VALLEY SANITARY DISTRICT
SEWER SYSTEM MANAGEMENT PLAN
(SSMP)

VSD

May 2023

Adopted by VSD Board of Directors: June 25, 2019

Latest Revision: May 2023

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
For
Sanitary Sewer Systems
Order No. 2006-0003-DWQ

This Sewer System Management Plan (SSMP) sequentially follows the Statewide General Waste Discharge Requirements (WDR) Order No. 2006-0003 for Wastewater Collection Agencies, that is, each section of this SSMP follows the WDR requirements. This will allow a reviewer or auditor to easily reference the WDR language in the (SSMP) sections. The Sections for this SSMP are based on each mandatory element of the WDR and the Monitoring and Reporting (M&R) Program Statewide General Waste Discharge Requirements for Sanitary Sewer Systems No. 2006-0003 documents. Specific requirements needing comment, action or review are extracted from each paragraph and presented in an outline format in this SSMP.

After the WDR was adopted on May 6, 2006, VSD reviewed the requirements of the WDR and determined what tasks had been completed or needed to be done. VSD then developed a plan to assess and assign the staff resources necessary to complete this effort, and began those tasks that are due first.

This SSMP has support documents and expanded responses (as necessary) and is a narrative summary of how we are complying with each WDR or M&R paragraph.

This SSMP is in a format that will allow quick access by staff or auditors. Other major documents, plans, engineering standards, operations and maintenance databases, and related background information is referred to in this SSMP as well as where the actual data is stored or maintained.

As the above data is reviewed for accuracy, elements within this SSMP may change to reflect the most up-to-date and accurate information available.

Our goal is to ensure that we have user-friendly documents for VSD staff, VSD Board members and for public review as required by the WDR.

VSD has assigned staff from each division to review each section of this SSMP to ensure that it complies with all requirements of this WDR.

SSMP FORMAT:

Each section of this SSMP is a summarized description of the mandatory elements of the Statewide General Waste Discharge Requirements (WDR) and is printed in bold type. Everything that is not in bold type describes how Valley Sanitary District complies..

ABBEVIATIONS / ACRONYMS:

BMP	Best Management Practice
CCTV	Closed-Circuit Television
CIP	Capital Improvement Plan
CWEA	California Water Environment Association
FOG	Fats, Oils, and Grease
GIS	Geographical Information Systems
I/I	Inflow / Infiltration
MRP	Monitoring and Reporting Program
NPDES	National Pollution Discharge Elimination System
MRP	Monitoring and Reporting Program
O&M	Operation and Maintenance
Order	State Water Resources Control Board Order No. 2006-003-DWQ
PM	Preventative Maintenance
RWQCB	Regional Water Control Board
SSO	Sanitary Sewer Overflow
SSMP	Sewer System Management Plan
WDR	Waste Discharge Requirements

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN (SSMP)

Section 1
SSMP GOALS

In compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This section outlines the requirements of the Statewide Sanitary Sewer General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District (VSD) complies.

1. Goals: The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent Sanitary Sewer Overflows (SSOs), as well as mitigate any SSOs that occur.

The mission of the Valley Sanitary District is to collect wastewater, treat and reclaim the water for beneficial use in a safe and cost effective manner as prescribed by state and federal law. The District is dedicated to: excellence in service; maintaining a high standard of operation and maintenance; forward thinking in planning for facility and operation needs, and achieving maximum cost efficiency and effectiveness. The District board and staff are dedicated to having the District be a positive asset to the community.

In support of this mission, the District has developed the following goals for the operation and maintenance of its sewer collection system.

1. Minimize sanitary sewer overflows.
2. Prevent public health hazards.
3. Minimize inconveniences by responsibly handling interruption in service.
4. Protect the large investment in collection systems by maintaining adequate capacities and extending useful life.
5. Prevent unnecessary damage to public and private property.
6. Use funds available for sewer operation in the most efficient manner.
7. Convey wastewater to the treatment facility with minimum of infiltration, inflow and exfiltration.
8. Provide adequate capacity to convey peak flows.
9. Perform all operations in a safe manner to avoid personal injury and property damage.

This SSMP supplements and supports the District's existing Operation & Maintenance Program and goals by providing high-level, consolidated guidelines and procedures for all aspects of the District's sewer system management. The SSMP will contribute to the proper management of the collection system and assist the District in minimizing the frequency and impacts of SSO's by providing guidance for appropriate maintenance, capacity management, and emergency response.

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 2
ORGANIZATION

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This Section outlines the requirements of the Statewide Sanitary Sewer General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

2. Organization: The SSMP must identify:

a. **The name of the agency's responsible or authorized representative.**
b. **The name and telephone number for management, administrative, and maintenance positions for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and**

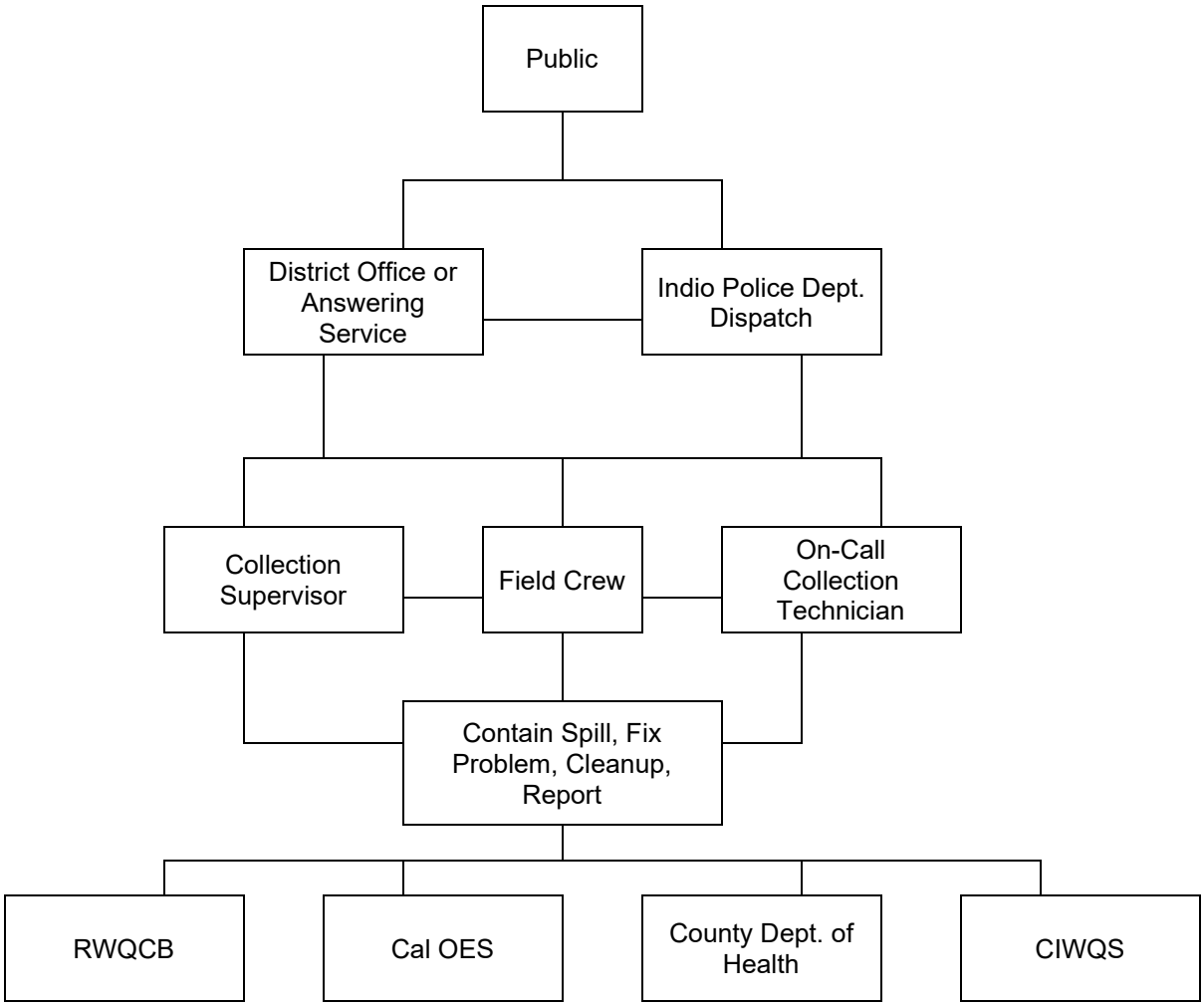
A Collection system organization chart that identifies District personnel responsible for implementing specific programs in the SSMP is included in this section.

c. **The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such a County Health Officer, County Environmental Health agency, Regional Water Board, and/or State Office of Emergency Services (OES).**

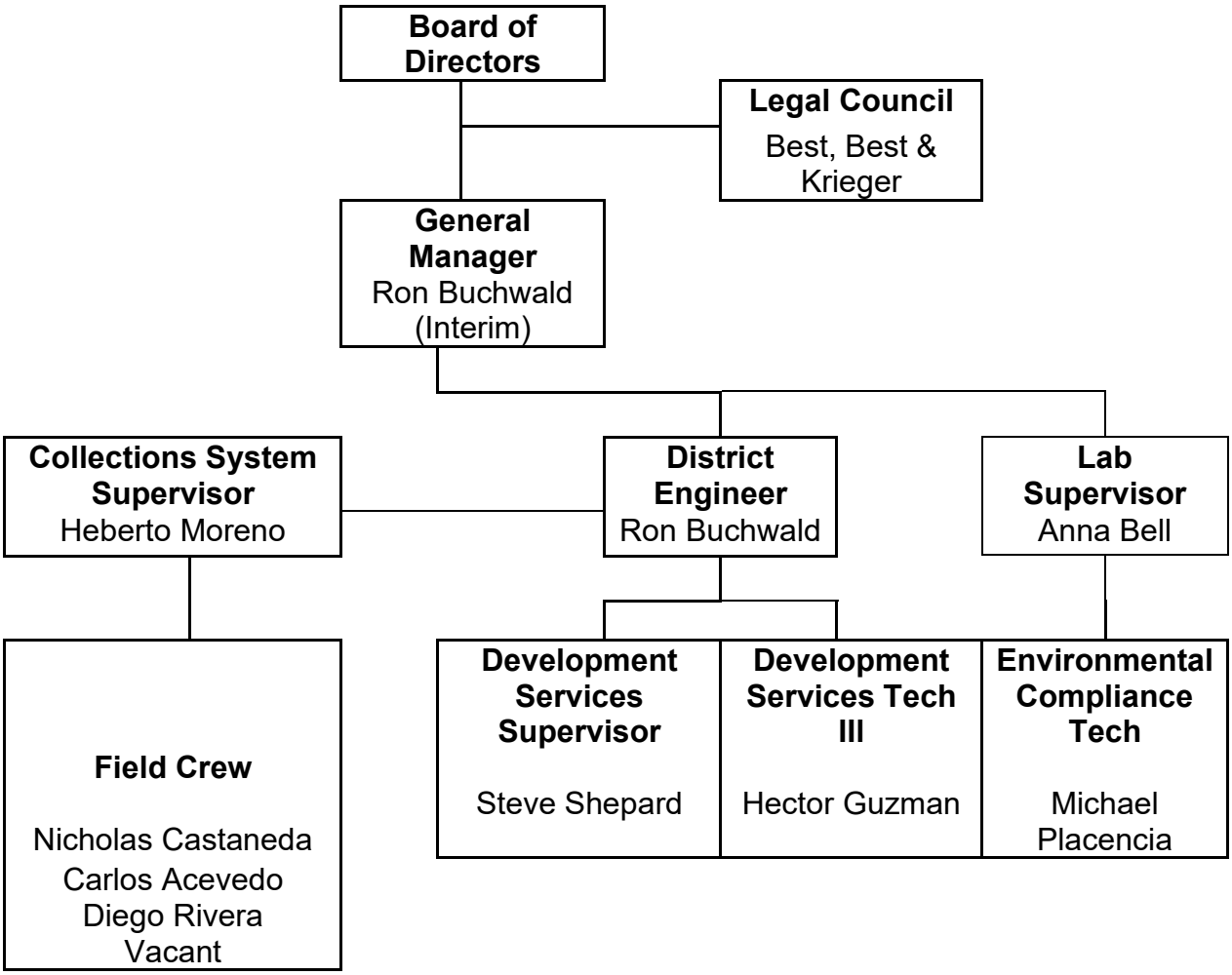
A chain of communication chart for reporting Sanitary Sewer Spills is located in this section and a detailed procedure for responding to and reporting spills can be found in our Sanitary Sewer Spill Emergency Response Plan located in the Spill Emergency Response Plan section.

