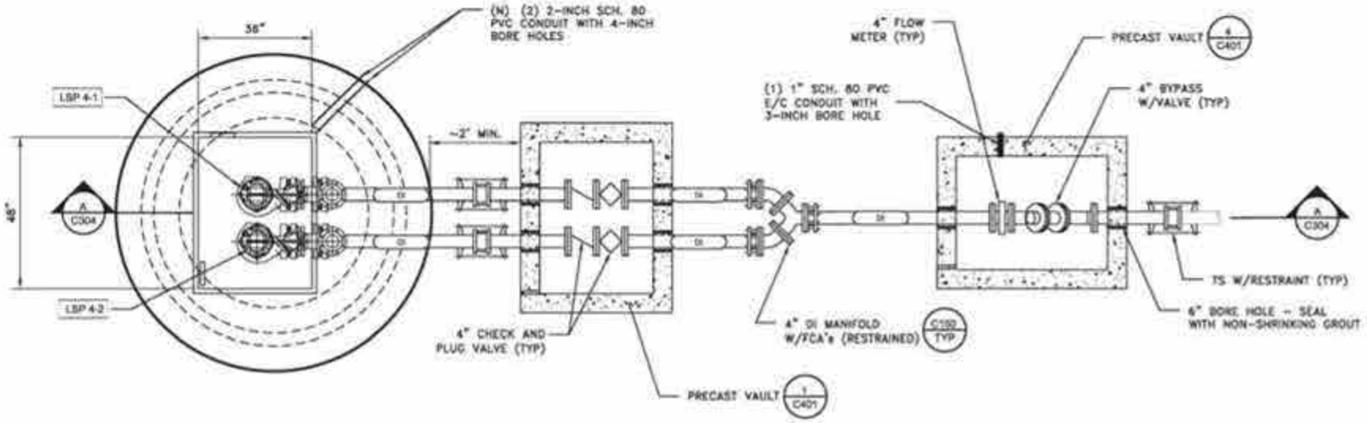
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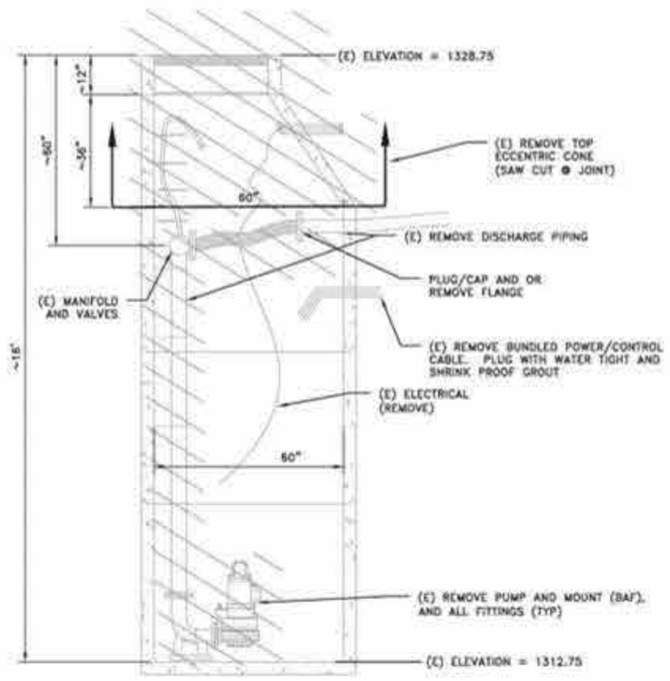
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(E) LIFT STATION PLAN

SCALE: 1/2"=1'-0"

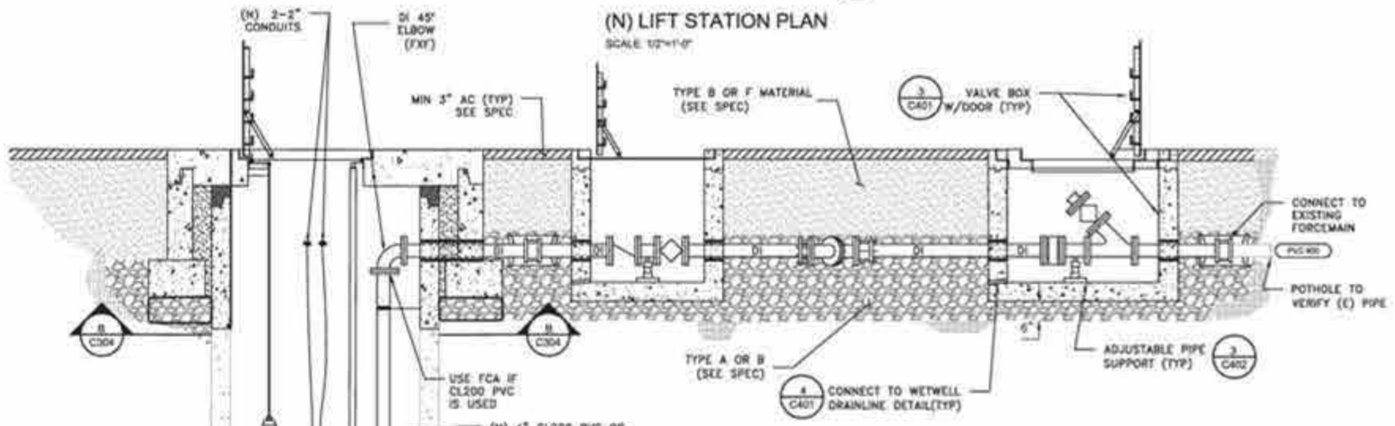


(E) LIFT STATION SECTION

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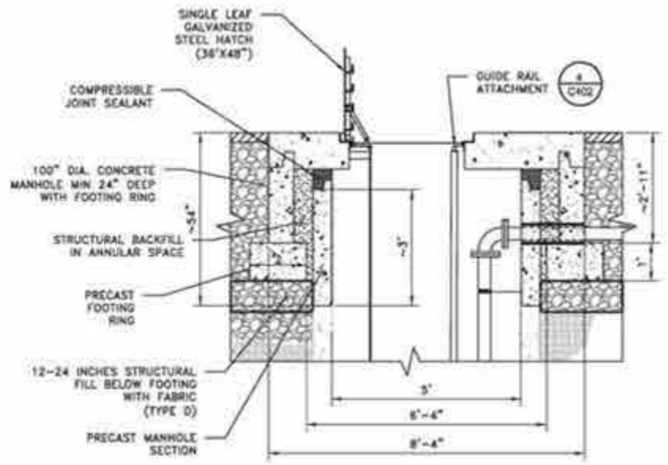
(N) LIFT STATION PLAN

SCALE: 1/2"=1'-0"



(N) LIFT STATION SECTION

SCALE: 1/2"=1'-0" A C304



(N) LIFT STATION SECTION

SCALE: 1/2"=1'-0" B C304

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LIFT STATION IMPROVEMENTS

PUMP STATION 4 ELEVATIONS

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO. 001-004

DATE APRIL 10, 2017

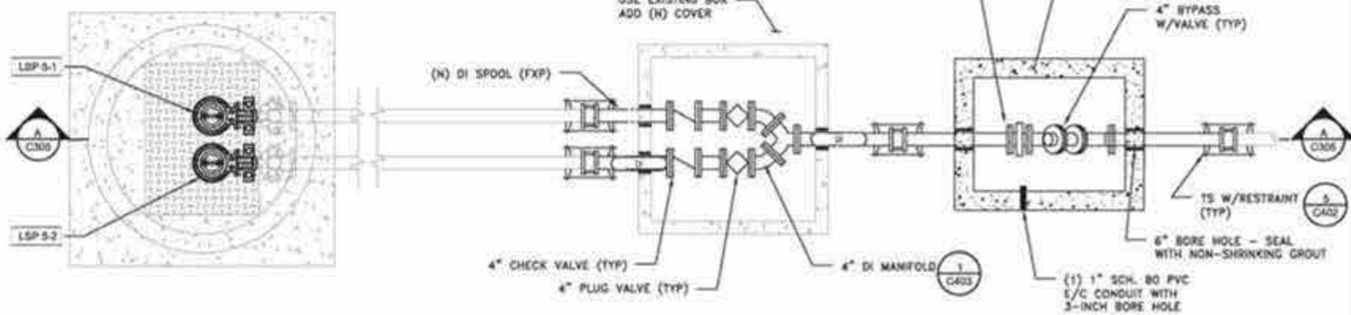
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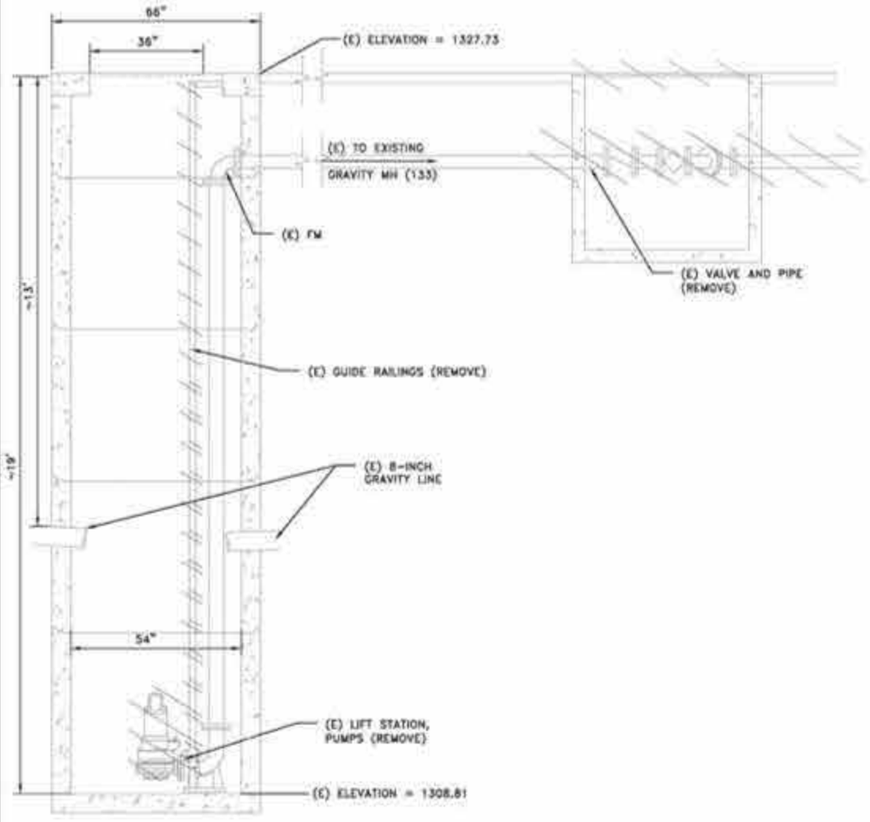
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(E) LIFT STATION PLAN

SCALE: 1/2"=1'-0"

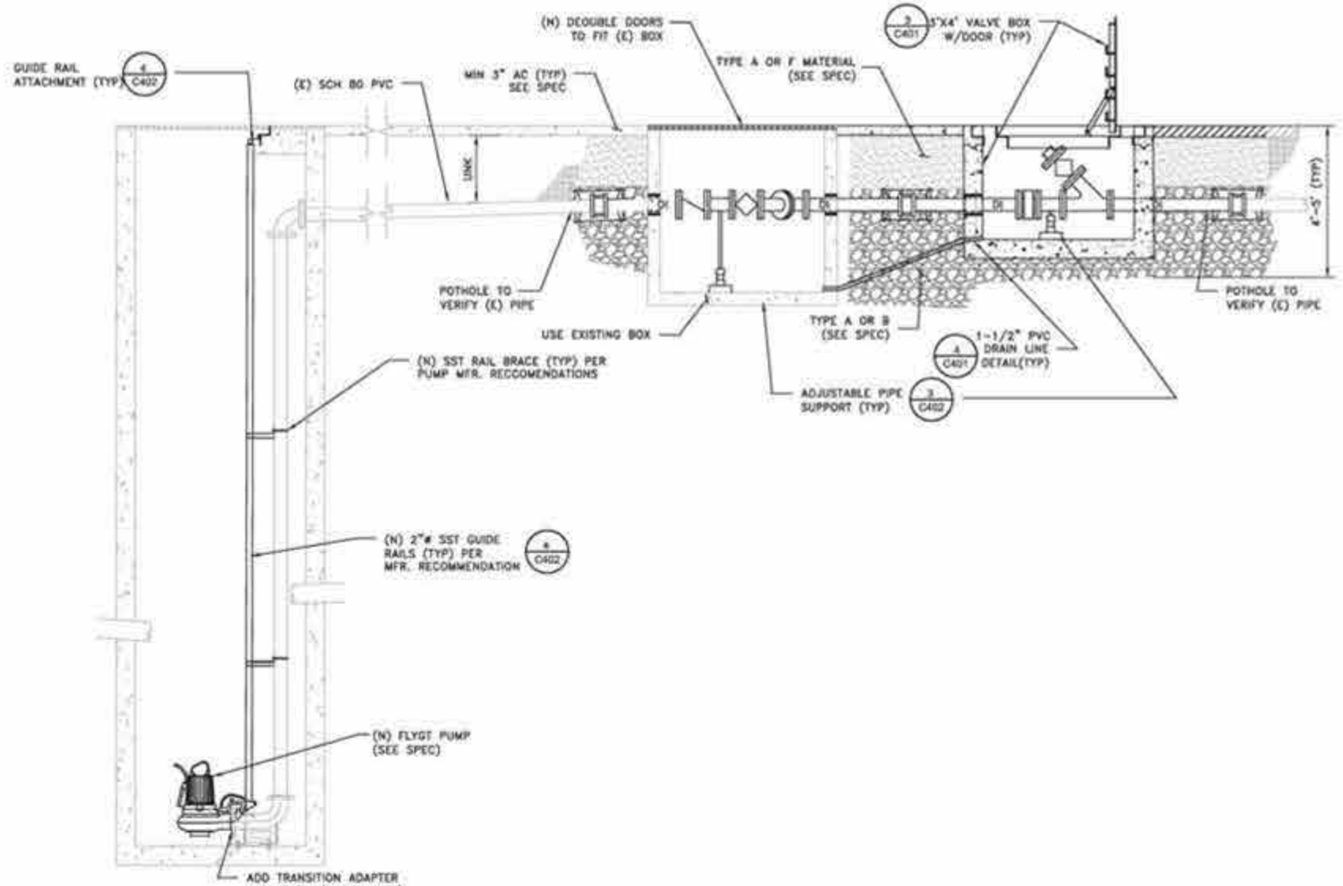


(E) LIFT STATION SECTION

SCALE: 1/2"=1'-0"

(N) LIFT STATION PLAN

SCALE: 1/2"=1'-0"



(N) LIFT STATION SECTION A/C305

SCALE: 1/2"=1'-0"

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LIFT STATION IMPROVEMENTS

PUMP STATION 5
ELEVATIONS

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

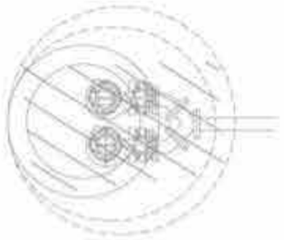
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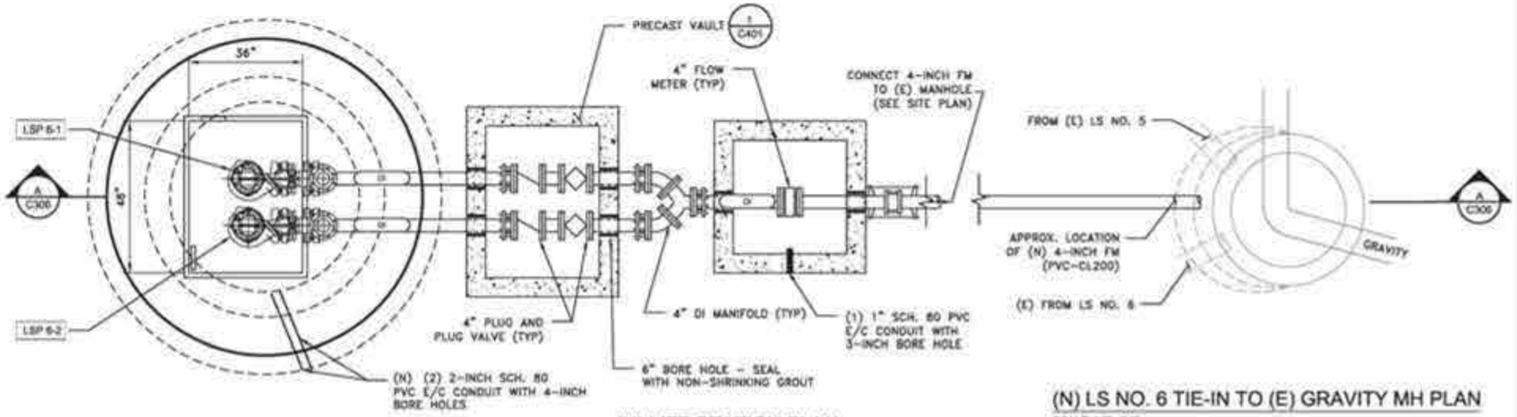
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(N) LIFT STATION PLAN

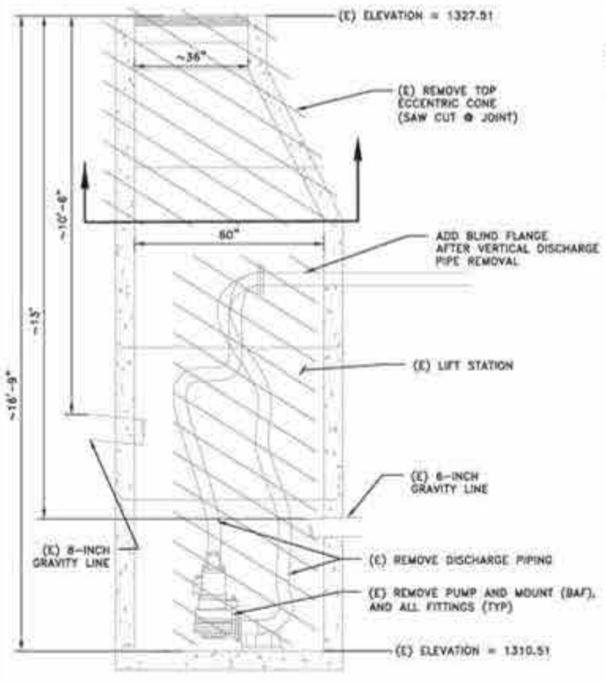
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(N) LS NO. 6 TIE-IN TO (E) GRAVITY MH PLAN

SCALE: 1/2"=1'-0"

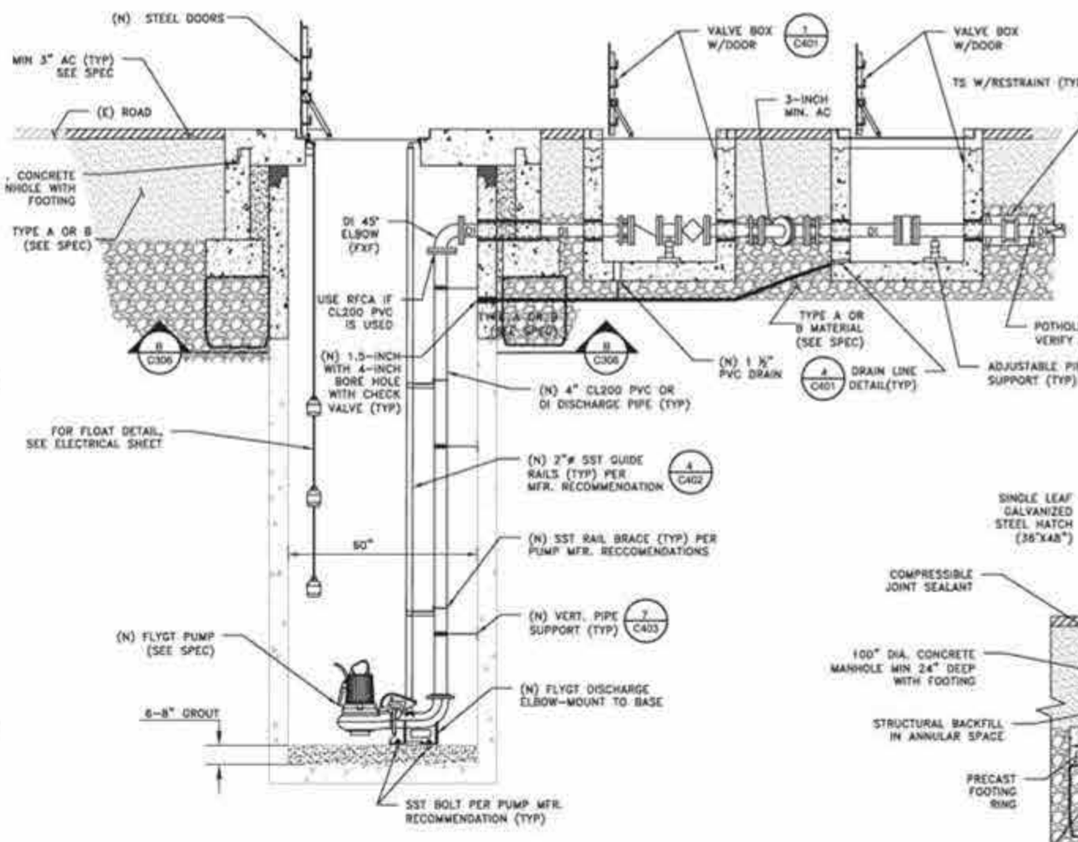
(E) LIFT STATION PLAN

SCALE: 1/2"=1'-0"



(E) LIFT STATION SECTION

SCALE: 1/2"=1'-0"

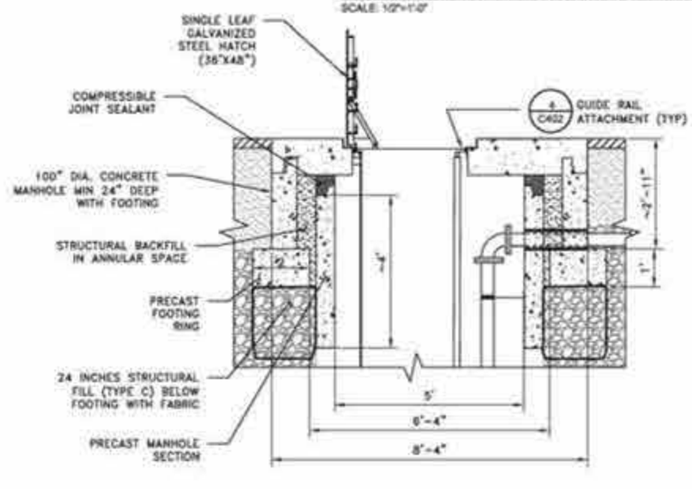


(N) LIFT STATION SECTION A C306

SCALE: 1/2"=1'-0"

(N) LS NO. 6 TIE-IN TO (E) GRAVITY MH SECTION

SCALE: 1/2"=1'-0"



(N) WET-WELL BARREL SECTION B C306

SCALE: 1/2"=1'-0"

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WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

PUMP STATION 6
ELEVATIONS

CLEARLAKE OAKS COUNTY WATER DISTRICT

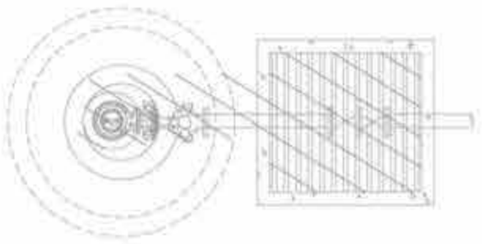
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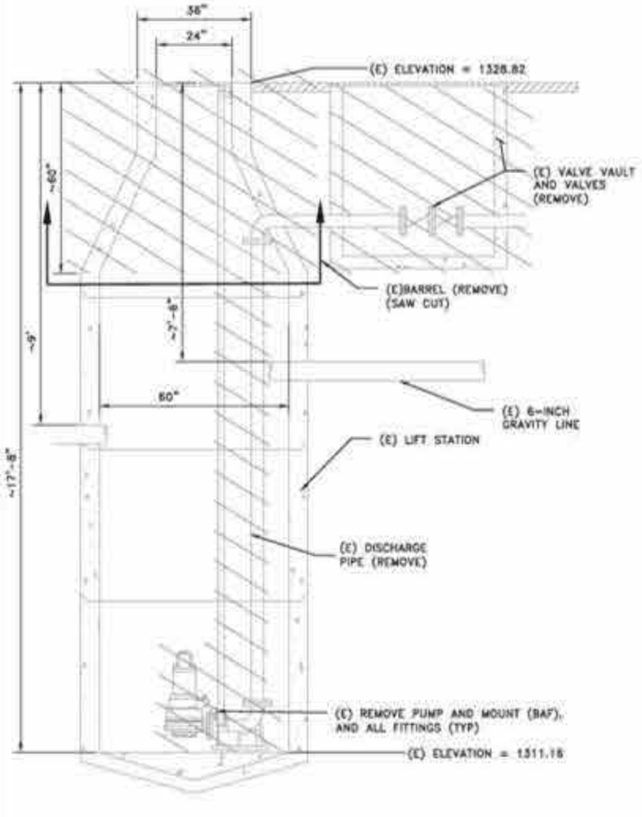
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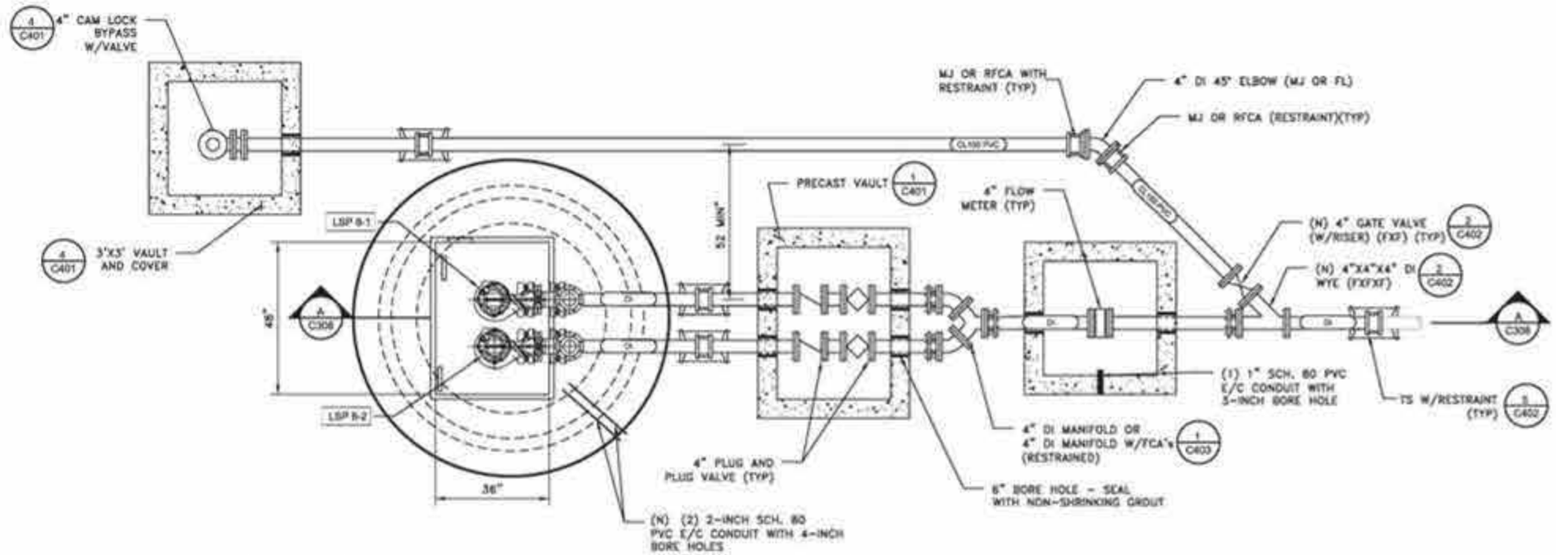
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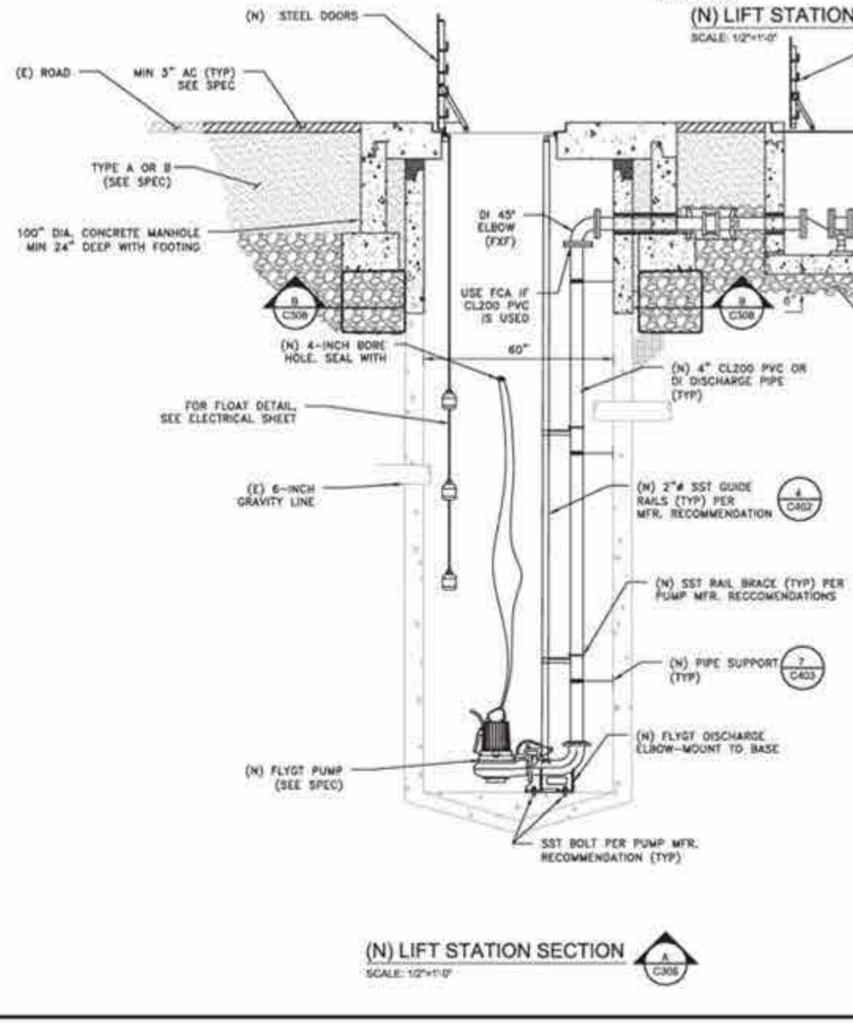


(E) LIFT STATION PLAN
SCALE: 1/2"=1'-0"



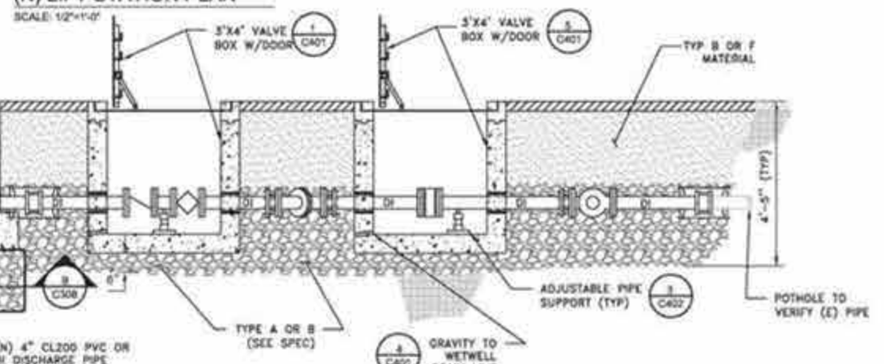
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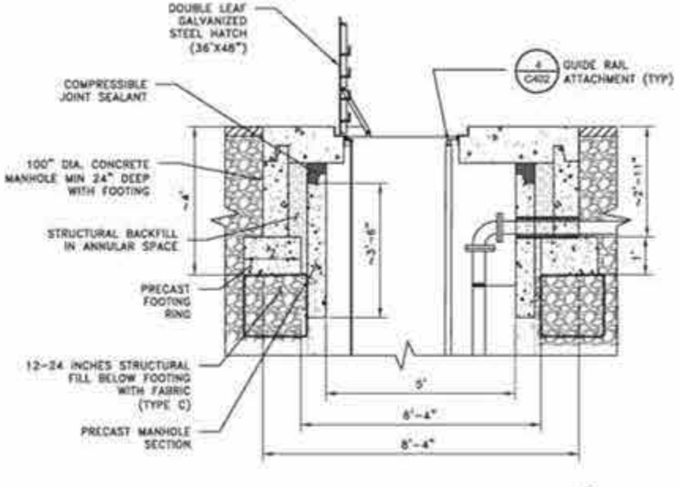




(N) LIFT STATION SECTION A C308
SCALE: 1/2"=1'-0"

(N) LIFT STATION PLAN
SCALE: 1/2"=1'-0"





(N) WET-WELL BARREL SECTION B C308
SCALE: 1/2"=1'-0"

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

PUMP STATION 8
ELEVATIONS

CLEARLAKE OAKS COUNTY WATER DISTRICT

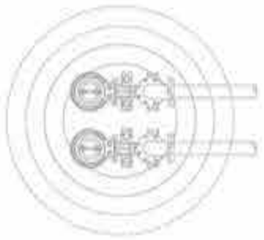
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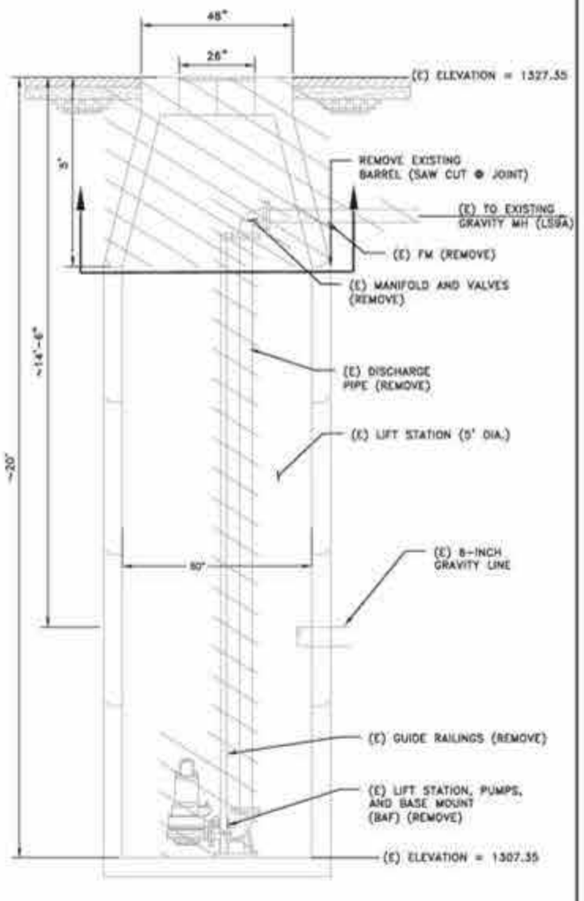
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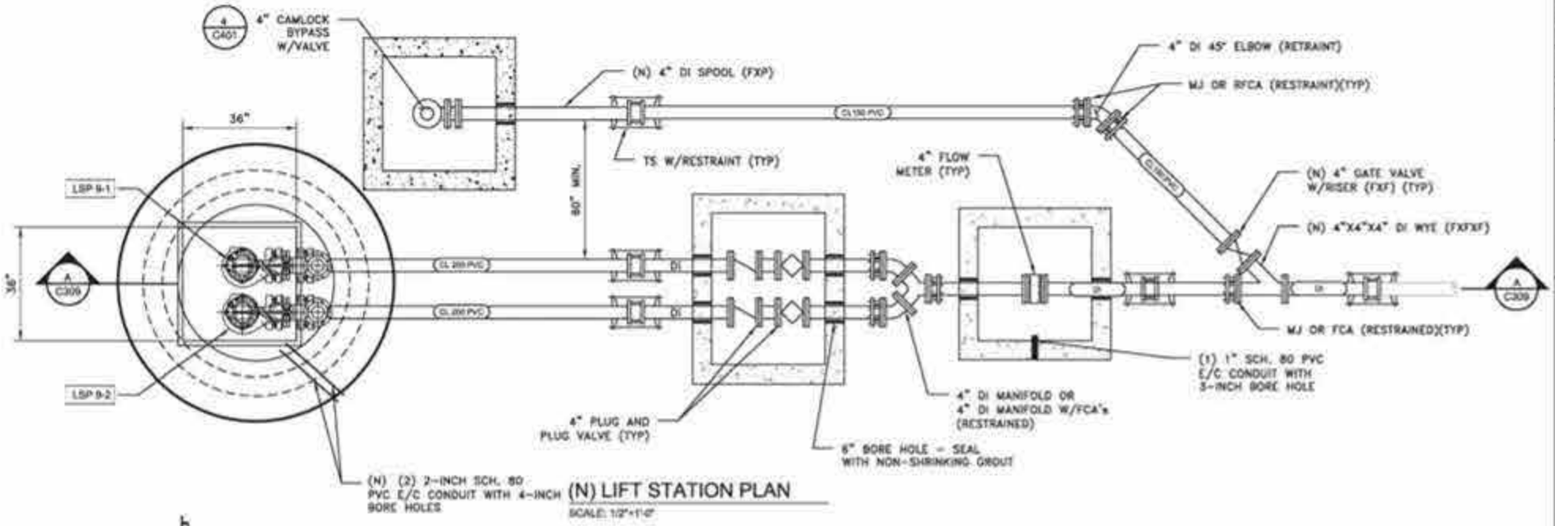
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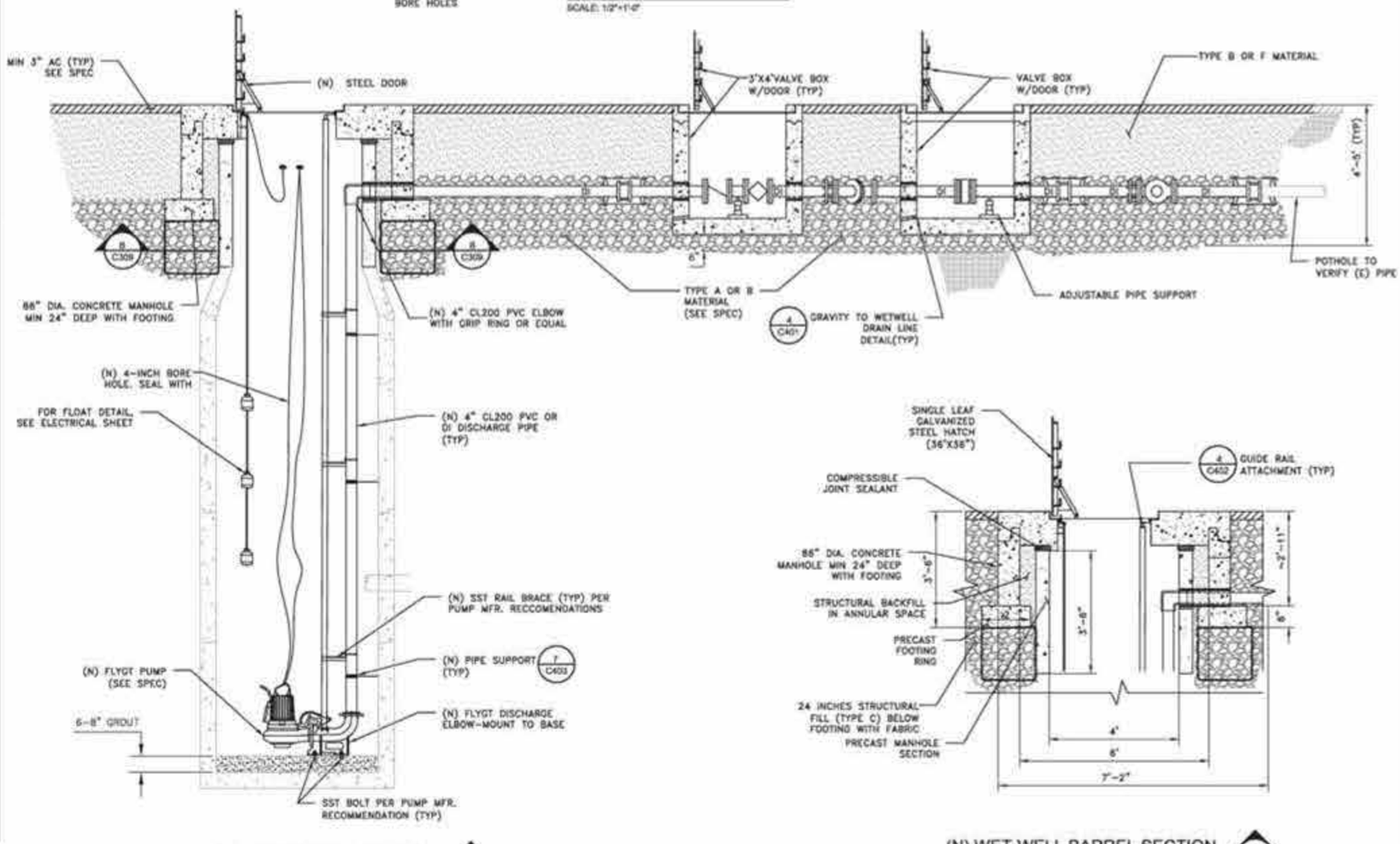
(E) LIFT STATION PLAN
SCALE: 1/2"=1'-0"



(E) LIFT STATION SECTION
SCALE: 1/2"=1'-0"



(N) LIFT STATION PLAN
SCALE: 1/2"=1'-0"



(N) LIFT STATION SECTION
SCALE: 1/2"=1'-0"
A C309

(N) WET-WELL BARREL SECTION
SCALE: 1/2"=1'-0"
B C309

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

PUMP STATION 9
ELEVATIONS

CLEARLAKE OAKS COUNTY WATER DISTRICT

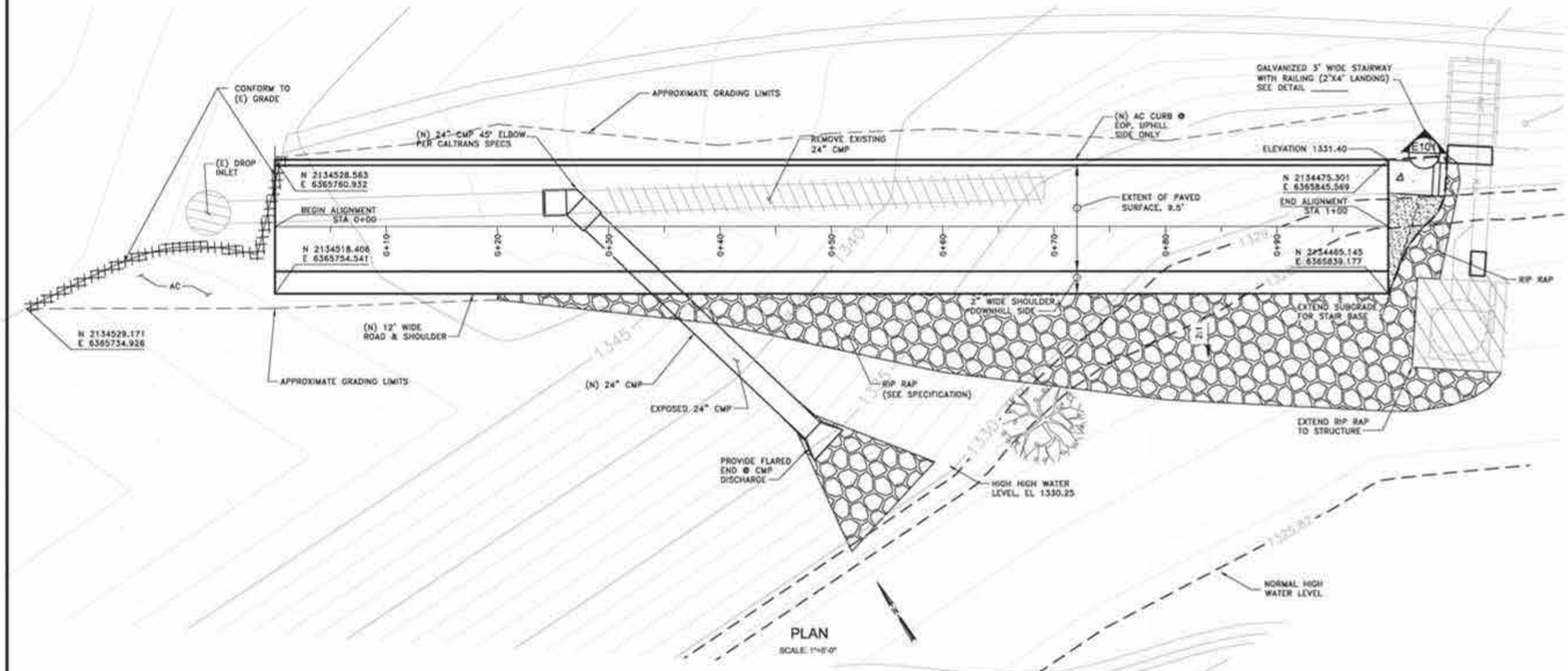
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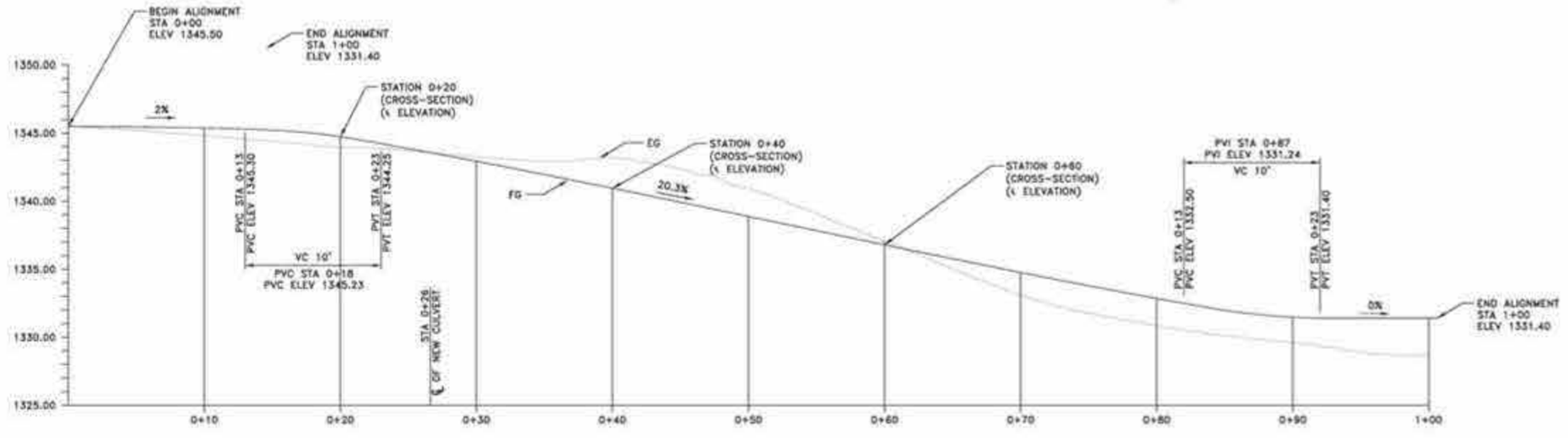
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PLAN

SCALE: 1"=5'-0"



PROFILE

SCALE: 1"=5'-0"

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

LIFT STATION NO. 1
PLAN AND PROFILE

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO. 001-004

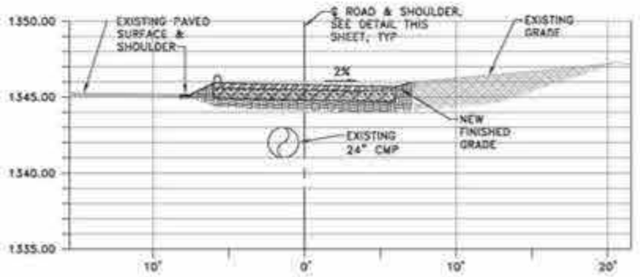
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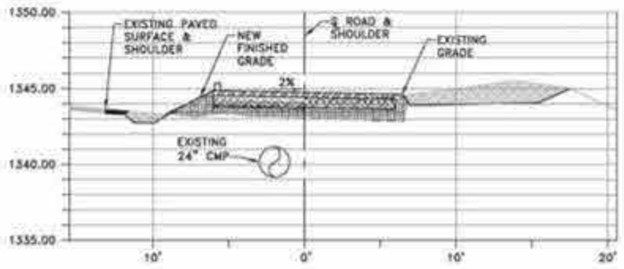
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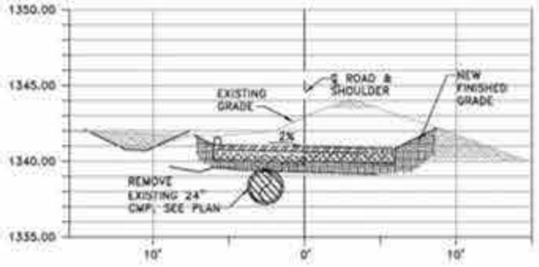
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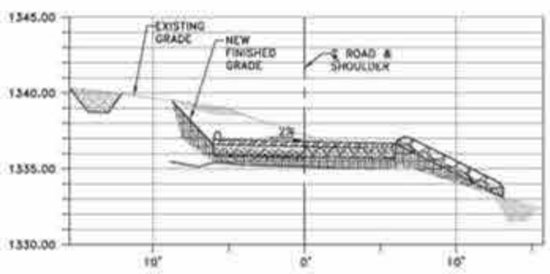
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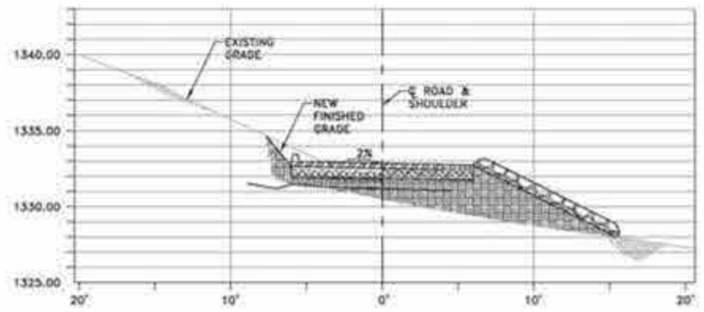
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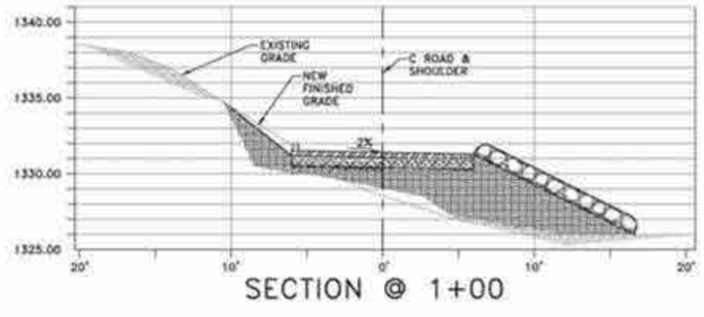
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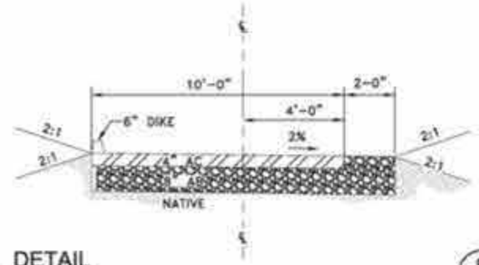
SECTION @ 0+60