Appendix A

SSO Reporting Chain of Communications



Valley Sanitary District
Collection System Organization Chart
Contact Number for all personnel
(760) 238-5400



Board of Directors: Establish policy.

General Manager: Enforce policy, plan strategy, lead staff, allocate resources, authorize outside contractors to perform service, and serve as public information officer.

District Engineer: Legally Responsible Officer for certifying Sewer System Management Plan (SSMP) elements, SSO reports and lead the development and implementation of the SSMP. Prepare bid documents for and manage rehabilitation Capital Improvement Projects. Planning, organizing, administering, and directing the installation and upgrading of the District's wastewater collection

system infrastructure. Responsible for ensuring the District's compliance with local, State and Federal regulations pertaining to wastewater collection.

Collection Supervisor: Manage field operations and maintenance activities, provide relevant information to agency management, leads emergency response, and CIWQS Data Submitter for spill reports. Train field crews.

Field Crew: Under direction of the Collection Supervisor, conduct preventive and corrective maintenance activities, mobilize and respond to notification of stoppages and SSOs.

Development Services Supervisor: Under direction of the District Engineer assist with plan and field reviews for compliance with District ordinances and regulations; perform FOG inspections; perform field construction inspections CIWQS Data Submitter for spill reports.

Development Services Tech I: Under direction of the Development Services Supervisor assist with plan and field reviews for compliance with District ordinances and regulations; perform FOG inspections; perform field construction inspections.

Lab Supervisor: Is responsible for the sampling, collection, monitoring, analyzing, and reporting of the quality of the wastewater treatment process. The Laboratory reports its findings to the California Regional Water Quality Control Board, the California Department of Health and the U.S. Environmental Protection Agency.

Environmental Compliance Tech: Under general supervision inspects pretreatment processes to ensure users are in compliance with the District's Environmental Compliance Pretreatment programs; inspects customer facilities to ensure compliance with District ordinances and regulations regarding the use of grease interceptors, sand/oil interceptors and clarifiers; develops, implements and maintains pretreatment program documentation and databases; and performs related duties as assigned.

2.0 ORGANIZATION
SSMP ELEMENT UPDATE LOG

1. **5/19/10 - Updated the name of the General Manager from Rex Sharp to Joseph Glowitz. By Steve Shepard**
2. **6/14/12- Removed Bill Rosamond From Organization Chart, Update new District phone number. By Steve Shepard**
3. **2/21/13 - Updated Organization Chart adding District Engineer. By Steve Shepard**
4. **8/5/13 - Updated Organization Cart to reflect changes to job titles. By Steve Shepard**
5. **6/4/14 - Updated Organizational Chart to reflect changes to job titles and personnel changes. By Steve Shepard**
6. **4/12/17- Updated Organizational Chart to reflect personnel changes. By Heberto Moreno**
7. **3/7/19- Updated Organizational Chart to reflect personnel changes. By Heberto Moreno**
8. **3/1/21- Updated Organizational Chart to reflect personnel changes. By Heberto Moreno**
9. **5/9/23- Updated Organizational Chart to reflect personnel changes. By Heberto Moreno**

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 3
LEGAL AUTHORITY

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This Section outlines the requirements of the Statewide Sanitary Sewer General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

VSD's General Authority to operate a wastewater collection and treatment facility is included in California Health and Safety Code, Division 6, Part 1, Sanitary District Act of 1923, 6400-6825.

3. Legal Authority: Each Enrollee must demonstrate, though sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

a. **Prevent illicit discharges into its sewer system, including I/I from satellite wastewater collection systems and laterals, stormwater, unauthorized debris, etc.**
   Valley Sanitary District Development Design Manual Edition 2016-1, Appendix B Sewer Construction and Use Ordinance 2022-121, Article 2 Prohibitions and Limits on Discharges, Resolution 2022-1170 Maximum Concentration Industrial Wastewater Pollutant Limitations. Illicit discharges are addressed in Article 2 – Prohibitions and Limits on Discharges.

b. **Require proper design and construction of sewers and connections.**
   VSD Development Design Manual 2016-1, Appendix I Standard Drawings and General Notes, Appendix J District Standard Specifications, was adopted by the Board of Directors to establish uniform construction standards for sanitary sewers and appurtenances.

   Sewer Use and Construction Ordinance 2022-121, Article 3, Sewer Construction, contains standards for sewer construction requirements, public and private sewer construction and out of district sewers. Article 5, Facilities Requirements, also contains standards for construction of pre-treatment related facilities.

   The District supplements these standards with:
   - "Greenbook" Standard Specifications for Public Works Construction.
   - California Plumbing Code, CCR Title 24, Part 5.
   - Recommendations by and of California Registered Civil Engineers
   - Accepted industry standards when applicable.

c. **Ensure access for maintenance, inspection, and repairs to publicly owned portions of laterals.**
VSD Development Design Manual 2016-1, Sewer Construction and Use Ordinance 2022-121, Article 3, Section 302-G, lateral sewers and private sewers are owned by the owner of the property. VSD is not responsible for any portion of the private lateral or sewer system.

d. **Limit the discharge of FOG and other debris that may cause blockages.**
VSD Development Design Manual 2016-1, Sewer Construction and Use Ordinance 2022-121, Article 2, Prohibitions and Limits on Discharges, Section 202 Specific Prohibitions, A3, prohibits the discharge of, "Solid or viscous pollutants which will cause obstruction to the flow in the sewer system resulting in interference or damage to the sewerage facilities".

Resolution 2022-1170 Industrial Wastewater Pollutant Limitations; establishes a local limit of 400.0 milligrams per liter (mg/L) for oil and grease discharges.

The District has implemented a formal FOG control program that dedicates personnel to:

- Identify the impact of FOG on the collection system.
- Identify and document sources of FOG, restaurants, bakeries etc. within the District.
- Establish outreach program to educate and assist FOG dischargers.
- Determine compliance by inspection/testing and ongoing monitoring.
- Interact with non-compliant FOG dischargers to achieve acceptable standards.
- Implement progressive enforcement as required.
- Work with potential dischargers prior to project development and discharge.

e. **Enforce violations of its sewer ordinances.**
Federal and State Laws grant the District the authority to prohibit flows and to take all actions necessary as described in Ordinance 2022-121, Article 1, General Provisions, Section 106, Authority.

Sewer Construction and Use Ordinance 2022-121 addresses enforcement of sewer ordinance violations in Article 7, Enforcement, Section 703, Enforcement Procedures and Applicable Fees.

The California Penal Code Section 374.2(a) also provides enforcement authority for the malicious discharge or dumping of substances into the sanitary sewer capable of causing substantial damage or harm to the operation of the public sewer. A copy of 374.2(a) PC is included for reference.

State of California

PENAL CODE

Section 374.2

374.2. (a) It is unlawful for any person to maliciously discharge, dump, release, place, drop, pour, or otherwise deposit, or to maliciously cause to be discharged, dumped, released, placed, dropped, poured, or otherwise deposited, any substance capable of causing substantial damage or harm to the operation of a public sewer sanitary facility, or to deposit in commercial quantities any other substance, into a manhole, cleanout, or other sanitary sewer facility, not intended for use as a point of deposit for sewage, which is connected to a public sanitary sewer system, without possessing a written authorization therefor granted by the public entity which is charged with the administration of the use of the affected public sanitary sewer system or the affected portion of the public sanitary sewer system.

As used in this section, “maliciously” means intent to do a wrongful act.

(b) For the purposes of this section “person” means an individual, trust, firm, partnership, joint stock company, limited liability company, or corporation, and “deposited in commercial quantities” refers to any substance deposited or otherwise discharged in any amount greater than for normal domestic sewer use.

(c) Lack of specific knowledge that the facility into which the prohibited discharge or release occurred is connected to a public sanitary sewer system shall not constitute defense to a violation charged under this section.

(d) Any person who violates this section shall be punished by imprisonment in the county jail for not more than one year, or by a fine of up to twenty-five thousand dollars ($25,000), or by both a fine and imprisonment. If the conviction is for a second or subsequent violation, the person shall be punished by imprisonment in the county jail for not more than one year, or imprisonment pursuant to subdivision (h) of Section1170 for 16, 20, or 24 months, and by a fine of not less than five thousand dollars ($5,000) or more than twenty-five thousand dollars ($25,000).

(Amended by Stats. 2011, Ch. 15, Sec. 337. (AB 109) Effective April 4, 2011. Operative October 1, 2011, by Sec. 636 of Ch. 15, as amended by Stats. 2011, Ch. 39, Sec. 68.)

Document locations

- A copy of the Valley Sanitary District Development Design Manual Edition 2016-1 can be found in the Development Design Manual section of the SSMP and on the District website.
- A copy of the Sewer Construction and Use Ordinance 2022-121 and Resolution 2022-1170 “Maximum Concentration Limits Industrial Wastewater Pollutant Limitations”; can be found in the VSD Development Design Manual 2016-1 Appendix B Sewer Construction and Use Ordinance section of the SSMP and on the District website.
- A copy of The California Penal Code Section 374.2(a) is included in this section for reference.

374.2. (a) It is unlawful for any person to maliciously discharge, dump, release, place, drop, pour, or otherwise deposit, or to maliciously cause to be discharged, dumped, released, placed, dropped, poured, or otherwise deposited, any substance capable of causing substantial damage or harm to the operation of a public sewer sanitary facility, or to deposit in commercial quantities any other substance, into a manhole, cleanout, or other sanitary sewer facility, not intended for use as a point of deposit for sewage, which is connected to a public sanitary sewer system, without possessing a written authorization therefor granted by the public entity which is charged with the administration of the use of the affected public sanitary sewer system or the affected portion of the public sanitary sewer system.

As used in this section, "maliciously" means an intent to do a wrongful act.

(b) For the purposes of this section "person" means an individual, trust, firm, partnership, joint stock company, limited liability company, or corporation, and "deposited in commercial quantities" refers to any substance deposited or otherwise discharged in any amount greater than for normal domestic sewer use.

(c) Lack of specific knowledge that the facility into which the prohibited discharge or release occurred is connected to a public sanitary sewer system shall not constitute a defense to a violation charged under this section.