SECTION @ 0+80



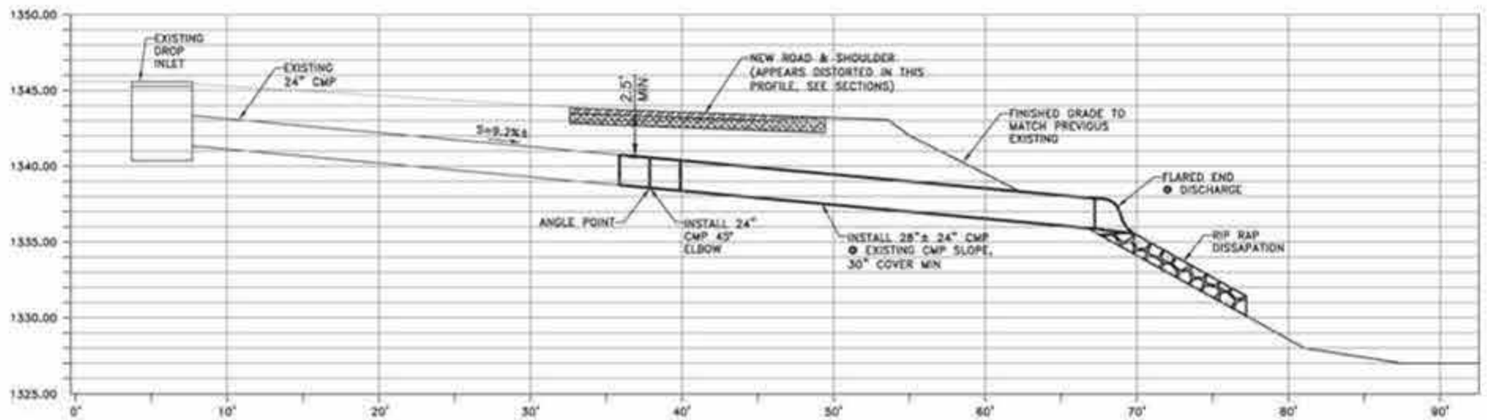
SECTION @ 1+00



DETAIL

SCALE: NONE

C
403



NEW CMP PIPE PROFILE

SCALE: 1"=5'-0"

REVISION

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

LIFT STATION NO. 1
CROSS SECTIONS

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

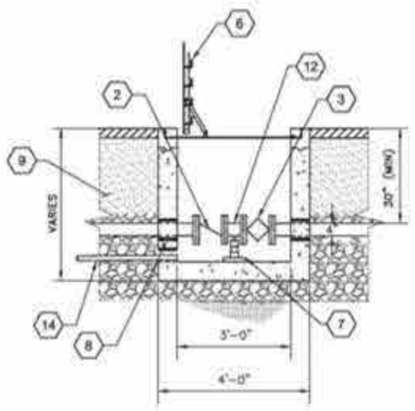
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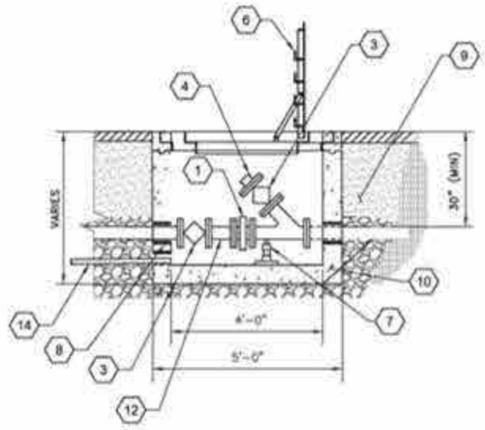
C311

21 OF 35 SHEETS

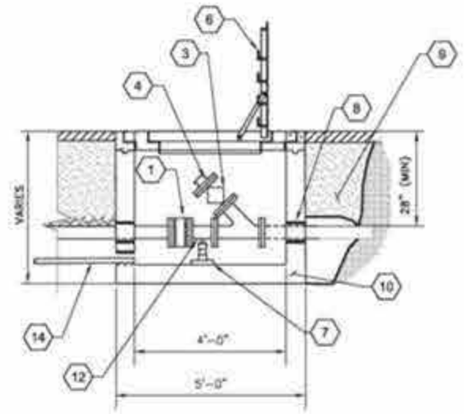
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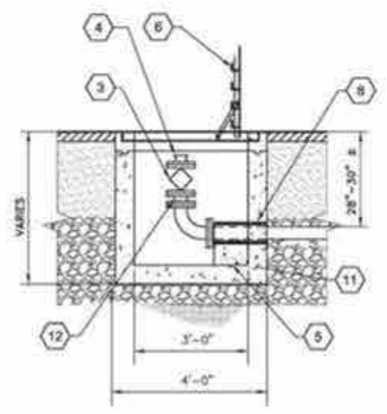
36" x 48" VALVE VAULT DETAIL (1 / C401)
SCALE: 1/2"=1'-0"



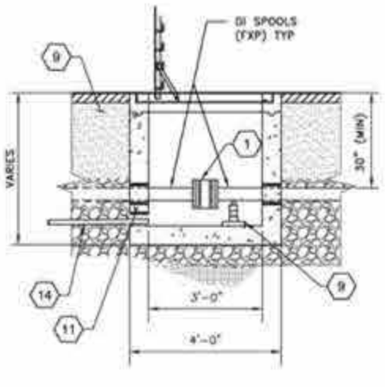
36" x 48" METER, BYPASS, & VALVE VAULT DETAIL (2 / C401)
SCALE: 1/2"=1'-0"



36" x 48" METER AND BYPASS VAULT DETAIL (4 / C401)
SCALE: 1/2"=1'-0"



36" x 36" BYPASS VAULT DETAIL (4 / C401)
SCALE: 1/2"=1'-0"



36" x 36" SINGLE METER VAULT DETAIL (S-TYP / C401)
SCALE: 1/2"=1'-0"

PUMPSTATION SCHEDULE								
PUMP DESCRIPTIONS	PUMP MODEL/ IMPELLOR	NO. OF PUMPS	POWER (hp)	FLOW METER	BYPASS W/ VAULT	NEW BARREL SECTION	USE EXISTING PUMP MOUNT	NEW GUIDE RAILS
LSP 1-1, 1-2	N3085 - MT463	NOT A PART OF THIS PROJECT	3 hp, 208v 30	SPARLING TIGERMAG 4-INCH	YES, NO VAULT	-	YES, FABRICATED FLANGE	YES
LSP 3-1, 3-2	N3085 - MT463	2	3 hp, 208v 30	SPARLING TIGERMAG 4-INCH	YES	-	YES, FABRICATED FLANGE	YES
LSP 4-1, 4-2	N3085 - MT463	2	3 hp, 208v 30	SPARLING TIGERMAG 4-INCH	YES	YES	-	YES
LSP 5-1, 5-2	N3085 - MT462	2	3 hp, 208v 30	SPARLING TIGERMAG 4-INCH	YES	-	YES, FABRICATED FLANGE	YES
LSP 6-1, 6-2	N3085 - MT463	2	3 hp, 208v 30	SPARLING TIGERMAG 4-INCH	-	YES	-	YES
LSP 8-1, 8-2	N3085 - MT463	2	3 hp, 208v 30	SPARLING TIGERMAG 4-INCH	YES	YES	-	YES
LSP 9-1, 9-2	N3085 - MT463	2	3 hp, 208v 30	SPARLING TIGERMAG 4-INCH	YES	YES	-	YES
LSP 10-1, 10-2	N3187	ALREADY INSTALLED	10 hp, 208v 30	SPARLING TIGERMAG 6-INCH	YES W/RISER	-	YES	YES

KEYNOTES

1. 4-INCH SPARLING TIGERMAGEP FM 656 OR EQUAL WATER METER (FXF)
2. 4-INCH SWING-FLEX CHECK VALVE (TYP) WITH WEIGHTED LEVER BY VAL-MATIC MODEL #503A OR EQUAL (REFER TO SPECIFICATION SECTION 15100 VALVES)
3. 4-INCH ECCENTRIC 100%-PORT PLUG (TYP) VALVE-175 PSI-RESILIENT PLUG FACE - WITH HAND LEVER (FXF) (REFER TO SPECIFICATION SECTION 15100 VALVES)
4. 4-INCH CAMLOC W/ 4" DIXON OR EQUAL 4": NPT THREADED FLANGE (TYP)
5. SPECIAL PIPE SUPPORT (1 / C404)
6. 36" x 36" DIAMOND PLATE GALVANIZE STEEL SINGLE LEAF (H-20) LEVEL 6 - 35 MPH RATED DROP IN HATCH ASSEMBLY
7. ADJUSTABLE PIPE SUPPORT REFER TO DETAIL (S-TYP / C402)
8. DRILL 6-INCH HOLE (TYP) FOR ALL VAULTS EXCEPT AS OTHER USE NOTED - SEAL WATER TIGHT W/ NON-SHRINK GROUT
9. TYPE F MATERIAL - CONTROLLED DENSITY FILL (CDF) COMPRESSIVE STRENGTH 28-DAYS BETWEEN 50-PSI AND 200-PSI (REFER TO SPECIFICATION SECTION 02201) OR TYPE B
10. 36" x 48" CONCRETE VAULT
11. 36" x 36" CONCRETE VAULT
12. 4" DI SPOOL 6"-24" LONG (FXF) TO FIT
13. 4" GATE VALVE (DOUBLE RESILIENT)
14. 1-1/2" SCHEDULE 80 PVC DRAIN LINE TO WET WELL (1% SLOPE MIN.) ADD SCREEN DEVICE AT VAULT INLET AND DRILL 6-INCH HOLE (TYP) FOR ALL VAULTS EXCEPT AS OTHER USE NOTED - SEAL WATER TIGHT W/ NON-SHRINK GROUT

NOTES:

1. ALL FITTINGS INSTALL BE POLY WRAP IN 8 MIL. POLY. APPROVED DIP MANUFACTURER INCLUDE PACIFIC STATES, TYLER, US PIPE OR APPROVED EQUALS
2. PIPES SHALL BE MECHANICALLY RESTRAINED TO THE LENGTH SPECIFIED IN THE APPROVED PLANS USING MATERIALS SPECIFIED HEREIN. FITTING SECTIONS SHALL BE MECHANICALLY AND/OR DFN FLANGED FITTINGS WITH MEGALUG (EBBA OR EQUAL) PVC PIPE, WHERE SPECIFIED MAY USE GRIP RING SOCKETS (ROMAC CORP RINGS OR EQUAL)

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

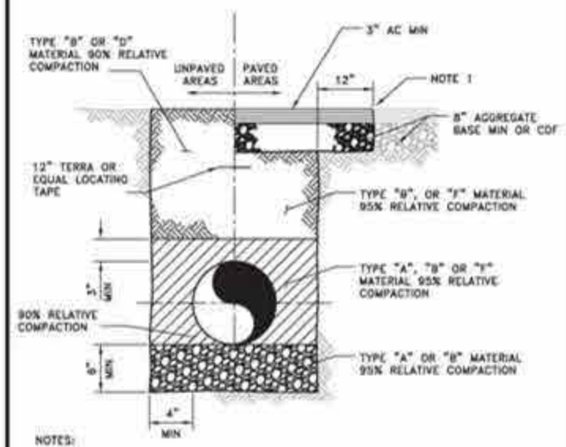
CIVIL DETAILS - 1

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO. 001-004

DATE APRIL 10, 2017

DRAWING NUMBER
C401



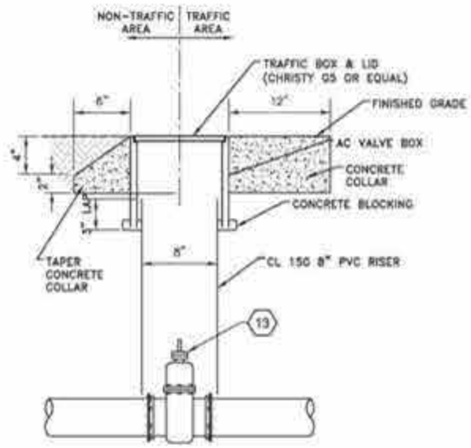
NOTES:

1. EXTEND TRENCH PAVING TO SAWCUT LINE WHERE TRENCHING ACROSS (E) PAVED AREAS. ASPHALT THICKNESS PER LAKE COUNTY STANDARD
2. WHEN SLURRY CEMENT BACKFILL IS USED IN PAVING AREAS, CLASS 2 AGGREGATE BASE MAY BE ELIMINATED
3. IF WET UNSTABLE SOIL IS ENCOUNTERED IN BEDDING ZONE, THE TYPE "C" MATERIAL W/ FABRIC MAY BE REQUIRED

TYPICAL FORCE MAIN TRENCH DETAIL

SCALE: NONE

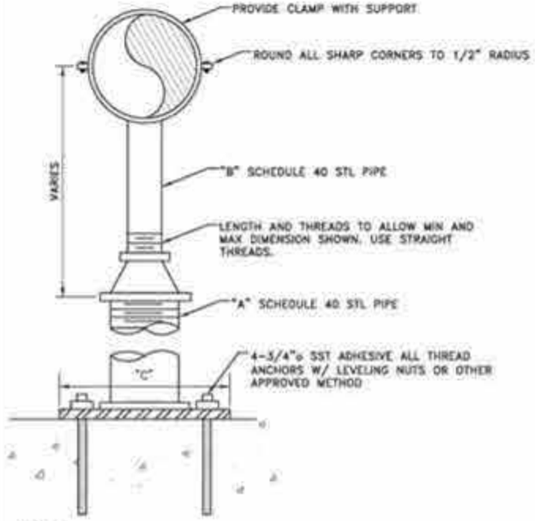
1-TYP C402



BURIED VALVE RISER

SCALE: NONE

2-TYP C402



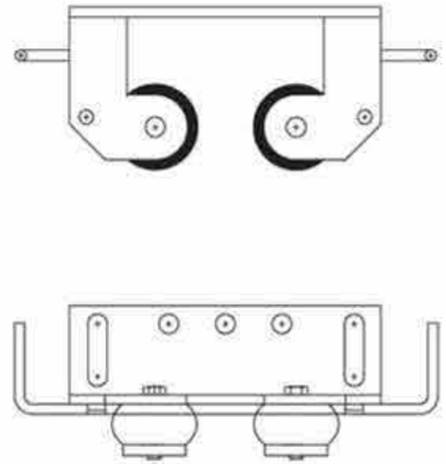
NOTES:

1. HOT DIP GALVANIZED AFTER FABRICATION
2. FIELD PAINT GALVANIZED STEEL IN ACCORDANCE WITH THE SPECIFICATIONS
3. WHERE SST IS INDICATED ON THE DRAWINGS FABRICATE SUPPORT FROM TYPE 304 01 316 STAINLESS STEEL

ADJUSTABLE PIPE SUPPORT

SCALE: NONE

3-TYP C402



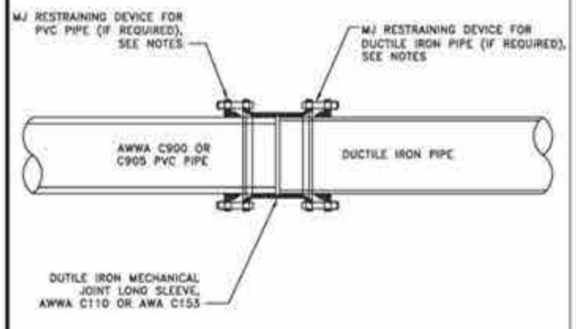
NOTES:

1. 3/8 – 16 LATERAL NUT (SS)
2. HEX HEAD BOLT (2) 3/8 – 16 X 7/8" (SS)
3. 3/8" PLAIN WASHER; 3/8" LOCK WASHER (2) (SS)

2-INCH GUIDE RAIL ATTACHMENT DETAIL

SCALE: NONE

4-TYP C402



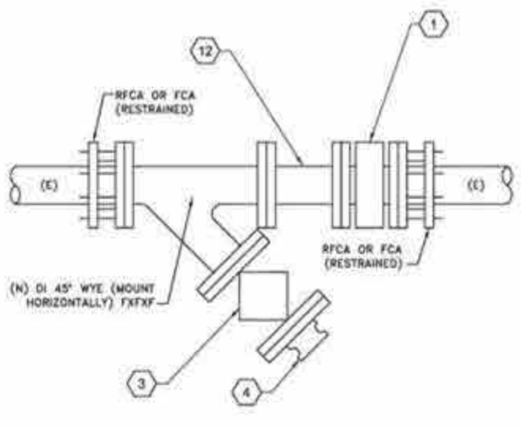
NOTES:

1. THIS DETAIL SHALL BE USED AT ALL IN-LINE TRANSITIONS BETWEEN PVC PIPE AND DUCTILE IRON PIPE.
2. TRANSITIONS SHALL BE LOCATED OUTSIDE OF RESTRAINED AREAS, UNLESS APPROVED BY THE WATER UTILITY.
3. TRANSITIONS LOCATED WITHIN RESTRAINED AREAS SHALL BE RESTRAINED. RESTRAINING DEVICE FOR THE PVC PIPE SIDE SHALL BE EBAA 2000PV, STAR PIPE PRODUCTS STARGRIP 4000, OR SIGMA ON-LOC SLCE. RESTRAINING DEVICE FOR THE DUCTILE IRON PIPE SIDE SHALL BE EBAA MEGALUG 1100, STAR PIPE PRODUCTS STARGRIP 3000, OR SIGMA ONE-LOK SLDE.
4. RESTRAINING DEVICES NOT REQUIRED IF TRANSITION IS NOT IN A RESTRAINED AREA OR AS OTHERWISE NOTED ON PLANS.
5. BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.

TRANSITION SLEEVE DETAIL

SCALE: NONE

5-TYP C402



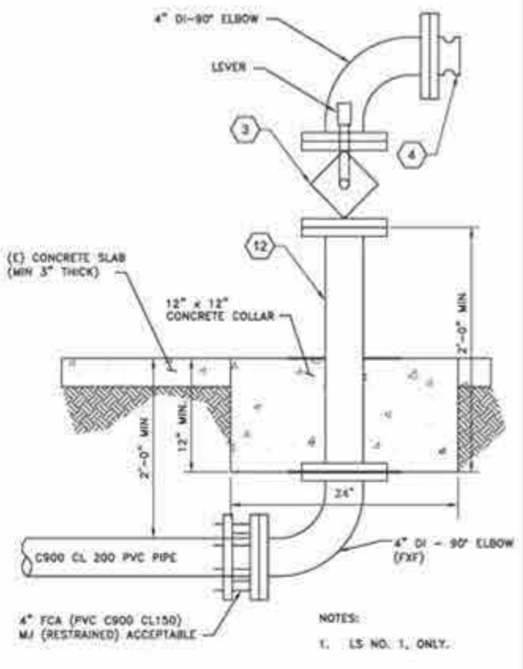
NOTES:

1. LS NO. 1, ONLY.

4" BYPASS CONNECTION WYE WITH METER (EXPOSED)

SCALE: NONE

6-TYP C402



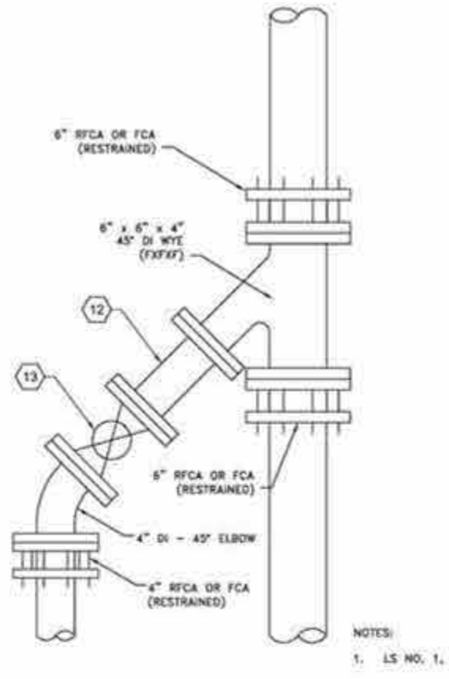
NOTES:

1. LS NO. 1, ONLY.

4" BYPASS QUICK CONNECT DETAIL (LS 10)

SCALE: NONE

7-TYP C402



NOTES:

1. LS NO. 1, ONLY.

6" x 6" x 4" BYPASS WYE (LS 10)

SCALE: NONE

8 C402

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

CIVIL DETAILS - 2

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO. 001-004

DATE APRIL 10, 2017

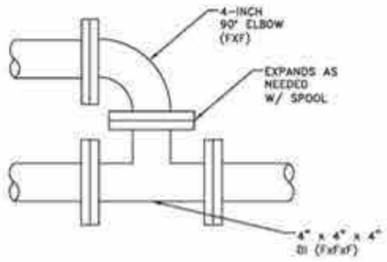
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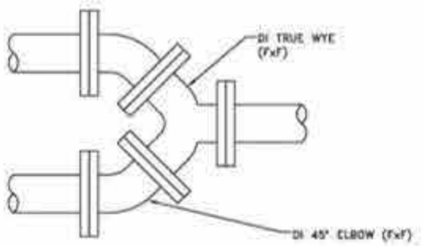
23 OF 35 SHEETS

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OPTION 1



OPTION 2



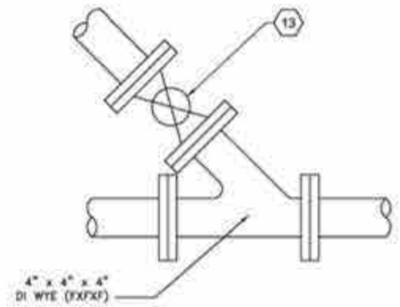
NOTES:

1. FITTING AND CONFIGURATION SHALL MATCH EXISTING PIPELINE ALIGNMENT W/ ALL NON-FLANGED JOINTS TO BE RESTRAINED

4" x 4" x 4" MANIFOLD CONNECTION OPTIONS

1-TYP C403

SCALE: NONE



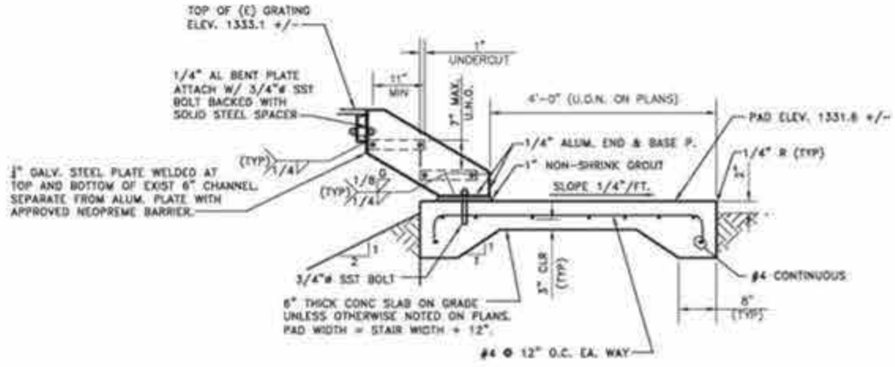
NOTES:

1. SEE XX RISER DETAIL FOR VALVE DETAIL
2. FITTING AND CONFIGURATION SHALL MATCH EXISTING PIPELINE ALIGNMENT

4-INCH BYPASS WYE CONNECTION BURY

2-TYP C403

SCALE: NONE



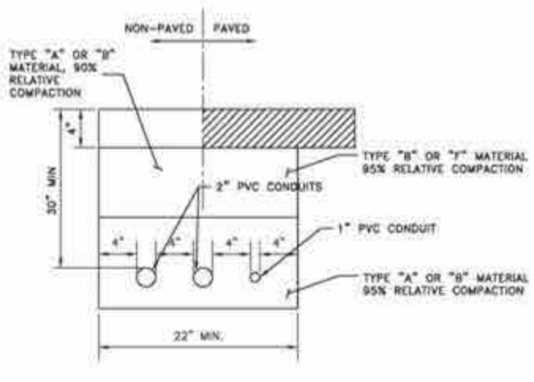
NOTES:

1. COAT ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE PER SPECIFICATIONS.
2. SEE DRAWINGS FOR DIMENSIONS "L", "H", AND STAIR WIDTH. STAIR WIDTH =3'-0" CLEARANCE BETWEEN CHANNELS UNLESS OTHERWISE NOTED ON PLANS.
3. ALUMINUM C10x8.91 FOR "L" LESS THAN OR EQUAL TO 14'-0", ALUMINUM C12 x 8.64 FOR "L" GREATER THAN 14'-0" AND LESS THAN OR EQUAL TO 18'-0".
4. TREAD WIDTH = TREAD WIDTH + 1" (TYPICAL ALL TREADS).
5. STAINLESS STEEL BOLTS AND HARDWARE SHALL BE TYPE 316.

ALUMINUM STAIRWAY

2-TYP C403

SCALE: NONE



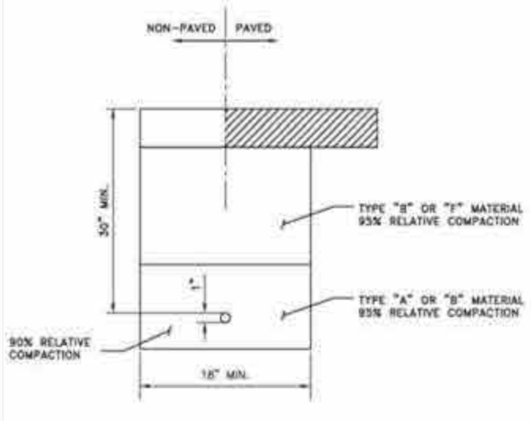
NOTES:

1. FROM CONTROL PANEL TO VAULT

TYPICAL E/C TRENCH DETAIL

4-TYP C403

SCALE: NONE



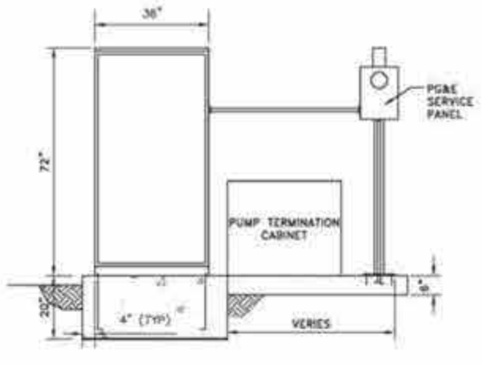
NOTES:

1. WET WELL TO METER VAULT TRENCH DETAILS

TYPICAL E/C (METER) TRENCH DETAIL

5-TYP C403

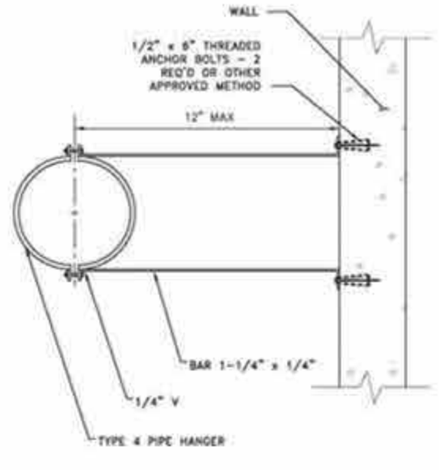
SCALE: NONE



CONTROL AND SERVICE PANEL

4-TYP C403

SCALE: NONE



NOTES:

1. ALL MATERIAL SHALL BE STAINLESS STEEL

PIPE SUPPORT AND SWAY BRACE DETAIL

2-TYP C403

SCALE: NONE

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

CIVIL DETAILS - 4

CLEARLAKE OAKS COUNTY WATER DISTRICT

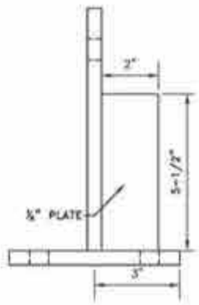
JOB NO. 001-004

DATE APRIL 10, 2017

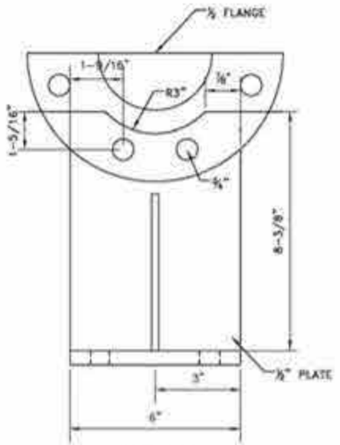
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C403

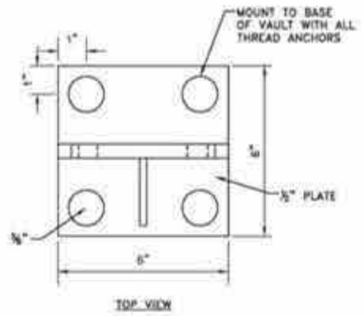
24 OF 35 SHEETS



SIDE VIEW



FRONT VIEW

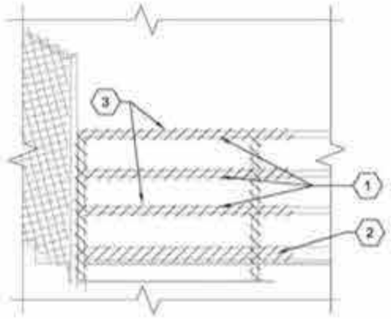


TOP VIEW

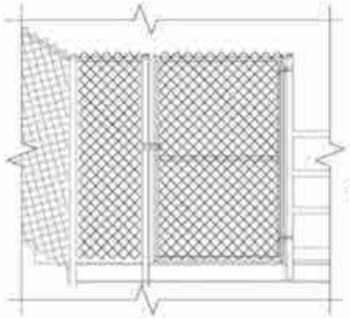
4" FLANGE PIPE SUPPORT

SCALE: NONE

1 C404



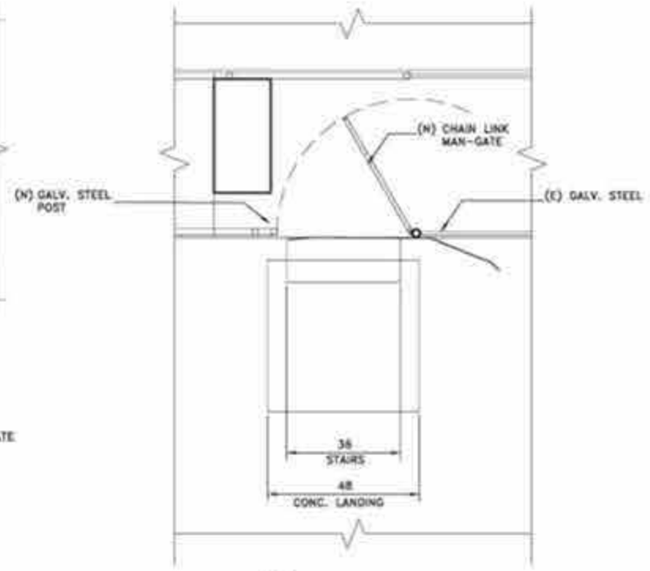
DEMO ELEVATION



ELEVATION

NOTES:

1. CUT (E) HANDRAIL AND PREP TO ACCOMMODATE WELDING OF NEW POST.
2. SAWCUT (E) TOE KICK.
3. REMOVE (E) HANDRAIL.



PLAN

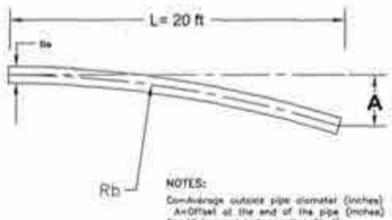
NOTES:

1. PROVIDE (N) GATE LATCH W/LOCK HOLES GALVANIZED
2. (N) GATE TO HINGE FROM (E) POST
3. COAT ALL FIELD WELDS W/ZINC PAINT

LIFT STATION 1 GATE DETAIL

SCALE: NONE

2 C404



NOTES:
Do=Average outside pipe diameter (inches)
A=Offset at the end of the pipe (inches)
Rb=Minimum bending radius (feet)

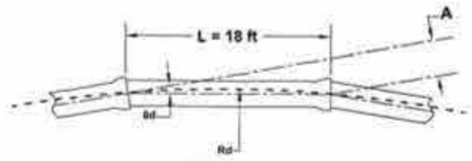
MAXIMUM BENDING DEFLECTION FOR PVC PIPE				
Nominal Pipe Diameter (inches)	Average Outside Pipe Diameter "Do" (inches)	Minimum Wall Thickness (inches)	Minimum Bending Radius "Rb" (feet)	Offset at Free End, "A" (inches)
AWWA C900 CLASS 150 DR 18				
4	4.800	0.267	120	20
6	6.900	0.383	165	13
8	9.050	0.503	240	10
10	11.100	0.617	400	6
12	13.200	0.733	500	3
AWWA C905 CLASS 235 DR 18				
14	15.300	0.850	1500	2
16	17.400	0.967	1500	2
18	19.500	1.083	1500	2

JOINT DEFLECTION OF AWWA C900 & C905 PVC PIPE IS PROHIBITED.

MAXIMUM DEFLECTION FOR PVC PIPE

SCALE: NONE

3 C404



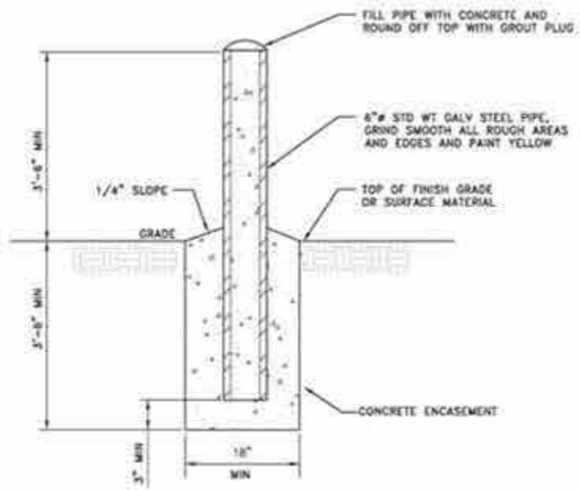
NOTES:
θd = Maximum joint deflection angle (degrees)
A = Offset at the end of the pipe (inches)
Rd = Minimum radius of curve produced by succession of joints (feet)

MAXIMUM JOINT DEFLECTION FOR DUCTILE IRON PIPE						
Size Of Pipe (inches)	UNRESTRAINED JOINTS			RESTRAINED JOINTS		
	Maximum Deflection Angle, "θd" (degrees)	Minimum Radius, "Rd" (feet)	Offset At Free End, "A" (inches)	Maximum Deflection Angle, "θd" (degrees)	Minimum Radius, "Rd" (feet)	Offset At Free End, "A" (inches)
4	2.5	400	10	2.5	400	10
6	2.5	400	10	2.5	400	10
8	2.5	400	10	2.5	400	10
10	2.5	400	10	2.5	400	10
12	2.5	400	10	2.5	400	10

MAXIMUM DEFLECTION FOR DUCTILE IRON PIPE

SCALE: NONE

4 C404



NOTES:

1. TYPE "B" OR "F" MATERIAL 95% RELATIVE COMPACTION

BOLLARD

SCALE: NONE

5 C404

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VOLUME 2 OF 2
WASTEWATER SYSTEM IMPROVEMENTS
LIFT STATION IMPROVEMENTS

CIVIL DETAILS - 4

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

DATE: APRIL 10, 2017

DRAWING NUMBER

C404

25 OF 35 SHEETS

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LEGEND

X 20A 3P OR X 100AF 80AT 3P — LOW VOLTAGE CIRCUIT BREAKER (CB). RATINGS AND NO. OF POLES AS SHOWN. WHEN SPECIFIC TYPE IS REQUIRED, X INDICATES TYPE.

TYPES:
MCCB – MOLDED CASE
ICCB – INSULATED CASE
LVP – LOW VOLTAGE POWER
MCP – MOTOR CIRCUIT PROTECTOR (RATING PER CONNECTED LOAD)

CB — SEPARATELY MOUNTED CIRCUIT BREAKER, SEE ELECTRICAL ONE LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION

GFP — GROUND FAULT PROTECTION

52 — MEDIUM VOLTAGE CIRCUIT BREAKER

FUSE, SIZE AND NUMBER OF FUSES AS NOTED

FUSED CUTOUT, CURRENT RATING, FUSE SIZE AND NUMBER OF POLES AS NOTED

FUSIBLE SWITCH, CURRENT RATING, FUSE SIZE AND QUANTITY AS NOTED

NON-FUSED SWITCH, CURRENT RATING AND NUMBER OF POLES AS NOTED

DISCONNECT OR DRAWOUT CONNECTION

MAGNETIC MOTOR STARTER AND SEPARATELY MOUNTED COMBINATION MAGNETIC MOTOR STARTER.

MOTOR CONTROLLER AND SEPARATELY MOUNTED MOTOR CONTROLLER WITH SHORT CIRCUIT PROTECTION AND DISCONNECT.

MOTOR STARTER AND CONTROLLER SUBSCRIPTS:

A – MAGNETIC STARTER NEMA SIZE

B – STARTER TYPE
NONE – FULL VOLTAGE NON-REVERSING (FVNR)
FVR – FULL VOLTAGE REVERSING
2S – TWO SPEED
RVAT – REDUCED VOLTAGE AUTO TRANSFORMER

C – CONTROL DIAGRAM OR CONTROLS SCHEDULE NUMBER (IF REQUIRED)

D – CONTROLLER TYPE
VFD – VARIABLE FREQUENCY DRIVE
SS – SOLID STATE

SEPARATELY MOUNTED COMBINATION MOTOR STARTER OR CONTROLLER, SEE ELECTRICAL ONE LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION

THERMAL OVERLOAD ELEMENT

OL — THERMAL OVERLOAD RELAY CONTACT

DISCONNECT OR SAFETY SWITCH, 30A, 3P, NON-FUSED UNLESS OTHERWISE NOTED

7.5 OR HP — MOTOR WITH DESIGN HORSEPOWER (WHEN INDICATED)

G — GENERATOR

ATS — TRANSFER SWITCH, CURRENT RATING AND NUMBER OF POLES AS NOTED.
ATS – AUTOMATIC
MTS – MANUAL

TRANSFORMER
Δ 3 PHASE, 3 WIRE DELTA CONNECTION
Y 3 PHASE, 4 WIRE GROUNDED WYE CONNECTION

SWITCHBOARD OR PANELBOARD. NAME, VOLTAGE, PHASE, NUMBER OF WIRES WHEN INDICATED.

FAA — FIRE ALARM ANNUNCIATOR

FACP — FIRE ALARM CONTROL PANEL

F — FIRE ALARM MANUAL PULL STATION

CR — FIRE ALARM CONTROL RELAY

FS — FIRE ALARM CONTACT, FLOW SWITCH

TS — FIRE ALARM CONTACT, TAMPER SWITCH

PS — FIRE ALARM CONTACT, PRESSURE SWITCH

100 KVA — NON-MOTOR LOAD WITH DESIGN KVA, KW OR AMPS

CPT — CONTROL POWER TRANSFORMER (CPT)

VOLTAGE TRANSFORMER (VT OR PT)

CURRENT TRANSFORMER (CT)

WH — UTILITY WATT-HOUR METER PER UTILITY REQUIREMENTS

DMP — DIGITAL METERING PACKAGE

RTM — RUN TIME METER

GROUND

LIGHTNING ARRESTER

SPD — LOW VOLTAGE SURGE PROTECTIVE DEVICE

ELECTRICAL CONNECTION

OR OR — NO ELECTRICAL CONNECTION

SV OR — SOLENOID VALVE

X/Y — CONTROL/RELAY COIL, X INDICATES TYPE, Y INDICATES LOOP NO. WHEN USED

TYPES:
CR – CONTROL RELAY
DP – DEFINITE PURPOSE RELAY
LC – LIGHTING CONTACTOR
M – MOTOR STARTER
PC – PHOTO CELL
TC – TIME CLOCK
TR – TIMING RELAY

NORMALLY OPEN CONTACT (N.O.)

NORMALLY CLOSED CONTACT (N.C.)

NORMALLY OPEN TIME DELAY RELAY CONTACT, WITH TIME DELAY ON CLOSING AFTER COIL IS ENERGIZED

NORMALLY CLOSED TIME DELAY RELAY CONTACT, WITH TIME DELAY ON OPENING AFTER COIL IS ENERGIZED

NORMALLY OPEN TIME DELAY RELAY CONTACT, WITH TIME DELAY ON OPENING AFTER COIL IS DE-ENERGIZED

NORMALLY CLOSED TIME DELAY RELAY CONTACT, WITH TIME DELAY ON CLOSING AFTER COIL IS DE-ENERGIZED

NORMALLY OPEN TEMPERATURE SWITCH, CLOSE ON RISING TEMPERATURE

NORMALLY CLOSED TEMPERATURE SWITCH, OPEN ON RISING TEMPERATURE

NORMALLY OPEN FLOW SWITCH, CLOSE ON INCREASING FLOW

NORMALLY CLOSED FLOW SWITCH, OPEN ON INCREASING FLOW

NORMALLY OPEN LEVEL SWITCH, CLOSE ON RISING LEVEL

NORMALLY CLOSED LEVEL SWITCH, OPEN ON RISING LEVEL

X — ALARM BELL

X — ALARM HORN

X — ALARM FLASHING LIGHT

X — ALARM BELL AND FLASHING LIGHT COMBINATION UNIT

X — ALARM HORN AND FLASHING LIGHT COMBINATION UNIT

SUBSCRIPT:
NONE – GENERAL ALARM DEVICE
F – FIRE ALARM DEVICE

NORMALLY OPEN PRESSURE SWITCH, CLOSE ON INCREASING PRESSURE

NORMALLY CLOSED PRESSURE SWITCH, OPEN ON INCREASING PRESSURE

NORMALLY OPEN LIMIT SWITCH, CLOSE ON REACHING LIMIT

NORMALLY CLOSED LIMIT SWITCH, OPEN ON REACHING LIMIT

X — INTERLOCK, X INDICATES TYPE

TYPES:
E – ELECTRICAL
M – MECHANICAL
K – KEY

OFF HAND AUTO — 3 POSITION SELECTOR SWITCH, MAINTAINED CONTACTS, UNLESS OTHERWISE NOTED, 2 POSITION SIMILAR

NORMALLY OPEN PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED

NORMALLY CLOSED PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED

X — INDICATING LIGHT, X INDICATES LENS COLOR

X — PUSH TO TEST INDICATING LIGHT, X INDICATES LENS COLOR

LENS COLORS:
R – RED
G – GREEN
B – BLUE
Y – YELLOW
W – WHITE
A – AMBER

T — TRANSFORMER

SS — SELECTOR SWITCH

PB — PUSHBUTTON

LOS — LOCKOUT/STOP PUSHBUTTON

CONTROL PANEL INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT

CONTROL PANEL WITH DISCONNECT SWITCH INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT

JUNCTION OR PULL BOX

CONDULET

PANELBOARD (250V TO 600V)

PANELBOARD (LESS THAN 250V)

ELECTRICAL EQUIPMENT ENCLOSURE: SWITCHBOARD, MOTOR CONTROL CENTER, CONTROL PANEL OR OTHER EQUIPMENT AS INDICATED

PC — PHOTOCELL

X/Y — CEILING/PENDANT MOUNTED LUMINAIRE – HID, COMPACT FLUORESCENT OR INCANDESCENT

X/Y — WALL MOUNTED LUMINAIRE – HID, COMPACT FLUORESCENT OR INCANDESCENT

X/Y — CEILING/PENDANT MOUNTED FLUORESCENT FIXTURE

X/Y — WALL MOUNTED FLUORESCENT FIXTURE

X/Y — CEILING/PENDANT MOUNTED FLUORESCENT FIXTURE NORMAL/EMERGENCY

X/Y — WALL MOUNTED FLUORESCENT FIXTURE NORMAL/EMERGENCY

X/Y — EMERGENCY LIGHT FIXTURE, 2 ATTACHED HEADS AS SHOWN

X/Y — EMERGENCY LIGHT, REMOTE MOUNTED HEAD

S_X AND S_X — SMOKE AND DUCT DETECTOR

SUBSCRIPT:
I – IONAZATION TYPE
P – PHOTOELECTRIC TYPE

H_X — HEAT DETECTOR

SUBSCRIPT:
R/C – RATE COMPENSATION
R/F – COMBINATION RATE OF RISE AND FIXED TEMP
R – RATE OF RISE
F – FIXED

X/Y — DOUBLE FACED CEILING OR WALL MOUNTED EXIT LIGHT, DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS

X/Y — SINGLE FACED CEILING OR WALL MOUNTED EXIT LIGHT, DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS

X/Y — AREA OR ROADWAY LIGHT – POLE MOUNTED

LIGHTING FIXTURE SUBSCRIPTS:
X – INDICATES FIXTURE TYPE PER LIGHTING FIXTURE SCHEDULE
Y – INDICATES CIRCUIT NUMBER FROM PANELBOARD
z – INDICATES CONTROLLING SWITCH (IF REQUIRED)

Y/X — TOGGLE SWITCH

SUBSCRIPTS:
X – INDICATES TYPE
NONE NONE – SINGLE POLE
3 – THREE-WAY
4 – FOUR-WAY
HP – TOGGLE SWITCH, HORSEPOWER RATED
K – KEY SWITCH
TE – MANUAL MOTOR STARTER WITH THERMAL ELEMENT
P – PILOT LIGHT
L – LIGHTED HANDLE
Y – INDICATES CONTROLLING SWITCH (IF REQUIRED)

SPECIAL PURPOSE RECEPTACLE AS DEFINED ON PLANS

PLUG-IN RECEPTACLE STRIP, QUANTITY AND SPACING OF RECEPTACLES AS NOTED OR SPECIFIED

TELECOMMUNICATIONS OUTLET JUNCTION BOX

X/Y — QUAD-DUPLEX RECEPTACLE, TWO NEMA 5-20R UNDER COMMON COVER PLATE.

X/Y — DUPLEX RECEPTACLE, NEMA 5-20R

X/Y — SIMPLEX RECEPTACLE, NEMA 5-20R

SUBSCRIPTS:
X – INDICATES TYPE
GFCI – GROUND FAULT CIRCUIT INTERRUPTER
Y – INDICATES CIRCUIT NUMBER FROM PANELBOARD

CONDUIT TURNING UP

CONDUIT TURNING DOWN

HOME RUN TO PANEL, 2 #12, 1 #12G IN 3/4"C UNLESS OTHERWISE NOTED

CIRCUIT RUN BETWEEN DEVICES EXPOSED IN NON-ARCHITECTURALLY FINISHED AREAS, CONCEALED IN ARCHITECTURALLY FINISHED AREAS. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT

CONDUIT RUN BETWEEN DEVICES CONCEALED IN NON-ARCHITECTURALLY FINISHED AREAS OR UNDER FLOOR SLAB. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT.

CIRCUIT HASH MARKS (WHEN INDICATED), LONG, SHORT, SINGLE DOT AND DOUBLE DOT REPRESENT PHASE, NEUTRAL, EQUIPMENT GROUND AND ISOLATED EQUIPMENT GROUND RESPECTIVELY. #12 IN 3/4" CONDUIT UNLESS OTHERWISE INDICATED

CIRCUIT CONTINUATION

CONDUIT STUBBED OUT AND CAPPED

XXX — CONDUIT TAG OR CIRCUIT NUMBER – WIRE AND CONDUIT SIZE AS SPECIFIED IN CIRCUIT SCHEDULE ON THE SHEETS

GROUND ROD

GROUND CABLE

E — UNDERGROUND ELECTRICAL DUCTBANK

EE — EXISTING UNDERGROUND ELECTRICAL DUCTBANK

GENERAL NOTES:

1. THIS IS A STANDARD ELECTRICAL SYMBOLS SHEET. ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT.
2. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE.
3. BELOW GROUND CONDUIT – PVC
   ABOVE GROUND CONDUIT – GRC

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Expires 06/30/18
4/7/17

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VOLUME 2 OF 2
LIFT STATION
PLANT IMPROVEMENTS

ELECTRICAL LEGEND AND ABBREVIATIONS

CLEARLAKE OAKS COUNTY WATER DISTRICT

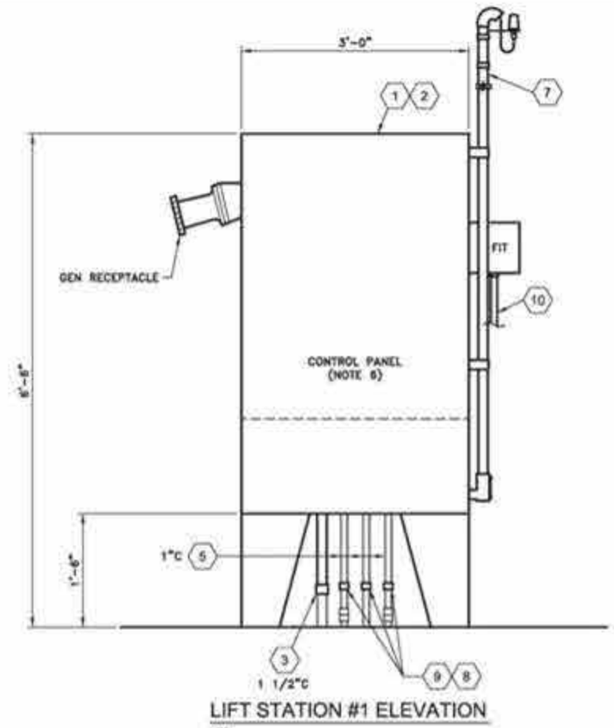
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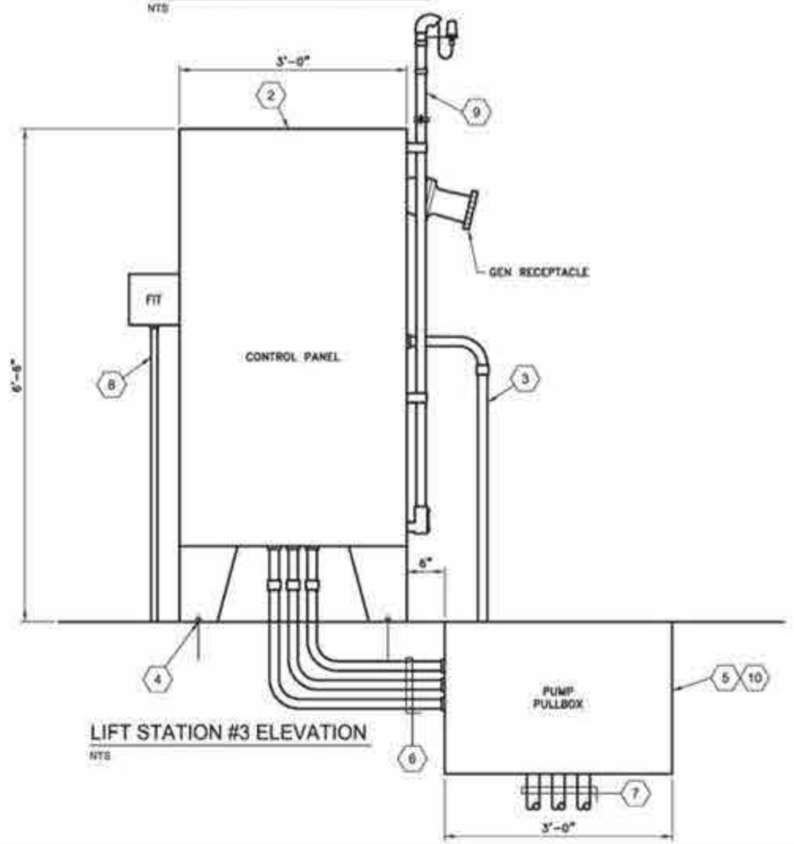
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LIFT STATION #1 ELEVATION

NTS



LIFT STATION #3 ELEVATION

NTS

LIFT STATION #1 ELEVATION NOTES:

1. REMOVE EXISTING PANEL, MOUNTING UNISTRUT TO REMAIN. INSTALL NEW PANEL IN SAME LOCATION.
2. ATTACHED TO EXISTING 1/4" PLATE, MODIFY AS REQUIRED TO MOUNT PANEL. INSTALL UNISTRUT.
3. REMOVE CONDUCTORS BETWEEN MAIN CIRCUIT BREAKER AND CONTROL PANEL, INTERCEPT CONDUIT AND EXTEND (1 1/2" CONDUIT) TO CONTROL PANEL. INSTALL 3#2, 1#6 (G) FROM MAIN CIRCUIT BREAKER TO CONTROL PANEL.
4. PANEL TO SIT ON TOP OF STEEL PLATE. INSTALL UNISTRUT TO HANDRAIL AND SECURE PANEL TO UNISTRUT (6 PLACES).
5. REMOVE CONDUITS AND CONDUCTORS. INSTALL NEW CONDUIT AND SEALS.
6. CONTROL PANEL LEGS SHALL BE 18" HIGH.
7. ROUTE CELLULAR RADIO TO SIDE OF PANEL. INSTALL 1 1/2" RGS CONDUIT TO 5' ABOVE PANEL. SEE E300 FOR DETAIL.
8. INTERCEPT EXISTING CONDUIT AND EXTEND CABINET. REMOVE CONDUCTORS AND SEALS. TERMINATE EXISTING CONDUIT INTO CABINET. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLE TO CONTROL PANEL. INSTALL SEALS AT 6" ABOVE PLATE. INSTALL NEW CONDUIT FROM SEAL TO PANEL.
9. INSTALL 1-TSP, LEVEL SWITCH CABLES TO WETWELL.
10. INSTALL 'FIT' ADJACENT TO CONTROL PANEL. INSTALL 1"C, FE CABLE TO FLOW ELEMENT IN VAULT. INSTALL TWO NIPPLES TO CONTROL PANEL, 1-TSP (SIGNAL), 2#12, 1#12 (G) (POWER).
11. SHADE STRUCTURE TO REMAIN.