(d) Any person who violates this section shall be punished by imprisonment in the county jail for not more than one year, or by a fine of up to twenty-five thousand dollars ($25,000), or by both a fine and imprisonment. If the conviction is for a second or subsequent violation, the person shall be punished by imprisonment in the county jail for not more than one year, or imprisonment in the state prison for 16, 20, or 24 months, and by a fine of not less than five thousand dollars ($5,000) or more than twenty-five thousand dollars ($25,000).

3.0 LEGAL AUTHORITY
SSMP ELEMENT UPDATE LOG

1. **6/14/12- Updated reference to Sewer Use Ordinance 2010-118 By Steve Shepard**
2. **4/12/17- Updated reference to VSD Development Design Manual. Updated Reference location to document of The California Penal Code Section 374.2(a). Updated section C of the document in reference to access to "publicly owned" laterals. By Heberto Moreno**
3. **6/5/19- Updated Resolution 2008-998 "Local Pollutant Limitations" with Resolution 2019-1114.**
4. **5/5/23- Update references to adopted "Sewer Use Ordinance" 2022-121 and "Maximum Concentration Limits" Resolution 2022-1170. By Heberto Moreno**

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 4
OPERATION & MAINTENANCE PROGRAM

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This section outlines the requirements of the Statewide Sanitary Sewer General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

4.0 Operation & Maintenance Program: The SSMP must include those elements listed below that are appropriate and applicable to the Enrollee's system:

4a. Collection System Map: Each wastewater collection system agency shall maintain up-to-date maps of its wastewater collection facilities, showing all gravity line segments and manholes, pumping facilities, pressure pipe and valves, and applicable storm water and piping facilities.

The District owns and maintains a GIS system, Arc GIS, Arc Map 10, to maintain and update collection system mapping information. The graphical representations of the collection facilities are maintained in shape file format and overlaid over a County of Riverside parcel map and an aerial map of the District's service area. Staff digitizes as-built field drawings and information into the GIS.

The City of Indio & the City of Coachella are the local storm water authority. The District's storm water related file information includes a variety of drawings and composite storm water system drawings compiled for the City of Indio by a professional engineering firm. These drawings are recorded as tiff files on a file server common access by all staff. The drawings are also available in conventional paper format and stored in a file drawer labeled as 2C drawings.

4b. Preventative Operation and Maintenance: Describe routine preventative operation and maintenance activities by staff and contractors, include a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventative Maintenance (PM) should have a system to document scheduled and conducted activities, such as work orders.

The District currently employs five (5) employees dedicated to the operation and maintenance of the collection system. A Vactor 2100 Plus Series sewer cleaning vehicle is operated by two (2) employees on a 9/80 workweek schedule performing hydraulic rodding and vacuum removal of debris. A second Vactor

2100 Series sewer cleaning vehicle is utilized as a backup unit. Two (2) department employee's operate the television inspection truck identifying and evaluating the existing collection system. All maintenance personnel inspect and document system deficiencies on a daily basis.

A computerized asset management system is used to record and document collection system structural deficiencies as well as FOG and root problem areas identified by maintenance personnel. This management system is also used to generate and schedule work orders for the line maintenance crew. All information entered into the system database, including footage cleaned per day, month and year and the date it was cleaned, can easily be retrieved for review. SSO occurrences recorded in this database contain time, date, cause and remedy information.

The periodic time frame for cleaning the entire system is based on a priority ranking system. Areas of less volume flow such as housing subdivisions require more frequent cleaning than interceptor sewers. Sewers with roots or other defects impeding flow and FOG problem areas are also higher in priorities to prevent SSOs.

4c. Rehabilitation and Replacement Program: Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspection of manholes and sewer pipes, and a system of ranking the conditions of sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule to implement the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement program.

The district has a sewer system inspection program that includes closed circuit television (CCTV) inspection of all sewer mains. These sewer mains are televised subsequent to the sewer cleaning operation and during the sewer main cleaning process all manholes are inspected by the cleaning crew. All pump stations are inspected on a regular basis and any components found to be defective or worn are replaced. Inspection data is imported into our asset management program to be analyzed and the results are displayed on a Geographical Information System (GIS) map of the sewer system.

A section of the 2013 Sewer Master Plan also describes a pipeline replacement program for VSD based on the observed condition data obtained through CCTV and estimated condition based on age of the pipelines. This section presents a systematic, decision-making framework for prioritizing condition assessment activities, VSD's existing CCTV assessment data, and pipeline replacement and rehabilitation prioritizations based on the CCTV data. This section breaks down the analysis results into two categories:

1. Replacement or rehabilitation of pipelines that fall under high risk category due to age or known deterioration based on CCTV data.
2. Regular cleaning and televising of pipelines that are under medium to low risk category.

Since 2013, economic factors have led to less growth than anticipated in the 2013 CSMP, and effective conservation measures have also contributed to lower than anticipated increase in sewerage flow. In 2018, a review of the Collection System Master Plan was done and a Technical Memorandum (TM) was created. Review was initiated to refine earlier population projections, update the model with current observed flows from the Water Reclamation Facility (WRF) and recently added infrastructure improvements, and verify project recommendations from the CSMP.

Areas of Concern (AOC's) previously identified in the CSMP (2013) were verified by the CSMP Review and have been associated with a capital improvement project. New areas of concern identified in the CSMP Review do not have a capital improvement project but will be monitored by VSD. **Table 7** and **Figure 12** of the 2018 TM show a summary of areas of concern by planning horizon i.e. existing conditions (2017), interim planning horizon conditions (2035), build-out conditions.

In early 2018, the Collections System Design and Program Management Project was initiated. This capital improvement project will be divided into phases that will span over the next 10 years or so. Harris and Associates was hired to be the Program Manager for the duration of the project and assist the District in categorizing and prioritizing the sewer pipes and manholes in the collection system for rehabilitation and replacement. This will be accomplished by analyzing new and existing CCTV data collected by VSD's collections crew and assigning risk ratings to all pipes within VSD's sewer collections system. Based upon the assigned ratings and other prioritization criteria, the Program Manager will establish immediate needs based on impacts of failure, maintenance priorities, and other risk-based assessments; pipes and manholes will be slated for rehabilitation, replacement, or regular maintenance.

In addition, the Program Manager will help the District group construction and maintenance projects into phases and schedule bidding and construction of all projects within each phase. The Program Manager will also provide other various project tasks such as engagement with project stakeholders, drafting of construction and bid documents, and quality control/quality assurance review.

4d. Training: Provide training on a regular basis for staff in sanitary sewer system operations and maintenance and require contractors to be appropriately trained.

Prior to the end of their orientation period Collection personnel are required to obtain a California Water Environmental Association (CWEA) Collection System Technician Grade 1 certification and to complete training contained in the collection department orientation manual, which is a check list of the minimum knowledge of collection department equipment and safety procedures.

Currently the District Board of Directors supports the education and promotion of collection personnel to advanced job positions and higher pay scales for the acquisition of higher-grade certifications up to a grade 3 in their field.

The District budgets each year for continued education and training for employees. Collection personnel attend selected CWEA training conferences and specialty workshops as part of the continued educational training process.

The Districts Injury and Illness Program includes regular safety training for District personnel throughout the year.

The bid documents for contracted work on the District's Collection system include a contractor safety program that requires safety training for contractors.

A copy of the Contractor Safety program, Collection Department Orientation Manual, and a summary of the most recent calendar year of safety training topics are available for review upon request.

4e. Contingency Equipment and Replacement Inventories: Provide Equipment and replacement part inventories, including identification of critical parts.

The collection department keeps an inventory of parts needed to repair the most common components in the collections system which are subject to a failure that would interrupt service.

All the District's lift stations have a bypass overflow and can be shut down for extended periods of time for required repairs.

The most important piece of equipment for the collection system is the Vactor combination truck. We have two similar combination units that are rotated for usage and act as backups to each other if either unit were to be down for servicing or repairs.

We utilize two local suppliers that carry well stocked inventories of sewer system parts and components.

Document Locations

- A copy of the “Collection System Master Plan 2013” can be located for reference in the Master Plan Section of the SSMP and on the District website.
- A copy of the “Collection System Master Plan Review 2018” can be located for reference in the Master Plan Section of the SSMP and on the District website.
- A copy of the “Program Management Plan and Design for the Collection System Infrastructure” can be located for reference in the Program Management Plan section of the SSMP or in the District website

A copy of the most recent District budget including a time schedule and a plan for developing funds for long term and short-term capital improvement projects can be located for reference in the Annual Budget Section of the SSMP and on the District website.

4.0 Operation & Maintenance Program
SSMP Element Updates Log

1. **6/4/14- Section 4c: Collection System Master Plan date changed from 2003 to 2013. By Heberto Moreno**
2. **6/16/14- Section 4c: Added Pipeline Replacement Evaluation information and updated Capital Improvements projects based on our 2013 Master Plan. By Heberto Moreno**
3. **6/18/14- Section 4e: Updated and added information regarding the Vactor Units. By Heberto Moreno**
4. **4/12/17- Updated section 4b, workweek schedule. By Heberto Moreno**
5. **3/12/19- Updated section 4c, with CSMP Review 2018 and updated Areas Of Concern (AOC). By Heberto Moreno**
6. **3/15/21- Updated section 4b, to reflect the number of current employees and employees per crew (Vactor and CCTV). By Heberto Moreno**

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 5
DESIGN & PERFORMANCE PROVISIONS

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This Section outlines the requirements of the Statewide Sanitary Sewer General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

5. Design and Performance Provisions

5a. Standards for Installation, Rehabilitation and Repair: The SSMP must identify design and construction standards and specifications for the installation of new sanitary sewer system, pump stations and other appurtenances; and the rehabilitation and repair of existing sanitary sewer system.

Valley Sanitary District Development Design Manual 2016-1, design and construction of sewer facilities (VSD Standard Specifications) was adopted by the Board of Directors to establish uniform construction standards for sanitary sewers and appurtenances. In 2022, the Board of Directors adopted a revised Sewer Construction and Use Ordinance 2022-121, Appendix B of the Development Design Manual.

Sewer Construction and Use Ordinance 2022-121, Article 3, Sewer Construction, contains standards for sewer construction requirements, public and private sewer construction and out of District sewers.

The District supplements these standards with:

- “Greenbook” Standard Specifications for Public Works Construction.
- California Plumbing Code, CCR Title 24, Part 5.
- City of Indio Public Works Street Standards and the City of Indio/Indio Water Authority (IWA) Design Standards and Specifications
- City of Coachella Public Works Street Standards and the City of Coachella Water Design Standards and Specifications
- Recommendations by California Registered Civil Engineers
- Accepted industry standards when applicable.

5b. Standards for Inspection and Testing of New, Rehabilitated, and Repaired Facilities: The SSMP must identify the procedures and standards for inspecting and testing the installation of new sewers, pumps and other appurtenances and for rehabilitation and repair projects.

Standards for inspection and testing are outlined in the Valley Sanitary District Development Design Manual 2016-1, Standard Specifications. Any testing procedures

that are not covered under the VSD Standard specification shall be tested in accordance with the most recent edition of “Standard Specifications for Public Works Construction”.

Document locations

- A copy of the Valley Sanitary District Development Design Manual 2016-1 and Standard Specifications can be found in the Development Design Manual section of the SSMP and on the District's website.
- A copy of the minutes of the Regular Board Meeting where action was taken to adopt the Valley Sanitary District Development Design Manual is included in this section.
- A copy of the minutes of the Regular Board Meeting where action was taken to adopt the revised Sewer Construction and Use Ordinance 2022-121.

VALLEY SANITARY DISTRICT
MINUTES OF REGULAR BOARD MEETING
June 28, 2016

A regular Board Meeting of the Governing Board of Valley Sanitary District (VSD) was held at the District offices, 45-500 Van Buren Street, Indio, California, on Tuesday, June 28, 2016.

CALL TO ORDER, ROLL CALL

1. PRESIDENT YORK called the meeting to order at 1:01 p.m. Those in attendance were as follows:

DIRECTORS PRESENT:	Douglas A. York, Mike Duran, Merritt Wiseman, William Teague, and Eric Davenport
DIRECTORS ABSENT:	None
STAFF PRESENT:	Joseph Glowitz, General Manager, Holly Gould, Ron Buchwald, Nicholas Castaneda and Andy Boyd
GUESTS:	Dr. Bruce Underwood, Healthy Futures

CONSENT ITEMS

a. Consideration of the June 14, 2016 Regular Board Meeting Minutes

b. Approval of Summary of Cash & Investments for May 2016

c. Approval of Expenditures for June 9, 2016 to June 22, 2016

Check numbers 33989 to 34032 totaling $118,937.66 and a transfer of $515,228.66 were issued, as well as $84,817.34 in payroll transfers.

ACTION TAKEN:
MOTION: DIRECTOR TEAGUE made a motion to approve the minutes for the Regular Board Meeting held June 14, 2016, to approve the Summary of Cash & Investments for May 2016 and to pay the disbursement items as presented. DIRECTOR DURAN seconded the motion. Motion carried by the following vote: 5 yes

MINUTE ORDER NO. 2016-2560

PUBLIC COMMENTS

Dr. Bruce Underwood of Healthy Futures presented an overview of the District's Wellness Program. He gave an update of the program's attendance from what was stated to the Board at the last board meeting.

EMPLOYEE RECOGNITION

2. Presentation of Employee Anniversary Pin

- Andy Boyd – 7 years
- Nicholas Castaneda – 2 years

The Board presented Andy and Nicholas with their anniversary pins and thanked them for their contribution and years of service to the District.

NON-HEARING ITEMS

3. Adopt the 2016 Valley Sanitary District's Development Design Manual

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Staff has been working with a consultant to develop an update to the District's Development Standards and Specifications that stipulates how developers design and construct sewer systems for the District.

ACTION TAKEN:
MOTION: DIRECTOR TEAGUE made a motion to adopt the 2016 Valley Sanitary District's Development Design Manual. DIRECTOR DURAN seconded the motion. Motion carried by the following roll call vote:

AYES: Director(s) Davenport, Duran, Teague, Wiseman, York
NOES: None
ABSENT: None
ABSTAIN: None

MINUTE ORDER NO. 2016-2561

4. Solar PV Project – Electrical Engineering & Inspection Services

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The Solar PV project is owned and operated by Solar City. However, since the solar project will be connected to the Imperial Irrigation District's transformer and grid, electrical plan review and inspection will be required. MWH is currently performing construction management services for the District on the Requa Interceptor Project. MWH has personnel who can perform the required electrical engineering and inspection services. MWH provided a proposal to perform this work for a not to exceed cost of $16,840.

ACTION TAKEN:
MOTION: DIRECTOR WISEMAN made a motion to authorize the General Manager to enter into a professional services agreement with MWH Global, Inc., (MWH) for a not to exceed fee of $16,840 for electrical engineering and inspection services. DIRECTOR DAVENPORT seconded the motion. Motion carried by the following roll call vote:

AYES: Director(s) Davenport, Duran, Teague, Wiseman, York
NOES: None
ABSENT: None
ABSTAIN: None

MINUTE ORDER NO. 2016-2562

5. Requa Interceptor Project Report Number 1

The Requa Interceptor project is just getting started. Potholing for utility conflicts has begun. Survey staking has been completed. The baseline construction schedule has been submitted and accepted. Actual excavation work is set to begin during the week of July 18, 2016, pending pipe material arrival, City traffic control approval, and other coordination work. Staff continues to meet with project stakeholders. A preconstruction meeting was held on June 15, 2016 to discuss the project with utility companies, City of Indio staff, and other project stakeholders. Staff plans to attend two upcoming Town Hall meetings on June 30, 2016 at the Boys and Girls Club and July 21, 2016 at the Senior Center, both at 6 PM. Staff did a presentation for the City Council and was well received. VSD staff has negotiated a change order to account for the delay in releasing the Notice to Proceed, as well as adding a four day delay to account for the new concert series the first two weekends in October. DCI, Inc. submitted a progress payment request for work completed to date.

ACTION TAKEN:
MOTION: DIRECTOR DURAN made a motion to approve Change Order No. 1 and approve a progress payment to DCI, Inc. for $422,594.51 and $46,954.95 to be placed in a retention account. DIRECTOR TEAGUE seconded the motion. Motion carried by the following roll call vote:

AYES: Director(s) Davenport, Duran, Teague, Wiseman, York
NOES: None
ABSENT: None
ABSTAIN: None

MINUTE ORDER NO. 2016-2563

6. Front Wall & Entrance Improvement Project Report Number 5

The Front Wall and Entrance Improvement Project is complete as of this progress payment, excluding a portion of the work listed in Change Order No.5 (extending the wrought iron fence northerly to the north property line). The Contractor has made all the corrections to deficient work found during the final job walk inspection. The remaining 135 lineal feet of wrought iron fence will be installed after the completion of the Solar Project and the portion of the Requa alignment on the north end of District's property. This work is estimated to be installed in September 2016. Change Order No. 6 to add a timer on the southerly gate is recommended for approval.

ACTION TAKEN:
MOTION: DIRECTOR DAVENPORT made a motion to approve Change Order No. 6 and approve a progress payment to RDP/SCI, Inc. for $84,097.61 and $4,426.19 to be placed in a retention payable account. DIRECTOR DURAN seconded the motion. Motion carried by the following roll call vote:

AYES: Director(s) Davenport, Duran, Teague, Wiseman, York
NOES: None
ABSENT: None
ABSTAIN: None

MINUTE ORDER NO. 2016-2564

7. California Special Districts Association (CSDA) 2016 Board Elections

It was the consensus of the Board to elect Bill Nelson for the CSDA Board of Directors Southern Network; Seat B.

ACTION TAKEN:
MOTION: DIRECTOR TEAGUE made a motion to elect Bill Nelson for the CSDA Board of Directors Southern Network; Seat B. DIRECTOR WISEMAN seconded the motion. Motion carried by the following roll call vote:

AYES: Director(s) Davenport, Duran, Teague, Wiseman, York
NOES: None
ABSENT: None
ABSTAIN: None

MINUTE ORDER NO. 2016-2565

8. Local Agency Formation Commission (LAFCO) 2016 Elections

It was the consensus of the Board to elect Nancy Wright as Regular Special District Member and Robert Stockton as Alternate Special District Member for the Local Agency Formation Commission.

ACTION TAKEN:
MOTION: DIRECTOR TEAGUE made a motion to elect Nancy Wright as Regular Special District Member and Robert Stockton as Alternate Special District Member of the Local Agency Formation Commission. DIRECTOR DAVENPORT seconded the motion. Motion carried by the following roll call vote:

AYES: Director(s) Davenport, Duran, Teague, Wiseman, York
NOES: None
ABSENT: None
ABSTAIN: None

MINUTE ORDER NO. 2016-2566

9. General Manager's Report

The generator from recently demolished TFP Building has been sold as surplus. The old house has been painted to match the rest of the buildings on site. Interviews for the Maintenance Supervisor position are underway. The new Associate Engineers will start on July 11, 2016. Two of the ponds at the Wetlands have been drained. Nests are clear.

DIRECTORS' ITEMS

Directors' items not listed are for discussion only; no action will be taken without an urgency vote pursuant to State law.

INFORMATIONAL ITEMS

The Board received and acknowledged the copy of the Combined Monthly Account Summary for expenses incurred by the District in May 2016.

ADJOURNMENT

There being no further business to discuss, the meeting was adjourned at 1:45 p.m., and the next Regular Board Meeting will be held July 12, 2016.

Respectfully submitted,

Joseph Glowitz

Joseph Glowitz, General Manager
Valley Sanitary District

5.0 Design & Performance
SSMP ELEMENT UPDATE LOG

1. **6/14/12- Changed reference to new Sewer use Ordinance 2010-118. By Steve Shepard**
2. **4/12/17- Add reference to Development Design Manual. By Heberto Moreno**
3. **4/16/19- Add copy of the Regular Board Meeting minutes referencing the adoption of the VSD Development Design Manual. By Heberto Moreno**
4. **5/9/23- Reference the adopted Sewer Construction and Use Ordinance 2022-121, Appendix B of the Development and Design Manual. Board Meeting minutes included. By Heberto Moreno**

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 6
SPILL EMERGENCY RESPONSE PLAN

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2022-0003-DWQ

This Section outlines the requirements of the Statewide Spill Response Plan General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

6. The Plan must include an up-to-date Spill Emergency Response Plan to ensure prompt detection and response to spills, to reduce spill volumes and collect information for prevention of future spills. The Spill Emergency Response Plan must include procedures to:

a. **Notify primary responders, appropriate local officials, and appropriate regulatory agencies of a spill in a timely manner.**
b. **Notify other potentially affected entities (for example, health agencies, water suppliers, etc.) of spills that potentially affect public health or reach waters of the State.**
c. **Comply with the notification, monitoring, and reporting requirements of this General Order, State law and regulations, and applicable Regional Water Board Orders**
d. **Ensure that appropriate staff and contractors implement the Spill Emergency Response Plan and are appropriately trained.**
e. **Address emergency system operations, traffic control, and other necessary response activities**
f. **Contain a spill and prevent/minimize discharge to waters of the State or any drainage conveyance system.**
g. **Minimize and remediate public health impacts and adverse impacts on beneficial uses of waters of the State.**
h. **Remove sewage from the drainage conveyance system.**
i. **Sanitize the spill area and drainage conveyance system in a manner that does not inadvertently impact beneficial uses in the receiving waters.**
j. **Implement technologies, practices, equipment, and interagency coordination to expedite spill containment and recovery.**
k. **Implement pre-planned coordination and collaboration with storm drain agencies and other utility agencies/departments prior, during, and after a spill event.**
l. **Conduct post-spill assessments of spill response activities.**
m. **Document and report spill events as required in this General Order**
n. **Annually review and assess effectiveness of the Spill Emergency Response Plan, and update the Plan as needed.**

The District's Sanitary Sewer Spill Emergency Response Plan was developed to be an up to date, step by step guide on how to respond to, report and prevent a spill from negatively impacting public health, the environment and personal property. The Spill Emergency Response plan addresses all of the elements outlined above. A copy of the Spill Emergency Response plan is included in this section.

VALLEY SANITARY DISTRICT
MANUAL OF POLICIES AND PROCEDURES

SUBJECT: SANITARY SEWER SPILL EMERGENCY RESPONSE PLAN

Administrative Policy:
Policy No.96-B007
Date Issued 08/13/96
Revised 06/05/2023

PURPOSE

The District operates & maintains a collection system, which consists of pumping stations, gravity sewer mains and force mains. These facilities are well maintained and normally should not result in any sanitary sewer spills. However, the possibility exists that unforeseen accidents, unusual equipment failure or other events not controllable by the District could result in a sanitary sewer spill. This procedure provides a plan that when enacted in response to a spill would reduce or eliminate public health hazards, prevent unnecessary property damage and minimize the inconvenience of service interruptions. In order for response personnel to accurately assess the level of response, the potential for outside cost associated with cleanup, potential liability claims for property damage and to accurately report sanitary sewer spills to regulatory agencies the following methods of containment shall apply.