LIFT STATION #3 ELEVATION NOTES:

1. REMOVE EXISTING PANEL.
2. FLOOR MOUNTED CONTROL PANEL.
3. REMOVE CONDUCTORS BETWEEN MAIN CIRCUIT BREAKER AND CONTROL PANEL, INTERCEPT CONDUIT AT SERVICE PANEL AND INSTALL 1 1/2" CONDUIT FROM SERVICE PANEL TO CONTROL PANEL. SAWCUT CONCRETE AND REPLACE AFTER CONDUIT INSTALLATION. INSTALL 3#2, 1#16 (G) FROM MAIN CIRCUIT BREAKER TO CONTROL PANEL.
4. INSTALL 6" EPOXY ANCHOR TO MOUNT PANEL.
5. INSTALL PUMP PULLBOX TERMINATE PUMP CABLES, LEVEL TRANSMITTER CABLE AND FLOAT SWITCHES. PULLBOX 2'x3'x2'D H20 RATED.
6. INSTALL FOLLOWING FROM PUMP PULLBOX TO CONTROL PANEL, SURFACE MOUNT:

   A. 1"C, 3#12, 1#12 (G), 2#14 (PUMP #1)
   B. 1"C, 3#12, 1#12 (G), 2#14 (PUMP #2)
   C. 1"C, 1-TSP, 4#14 (LEVEL XMTR, LEVEL SWITCHES)

   INSTALL CONDUIT SEALS BELOW PANEL.
7. INSTALL NEW CONDUITS (3-2" CONDUITS) FROM PUMP PULLBOX TO WETWELL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO CABINET.
8. INSTALL 'FIT' ADJACENT TO CONTROL PANEL. INSTALL 1"C, FE CABLE TO FLOW ELEMENT IN VAULT. INSTALL TWO NIPPLES TO CONTROL PANEL, 1-TSP (SIGNAL), 2#12, 1#12 (G) (POWER). INSTALL IN NEMA 4 LOCKABLE BOX.
9. ROUTE CELLULAR RADIO TO SIDE OF PANEL. INSTALL 1 1/2" RGS CONDUIT TO 5' ABOVE PANEL. SEE E300 FOR DETAIL.
10. REMOVE EXISTING CONCRETE PAD TO INSTALL PULLBOX.

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VOLUME 2 OF 2
LIFT STATION
PLANT IMPROVEMENTS

ELECTRICAL PANEL
ELEVATION ARRANGEMENT 1

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO. 001-004

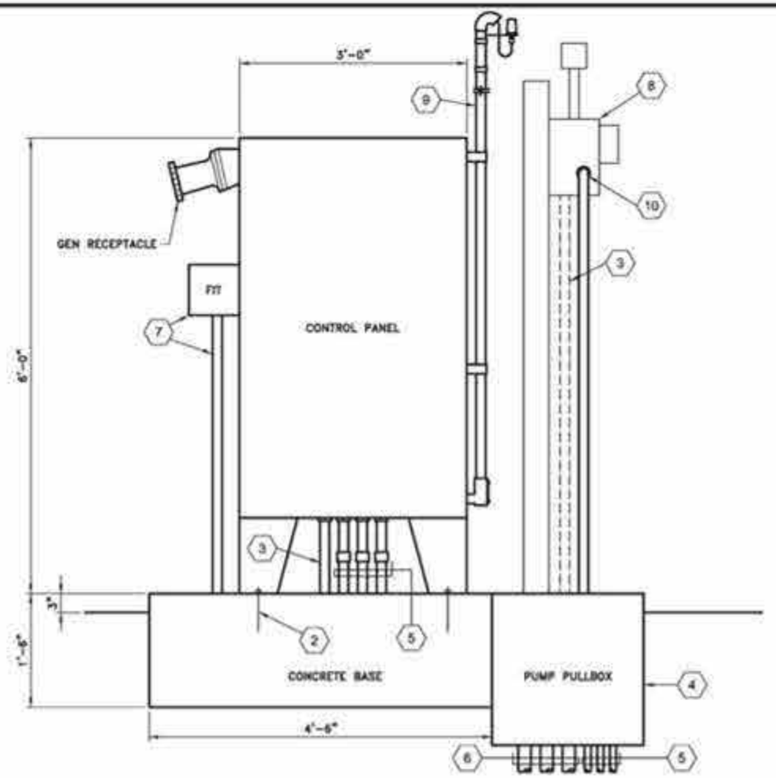
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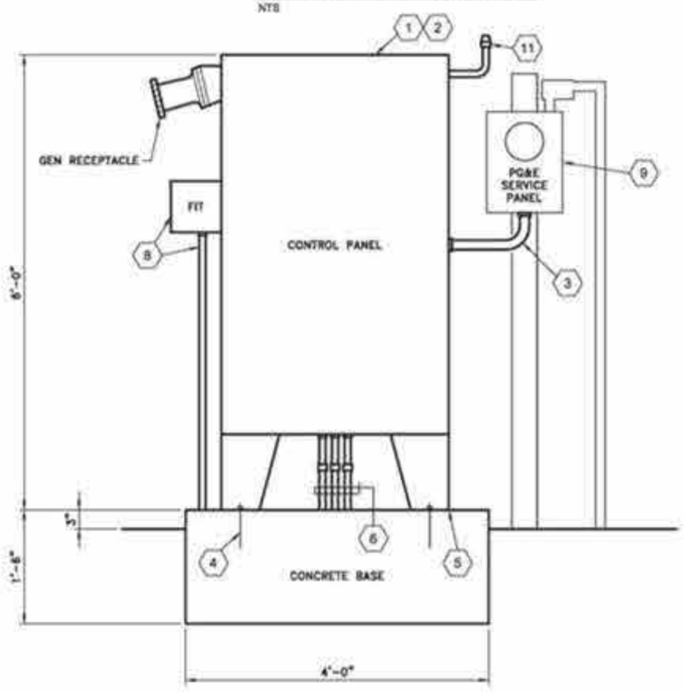
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LIFT STATION #4 ELEVATION
NTS



LIFT STATION #5 ELEVATION
NTS

LIFT STATION #4 ELEVATION NOTES:

1. REMOVE EXISTING PANEL, MTS AND GENERATOR RECEPTACLE.
2. INSTALL 5/8"øX0'-6" LONG BOLT TO CONNECT PANEL AND TERMINATION PANEL TO CONCRETE.
3. REMOVE CONDUCTORS BETWEEN MAIN CIRCUIT BREAKER AND CONTROL PANEL. INTERCEPT CONDUIT AT SERVICE PANEL AND INSTALL 1 1/2" CONDUIT FROM SERVICE PANEL TO CONTROL PANEL UNDERGROUND. INSTALL 3#2, 1#16 (G) FROM MAIN CIRCUIT BREAKER TO CONTROL PANEL.
4. INSTALL PULLBOX. TERMINATE PUMP CABLES, LEVEL TRANSMITTER CABLE AND FLOAT SWITCHES. INSTALL CONCRETE PAD BELOW CABINET. PULLBOX 2'x3'x2'D, H20 RATED.
5. INSTALL FOLLOWING FROM PULLBOX TO CONTROL PANEL, SURFACE MOUNT:
   A. 1"C, 3#10, 1#12 (G), 2#14 (PUMP #1)
   B. 1"C, 3#10, 1#12 (G), 2#14 (PUMP #2)
   C. 1"C, 1-TSP, 4#14 (LEVEL XMTR, LEVEL SWITCHES)

   INSTALL CONDUIT SEALS BELOW PANEL.
6. INSTALL NEW CONDUITS (3-2" CONDUITS) FROM PULLBOX TO WETWELL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO CABINET.
7. INSTALL 'FIT' ADJACENT TO CONTROL PANEL. INSTALL 1"C, FE CABLE TO FLOW ELEMENT IN VAULT. INSTALL TWO NIPPLES TO CONTROL PANEL, 1-TSP (SIGNAL), 2#12, 1#12 (G) (POWER). INSTALL IN LOCKABLE BOX.
8. EXISTING PG&E SERVICE PANEL TO REMAIN, PROTECT SERVICE CONDUIT AND SUPPORT.
9. ROUTE CELLULAR RADIO TO SIDE OF PANEL. INSTALL 1 1/2" RGS CONDUIT TO 5' ABOVE PANEL. SEE E300 FOR DETAIL.
10. CONNECT TO EXISTING KNOCKOUT ON SIDE OF PANEL.

LIFT STATION #5 ELEVATION NOTES:

1. REMOVE EXISTING PANEL, MTS AND GENERATOR RECEPTACLE.
2. FLOOR MOUNTED CONTROL CABINET.
3. REMOVE CONDUIT AND CONDUCTORS BETWEEN MAIN CIRCUIT BREAKER AND CONTROL PANEL. INTERCEPT CONDUIT AT SERVICE PANEL AND INSTALL 1 1/2" CONDUIT FROM SERVICE PANEL TO CONTROL CABINET. INSTALL 3#2, 1#16 (G) FROM MAIN CIRCUIT BREAKER TO CONTROL PANEL.
4. INSTALL 5/8"øX0'-6" LONG BOLT TO CONNECT PANEL AND TERMINATION PANEL TO CONCRETE.
5. INSTALL PANEL OVER EXISTING CONDUIT.
6. INSTALL FOLLOWING PULLBOX IN STREET TO CONTROL PANEL, IN EXISTING CONDUIT.
   A. 3#10, 1#12 (G), 2#14 (PUMP #1)
   B. 3#10, 1#12 (G), 2#14 (PUMP #2)
   } MAY BE COMBINED INTO 1 CONDUIT
   C. 1-TSP, 4#14 (LEVEL XMTR, LEVEL SWITCHES)

   INSTALL CONDUIT SEALS BELOW PANEL.
7. NOT USED.
8. INSTALL "FIT" ADJACENT TO CONTROL PANEL. INSTALL 1"C, FE CABLE TO FLOW ELEMENT IN VAULT. INSTALL TWO NIPPLES TO CONTROL PANEL, 1-TSP (SIGNAL), 2#12, 1#12 (G) (POWER). INSTALL IN NEMA 4 LOCKABLE BOX.
9. EXISTING PG&E SERVICE PANEL TO REMAIN, PROTECT SERVICE CONDUIT AND SUPPORT.
10. INSTALL #2 BARE COPPER GROUND AND GROUND ROD. BOND TO CONTROL PANEL, SERVICE, AND GENERATOR CB.
11. INSTALL CELLULAR RADIO TO SIDE OF PANEL. INSTALL 1 1/2" RGS CONDUIT TO 5' ABOVE PANEL. SEE E300 FOR DETAIL.

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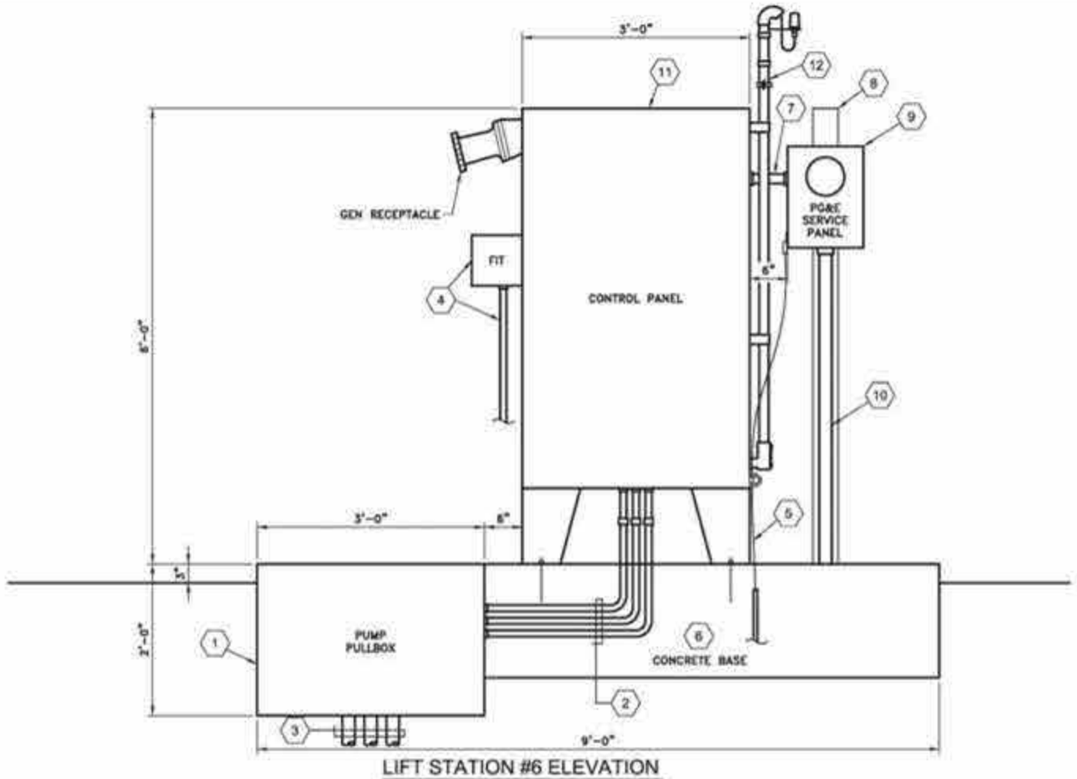
VOLUME 2 OF 2
LIFT STATION
PLANT IMPROVEMENTS

ELECTRICAL PANEL
ELEVATION ARRANGEMENT 2

CLEARLAKE OAKS COUNTY WATER DISTRICT

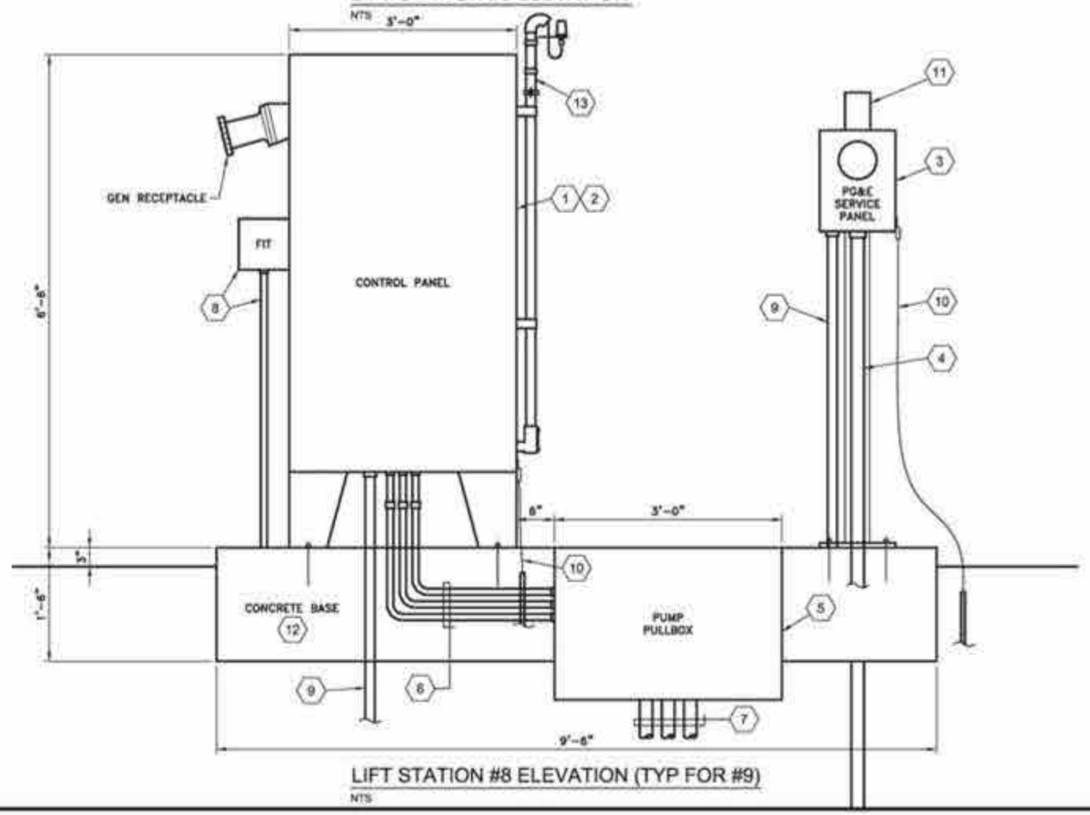
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DATE: APRIL 10, 2017
DRAWING NUMBER
E102
28 OF 35 SHEETS

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LIFT STATION #6 ELEVATION

NTS



LIFT STATION #8 ELEVATION (TYP FOR #9)

NTS

LIFT STATION #6 ELEVATION NOTES:

1. INSTALL PUMP PULLBOX, TERMINATE PUMP CABLES, LEVEL TRANSMITTER CABLE AND FLOAT SWITCHES. INSTALL CONCRETE PAD BELOW CABINET. PULLBOX 2'x3'x2'D, H20 RATED.
2. INSTALL FOLLOWING FROM PULLBOX TO CONTROL PANEL:
   A. 1"C, 3#12, 1#12 (G), 2#14 (PUMP #1)
   B. 1"C, 3#12, 1#12 (G), 2#14 (PUMP #2)
   C. 1"C, 1-TSP, 4#14 (LEVEL XMTR, LEVEL SWITCHES)

   INSTALL CONDUIT SEALS BELOW CABINET.
3. INSTALL NEW CONDUITS (3-2" CONDUITS) FROM PULLBOX TO WETWELL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO CABINET.
4. INSTALL "FIT" ADJACENT TO CONTROL PANEL. INSTALL 1"C, FE CABLE TO FLOW ELEMENT IN VAULT. INSTALL TWO NIPPLES TO CONTROL PANEL, 1-TSP (SIGNAL), 2#12, 1#12 (G) (POWER). INSTALL IN NEMA 4 LOCKABLE BOX.
5. INSTALL #2 BARE COPPER GROUND AND GROUND ROD. BOND TO CONTROL PANEL & PG&E SECURE PANEL.
6. INSTALL CONCRETE BASE, SIZE AS SHOWN. BASE TO BE 3" ABOVE FINISH GRADE AND SUPPORT ANGLE IRON AND PUMP TERMINATION PANEL.
7. INSTALL 1 1/2" CONDUIT, 3#2, 1#6 (G) FROM PG&E SERVICE PANEL TO CONTROL PANEL.
8. INSTALL 6'-C4x5.4 WITH BASE FOR PG&E SERVICE PANEL.
9. INSTALL NEW PG&E SERVICE PANEL WITH 100 AMP CIRCUIT BREAKER. INSTALL 1 1/2" CONDUIT FROM SERVICE PANEL TO CONTROL PANEL . INSTALL 3#2, 1#6 (G) FROM MAIN CIRCUIT BREAKER TO CONTROL PANEL.
10. INSTALL 2"C, PW TO PG&E SERVICE POINT.
11. FLOOR MOUNTED CONTROL PANEL.
12. ROUTE CELLULAR RADIO TO SIDE OF PANEL. INSTALL 1 1/2" RGS CONDUIT TO 5' ABOVE PANEL. SEE E300 FOR DETAIL. INSTALL 1 1/2" RGS CONDUIT TO 5' ABOVE PANEL. SEE E300 FOR DETAIL.

LIFT STATION #8 & 9 ELEVATION NOTES:

1. REMOVE EXISTING PANEL, ELECTRICAL SERVICE.
2. FLOOR MOUNTED CONTROL PANEL.
3. INSTALL NEW PG&E SERVICE PANEL WITH 100 AMP CIRCUIT BREAKER. INSTALL 1 1/2" CONDUIT FROM SERVICE PANEL TO CONTROL PANEL. INSTALL 3#2, 1#6 (G) FROM MAIN CIRCUIT BREAKER TO CONTROL PANEL.
4. INSTALL 2"C, PW TO PG&E SERVICE POINT.
5. INSTALL PULLBOX. TERMINATE PUMP CABLES, LEVEL TRANSMITTER CABLE AND FLOAT SWITCHES. INSTALL CONCRETE PAD BELOW CABINET BEYOND LARGE PAD TO ACCOMMODATE CABINET. PULLBOX 2'x3'x2'D, H20 RATED.
6. INSTALL FOLLOWING FROM PULLBOX TO CONTROL PANEL, SURFACE MOUNT:
   A. 1"C, 3#12, 1#12 (G), 2#14 (PUMP #1)
   B. 1"C, 3#12, 1#12 (G), 2#14 (PUMP #2)
   C. 1"C, 1-TSP, 4#14 (LEVEL XMTR, LEVEL SWITCHES)

   INSTALL CONDUIT SEALS BELOW CABINET
7. INSTALL NEW CONDUITS (3-2" CONDUITS) FROM PULLBOX TO WETWELL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO CABINET.
8. INSTALL "FIT" ADJACENT TO CONTROL PANEL. INSTALL 1"C, FE CABLE TO FLOW ELEMENT IN VAULT. INSTALL TWO NIPPLES TO CONTROL PANEL, 1-TSP (SIGNAL), 2#12, 1#12 (G) (POWER). INSTALL IN NEMA 4 LOCKABLE BOX.
9. INSTALL 1 1/2" CONDUIT, 3#2, 1#6 (G) FROM PG&E SERVICE PANEL TO CONTROL PANEL.
10. INSTALL #2 BARE COPPER GROUND AND GROUND ROD. BOND TO CONTROL PANEL AND PG&E SERVICE PANEL.
11. INSTALL 6'-C4x5.4 WITH BASE FOR PG&E SERVICE PANEL.
12. INSTALL CONCRETE BASE (SEE DETAIL DWG XX), SIZE AS SHOWN. BASE TO BE 3" ABOVE FINISH GRADE AND SUPPORT ANGLE IRON AND PUMP TERMINATION PANEL.
13. ROUTE CELLULAR RADIO TO SIDE OF PANEL. INSTALL 1 1/2" RGS CONDUIT TO 5' ABOVE PANEL. SEE E300 FOR DETAIL.

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VOLUME 2 OF 2
LIFT STATION
PLANT IMPROVEMENTS

ELECTRICAL PANEL
ELEVATION ARRANGEMENT 3

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

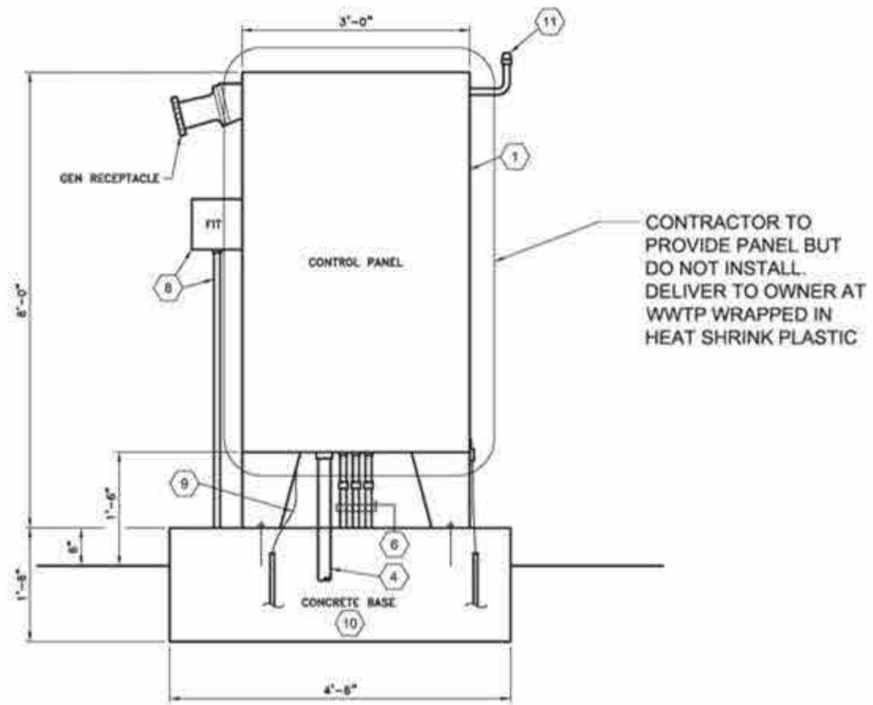
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CONTRACTOR TO PROVIDE PANEL BUT DO NOT INSTALL. DELIVER TO OWNER AT WWTP WRAPPED IN HEAT SHRINK PLASTIC

LIFT STATION #10 ELEVATION
NTS

LIFT STATION #10 ELEVATION NOTES:

1. REMOVE EXISTING PANEL, ELECTRICAL FEED FROM BUILDING. INSTALL NEW FLOOR MOUNTED CONTROL PANEL.
2. NOT USED.
3. NOT USED.
4. INSTALL 2"C, 3#2, 1#6 (G) FROM PG&E SERVICE PANEL TO CONTROL PANEL.
5. NOT USED.
6. INSTALL FOLLOWING FROM PUMP PULLBOX TO CONTROL PANEL:

   A. 2"C, 3#10, 1#10 (G), 2#14 (PUMP #1)
   B. 2"C, 3#10, 1#10 (G), 2#14 (PUMP #2)
   C. 2"C, 1-TSP, 4#14 (LEVEL XMTR, LEVEL SWITCHES)
   (INSTALL DIRECT FROM WETWELL) INSTALL SEAL IN CONDUIT.

   INSTALL CONDUIT SEALS BELOW PANEL.
7. INSTALL NEW CONDUITS (3-2" CONDUITS) FROM PUMP TERMINATION CABINET TO WETWELL. INSTALL PUMP 1 AND PUMP 2 CABLES, LIT, LSHH, AND LSLL CABLES TO CABINET. INSTALL IN NAME 4 LOCKABLE BOX.
8. INSTALL "FIT" ADJACENT TO CONTROL PANEL. INSTALL 1"C, FE CABLE TO FLOW ELEMENT IN VAULT. INSTALL TWO NIPPLES TO CONTROL PANEL, 1-TSP (SIGNAL), 2#12, 1#12 (G) (POWER).
9. INSTALL #2 BARE COPPER GROUND AND GROUND ROD. BOND TO CONTROL PANEL AND PG&E SERVICE PANEL.
10. INSTALL CONCRETE BASE (SEE DETAIL DWG XX), SIZE AS SHOWN. BASE TO BE 3" ABOVE FINISH GRADE AND SUPPORT ANGLE IRON AND PUMP TERMINATION PANEL.
11. ROUTE CELLULAR RADIO OUTSIDE.

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LIFT STATION
PLANT IMPROVEMENTS

ELECTRICAL PANEL
ELEVATION ARRANGEMENT 4

CLEARLAKE OAKS COUNTY WATER DISTRICT

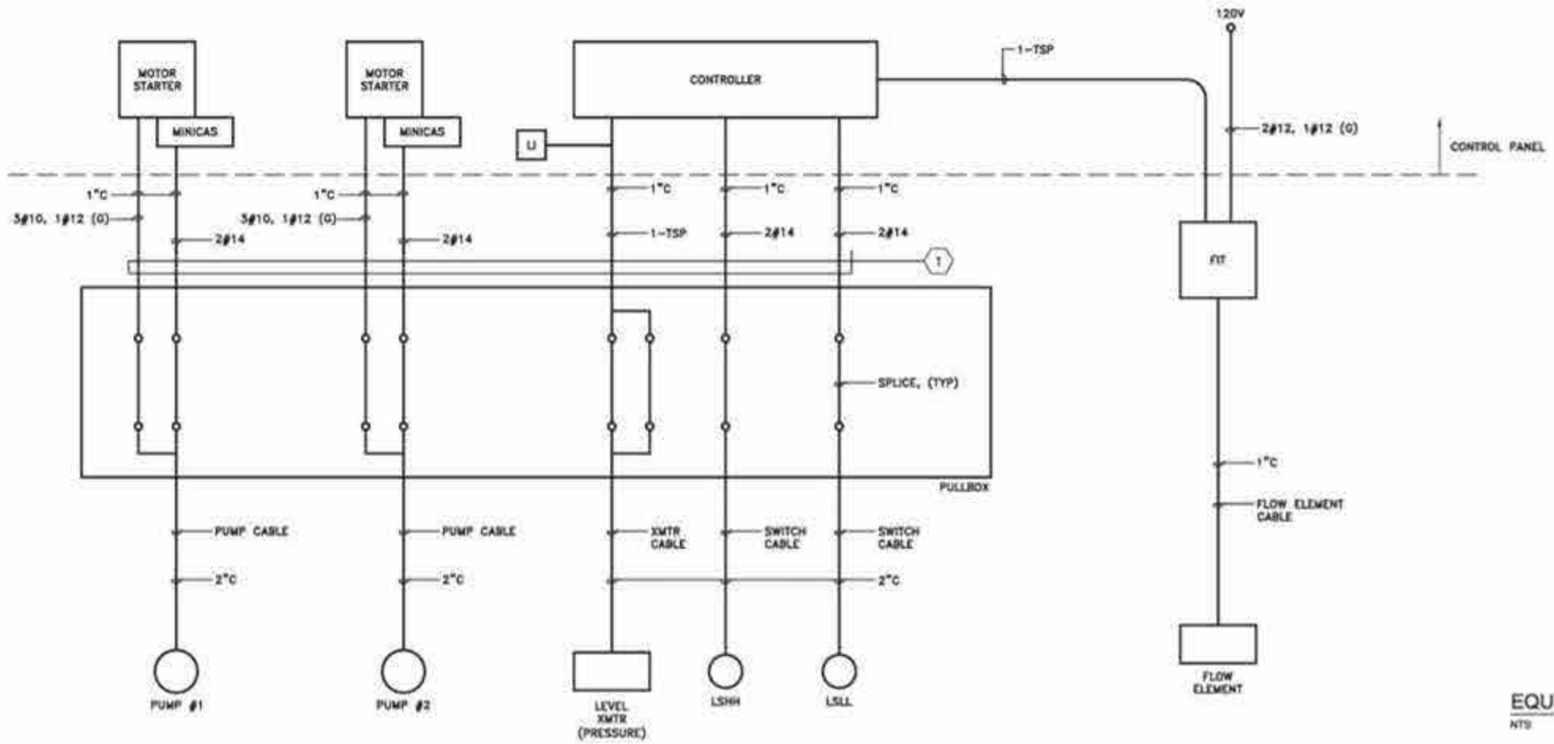
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TYPICAL LIFT STATION CONDUIT & CABLE DIAGRAM

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NOTE (1)

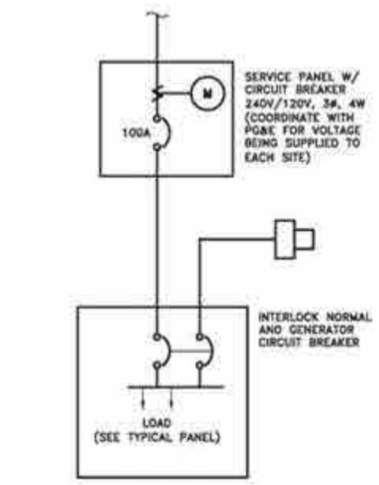
LIFT STATION	PG&E SERVICE PANEL	PUMP PULLBOX
LS1	1	NO
LS3	1	YES
LS4	1	YES
LS5	1	NO
LS6	3	YES
LS8	3	YES
LS9	3	YES
LS10	3	NO

NOTES:
1. REMAIN IN PLACE, CONNECT AS SHOWN.
2. REUSE EXISTING, MOVE AND CONNECT AS SHOWN.
3. NEW, INSTALL AS SHOWN.
4. INSTALL SEALS IN CONDUIT WHEN PUMP TERMINATION CABINET NOT USED.

EQUIPMENT REPLACEMENT SCHEDULE

NTS

(1) INSTALL SEALS IN CONDUIT BELOW PANEL. SEALS TO BE PVC-GRS CYS CONDUIT SEALING FITTING. FILL WITH DUCT SEAL.



NOTE: SEE SCHEDULE FOR WHAT IS NEW AND EXISTING FOR EACH STATION.

SINGLE LINE PUMP STATION (TYP)

NTS

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VOLUME 2 OF 2
LIFT STATION PLANT IMPROVEMENTS

TYPICAL SINGLE LINE

CLEARLAKE OAKS COUNTY WATER DISTRICT

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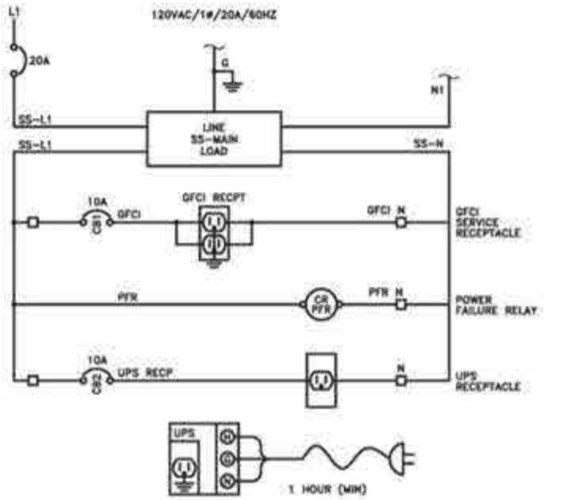
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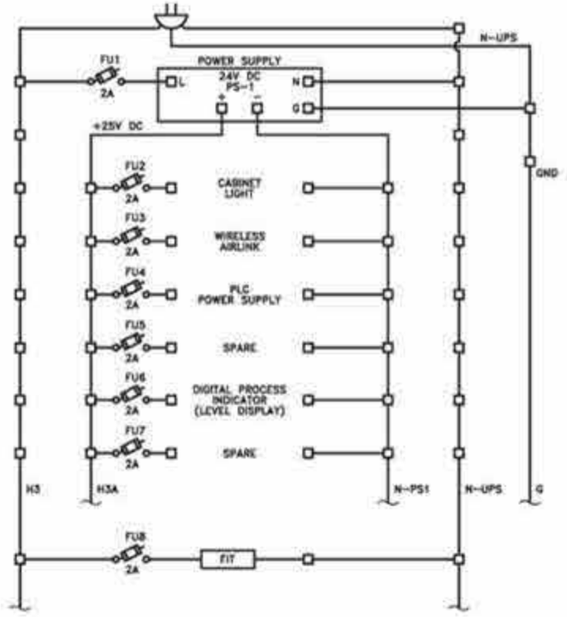
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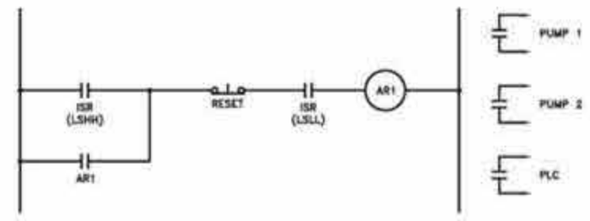
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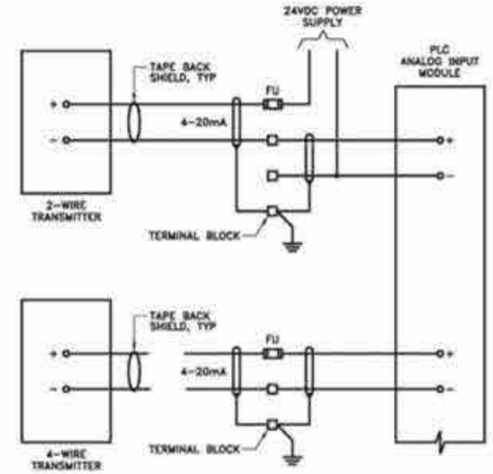
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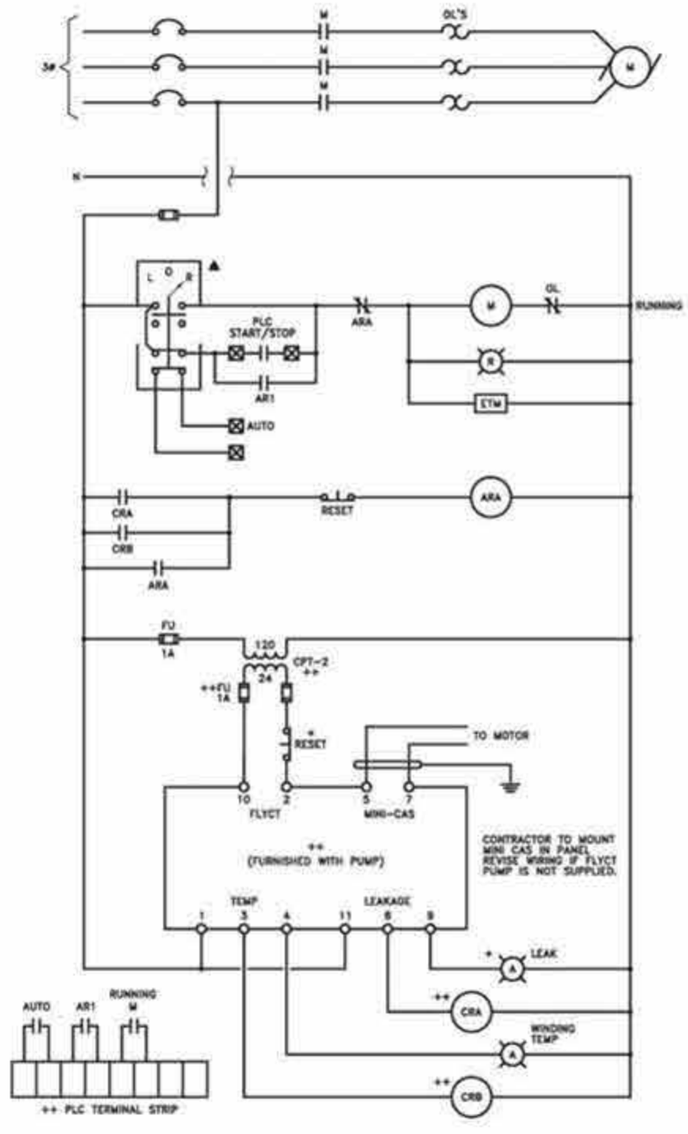




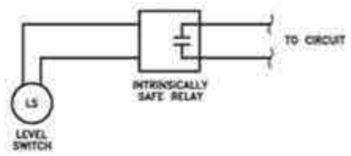
HIGH LEVEL ALARM



CONTROL PANEL TYPICAL I/O CONNECTIONS



LIFT STATION PUMP



LEVEL SWITCH CONNECTOR

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LIFT STATION
PLANT IMPROVEMENTS

CONTROL DIAGRAM I

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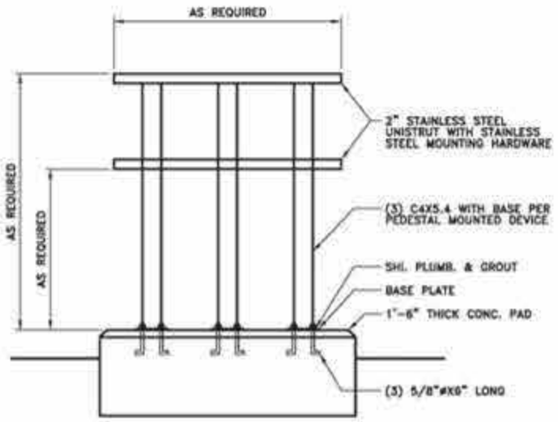
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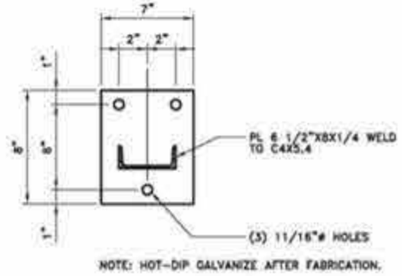
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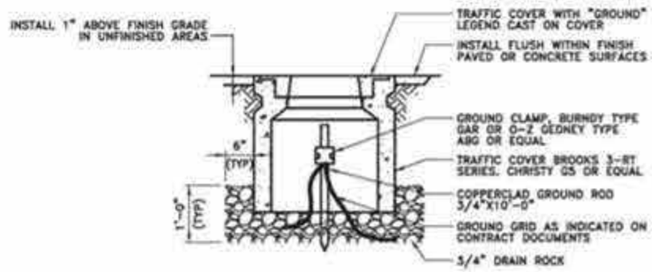
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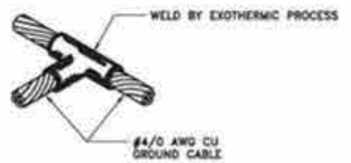
LARGE PEDESTAL MOUNTING DETAIL
NTS



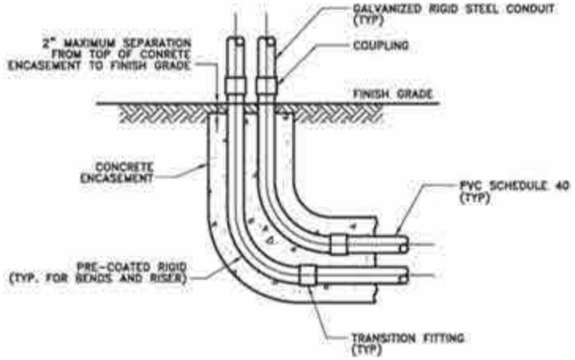
NOTE: HOT-DIP GALVANIZE AFTER FABRICATION.



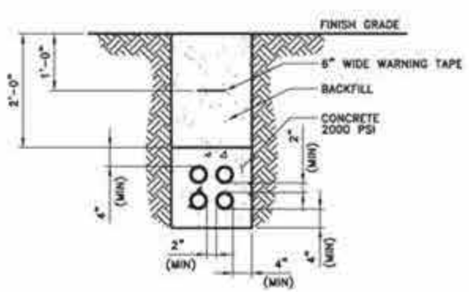
GROUND WELL DETAIL
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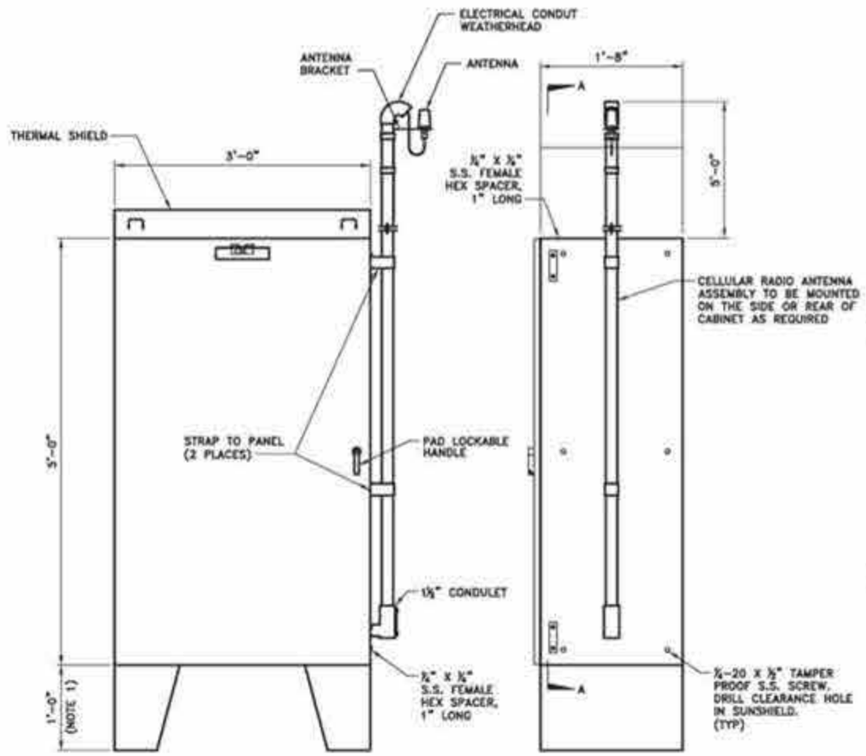
GROUND GRID TEE CONNECTION DETAIL
NTS



CONDUIT RISER FROM GROUND DETAIL
NTS

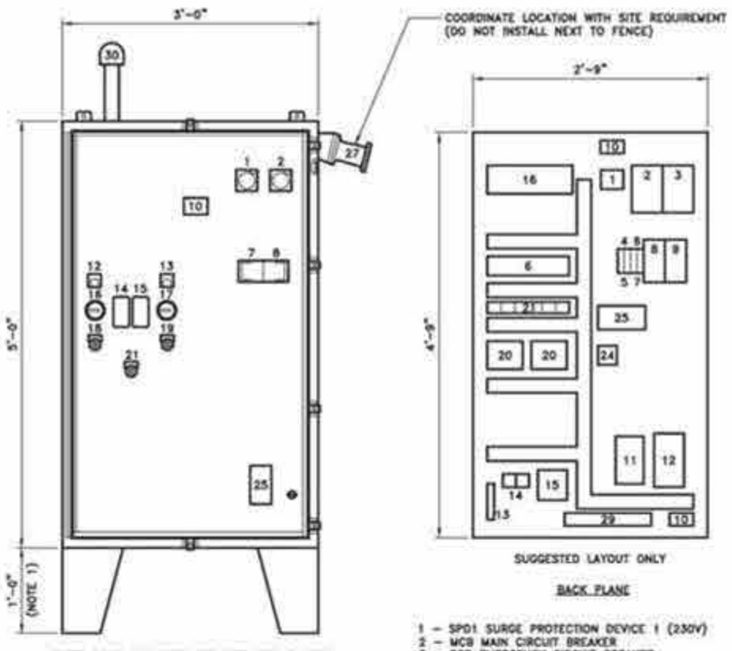


DUCT BANK SECTION
NTS



FRONT VIEW

RIGHT SIDE VIEW



OUTER DOOR HAS BEEN REMOVED FOR CLARITY

1 – MCB MAIN CIRCUIT BREAKER
2 – ECB EMERGENCY CIRCUIT BREAKER
7 – MB1 MOTOR BREAKER 1
8 – MB2 MOTOR BREAKER 2
10 – LEVEL INDICATOR
12 – RL1 RUN LIGHT 1
13 – RL2 RUN LIGHT 2
14 – MC1 MINICAS 1
15 – MC2 MINICAS 2
16 – ETM1 ELAPSED TIME METER
17 – ETM2 ELAPSED TIME METER 2
18 – HOA HAND-OFF-AUTO SWITCH PUMP 1
19 – HOA HAND-OFF-AUTO SWITCH PUMP 2
20 – ANTENNA
21 – BACKUP FLOAT RESET
25 – DR1-2 DUPLEX RECEPTACLE GFI 1-2
27 – GR GENERATOR RECEPTACLE
30 – ANTENNA

SUGGESTED LAYOUT ONLY

BACK PLANE

1 – SPD1 SURGE PROTECTION DEVICE 1 (230V)
2 – MCB MAIN CIRCUIT BREAKER
3 – ECB EMERGENCY CIRCUIT BREAKER
4 – LCB LIGHTING CIRCUIT BREAKER
5 – DRB1 DUPLEX RECEPTACLE BREAKER 1
6 – RADIO-AIRLINK 1
7 – CCB CONTROL CIRCUIT BREAKER
8 – MB1 MOTOR BREAKER 1
9 – MB2 MOTOR BREAKER 2
10 – GROUND BUSBAR
11 – MS1 MOTOR STARTER 1
12 – MS2 MOTOR STARTER 2
13 – ISB INTRINSICALLY SAFE BARRIER
14 – ISR1-2 INTRINSICALLY SAFE RELAY 1-2
15 – HT HEATER
17 – PS 24VDC POWER SUPPLY
18 – DC UPS
19 – SPD2 SURGE PROTECTION DEVICE 2 (120V)
20 – DC UPS BATTERIES
21 – R1-13 RELAY 1-13
24 – PM PHASE MONITOR
25 – FUSE BLOCKS

(MOUNT ON LARGE PEDESTAL MOUNTING)

TYPICAL PANEL ELEVATION VIEW
NTS

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VOLUME 2 OF 2
LIFT STATION
PLANT IMPROVEMENTS

ELECTRICAL DETAILS - 1

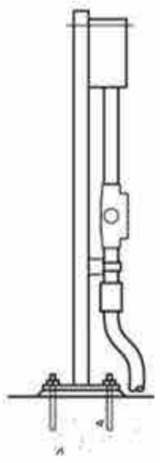
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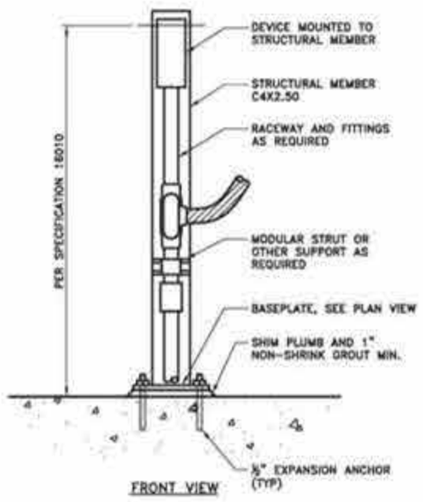
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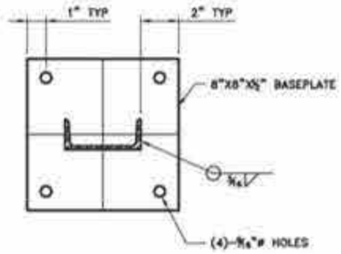
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SIDE VIEW



FRONT VIEW



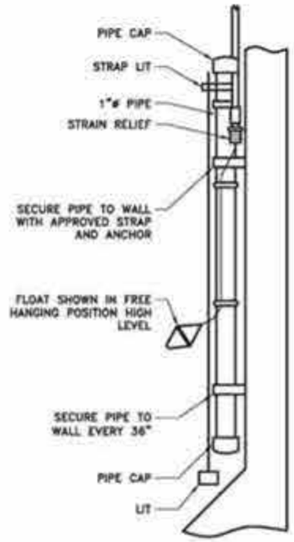
BASEPLATE PLAN VIEW

NOTES:

1. EQUIPMENT LOAD SHALL NOT EXCEED 50 POUNDS.
2. PEDESTAL ASSEMBLY MATERIAL TYPE: HOT-DIP GALVANIZED WITH DARK BRONZE POWER COATING FINISH.
3. ANCHORS: STAINLESS STEEL, ½" DIAMETER, 3½" EMBEDMENT.
4. ATTACH MODULAR STRUT TO STRUCTURAL MEMBER WITH A MINIMUM OF TWO ⅜" DIAMETER STAINLESS STEEL ROUND HEAD MACHINE SCREWS WITH LOCK WASHER AND NUT.
5. PROTECT SURFACES WITH DISSIMILAR MATERIALS IN ACCORDANCE WITH SPECIFICATION 09905.