NOTIFICATION

Calls coming into the office reporting sewer spills are handled in two different ways depending on if the call is during regular business hours or if it is after hours, night, weekends or a holiday. From the time a call comes in, to the time a technician arrives on scene is expected to be less than one hour. A Sanitary Sewer Spill Reporting chain of communication is included in this plan (**Appendix A)**:

1. Procedures for calls that are received during working hours:

   a) The phone operator obtains all relevant information available regarding the spill including:

      - Time and date call received.
      - Specific location.
      - Description of problem.
      - Caller's name and phone number.
      - Is the spill heading to storm drain or wash.
      - Other relevant information.

   b) The phone operator notifies the collection supervisor and the supervisor dispatches collection maintenance personnel.

2. Procedures for calls that are received during non- office hours:

   a) Calls that come into the regular office phone number are automatically forwarded to the answering service.

   b) The answering service phone operator obtains all relevant information regarding the spill.

   c) The answering service operator pages a numeric pager that is carried by the designated on-call collection technician.

   d) The on-call collection technician calls into the answering service to obtain information regarding the backup or spill.

3. Procedures for a call that are called into the City of Indio, City of Coachella, 911 or spill that are discovered by public safety officers.

   a) The Indio Police dispatcher obtains all relevant information and then calls our office number to relay the information.

4. In the event that there may be a break down in any of the communication systems both the District answering service and Indio Police dispatch have a phone number list with District personnel home phone and cell phone numbers and are directed to go down the list until a District personnel has acknowledged the call.

SAFETY

Whenever a District personnel responds to a report of a spill, they may encounter an emergency situation that requires immediate action. Depending on the nature or cause of the spill, personnel may be performing mechanical or electrical repairs at a pumping station, removing a mainline stoppage with the Vactor, or repairing a damaged section of pipeline. At this point, it is essential that all applicable safety procedures are followed so that the response does not cause the situation to escalate. The most critical aspect of resolving an incident of this nature is to safely and competently perform the actions necessary to return the damaged equipment or facility to operation as soon as possible.

Typical responses may require personnel to implement the following types of safety procedures.

- Lockout/Tagout of equipment for repairs
- Confined Space Entry procedures
- Traffic control procedures
- Trench safety and shoring procedures
- Equipment and/or vehicle operation
- Use of personnel protective equipment

Another important aspect of responding to a spill is the ability to maintain adequate communication via two-way radio and/or cellular telephone. Responders may need to call for additional resources as the situation may warrant as well as to notify other personnel and supervisors of the situation.

RESPONSE

Procedures when arriving on the scene of a spill:

- Evaluate spill and make corrections as needed to contain and remedy cause of spill.
- Record all events and volume of spill via photos and written report on Sewer Spill report (**Appendix B**).
- Contact Collection Supervisor of any spills or if property damage occurs.

CONTAINMENT

- Dikes (construct small dikes of dirt and or sandbags to contain spill).
- Divert (construct small dikes to change direction of sewer flow or direct to a containment area)
- Retain (let spill collect in natural low areas and remove as soon as possible).
- Plug off street storm drains or cover curb catch basins with plastic and sandbags to prevent spills from entering.
- Contain the sewer spill to the maximum extent possible to prevent the discharge of sewage into surface waters.

CONTROL

- Jet sewer to clear sewer main, determine cause of blockage.
- Transfer sewage by utilizing jet vactor truck or by-pass pumps to divert flow to treatment plant or downstream manhole.
- Repair problem if spill is caused by a damaged sewer main.

ENTRY INTO AREA

- Use barricades, cones or flagmen to control traffic or pedestrians.
- Isolate spill area.

CLEANUP AND RECOVERY

- Use jet vacuum truck or trash pump to recover spilled materials for transfer to treatment plant or return to sewer.

- Use sand or other absorbent products to absorb spilled material and remove with shovels or front-end loader.
- Double check area of spill to assure final cleanup and disinfection is completed.
- If a spill enters a drainage conveyance system, locate the furthest downstream storm drain manhole, utilize provided City of Indio Storm Drain System map, and divert the flow in the conveyance system to the sewer system using by-pass pump or Vacuum truck until the conveyance system is free of sewage.
- If sewage enters a drainage conveyance system, make every effort to recover and cleanup the spill area and post the area with the contaminated water warning signs.

SANITARY SEWER SPILL CATEGORIES

Category 1 – A Category 1 spill is a spill of any volume of sewage from or caused by a sanitary sewer system regulated under this General Order that results in a discharge to:

a) A surface water, including a surface water body that contains no flow or volume of water; or

b) A drainage conveyance system that discharges to surface waters when the sewage is not fully captured and returned to the sanitary sewer system or disposed of properly.

Any spill volume not recovered from a drainage conveyance system is considered a discharge to surface water unless the drainage conveyance system discharges to a dedicated stormwater infiltration basin or facility.

Category 2 – A Category 2 spill is a spill of 1,000 gallons or greater, from or caused by a sanitary sewer system regulated under this General Order that does not discharge to a surface water.

Category 3 – A Category 3 spill is a spill of equal to or greater than 50 gallons and less than 1,000 gallons, from or caused by a sanitary sewer system regulated under this General Order that does not discharge to a surface water.

Category 4 - A Category 4 spill is a spill of less than 50 gallons, from or caused by a sanitary sewer system regulated under this General Order that does not discharge to a surface water.

Voluntary Reporting of Spills from Privately-Owned Sewer Laterals and/or Private Sanitary Sewer Systems

Within 24 hours of becoming aware of a spill (as described below) from a private sewer lateral or private sanitary sewer system that is not owned/operated by the

Enrollee, the Enrollee is encouraged to report the following observations to the online CIWQS Sanitary Sewer System Database at the following link: https://ciwqs.waterboards.ca.gov:

- A spill equal or greater than 1,000 gallons that discharges (or has a potential to discharge) to a water of the State, or a drainage conveyance system that discharges to waters of the State; or

- Any volume of sewage that discharges (or has a potential to discharge) to surface waters.

In the CIWQS module, the Enrollee is encouraged to identify:

- Time of observation.

- Description of general spill location (for example, street name and cross street names).

- Estimated volume of spill.

- If known, general description of spill destination (for example, flowing into drainage channel, flowing directly into a creek, etc.); and

- If known, name of private system owner/operator.

Voluntary Notification of Spills from Privately-Owned Laterals and/or Systems to the California Office of Emergency Services

Upon observing or acquiring knowledge of any of the following from a private sewer lateral or private sanitary sewer system that is not owned/operated by the Enrollee, the Enrollee is encouraged to notify the California Office of Emergency Services (as provided by Health and Safety Code section 5410 et. seq. and Water Code section 13271), or inform the responsible party that State law requires such notification to the Office of Emergency Services by any person that causes or allows a sewage discharge to waters of the State:

- A spill equal to 1,000 gallons or more that discharges (or has a potential to discharge) to waters of the State, or a drainage conveyance system that discharges to waters of the State; or

- A spill of any volume to surface waters.

PROCEDURES

This section provides the step-by-step procedures explaining the actions to be taken in response to a spill. This section is divided into three sections depending on the cause of the spill: Private lateral, mainline stoppage, force main leak or pump station failure.

PRIVATE LATERAL STOPPAGE/ DISCHARGE

1. Contact property owner or person reporting spill and obtain information on location to determine if the spill is within the District's service area as well as further information needed for monitoring and reporting requirements. Inform the owner or tenant to restrain from any further water usage until service has been restored back to normal.

2. Upon arrival at the scene a determination must be made as to the source of the blockage that's causing the spill. Is the blockage in the public sewer main or is it in the private lateral or private sewer main? If in the public sewer main proceed to Section labeled "Mainline Stoppage". If the spill has affected the general public right-of-way, containment and corrective actions will be needed to insure the health and safety of the public, to include notifying City of Indio Environmental Programs Coordinator.

3. Secure and contain the spill area to prevent sewage spill flow from entering surface waters, storm drains, storm channels, or storm drain catch basin, if possible.

4. Take photographs of the affected area and/or property damage for District records.

5. **If the spill originated from a private single family residential lateral:** The **owner** or **tenants** of the residents must be notified and informed that they are responsible for mitigating the necessary corrective action (ex. contacting a plumber of their choice to service the lateral) in response to the issue. If the spill reaches the public-right-of-way VSD will clean up, recover, and disinfect the spill affected area along with notifying City of Indio Environmental Programs Coordinator.

6. **If the spill originating from a private commercial/ industrial/ multifamily lateral:** contain the spill on-site. The **owner** or **property managers** must be notified and informed that they are responsible for mitigating the necessary corrective action (ex. contacting a plumber of their choice to service the lateral) in response to the issue. If the spill reaches the public right-of-way and proper action has not been taken by the property owner within an appropriate

and responsible time frame, VSD will proceed with containment and recovery of the spill. VSD will notify the City of Indio Environmental Programs Coordinator.

7. Estimate the volume of the spill utilizing the SSO Emergency Response and Reporting Handbook, located in the responding Vactor truck and District office.

MAINLINE STOPPAGE

1. Contact property owner or person reporting spill and obtain information on location to determine if the spill is within the District's service area and for completion of reporting requirements.

2. Upon arrival at the scene a determination must be made as to the spill source or sources. **Is the spill appearance point from a mainline manhole or an individual building lateral or private sewer or combination?** If the spill has affected the general public right-of-way, containment and corrective actions will be needed to ensure the health and safety of the public, to include notifying City of Indio Environmental Programs Coordinator.

3. Prevent sewage flow from entering Conveyance Drainage System or Surface Water, if possible.

4. Estimate the volume of the spill utilizing the Spill Emergency Response and Reporting Handbook that is located in the responding Vactor truck and Collection's office

5. In the event of a spill over 50,000 gallons, water quality sampling will be required using the procedures outlined in the Water Quality Monitoring Program (**Appendix D**).

6. Inspect flow conditions downstream from the spill appearance point to determine the location and set up for the Vactor truck. (non-surcharging manhole)

7. Once the blockage has been relieved and the spill has ceased, every attempt should be made to contain the sewage that has spilled.

8. If there is flooding or property damage notify the Collection System Supervisor immediately. Have the homeowner fill out the personal property damage list form (**Appendix C**). Take photographs of the affected area and/or property damage for District records. The Collection System Supervisor shall notify the General Manager.

9. To minimize health hazards and damage, provide proper cleanup by removing debris, sanitize affected areas, wash down and recover.

10. Do not discuss District liability; but provide factual information. Be polite and sympathetic to property owner's concerns.

FORCE MAIN LEAK

In the event that a spill has occurred due to a leak from a force main the following actions shall be taken:

1. Turn the pumps to the off position.

2. Inspect the bypass system downstream to make sure that the sewer system can accommodate the extra flow.

3. Contain and recover the entire sewage spill as best as possible and report as required.

4. Depending on the nature of the damage to the pipeline, location of leak, volume of flow being conveyed and depth of the pipeline, emergency repairs may be conducted by District personnel or by a contractor.

PUMP STATION FAILURE

Each pump station is with fitted an alarm system that provides information to the District in the event of a system failure. Each of the pump stations are equipped with a by-pass overflow system that, in the event of a pump station failure, the wastewater will build up in the wet well until it reaches a level where it should flow through a bypass line to the gravity system without a spill from the upstream system. District staff shall respond when an alarm message is received regarding a pump station failure and utilize the following procedure:

1. Upon receiving a pump station alarm, the collection system person on call shall respond to the pump station from which the alarm has originated.