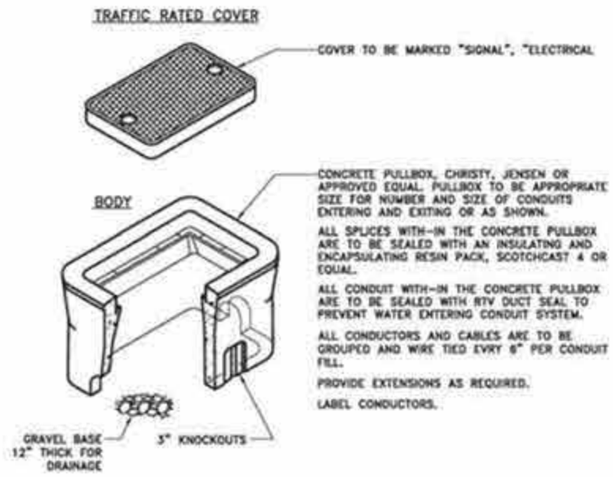
SINGLE DEVICE PEDESTAL DETAIL

NTS



FLOAT SWITCH & LIT INSTALLATION DETAIL

NTS



H20 RATED CONCRETE PULLBOX DETAIL

NTS

REVISION

DESN L. SMITHY

DRW M. HARRINGTON

CHK D. PIVETTI

APV A. GARDINER (GM)

Expires 06/30/18

4/7/17

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VOLUME 2 OF 2
LIFT STATION
PLANT IMPROVEMENTS

ELECTRICAL DETAILS - 2

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

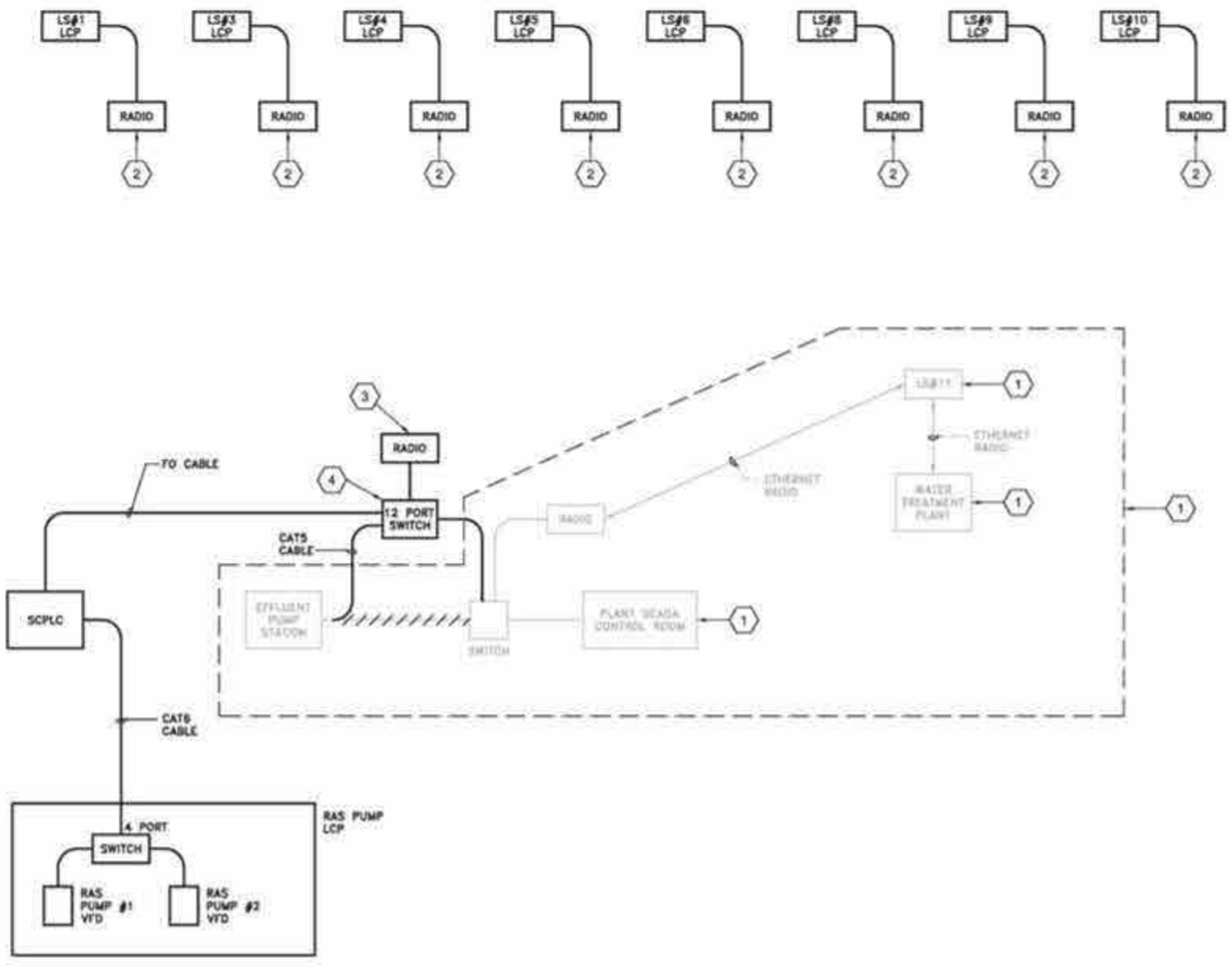
DATE: APRIL 10, 2017

DRAWING NUMBER

E301

34 OF 35 SHEETS

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SCADA BLOCK DIAGRAM
NTS

NOTES:

(1) EXISTING

(2) RADIO SCHEDULE

LS #1	CELLULAR
LS #3	CELLULAR
LS #4	CELLULAR
LS #5	CELLULAR
LS #6	CELLULAR
LS #8	CELLULAR
LS #9	CELLULAR
LS #10	CELLULAR

(3) INSTALL CELLULAR CONNECTION AT WWTP.

(4) INSTALL 12 PORT SWITCH AT CONTROL ROOM. REARRANGE EXISTING CONNECTIONS.

REVISION

DESN L. SMITHY

DRW M. HARRINGTON

CHK D. PIVETTI

APV A. GARDNER (GM)

7/7/17

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VOLUME 2 OF 2
LIFT STATION PLANT IMPROVEMENTS

SCADA BLOCK DIAGRAM

CLEARLAKE OAKS COUNTY WATER DISTRICT

JOB NO: 001-004

DATE: APRIL 10, 2017

DRAWING NUMBER

E400

35 OF 35 SHEETS

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Date: September 15, 2016

To: Alan Gardner, CLOCWD General Manager

From: Mark Carey, P.E. MC Engineering Principal Engineer

RE: CLOCWD Wastewater Facility Improvements (TM No. 2 Lift Station Predesign)

Mr. Gardner,

MC Engineering is pleased to submit the attached Technical Memo No. 2 for the USDA related predesign work associated with the District's lift stations and proposed improvements to be constructed in 2017. The intent of this submittal was to define the design requirements, related improvements at each lift station, and an opinion of costs for District review prior to embarking on detailed design. The information used to develop the predesign was based, in part, on staff interviews combined with limited site reviews of each station. A more refined opinion of costs will be developed in the design phase. Due to the lack of detailed record drawings, some unknowns remain that may need to be identified during construction. We have carried a contingency in our estimates and the actual costs will likely vary depending in part on the bid environment in the spring of 2017 when we plan to advertise for the work.

We would like to acknowledge the input and support we received from the following District staff in preparing this document:

- Jason Mitchell, CLOCWD Operations Manager
- Pamela Parker, CLOCWD WWTP Operator
- Dan Hodem, WTP Operator

A subsequent memo (TM No. 1) is still under development which will define improvement needs at the WWTP which will be submitted in the immediate future. Once adjusted based on District review comments, these documents will form the basis of our pending final Scope of Work for the related improvements.

Your input, and review comments from staff, on this draft document is greatly appreciated. Once any comments are received we will make adjustments as needed prior to embarking on the design. We look forward to completing the design and moving forward with construction of related improvements in 2017. Thank you for the opportunity to support you in this effort.

Respectfully,

Mark Carey, PE
MC Engineering, Inc.

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CLOCWD USDA Wastewater System Improvements

Lift Station Upgrades/Improvements
Pre-Design/Technical Memo No.2

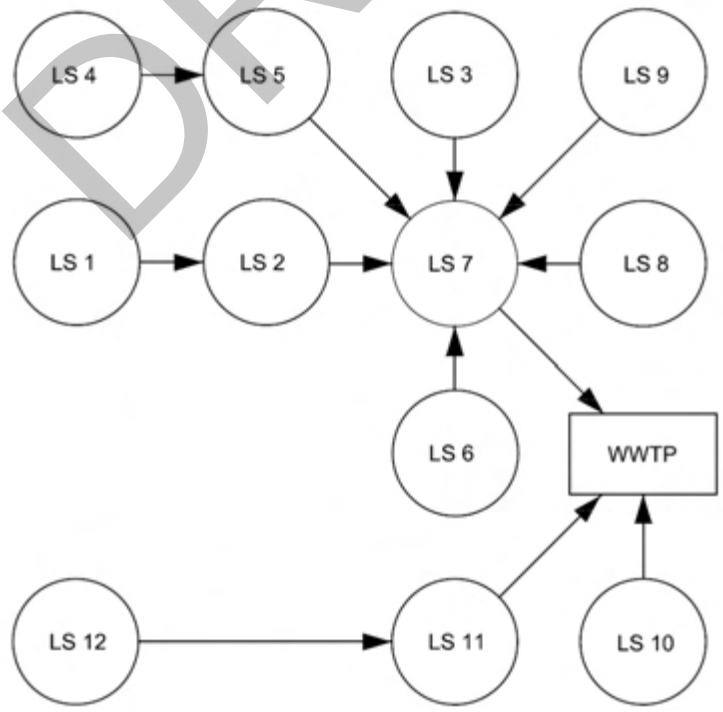
System Overview and Assumptions

The majority of the District's lift stations (LS) were constructed in 1966 with additional stations being added over a fifteen year period. Most lift stations were built concurrent with the construction of the Keys subdivision. Due to the difficulties associated with constructing gravity flow sewers in this area, a system of multiple LSs' and force mains were constructed instead.

The system consists of 12 LSs' which are presented schematically in **Figure 1** below. LS No. 7 is considered the central lift station and it pumps approximately 90% of the raw sewage flows to the WWTP. A 10 inch force main conveys flows from LS 7 to the WWTP. LSs' 1, 3, 4, 5, 6, 8, 9, and 10 are considered submersible lift stations consisting of a single wetwell. Lift stations 2 and 7 are dry pit stations with adjacent wet-wells. Lift station number 11 is a pneumatic ejector station that operates using a compressed air system. A LS shed area map, and LS system map are presented below in **Figures 2** and **3** below.

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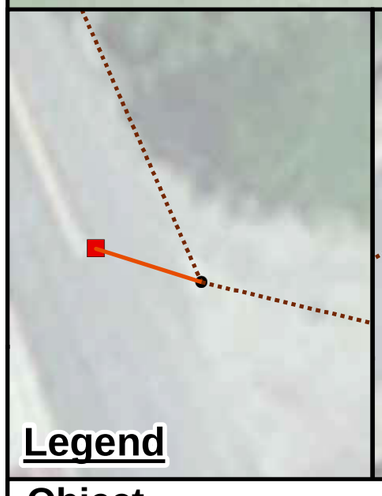
Figure 1 Lift Station System Schematic



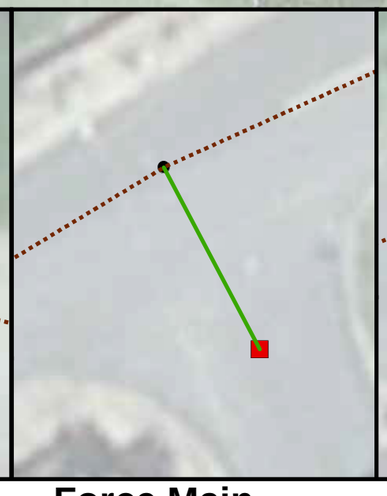
LS 1
LS 2
LS 3
LS 4
LS 5
LS 6
LS 7
LS 8
LS 9
LS 10
LS 11
LS 12

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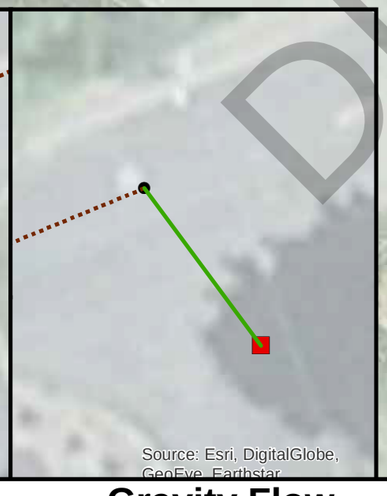
LS 6



LS 8



LS 9



Source: Esri, DigitalGlobe, GeoEye, Earthstar

Legend

Object
- Manhole(s) on Gravity Line
- Lift Station

Force Main
- FM, 4
- FM, 6
- FM, 8
- FM, 10
- FM, 12

Gravity Flow
- Diameter Varies

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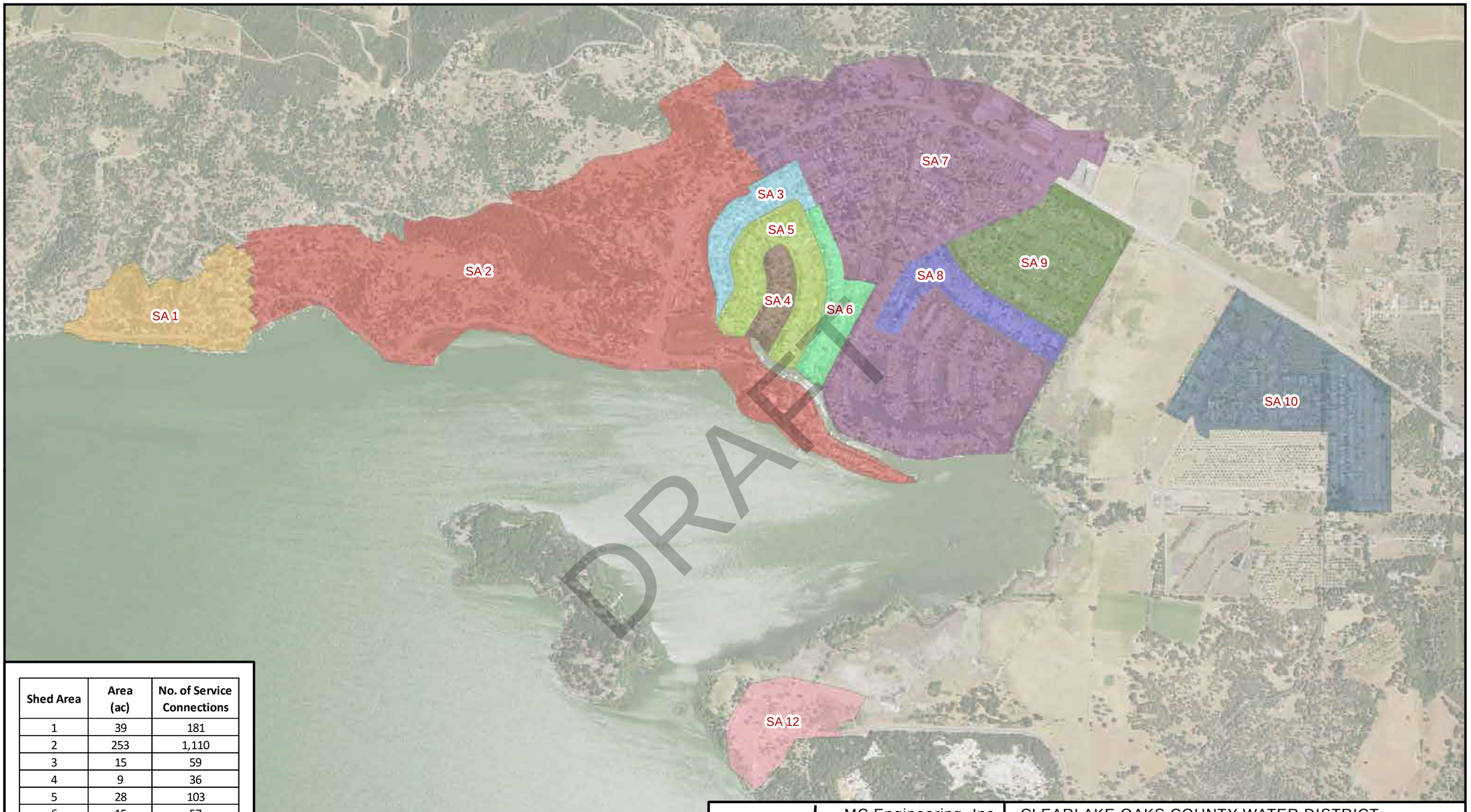
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CLEARLAKE OAKS COUNTY WATER DISTRICT
WATER MASTER PLAN

FIGURE 3:
SANITARY SEWER LIFT STATION FORCE MAIN & GRAVITY INTERCEPTORS

0 0.125 0.25 0.5 Miles

N



DRAFT

Shed Area	Area (ac)	No. of Service Connections
1	39	181
2	253	1,110
3	15	59
4	9	36
5	28	103
6	15	57
7	227	846
8	22	99
9	47	257
10	92	305
11	53	0
12	26	33

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CLEARLAKE OAKS COUNTY WATER DISTRICT
WATER MASTER PLAN

FIGURE 2:

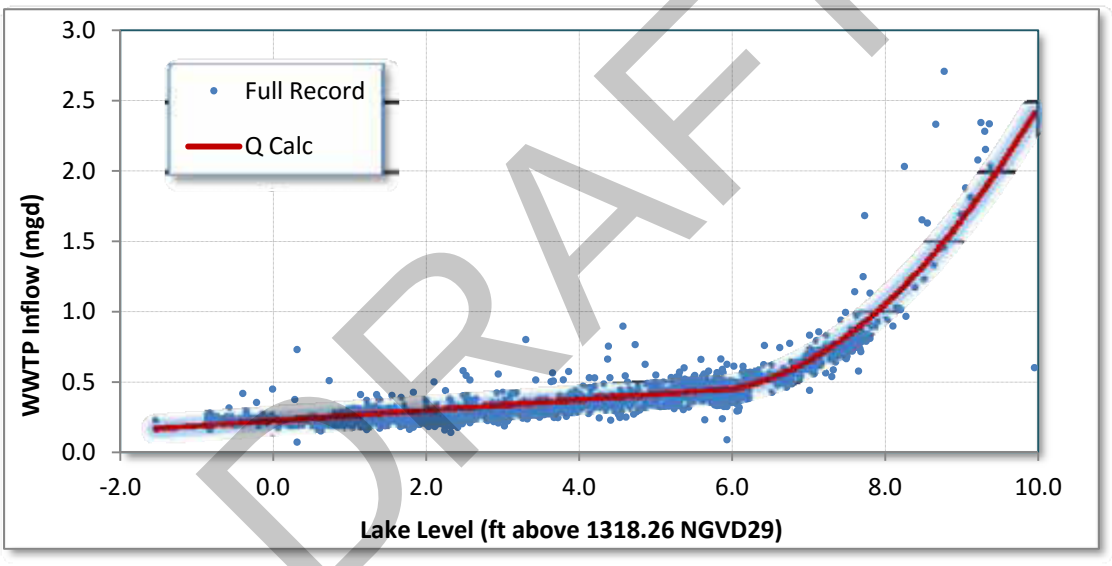
SANITARY SEWER LIFT STATION SHED AREAS

N

0 0.125 0.25 0.5 Miles

The Inflow and Infiltration (I/I) study previously prepared by MC Engineering (completed in 2015) found that the service area identified as the "Keys" was responsible for a majority of the inflow and infiltration within the collection system during high lake levels. This is largely due to the fact that a majority of the manhole inverts and pipes within this area fall below the groundwater table as the lake level rises in the winter, particularly in years with high amounts of rainfall. The lift stations servicing this area include lift stations: 2, 3, 5, 6, 8, and 9. It should be mentioned LS 2 collects infiltration from connections on Island Dr as well as inflow from connections on the mountain side north west of Highway 20. The combined flow from these stations are pumped to LS 7 (also located in the Keys) where flow is then pumped directly to the headworks of the WWTP. LSs' 1 and 4 are also impacted by lake level but contribute relatively less flow. LSs' 10, 11, and 12 are not significantly impacted by the lake level but they do convey I/I flows (inflow) produced directly by rainfall. The cumulative flows of the system which enter the headworks of the WWTP as a function of lake level are presented below in **Figure 4**.

Figure 4 WWTP Influent Flow to Lake Level Correlation



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Figure 4 above, presents the WWTP influent to lake level correlation based on data collected from 2010 to 2015 events. The regression curve shows that I/I is proportional, on a linear basis, to the lake level for elevations below 6 feet relative to the Rumsey gage. Once the lake level exceeds 6 feet a significant portion of the collection system within the Keys is exposed to high groundwater resulting in an exponential increase in influent flow to lift station 7 as the lake level continues to rise. More recently, in the rainfall periods of 2016, this was found to be the case.

During the floods in 1983, lift station 7 was completely flooded. The flooding required major improvements to the station and related facilities. The lift station's capacity was upgraded and during the floods of 1986 the collection system remained in operation. During this upgrade it was found that a capacity of at least 2.1 mgd at lift station 7 was adequate in preventing sewage-contaminated water

from escaping the collection system during relatively high lake levels. It was also found that if the pump capacity were to increase then I/I flows would also increase, being limited only by the pump capacity. The consequence of this situation is that for high lake levels with a return interval greater than ten years the I/I correction necessary to reduce flows at lift station 7 would require essentially a complete rehabilitation/replacement of the collection system within the Keys area. The 2014/2015 flow metering and I/I study identified specific sections of pipeline to be rehabilitated. It is estimated that if the $850,000 of proposed rehabilitation improvements are made then the I/I could be reduced by 10 to 20%.

For this reason, the proposed improvements identified by this pre-design report are intended to enhance the system's reliability, serviceability, safety, and monitoring capabilities such that preventative actions/maintenance may be taken by operators in maintaining lift station service to ensure greater environmental protection and a safer work environment.

Due to limited funding and lack of detailed and extensive operating data, the following assumptions were used in the preliminary 10% design report:

- Lift Station design capacity is consistent with historical values
- Reductions in flow from efforts to reduce I/I by repairing the collection system, will range from 10 to 20% but this does not account for the ongoing deterioration of the collection system in all areas.
- Operator input on certain features was utilized in response to a lack of record drawings, therefore, some additional investigative work will be required during construction
- The overall structural integrity of wet-wells was based on limited visual inspection from the surface using a pole camera
- Conflicts with other "dry utilities" are considered minimal. This should be confirmed by the contractor prior to construction
- Prioritization of improvements, if necessary, will be conducted pending budget availability after bidding
- Pump model and make should be as consistent as possible to minimize variability between pump stations. Panel configuration and design consistency will be maintained where possible
- Force main condition is assumed to be adequate, except for portions of force mains from lift station no. 11. The District is encouraged to confirm the condition of existing force-mains through pressure testing or other means. Note; VFD and soft starts are to be used on critical LS's.

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Typical System Wide Lift Station Improvements

The proposed improvements primarily consist of upgrading the electrical and control systems at each lift station to allow remote monitoring and operation of each lift station, as well as performing cost-effective structural and mechanical rehabilitation/improvements to facilitate extended service life, safety, and reliability. The electrical and control system upgrades are typical for the entire system except stations No. 2, 7, and 12. An assessment of each lift station (No. 1 through 12) will describe the existing conditions and rehabilitation specific to each lift station and include the replacement or modification of existing equipment including:

- New submersible pumps at select sites
- Modified wetwell structures as required to improve access and maintenance capabilities
- New guide railings, and flange connections where needed
- Associated check and gate valves
- New flow meters at select sites (where feasible)
- Miscellaneous appurtenances
- Electrical and controls to (including SCADA centralized at the WWTP)
- Improved accessibility & operator safety issues, during emergency and non-emergency maintenance.
- Bypass connections (at select sites)

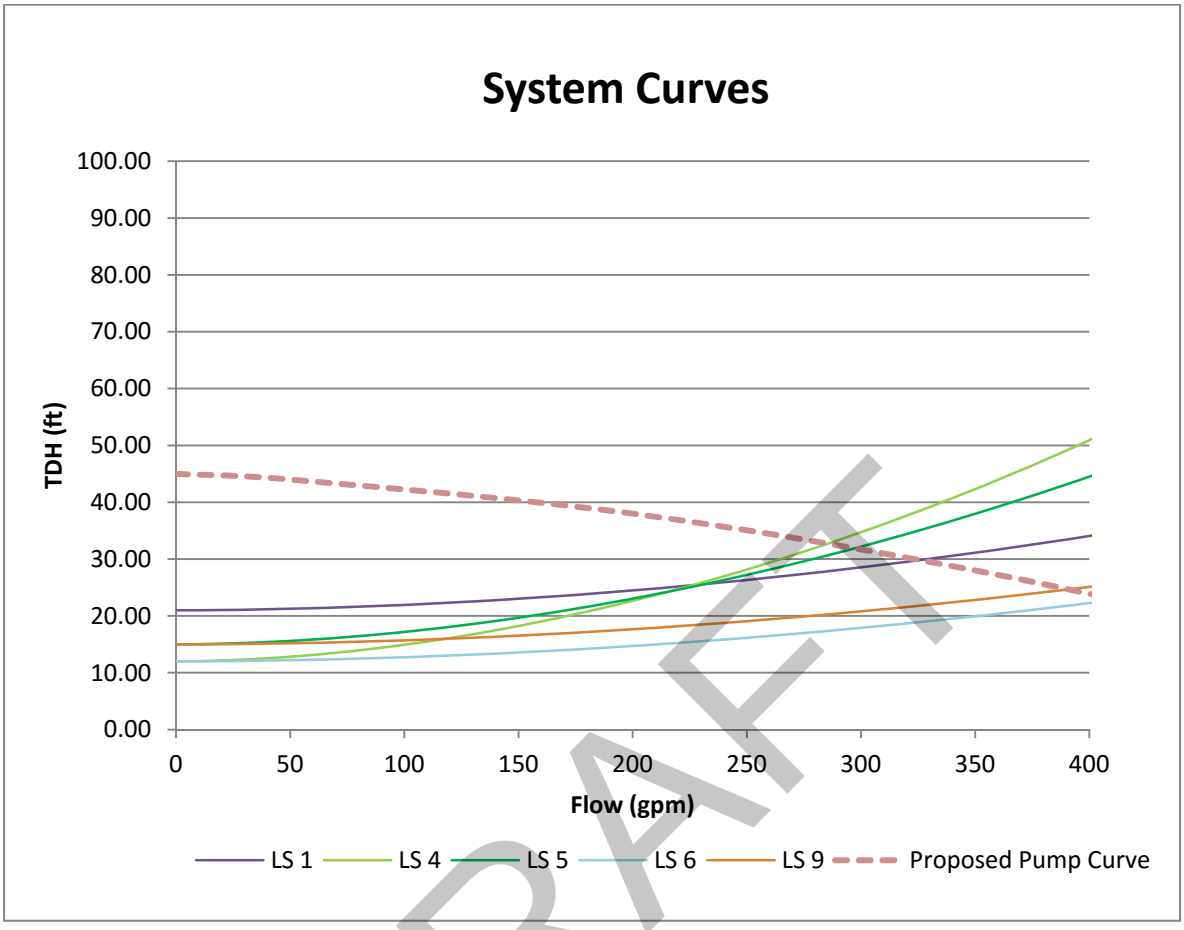
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Typical Mechanical/Equipment/Structural System Improvements

Submersible Pumps: With the exception of LSs' 8, 10, and 11, for each aforementioned lift station the proposed work will include replacing the existing pumps with new heavy duty submersible sewage pumps. The pumps at station 8 were recently replaced with submersible pumps which are considered adequate to meet existing needs. Therefore, LS 8 is not included as part of this project. Recently, the pumps at LS 10 failed from debris and rags. Failure at this location has been a recurring theme primarily due to excessive debris. As a result, the pumps were recently replaced by (2) 10 Hp chopper pumps to avoid further pump failures**.** Lift station 11 utilizes pneumatic injectors which will not be replaced.

For ease of operation and maintenance a heavy duty type submersible model will be used to accommodate the seasonal change in waste flows associated with low and high lake levels. The system curves for lift stations 1, 4, 5, 6, and 9 are shown below in **Figure 5** where the dashed line represents the proposed "typical" pump curve for these lift stations. By using a common model for these LSs' the maintenance and operation would be simplified by common use of spare parts and the operators familiarity with the equipment. It is expected that LS 3 will require more TDH than shown on the proposed pump curve below due to the dynamic losses generated within the 600' discharge force main requiring submersible pumps with more power. The specific pump curves will be re-visited in more detail during design.

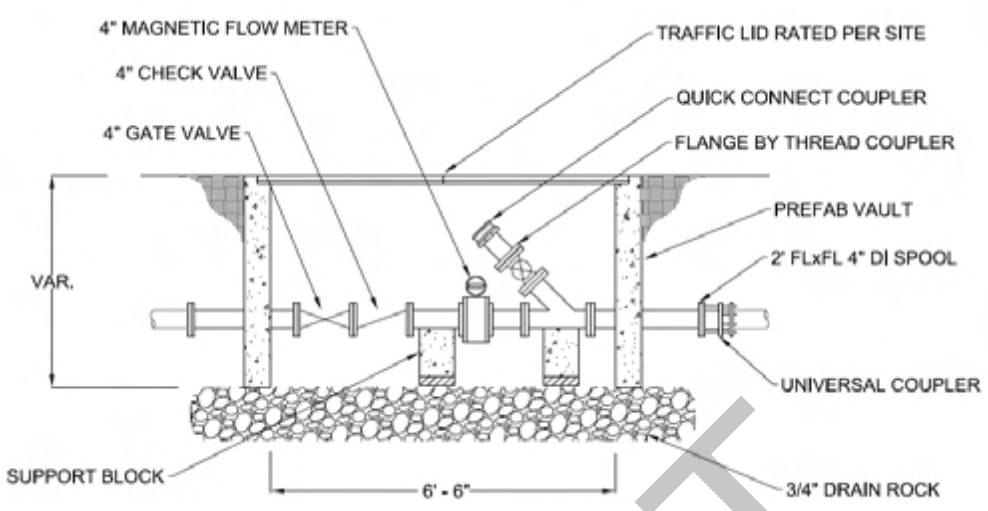
Figure 5 Lift Station System Curves (LSs' 1, 4, 5, 6, & 9)



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Emergency Quick Connect Pump Bypass: All of the lift stations, except LS 8 and LS 9, will be equipped with a trash pump quick connection to accommodate the District's existing portable pump such that sewage can be pumped from the wetwell back into the discharge piping to mitigate a catastrophic LS failure. The connection shall consist of a ductile iron wye equipped with a ball valve and quick connect coupler located in a nearby vault for manual operation. The ability to remove sewage from every wetwell is critical to the District's ability of preventing potential sewer system overflows (SSO) and protect the environment. A typical emergency bypass connection is presented in **Figure 6** below, this arrangement is typical for LSs' 4, 6, and 9 where the bypass connection, flow meter, and valving are housed in a 4' by 6' (nominal) vault. Other LSs' which do not require a flow meter will utilize existing vaults to house the emergency bypass connection.

Figure 6 Typical 4'x6' Vault and Bypass Connection



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Pump Guiderail System: Currently many of the wetwells do not have pump guide rail systems and, when present, existing guide rails are corroded and are in need of replacement. This is due to the design standards used 30 years ago which used a 36-inch manhole cover which does not provide enough room for a new guide rail system. Retrieving the pumps for maintenance requires lowering a hook into the wetwell and lifting equipment with a truck mounted hoist. This process unsafe as it exposes personnel to hazards. It is also relatively time consuming considering the immediate need for access during an emergency. For immediate access to the pumps at ground level, a guide rail system is recommended at each lift station as a typical improvement. The use of a guide rail system would also replace any flex hose with standardized discharge piping to improve operator safety and system reliability. The flex hose was added within the last 10 years as a result of discharge piping corrosion.

Wetwell Structure: At LSs' 4, 6, and 9 the existing concrete manhole cone dimensions do not accommodate standard methods for pump removal and the cones must be removed for the installation of a more efficient guide rail system. The cones will need to be replaced with concrete barrel extensions including a double door access hatch to facilitate pump removal. Wetwells showing infiltration at joints and other areas are to be repaired using cementitious material and/or epoxy coating as needed. The basic construction sequencing for LSs' 4, 6, and 9 would (at a minimum) include:

1) Construction of a new vault and pump bypass
2) Transfer of power to temporary trash pump for bypassing flows
3) Excavation and removal of concrete concentric cone, and installation of new equipment

Typical Electrical and Control System Improvements

Instrumentation and Control Hardware

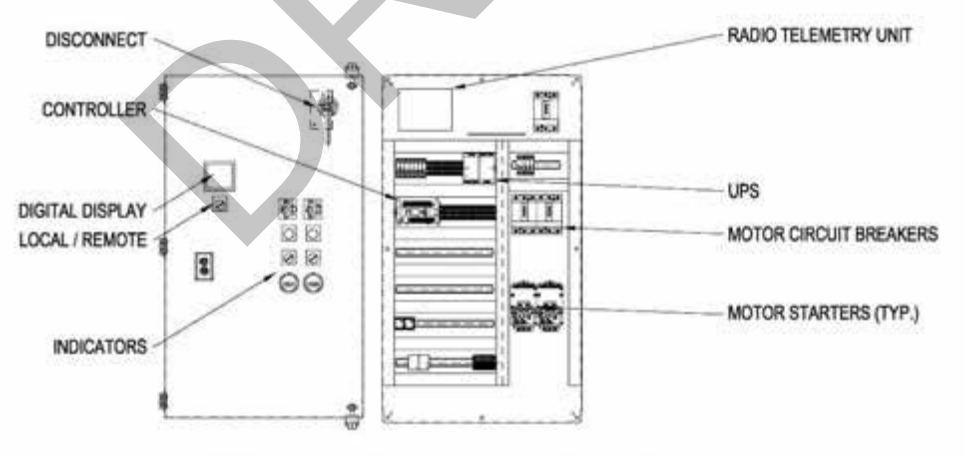
Typical Lift Station Control System: The goal associated with improving the electrical and control systems at each lift station is to develop a standard design such that the control enclosure, transfer switch, generator inlet receptacle, PG&E meter, and service breaker components, to be identical at each LSs mounting and backboard systems. The intent is to standardize the equipment for the ease of operation while improving the capabilities and features of the system as a whole.

Control System Enclosure: Each lift station will have a standard white powder coated NEMA Type 3R vented control enclosure. A dual thermostat with individual high and low temperature set points will control the enclosures by relying on a built in fan and heater. The enclosure will also have a panel light fixture operated by a door switch and a wing knob with a padlock on the door latch.

Dead Front Panel Controls: The typical enclosure is equipped with a dead front panel which will prevent the operator's exposure to live parts. A Thru-Door Rotary Switch located on the dead front panel will operate the main disconnect and motor circuit breakers. These switches can also be used by maintenance for lockout/tag out functions. A Local / Remote mode selector switch, a digital level read out, Hand-Off-Auto selector switches, run indicator lamps, and runtime meters for Pump 1 and Pump 2 will also be located on the dead front panel. An elevation of the dead front panel is presented below in **Figure 7.**

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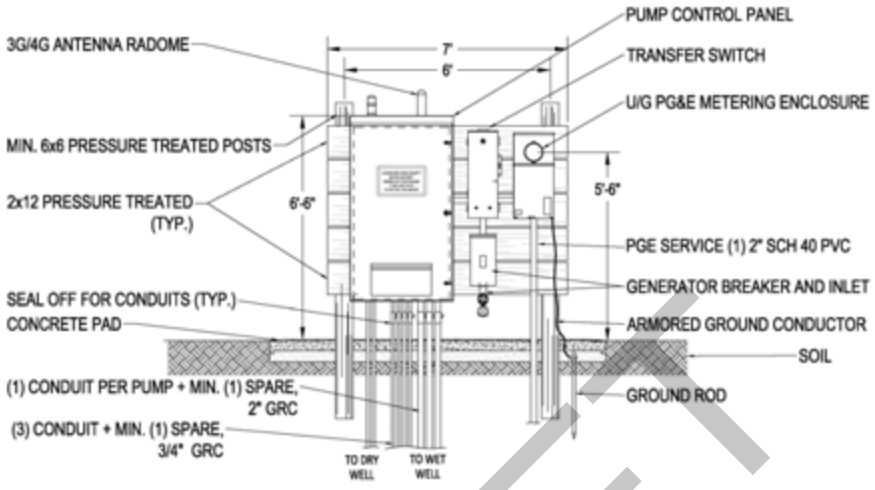
Figure 7 Dead Front Panel Elevation



Control Panel Components: The main components mounted to the control panel will include the main circuit breaker, motor circuit breakers, motor starters, PLC controller, radio telemetry equipment, surge suppressor, uninterruptable power source (UPS), control power circuit breakers, control relays, terminals, and intrinsically safe barriers to interface with the float switches and analog level sensor located in the wetwell. Recently, many of the existing lift stations were upgraded to provide transfer switches and associated equipment to interface with backup generators; these components will be

retained and integrated into the new panels. An elevation of the proposed typical control panel is presented below in **Figure 8**.

Figure 8 Control Panel Elevation



DRAFT

Field Instruments: A submersible level transmitter will be used as the primary wetwell level indicator; this device will measure the hydrostatic pressure from the bottom of the wetwell to determine the liquid level and produce a continuous 4-20mA analog signal output relative to a fixed level range. Four float switches will be used as a backup method to determine the liquid level for starting and stopping pumps and alarming on high level in the event of a transducer failure. Select lift stations will be equipped with electromagnetic flow meters with the intent of monitoring flows from major shed areas and / or the summation of multiple minor shed areas. **Table 1** below lists the LSs' which require flow meters. The determination of whether a flow meter is necessary is discussed for each LS within the Evaluation and Rehabilitation section below.

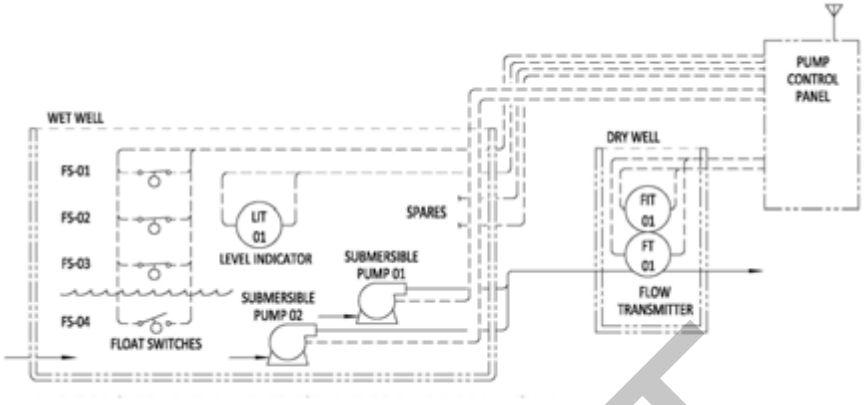
Table 1 Flow Meter Designation Schedule

Lift Station	1	2*	3	4	5	6	7*	8	9	10	11*	12*
Flow Meter	Y	Y	N	Y	N	Y	Y	N	Y	Y	Y	N

*Although future improvements at these Lift Stations are beyond the scope of this project, the need (or lack of need) of flow meters at the remaining stations is contingent on the assumption that likely improvements at LSs' 2 and 7 would include flow metering; and LSs' 11 and 12 would not enjoy these improvements within the foreseeable future.

These flows will aid in measuring and verifying the amount of I/I and the relative success of future collection system improvements in addition to monitoring pump performance. A schematic of typical instrumentation improvements are shown below in **Figure 9.**

Figure 9 Instrumentation Schematic



Typical Field Work: The work expected at each lift station for the installation of new panels and control systems would consist of, at a minimum:

- Installation of two new 1" conduits from flow meters to the panel location where applicable
- Installation of new 2" conduits for pumps, floats, level sensors, if existing conduits are inadequate
- Removal of existing enclosures, and installation of (reused or new) transfer switch and generator plug, power source equipment, float switches, analog level sensor, etc
- Field wiring terminations at panel terminals and at device terminals for motors, float switches, analog level sensor, flow meter and signal, power source and transfer switch
- PLC and SCADA programming
- Panel/pump station startup and calibration

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Operation and Control Strategy

Lift Station Local/Remote and On–Off–Auto Selector Switches: Each lift station pump will have an On-Off-Auto selector switch on the control panel. When the respective pump selector switch is in the On position, the pump will run regardless of the position of the Local/Remote mode selector switch and independent of the wetwell level transmitter or float switches. Likewise, when the On-Off-Auto selector switch is in the Off position, the respective pump motor starter will turn off and remain off regardless of the position of the Local/Remote mode selector switch and independent of the wetwell level transmitter or float switches.

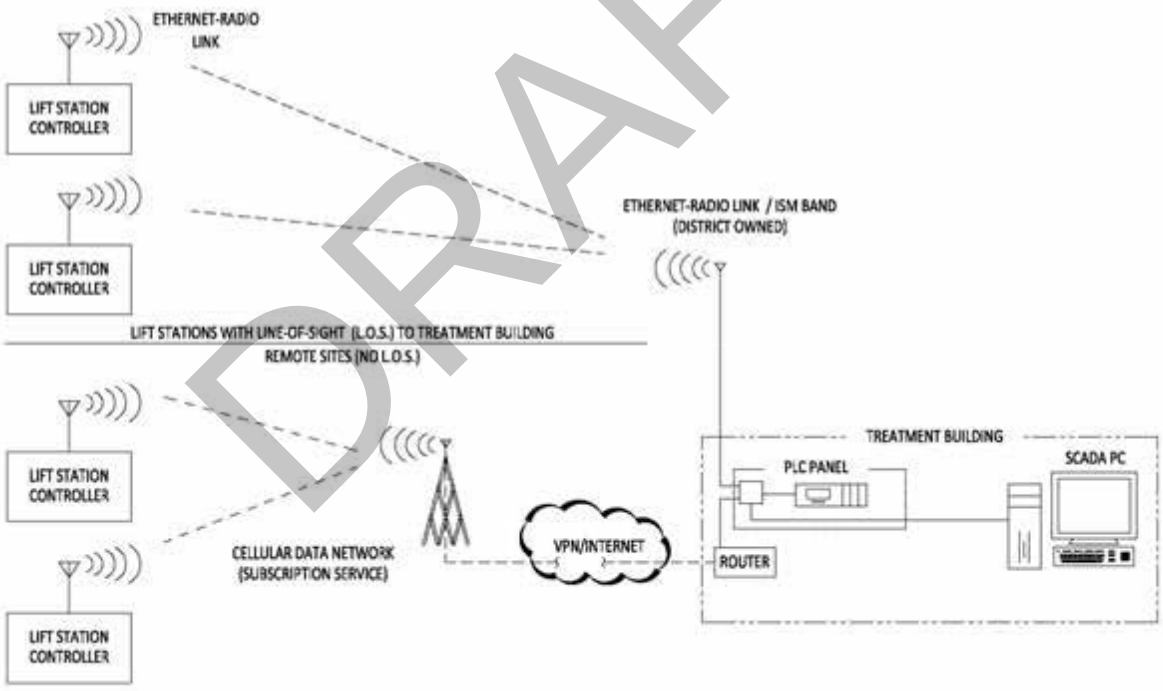
When the Local/Remote mode selector switch is set to Remote and the On-Off-Auto selector switch is set to Auto, the pump will be automatically controlled by the SCADA system and PLC. When the Local/Remote mode selector switch is set to Local and the On-Off-Auto selector switch is set to Auto, the pump will be automatically controlled by the level switches independent of the SCADA system and PLC.

SCADA Control of On–Off–Auto: When the SCADA system is in control of the lift station pump because the Local/Remote mode selector switch is set to Remote and the On-Off-Auto selector switch is set to Auto, and the operator interface controls for that pump will allow the operator to remotely select On-Off-Auto via a pop up control box for that pump.

Radio Communications: Lift stations which have direct line of sight (LOS) with the District's ethernet radio tower which will employ ISM band communications. If a lift station does not have LOS with the radio tower but has LOS with another station that does, then a mesh system would be used whereby a repeater is installed at the LOS station that can carry radio transmissions from the far station to the District's radio tower. Lift Stations without line of site to another station or the District's tower will communicate via a cellular data network by a subscription service.

Currently LS 7 employs cellular communication; it may be possible for nearby stations such as LS 8 and 9 to communicate through LS 7. Distant LSs' such as LS 1 would require cellular communication. Ultimately, a line of sight survey would need to be conducted to determine the appropriate communication needs at each lift station. A radio schematic is presented below in **Figure 10.**

Figure 10 Lift Station Communication Schematic



DRAFT

SCADA Wetwell Level Control: The SCADA system will display the wetwell level in units of feet and will also allow the operator to configure the control point levels for the lift station automatic pump operation; the operator will be able to configure the Start and Stop of the lead and lag pumps based on the wetwell level. If both pumps are in Auto and in SCADA control, the lead will automatically alternate between pump 1 and pump 2.

Pump Motor Starter On Indicators: A Lamp will be installed above the On-Off-Auto selector switch for each lift station pump to indicate that the motor starter is energized. The SCADA system will also show that a pump's motor starter is energized by turning the pump icon to Green.

Pump Elapsed Runtime and Number of Starts: An Elapsed runtime meter will be mounted below the On-Off-Auto selector switch for each lift station pump to show the total hour runtime. The SCADA system will also display daily and total pump runtime meters. Additionally, the SCADA system will display an operator resettable and a non-resettable total meter for cumulative number of pump starts.

Lift Station Flow and Flow Totalization:
The SCADA system will display the real time flow rates in GPM. Daily cumulative and total cumulative gallons will also be displayed on the SCADA system.

Lift Station Alarms:
In the event of a lift station alarm, a red beacon will flash at the lift station. The alarm will also be displayed in the SCADA system and an alert call will be made out to the Duty phone and to the others on the alert list according to the SCADA system call out hierarchy. The proposed alarms and described below in **Table 2.**

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Table 2 Lift Station Alarm Schedule

Alarm	Description
Wetwell High Level	A lift station High Level Alarm will be generated when the lift station's level rises above an operator adjustable level set point in the SCADA system.
Wetwell High-High Level	A lift station High-High Level Alarm will be generated when the lift station's level rises to a level that tips the High-High float switch in the wetwell.
Wetwell Low Level	A lift station Low Level Alarm will be generated when the lift station's level drops below an operator adjustable level set point in the SCADA system.
Wetwell Low-Low Level	A lift station Low-Low Level Alarm will be generated when the lift station's level drops to a level that triggers the Low-Low float switch in the wetwell.
Pump Motor Fail	For each pump motor, a Fail Alarm will be generated when the pump is controlled by the SCADA system and is called to start or stop and does not respond with the running feedback signal. The alarm will be cleared by pushing the reset pushbutton in SCADA or by switching the pump out of Auto at the On-Off-Auto selector switch at the control panel.
Power Fail	A Power Fail Alarm will be triggered when PG&E power is lost and the power fail relay input is activated.
UPS Fail	A UPS Fail Alarm will be triggered when the UPS fail relay input is activated.
Communications Fail	A Communications Fail Alarm will be triggered when the handshake signal between the wastewater plant PLC and the Lift Station PLC fails for a predetermined amount of time. In the event of a communication failure, the lift station will continue to operate via the PLC with the set points last set by the SCADA system. The ability to monitor and remote control the lift station will be lost until the communications is restored.

SCADA Functionality

General: The SCADA operator interface software will display the lift station's status, trigger alerts to auto dial duty phone and others on the call list in the event of an alarm, trend and display runtime information, and allow the operator to remotely control the pumps.

Lift Station Overview Graphic Screen: The Overview graphic will show the status of all of the lift stations on one screen. The operator will be able to quickly see pump status, wetwell levels, status of the Remote/Local and On-Off-Auto selector switches, and whether or not any lift station has an active alarm.

Lift Station Detail Screen: The Lift Station Detail Screen will show a graphic of the lift station and complete lift station status information. It will allow access to control remote pump modes and configure the lift station instrument set points. The operator will be able to see flow meters, totalizers, pump run times, and number of pump starts.

Lift Station Historical Trend Screen: The Historical Trend Screen will allow the operator to bring up historical data to be displayed on the trend chart. That data will include discrete data such as when each pump turned on and off. This feature will inherently allow the operator to see the pump run time duration for each run cycle. The analog trend data will display the continuous historic wet well level over time and the historic flow rate of based on the flow meter readings. The operator will be able to display both discrete and analog trends together to determine the pump performance.

Operator Auditing: The Auditing feature will track all operator configuration changes and any pump control changes performed on the SCADA system. Auditing will identify which operator made the change and a provide time stamp of when the change was made.

SCADA Security: The administrator can assign operator user names, passwords and roles for each operator. This function allows the administrator to control individual operator access to each area of the SCADA system and whether or not he can view only vs. have complete control or only limited control of the system settings/controls.

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Lift Station Evaluation and Recommended Rehabilitation/Improvements

Lift Station 1

Location: Lift Station 1 (LS 1) is located on a narrow embankment between the lakefront of Clear Lake and Highway 20 approximately 1 mile west of the WTP. This station services the west end of the collection system. The upper portion of the lift station structure is above grade and is accessible by a steel catwalk leading to the panel and manhole lid (see **Figure 11** below).