2. Based upon the nature of the problem the collection system personnel shall determine the appropriate course of action and decide on the staff response that will be needed. The Collection System Supervisor shall be notified.

3. A determination shall be made as to the likelihood that the shutdown or equipment failure will result in the release of sewage. Immediately notify the Collection System Supervisor and mobilize the necessary personnel and/or equipment to correct the problem.

4. Take the necessary steps to return the pump station to proper operation.

5. If a spill has occurred, contain the area and notify the Collection System Supervisor. Refer to mainline stoppage procedures for containment & cleanup.

SPILL REPORTING AND NOTIFICATION TIMEFRAMES

For any spill greater than or equal to 1,000 gallons that results or may result in a discharge to a surface water of the state, either directly or by way of a drainage channel or separate municipal storm drain system, the enrollee shall, as soon as possible, within two (2) hours after (A) that enrollee has knowledge of the discharge by discovery or receiving information from a public informant or other source(s), (B) notification is possible, and (C) notification can be provided without substantially impeding cleanup or other emergency measures, notify the California Office of Emergency Services (Cal OES) and obtain a notification control number.

Category 1 & Category 2 – Spills that meet the criteria for Category 1 or Category 2 shall be reported as soon as: (1) the enrollee has knowledge of the spill, (2) reporting is possible, and (3) reporting can be provided without substantially impeding cleanup or other emergency measures.

a. Draft reports for **Category 1** and **Category 2** shall be submitted to the CIWQS Online Database as soon as possible but within 3 business days of the knowledge of the spill.

b. A final certified **Category 1** or **Category 2** report shall be completed through the CIWQS Online Database within 15 calendar days of the end date of the spill.

c. Submit Amended Spill Report within 90 calendar days after the spill end date.

d. For sewage spills in which an estimated 50,000 gallons or greater are discharged into a surface water, the Enrollee shall conduct water quality sampling (**Appendix D**) no later than **18 hours** after the Enrollee's knowledge of a potential discharge to a surface water. Submit Technical Report within 45 calendar days after the spill end date.

Category 3– All spills that meet the criteria for Category 3 spills shall submit monthly Certified Spill Report to the online CIWQS Sanitary Sewer System Database and certified:

a. within 30 days after the end of the calendar month in which the spills occurred (**e.g., all spills occurring in the month of February shall be entered into the database by March 30th**).

b. Submit Amended Spill Report within 90 calendar days after the Certified Spill Report due date.

Category 4 – All spills that meet the criteria for Category 4 spills shall submit monthly Certified Spill Report to the online CIWQS Database:

a. Estimated total spill volume and the total number of all Category 4 spills into CIWQS, within 30 days after the end of the calendar month in which the spills occurred.

b. Upload and certify a report of all Category 4 spills to CIWQS, by February 1st after the end of the calendar year in which the spills occurred.

All Spills- Must be reported to Regional Water Quality Control Board as follows: Phone call to number as listed under RWQCB contact information within 24 hours from the time the Discharger becomes aware of a spill. Followed by a detailed report within 5 days.

Voluntary Reporting of Spills from Privately-Owned Sewer Laterals and/or Private Sanitary Sewer Systems

Within 24 hours of becoming aware of a spill (as described below) from a private sewer lateral or private sanitary sewer system that is not owned/operated by the Enrollee, the Enrollee is encouraged to report the following observations to the online CIWQS Sanitary Sewer System Database at the following link: https://ciwqs.waterboards.ca.gov:

- A spill equal or greater than 1,000 gallons that discharges (or has a potential to discharge) to a water of the State, or a drainage conveyance system that discharges to waters of the State; or

- Any volume of sewage that discharges (or has a potential to discharge) to surface waters.

In the CIWQS module, the Enrollee is encouraged to identify:

- Time of observation.

- Description of general spill location (for example, street name and cross street names).

- Estimated volume of spill.

- If known, general description of spill destination (for example, flowing into drainage channel, flowing directly into a creek, etc.); and

- If known, name of private system owner/operator.

Voluntary Notification of Spills from Privately-Owned Laterals and/or Systems to the California Office of Emergency Services

Upon observing or acquiring knowledge of any of the following from a private sewer lateral or private sanitary sewer system that is not owned/operated by the Enrollee, the Enrollee is encouraged to notify the California Office of Emergency Services (as provided by Health and Safety Code section 5410 et. seq. and Water Code section 13271), or inform the responsible party that State law requires such notification to the Office of Emergency Services by any person that causes or allows a sewage discharge to waters of the State:

- A spill equal to 1,000 gallons or more that discharges (or has a potential to discharge) to waters of the State, or a drainage conveyance system that discharges to waters of the State; or

- A spill of any volume to surface waters.

REPORTING TO THE BOARD OF DIRECTORS & MEDIA RELATIONS

The General Manager shall be responsible for notifying the Board of Directors regarding all major spills so that the Board of Directors will be prepared in the event of the media requesting information.

Collection personnel shall not respond directly to the media other than to refer all questions and requests from the media to the General Manager.

The General Manager and the Collection System Supervisor are responsible for ensuring all Collection and Operation personnel are trained in and follow these procedures.

All Collection personnel are responsible for following these procedures and completing reports with all pertinent information.

REPORTING OUTSIDE THE DISTRICT ORGANIZATION

Reporting is the process that ensures that the appropriate people and public agencies are informed of the occurrence of, and the details related to the unauthorized release of treated or untreated sewage.

The City of Indio is the local storm water authority. The District's storm water related file information includes a variety of drawings and composite storm water system drawings compiled for the City of Indio by a professional engineering firm. These drawings are recorded as tiff files on a file server common access by all staff. The drawings are also available in conventional paper format and stored in a file drawer labeled as 2C drawings, a copy can also be found in the Spill Emergency Respond and Reporting Handbook located in the responding vehicle and office. Contact information can be found in the section below.

California Office of Emergency Services (Cal OES)

The California Office of Emergency Services is responsible for maintaining and implementing the State of California's Emergency Plan. The Cal OES must be notified immediately if the sewage enters or will enter the Whitewater Storm Channel. The Cal OES operator will give you a report number and they will notify other state agencies of the spill. Their notification list includes California Department of Fish and Game, California Highway Patrol, California Department of Health Services, Caltrans, US Environmental Protection Agency, and US Fish and Wildlife Service.

Telephone (800) 852-7550 or (916) 845-8100

Regional Water Quality Control Board (RWQCB)

The RWQCB is part of the State Water Resources Control Board (SWRCB), and it is charged with the protection of all state water resources and with protecting the beneficial uses of those resources. This includes surface water, ground water, salt and fresh waters. The SWRCB has the legal authority to abate, through a cease-and-desist order, any situation that impacts or threatens to impact the waters of the state. This includes regulating all discharges to state waters, pursuing cleanup of spills, and assuring proper disposal of pollutants. The agency has broad powers to enforce standards and prohibitions to protect the waters of the state. Damage assessment reports or remedial action plans maybe required of the discharger. They have extensive expertise in the area of the impact of spills on the environment and they have the ability to conduct monitoring when required.

Telephone (760) 352-1464 FAX (760) 341-6820
E-Mail: jfigueroa-acevedo@waterboards.ca.gov

Riverside County Environmental Health Department

The Riverside County Environmental Health Department must be contacted when the spill poses a threat to public health and safety. They may order the discharger to abate the contamination. They may also require posting of the area to warn the public of the potential hazard.

Telephone (760) 863-7570 FAX (760) 863-7013

City of Indio Environmental Programs Coordinator

Contact the City of Indio in the event of a spill reaching the public right-of- way, street, curb n gutter, or any storm drain related facility.

Telephone (760) 625-1815
Email stoyoda@indio.org

COLLECTION SYSTEM PUMP STATION LOCATIONS

Site Name - Carver Pump Station
Location – Avenue 48 and Bataan
Emergency by-pass - Yes

Site Name – Vandenberg Lift Station
Location – Vandenberg and Pic Wy
Emergency by-pass - Yes

Site Name - Barrymore Pump Station
Location - Barrymore and Garbo
Emergency by-pass - Yes

Site Name – Calhoun Pump Station
Location – Calhoun St. and Avenue 49
Emergency by-pass - Yes

SPECIALTY CONTRACTORS LIST

In the event that a repair is required that District personnel would not be able to carry out, the following contractors may be available to do the work. These contractors have successfully completed emergency repairs for the District in the past.

Contractors Company	Phone	Cell	Contact Person
Borden Excavating	(909) 795-5410	(951) 543-5856	Shaun Borden
Valley Pipeline Inc.	(760) 564-9220	(760) 702-1581	Steve Vatter
Downing Construction	(909) 797-7444	(951) 377-7896	Kevin Ellis
James A. Shirley Inc.	(760) 228-0447	(760) 401-2619	Jim Shirley
Rain for Rent	(951) 653-2171	(909) 332-0316	Jeremy Mattson

VEHICLES AND EQUIPMENT LIST

Vehicle No.	Equipment Description	Location of Equipment	Fuel Type	Use	Comments
05	1/2 ton PU Truck	Yard	Gas	Sewer/Maints.	Avail. 24 hours
04A	Jet Vactor Truck	Yard	Diesel	Sewer/Maints.	Avail. 24 hours
04B	Jet Vactor Truck	Yard	Diesel	Sewer/Maints.	Avail. 24 hours
38	1 ton Crane Truck with arrow board	Yard	Gas	Const./Maints.	Avail. 24 hours
06	1 ton PU Truck with arrow board	Yard	Gas	Const./Maints.	Avail. 24 hours
21	TV Inspection Van	Yard	Gas	TV Inspection	Avail. 24 hours
	Lateral Camera	Yard		Lateral TV Inspection	Avail. 24 hours
	6 inch Trash Pump	Yard	Diesel	Pump/Bypass	Avail. 24 hours
	Jet Trailer with 1/2" Hose & 600' hose	Yard	Diesel	Sewer Maints	Avail. 24 hours
	8-12 inch Air Plug	Shop			
	12 -18 inch Air Plug	Shop			
	18-24 inch Air Plug	Shop			
	8-12 inch Air Bypass Plug	Shop			
	12-18 inch Air Bypass Plug	Shop			
	18-24 inch Air Bypass Plug	Shop			

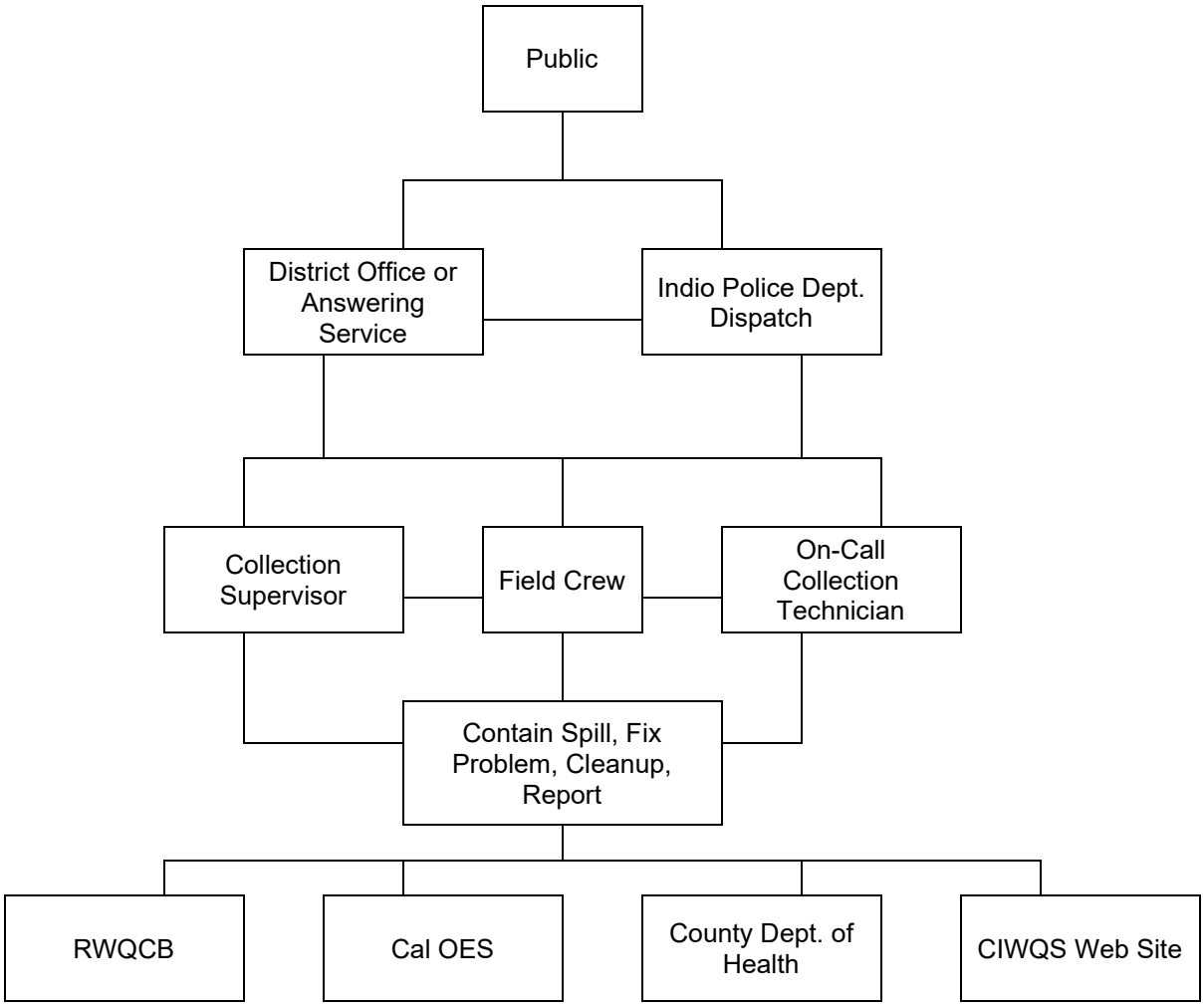
SPILL RESPONSE TRAINING

District collection system personnel have annual training on responding and reporting sewer spills and conduct mock drills on responding to sewer spill situations. This includes post-spill assessment when responding to a spill event.

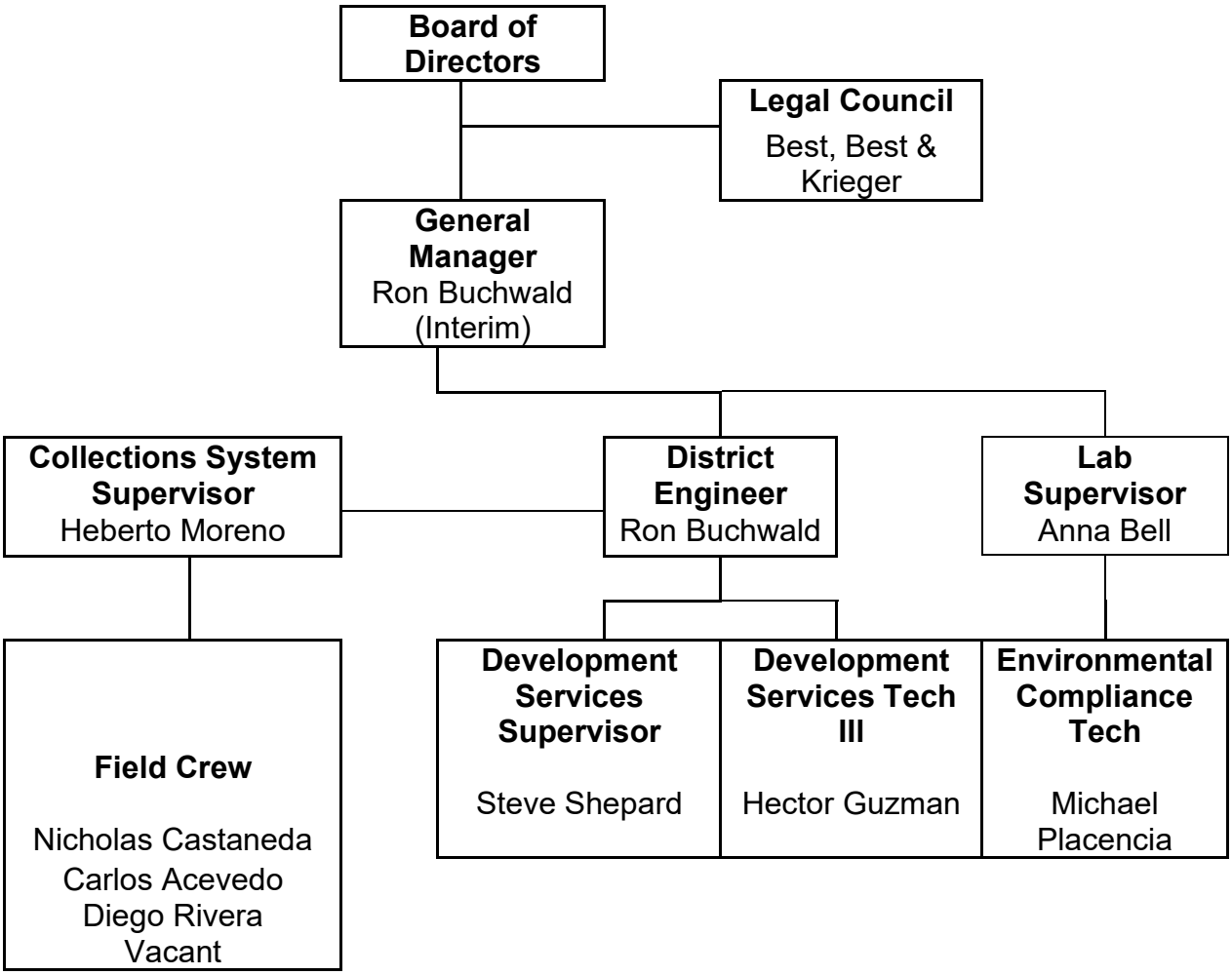
Contractors that work for the District are given a copy of and are trained on the Spill Emergency Response Plan in a preconstruction meeting before starting any projects.

Appendix A

SSO Reporting Chain of Communications



Valley Sanitary District
Collection System Organization Chart
Contact Number for all personnel
(760) 238-5400



Board of Directors: Establish policy.

General Manager: Enforce policy, plan strategy, lead staff, allocate resources, authorize outside contractors to perform service, and serve as public information officer.

District Engineer: Legally Responsible Officer for certifying Sewer System Management Plan (SSMP) elements, SSO reports and lead the development and implementation of the SSMP. Prepare bid documents for and manage rehabilitation Capital Improvement Projects. Planning, organizing, administering, and directing the installation and upgrading of the District's wastewater collection

system infrastructure. Responsible for ensuring the District's compliance with local, State and Federal regulations pertaining to wastewater collection.

Collection Supervisor: Manage field operations and maintenance activities, provide relevant information to agency management, leads emergency response, and Legally Responsible Officer for certifying SSOs reports. Train field crews.

Field Crew: Under direction of the Collection Supervisor, conduct preventive and corrective maintenance activities, mobilize and respond to notification of stoppages and SSOs.

Development Services Supervisor: Under direction of the District Engineer assist with plan and field reviews for compliance with District ordinances and regulations; perform FOG inspections; perform field construction inspections Legally Responsible Officer for certifying SSOs reports.

Development Services Tech I: Under direction of the Development Services Supervisor assist with plan and field reviews for compliance with District ordinances and regulations; perform FOG inspections; perform field construction inspections.

Lab Supervisor: Is responsible for the sampling, collection, monitoring, analyzing, and reporting of the quality of the wastewater treatment process. The Laboratory reports its findings to the California Regional Water Quality Control Board, the California Department of Health and the U.S. Environmental Protection Agency.

Environmental Compliance Tech: Under general supervision inspects pretreatment processes to ensure users are in compliance with the District's Environmental Compliance Pretreatment programs; inspects customer facilities to ensure compliance with District ordinances and regulations regarding the use of grease interceptors, sand/oil interceptors and clarifiers; develops, implements and maintains pretreatment program documentation and databases; and performs related duties as assigned.

Appendix B
Valley Sanitary District
Collection System Department

SEWER SPILL REPORT

INSTRUCTIONS:

Category 1 Spill – Please complete **Part 1**. A spill of 1,000 gallons or greater complete **Part 2**. (Spills of 50,000 gal or greater require Water Quality Sampling Analysis submit Spill Technical Report) :

A. Any volume reaches a surface water, including a surface water body that contains no flow or volume of water; or

B. A drainage conveyance system that discharges to surface waters when the sewage is not fully captured and returned to the sanitary sewer system or disposed of properly.

Category 2 Spill – Please complete Part 1 for all discharges of sewage of 1,000 gallons or greater that does not discharge to a surface water.

Category 3 Spill- Please complete Part 1 for spills equal to or greater than 50 gallons and less than 1,000 gallons that do not discharge to surface water.

Category 4 Spill- Please complete Part 1 for spills of less than 50 gallons that's does not discharge to surface water.

Private Lateral Spill – Please complete Part 1 and Part 3 for sewage discharge that are caused by blockages or other problems within a privately owned lateral or sewer.

PART 1: All Sewer Spills

REPORTED BY

Final Spill Report Identification No. (From Spill CWIQS) _____

Date Reported: _____ Call Received Time: _____

Caller's Name: _____Caller's Phone _____

Caller's Address: _____

Applicable Region: _____**Region 7**_____ County: _____**Riverside**_____

Technician Name: _____ Technician arrival Date & time: _____

Estimated spill start date/time: _____ Estimated spill end date/time: _____

SPILL LOCATION

Spill Location and affected area: (GPS, street address/intersection/distance and direction from Intersection, name of structure, e.g., pump station etc. if applicable): _____

_____

Spill Appearance point: _____
(Cleanout, manhole, pump station etc.)

Description of spill's final destination _____
(unpaved area, street gutter, other paved area etc,)

Pipe material and estimated age of pipe, at the failure point: _____

Spill associated with a storm event: _____

Did the spill reach a drainage conveyance system? If yes continue below: _____

Description of the drainage conveyance system transporting the spill: _____

Spill entry location into conveyance system: (photos)_____

Estimated spill volume fully recovered from drainage conveyance system: _____

Estimated spill volume remaining within the drainage conveyance system: _____

Spill discharge into surface waters?_____

Estimated spill volume (gallons): _____

Estimated spill volume recovered (gallons):_____

Determined Spill Category: _____

CAUSE OF SPILL

Spill cause: _____
(Roots, Grease, Debris, Vandalism, etc.)