Figure 11 Lift Station 1







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Design Criteria: Sewage and I/I flows collected in this wetwell range from 1,150 GPD during average lake levels to as high as 14,000 GPD during high lake levels. The structure consists of a single wetwell approximately 22 ft in depth with a maximum capacity of 1,140 gallons. Discharge piping consists of approximately 60 ft of 4" DI pipe leading to a nearby manhole in Highway 20. The total dynamic head required for high flows is approximately 31 ft. There are approximately 181 Single Family Equivalent Connections (SFECs') which flow by gravity to this Lift Station (shed area as shown in **Figure 2**).

Condition Analysis

- **Structural**: Infiltration has been identified at some joints in the wetwell during high lake levels. The concrete manhole structure appears to be in fair condition. The wet-well guide railing system is in poor condition due to excessive corrosion. There are no provisions for by-pass pumping if a catastrophic failure occurs at LS 1.
- **Mechanical**: Pumps are over 18 years in age and have reached the end of their life expectancy. They have failed previously and pose a risk due to their condition. The float level controls are also past their expected service life and are unreliable.
- **Piping/Valves**: The existing discharge piping, manifold, gate valves, and check valves appear to be in adequate condition.
- **Electrical**: Currently there is a local remote alarm system and levels are checked by visual inspection. All current alarms are audio and visual at the immediate site only.
- **R/W Adequacy**: Access to the site is very limited and poses complications in the event of an emergency by impeding the mobilization of emergency equipment (i.e. generator, trash pump, etc) to the site. There is no space available on either shoulder of Highway 20, near or around LS 1, for staging of construction or future operations such as running an emergency generator or bypass trash pump.

Proposed Improvements and Costs:

The opinion of probable construction cost for the following improvements are presented in **Table 3** below.

- **Structural**: Infiltration along the joints of the wetwell will be corrected using a bituminous epoxy sealant. A new guide railing system will be needed to replace the existing one. A trash pump quick connect attachment will need to be located under the walk way.
- **Mechanical:** (2) New 3 HP pumps capable of meeting the flow and head requirements specified will be needed to replace the existing pumps. A new level transducer and float system will also be needed to replace the existing floats.
- **Piping/Valves**: With the exception of the WYE and ball valve associated with the new trash pump connection, the existing valves will be retained for future service.
- **Electrical/Control**: A new rail mounted panel will replace the existing panel and will include all of the typical control improvements features previously described above. New conduit and fittings will be constructed as needed. A new magnetic flow meter will be installed under the walk way as well and will function as previously described. A flow meter at this location is needed to monitor pump performance as well as determine the flows entering LS 2 by gravity.

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- **R/W Adequacy**: There appears to be sufficient area to develop a small access entry by placing approximately 140 CY of compacted fill with AB rock to allow access. The ramp will allow operators to back down trailer mounted equipment to the area below the walk way.

Table 3 Opinion of Probable Construction Costs for LS 1

Lift Station No. 1	Labor / Equipment	Materials	Total
Site Work			
Prep, traffic control, MOB	$4,500	NA	$4,500
Earth Work	$18,000	4,500	$22,500
Structural			
Vault	NA	NA	NA
Vault Hatch	$850	$500	$1,350
LS Access Hatch	NA	NA	NA
Rail System	$2,000	$2,500	$4,500
Cone/Barrel/Slab	NA	NA	NA
Panel Canopy/Slab	$1,750	$750	$2,500
Mechanical/Piping			
Pumps	$2,100	$17,000	$19,100
Piping	$1,500	$1,800	$3,300
Valves	$600	$100	$700
Pump Bypass	$1,300	$500	$1,800
Flow Meter	$1,400	$3,000	$4,400
Electrical/Controls			
Panel and Components	$2,700	$19,000	$21,700
Electricians Work	$1,800	$1,000	$2,800
PLC Programming and Installation	$1,800	NA	$1,800
SCADA Programming and Installation	$1,800	NA	$1,800
Startup and Verification	$2,400	$100	$2,500
Total	**$44,500**	**$50,750**	**$95,250**

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Lift Station 2

Location: Lift station 2 is located near the edge of pavement in front the RV Trailer Park at 12840 Island Dr. The structure consists of a dry pit and wetwell. As discussed, it is expected that the improvements needed at this location would include flow metering due to its large service area (1,110 service connections). A flow meter at this location would also be useful in distinguishing flows entering LS 7.

Design Criteria: Investigation and planning for much needed improvements at this LS have been documented within the I/I Study prepared by MC Engineering, under funding by the State Water Resources Control Board (SWRCB). Subsequent pre-design criteria will not be included as part of this pre-design as a result. It is assumed that this LS will be upgraded through funding from the SWRCB SRF Small Community Grant Program, anticipated completion 2017. (Note: prior to the winter of 2016/17 it is recommended that a quick connect for emergency bypassing be constructed at this location).

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Lift Station 3

Location: Lift station 3 is located within a fenced area on the corner of Shoreview Dr and Blue Heron Ct. The structure consists of a fiberglass lined wetwell with a 46" diameter wetwell that is approximately 13' deep (see **Figure 12** below).

Figure 12 Lift Station 3





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Design Criteria: Sewage and I/I flows collected in this service area range from 12,000 GPD during average lake levels to as high as 100,000 GPD during high lake levels. Discharge piping consists of 600 ft of 4" DI pipe. The total dynamic head required for high flows is approximately 70 ft. The shed area for this LS consists of approximately 59 SFECs' (see **Figure 2**).

Condition Analysis:

- **Structural:** The existing wetwell concrete structure is in fair condition. The wetwell guide railing is in poor condition due to excessive corrosion and age. There is no traffic protection as the fence and panel are located immediately north of the edge of pavement, exposed to traffic.
- **Mechanical**: Pumps are over 18 years in age and have reached the end of their life expectancy, and have failed previously and pose a risk due to their condition. The float level controls have exceeded their service life and are unreliable.
- **Piping/Valves**: The existing check valves and gate valves appear to be in relatively good condition. Discharge and manifold piping are in fair condition.
- **Electrical/Control**: There is only a local alarm system in place, the panel is over 15 years old and is in need of new breakers, starters relays and liquid level controls. All current alarms are audio and visual at the immediate site only.
- **R/W Adequacy**: Street access is good with sufficient space for operators and equipment (i.e. generator, trash pump, etc); however there is not enough space to add a flow meter and vault without going into the roadway.

Proposed Improvements and Costs:

The opinion of probable construction cost for the following improvements are presented in **Table 4** below.

- **Structural:** A new guide rail system will be needed to replace the existing. Four to five bollards will be installed to protect the panel/equipment from traffic. A new emergency bypass connection will be installed within the existing vault.
- **Mechanical**: (2) New heavy duty submersible pumps capable of meeting the flow and head requirements will be needed to replace the existing pumps.
- **Piping/Valves**: With the exception of the new WYE fitting and ball valve associated with the new trash pump, no other valves or fittings will be needed to replace the existing ones.
- **Electrical/Control**: A new panel will replace the existing and will include all of the typical control improvements and features previously described. Because the shed area of this LS consists of only 59 connections a flow meter is not necessary at this connection.
- **R/W Adequacy**: No proposed improvements, however the feasibility of placing bollards within the AC of the roadway will need to be investigated. An alternative would consist of relocating the panel within the fenced area to accommodate bollards behind the fence.

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Table 4 Opinion of Probable Construction Costs for LS 3

Lift Station No. 3	Labor / Equipment	Materials	Total
Site Work			
Prep, traffic control, MOB	$1,800	$100	$1,900
Earth Work	$1,400	$700	$2,100
Structural			
Vault	NA	NA	NA
Vault Hatch	NA	NA	NA
LS Access Hatch	NA	NA	NA
Rail System	$1,800	$2,000	$3,800
Cone/Barrel/Slab	NA	NA	NA
Panel Canopy/Slab	$1,300	$500	$1,800
Mechanical/Piping			
Pumps	$2,600	$17,000	$19,600
Piping	$1,000	$1,000	$2,000
Valves	NA	$100	$100
Pump Bypass	$1,150	$1,500	$2,650
Flow Meter	NA	NA	NA
Electrical/Controls			
Panel and Components	$2,700	$19,000	$21,700
Electricians Work	$3,300	$1,500	$4,800
PLC Programming and Installation	$1,800	NA	$1,800
SCADA Programming and Installation	$1,800	NA	$1,800
Startup and Verification	$2,400	NA	$2,400
Total	**$23,050**	**$43,400**	**$66,450**

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Lift Station 4

Location: LS 4 is located on the north end of a subdivision island which constitutes the cul-de-sac of Blue Heron Ct. The wetwell structure consists of a concrete manhole 5' in diameter that is approximately 16 ft in depth. The structure is only accessible by the standard 24" lid in the middle of the roadway as shown below in **Figure 13** below.

Figure 13 Lift Station 4







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Design Criteria: Sewage and I/I flows collected in this service area range from 4,650 GPD during average lake levels to as high as 106,000 GPD during high lake levels. Discharge piping consists of 250 ft of 4" DI pipe. The total dynamic head required for high flows is approximately 35 ft. The shed area for this LS consists of 36 SFECs' (see **Figure 2**).

Condition Analysis:

- **Structural**: The wetwell concrete structure appears to be in adequate condition. There is no guide railing so the existing pumps are retrieved by hooks and a truck mounted hoist. There are serious access issues associated with the wetwell as a result of a narrow, 24-inch diameter access, located on top of an eccentric concrete manhole cone section. This type of design also prevents guide rail construction for pump removal and/or installation and attachment. Quick access is also prevented as a result of this narrow opening and it requires a confined space entry, under dangerous conditions.
- **Mechanical**: Pumps are over 18 years in age and have reached the end of their life expectancy; they have failed previously and pose a risk due to their condition. The float level controls are unreliable due to their age.
- **Piping/Valves:** The existing manifold piping is in poor condition due to excessive corrosion. Both the existing check and gates valves are worn and corroded and are no longer function reliably. The valves are also inaccessible and located in a hazardous space.
- **Electrical/Control**: Currently there is only a local alarm system and levels are checked by visual inspection. The existing panel and electrical components need replacement. The controller is over 30 years in age. There is no telemetry or remote monitoring capabilities.
- **R/W Adequacy**: There is sufficient area within the street for staging of construction and future operations, however the panel is no more than a couple feet from the edge of pavement requiring operators/personnel to stand in the street which is unsafe.

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Proposed Improvements and Costs:
The opinion of probable construction cost for the following improvements are presented in **Table 5** below.

- **Structural**: Removal and installation of pumps is critical for maintenance operations and requires good access and guide rail system for the submersible pumps. In order for a wetwell guide rail system to be installed it is necessary that the concrete eccentric cone be excavated and removed. The cone will be replaced by a 60" precast concrete barrel and slab top. The slab top would provide double door access with H22 loading. A new 4' x 6' precast vault will be needed to house the new trash pump connection. As an alternative, a pre-manufactured wetwell and/or vault meeting the requirements of the existing site may also be considered but would be subject to approval by the engineer. At a minimum, construction sequencing would consist of installing the bypass vault and piping before wetwell improvements such that a trash pump could be used to continue LS service during the wetwell improvements. Due to the location of this LS, some traffic control measures would be necessary.

- **Mechanical**: (2) New heavy duty submersible pumps capable of meeting the flow and head requirements will be needed to replace the existing pumps. A new level control system will also be needed to replace the existing floats.
- **Piping/Valves**: New discharge piping is needed to replace the existing flex hose as well as new manifold piping. The existing check valves and gate valves must be replaced and located outside the wetwell in an easily accessible concrete vault.
- **Electrical/Control:** A new panel will replace the old existing one and will include all of the typical control improvements as previously described: level sensors, PLC, radio communications, generator quick connect, ect; however a new magnetic flow meter will not be necessary at this location due to the small size of the service area.
- **R/W Adequacy**: The new panel will be located away from the road and placed in the easement area near the CMU wall west of the MH.

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Table 5 Opinion of Probable Construction Costs for LS 4

Lift Station No. 4	Labor / Equipment	Materials	Total
Site Work			
Prep, traffic control, MOB	$3,180	NA	$3,180
Earth Work	$3,400	$2,000	$5,400
Temporary Facilities	$4,950	250	$5,200
Structural			
Vault	$1,700	$2,000	$3,700
Vault Hatch	$1,500	$4,000	$5,500
LS Access Hatch	$1,500	$4,000	$5,500
Rail System	$3,000	$2,000	$5,000
Cone/Barrel/Slab	$4,800	$2,000	$6,800
Panel Canopy/Slab	$2,400	$2,000	$4,400
Mechanical/Piping			
Pumps	$2,400	$17,000	$19,400
Piping	$3,000	$2,500	$5,500
Valves	$1,400	$2,000	$3,400
Pump Bypass	$1,400	$1,000	$2,400
Flow Meter	NA	NA	NA
Electrical/Controls			
Panel and Components	$3,400	$19,000	$22,400
Electricians Work	$5,800	$2,000	$7,800
PLC Programming and Installation	$1,800	NA	$1,800
SCADA Programming and Installation	$1,800	NA	$1,800
Startup and Verification	$2,400	NA	$2,400
Total	**$49,830**	**$61,750**	**$111,580**

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Lift Station 5

Location: LS 5 is located on the Island Cir, midway between Blue Heron Ct and Konocti View. The structure consists of a concrete wetwell with a 4.5' diameter that is approximately 19' deep with a fiberglass liner. The manhole is accessible by a 3' x 4' hatch in the roadway as shown below in **Figure 14**.

Figure 14 Lift Station 5



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Design Criteria: Sewage and I/I flows collected in this service area & manhole range from 17,950 GPD during average lake levels to as high as 122,600 GPD during high lake levels. Discharge piping consists of 300 ft of 4" PVC pipe. The total dynamic head required for high flows is approximately 34 ft. The shed area for this LS includes approximately 103 SFECs' and flows from LS 4 (see **Figure 2**).

Condition Analysis

- **Structural**: The concrete/fiberglass wetwell structure, are in adequate condition with the exception of minor I/I at some joints. The existing railing system is in poor condition due to excessive corrosion and age. The access hatch has been damaged and is not rated for H22 loadings.
- **Mechanical**: The pumps have failed previously, and are near the end of their life expectancy. The float level controls are unreliable due to their age.
- **Piping/Valves**: The existing discharge piping, manifold, gate valves, and check valves appear to be in relatively good condition and are accessible in a vault.
- **Electrical/Control**: Currently there is no external alarm system, or telemetry. The existing panel and electrical components are over 25 years old.
- **R/W Adequacy**: The wetwell and pumps are easily accessible from the street and there is adequate area for construction staging, and future operating equipment. However, the valve vault and the electrical panel are located on an easement on private property and are not easily accessible.

Proposed Improvements and Costs:
The opinion of probable construction cost for the following improvements are presented in **Table 6** below.

- **Structural**: Infiltration along the joints will be corrected using a bituminous epoxy sealant. A new railing system will be needed to replace the existing one. A new spring assisted H22 traffic rated hatch will need to replace the existing manhole access.
- **Mechanical**: (2) New heavy duty submersible pumps capable of meeting the flow and head requirements will be needed to replace the existing pumps.
- **Piping/Valves**: With exception of the WYE fitting and ball valve associated with the trash pump bypass connection, no new valves will be needed.
- **Electrical/Control**: A new panel will replace the existing panel and will include all of the typical control features previously described. Due to the small size of this service area, a flow meter at this location is not necessary.
- **R/W Adequacy**: The new panel will need to be mounted within the confines of the existing easements.

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Table 6 LS Opinion of Probable Construction Costs for LS 5

Lift Station No. 5	Labor / Equipment	Materials	Total
Site Work			
Prep, traffic control, MOB	$1,720	$100	$1,820
Earth Work	$2,300	$600	$2,900
Structural			
Vault	NA	NA	NA
Vault Hatch	NA	NA	NA
LS Access Hatch	$1,200	$5,000	$6,200
Rail System	$1,900	$2,000	$3,900
Cone/Barrel/Slab	NA	NA	NA
Panel Canopy/Slab	$1,400	$500	$1,900
Mechanical/Piping			
Pumps	$2,700	$17,000	$19,700
Piping	$1,000	$1,000	$2,000
Valves	$300	$100	$400
Pump Bypass	$1,150	$500	$1,650
Flow Meter	NA	NA	NA
Electrical/Controls			
Panel and Components	$2,700	$19,000	$21,700
Electricians Work	$3,300	$1,500	$4,800
PLC Programming and Installation	$1,800	NA	$1,800
SCADA Programming and Installation	$1,800	NA	$1,800
Startup and Verification	$2,400	NA	$2,400
Total	**$25,670**	**$47,300**	**$72,970**

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Lift Station 6

Location: LS 6 is located near the corner of Schindler St and Lake St. The structure consists of a single wetwell 5' in diameter and approximately 17 ft in depth. The wetwell structure is accessible by the 24" manhole lid in the middle of the roadway as shown below in **Figure 15**.

Figure 15 Lift Station 6







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Design Criteria: Sewage and I/I flows collected in this service area and manhole range from 8,200 GPD during average lake levels to as high as 27,600 GPD during high lake levels. Discharge piping consists of approximately 60 ft of 4" PVC pipe. The total dynamic head required for high flows is approximately 18 ft. The shed area for this LS consists of approximately 57 SFECs' (see **Figure 2**).

Condition Analysis:

- **Structural**: The wetwell concrete structure appears to be in fair condition. There is no railing system and removal of pumps for maintenance is only possible by using hooks and a truck mounted hoist.
- **Mechanical**: The pumps appear to be in fair condition. The float level controls do not function reliably due to their age.
- **Piping/Valves**: The existing manifold piping is in poor condition due to excessive corrosion. Both the existing check and gate valves are inaccessible and unreliable due to age and corrosion.
- **Electrical/Control**: Currently there is only a local alarm system and levels are checked by visual inspection at the immediate site only. The existing panel uses a controller that is over 20 years old. There is no telemetry, automation, or remote alarm in the existing control panel.

Proposed Improvements and Costs:

The opinion of probable construction cost for the following improvements are presented in **Table 7** below.

- **Structural**: The existing 24" eccentric concrete cone opening requires confined space entry and is not sufficient for the needed railing system to retrieve the pumps. In order for a railing system to be installed it is necessary that the eccentric cone be excavated and removed. The cone will be replaced by a 60" barrel and precast slab top. The slab top would provide double door access with H22 loading. As an alternative, a pre-manufactured wetwell and/or vault meeting the requirements of the existing site may also be considered but would be subject to approval by the engineer.
- **Mechanical**: (2) New heavy duty submersible pumps capable of meeting the flow and head requirements will be needed to replace the existing pumps.
- **Piping/Valves**: New discharge piping is needed to replace the existing flex hose as well as new manifold piping. The existing check valves and gate valves must be replaced and located in an outside vault with safe access.
- **Electrical/Control**: A new panel will replace the existing and will include all of the typical control improvements features previously described. A flow meter at this LS is also required to distinguish the flows entering LS 7.
- **R/W Adequacy**: Street access is good and allows for emergency equipment staging as needed with some traffic control measures.

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Table 7 Opinion of Probable Construction Costs for LS 6

Lift Station No. 6	Labor / Equipment	Materials	Total
Site Work			
Prep, traffic control, MOB	$3,180	NA	$3,180
Earth Work	$3,400	$2,000	$5,400
Temporary Facilities	$4,950	250	$5,200
Structural			
Vault	$1,700	$2,000	$3,700
Vault Hatch	$1,500	$4,000	$5,500
LS Access Hatch	$1,500	$4,000	$5,500
Rail System	$3,000	$2,000	$5,000
Cone/Barrel/Slab	$4,800	$2,000	$6,800
Panel Canopy/Slab	$2,400	$2,000	$4,400
Mechanical/Piping			
Pumps	$2,400	$17,000	$19,400
Piping	$3,000	$2,500	$5,500
Valves	$1,400	$2,000	$3,400
Pump Bypass	$1,400	$1,000	$2,400
Flow Meter	$1,400	$3,000	$4,400
Electrical/Controls			
Panel and Components	$2,200	$19,000	$21,200
Electricians Work	$6,800	$2,000	$8,800
PLC Programming and Installation	$1,800	NA	$1,800
SCADA Programming and Installation	$1,800	NA	$1,800
Startup and Verification	$2,400	NA	$2,400
Total	**$51,030**	**$64,750**	**$115,780**

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Lift Station 7

Location: LS 7 is located at the intersection of Keys and Everglade Blvd. The structure consists of a dry pit and wetwell configuration. With the exception of flow from LSs' 10, 11, and 12; all other flows are conveyed from LS 7 to the WWTP which accounts for 95% of flows during wet weather. As mentioned above, it is expected that improvements at this LS would include flow metering. With flow meters at LSs' 2, 6, and 8 the flows generated by the approximate 846 service connections within the LS 7 shed area can be determined allowing for monitoring of flows from the north and south quadrants of the Keys.

Design Criteria: Investigation and planning for much needed improvements at this LS have been documented within the I/I Study prepared by MC Engineering, under funding by the State Water Resources Control Board (SWRCB). Subsequent pre-design criteria will not be included as part of this pre-design. It is anticipated that a new LS will be constructed through funding from the SWRCB SRF Small Community Grant Program, anticipated completion 2017/18.

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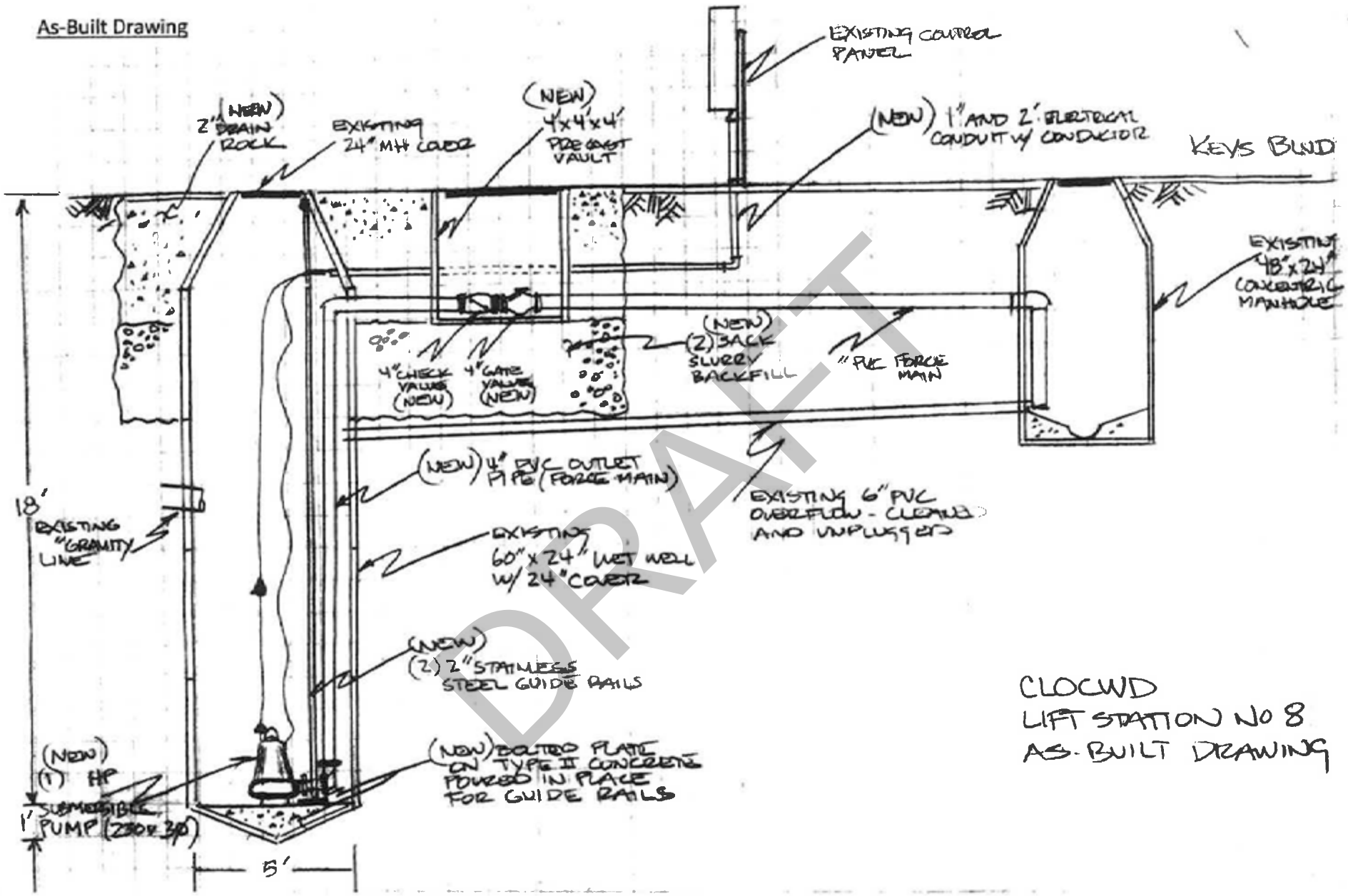
Lift Station 8

Location: LS 8 is located at the intersection of Venus Village and Keys Blvd. The structure consists of a single concrete wetwell 5' in diameter and approximately 17 ft in depth. The structure is accessible by the 36" lid in the middle of the roadway (see **Figure 16** below). In January 2015, significant improvements were made to the LS which included: replacement of submersible pump, modified guide rail system, replacement manifold and outlet piping, installation of an electric pull box, new precast vault with traffic rated lid, and new gate and check valves. An as-built drawing showing these improvements is shown below in **Figure 17**.

Figure 16 Lift Station 8



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LIFT STATION 8 AS-BUILT

Figure 17

Design Criteria: Sewage and I/I flows collected in this manhole range from 8,200 GPD during average lake levels to as high as 27,600 GPD during high lake levels. Discharge piping consists of approximately 60 ft of 4" PVC pipe. The total dynamic head required for conveying high flows is approximately 18 ft. The shed area for this LS consists of approximately 99 SFECs' (see **Figure 2**).

Condition Analysis

- **Structural**: The concrete wetwell structure appears to be in fair condition.
- **Mechanical**: The recently installed pump appears to be in good condition and is functioning well. The float level controls do not function properly due to their age.
- **Piping/Valves**: The recently installed manifold piping, gate, and check valves appear to be in good condition.
- **Electrical/Control**: Currently there is only a local alarm system and levels are checked by visual inspection at the immediate site only. The existing panel uses a controller that is over 20 years old. There is no telemetry, automation, or remote alarm within the existing control panel.
- **R/W Adequacy**: Street access is good for staging of construction and future operating equipment; however the panel is located near the edge of the road presenting operator/personnel safety issues.

Proposed Improvements and Costs:
The opinion of probable construction cost for the following improvements are presented in **Table 8** below.

- **Structural**: No structural improvements are needed at this location.
- **Mechanical**: No mechanical components are included for replacement.
- **Piping/Valves**: The recently installed valves and piping are in good condition; however the piping and valve arrangement within the vault will need to be modified to accommodate the addition of a 4" WYE for the trash pump bypass connection.
- **Electrical/Control**: A new panel will replace the old existing one and will include all of the typical control features previously described.
- **R/W Adequacy**: The new panel should be relocated away from the road to the west near the fence in order to reduce traffic hazards.

DRAFT

Table 8 Opinion of Probable Construction Costs for LS 8

Lift Station No. 8	Labor / Equipment	Materials	Total
Site Work			
Prep, traffic control, MOB	$1,500	NA	$1,500
Earth Work	$900	$500	$1,400
Structural			
Vault	NA	NA	NA
Vault Hatch	NA	NA	NA
LS Access Hatch	NA	NA	NA
Rail System	NA	NA	NA
Cone/Barrel/Slab	NA	NA	NA
Panel Canopy/Slab	$1,500	$1,000	$2,500
Mechanical/Piping			
Pumps	NA	NA	NA
Piping	$300	$100	$400
Valves	NA	$100	$100
Pump Bypass	$600	$1,500	$2,100
Flow Meter	NA	NA	NA
Electrical/Controls			
Panel and Components	$2,700	$19,000	$21,700
Electricians Work	$7,000	$2,000	$9,000
PLC Programming and Installation	$1,800	NA	$1,800
SCADA Programming and Installation	$1,800	NA	$1,800
Startup and Verification	$2,400	NA	$2,400
Total	**$20,500**	**$24,200**	**$44,700**

DRAFT

Lift Station 9

Location: LS 9 is located near the intersection of Keys Blvd and Driftwood Village. The structure consists of a single wetwell 5' in diameter and approximately 20 ft in depth. The structure is accessible by the 36" lid in the middle of the roadway as shown below in **Figure 18**.

Figure 18 Lift Station 9



DRAF

Design Criteria: Sewage and I/I flows collected in this service area range from 12,000 GPD during average lake levels to as high as 54,500 GPD during high lake levels. Discharge piping consists of approximately 35 ft of 4" DI pipe. The total dynamic head required for high flows is approximately 22 ft. The shed area for this LS consists of 257 SFECs' (see **Figure 2**).

Condition Analysis

- **Structural**: The wetwell concrete structure appears to be in fair condition. There is no railing system as the existing pumps are retrieved by hooks and gantry crane. Minor infiltration is evident between joints.
- **Mechanical**: The pumps are fairly new in moderate condition. The float level controls do not function reliably due to their age.
- **Piping/Valves**: The existing manifold piping is in poor condition due to excessive corrosion. The existing check and gates valves are inaccessible, unreliable, and prone to failure.
- **Electrical/Control**: Currently there is a local alarm system and levels are checked by visual inspection at the immediate site only. The existing panel is 11 years old and has proven to be problematic. There is no telemetry, automation, or remote alarm capabilities within the control panel.
- **R/W Adequacy**: Street access is good for staging of construction and future operating equipment; however the panel is located near the edge of the road presenting operator/personnel safety issues.

Proposed Improvements and Costs:

The opinion of probable construction cost for the following improvements are presented in **Table 9** below.

- **Structural**: The existing 36" concrete eccentric cone opening requires confined space entry and is not sufficient for the needed railing system to retrieve the pumps. In order for a railing system to be installed it is necessary that the eccentric cone be excavated and removed. The cone will be replaced by a 60" barrel and precast lid. The lid would provide double door access with an H22 traffic rated loading. A new 4' x 6' precast vault will be needed to house the new check valves, gate valves, and trash pump connection. As an alternative, a pre-manufactured wetwell and/or vault meeting the requirements of the existing site may also be considered but would be subject to approval by the engineer.
- **Mechanical**: (2) New heavy duty submersible pumps, capable of meeting the flow and head requirements, will be needed to replace the existing pumps.
- **Piping/Valves**: New discharge piping is needed to replace the existing flex hose as well as new manifold piping. The existing check valves and gate valves must be replaced and located outside in a vault with good access.
- **Electrical/Control**: A new panel will replace the existing panel and will include all of the typical control features previously described. A flow meter at this location is not necessary considering that flows would be measured at LS 8.
- **R/W Adequacy**: The new panel should be relocated away from the road to the west near the fence to reduce traffic hazards.

DRAFT

Table 9 Opinion of Probable Construction Costs for LS 9

Lift Station No. 9	Labor / Equipment	Materials	Total
Site Work			
Prep, traffic control, MOB	$3,180	$500	$3,680
Earth Work	$3,400	$2,000	$5,400
Temporary Facilities	$4,950	$250	$5,200
Structural			
Vault	$1,700	$2,000	$3,700
Vault Hatch	$1,500	$4,000	$5,500
LS Access Hatch	$1,500	$4,000	$5,500
Rail System	$3,000	$2,000	$5,000
Cone/Barrel/Slab	$4,800	$2,000	$6,800
Panel Canopy/Slab	$2,400	$2,000	$4,400
Mechanical/Piping			
Pumps	$2,400	$17,000	$19,400
Piping	$3,000	$2,500	$5,500
Valves	$1,400	$2,000	$3,400
Pump Bypass	$1,400	$1,000	$2,400
Flow Meter	$1,400	$3,000	$4,400
Electrical/Controls			
Panel and Components	$2,200	$19,000	$21,200
Electricians Work	$6,800	$2,000	$8,800
PLC Programming and Installation	$1,800	NA	$1,800
SCADA Programming and Installation	$1,800	NA	$1,800
Startup and Verification	$2,400	NA	$2,400
Total	**$51,030**	**$65,250**	**$116,280**

DRAFT

Lift Station 10

Location: LS 10 is located approximately 700 ft north of the WWTP west of Orchard Shores Dr. near the corner of Schindler St and Lake St. The structure consists of a single wetwell 8' in diameter and approximately 11 ft in depth. The structure is accessible by the 2' x 4' door as shown below in **Figure 19**.

Figure 19 Lift Station 10





DRAFT

Design Criteria: Sewage and I/I flows collected in this station reach as high as 350,000 GPD during high precipitation events; the flows are affected minimally by lake level. Discharge piping consists of approximately 120 ft of 4" AC pipe conveying flows to a junction where flows are combined with the FM from LS 7 and 11 and sent to the headworks of the WWTP. The total dynamic head required for conveying high flows is approximately 39 ft. The shed area for this LS consists of 305 SFECs' (see **Figure 2**).

Condition Analysis

- **Structural**: The concrete wetwell structure appears to be in fair condition. The railing system is in poor condition due to excessive corrosion.
- **Mechanical**: Recently [August 2016] the pumps failed due to excessive rags and debris, consequently the pumps have been replaced by new heavy duty submersibles.
- **Piping/Valves**: The existing manifold piping is in poor condition due to excessive corrosion. Both the existing check and gates valves are in unknown condition and may need replacement.
- **Electrical/Control**: Currently there is a local alarm system exists and levels are checked by visual inspection at the immediate site only. There is no telemetry, automation, or remote alarm within the control panel.
- **R/W Adequacy**: Road access is good with adequate room for staging emergency equipment and operator access. The site is fenced for security, but lacks sufficient lighting.

Proposed Improvements and Costs:
The opinion of probable construction cost for the following improvements are presented in **Table 10** below.

- **Structural**: New railings will be needed to replace the existing rail system for quick access. A new 4' x 6' vault will be needed to house the new flow meter and emergency bypass pump connection.
- **Mechanical:** No proposed improvements.
- **Piping/Valves**: The existing discharge piping and valves are in unknown condition and may be in need of improvement. New valves and piping will be limited to the installation of a new trash pump connection as described in the typical improvements.
- **Electrical/Control:** A new panel will replace the old existing one and will include all of the typical control improvements features previously described. A flow meter located at this station would be necessary considering the size of the service area.
- **R/W Adequacy:** Site lighting is needed to improve safety and ease of operation.

DRAFT

Table 10 Opinion of Probable Construction Costs for LS 10

Lift Station No. 10	Labor / Equipment	Materials	Total
Site Work			
Prep, traffic control, MOB	$1,100	$500	$1,600
Earth Work	$2,200	$500	$2,700
Structural			
Vault	$1,800	$2,000	$3,800
Vault Hatch	$1,150	$1,500	$2,650
LS Access Hatch	$1,800	$3,000	$4,800
Rail System	$2,100	$2,200	$4,300
Cone/Barrel/Slab	NA	NA	NA
Panel Canopy/Slab	$1,200	$2,000	$3,200
Mechanical/Piping			
Pumps	NA	NA	NA
Piping	$1,400	$1,000	$2,400
Valves	$900	$1,500	$2,400
Pump Bypass	$1,500	$1,500	$3,000
Flow Meter	$1,500	$3,000	$4,500
Electrical/Controls			
Panel and Components	$2,700	$19,000	$21,700
Electricians Work	$4,100	$1,500	$5,600
PLC Programming and Installation	$1,800	NA	$1,800
SCADA Programming and Installation	$1,800	NA	$1,800
Startup and Verification	$1,800	NA	$1,800
Total	**$28,850**	**$39,200**	**$68,050**

DRAFT

Lift Station 11

Introduction: LS 11 is located approximately a quarter mile southwest of the WWTP. Unlike the other stations, pneumatic air ejectors are used instead of submersible pumps. The structure consists of a dry pit approximately 8 ft in diameter and 16 ft in depth. The dry well houses a pneumatic ejector consisting of (2) 30 gallon pots. The dry well is accessible by the wood building directly above it which also houses the panel, circuit breaker and compressor as shown below in **Figure 20**.

Figure 20 Lift Station 11





Design Criteria: Sewage and I/I flows collected in this manhole reach 12,000 GPD during intense precipitation events; I/I flows are not impacted significantly by high lake levels at this station. Most of the flow conveyed by this LS are from the LS 12 shed area as there are no service connections which drain directly to this LS. The discharge piping consists of approximately 1850' of 4" AC piping to existing junctions with flows from LS 7 and 10 before reaching the headworks of the WWTP (see **Figure 2**).

Condition Analysis:

- **Structural**: The dry-pit structure is in fair condition. The structural integrity of the wood structure should be evaluated. Due to the remote location, minor vandalism has been reported.
- **Mechanical:** The old pneumatic ejectors and air compressor are in fair condition, however it should be noted that replacement parts have become less available for the aging ejectors.

- **Piping/Valves**: The existing discharge piping and manifold are in fair condition.
- **Electrical/Control**: Currently there is only a local alarm system and levels are checked by visual inspection. There is no telemetry, automation, or alarm capabilities within the existing control panel, however an existing SCADA antenna is mounted at the site to relay radio communications from LS 12.
- **R/W Adequacy**: Road access is good with adequate room for staging emergency equipment and operator access.

Proposed Improvements and costs:
The opinion of probable construction cost for the following improvements are presented in **Table 11** below.

- **Structural**: A new 4' x 6' vault will be needed to house an emergency pump bypass connection.
- **Mechanical:** A new flow meter will be added to this station as part of the typical improvements previously described. While the existing equipment is in fair condition there is no immediate need for improvements.
- **Piping/Valves**: No immediate improvements to the existing discharge piping or valves are necessary other than the required fittings and ball valves associated with the new trash pump connection as described in the typical improvements.
- **Electrical/Control:** Currently there is a limited alarm system and levels checked by visual inspection at the immediate site only. The existing panel is approximately 30 years old. There is no telemetry. The existing panel will be replaced with a new one as described in the typical improvements, except the NEMA 4 rating will not be necessary due to the protection provided by the existing structure.
- **R/W Adequacy**: No improvements required.

Alternative Improvement:
As mentioned the housing for this LS is in questionable condition, and further maintenance of the ejectors may become problematic with the diminishing supply of replacement parts. Rather than rehabilitation, the complete demolition (or abandonment) of LS 11 should be considered whereby a new force main would convey wastewater directly to the WWTP effectively bypassing the gravity pipes between LS 12 and 11.

DRAFT

Table 11 Opinion of Probable Construction Costs for LS 11

Lift Station No. 11	Labor / Equipment	Materials	Total
Site Work			
Prep, traffic control, MOB	NA	NA	NA
Earth Work	$1,650	$500	$2,150
Structural			
Vault	$1,700	$1,500	$3,200
Vault Hatch	$1,150	$1,000	$2,150
LS Access Hatch	NA	NA	NA
Rail System	NA	NA	NA
Cone/Barrel/Slab	NA	NA	NA
Panel Canopy/Slab	$1,150	$250	$1,400
Mechanical/Piping			
Pumps	NA	NA	NA
Piping	NA	NA	NA
Valves	NA	$100	$100
Pump Bypass	$1,700	$1,500	$3,200
Flow Meter	$1,500	$3,000	$4,500
Electrical/Controls			
Panel and Components	$2,700	$19,000	$21,700
Electricians Work	$1,700	$1,000	$2,700
PLC Programming and Installation	$1,800	NA	$1,800
SCADA Programming and Installation	$600	NA	$600
Startup and Verification	$1,800	NA	$1,800
Total	**$17,450**	**$27,850**	**$45,300**

DRAFT

Lift Station 12

Location: LS 12 is located approximately 700 feet northeast of the intersection Elem Rd and Pomo Rd. This LS was recently repaired with grant money received from Elem Indian Reservation. Further improvements to this LS are beyond the scope of this project.

DRAFT

Opinion of Probable Construction Cost

The cost estimates previously presented above for each LS were prepared in accordance with Class 3 estimates defined by the Association for the Advancement of Cost Engineering International (AACEI). The classifications are intended to provide a guideline for generally-accepted cost engineering practices, the Class 3 estimate is defined as:

Generally prepared to form the basis for the project authorization, and/ or funding. Typically, engineering is from 10 percent to 40 percent complete, and would comprise process flow diagrams, preliminary piping runs for major processes, facility layout drawings, and essentially complete process and facility equipment lists. This estimate becomes the project control or project budget estimate until more detailed estimates are completed. Examples of methods used would be a high degree of detailed unit cost and quantity takeoffs for major processes. Factoring and/ or scale-up factors can be used for less significant or support areas of the project. This type of estimate requires a great deal of time to prepare, where actual equipment and processes have been designed. The typical expected accuracy range for this class estimate are -10 percent to -20 percent on the low side and +10 percent to +30 percent on the high side.

A summary of the costs for all projects discussed in the TM are presented below in **Table 12**.

DRAFT

Table 12 Opinion of Probable Construction Costs from Conceptual System Wide Lift Station Pre-design Improvements

LS No.	Labor / Equipment Cost	Materials Cost	Total Costs
1	$44,500	$50,750	$95,250
3	$23,050	$43,400	$66,450
4	$49,830	$61,750	$111,580
5	$25,670	$47,300	$72,970
6	$51,030	$64,750	$115,780
8	$20,500	$24,200	$44,700
9	$51,030	$65,250	$116,280
10	$28,850	$39,200	$68,050
11	$17,450	$27,850	$45,300
Total:			$736,360
		10% Contingency	$73,636
Total with contingencies:			$809,996
	10% Subcontractor Markup		$81,000
Total Construction Cost Estimate:			$890,996

The estimates shown above are reflective of the information available while the estimate was prepared. The final costs of the project will depend on actual labor and material costs, market conditions, site conditions, contract terms, final project scope, and other variable factors. As a result, the final project costs will vary from the estimate presented here.

EXHIBIT 1D

CLOCWD USDA Wastewater System Improvements – Lift Station Upgrades/Improvements
Tech Memo No. 2.

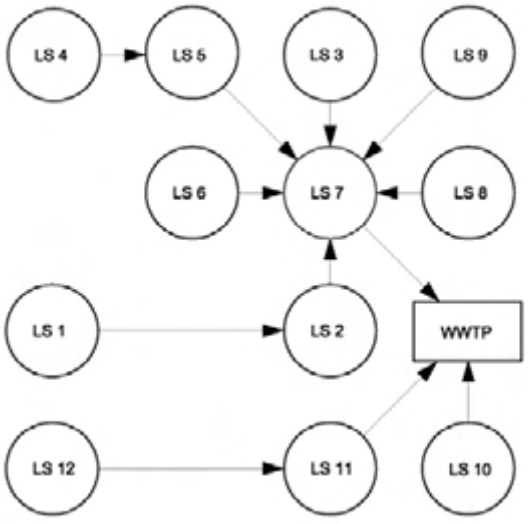
CLOCWD USDA Wastewater System Improvements – Lift Station Upgrades/Improvements Technical Memo No.2

System Overview and Assumptions

The majority of the District's lift stations were constructed in 1966 with additional stations being added over a fifteen year period. Most lift stations were built concurrent with the construction of the Keyes. Due to the difficulties associated with constructing gravity flow sewers in this area, system of multiple lift stations (LSs') and force mains were constructed instead.

The system consists of 12 LSs' and is presented schematically in **Figure 1** below. LS No. 7 is considered the central lift station and pumps approximately 90% of the raw sewage flows to the WWTP. A 10 inch force main conveys flows from Lift Station No. 7 to the WWTP. LSs' 1, 3, 4, 5, 6, 8, 9, and 10 are considered submersible lift stations consisting of a single wet well. Lift stations 2 and 7 are dry pit type stations with adjacent wet-wells. Lift station number 11 is a pneumatic ejector station that operates using a compressed air system. A system flow schematic, LS shed area map, and LS system map are presented below in **Figure 1, 2** and **3** below.

Figure 1



SA 7

SA 3

SA 5

SA 2

SA 9

SA 8

SA 4

SA 6

SA 1

SA 10

SA 12

Shed Area	Area (ac)	No. of Service Connections
1	39	181
2	253	1,110
3	15	59
4	9	36
5	28	103
6	15	57
7	227	846
8	22	99
9	47	257
10	92	305
11	53	0
12	26	33

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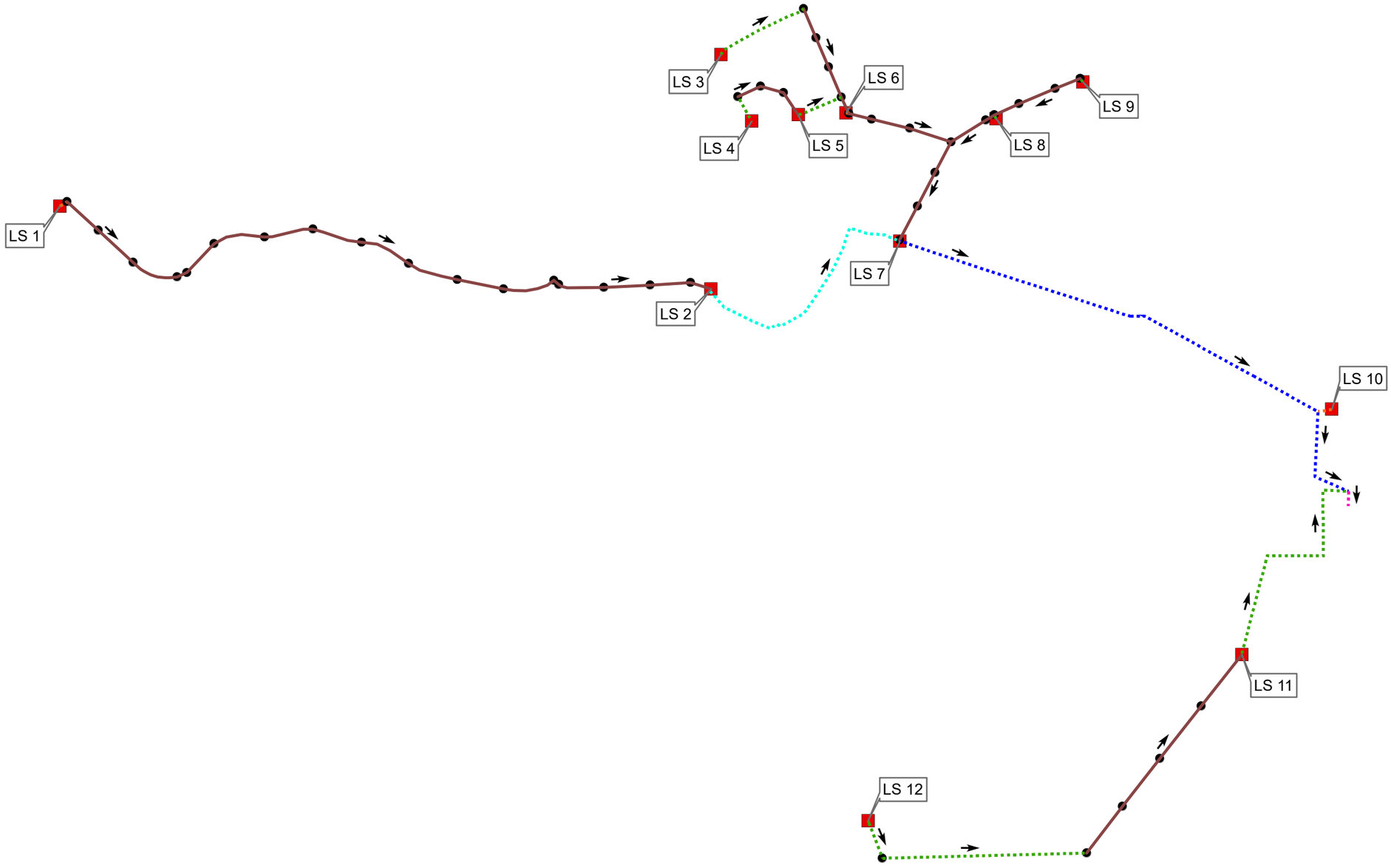
CLEARLAKE OAKS COUNTY WATER DISTRICT
WATER MASTER PLAN

FIGURE 2:

SANITARY SEWER LIFT STATION SHED AREAS

N

0 0.125 0.25 0.5 Miles



Legend

Object
- Manhole(s) on Gravity Line
- Lift Station

Force Main
- FM, 4
- FM, 6
- FM, 8
- FM, 10
- FM, 12

Gravity Flow
- Diameter Vary

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CLEARLAKE OAKS COUNTY WATER DISTRICT
WATER MASTER PLAN

FIGURE 3:
SANITARY SEWER LIFT STATION SHED SYSTEM

0 0.125 0.25 0.5 Miles

N

The I/I study previously prepared by MC Engineering last year found that the area identified as the "Keys" was responsible for a majority of the inflow and infiltration within the collection system during high lake levels. This is largely due to the fact that a majority of the manhole inverts and pipes within this area fall below the lake level during events which cause high lake levels. The lift stations servicing this area include lift stations: 2, 3, 5, 6, 8, and 9. It should be mentioned LS 2 collects infiltration from connections on Island Dr as well as inflow from connections on the mountain side north west of Highway 20. The flow from these stations are pumped to LS 7 (also located in the keys) where flow is then pumped directly to the headworks of the WWTP. Lift stations 1 and 4 are also impacted by lake level but contribute relatively less flow. Lift stations 10, 11, and 12 are not impacted by the lake level but do convey I/I flows produced directly by rainfall. The cumulative flows of the system which enter the headworks of the WWTP as a function of lake level are shown below in **Figure 4**.

Figure 4 WWTP Influent Flow to Lake Level Correlation

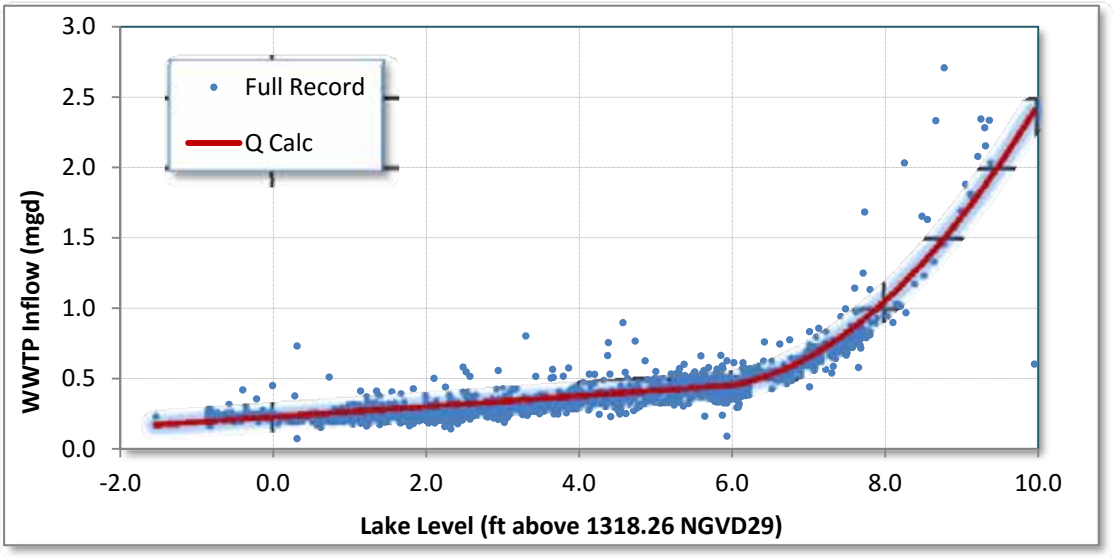


Figure 4 above presents the influent to lake level correlation based on data collected from 2010 to 2015. The regression curve shows that I/I is proportional, on a linear basis, to the lake level for elevations below 6 feet relative to the Rumsey gage. Once the lake level exceeds 6 feet a significant portion of the collection system within the Keys is exposed to I/I resulting in an exponential increase in influent flow to lift station 7 as the lake level continues to rise.

During the floods in 1983 lift station 7 was completely flooded which required major improvements. The lift station's capacity was upgraded and during the floods of 1986 the collection system remained in operation. During this upgrade it was found that a capacity of at least 2.1 mgd at lift station 7 was adequate in preventing sewage or sewage-contaminated water from escaping the collection system during relatively high lake levels. It was also found that if the pump capacity were to increase then I/I flows would also increase, being limited only by the pump capacity. The consequence of this situation is

that for high lake levels with a return interval greater than ten years the I/I correction necessary to reduce flows at lift station 7 would require essentially a complete rehabilitation/replacement of the collection system within the Keys area.

For this reason, the proposed improvements identified by this pre-design report are intended to enhance the system's reliability, serviceability, safety, and monitoring capabilities; such that preventative actions/maintenance may be taken by operators in maintaining lift station service to ensure greater environmental protection and a safer work environment.

Due to limited funding and lack of detailed and extensive operating data the following assumptions were used in the preliminary 10% design report:

- Lift Station design capacity
- I/I Improvements-flow benefits, if any
- Design input from operators
- Overall structural integrity of wet-wells
- Conflicts with other "dry utilities"
- Prioritization of improvements, if necessary
- Pump model and make consistency
- Panel configuration and design consistency
- Force main condition is assumed to be adequate, except for portions of forcemains from lift station no. 11. Note; VFD and soft starts to be used on critical LS's

Typical System Wide Lift Station Improvements

The proposed improvements primarily consist of upgrading the electrical and control system to allow remote monitoring and operation of each lift station, as well as the structural and mechanical cost-effective rehabilitation/improvements for extended service life. The electrical and control system upgrades are typical for the entire system except stations No. 2, 7, and 12. An assessment of each lift station (No. 1 through 12) will describe the existing conditions and rehabilitation specific to each lift station and include the replacement or modification of existing:

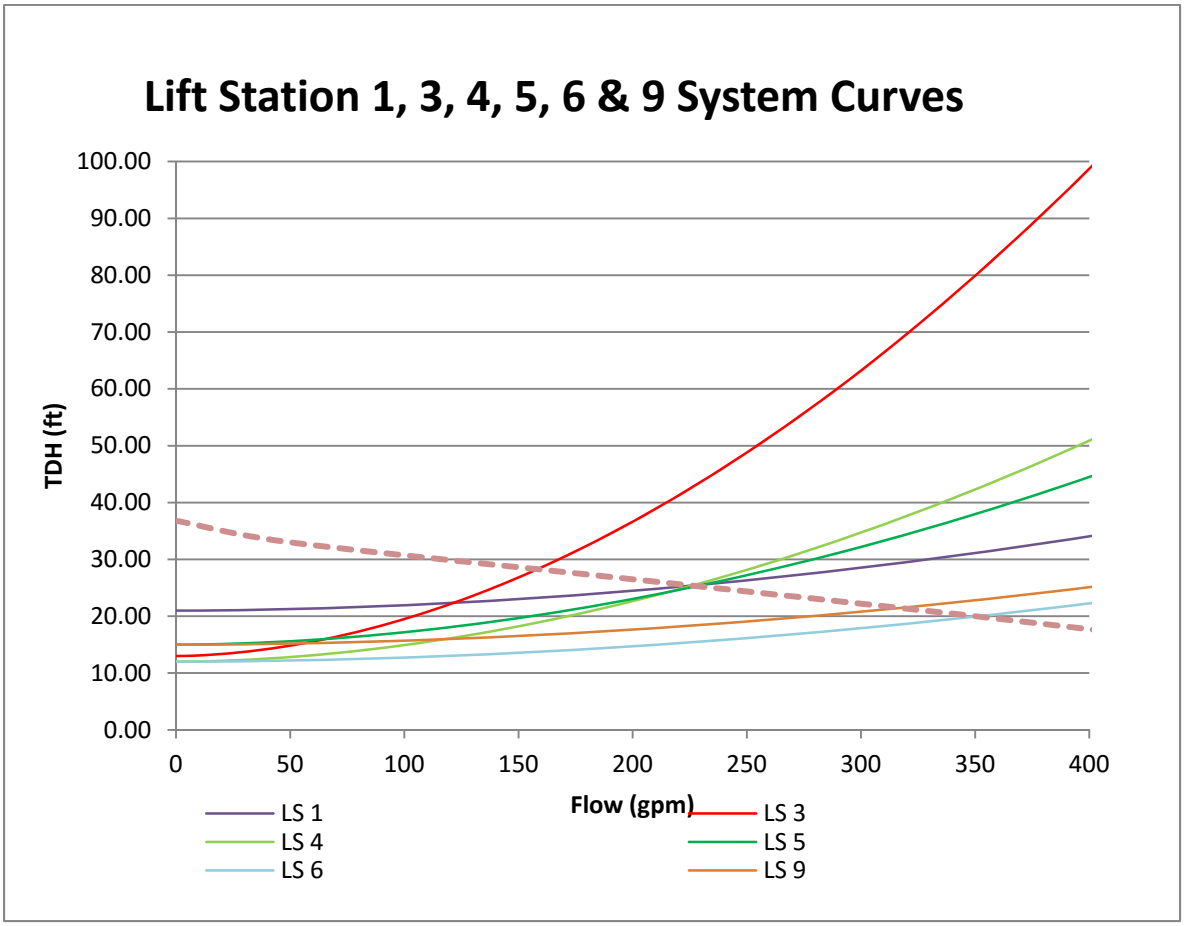
- submersible pumps
- Wet-well structures
- guide railings, and flange connections
- check and gate valves,
- miscellaneous appurtenances
- electrical and controls to include SCADA
- accessibility & operator safety issues
- location/logistics

Typical Mechanical/Equipment/Structural System Improvements

Submersible Pumps: With the exception of LSs' 8, 10, and 11 each aforementioned lift stations will have the existing pumps replaced with a new heavy duty submersible sewage pumps. The pumps at station 8 were recently replaced with a submersible pumps which are adequate to meet existing needs and is not included as part of this project. Recently, the pumps at LS 10 failed from debris and rags. Failure at this location has been a recurring theme primarily due to excessive debris, the pumps will need to be replaced by (2) 7.5 Hp chopper pumps to avoid further pump failures**.** Lift station 11 utilizes pneumatic injectors which will not be replaced.

For ease of operation and maintenance a heavy duty type submersible model will be used to accommodate the seasonal change in waste flows associated with low and high lake levels. System curves to be based on a ITT Flyght performance curve. The system curves for lift stations 1, 3, 4, 5, 6, and 9 are shown below in **Figure 5** where the dashed line represents the proposed pump curve.

Figure 5 Lift Station System Curves



Emergency Quick Connect Pump Bypass: All of the lift stations, except LS 8 and LS 9, will be equipped with a (districts existing) trash pump quick connection such that sewage can be pumped from the wet well back into the discharge piping to mitigate a catastrophic LS failure. The connection would consist of a ductile iron wye equipped with a ball valve and quick connect coupler for manual operation located in a vault. The ability to remove sewage from every wet well is critical to the District's ability to prevent potential sewer system overflows (SSO) and protect the environment.

Pump Guiderail System: Currently many of the wet wells (constructed as manholes) do not have pump guide rail systems, existing guide rails are corroded and are in need of replacement. Retrieving the pumps for maintenance requires lowering a hook into the wet well and lifting equipment with a truck mounted hoist. This process unsafe as it exposes personnel to hazards; and is relatively time consuming considering the immediate need for access during an emergency. For immediate access to the pumps at ground level a guide rail system is recommended at each lift station as a typical improvement. The use of a guide rail system would also replace any flex hose with standardized discharge piping and improve operator safety.

Wet well Structure: At LSs' 4, 6, and 9 the existing concrete manhole cone dimension do not allow typical pump removal and must be removed for the installation of a more efficient guide rail system.

The cones will need to be replaced with concrete barrel extension including a double door access hatch to accommodate pump removal. Wet well showing infiltration among joints and other areas are to be repaired using cementitious material and/or epoxy coating as needed. The basic construction sequencing for LSs' 4, 6, and 9 would (at a minimum) include:

1) Construction of a new vault and pump bypass
2) Transfer of power to temporary trash pump for bypassing flows
3) Excavation of concrete concentric cone, and installation of new equipment

Typical Electrical and Control System Improvements

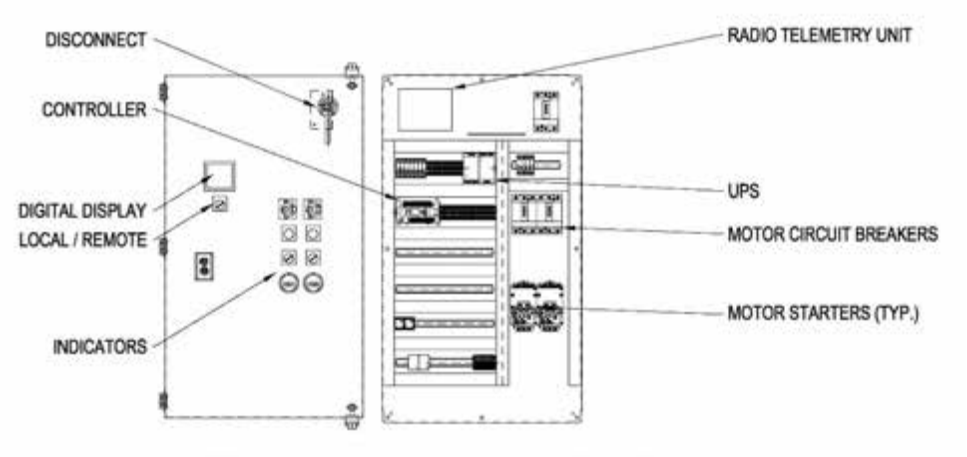
Instrumentation and Control Hardware

Typical Lift Station Control System: The goal in improving the electrical and control systems of each lift station is to develop a standard such that the control enclosure, transfer switch, generator inlet receptacle, PG&E meter and service breaker components which are identical at each lift station and are all mounted, in a similar fashion, to the backboard. The intent is to standardize the equipment for the ease of operation, and improve the system capabilities and features of the system as a whole.

Control System Enclosure: Each lift station will have a standard white powder coated NEMA Type 3R vented control enclosure. A dual thermostat with individual high and low temperature set points will control the enclosures built in fan and also the heater. The enclosure will also have a panel light fixture operated by a door switch and a padlocking wing knob door latch.

Dead Front Panel Controls: The enclosure is equipped with a dead front panel which will prevent the operator's exposure to live parts. A Thru-Door Rotary Switch located on the dead front panel will operate the main disconnect and motor circuit breakers. These switches can also be used by maintenance for lockout tag out functions. A Local / Remote mode selector switch, a digital level read out, Hand-Off-Auto selector switches, run indicator lamps, and runtime meters for Pump 1 and Pump 2 will also be located on the dead front panel. An elevation of the dead front panel is shown below in **Figure 6**

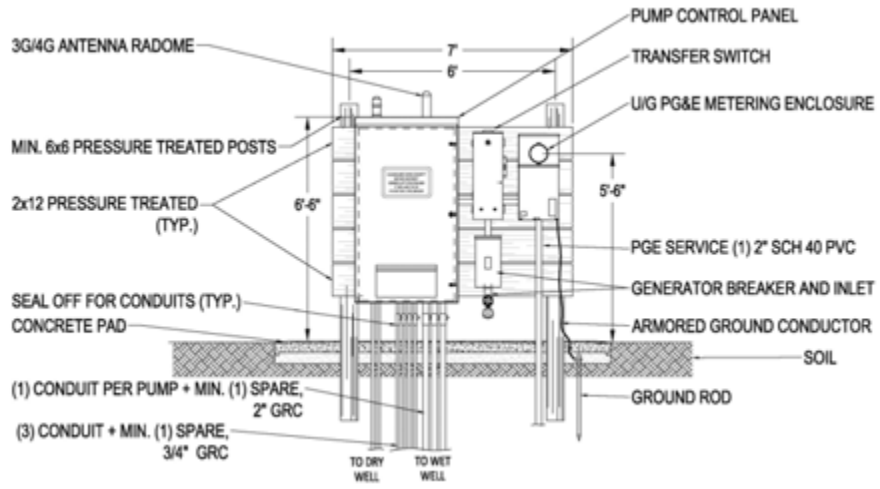
Figure 6 Dead Front Panel Elevation



Control Panel Components: The main components mounted to the control panel will include the main circuit breaker, motor circuit breakers, motor starters, PLC controller, radio telemetry equipment, surge suppressor, uninterruptable power source (UPS), control power circuit breakers, control relays, terminals, and intrinsically safe barriers to interface with the float switches and analog level sensor located in the wet well. Recently, many of the existing lift stations were upgraded to provide transfer switches and associated equipment to interface with backup generators; these components will be

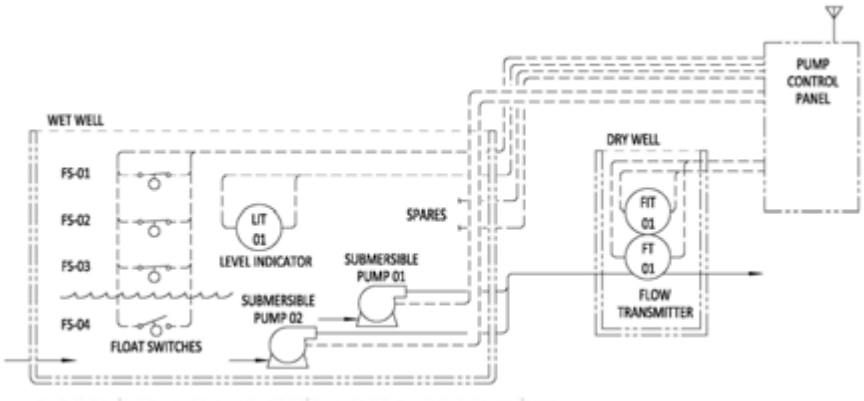
retained and integrated into the new panels. An elevation of the control panel is shown below in **Figure 7**.

Figure 7 Control Panel Elevation



Field Instruments: A submersible level transmitter will be used as the primary wet well level indicator; this device will measure the hydrostatic pressure from the bottom of the wet well to determine the liquid level and produce a continuous 4-20mA analog signal output relative to a fixed level range. Four float switches will be used as a backup method to determine the liquid level and thus when to start and stop the lead and lag pumps and also will provide for a high level alarm. Selected lift stations will also have an electromagnetic flow meter which will measure the rate of flow which we will use for metering and, flow totals and also will be used to determine pump performance. A schematic of typical instrumentation improvements are shown below in **Figure 8.**

Figure 8 Instrumentation Schematic



Operation and Control Strategy

Lift Station Local/Remote and On–Off–Auto Selector Switches: Each lift station pump will have an On-Off-Auto selector switch on the control panel. When the pumps selector switch is in the On position, the pump will run regardless of the position of the Local/Remote mode selector switch and independent of the wet well level transmitter or float switches. Likewise, when the On-Off-Auto selector switch is in the Off position, the pumps motor starter will turn off and remain off regardless of the position of the Local/Remote mode selector switch and independent of the wet well level transmitter or float switches.

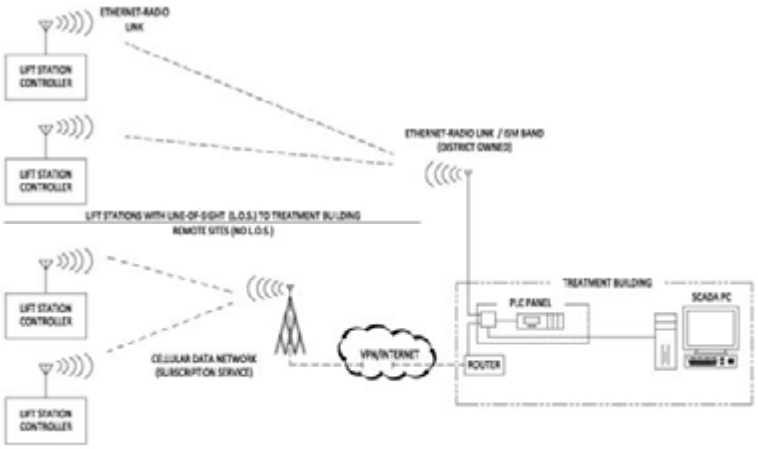
When the Local/Remote mode selector switch is set to Remote and the On-Off-Auto selector switch is set to Auto, the pump will be automatically controlled by the SCADA system and PLC. When the Local/Remote mode selector switch is set to Local and the On-Off-Auto selector switch is set to Auto, the pump will be automatically controlled by the level switches independent of the SCADA system and PLC.

SCADA Control of On–Off–Auto: When the SCADA system is in control of the lift station pump because the Local/Remote mode selector switch is set to Remote and the On-Off-Auto selector switch is set to Auto, the operator interface controls for that pump will allow the operator to remotely select On-Off-Auto via a pop up control box for that pump.

Radio Communications: Lift stations which have direct line of sight (LOS) with the District's ethernet radio tower will employ ISM band communication. If a lift station does not have LOS with the radio tower but has LOS with another station which does, then a mesh system would be used whereby a repeater is installed at the LOS station which would carry radio transmission from the far station to the Districts radio tower. Lift Stations without line of site to another station or the districts tower will communicate via a cellular data network by a subscription service.

Currently LS 7 employs cellular communication; it may be possible for nearby stations such as LS 8 and 9 to communicate through LS 7. Distant LSs' such as LS 1 would require cellular communication. Ultimately, a line of sight survey would need to be conducted to determine the appropriate communication needs at each lift station. A radio schematic is presented below in **Figure 9.**

Figure 9 Lift Station Communication Schematic



SCADA Wet Well Level Control: The SCADA system will display the wet well level in units of feet and will also allow the operator to configure the control point levels for the lift station automatic pump operation; the operator will be able to configure the Start and Stop of the lead and lag pumps based on the wet well level. If both pumps are in Auto and in SCADA control, the lead will automatically alternate between pump 1 and pump 2.

Pump Motor Starter On Indicators: A Lamp will be installed above the On-Off-Auto selector switch for each lift station pump to indicate that the motor starter is energized. The SCADA system will also show that a pump's motor starter is energized by turning the pump icon to Green.

Pump Elapsed Runtime and Number of Starts: An Elapsed runtime meter will be mounted below the On-Off-Auto selector switch for each lift station pump to show the total hour runtime. The SCADA system will also display daily and total pump runtime meters. Additionally, the SCADA system will display an operator resettable and a non-resettable total meter for cumulative number of pump starts.

Lift Station Flow and Flow Totalization:
The SCADA system will display the real time flow rates in GPM. Daily cumulative and total cumulative gallons will also be displayed on the SCADA system.

Lift Station Alarms:
In the event of a lift station alarm, a red beacon will flash at the lift station. The alarm will also be displayed in the SCADA system and an alert call will be made out to the Duty phone and to the others on the alert list according to the SCADA system call out hierarchy. The proposed alarms and described below in **Table 1.**

Table 1 Lift Station Alarm Schedule

Alarm	Description
Wet Well High Level	A lift station High Level Alarm will be generated when the lift station's level rises above an operator adjustable level set point in the SCADA system.
Wet Well High-High Level	A lift station High-High Level Alarm will be generated when the lift station's level rises to a level that tips the High-High float switch in the wet well.
Wet Well Low Level	A lift station Low Level Alarm will be generated when the lift station's level drops below an operator adjustable level set point in the SCADA system.
Wet Well Low-Low Level	A lift station Low-Low Level Alarm will be generated when the lift station's level drops to a level that triggers the Low-Low float switch in the wet well.
Pump Motor Fail	For each pump motor, a Fail Alarm will be generated when the pump is controlled by the SCADA system and is called to start or stop and does not respond with the running feedback signal. The alarm will be cleared by pushing the reset pushbutton in SCADA or by switching the pump out of Auto at the On-Off-Auto selector switch at the control panel.
Power Fail	A Power Fail Alarm will be triggered when PG&E power is lost and the power fail relay input is activated.
UPS Fail	A UPS Fail Alarm will be triggered when the UPS fail relay input is activated.
Communications Fail	A Communications Fail Alarm will be triggered when the handshake signal between the wastewater plant PLC and the Lift Station PLC fails for a predetermined amount of time. In the event of a communication failure, the lift station will continue to operate via the PLC with the set points last set by the SCADA system. The ability to monitor and remote control the lift station will be lost until the communications is restored.

SCADA Functionality

General: The SCADA operator interface software will display the lift stations status, trigger alerts to auto dial duty phone and others on the call list in the event of an alarm, trend and display runtime information, and allow the operator to remotely control the pumps.

Lift Station Overview Graphic Screen: The Overview graphic will show the status of all of the lift stations on one screen. The operator will be able to quickly see pump status, wet well levels, status of the Remote/Local and On-Off-Auto selector switches, and if any lift station has an active alarm.
Lift Station Detail Screen:
The Lift Station Detail Screen will show a graphic of the lift station and complete lift station status information. It will allow access to control remote pump modes and configure the lift station instrument set points. The operator will be able to see flow meters, totalizers, pump run times, and number of pump starts.

Lift Station Historical Trend Screen: The Historical Trend Screen will allow the operator to bring up historical data to be displayed in trend chart. That data will include discrete data such as when each pump turned on and off which inherently allows the operator to see the pumps run time duration for each run cycle. The analog trend data will display the continuous historic Wet Well level over time and the historic flow rate or the flow meter. The operator will be able to display both discrete and analog trends together to determine the pumps performance.

Operator Auditing: The Auditing feature will track all operator configuration changes and any pump control changes done on the SCADA system. Auditing will identify which operator made the change and a time stamp of when the change was made.

SCADA Security: The administrator can assign operator user names, passwords and roles for each operator. This function allows the administrator to control individual operator access to each area of the SCADA system and weather he can view only vs. have complete control or only limited control of the system controls.

Lift Station Evaluation and Recommended Rehabilitation/Improvements

Lift Station 1

Location: Lift Station 1 (LS 1) is located on a narrow embankment between the lakefront of Clear Lake and Highway 20 approximately 1 mile west of the WTP and services the west end of the collection system. The upper portion of the lift station structure is above grade and is accessible by a steel catwalk leading to the panel and manhole lid.

Design Criteria: Sewage and I/I flows collected in this manhole range from 1,150 gpd during average lake levels to as high as 14,000 gpd during high lake levels. The structure consists of a single wet well approximately 22 ft in depth with a maximum capacity of 1140 gallons. Discharge piping consists of approximately 60 ft of 4" DI pipe leading to a nearby manhole on Highway 20. The total dynamic head required for high flows is approximately 31 ft. There are 181 Single Family Equivalent Connections (SFECs') which flow by gravity to this Lift Station (shed area).

Condition Analysis

- **Structural**: Infiltration has been identified at some joints during high lake levels. The concrete manhole structure appears to be in fair condition. The wet-well guide railing system is in poor condition due to excessive corrosion. There are no provisions for by-pass pumping if a catastrophic failure occurs at LS 1.
- **Mechanical**: Pumps are over 18 years in age and have reached the end of their life expectancy, they have failed previously. The float level controls are also past their expected service life and are unreliable.
- **Piping/Valves**: The existing discharge piping, manifold, gate valves, and check valves appear to be in adequate condition.
- **Electrical**: Currently there a local remote alarm system and levels are checked by visual inspection. All current alarms are audio and visual at site, only.
- **R/W Adequacy**: Access to the site is very limited and poses complications in the event of an emergency by impeding the mobilization of emergency equipment (generator, trash pump) to the site.

Proposed Improvements and Costs:

- **Structural**: Infiltration along the joints of the wet well will be corrected using a bituminous epoxy sealant. A new guide railing system will be needed to replace the existing one. A trash pump quick connect attachment will need to be located under the walk way.
- **Mechanical:** (2) New 3 Hp pumps capable of meeting the flow and head requirements, per pump curves, will be needed to replace the existing pumps. A new float system will also be needed to replace the existing floats.

- **Piping/Valves**: The existing gate and check valves are suspended under the walk way grating and are not easily accessible. The catwalk will need to be modified to include a field fabricated bolt-in-place hatch to access from above. This will consist of cutting an opening within the grating for access to the existing valves and new trash pump connection. The work associated with the walk way will require a 12 foot wide "all surface ramp to the base of the walk way for staging and constructability as there is little to no staging area near the highway.
- **Electrical/Control**: A new panel will replace the existing and will include all of the typical control improvements features previously described. Construct new conduit and fittings, as needed.
- **R/W Adequacy**: However there is sufficient area to develop a small access entry by placing approximately 10 CY of compacted fill with AB rock to allow access. There is no space available on either shoulder of Highway 20, near or around LS 1 for staging of construction or future operations such as running an emergency generator or bypass trash pumps.

Table 2.1 LS Opinion of Probable Construction Costs for LS 1*

Lift Station No. 1	Labor / Equipment	Materials
Site Work		
Prep, traffic control, MOB	$1,650	NA
Earth Work	$1,700	1,000
Structural		
Vault	$0	NA
Vault Hatch	$550	$500
LS Access Hatch	$0	NA
Rail System	$1,500	$2,500
Cone/Barrel/Slab	$0	NA
Panel Canopy/Slab	$1,050	$750
Mechanical/Piping		
Pumps	$2,440	$17,000
Piping	$2,400	$1,800
Valves	$300	$100
Pump Bypass	$1,300	$500
Flow Meter	$1,400	$3,000
Electrical/Controls		
Panel and Components	$2,700	$19,000
Electricians Work	$3,000	$1,000
PLC Programming and Installation	$1,800	$0
SCADA Programming and Installation	$1,800	$0
Startup and Verification	$1,900	$0
Totals	$25,490	

*

Lift Station 2

Location: Lift station 2 is located near the edge of pavement in front the RV Trailer Park at 12840 Island Dr. The structure consists of a dry pit and wet well.

Design Criteria: Investigation and planning for much needed improvements at this LS have been documented within the I/I Study prepared by MC Engineering, under funding by the State Water Resources Control Board (SWRCB). Subsequent pre-design criteria will not be included as part of this pre-design, as it is out of scope.

Lift Station 3

Location: Lift station 3 is located within a fenced area on the corner of Shoreview Dr and Blue Heron Ct. The structure consists of a fiberglass lined wet well with a 46" diameter approximately 13' deep.

Design Criteria: Sewage and I/I flows collected in this service area range from 12,000 gpd during average lake levels to as high as 100,000 gpd during high lake levels. Discharge piping consists of 600 ft of 4" DI pipe. The total dynamic head required for high flows is approximately 70 ft. The shed area for this LS consists of 59 SFECs'.

Condition Analysis:

- **Structural:** The existing wet-well concrete structure is in fair condition. The wet-well guide railing is in poor condition due to excessive corrosion and age.
- **Mechanical**: Pumps are over 18 years in age and have reached the end of their life expectancy, and have failed previously. The float level controls have exceeded their service life and are unreliable.
- **Piping/Valves**: The existing check valves and gate valves appear to be in relatively good condition. Discharge and manifold piping are in fair condition.
- **Electrical/Control**: There is only a local alarm system in place, the panel is over 15 years old and is in need of new breakers, starters relays and liquid level controls.
- **R/W Adequacy**: Street access is good with sufficient space for operators and equipment however there is not enough space to add a flow meter and vault without going into the roadway.

Proposed Improvements and Costs:

- **Structural:** A new guide rail system will be needed to replace the existing.
- **Mechanical**: (2) New heavy duty submersible pumps capable of meeting the flow and head requirements will be needed to replace the existing pumps.
- **Piping/Valves**: A new trash pump connection will be installed within the existing vault.
- **Electrical/Control** : A new panel will replace the existing and will include all of the typical control improvements features previously described.
- **R/W Adequacy**: No proposed improvements.

Lift Station 4

Location: Lift Station 4 is located on the north end of a subdivision island which constitutes the cul-de-sac of Blue Heron Ct. The wet well structure consists of a concrete manhole 5' in diameter and approximately 16 ft in depth. The structure is only accessible by the standard 24" lid in the middle of the roadway.

Design Criteria: Sewage and I/I flows collected in this service area range from 4,650 gpd during average lake levels to as high as 106,000 gpd during high lake levels. Discharge piping consists of 250 ft of 4" DI pipe. The total dynamic head required for high flows is approximately 35 ft. The shed area for this lift station consists of 36 SFECs'.

Condition Analysis:

- **Structural**: The wet well concrete structure appears to be in adequate condition. There is no guide railing so the existing pumps are retrieved by hooks and truck mounted hoist. There are serious access issues to the wet well as a result of a narrow, 24-inch diameter access, located on top of an eccentric concrete manhole cone section. This type of design also prevents guide rail construction for pump removal and or installation. and attachment. Quick access is also prevented as a result of this narrow opening and it requires a confined space entry, under dangerous conditions.
- **Mechanical**: Pumps are over 18 years in age and have reached the end of their life expectancy, they have failed previously. The float level controls are unreliable due to their age.
- **Piping/Valves:** The existing manifold piping is in poor condition due to excessive corrosion. Both the existing check and gates valves are worn and corroded and are no longer function reliably.
- **Electrical/Control**: Currently there is only a local alarm system and levels are checked by visual inspection. The existing panel and electrical components need replacement. The controller is over 30 years in age. There are no telemetry or remote monitoring capabilities.
- **R/W Adequacy**: The is sufficient area within the street for staging of construction and future operations, however the panel is no more than a couple feet from the edge of pavement requiring operators/personnel to stand in the street which is unnecessary and unsafe.

Proposed Improvements and Costs:

- **Structural**: Removal and installation of pumps is critical for maintenance operations and requires good access and guide rail system for the submersible pumps. In order for a wet well

guide rail system to be installed it is necessary that the concrete eccentric cone be excavated and removed. The cone will be replaced by a 60" precast concrete barrel and slab top. The slab top would provide double door access with H22 loading. A new 4' x 8' precast vault will be needed to house the new flow meter and trash pump connection. At a minimum, construction sequencing would consist of installing the bypass vault and piping before wet well improvements such that a trash pump could be used to continue LS service during the wet well improvements. Due to the location of this LS traffic control would be necessary.

- **Mechanical**: (2) New heavy duty submersible pumps capable of meeting the flow and head requirements will be needed to replace the existing pumps. A new level control system will also be needed to replace the existing floats.
- **Piping/Valves**: New discharge piping is needed to replace the existing flex hose as well as new manifold piping. The existing check valves and gate valves must be replaced and located outside the wet well in an easily accessible concrete vault.
- **Electrical/Control:** A new panel will replace the old existing one and will include all of the typical control improvements features previously described. The new panel will be located away from the road and placed in the easement area near the CMU wall west of the MH.

Lift Station 5

Location: Lift Station 5 is located on the Island Cir, midway between Blue Heron Ct and Konocti View. The structure consists of a concrete wet well with a 4.5' diameter approximately 19' deep with fiberglass liner. The manhole is accessible by a 3' x 4' hatch in the roadway.

Design Criteria: Sewage and I/I flows collected in this service area & manhole range from 17,950 gpd during average lake levels to as high as 122,600 gpd during high lake levels. Discharge piping consists of 300 ft of 4" PVC pipe. The total dynamic head required for high flows is approximately 34 ft. The shed area for this lift station includes 103 SFECs' and flows from LS 4.

Condition Analysis

- **Structural**: The concrete/fiberglass wet well structure, are in relatively good condition with the exception of minor I/I at some joints. The existing railing system is in poor condition due to excessive corrosion and age. The access hatch has been damaged and is not rated for H22 loadings.
- **Mechanical**: The pumps have failed previously. The float level controls are unreliable due to their age.
- **Piping/Valves**: The existing discharge piping, manifold, gate valves, and check valves appear to be in relatively good condition and are accessible in a vault.
- **Electrical/Control** : Currently there is no external alarm system, telemetry, or automation capabilities. The existing panel and electrical components are over 25 years old.
- **R/W Adequacy**: The wet well and pumps are easily accessible from the street and there is adequate area for construction staging, and future operating equipment. However, the valve vault and the electrical panel are located on an easement on private property and are not easily accessible.

Proposed Improvements and Costs:

- **Structural**: Infiltration along the joints will be corrected using a bituminous epoxy sealant. A new railing system will be needed to replace the existing one. A new spring assisted H22 traffic rated hatch will need to replace the existing.
- **Mechanical:** (2) New heavy duty submersible pumps capable of meeting the flow and head requirements will be needed to replace the existing pumps.
- **Piping/Valves**: [Trash pump bypass to be placed in vault?]
- **Electrical/Control**: A new panel will replace the existing and will include all of the typical control improvements features previously described.
- **R/W Adequacy**:

Lift Station 6

Location: Lift Station 6 is located near the corner of Schindler St and Lake St. The structure consists of a single wet well 5' in diameter and approximately 17 ft in depth. The wet well structure is accessible by the 24" lid in the middle of the roadway.

Design Criteria: Sewage and I/I flows collected in this service area and manhole range from 8,200 gpd during average lake levels to as high as 27,600 gpd during high lake levels. Discharge piping consists of 60 ft of 4" PVC pipe. The total dynamic head required for high flows is approximately 18 ft. The shed area for this lift station consists of 57 SFECs'.

Condition Analysis:

- **Structural**: The wet well concrete structure appears to be in fair condition. There is no railing system and removal of pumps for maintenance is only possible by using hooks and truck mounted hoist.
- **Mechanical**: The pumps appear to be in fair condition. The float level controls do not function reliably due to their age.
- **Piping/Valves**: The existing manifold piping is in poor condition due to excessive corrosion. Both the existing check and gates valves are inaccessible and unreliable due to age and corrosion.
- **Electrical/Control**: Currently there is only a local alarm system and levels are checked by visual inspection. The existing panel is uses a controller over 20 years in age. There are no telemetry, automation, or remote alarm capabilities in the existing control panel.

Proposed Improvements and Costs:

- **Structural**: The existing 24" eccentric concrete cone opening requires confined space entry and is not sufficient for the needed railing system to retrieve the pumps. In order for a railing system to be installed it is necessary that the eccentric cone be excavated and removed. The cone will be replaced by a 60" barrel and precast slab top. The slab top would provide double door access with H22 loading. A new 4' x 8' precast vault will be needed to house the new flow meter and trash pump connection.
- **Mechanical**: (2) New heavy duty submersible pumps capable of meeting the flow and head requirements will be needed to replace the existing pumps.
- **Piping/Valves**: New discharge piping is needed to replace the existing flex hose as well as new manifold piping. The existing check valves and gate valves must be replaced and located in an outside vault with adequate access.
- **Electrical/Control**: A new panel will replace the existing and will include all of the typical control improvements features previously described.
- **R/W Adequacy**: Street access is good and allows for emergency equipment staging as needed with some traffic contol.

- With respect to costs the proposed Improvements for this lift station are similar to lift station 4 such that bare equipment, labor, and construction equipment costs described in the lift station 4 evaluation can be made reference to for this lift station. ???

Lift Station 7

Location: Lift station 7 is located at the intersection of Keys and Everglade Blvd. The structure consists of a dry pit and wet well configuration. With the exception of flow from LSs' 10, 11, and 12; all other flows are conveyed from LS 7 to the WWTP which accounts for 95% of flows during wet weather.

Design Criteria: Investigation and planning for much needed improvements at this LS have been documented within the I/I Study prepared by MC Engineering, under funding by the State Water Resources Control Board (SWRCB). Subsequent pre-design criteria will not be included as part of this pre-design, as it is out of scope.

Lift Station 8

Location: Lift Station 8 is located at the intersection of Venus Village and Keys Blvd. The structure consists of a single concrete wet well 5' in diameter and approximately 17 ft in depth. The structure is accessible by the 36" lid in the middle of the roadway. In January 2015, significant improvements were made to the LS which included: replacement of both pumps, modified guide rail system, replacement manifold and outlet piping, installation of an electric pull box, new precast vault with traffic rated lid, and new gate and check valves.

Design Criteria: Sewage and I/I flows collected in this manhole range from 8,200 gpd during average lake levels to as high as 27,600 gpd during high lake levels. Discharge piping consists of 60 ft of 4" PVC pipe. The total dynamic head required for high flows is approximately 18 ft. The shed area for this lift station consists of 99 SFECs'.

Condition Analysis

- **Structural**: The concrete wet well structure appears to be in fair condition.
- **Mechanical**: The recently installed pumps appear to be in good condition and are functioning well. The float level controls do not function properly due to their age.
- **Piping/Valves**: The recently installed manifold piping, gate, and check valves appear to be in good condition.
- **Electrical/Control**: Currently there is only a local alarm system and levels are checked by visual inspection. The existing panel is uses a controller over 20 years in age. There are no telemetry, automation, or alarm capabilities within the existing control panel.
- **R/W Adequacy**: Street access is good for staging of construction and future operating equipment; however the panel is located near the edge of the road presenting operator/personnel safety issues.

Proposed Improvements and Costs:

- **Structural**: No structural improvements are necessary.
- **Mechanical**: No mechanical components in need of replacement.
- **Piping/Valves**: The recently installed valves and piping are in good condition; however the piping and valve arrangement within the vault will need to be modified to accommodate the addition of a 4" wye for the trash pump bypass connection.
- **Electrical/Control**: A new panel will replace the old existing one and will include all of the typical control improvements features previously described.
- **R/W Adequacy**: The new panel should be relocated away from the road west near the fence, reduce traffic hazards.

Lift Station 9

Location: LS 9 is located near the intersection of Keys Blvd and Driftwood Village. The structure consists of a single wet well 5' in diameter and approximately 20 ft in depth. The structure is accessible by the 36" lid in the middle of the roadway.

Design Criteria: Sewage and I/I flows collected in this service area range from 12,000 gpd during average lake levels to as high as 54,500 gpd during high lake levels. Discharge piping consists of 35 ft of 4" DI pipe. The total dynamic head required for high flows is approximately 22 ft. The shed area for this lift station consists of 257 SFECs'.

Condition Analysis

- **Structural**: The wet well concrete structure appears to be in fair condition. There is no railing system as the existing pumps are retrieved by hooks and gantry crane. Minor infiltration is evident between joints.
- **Mechanical**: The pumps are fairly new in moderate condition. The float level controls do not function reliably due to their age.
- **Piping/Valves**: The existing manifold piping is in poor condition due to excessive corrosion. The existing check and gates valves are inaccessible, unreliable, and prone to failure.
- **Electrical/Control**: Currently there is only a local alarm system and levels are checked by visual inspection. The existing panel is 11 years old and has proven problematic. There are no telemetry, automation, or remote alarm capabilities within the control panel.
- **R/W Adequacy**: Street access is good for staging of construction and future operating equipment; however the panel is located near the edge of the road presenting operator/personnel safety issues.

Proposed Improvements and Costs:

- **Structural**: The existing 36" concrete eccentric cone opening requires confined space entry and is not sufficient for the needed railing system to retrieve the pumps. In order for a railing system to be installed it is necessary that the eccentric cone be excavated and removed. The cone will be replaced by a 60" barrel and precast slab top. The slab top would provide double door access with H22 traffic rated loading. A new 4' x 8' precast vault will be needed to house the new check valves, gate valves, flow meter and trash pump connection.
- **Mechanical**: (2) New heavy duty submersible pumps capable of meeting the flow and head requirements will be needed to replace the existing pumps.
- **Piping/Valves**: New discharge piping is needed to replace the existing flex hose as well as new manifold piping. The existing check valves and gate valves must be replaced and located outside in a vault with good access..
- **Electrical/Control**: A new panel will replace the existing and will include all of the typical control improvements features previously described.

- **R/W Adequacy:** The new panel should be relocated away from the road west near the fence, reduce traffic hazards.

Lift Station 10

Location: Lift Station 10 is located approximately 700 ft north of the WWTP west of Orchard Shore Dr. near the corner of Schindler St and Lake St. The structure consists of a single wet well 8' in diameter and approximately 11 ft in depth. The structure is accessible by the 2' x 4' door.

Design Criteria: Sewage and I/I flows collected in this station reach as high as 350,000 gpd during high precipitation events; the flows are affected minimally by lake level. Discharge piping consists of 120 ft of 4" AC pipe to a junction where flows are combined with the FM from LS 7 and 11 and sent to the headworks of the WWTP. The total dynamic head required for high flows is approximately 39 ft. The shed area for this lift station consists of 305 SFECs'

Condition Analysis

- **Structural**: The concrete wet well structure appears to be in fair condition. The railing system is in poor condition due to excessive corrosion.
- **Mechanical**: Recently [August 2016] the pumps failed due to excessive rags and debris. Pump failure at this location from excessive rags and debris has occurred previously as well.
- **Piping/Valves**: The existing manifold piping is in poor condition due to excessive corrosion. Both the existing check and gates valves are in a state of disrepair and are no longer operational.
- **Electrical/Control**: Currently only a local alarm system exists and levels are checked by visual inspection. There is no telemetry, automation, or remote alarm capabilities within the control panel.
- **R/W Adequacy**: Road access is good with adequate room for staging emergency equipment and operator access. The site is fenced for security.

Proposed Improvements and Costs:

- **Structural**: New railings will be needed to replace the existing rail system for quick access. A new 4' x 6' vault will be needed to house the new flow meter and trash pump connection.
- **Mechanical:** (2) New heavy duty submersible pumps capable of meeting the flow and head requirements will be needed to replace the existing pumps. The new pumps submersible will feature chopper impellers to handle the excessive trash which has historically caused this station to fail. A new flow meter will be installed as part of the typical improvement previously described.
- **Piping/Valves**: The existing discharge piping and valves are in adequate condition and are not in need of immediate improvement. New valves and piping will be limited to the installation of a new trash pump connection as described in the typical improvements.
- **Electrical/Control:** A new panel will replace the old existing one and will include all of the typical control improvements features previously described.
- **R/W Adequacy:** No improvements required.

Lift Station 11

Introduction: Lift station 11 is located approximately a quarter mile south west of the WWTP. Unlike the other stations, pneumatic air ejectors are used instead of submersible pumps. The structure consists of a dry 8 pit approximately 8 ft in diameter and 16 ft in depth. The dry well houses a pneumatic ejector consisting of two 30 gallon pots. The dry well is accessible by the wood building directly above it which also houses the panel, circuit breaker and compressor.

Design Criteria: Sewage and I/I flows collected in this manhole reach 12,000 gpd during intense precipitation events; I/I flows are not impacted by high lake levels at this station. Most all flows conveyed by this LS are from LS 11 as there are no service connections which drain directly to this lift station. The discharge piping consists of approximately 1850' of 4" AC piping which junctions with flows from LS 7 and 10 before reaching the headworks of the WWTP.

Condition Analysis:

- **Structural**: The dry pit and wooded structure are in fair condition. Due to the remote location, minor vandalism has been reported.
- **Mechanical:** Old pneumatic ejectors, and air compressor are in (2) 30 gallons in fair condition.
- **Piping/Valves**: The existing discharge piping and manifold are in fair condition.
- **Electrical/Control**: Currently there is only a local alarm system and levels are checked by visual inspection. There are no telemetry, automation, or alarm capabilities within the existing control panel.
- **R/W Adequacy**: Road access is good with adequate room for staging emergency equipment and operator access.
-

Proposed Improvements and costs:

- **Structural**: A new 4' x 6' vault will be needed to house the new flow meter and trash pump connection. At a minimum a new chain link fence will be needed to protect infrastructure from future vandalism.
- **Mechanical:** A new flow meter will be added to this station as part of the typical improvements previously described. While the existing equipment is in fair condition there is no immediate need for improvements.
- **Piping/Valves**: No immediate improvements to the existing discharge piping or valves are necessary other than the required fittings and ball valves associated with the new trash pump connection as described in the typical improvements.
- **Electrical/Control:** Currently there is no alarm system and levels are checked by visual inspection. The existing panel is 30 years old. There are no telemetry, automation, or alarm capabilities. The existing panel will be replaced with a new one as described in the typical improvements except the NEMA 3R rating will not be necessary.
- **R/W Adequacy**: No improvements required.

Lift Station 12

Introduction: LS 12 is located approximately 700 feet north east of the Elem Rd and Pomo intersection. This LS was recently repaired with grant money received from Elem Indian Reservation. Further improvements to LS are beyond the scope of this project.

Opinion of Probable Construction Cost

The cost estimates previously shown for each lift station were prepared in accordance with Class 3 estimates defined by the Association for the Advancement of Cost Engineering International (AACEI). The classifications are intended to provide a guideline for generally-accepted cost engineering practices, the Class 3 estimate is defined as:

Generally prepared to form the basis for the project authorization, and/ or funding. Typically, engineering is from 10 percent to 40 percent complete, and would comprise process flow diagrams, preliminary piping runs for major processes, facility layout drawings, and essentially complete process and facility equipment lists. This estimate becomes the project control or project budget estimate until more detailed estimates are completed. Examples of methods used would be a high degree of detailed unit cost and quantity takeoffs for major processes. Factoring and/ or scale-up factors can be used for less significant or support areas of the project. This type of estimate requires a great deal of time to prepare, where actual equipment and processes have been designed. The typical expected accuracy range for this class estimate are -10 percent to -20 percent on the low side and +10 percent to +30 percent on the high side.

[INSERT TABLE WITH COST FOR EACH LIFT STATION WITH GRAND TOTAL CONTINGENCIES…]

Appendix B

Cleanup and Abatement Order (CAO) No. R5-2014-0707

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER R5-2014-0707
FOR
CLEARLAKE OAKS COUNTY WATER DISTRICT
WASTEWATER TREATMENT FACILITY
LAKE COUNTY

This Order is issued to Clearlake Oaks County Water District based on provisions of Water Code section 13304, which authorizes the California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board or Board) to issue a Cleanup and Abatement Order (CAO), and Water Code section 13267, which authorizes the Board to require the submittal of technical reports.

The Assistant Executive Officer of the Central Valley Water Board finds, with respect to the Discharger's acts, or failure to act, the following:

1. Clearlake Oaks County Water District (hereafter Discharger) owns and operates the Clearlake Oaks Wastewater Treatment Facility (WWTF).

2. The WWTF is located at 13705 Jensen Road in Clearlake Oaks, Section 32, T14N, R7W, MDB&M, and serves approximately 2,350 residents from Clearlake Oaks, Orchard Shores, Heritage, the Keys, and other unincorporated areas along the southeastern shore of Clear Lake.

3. On 23 October 1998, the Central Valley Water Board adopted Waste Discharge Requirements (WDRs) Order 98-211, which prescribes requirements for the treatment and disposal of domestic wastewater. The WDRs allow a maximum daily flow of 2.1 million gallons per day (mgd), with a monthly average dry weather discharge flow not to exceed 0.5 mgd.

4. The WWTF consists of a treatment plant headworks where a grinder and bar screen collects the solids. From the headworks, the wastewater enters an oxidation ditch where it mixes with backwash from the plant. From the oxidation ditch the wastewater enters a clarifier and then is pumped into two lined facultative ponds, and then to the chlorine contact chamber. The treated wastewater is then pumped from the contact chamber into a pipeline that is connected to the Lake County Sanitation District Southeast Regional wastewater storage pond. Lake County Sanitation District is responsible for disposal of the wastewater.

5. The Discharger is also responsible for operation and maintenance of the sewage collection system. The collection system consists of 12 lift stations and approximately 53,669 feet of piping. The piping is a combination of vitrified clay pipe, asbestos concrete pipe, and ductile iron pipe.

6. This Order is necessary to address the antiquated sewer collection system, sporadically maintained lift stations, and other WWTF components that are in need

of improvements to reduce the threat of sewage spills into Clear Lake, as well as enhance wastewater treatment to better protect water quality.

PREVIOUS BOARD ENFORCEMENT

7. The Clearlake Oaks County Water District has a history of sewage spills and overflows which have resulted in the following enforcement actions since issuance of the 1998 WDRs:

   a. On 24 February 1999, the Executive Officer issued CAO 99-704 for a raw sewage spill estimated at 150,000 gallons per day into Clear Lake. The spill resulted from a ruptured force main pipeline between the last lift station and the wastewater treatment plant. The CAO required the Discharger to immediately cease the discharges of wastewater into surface waters and operate the WWTF in compliance with the WDRs. In addition, the CAO required the Discharger to address the ruptured force main and any other areas of the collection system where pipelines cross under waterways or surface water drainage courses, and submit certain technical reports summarizing completion of the work.

   b. On 3 October 2002, the Executive Officer issued California Water Code Section 13308 Time Schedule Order (TSO) R5-2002-0902 for not completing the work required by the CAO. The TSO required the Discharger to submit an updated compliance schedule to address the items that had not been completed in the CAO.

8. On 7 November 2003, the Executive Officer rescinded the both the CAO and the TSO. The order rescissions were based on a 14 August 2003 site inspection, and Board staff's determination that the Discharger had completed each item required by the CAO and TSO.

SEWAGE SPILL VIOLATIONS

9. Discharge Prohibition No. 1 of WDRs Order 98-11 states: "*Discharge of wastes to surface waters or surface water drainage courses is prohibited.*"

10. Discharge Prohibition No. 2 of the WDRs states: "*Bypass or overflow of untreated or partially treated waste is prohibited.*"

11. The Discharger has experienced various wastewater spills that are in violation of Discharge Prohibitions Nos. 1 and 2 of the WDRs. Board staff's review of records over the last 10 years shows that the Discharger has reported six raw sewage spills exceeding 1,000 gallons, as listed in the table below.

Date of Spill	Volume Discharged (Gallons)	Discharge to Surface Water Drainage Course?	Type of Waste	Cause of Spill
01/07/2007	4,500	Yes	Raw Sewage	Obstruction in sewer line caused by grease.
03/15/2007	3,000	No	Raw Sewage	Overflow from oxidation ditch.
01/20/2010	10,000 to 20,000	Yes	Raw Sewage	Broken force main along with storm surge.
01/25/2010	15,000	No	Raw Sewage	Broken force main at the treatment plant.
07/31/2014	19,000	No	Raw Sewage	Structural failure of sewer line.
10/17/2014	4,000	No	Raw Sewage	Operational error resulting in a pump failure at Lift Station 11.

12. In addition, on 28 July 2014, the Discharger reported that Lift Station 8 experienced a structural and mechanical failure. To avoid raw sewage spills to Clear Lake, pumper trucks were used over a two week period to transport raw sewage from the lift station to the treatment plant. The Discharger then constructed a temporary system to pump the raw sewage from the lift station into a manhole located downstream of the lift station. This practice will continue until Lift Station 8 is repaired.

WASTEWATER SYSTEM ISSUES AND PROPOSED IMPROVEMENTS

13. Because of the aging infrastructure, history of overflows and problems with the treatment facility, in March 2014, the Discharger prepared a Wastewater Preliminary Engineering Report (PER) in accordance with guidelines provided by the United States Department of Agriculture (USDA) Rural Development Agency. The PER was part of a funding request to address issues with the 12 sewer lift stations, sewer collection system, and treatment facility.

Lift Stations

14. Because Lift Station 8 is in need of immediate repairs to prevent likely raw sewage spills to Clear Lake, on 19 August 2014 the Discharger submitted a grant application package to the State Water Resources Control Board (State Water

Board) Division of Financial Assistance. On 26 August 2014, Central Valley Water Board staff met with the Discharger to discuss the issues with Lift Station 8, and those issues associated with wastewater collection and treatment system described in the PER. On 4 September 2014, the SWRCB approved grant funding in the amount of $50,000 from the Cleanup and Abatement Account to cover emergency repairs for Lift Station 8.

15. The 11 other lift stations within the sewer collection system are also in need of repair and or replacement primarily due to sporadic maintenance, as evident by corrosion issues. The Discharger has recommended upgrades to the lift stations which are to include new panels, access doors, pump railings, reconditioned wet wells, and new programmable logic controllers with float controls. This Order requires the Discharger to submit a *Wastewater System Improvement Workplan* and a *Project Completion Report.*

Sewer Collection System

16. The PER indicates that the sewer collection system's pipelines and components have a history of leakage that have resulted in wet weather surcharging, overflows, and excessive flows to the treatment facility. These inflow/infiltration (I/I) issues are associated with cracks, breaks, root intrusions, cracked cleanouts and manholes, cross connections from storm drains, sagging, and other related problems. In addition, because a majority of the sewer collection system is located within close proximity to the lake, groundwater can infiltrate into the sewer collection system during periods of high lake levels and cause excessive flow conditions.

17. The monthly monitoring reports required by the WDRs show that in March 2011 the influent flows to the treatment plant exceeded the maximum daily discharge flow of 2.1 mgd allowed by Discharge Specification B.2 of the WDRs. The highest influent flows were 2.7 mgd reported on 24 March 2011. These high volumes, which the Discharger managed by placing wastewater in the overflow ponds, are attributed to I/I issues within the sewer collection system, and the high lake levels that occurred during this period.

18. On 9 September 2014, the Discharger submitted a *Collection System Mapping and Infiltration and Inflow Analysis Plan of Study* to the State Water Board's Division of Financial Assistance as part of a planning grant application. The *Plan of Study* includes a scope of work for mapping the collection system, and completing an I/I analysis and sewer system survey. The scope of work includes the following tasks:

    a. A mapping and system model to facilitate the I/I evaluation and condition assessment.

b. An I/I Analysis and Sewer System Evaluation Survey which includes: (a) a collection system historical operation condition review, (b) hydraulic modeling and metering plan, (c) sewer manhole inspections, (d) flow meter installations, monitoring, and reporting, (e) rainfall meter installations and monitoring, (f) groundwater monitoring well installations and monitoring, (g) flow and rain monitoring reporting, (h) smoke testing of the sewer lines, (i) flow isolation studies, (j) main sewer line cleaning and video inspections, (k) optional dye testing of the sewer lines, (l) a cost effective analysis, and (m) submittal of a final report that provides recommendations for the collection system improvements.

19. This Order requires the Discharger to submit an *Inflow and Infiltration Assessment Workplan, Inflow and Infiltration Assessment Report,* and an *Inflow and Infiltration Project Completion Report.*

Treatment Facility

20. According to the PER, the WWTF headworks, oxidation ditch, secondary clarifier, return activated sludge pump station, and sludge drying beds are also unreliable, resulting in operational issues. As a result of their age and condition, the following improvements are recommended by the Discharger and required by this Order:

a. Replace the flow splitter valve at the headworks.

b. Replace the rotor brush at the oxidation ditch.

c. Clean and remove accumulated sludge and debris from the oxidation ditch.

d. Design and construct a new clarifier to replace the existing outdated and under-designed clarifier.

e. Replace the existing return activated sludge pump and make the necessary pump station improvements, including electrical and controls, wet well, and piping.

f. Construct a new flow splitter box at the discharge point from the oxidation ditch.

g. Replace the existing liner in aerated lagoon No. 2.

h. Replace three of the existing center drains in the sludge drying beds.

i. Design and construct a fourth sludge drying bed.

j. Install a new electrical panel, programmable logic controller, and transformer at the operations building.

k. Install a new Supervisory Control and Data Acquisition (SCADA) system that will be used to integrate flow data from the lift stations and various components at the treatment plant to the main control building.

21. This Order requires the Discharger to submit a *Wastewater System Improvement Workplan* and a *Project Completion Report.*

GROUNDWATER ISSUES

22. Provision D.1 of WDRs Order 98-211 states: *"The discharge shall not cause underlying groundwater to be degraded."*

23. A review of groundwater monitoring reports submitted since the first quarter 2009 sampling event shows that total coliform organisms are consistently present in groundwater monitoring wells WWTP-01MW and WWTP-03MW, and in WWTP-02MW when there is sufficient groundwater to sample. This Order requires the Discharger to submit technical reports to address the total coliform detections in the wells.

24. A review of groundwater monitoring reports submitted since the First Quarter 2009 sampling event shows that WWTP-02MW did not contain sufficient water to sample during the following events: Third Quarter 2009, Fourth Quarter 2009, Fourth Quarter 2010, Fourth Quarter 2012, Third Quarter 2013, Fourth Quarter 2013, and Second Quarter 2014. This Order requires the Discharger to submit a report which evaluates the condition and performance of the groundwater monitoring system.

REGULATORY CONSIDERATIONS

25. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Board. Pursuant to Water Code section 13263(a), waste discharge requirements must implement the Basin Plan.

26. Surface water drainage is to Clear Lake. The Basin Plan designates the beneficial uses of Clear Lake as domestic supply; agricultural supply; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; spawning reproduction and/or early development; wildlife habitat; and commercial and sport fishing.

27. The Basin Plan designates the beneficial uses of the underlying groundwater as municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

28. Water Code section 13304(a) states, in relevant part:

> Any person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the regional board, clean up the waste or abate the effects of the waste, or, in the case of threatened pollution or nuisance, take other necessary remedial action, including, but not limited to, overseeing cleanup and abatement efforts.

29. Water Code section 13267(b) states, in relevant part:

> In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

30. The technical reports required by this CAO are necessary to ensure compliance with this CAO and WDRs Order 98-211, and to ensure the protection of water quality. The Discharger is subject to these requirements because the Discharger owns and operates the facility that discharges waste subject to this CAO and WDRs Order 98-211.

31. The issuance of this Order is an enforcement action taken by a regulatory agency and is exempt from the provisions of the California Environmental Quality Act pursuant to California Code of Regulations, title 14, section 15321(a)(2).

IT IS HEREBY ORDERED that, pursuant to Water Code sections 13304 and 13267, Clearlake Oaks County Water District shall cleanup and abate the Clearlake Oaks County Water District WWTF and sewage collection system in accordance with the scope and schedule set forth below in order to comply with WDRs Order 98-211.

All submittals required by this Order shall be converted to PDF and sent to centralvalleysacramento@waterboards.ca.gov. To ensure that the submittals are routed to the appropriate staff as quickly as possible, please include the following

information in the body of the email: Attention Guy Childs, Compliance Unit, Waste Discharge to Land (Non-15). In addition, please include the Discharger name, facility name, county, and CIWQS place ID (No. 214812) in the body of the email.

1. The Discharger shall **immediately** comply with all aspects of WDRs Order No. 98-211(or subsequent WDRs that rescind and replace Order No. 98-211).

2. **Beginning 1 January 2015, and continuing quarterly until this Order is rescinded**, the Discharger submit quarterly progress reports describing the work completed to date to comply with each of the requirements described below. In addition, the reports shall include: (a) signed copies of all applications that have been submitted to obtain the funds necessary to complete the work described in this Order, (b) the status of obtaining those funds, and (c) a copy of the Notice of Award to complete the improvements described in the Findings of this Order. **The Quarterly Progress Reports shall be submitted by the 1st day of the month following the end of the quarter (e.g. 1 January, 1 April, 1 July, and 1 October).**

Collection System Assessment

3. By **1 December 2014**, the Discharger shall submit an *Inflow and Infiltration Assessment Workplan* based on the outline in Finding 18 of this Order. At a minimum, the workplan shall include the following: (a) measures to quantify and identify the I/I sources using information pertaining to observed overflows, surcharges, reported bypasses, chronic maintenance activities, etc., (b) an evaluation of cost effective measures to reduce the I/I, (c) a description of how identified repairs and any sewer line replacements will be implemented and the timing for the work, and (d) an identification of the types of repairs that should be done in the field without further evaluation. The workplan shall also describe methods (i.e., smoke testing, video surveying, manhole surveying, etc.) that will be used to provide an assessment of those segments of the collection system known to exhibit significant I/I and shall describe those portions of the collection system that are in need of immediate repair and shall include a proposed schedule for completing these necessary repairs.

4. By **7 August 2015**, the Discharger shall submit an *Inflow and Infiltration Assessment Report* that describes the results of the Discharger's I/I evaluation of the collection system, and describes the repairs which must be completed to reduce I/I. The report shall also include a proposed schedule for necessary repairs and/or replacement of collection system components contributing to the I/I problems not to extend beyond **1 June 2017**.

5. By **1 June 2017,** the Discharger shall submit an *Inflow and Infiltration Project Completion Report* that provides a description of the final improvements to sewer

collection system that were identified in the *Inflow and Infiltration Assessment Report*.

Wastewater System Improvements

6. By **1 August 2015**, the Discharger shall submit a *Wastewater System Improvement Workplan* that provides final designs of the proposed wastewater system improvements described in Findings 15 and 20 of this Order.

7. By **1 June 2017**, the Discharger shall submit a *Project Completion Report* that provides a description of the final improvements to the wastewater system that have been completed in accordance with the *Wastewater System Improvement Workplan*.

Groundwater Monitoring

8. By **1 December 2014**, the Discharger shall submit a *Groundwater Monitoring Well Disinfection and Development Workplan* that shall describe how the three monitoring wells will be disinfected and re-developed. The purpose of this work is to address the total coliform detections outlined in Finding 23 of this Order.

9. By **1 March 2015**, the Discharger shall submit a *Groundwater Monitoring Well Disinfection and Development Completion Report* that describes the results of the disinfection and development work. This report shall also include an evaluation of the conditions and performance of the monitoring well network.

10. By **1 April 2016**, the Discharger shall submit a *Groundwater Monitoring Well Evaluation Report* that evaluates the total coliform levels in the wells, both before and after the wells were disinfected and re-developed. If the concentrations still show that groundwater is degraded, then the *Report* shall contain a proposal for facility improvements such that the Discharger will comply with Provision D.1 of WDRs Order 98-211.

As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, all reports shall be prepared by, or under the supervision of, a California Registered Engineer or Professional Geologist and signed by the registered professional.

Any person signing a document submitted under this Order shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my knowledge and on my inquiry of those individuals immediately responsible for

obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

If the Discharger is unable to perform any activity or submit any document in compliance with the schedule set forth herein, or in compliance with any work schedule submitted pursuant to this Order and approved by the Assistant Executive Officer, the Discharger may request, in writing, an extension of the time specified. The extension request shall include justification for the delay. Any extension request shall be submitted as soon as a delay is recognized and prior to the compliance date. An extension may be granted by revision of this Order or by a letter from the Assistant Executive Officer.

If the Discharger fails to comply with the provisions of this Order, the Assistant Executive Officer may refer this matter to the Attorney General for judicial enforcement or may issue a complaint for administrative civil liability. Failure to comply with this Order may result in the assessment of administrative civil liability up to $10,000 per violation per day, pursuant to the Water Code sections 13268, 13350, and/or 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

This Order is effective upon the date of signature.

Original signed by

_____

ANDREW ALTEVOGT, Assistant Executive Officer

_____

(Date)

gjc: 3 Nov-14

Appendix C

Biological Resources Assessment

BIOLOGICAL RESOURCES ASSESSMENT



Clearlake Oaks County Water District

Wastewater Infrastructure and Rehabilitation Project

Lake County, CA | December 2025

BIOLOGICAL RESOURCES ASSESSMENT

Clearlake Oaks County Water District

Wastewater Infrastructure and Rehabilitation Project

Lake County, CA | December 2025

Prepared For:

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Section 1 | Introduction

1.1 PURPOSE OF ASSESSMENT

This assessment provides information about the biological resources within the Proposed Project improvement areas, the regulatory environment affecting such resources, any potential Project-related impacts upon these resources, and finally, to identify mitigation measures and other recommendations to reduce the significance of these impacts.

1.2 DESCRIPTION OF PROPOSED PROJECT AND PROPOSED PROJECT IMPROVEMENT AREAS

1.2.1 Project Location

The Clearlake Oaks County Water District (CLOCWD or District) Wastewater Infrastructure and Rehabilitation Project (Proposed Project) involves improvements, repairs, and upgrades to facilities at the Clearlake Oaks Sewage Treatment Plant, located at 13705 Jensen Road, Clearlake Oaks, CA 95423 and within the wastewater collection system (i.e. lift stations, manholes, pipelines) in and around the community of Clearlake Oaks in Lake County, California adjacent to Clear Lake. The improvement areas are located in Sections 5 and 6 of Township 13 North, Range 7 West; Sections 29, 31, and 32 of Township 14 North, Range 7 West; and Section 36 of Township 14 North, Range 8 West as depicted on the Mount Diablo Principal Meridian U.S. Geological Survey (USGS) 7.5' Clearlake Oaks quadrangle map. **Figure 1** and **Figure 2** show the location of the various improvements included within the Proposed Project.

1.2.2 Project Description

The following components of the Proposed Project are described in detail within the Wastewater Infrastructure and Rehabilitation Projects Phase 4-DFA SRF Grant Request Technical Memo No. 1 and are shown on **Figure 3**.

Wastewater Treatment Plant Improvements

Oxidation Ditch

The Proposed Project includes upgrades and replacement of two 10 Hp brush aerators with new 15 Hp aerators and special attachments and modifications to the oxidation ditch and rotor brushes (wider design). Currently the existing aerators do not provide enough oxygen to the existing oxidation ditch for adequate treatment of raw sewage and the rotor brushes short circuit.

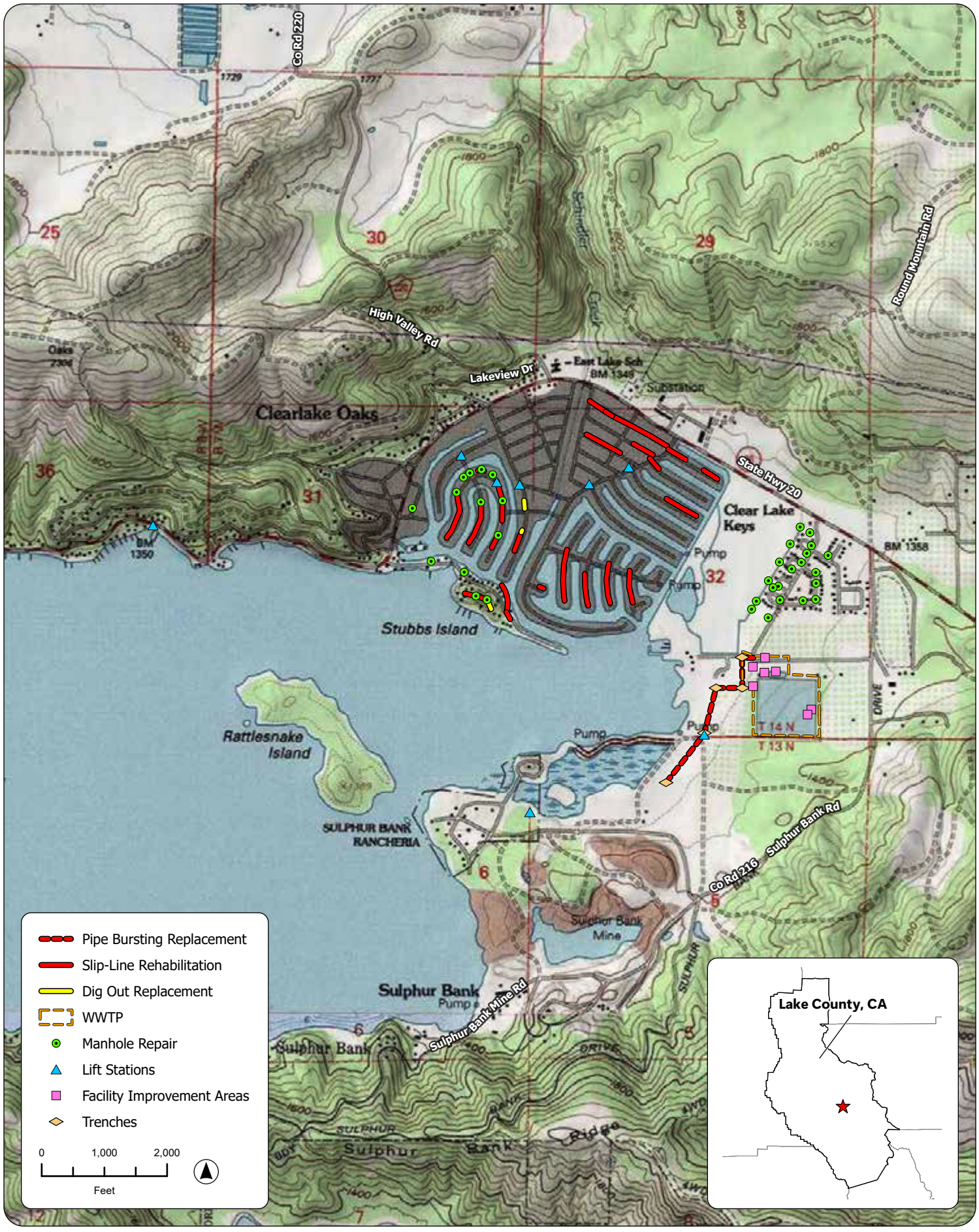
Sludge Drying Beds

The Proposed Project includes upgrading three of the existing sludge drying beds (No. 2, 3, and 4) with new underdrain piping and 6 to 12 inches of sub-base and 4 to 6 inches of concrete. The existing sludge drying beds have deteriorated AC surfaces with varying thicknesses and have been cracking and unraveling causing contaminated sludge being missed with the dried sludge. In addition, the underdrain system does not allow for the removal of the built up leachate.



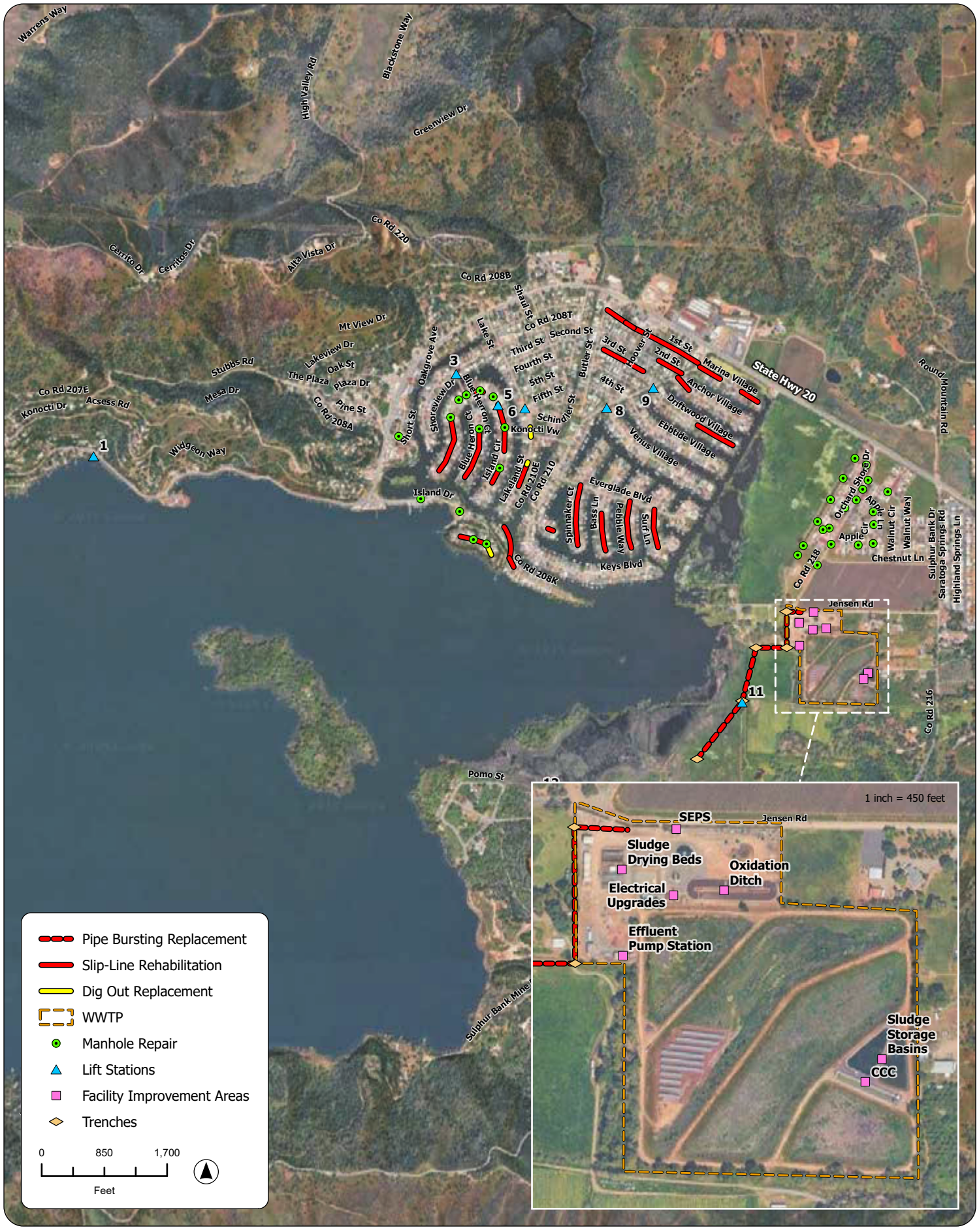
SOURCE: ESRI, 2025; Acorn Environmental, 11/6/2025

Figure 1
Regional Location



SOURCE: "Clearlake Oaks, CA" USGS 7.5 Minute Topographic Quadrangle, T13N R07W, T14N R07W, T14N R08W, Sections 5, 6, 29, 31, 32, & 36, Mt. Diablo Baseline & Meridian; ESRI, 2025; Acorn Environmental, 12/4/2025

Figure 2
Site and Vicinity



SOURCE: ESRI, 2025; Google Earth Aerial Photograph, 5/2024; Acorn Environmental, 12/4/2025

Figure 3
Aerial Overview

Groundwater Monitoring Well

The Proposed Project includes the installation of a new groundwater monitoring well at the wastewater treatment plant (WWTP). The well will be approximately 50 to 60 feet deep. A 20-foot by 20-foot area would be required for the equipment but would not require any ground disturbance beyond the well. This groundwater monitoring well is a current requirement by the CRWQCB and is part of the current Cleanup and Abatement Order (CAO) No. R5-2014-0700 issued by the Central Valley RWQCB.

Electrical Panel

The Proposed Project includes upgrades to the electrical panel to the WWTP to accommodate the additional demands of the other WWTP upgrades. The upgrades include a new transformer and electrical drop from the nearest power pole and E(3) Phase power supply (overhead) and underground electrical wiring to portions of the WWTP and main control room panel.

Sludge Pond

The Proposed Project includes replacing the poly lining on Sludge Pond No. 2. The existing Sludge Pond No. 2 aerated lagoons poly lining is ripped and deteriorating and leakage from this Sludge Pond will impair the groundwater.

CL2 Basin

The Proposed Project includes removing a temporary poly lined CL2 contact basin and replacing it with a new concrete contact basin, along with a mixing chamber, vertical shaft aerators, pumps, analyzers, chlorinators, controllers and panels. This will improve the overall needed chlorine contact time and efficiency. The existing chlorine contact basin was constructed as a temporary basin in 2000 with a poly lining. This poly lining is problematic due to its deterioration and the contact floor within the basin is uneven, which causes an accumulation of sludge, algae, and other bypassed effluent particles. In addition, the basin has a tendency to short circuit.

WWTP Facility/Building

The Proposed Project includes remodeling over 380 square feet of office space, electrical wiring, restroom facilities and demolishing old and deteriorated facilities located in the WWTP and surrounding buildings. The existing laboratory and control building was constructed over 45 years ago and is in need of repairs and upgrades for safety and efficiency purposes, this includes roof replacements and improvements to restroom facilities, and an addition of a conference room.

Filter Press

The Proposed Project includes installation of a filter press at the Water Treatment Plant (WTP) to remove up to 80 percent of the algae that is impacting the WWTP. Currently excessive lake algae produced during the WTP clarifier and filter backwash cycles is being discharged into the sewer collection system which is then transported by the interceptor/collection system to the WWTP. The excessive algae places a burden on both the oxidation ditch and impacts the secondary clarifier, which bulks during high algae influent especially during the peak of summer.

Lift Station Improvements

Lift Station No. 1

The Proposed Project includes a new access driveway for emergency and general operational access to LS 1; refer to **Figure 4** for the specific site plan. The driveway will be approximately 100 feet in length and approximately 10 feet wide. This includes a new access stairway and gate, with the existing access along Highway 20 locked, since it currently poses as an unsafe access and entry point to the LS and requires parking on north -side of Highway 20. Rip rap will be applied to the southern exposed embankment for slope protection, with a total amount of fill of approximately 100 cubic yards. Approximately 35 linear feet of the existing 24-inch corrugated metal pipe (CMP) used to convey stormwater from Highway 20 will be abandoned in place, and 35 linear feet will be constructed under the access road towards Clear Lake. Rip rap will be applied to the end of the pipeline for slope protection. The Proposed Project also includes the cutting-in of a 6-inch bypass quick connect valve (located above ground) to provide operators with an emergency inter-tie to bypass raw sewage in the event of a failure at LS 1. Additionally, a new control and Supervisory Control and Data Acquisition (SCADA) panel, including new wiring, would be installed. A Caltrans Encroachment Permit will be needed for construction within the right-of-way along Highway 20.

Lift Station No. 3

The Proposed Project includes installation of new electrical wiring and controls, valve box, quick connect assembly and the extension of the perimeter fence around the LS to by approximately 40 linear feet to encompass the new bypass structure and valve box. The new components will be installed within existing paved or disturbed areas in the public right of way.

Lift Station No.'s 5, 6, 8, and 9

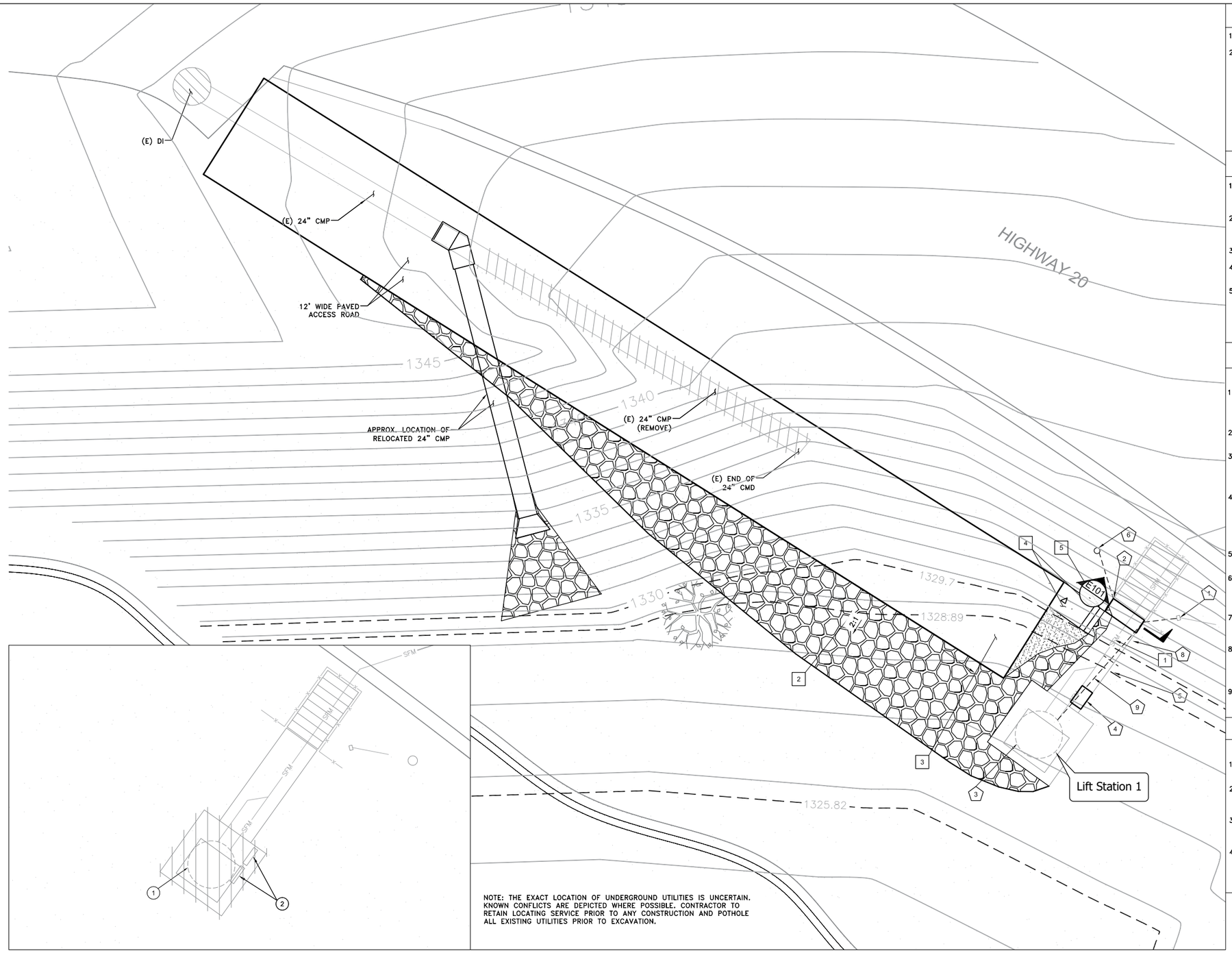
The Proposed Project includes installation of a new wet-well, pumps, rails, valves, valve boxes, and a quick connect assembly with valve box for catastrophic failures at each of these lift stations. All improvements will be done within paved or disturbed areas in the public right of way.

Collection System Rehabilitation (Pipelines and Manholes)

The proposed improvements for the collection system within roadways and/or shoulder areas include a combination of various types of pipeline and manhole improvements. These pipeline and manhole improvements include trenchless pipeline rehabilitation with polyethylene slip lining; trenching for spot repairs and replacement of pipeline segments; crack sealing with gout and/or epoxy of pipelines; removing roots and grouting of pipelines; and replacing and/or grouting manholes.

Trenchless slip lining will be used in cases where there are multiple defects found in pipeline segments between manholes. The material used for the slip lining is made of polyester, fiberglass cloth and is introduced in the upstream manhole or at cleanouts where house service connections require repair. Once installed the material is cured in place with hot water, ultraviolet (UV) light, or steam. Polyethylene slip lining meets American Society for Testing and Materials (ASTM) Standard F2561. **Figure 3** shows the segments of pipeline where slip-lining will be installed.

In situations where the pipeline sags are considered significant or a slip line cannot be properly installed, a backhoe or trencher will be used to dig out those deteriorated and sagging pipeline segments. **Figure 3** shows the two segments of pipelines that will be dug out and replaced and one dig out for spot repair. The new pipe sections will have flexible transition couplings made of elastomeric materials conforming to



(E) SITE PLAN (DEMO)
SCALE: 1"=5'

(N) SITE PLAN
SCALE: 1"=5'

0 5 10
Feet

DEMOLITION KEYNOTES

1. PUMPS NOT INCLUDED.
2. REMOVE (E) PANEL AND CONTROLS. SALVAGE PANEL COMPONENTS PER ELECTRICAL DESIGN. SEE SHEET C301.

IMPROVEMENT KEYNOTES

1. (N) FLOW METER AND SEWAGE BYPASS CONNECTION. SEE DETAIL 4 ON SHEET C201.
2. (N) AC ACCESS ROAD SEE SHEET C301 AND C311 FOR PROFILE AND SECTION.
3. (N) 10' BY 14' LANDING THIS LOCATION.
4. (N) CONCRETE LANDING & ALUMINUM STAIRS. SEE SHEET C403.
5. CUT, BAND, AND MODIFY EXISTING RAILING AND TOE KICK. INSTALL (N) MANGATE. PROVIDE SHOP DRAWING FOR DISTRICT APPROVAL PIOR TO FABRICATING.

ELECTRICAL KEYNOTES

1. EXISTING MAIN CIRCUIT BREAKER AND PG&E METER PANEL. REMOVE EXISTING CONDUCTORS, INSTALL 2'c, 3#2, 1#6(G) TO MTS.
2. SEE DETAIL DWG E101 FOR ELEVATION OF ELECTRICAL PANELS.
3. REPLACE PUMPS 1 AND 2, INSTALL LEVEL TRANSMITTER, LSHH AND LSLL. INSTALL PUMP CABLE AND LIT/LSH/LSL CABLES IN EXISTING CONDUIT TO PULLBOX.
4. INSTALL A 2'X2' NEW 4SS PULLBOX 18" ABOVE EXISTING CONDUITS. SPLICE PUMP CABLES IN PULLBOX TO CONDUCTORS. MOUNT PULLBOX TO RAILING AT 24" ABOVE GRADING WITH UNISTRUT MOUNTING EXTEND CONDUITS AS REQUIRED.
5. 1"c, FE CABLE. MOUNT TO EXISTING STRUCTURE WITH CLAMPS.
6. INSTALL BARE #2 TO GROUND ROD. BOND TO CONTROL PANEL, MTS, GENERATOR CIRCUIT BREAKER AND PUMP TERMINATION PANEL.
7. GENERAL – SEE TYPICAL PUMP STATION CONDUIT AND CABLE DIAGRAM FOR CONNECTIONS.
8. INSTALL CONDUITS SURFACE MOUNTED FROM PULLBOX TO CONTROL PANEL. 1–1"c, 3#10, K_0 (a), 4#14 (PUMP 2), 1–2"c, 4 #14, 1–TSP (LSHL, LIT).
9. INSTALL 2"c, TSP, 4#14 FROM PULLBOX TO WETWELL.

NOTES

1. ZERO RUMSEY IS EQUAL TO 1318.26–FEET ABOVE MEAN SEA LEVEL.
2. A "FULL LAKE" IS MEASURED AT 1325.82–FEET ABOVE MEAN SEA LEVEL ON THE RUMSEY GAUGE.
3. MAXIMUM RUMSEY GAUGE WAS MEASURED AT 1329.7–FEET AND OCCURRED ON FEBRUARY 24, 1998.
4. THE RUMSEY GAUGE WAS MEASURED AT 1328.89–FEET ON FEBRUARY 22, 2017.

SOURCE: MC Engineering, 4/10/2017; Acorn Environmental, 12/5/2025

Figure 4
Lift Station 1 Site Plan

ASTM C 1173 and will be banded with series 300 premium grade stainless steel. Excavation associated with the two pipeline replacements would be approximately 3 feet by 10 feet with an average depth of 6 feet, with approximately 540 CF of cut or 20 CY. Dewatering may be required to complete the pipeline replacements.

Root intrusion will be eliminated by in-line cutters and foaming and re-examined for possible in-line repair.

Lift Station No. 11 (Ejector) Bypass and Pipeline Replacements

LS No. 12 currently pumps waste flows from the Elem Indian Colony Tribal Grounds through a 5-Hp LS to a gravity manhole located approximately 2,925 LF from LS No. 11 Pneumatic Ejector Station, it is then pumped approximately 2,161 LF to a point of connection at the WWTP.

The Proposed Project includes replacing pumps and updating the control system at LS No. 12 and the replacement of approximately 2,161 linear feet of 6-inch asbestos-concrete (AC) pressurized pipe (force main) from LS No. 11 to the point of connection at the WWTP. Due to high ground water conditions, the pipe will be replaced with new 6-inch DR 18 PVC pipe via the pipe bursting method. In addition, 885 LF of pipe will be installed via the pipe bursting method to replace the gravity main that is connected to LS No. 11. The pipeline segments to be replaced are shown on **Figure 3.** No ground disturbance will occur at LS No. 12 as the pump replacement and control system is within the existing lift station facility.

Five boring trenches would be required to accommodate the pipe bursting/installation equipment used for the pipeline replacement. Each trench would be approximately 10 feet by 4 feet with an average depth of 4 feet, with approximately 160 CF of cut or 6 CY.

1.2.3 Construction and Timing

Construction of the Proposed Project would last approximately 18 months, with a tentative start date of June 1, 2026, assuming no delays.

The majority of the Proposed Project will take place within existing treatment components and will not require new ground disturbance. Due to the uncertainty of the exact locations of underground utilities, a locating service will be utilized to locate all existing utilities prior to any disturbance. The following components of the Proposed Project will require ground disturbance:

- LS No. 1: New 100-foot access drive installed with an average depth of 6 feet and width of 10 feet, with approximately 6,000 cubic feet (CF) of excavated material or 222 cubic yards (CY) of cut.
- Additional wire fencing around perimeter of LS No. 3: Approximately 40 linear feet.
- Collection system pipeline replacements: Two pipelines would be dug out via an approximately 3-foot by 10-foot trench with an average depth of 6 feet, with approximately 360 CF of cut or 13 CY.
- Bypass and pipeline replacements at LS No. 11 Ejector: Five boring trenches would be 10 feet by 4 feet with an average depth of 4 feet, with approximately 800 CF of cut or 30 CY.

There will be a total of approximately 265 CY of cut, of which 43 CY will be used as fill and the excess 222 CY will be hauled off-site.

Section 2 | Regulatory Setting

The following section summarizes some applicable regulations of biological resources on real property in California.

2.1.1 Special-Status Species Regulations

The United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service implement the Federal Endangered Species Act of 1973 (FESA) (16 USC §1531 et seq.). Threatened and endangered species on the federal list (50 CFR §17.11, 17.12) are protected from "take" (direct or indirect harm), unless a FESA Section 10 Permit is granted or a FESA Section 7 Biological Opinion with incidental take provisions is rendered. Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present in the Proposed Project improvement areas and determine whether the proposed project will have a potentially significant impact upon such species. Under FESA, habitat loss is considered to be an impact to the species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC §1536[3], [4]). Therefore, project-related impacts to these species or their habitats would be considered significant and would require mitigation. Species that are candidates for listing are not protected under FESA; however, USFWS advises that a candidate species could be elevated to listed status at any time, and therefore, applicants should regard these species with special consideration.

The California Endangered Species Act of 1970 (CESA) (California Fish and Game Code §2050 et seq., and CCR Title 14, §670.2, 670.51) prohibits "take" (defined as hunt, pursue, catch, capture, or kill) of species listed under CESA. A CESA permit must be obtained if a project will result in take of listed species, either during construction or over the life of the project. Section 2081 establishes an incidental take permit program for state-listed species. Under CESA, California Department of Fish and Wildlife (CDFW) has the responsibility for maintaining a list of threatened and endangered species designated under state law (CFG Code 2070). CDFW also maintains lists of species of special concern, which serve as "watch lists." Pursuant to requirements of CESA, an agency reviewing proposed projects within its jurisdiction must determine whether any state-listed species may be present in the Proposed Project improvement areas and determine whether the proposed project will have a potentially significant impact upon such species. Project-related impacts to species on the CESA list would be considered significant and would require mitigation.

California Fish and Game Code Sections 4700, 5050, and 5515 designates certain mammal, amphibian, and reptile species "fully protected", making it unlawful to take, possess, or destroy these species except under issuance of a specific permit. The California Native Plant Protection Act of 1977 (CFG Code §1900 et seq.) requires CDFW to establish criteria for determining if a species or variety of native plant is endangered or rare. Section 19131 of the code requires that landowners notify CDFW at least 10 days prior to initiating activities that will destroy a listed plant to allow the salvage of plant material.

Many bird species, especially those that are breeding, migratory, or of limited distribution, are protected under federal and state regulations. Under the Migratory Bird Treaty Act of 1918 (16 USC §703-711), migratory bird species and their nests and eggs that are on the federal list (50 CFR §10.13) are protected from injury or death, and project-related disturbances must be reduced or eliminated during the nesting

cycle. California Fish and Game Code (§3503, 3503.5, and 3800) prohibits the possession, incidental take, or needless destruction of any bird nests or eggs. Fish and Game Code §3511 designates certain bird species "fully protected", making it unlawful to take, possess, or destroy these species except under issuance of a specific permit. The Bald and Golden Eagle Protection Act (16 USC §668) specifically protects bald and golden eagles from harm or trade in parts of these species.

California Environmental Quality Act (CEQA) (Public Resources Code §15380) defines "rare" in a broader sense than the definitions of threatened, endangered, or fully protected. Under the CEQA definition, CDFW can request additional consideration of species not otherwise protected. CEQA requires that the impacts of a project upon environmental resources must be analyzed and assessed using criteria determined by the lead agency. Sensitive species that would qualify for listing but are not currently listed may be afforded protection under CEQA. The CEQA Guidelines (§15065) require that a substantial reduction in numbers of a rare or endangered species be considered a significant effect. CEQA Guidelines (§15380) provide for assessment of unlisted species as rare or endangered under CEQA if the species can be shown to meet the criteria for listing. Plant species on the California Native Plant Society (CNPS) Lists 1A, 1B, or 2 are typically considered rare under CEQA. California "Species of Special Concern" is a category conferred by CDFW on those species that are indicators of regional habitat changes or are considered potential future protected species. While they do not have statutory protection, Species of Special Concern are typically considered rare under CEQA and thereby warrant specific protection measures.

2.1.2 Water Resource Protection

Real property that contains water resources are subject to various federal and state regulations and activities occurring in these water resources may require permits, licenses, variances, or similar authorization from federal, state and local agencies, as described next.

The Federal Water Pollution Control Act Amendments of 1972 (as amended), commonly known as the Clean Water Act (CWA), established the basic structure for regulating discharges of pollutants into "waters of the United States". Waters of the US includes essentially all surface waters, all interstate waters and their tributaries, all impoundments of these waters, and all wetlands adjacent to these waters. CWA Section 404 requires approval prior to dredging or discharging fill material into any waters of the US, especially wetlands. The permitting program is designed to minimize impacts to waters of the US, and when impacts cannot be avoided, requires compensatory mitigation. The US Army Corps of Engineers (USACE) is responsible for administering Section 404 regulations. Substantial impacts to jurisdictional wetlands may require an Individual Permit. Small-scale projects may require only a Nationwide Permit, which typically has an expedited process compared to the Individual Permit process. Mitigation of wetland impacts is required as a condition of the CWA Section 404 Permit and may include on-site preservation, restoration, or enhancement and/or off-site restoration or enhancement. The characteristics of the restored or enhanced wetlands must be equal to or better than those of the affected wetlands to achieve no net loss of wetlands.

Under CWA Section 401, every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with State water quality standards. The California State Water Resources Control Board is responsible for administering CWA Section 401 regulations.

Section 10 of the Rivers and Harbors Act of 1899 requires approval from USACE prior to the commencement of any work in or over navigable Waters of the US, or which affects the course, location,

condition or capacity of such waters. Navigable waters of the United States are defined as waters that have been used in the past, are now used, or are susceptible to use, as a means to transport interstate or foreign commerce up to the head of navigation. Rivers and Harbors Act Section 10 permits are required for construction activities in these waters.

California Fish and Game Code (§1601 - 1607) protects fishery resources by regulating "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." The limit of CDFW jurisdiction is subject to the judgment of the Department; currently, this jurisdiction is interpreted to be the "stream zone", defined as "that portion of the stream channel that restricts lateral movement of water" and delineated at "the top of the bank or the outer edge of any riparian vegetation, whichever is more landward". CDFW reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by the CDFW and the applicant is the Lake or Streambed Alteration Agreement.

For construction projects that disturb one or more acres of soil, the landowner or developer must obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 2009-0009-DWQ).

Section 3 | Methods

3.1 PRELIMINARY DATA GATHERING AND RESEARCH

Prior to conducting the field survey, the following information sources were reviewed:

- Previous biological resource studies pertaining to the Proposed Project improvement areas or vicinity
- United States Geologic Service (USGS) 7.5 degree-minute topographic quadrangles of the Proposed Project improvement areas and vicinity
- Aerial photography of the Proposed Project improvement areas
- CNDDB, electronically updated monthly by subscription
- A query of the California Native Plant Society's database *Inventory of Rare and Endangered Plants of California* (online edition)
- USFWS National Wetlands Inventory (NWI) mapper
- USFWS species list (IPaC Trust Resources Report)

3.2 FIELD SURVEYS

Consulting biologist Dr. Geo Graening conducted a biological field assessment on October 31, 2025, and collected data on wildlife and plant species present, as well as habitat types and jurisdictional waters. Variable-intensity pedestrian surveys were performed. Fauna and flora observed were recorded in a field notebook and identified to the lowest possible taxon. Survey efforts emphasized the search for federally-listed species that had documented occurrences in the CNDDB within the vicinity of the Proposed Project improvement areas. Habitat types occurring in the Proposed Project improvement areas were mapped on aerial photographs and information on habitat conditions and the suitability of habitats to support listed species was also recorded. The Proposed Project improvement areas was also assessed for the presence of potentially-jurisdictional water features, including riparian zones, isolated wetlands and vernal pools, and other biologically-sensitive aquatic habitats.

3.3 MAPPING AND OTHER ANALYSES

Locations of species' occurrences and habitat boundaries within the Proposed Project improvement areas were recorded on color aerial photographs and then digitized to produce the habitat maps. The boundaries of potentially jurisdictional water resources within the Proposed Project improvement areas were identified and measured in the field and similarly digitized to calculate acreage and to produce informal delineation maps. Geographic analyses were performed using geographical information system software (ArcGIS 10, ESRI, Inc.). Vegetation communities (assemblages of plant species growing in an area of similar biological and environmental factors), were classified by Vegetation Series (distinctive associations of plants, described by dominant species and particular environmental setting) using the CNPS Vegetation Classification system (Sawyer and Keeler-Wolf, 1995). Wetlands and other aquatic habitats were classified using USFWS National Wetlands Inventory Classification System for Wetland and Deepwater Habitats, or "Cowardin class" (Cowardin et al., 1979).

Informal wetland delineation methods consisted of an abbreviated, visual assessment of the three requisite wetland parameters (hydrophytic vegetation, hydric soils, hydrologic regime) defined in the U.S. Army Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987).

Section 4 | Results

4.1 ENVIRONMENTAL SETTING

The Proposed Project improvement areas are within the Inner North Coast Range geographic subregion, which is contained within the Northwestern California geographic subdivision, which occurs within the California Floristic Province (Baldwin et al., 2012). This region has a Mediterranean-type climate and the Proposed Project improvement areas are in a thermal belt. The Proposed Project improvement areas and vicinity are in Climate Zone 2b "Warmer-Summer Intermountain Climate," characterized by milder summers and longer and colder winters than in the Central Valley (Sunset, 2025). The topography of the Proposed Project improvement areas is a relatively flat plain, with very gentle slopes toward Clear Lake. The elevation ranges from approximately 1,330 feet to 1,380 feet above mean sea level. The land uses of the Proposed Project improvement areas are: industrial, commercial, rural residential, urban residential, agricultural, and recreation.

4.2 VEGETATION COMMUNITIES AND WILDLIFE

Habitats occurring within the Proposed Project improvement areas were mapped (see **Figure 5a** and **5b**) and are discussed below.

WWTP Upgrades

Most of the WWTP compound is devoid of vegetation; it consists primarily of roads, buildings, and bare ground that is maintained free of weeds. There are landscaped areas with ornamental trees and shrubs, primarily oleander and cypress, in the northern portion of the property. Several stands of native oaks (*Quercus lobata, Q. agrifolia* and *Q. wislizeni*) are mixed in with ornamental plants near the aeration pond and office. Patches of ruderal vegetation occur in the sludge drying beds and ponds. This vegetation consists of nonnative annual grasses, Himalayan blackberry (*Rubus armeniacus*), yellow star-thistle (*Centaurea solstitialis*), coyote brush (*Baccharis pilularis*), long-beaked filaree (*Erodium botrys*), and other weedy forbs.

The industrial nature of the WWTP discourages most wildlife occupation, but urbanized animals do occur, such as American robin (*Turdus migratorius*), killdeer (*Charadrius vociferus*), and American crow (*Corvus brachyrhynchos*). Sheep (*Ovis aries*) are periodically allowed to graze the grass in the sludge ponds for weed control.

Lift Station No. 11 and Pipeline

Lift Station No. 11 and its associated pipelines are situated in agricultural lands that are used primarily for grazing animals and hay production. This habitat is highly managed and has simplified diversity and structure, dominated by European annual grasses and weedy forbs. The primary grasses observed during the survey were bromes (Bromus), slender wild oat (Avena barbata), mouse barley (Hordeum murinum), Italian wild ryegrass (Lolium perenne), wild rye (Leymus triticoides), and medusa head rye (Taeniatherum caput-medusae). The most common weedy forbs were doveweed (Croton setiger,) shortpod mustard (Hirschfeldia incana), fleabane (Dittrichia sp.), horehound (Marrubium vulgare), and yellow starthistle (*Centaurea solstitialis*). There were a few native species visible, such as coffeeberry (Frangula californica)

and valley oak (Quercus lobata) on the field edges. No vernal pool plant indicator plants are present (such as *Navarretia*, *Eryngium*, or *Eleocharis*). This vegetation community provides some forage and shelter for wildlife. The wildlife that were detected were: blacktail deer (Odocoileus hemionus columbianus); coyote (scat; Canis latrans); American crow (Corvus brachyrhynchos); and common songbirds. The nearby marshlands hosted a flock of red winged blackbirds (Agelaius phoeniceus) and there is an Osprey stand that was erected near the powerlines to the northwest of Lift Station No. 11.

Residential Collection System Upgrades (Clearlake Oaks and Clearlake Keys)

The residential subdivisions that require sewage collection system upgrades consist of paved roads, residences, and landscaping. Some alleys are dredged canals (keys) that have private docks and boat traffic. The vegetation is all ornamental or ruderal, and the most common trees were palms, conifers, fruit trees, maples, and some native oaks (primarily Q. lobata). Pets and disturbance-tolerant wildlife are present, primarily mockingbird (Mimus polyglottos) and other common songbirds.

Lift Station No. 1

The proposed upgrades to Lift Station No. 1, including the access road, are primarily located in a ruderal/developed area that was filled and raised with dirt and riprap for road construction (Highway 20 and private driveways) and maintained around the lift station. Vegetation includes western buttonwillow (Cephalanthus occidentalis), poison oak (Toxicodendron diversilobum), curly dock (Rumex crispus), cherry (Prunus) and California wild grape (Vitis californica). While no animals were present in this portion of the Proposed Project improvement areas during the survey, the adjacent lakeside area contained wading birds such as white pelican.

4.3 CRITICAL HABITAT AND SPECIAL-STATUS HABITAT

No critical habitat for any federally-listed species occurs within the Proposed Project improvement areas. The CNDDB reported no special-status habitats within the Proposed Project improvement areas. During the biological field survey, no special-status habitats were detected within Proposed Project improvement areas. However, there are special-status habitats in the vicinity: Clear Lake and its adjacent marshes, channels, and keys.

4.4 HABITAT PLANS, FISHERIES, AND WILDLIFE CORRIDORS

Wildlife movement corridors link remaining areas of functional wildlife habitat that are separated primarily by human disturbance, but natural barriers such as rugged terrain and abrupt changes in vegetation cover are also possible. Wilderness and open lands have been fragmented by urbanization, which can disrupt migratory species and separate interbreeding populations. Corridors allow migratory movements and act as links between these separated populations.

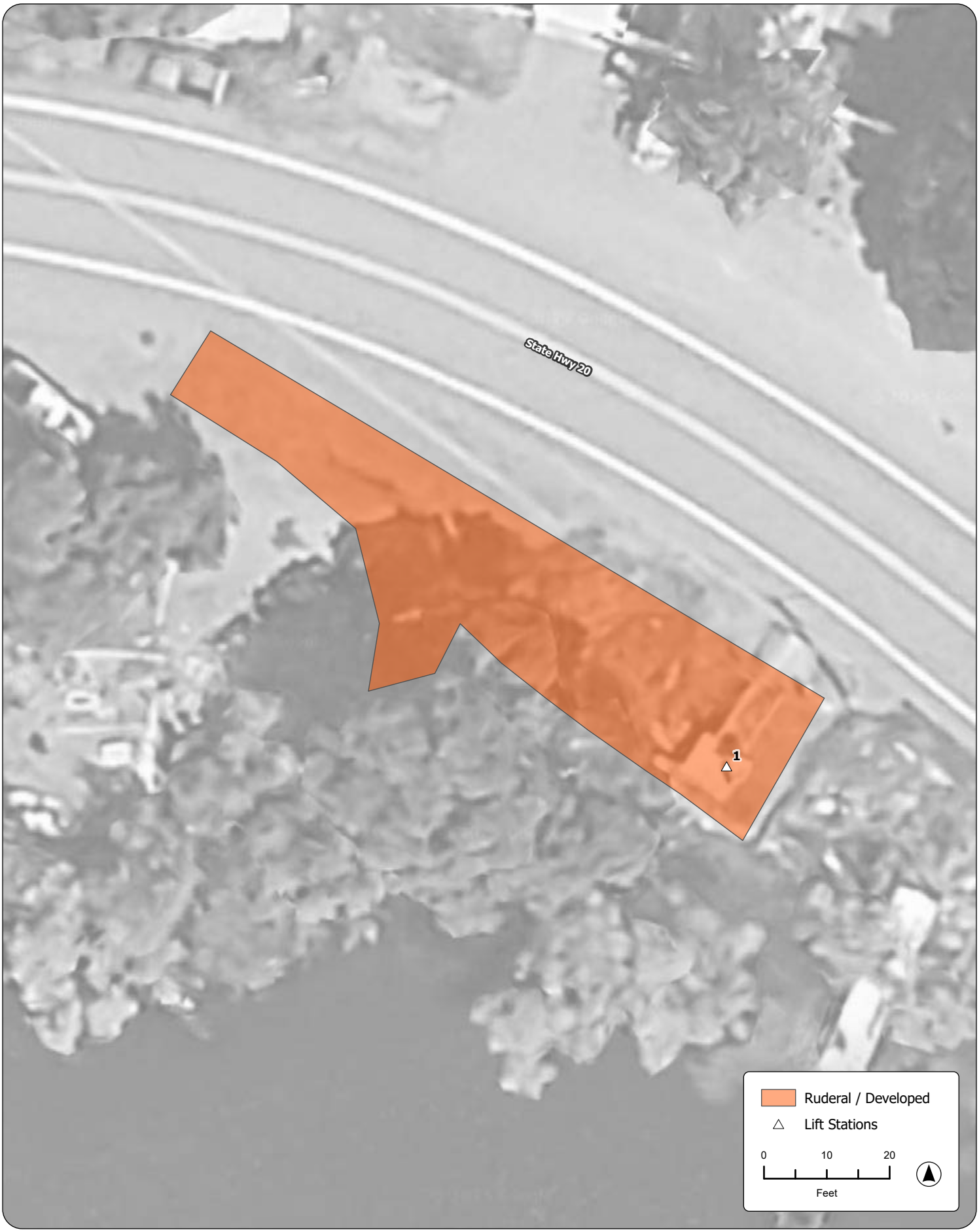
No wildlife corridors or fishery resources exist within the Proposed Project improvement areas. However, wildlife corridors exist nearby in the marshlands of Clear Lake, and Clear Lake contains important fishery resources. The Proposed Project improvement areas are not located within any adopted Habitat Conservation Plan or Natural Community Conservation Plan.



SOURCE: ESRI, 2025; Google Earth Aerial Photograph, 5/2024; Acorn Environmental, 12/4/2025

Figure 5A

Habitat Types (Page 1 of 2)



SOURCE: ESRI, 2025; Google Earth Aerial Photograph, 5/2024; Acorn Environmental, 12/4/2025

Figure 5B

Habitat Types (Page 2 of 2)

4.5 LISTED SPECIES AND OTHER SPECIAL-STATUS SPECIES

For the purposes of this assessment, "special status" is defined to be species that are of management concern to state or federal natural resource agencies, and include those species that are:

- Listed as endangered, threatened, proposed, or candidate for listing under the Federal Endangered Species Act;
- Listed as endangered, threatened, rare, or proposed for listing, under the California Endangered Species Act of 1970;
- Designated as endangered or rare, pursuant to California Fish and Game Code (§1901);
- Designated as fully protected, pursuant to California Fish and Game Code (§3511, §4700, or §5050);
- Designated as a species of special concern by CDFW;
- Plants considered to be rare, threatened or endangered in California by the California Native Plant Society (CNPS); this consists of species on Lists 1A, 1B, and 2 of the CNPS Ranking System; or
- Plants listed as rare under the California Native Plant Protection Act.

4.5.1 Reported Occurrences of Listed Species and Other Special-status Species

A list of special-status plant and animal species that have occurred within the Proposed Project improvement areas and vicinity was compiled based upon the following:

- Any previous and readily-available biological resource studies pertaining to the Proposed Project improvement areas;
- Informal consultation with USFWS by generating an electronic Species List (Information for Planning and Conservation website at https://ecos.fws.gov/ipac/); and
- A spatial query of the CNDDB
- A query of the California Native Plant Society's database Inventory of Rare and Endangered Plants of California (online edition).

The CNDDB was queried and any reported occurrences of special-status species were plotted in relation to the Proposed Project improvement areas boundary using GIS software. The CNDDB reported no special-status species occurrences specifically within the Proposed Project improvement areas, but it did report the following species occurrences in the vicinity:

Eel-grass pondweed (*Potamogeton zosteriformis*)

The location accuracy = 5 miles. The CNDDB species occurrence details are: "*CLEAR LAKE NEAR WYGALS RESORT AT SOUTH END OF LAKE. EXACT LOCATION UNKNOWN. MAPPED BY CNDDB IN GENERAL VICINITY OF SOUTH END OF CLEAR LAKE. SHALLOW WATER. ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1945 COLLECTION BY BAKER. NEEDS FIELDWORK*."

Townsend's big-eared bat (*Corynorhinus townsendii*)

The location accuracy = 1 mile. The CNDDB species occurrence details are: "*1 MI NE OF SULPHUR*

BANK MINE, ABOUT 10 MI SE LUCERNE. EXACT LOCATION UNKNOWN. MAPPED TO PROVIDED LOCALITY OF 1 MI NE OF SULPHUR BANK MINE, 10 MI SE OF LUCERN. 1945:1 BAT COLLECTED ON 2 DEC (MVZ #104356). 1948: 4 BATS COLLECTED ON 30 SEP & 1 OCT (MVZ #112178-112181). 1949: 2 BATS COLLECTED ON 19 MAR & 3 BATS COLLECTED ON 15 APR (MVZ #112908-112912). LISTED AS KNOWN MATERNITY ROOST IN 1986 REPORT."

Pallid bat (*Antrozous pallidus*)

The location accuracy = 1 mile. The CNDDB species occurrence details are: "1 MI NE OF SULPHUR BANK MINE; 10 MI SE LUCERNE. MAPPED ACCORDING TO LAT/LONG COORDINATES GIVEN IN MANIS, WITH UNCERTAINTY OF 1251.8136 M. 1 MALE SPECIMEN COLLECTED BY SETH B. BENSON ON 2 DEC 1945, MVZ #104357.

Osprey (*Pandion haliaetus*)

The location accuracy = 1/5 mile. The CNDDB species occurrence details are: "*0.6 MILE SOUTH OF HIGHWAY 20, 1.25 MILES DIRECTLY EAST OF RATTLESNAKE ISLAND, EAST SIDE OF CLEAR LAKE. MAPPED ACCCORDING TO LOCATION ON PROVIDED MAP. HABITAT AT CLEAR LAKE: SALIX, QUERCUS, AND OTHER HARDWOOD SPECIES. NEST STRUCTURES USUALLY DEAD. SURROUNDING LAND USE IS ORCHARDS, VINEYARDS, RESIDENTIAL, WATER RECREATION & FISHING. 1 NEST OCCUPIED AT THIS LOCATION DURING JULY OF 1992 AND 1993. CLEAR LAKE SURVEY OBSERVED 24 ADULTS & 11 JUVENILES DURING JULY 1992, AND 42 ADULTS & 17 JUVENILES DURING JULY 1993. POSSIBLE THREATS: LOSS OF SUITABLE NESTING LOCATIONS & AG CHEMICALS*."

Konocti manzanita (*Arctostaphylos manzanita ssp. elegans*)

The location accuracy = 1 mile. The CNDDB species occurrence details are: "*SULPHUR BANKS. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDB IN GENERAL VICINITY OF SULPHUR BANKS, SULPHUR BANK RIDGE, SULPHUR BANK MINE, AND SULPHUR BANK RANCHERIA. ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1902 BOWMAN COLLECTION. NEEDS FIELDWORK*."

Watershield (*Brasenia schreberi*)

The location accuracy = 1 mile. The CNDDB species occurrence details are: "*SULPHUR BANKS. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDB AROUND SULPHUR BANKS BASED ON A 1901 BOWMAN COLLECTION. ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1901 BOWMAN COLLECTION. NEEDS FIELDWORK*."

Clear Lake hitch (*Lavinia exilicauda chi*)

The location accuracy = non-specific area. The CNDDB species occurrence details are: "*CLEAR LAKE. COLLECTED 9 APR 1961 BY UCB ZOOLOGY 138 CLASS (CAS #72868) AND 8 APR 1962 BY P.R. NEEDHAM, & D.W. SEEGRIST & PARTY (CAS #24033) PARATYPE*."

Brownish dubiraphian riffle beetle (*Dubiraphia brunnescens*)

The location accuracy = non-specific area. The CNDDB species occurrence details are: "*CLEAR LAKE. COLLECTED FROM ROCKY POINT AND NICE, CLEAR LAKE. SHEPARD STATED IT IS ONLY*

KNOWN FROM THE NE SHORE OF CLEAR LAKE, BUT ROCKY PT IS NW. FURTHER, THERE IS ANOTHER ROCKY POINT FAR SE. MAPPED TO ENTIRE LAKE UNTIL BETTER LOCATION GIVEN. INHABITS EXPOSED, WAVE WASHED WILLOW ROOTS. 2 SPECIMENS AT THE CALIFORNIA STATE COLLECTION OF ARTHROPODS (CDFA), COLLECTED BY H. CHANDLER 3 JUL 1946. 2 SPECIMENS COLLECTED 24 JUL 1969. POPULATION HIGH IN 1988 AND STABLE OVER SEVERAL YEARS OF MONITORING."

Clear Lake tule perch (*Hysterocarpus traskii lagunae*)

The location accuracy = non-specific area. The CNDDB species occurrence details are: "*CLEAR LAKE. MAPPED ACROSS THE EXTENT OF THE LAKE. FOUND IN 1873, 1894, 1946, 1948, 1953, 1959, 1961, 1962, 1963, 1964, 1965, 1968, 1969, 1972, 1973, 1976, 1977, 1978, 1979 & 2012. ALSO, A SET OF ELECTROFISHING SURVEYS IN 2014-2015 FOUND H. T. LAGUNAE MADE UP 7% OF THE COUNT OF FISH CAUGHT. HABITAT HAS BEEN IMPACTED BY INTRODUCED FISHES, HISTORIC MINING, RESIDENTIAL DEVELOPMENT, AND AGRICULTURAL RUNOFF.*"

Western ridged mussel (*Gonidea angulata*)

The location accuracy = non-specific area. The CNDDB species occurrence details are: "*CLEAR LAKE. MULTIPLE HISTORICAL COLLECTIONS GIVE LOCALITY ONLY AS "CLEAR LAKE;" 1947 SPECIMEN FROM HORSESHOE BEND ON SE SHORE. 2009 RESURVEY SITE JKH09-009 FROM "ABOUT 2 MI S OF LUCERNE, CA 20 AT MILE MARKER 23.62." COLLECTED PRIOR TO 1909, PRIOR TO APR 1918, AND ON UNKNOWN DATE. 9 COLLECTED ON 29 JUL 1947. LOCALITY LISTED IN INGRAM (1948). NONE FOUND ON 19 JUL 2009.*"

A USFWS species list was generated online using the USFWS' IPaC Trust Resource Report System (see Appendix 1). This list is generated using a regional and/or watershed approach and does not necessarily indicate that the Proposed Project improvement areas provide suitable habitat. The following listed species should be considered in the impact assessment:

- California Condor (*Gymnogyps californianus*) Experimental Population, Non-Essential
- Northern Spotted Owl (*Strix occidentalis caurina*) Threatened
- Northwestern Pond Turtle (*Actinemys marmorata*) Proposed Threatened
- Clear Lake Hitch (*Lavinia exilicauda chi*) Proposed Threatened
- Monarch Butterfly (*Danaus plexippus*) Candidate
- Burke's Goldfields (*Lasthenia burkei*) Endangered

Migratory birds should also be considered in the impact assessment.

4.5.2 Listed Species or Special-status Species Observed During Field Survey

During the field survey, no special-status species were detected within the Proposed Project improvement areas or the immediate vicinity.

4.5.3 Potential for Listed Species or Special-status Species to Occur in the Proposed Project improvement Areas

Plants

No special-status plants are expected to occur within the Proposed Project improvement areas because the requisite habitats are not present. Konocti manzanita (Arctostaphylos manzanita ssp. elegans), is a conspicuous shrub that requires volcanic soils, and there are no manzanita plants at all in the Proposed Project improvement areas. Watershield (Brasenia schreberi) and eel-grass pondweed (Potamogeton zosteriformis) are found in freshwater marshes and swamps and Burke's goldfields (Lasthenia burkei) require vernal pools and wet meadows. The Proposed Project improvement areas are devoid of water resources such as marshes or standing water. Mendocino tarplant (Hemizonia congesta ssp. elegans) requires clay / serpentine soils that do not occur in the Proposed Project improvement areas.

Birds And Bats

The CNDDB reports the following special-status species in the vicinity: osprey (*Pandion haliaetus*), northern spotted owl (*Strix occidentalis caurina*), pallid bat (*Antrozous pallidus*), and Townsend's big-eared bat (*Corynorhinus townsendii*). Trees adjacent to the Proposed Project improvement areas could serve as bat roosting habitat and there is an osprey stand that was erected near the powerlines to the northwest of Lift Station No. 11. Northern spotted owl requires mature forest habitat, and has no potential to occur in, or near, the Proposed Project improvement areas.

Aquatic Species

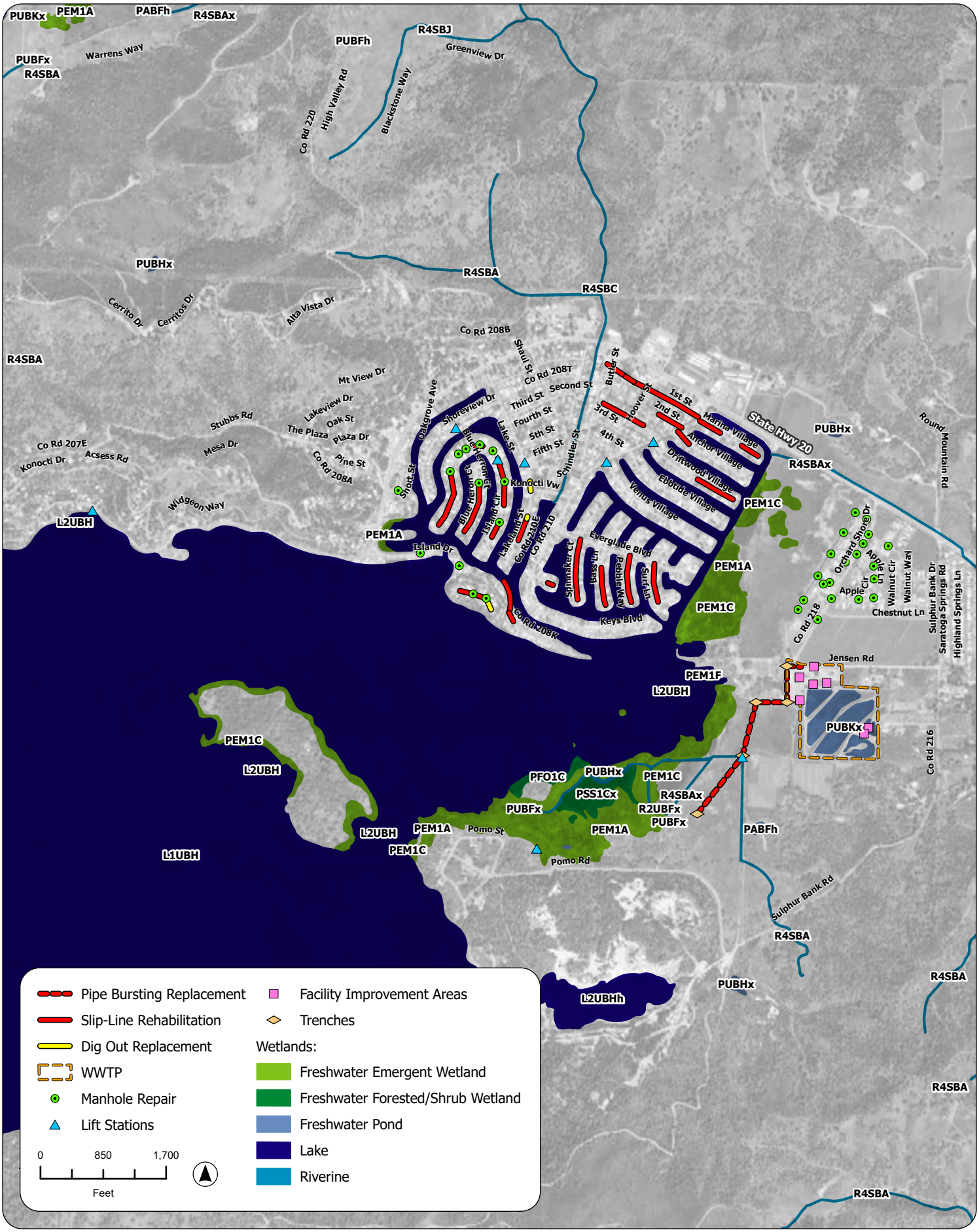
Special-status species occur in Clear Lake and its adjacent marshes; the species reported closest to the Proposed Project improvement areas are Clear Lake hitch, , Sacramento perch (*Archoplites interruptus*), Clear Lake prickly sculpin (*Cottus asper*), Clear Lake tule perch (*Hysterocarpus traskii lagunae*), and northwestern pond turtle (*Actinemys marmorata*). However, the Proposed Project improvement areas contain no water resources and will not directly interact with Clear Lake or its tributary waters. It is possible that northwestern pond turtles could migrate from aquatic habitats into the Proposed Project improvement areas, primarily the Lift Station No. 1 project site and the Lift Station No. 11/pipeline project site.

Other Species

Monarch butterfly (*Danaus plexippus*) could use the agricultural fields in the Lift Station No. 11/pipeline project site for nectar foraging habitat, although the biological survey did not detect any host plants, such as milkweeds (*Asclepias* spp.). The other project sites have no nectar resources. The Proposed Project improvement areas do not contain overwintering habitat and are not near an overwintering population.

4.6 POTENTIALLY-JURISDICTIONAL WATER RESOURCES

The USFWS National Wetland Inventory reported no water features specifically within the Proposed Project improvement areas, but there are water resources very nearby (**Figure 6**): the shoreline of Clear Lake and the keys of Clearlake Keys.



SOURCE: USFS, 5/7/2025; ESRI, 2025; Google Earth Aerial Photograph, 5/2024; Acorn Environmental, 12/4/2025

Figure 6

National Wetland Inventory

A preliminary assessment for the presence of potentially-jurisdictional water resources within the Proposed Project improvement areas was also conducted during the field survey, which identified the same features that the National Wetland Inventory did. The field survey determined that the Proposed Project improvement areas do not contain any channels or wetlands, but water resources do occur nearby.

WWTP Upgrades

The WWTP compound has no natural channels or wetlands. Ponds are present, but these were constructed in uplands to store sewage liquids and solids. These artificial ponds are not jurisdictional waters.

Lift Station No. 11 and Pipeline

Lift Station 11 and the associated pipeline work areas do not contain channels or wetlands; they are situated in agricultural fields that are well-drained. Outside of and to the west of the Proposed Project improvement areas, there is a wetland that borders the shoreline of Clear Lake. This is an emergent marsh of tule (*Schoenoplectus acutus*), teasel (*Dipsacus* sp.), and pepper weed (*Lepidium latifolium*), and it is punctuated with riparian trees and scrub of Fremont's cottonwood (*Populus fremontii*), red willow (*Salix laevigata*), and Himalayan blackberry (*Rubus armeniacus*). Other conspicuous plants are fiddle dock (*Rumex pulcher*), narrowleaf plantain (*Plantago lanceolata*), Pampas grass (*Cortaderia selloana*), cocklebur (*Xanthium*), and facultative grasses such as switchgrass (*Panicum virgatum*), mouse barley (*Hordeum murinum*), annual rabbitsfoot grass (*Polypogon monspeliensis*), and orchard grass (*Dactylis glomerata*).

Residential Collection Upgrades

The residential subdivisions have municipal stormwater collection systems, including vegetated swales and gutters and drop inlets, which ensure that no standing water is present. In the Clearlake Keys residential community, back alleys are dredged canals (keys) that have private docks and boat traffic. These keys are connected directly to Clear Lake and may be jurisdictional under state or federal laws; the proposed project does not involve any work in the keys.

Lift Station No. 1

The shoreline of Clear Lake is adjacent to Lift Station No. 1. However, no work is proposed in open water or the adjacent lacustrine wetlands (tule marsh). The work will occur above the ordinary high water mark of Clear Lake.

Section 5 | Impact Analyses And Mitigation Measures

This section establishes the impact criteria, then analyzes potential Project-related impacts upon the known biological resources within the Proposed Project improvement areas, and then suggests mitigation measures to reduce these impacts to a less-than-significant level.

The significance of impacts to biological resources depends upon the proximity and quality of vegetation communities and wildlife habitats, the presence or absence of special-status species, and the effectiveness of measures implemented to protect these resources from Project-related impacts. As defined by CEQA, the Project would be considered to have a significant adverse impact on biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a special-status species in local or regional plans, policies, or regulations, or by USFWS or CDFW
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by USFWS or CDFW
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites
- Conflict with any county or municipal policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved governmental habitat conservation plan.

5.1 POTENTIAL DIRECT / INDIRECT ADVERSE EFFECTS UPON SPECIAL-STATUS SPECIES

Will the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Operation of the infrastructure upgrades at the WWTP and the rehabilitation and replacement of LSs and pipe infrastructure throughout Clear Lake Oaks would not impact biological resources, either directly or through habitat modification. Construction impacts are addressed below by improvement area.

WWTP Upgrades

Most of the WWTP compound is devoid of vegetation; it consists primarily of roads, buildings, and bare ground. Vegetation that is present is ornamental or ruderal and does not contain special-status species or

potential habitat for special-status species. The industrial nature of the WWTP discourages most wildlife occupation. There will be no impacts to special-status species from project implementation in this area.

Lift Station No. 11 and Pipeline

Lift Station No. 11 and its associated pipelines are situated in agricultural lands that are used primarily for grazing animals and hay production. This habitat is highly managed and has simplified diversity and structure. Project implementation will not impact any known population of special-status species; however, the nearby marshlands to the west (outside of the Proposed Project improvement areas) host special-status species, and individuals could migrate into Proposed Project improvement areas between the time that the field survey was completed and the start of construction. Northwestern pond turtle is the primary concern, and this is a potentially significant impact before mitigation. Mitigation Measure BIO-1 below recommends a pre-construction clearance survey and placement of high visibility/wildlife exclusion fencing to prevent impacts to riparian/aquatic species. Mitigation would reduce this impact to a less-than-significant level through avoidance measures.

Noise, vibration, and other construction-related disturbance, could indirectly impact special-status nesting birds and roosting bats in trees near the Proposed Project improvement areas, which is considered a potentially significant impact. Mitigation Measure BIO-2 below recommends a pre-construction nesting bird and roosting bat survey and avoidance measures if found. Mitigation would reduce this impact to a less-than-significant level through avoidance measures.

Monarch butterfly could use the agricultural fields in the Lift Station 11/pipeline project site for nectar foraging habitat. Project implementation will not significantly reduce any nectar habitat for monarch butterfly, as there are ample grasslands surrounding the development area. The project will not impact overwintering habitat or host plants. This impact is considered less than significant.

Residential Collection System Upgrades (Clearlake Oaks and Clearlake Keys)

The residential subdivisions that require sewage collection system upgrades consist of paved roads, residences, and landscaping. Some alleys are dredged canals (keys) that have private docks and boat traffic. The vegetation is all ornamental or ruderal, and wildlife are unlikely to occupy these residential areas. Construction activities will have a less that significant impact upon special-status species in these areas.

Lift Station No. 1

The proposed upgrades to Lift Station No. 1, including the access road, are primarily located in an area that was filled and raised with dirt and riprap for road construction. This project site does not contain suitable habitat for special status species, but suitable habitat exists in the adjacent riparian habitat, and the wetlands and shoreline of Clear Lake. It is possible that aquatic species, especially northwestern pond turtles could migrate, from aquatic habitats into this project site, and this is a potentially significant impact before mitigation. Mitigation Measure BIO-1 below recommends a pre-construction clearance survey and placement of high visibility/wildlife exclusion fencing to prevent impacts to riparian/aquatic species. Mitigation would reduce this impact to a less-than-significant level through avoidance measures.

Noise, vibration, and other construction-related disturbance, could indirectly impact special-status nesting birds and roosting bats in trees near the Proposed Project improvement areas, which is considered

a potentially significant impact. Mitigation Measure BIO-2 below recommends a pre-construction nesting bird and roosting bat survey and avoidance measures if found. Mitigation would reduce this impact to a less-than-significant level through avoidance measures.

5.1.2 Recommended Mitigation Measures

Mitigation Measure BIO-1: Aquatic Species and Riparian Habitat Protection

A pre-construction survey for special-status species shall be performed by a qualified biologist for improvements related to Lift Station No. 1 and Lift Station No. 11 and its associated pipeline. If any listed species are detected, the appropriate wildlife agency (CDFW and/or USFWS) shall be contacted and construction shall be delayed until the species have voluntarily left the area.

Following the clearance survey, high-visibility wildlife exclusion fencing will be erected between construction areas and adjacent aquatic resources (marshes and lake shoreline) to prevent animals from migrating into work areas and prevent construction vehicles from entering sensitive riparian habitat. This fencing may be combined with erosion control fencing.

Mitigation Measure BIO-2: Roosting Bats and Nesting Birds

A pre-construction survey for roosting bat shall be conducted by a qualified biologist within 500 feet of improvements related to Lift Station No. 1 and Lift Station No. 11 and its associated pipeline. If construction activities occur during the nesting bird season (typically February through August), a pre-construction survey for the presence of special-status bird species or any nesting bird species should be conducted by a qualified biologist within 500 feet of improvements related to Lift Station No. 1 and Lift Station No. 11 and its associated pipeline. If active nests or roosting bats are identified in these areas, CDFW and/or USFWS shall be consulted to develop measures to avoid "take" prior to the initiation of any construction activities. Avoidance measures may include establishment of a buffer zone using construction fencing or postponement of construction activities until a qualified biologist has determined that the nest/roost are no longer active.

5.2 POTENTIAL IMPACTS TO SENSITIVE NATURAL COMMUNITIES

Will the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

The Proposed Project improvement areas do not contain any riparian habitat, aquatic resources, or other sensitive natural habitat; however, riparian habitat associated with Clear Lake occurs in close proximity of Lift Station 1 improvements. To prevent potentially significant impacts to this riparian habitat, Mitigation Measure BIO-1 is recommended which includes fencing off riparian habitat to avoid accidental impacts from large construction vehicles. Mitigation would reduce this impact to a less-than-significant level through avoidance measures.

5.2.1 Recommended Mitigation Measures

See Mitigation Measure BIO-1, above.

5.3 POTENTIAL IMPACTS TO JURISDICTIONAL AQUATIC RESOURCES

Will the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

There are no aquatic resources within the Proposed Project improvement areas; however, the shoreline of Clear Lake is adjacent to Lift Station No. 1 and the canals (keys) are adjacent to some lift stations or pipeline segments. Although no work is proposed in open water or the adjacent lacustrine wetlands, construction activities have the potential to introduce pollutants (sediment, petroleum products, concrete waste, etc.) into adjacent aquatic resources, which is considered a potentially significant impact. Mitigation Measure BIO-3 includes erosion control measures which would reduce these indirect impacts to a less-than-significant level through stormwater treatment and stabilization measures.

5.3.1 Recommended Mitigation Measures

Mitigation Measure BIO-3: Stormwater and Erosion Control

If the project area is one acre or greater, the District must enroll under the State Water Quality Control Board's Construction General Permit prior to the initiation of construction. In conjunction with enrollment under this Permit, a Storm Water Pollution Prevention Plan, Erosion Control Plan, and a Hazardous Materials Management/Spill Response Plan must be created and implemented during construction to avoid or minimize the potential for erosion, sedimentation, or accidental release of hazardous materials.

If the total disturbance area is less that one acre, the Proposed Project shall implement temporary erosion control measures (e.g., silt fencing, staked straw bales) in areas where runoff from construction areas has the potential to enter off-site aquatic resources, including Clear Lake and its associated keys. Construction activities should be scheduled outside of peak runoff periods. Soil stockpiles shall be properly covered and/or stabilized to prevent release into waterways. Disturbed areas shall be re-vegetated after completion of construction activities.

5.4 POTENTIAL IMPACTS TO WILDLIFE MOVEMENT, CORRIDORS, ETC.

Will the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

No wildlife corridors or fishery resources exist within the Proposed Project improvement areas. However, wildlife corridors exist nearby in the marshlands of Clear Lake, and Clear Lake contains important fishery resources. The Proposed Project will either replace existing structures or introduce new, small structures

to existing developed areas, without creating large barriers to wildlife movement. No structures will be built that will impede wildlife access or wildlife corridors. The Proposed Project will therefore have a less-than significant impact to wildlife movement.

5.4.1 Recommended Mitigation Measures

No mitigation is necessary.

5.5 POTENTIAL CONFLICTS WITH ORDINANCES, HABITAT CONSERVATION PLANS, ETC.

Will the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Will the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The Proposed Project is not located in an area covered by an adopted Habitat Conservation Plan or Natural Community Conservation Plan. Lake County has policies protecting oak woodlands; however, the Proposed Project would not involve the removal of oak trees. As such, there would be no impact.

5.5.1 Recommended Mitigation Measures

No mitigation is necessary.

Section 6 | References

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Section 7 | Qualifications of Surveyors and Authors

G.O. Graening, Ph.D., M.S.E.

G. O. Graening holds a Doctorate in Biological Sciences and a Master of Science in Biological Engineering, and is a certified arborist (International Society of Arboriculture). Dr. Graening has 26 years of experience in environmental assessment and research, including the performance of numerous wetland delineations and aquatic restoration projects. Dr. Graening also served as an adjunct professor of biology at California State University Sacramento for 10 years and was an active researcher in the area of conservation biology and groundwater ecology.

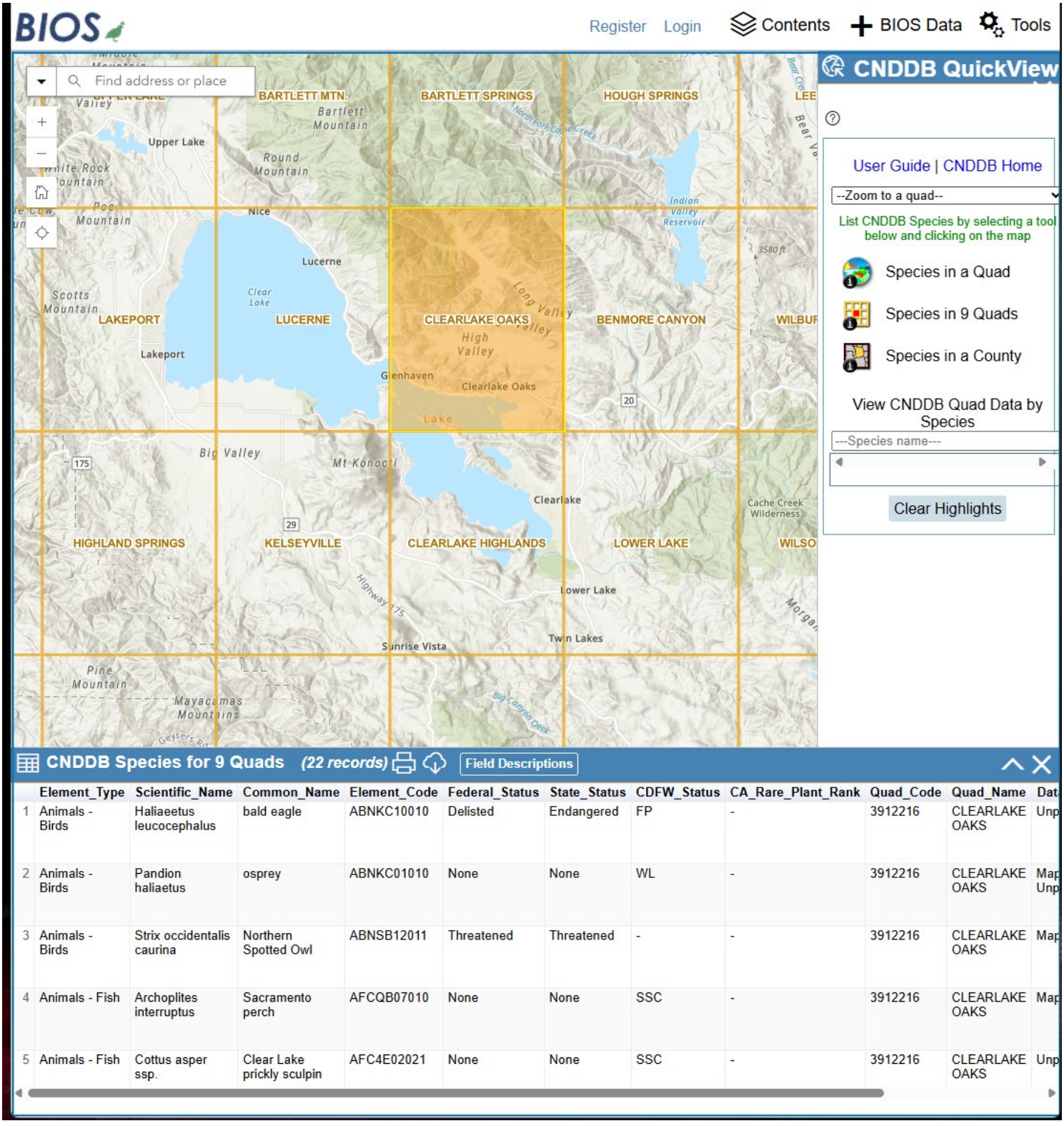
Jennifer Wade, Principal

Jennifer Wade is an environmental specialist with over 20 years' experience in the environmental consulting field, including biological surveys and oversight of biological resources reports. Ms. Wade has assisted federal agencies and Native American tribes with Section 7 Endangered Species Act consultation and Clean Water Act Section 404/401 permitting and certification. Prior to founding Acorn Environmental, she was the Northern California Land Management Program Manager within the Biological Resources group at Environmental Science Associates. Ms. Wade is currently one of the owners of Acorn Environmental and leads the biological resources group.

Attachment A: Database Queries

Scientific Name	Common Name	Status	General Habitat	Microhabitat
Actinemys marmorata	Northwestern Pond Turtle	FP	A THOROUGHLY AQUATIC TURTLE OF PONDS, MARSHES, RIVERS, STREAMS & IRRIGATION DITCHES WITH AQUATIC VEGETATION BELOW 6000 FT ELEVATION.	NEED BASKING SITES AND SUITABLE (SANDY BANKS OR GRASSY OPEN FIELDS) UPLAND HABITAT UP TO 0.5 KM FROM WATER FOR EGG-LAYING.
Antrozous pallidus	pallid bat	CSSC	DESERTS, GRASSLANDS, SHRUBLANDS, WOODLANDS & FORESTS. MOST COMMON IN OPEN, DRY HABITATS WITH ROCKY AREAS FOR ROOSTING.	ROOSTS MUST PROTECT BATS FROM HIGH TEMPERATURES. VERY SENSITIVE TO DISTURBANCE OF ROOSTING SITES.
Archoplites interruptus	Sacramento perch	CSSC	HISTORICALLY FOUND IN THE SLOUGHS, SLOW-MOVING RIVERS, AND LAKES OF THE CENTRAL VALLEY.	PREFERS WARM WATER. AQUATIC VEGETATION IS ESSENTAL FOR YOUNG. TOLERATES WIDE RANGE OF PHYSIO-CHEMICAL WATER CONDITIONS.
Arctostaphylos manzanita ssp. elegans	Konocti manzanita	CNPS 1B.3	CHAPARRAL, CISMONTANE WOODLAND, LOWER MONTANE CONIFEROUS FOREST.	VOLCANIC SOILS. 395-1400M.
Brasenia schreberi	watershield	CNPS 2B.3	FRESHWATER MARSHES AND SWAMPS.	AQUATIC FROM WATER BODIES BOTH NATURAL AND ARTIFICIAL IN CALIFORNIA.
Corynorhinus townsendii	Townsend's big-eared bat	CSSC	THROUGHOUT CALIFORNIA IN A WIDE VARIETY OF HABITATS. MOST COMMON IN MESIC SITES.	ROOSTS IN THE OPEN, HANGING FROM WALLS & CEILINGS. ROOSTING SITES LIMITING. EXTREMELY SENSITIVE TO HUMAN DISTURBANCE.
Cottus asper ssp.	Clear Lake prickly sculpin	CSSC	CLEAR LAKE, LOWER BLUE LAKE AND UPPER BLUE LAKE	
Danaus plexippus	Monarch butterfly	FP	WINTER ROOST SITES EXTEND ALONG THE COAST FROM NORTHERN MENDOCINO TO BAJA CALIFORNIA, MEXICO.	ROOSTS LOCATED IN WIND-PROTECTED TREE GROVES (EUCALYPTUS, MONTEREY PINE, CYPRESS), WITH NECTAR AND WATER SOURCES NEARBY.
Hysterocarpus traskii lagunae	Clear Lake tule perch	CSSC	CLEAR LAKE, LOWER BLUE LAKE AND UPPER BLUE LAKE	
Lasthenia burkei	Burke's goldfields	FE	VERNAL POOLS, MEADOWS AND SEEPS.	MOST OFTEN IN VERNAL POOLS AND SWALES. 15-580M.
Lavinia exilicauda chi	Clear Lake hitch	FP, CT	FOUND ONLY IN CLEAR LAKE, LAKE CO, AND ASSOCIATED PONDS. SPAWNS IN STREAMS FLOWING INTO CLEAR LAKE.	ADULTS FOUND IN THE LIMNETIC ZONE. JUVENILES FOUND IN THE NEARSHORE SHALLOW-WATER HABITAT HIDING IN THE VEGETATION.
Pandion haliaetus	osprey	CSSC	OCEAN SHORE, BAYS, FRESH-WATER LAKES, AND LARGER STREAMS.	LARGE NESTS BUILT IN TREE-TOPS WITHIN 15 MILES OF A GOOD FISH-PRODUCING BODY OF WATER.
Potamogeton zosteriformis	eel-grass pondweed	CNPS 2B.2	MARSHES AND SWAMPS.	PONDS, LAKES, STREAMS. 0-1860M.
Strix occidentalis caurina	Northern Spotted Owl	FT	PRIMARILY MATURE AND OLD-GROWTH CONIFEROUS FORESTS	

FP - Federally Proposed for Listing
FT - Federally Threatened
FE - Federally Endangered
CSSC - California Species of Special Concern
CT - California Threatened
CNPS - California Native Plant Society Ranking



CNDDB Species for 9 Quads *(22 records)* Field Descriptions

	Element_Type	Scientific_Name	Common_Name	Element_Code	Federal_Status	State_Status	CDFW_Status	CA_Rare_Plant_Rank	Quad_Code	Quad_Name	Dat
1	Animals - Birds	Haliaeetus leucocephalus	bald eagle	ABNKC10010	Delisted	Endangered	FP	-	3912216	CLEARLAKE OAKS	Unp
2	Animals - Birds	Pandion haliaetus	osprey	ABNKC01010	None	None	WL	-	3912216	CLEARLAKE OAKS	Map Unp
3	Animals - Birds	Strix occidentalis caurina	Northern Spotted Owl	ABNSB12011	Threatened	Threatened	-	-	3912216	CLEARLAKE OAKS	Map
4	Animals - Fish	Archoplites interruptus	Sacramento perch	AFCQB07010	None	None	SSC	-	3912216	CLEARLAKE OAKS	Map
5	Animals - Fish	Cottus asper ssp.	Clear Lake prickly sculpin	AFC4E02021	None	None	SSC	-	3912216	CLEARLAKE OAKS	Unp

Element_Type	Scientific_Name	Common_Name	Element_Code	Federal_Status	State_Status	CDFW_Status	CA_Rare_Plant_Rank	Quad_C
Animals - Birds	Haliaeetus leucocephalus	bald eagle	ABNKC10010	Delisted	Endangered	FP	-	3912216
Animals - Birds	Pandion haliaetus	osprey	ABNKC01010	None	None	WL	-	3912216
Animals - Birds	Strix occidentalis caurina	Northern Spotted Owl	ABNSB12011	Threatened	Threatened	-	-	3912216
Animals - Fish	Archoplites interruptus	Sacramento perch	AFCQB07010	None	None	SSC	-	3912216
Animals - Fish	Cottus asper ssp.	Clear Lake prickly sculpin	AFC4E02021	None	None	SSC	-	3912216
Animals - Fish	Lavinia exilicauda chi	Clear Lake hitch	AFCJB19011	Proposed Threatened	Threatened	-	-	3912216
Animals - Fish	Hysterocarpus traskii lagunae	Clear Lake tule perch	AFCQK02013	None	None	SSC	-	3912216
Animals - Insects	Dubiraphia brunnescens	brownish dubiraphian riffle beetle	IICOL5A010	None	None	-	-	3912216
Animals - Mammals	Cervus canadensis nannodes	tule elk	AMALC01011	None	None	-	-	3912216
Animals - Mammals	Pekania pennanti	Fisher	AMAJF01020	None	None	SSC	-	3912216
Animals - Mammals	Antrozous pallidus	pallid bat	AMACC10010	None	None	SSC	-	3912216
Animals - Mammals	Corynorhinus townsendii	Townsends big-eared bat	AMACC08010	None	None	SSC	-	3912216
Animals - Mammals	Myotis yumanensis	Yuma myotis	AMACC01020	None	None	-	-	3912216
Animals - Mollusks	Gonidea angulata	western ridged mussel	IMBIV19010	None	None	-	-	3912216
Animals - Reptiles	Actinemys marmorata	northwestern pond turtle	ARAAD02031	Proposed Threatened	None	SSC	-	3912216
Community - Terrestrial	Great Valley Mixed Riparian Forest	Great Valley Mixed Riparian Forest	CTT61420CA	None	None	-	-	3912216
Plants - Vascular	Hemizonia congesta ssp. calyculata	Mendocino tarplant	PDAST4R063	None	None	-	4.3	3912216
Plants - Vascular	Brasenia schreberi	watershield	PDCAB01010	None	None	-	2B.3	3912216
Plants - Vascular	Arctostaphylos manzanita ssp. elegans	Konocti manzanita	PDERI04271	None	None	-	1B.3	3912216

Plants - Vascular	Erythronium helenae	St. Helena fawn lily	PMLIL0U060	None	None	-	4.2	3912216
Plants - Vascular	Leptosiphon aureus	bristly leptosiphon	PDPLM09010	None	None	-	4.2	3912216
Plants - Vascular	Potamogeton zosteriformis	eel-grass pondweed	PMPOT03160	None	None	-	2B.2	3912216

CALIFORNIA NATIVE PLANT SOCIETY

CNPS Rare Plant Inventory

Search Results

6 matches found. Click on scientific name for details

Search Criteria: , Quad is one of [**3912216**]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Arctostaphylos manzanita ssp. *elegans*	Konocti manzanita	Ericaceae	perennial evergreen shrub	(Jan)Mar-May(Jul)	None	None	G5T3	S3	1B.3	Yes	2001-01-01	 ©2018 Dean Wm. Taylor
Brasenia schreberi	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	None	None	G5	S3	2B.3		2010-10-27	 ©2014 Kirsten Bovee
Erythronium helenae	St. Helena fawn lily	Liliaceae	perennial bulbiferous herb	Mar-May	None	None	G3	S3	4.2	Yes	1974-01-01	No Photo Available
Hemizonia congesta ssp. *calyculata*	Mendocino tarplant	Asteraceae	annual herb	Jul-Nov	None	None	G5T4	S4	4.3	Yes	1974-01-01	 © 2015 John Doyen
Leptosiphon aureus	bristly leptosiphon	Polemoniaceae	annual herb	Apr-Jul	None	None	G4?	S4?	4.2	Yes	1994-01-01	 © 2007 Len Blumin

Potamogeton zosteriformis	eel-grass pondweed	Potamogetonaceae	annual herb (aquatic)	Jun-Jul	None	None	G5	S3	2B.2	1994-01-01	No Photo Available

Showing 1 to 6 of 6 entries

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Suggested Citation:

California Native Plant Society, Rare Plant Program. 2025. Rare Plant Inventory (online edition, v9.5.1). Website https://www.rareplants.cnps.org [accessed 17 November 2025].

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: 11/03/2025 23:51:09 UTC
Project Code: 2026-0011866
Project Name: Clearlake Oaks CWD wastewater system improvements

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

PROJECT SUMMARY

Project Code: 2026-0011866
Project Name: Clearlake Oaks CWD wastewater system improvements
Project Type: Wastewater Facility - Maintenance / Modification
Project Description: wastewater collection and treatment system improvements
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.018583500000005,-122.66476251653238,14z



Counties: Lake County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

BIRDS

NAME	STATUS
California Condor *Gymnogyps californianus* Population: Pacific Northwest NEP No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8193	Experimental Population, Non-Essential
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened

REPTILES

NAME	STATUS
Northwestern Pond Turtle *Actinemys marmorata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

FISHES

NAME	STATUS
Clear Lake Hitch *Lavinia exilicauda chi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9298	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
Burke's Goldfields *Lasthenia burkei* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4338	Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: G.O. Graening
Address: 343 Carpenter Hill Road
City: Folsom
State: CA
Zip: 95630
Email ggraening@gmail.com
Phone: 9164525442

Attachment B: Site Photographs



At the WWTP looking south at the sludge beds



At the WWTP looking southwest near sludge beds



At the WWTP looking south at the pipeline repair segment and the effluent pump station in the background



At the WWTP looking southeast at the effluent pump station and pond levees in background



At the WWTP looking northwest at the oxidation ditch



At the WWTP looking north towards Pond 1



At the WWTP looking west towards the sludge storage



At the WWTP looking south at the CCC



At the WWTP looking west at the effluent pump station



At the WWTP looking north at Pond 1



Photo looking south within WWTP towards pipeline from Lift Station No. 11



Pipeline repair segment from WWTP to the west



Pipeline repair segment looking south to Lift Station L11



Pipeline repair segment looking south to Lift Station L11



Lift Station No. 11, looking north



Sewer pipe manhole between Lift Station No. 11 and Lift Station No. 12



Lift Station No. 12 near Pomo Road looking east



Shoreline below Lift Station No. 1 work area looking west



Looking west near Highway 20 at Lift Station No. 1



Looking east near Highway 20 at Lift Station No. 1



Looking east near Highway 20 at Lift Station No. 1



Manhole M1 on Short Street looking east from Highway 20



Manhole M2 on Island Drive looking west



Manhole M3 on Island Drive looking east



Manhole M4 on Oak Knoll Avenue looking southeast



Manhole M5 and pipeline repair segment on Oak Knoll Avenue



Pipeline repair segment on Island Drive looking northwest from Oasis Mobile Home Park



Lift Station No. 3 near intersection of Shoreview Drive and Blue Heron Court



Manhole M11 on Blue Heron Court and Island Circle



Manhole M10 on Island Circle looking south



Manhole M9 and pipeline repair segment on Island Circle looking south



Manhole M8 and pipeline repair segment on Blue Heron Court looking south



Manhole M12 and pipeline repair segment on Island Circle looking northeast



Manhole M13 on Island Circle looking east



L5 and pipeline repair segment on Island Circle looking southeast



Manhole M6 and pipeline repair segment on Island Circle south



Manhole M7 and pipeline repair segment on Island Circle south



Lift Station No. 6 on Lakeland Street near Konocti View Road looking north



Pipeline repair segment on Lakeland Street looking south



Pipeline repair segment on 1st Street looking west from Keys Boulevard



Pipeline repair segment on 2nd Street looking west from Keys Boulevard



Pipeline repair segment on 3rd Street looking east from Butler Street



Pipeline repair segment on Marina Village Drive looking east from Keys Boulevard



Pipeline repair segment on Anchor Village Road looking east



Lift Station No. 9 on Keys Boulevard at intersection with Driftwood Village looking northeast



Pipeline repair segment on Driftwood Village looking east



Lift Station No. 8 on Keys Boulevard at intersection with Venus Village Drive looking northeast



Pipeline repair segment on Spinnaker Court looking south from Everglade Boulevard



Pipeline repair segment on Bass Lane looking south from Everglade Boulevard



Pipeline repair segment on Pebble Way looking south from Everglade Boulevard



Pipeline repair segment on Surf Lane looking south from Everglade Boulevard



Pipeline repair segment on Flying Jib Court looking east



Manhole M15 on Apple Lane looking east



Manhole M14 on Apple Lane looking northeast



Manhole M28 on Apple Lane looking north



Manhole M27 on Apple Lane looking northwest



Manhole M26 on Orchard Shore Drive at Apple Lane looking south



Manhole M23 on Orchard Shore Drive looking south



Manhole M24 on Orchard Shore Drive looking south



Manhole M22 looking west from Orchard Shore Drive



Manhole M21 in alley looking southwest



Manhole M20 in alley looking south



Manhole M19 and (Manhole M18 beyond) in alley looking south



Manhole M17 and (Manhole M31 beyond) in alley looking south



Manhole M31 looking south from the terminus of Orchards Shore Drive



Manhole M32 looking east from alley



Manhole M30 looking east from alley



Manhole M25 looking east along Walnut Way near Hickory Lane



Manhole M29 looking west into alley from Orchards Shore Drive