System failure location (main, lateral, pump station etc.): _____

Activities to determine cause: _____

Spill response and corrective action activities: _____

_____

_____
(restore flow, CCTV, vacuum, return spill to sewer etc.)

Spill response completion date: _____

SPILL CONTAINMENT

Spill Containment Date & time: _____

Containment Measures: _____

_____

_____

PART 2: Spills of 1,000 Gallons or greater that discharges into waters of the state

Sanitary Sewer Spill Sequential Tracking No. (From OES): _____

Estimated spill rate from the system (gallons per minute)::

_____

Estimated discharge rate (gallons per minute) directly into waters of the State or indirectly into a drainage conveyance system: _____

Amount of spill contained: _____

Name of impacted surface water: _____

Is there an ongoing investigation? _____

Were samples taken? _____ List the parameters analyzed for: _____

_____

Which Regulatory agencies received sample results? _____

_____

Spill corrective action taken/preventative measures taken: _____

_____

PART 3: Private Lateral SSO's

Is the spill 1,000 gallons or greater with potential to discharge to a water of the State? _____

Provide the contact information for the party responsible for the private lateral/sewer: _____

_____

NOTIFICATION, MONITORING, and REPORTING REQUIREMENTS

Within 2 hours of becoming aware of a spill greater than or equal to 1,000 gallons, that discharges in or on any waters of the State, notify California Office of Emergency Services (Cal OES)

Category 1 & 2 Spill – Must be reported to the Online Spill Database (CIWQS) as soon as possible but no later than 3 business days after the District is made aware of the spill. A final certified report must be completed through the Online Spill System, within 15 calendar days of the conclusion of spill response and remediation.

Category 3 Spill – Must be reported to the Online Spill Database (CIWQS) within 30 days after the end of the calendar month in which the spill occurs.

Category 4 Spill- Report monthly, within 30 days after the end of the calendar month.

Private Lateral Sewage Discharges – May be reported to the Online Spill Database (CIWQS) upon the District's discretion.

All Spills – Must be reported to Regional Water Quality Control Board as follows: Phone call to number listed below within 24 hours from the time the Discharger becomes aware of spill. Followed by a detailed report within 5 days.

OTHER IMPORTANT MILESTONES

AGENCY	DATE	TIME	PHONE / FAX / OR VOICE
Regional Water Quality Control Board Attn: Jose Figueroa-Acevedo (760) 352-1464 FAX (760) 341-6820 EMAIL: jfigueroa-acevedo@waterboards.ca.gov			
California Office Of Emergency Services (800) 852-7550			
County Health Officer (760) 863-7570 FAX (760)-863-7013			
City of Indio Environmental Programs Coordinator (760) 625-1815 EMAIL: stoyoda@indio.org			
Collections System Supervisor (760) 497-2959			

Prepared by: _____ Date: _____

Title: _____

Reported by: _____ Date: _____

Title: _____

REPORT DECLARATION

The following statement of certification is to be signed by a duly authorized representative of Valley Sanitary District:

"I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based 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 and imprisonment for knowing violations."

Approved by: _____Date_____

Title: _____

SKETCH OF AREA/OTHER NOTES: (Include manholes, intersection, location of stoppage and spill, etc)

APPENDIX C

SEWER BACKUP INCIDENT REPORT

Date of incident_____ Time_____

Name_____ Address_____

Number of people living at residence_____ Approximate age of home_____

Number of Bathrooms_____ Number of rooms Affected_____

Approximate Time Sewerage has been sitting_____hrs/days

Does the home have a Backwater Prevention Device?	Yes( )	No( )
If yes, was the device operational at the time of the overflow?	Yes( )	No( )
If no, would one have prevented the overflow into the house?	Yes( )	No( )
Have there ever been any previous spills at this location?	Yes( )	No( )
Has there been any plumbing work done recently?	Yes( )	No( )
Is there a functioning and non-contaminated bathroom available?	Yes( )	No( )

Please Diagram the Rooms Affected(shade the areas most heavily affected)

AFFECTED PERSONAL PROPERTY INVENTORY SHEET

List all item that came into contact with any water due to the sewer backup.

Address_____Date_____

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

11._____

12._____

13._____

14._____

15._____

Name _____ Signature_____

SOP Type:
Internal Procedure

CONTROLLED DOCUMENT

Standard Operating Procedure

Water Quality Monitoring Program

Sanitary Sewer Overflow (SSMP)

For the VSD Laboratory & Collections

VSD

Valley Sanitary District

45-500 Van Buren St.

Indio, CA 92201

760-230-5400 x102

Responsible Parties

Name	Function / Title	Phone	Approval Signature	Date
Anna Bell	Laboratory Supervisor	760-238-5402	AnnBell	03/27/23
Anna Bell	Quality Assurance Officer	760-238-5402	AnnBell	03/27/23
Tito Moreno	Collections Supervisor	760-238-5416	[illegible]	03/29/23

Adopted Date:	04/01/23	Initials:	AmB
Effective Date:	04/01/23	Initials:	AmB

Annual Review of this SOP has been performed and the SOP still reflects current practice.

Initials: _____ Date: _____
Initials: _____ Date: _____
Initials: _____ Date: _____

LAB DOCUMENT CONTROL
SOP CODE: LAB-QS-4.7
Number: 028
Initials: AmB Date: 03/27/23

All VSD employees are responsible for ensuring that they use only the current approved version of this procedure.

1. Introduction

The Regional Water Quality Control Boards and State Water Boards are required to gather Sanitary Sewer Overflow (SSO) information and make it available to the public. A category one SSO is defined as any discharge of untreated or partially treated wastewater of any volume resulting from a sanitary sewer system failure or flow condition that reaches surface waters and/or drainage channels that contribute to surface waters or reach a storm sewer system that are not fully captured and returned to the sanitary sewer system. The SSO Water Quality Monitoring Program is to assess the impact from a category one SSO in which 50,000 gallons or greater are spilled to surface waters. The following are Valley Sanitary District's standard operating procedures to follow in such events.

2. Description of Collections

Valley Sanitary District (VSD) is located in a desert region. Stream flows in any storm channel or wash is very rare, except where the VSD's sewer treatment plant effluent outfall enters the Whitewater Channel. The other unique feature within the District is the fact that there are few storm drainpipes that could carry a SSO to any storm channel or wash. In most cases, streets are used to convey storm water to the storm channel. Except where VSD's effluent outfall enters the Whitewater channel, the channel or wash will be dry if a SSO makes it to the storm channel, which will prevent a SSO from entering surface water. None the less, VSD has developed standard operating procedures to deal with a large SSO that would reach surface waters.

There is one potential area where a large SSO could reach surface waters. This location is from the HWY 111 corridor and to the south which will travel through the Van Buren Street surcharge to street grade where it will migrate to the dirt channel adjacent to Dillon Street that eventually drains to Whitewater Storm channel. This route will have an extended detention time between initial spill point and the potential Whitewater surface water since it needs to reach a certain elevation before being able to flow into the storm channel. All initial efforts will be to contain the SSO so that a large flow will not enter the storm channel.

In the event a Category One SSO, in which 50,000 gallons or greater should reach surface waters, the following actions will occur:

- Notification and reporting to Cal OES will be made;
- Incident reports, technical reports, and a corrective action report will be prepared; and
- Sample collections will be obtained to demonstrate the contamination limit of the SSO.

3. Notification and Reporting

In the event of a Category One SSO, in which 50,000 gallons or greater are spilled to surface waters:

- Within 2 hours of becoming aware of SSO: Notify California Office of Emergency Services (Cal OES) and obtain notification control number.

Call: Cal OES (800) 852 – 7550

- Submit draft report within three (3) business days of becoming aware of SSO and certify within 15 calendar days of SSO end date.
- Enter data into the California Integrated Water Quality System (CIWQS) Online SSO database, certified by enrollee's Legally Responsible Official.
  http://ciwqs.waterboards.ca.gov
- Conduct water quality sampling within 18 Hours after initial SSO notification and upload results into CIWQS, this is required.

4. SSO Overflow Report

Refer to the SSO Overflow Report Form included in the Emergency Sewer Overflow Response Plan.

The completed form will be used in contacting Cal OES and providing them with the necessary information to obtain a control number for the SSO.

5. SSO Technical Report

A Technical Report must be submitted in the CIWQS online SSO Database within 45 calendar days of the SSO end date.

The report shall include the following:

- Causes and Circumstances of the SSO
  - Complete and detailed explanation of how and when the SSO was discovered.
  - Diagram showing the SSO failure point, appearance point(s), and final destination(s).
  - Description of the methodology employed, and available data used to calculate the volume of the SSO, and the volume recovered.
  - Description of the cause of the SSO.
  - Copies of original field crew records to document the SSO.
  - Historical maintenance records for the failure location.
- Enrollee's Response to SSO
  - Chronological narrative description of all actions taken to terminate the spill.
  - Explanation of how the SSO plan was implemented to and mitigation of.
  - Final corrective action(s) completed or planned, including future schedules of actions.
- Water quality monitoring
  - Description of sampling activities conducted including results and the evaluation of.
  - Detailed location map illustrating the sampling points.

6. SSO Corrective Action Report

Refer to Corrective Action Report form included within this document.

The completed form will be submitted as a draft report within three (3) business days of becoming aware of SSO.

7. Water Quality Sampling

Water Quality Sampling will be conducted within 18 Hours after initial SSO notification and each day for the duration of the spill.

Four (4) locations will be sampled. Each location will have a total of 4 samples obtained for the following analytes: Total coliform and E. Coli MPN, Fecal coliform MPN, Enterococcus MPN and Ammonia. Additional Samples will be collected and analyzed, as required by the applicable regional water board executive officer or designee.

- DCS-001: A point in a drainage conveyance system before the drainage conveyance system flow discharges into a receiving water. This location is determined by VSD Collections staff and will be described based on cross-street intersections due to the number of possibilities in the collections system.
- Upstream (EFF-001C Outfall): upstream of the spill site will be sampled to demonstrate original conditions of the Whitewater Storm Channel. This location is VSD's sewer treatment plant effluent outfall (the beginning of the surface water within the Whitewater Storm Channel).
- Spill Point (48 & Dillon): The spill introduction point (located approximately 1-mile from the outfall location) located at 48th Street and Dillon. This is where most storm water from the southern portion of the District enters the storm channel and the location where the SSO would enter the storm channel.
- Downstream (50 & SW Channel: Downstream of the spill site will be sampled to demonstrate the final conditions of the Whitewater Storm Channel which is located at 50th Street bridge. This is the closest and safest point to where one could enter the storm channel to take samples. This is approximately 1-mile downstream from the spill location.
- At each of the above locations the person taking samples will make an estimation of the spill travel time in the surface water by trying to measure the speed of the surface water.
- If during the duration of the spill a receiving water location were to have no flow present, then it shall be reported that no sampling was performed due to absence of flow in that location.

A SSO sampling kit has been put together to quickly take the above samples. Follow the sample collections guidelines included in this document and complete the Chain of Custody (COC) for the contracted laboratory sample analysis.

8. References

- Laboratory SOPs: Client Services (LAB-QS-4.7); Subcontracting (LAB-QS-4.5); and Collection of Samples (LAB-QS-5.7)
- Collections SOP: Overflow Emergency Response Plan
- State Water Resources Control Board – Statewide Waste Discharge Requirements. "General Order for Sanitary Sewer Systems". Rev. WQ-2022-XXXX-DWQ.

9. Document History

Revision #	Status* (D, I, R)	Date	Author	Approval By
1.0	I	09/05/2013	Anna Bell	Tito Moreno
2.0	R	04/01/2023	Anna Bell / Mario Luna	Tito Moreno

*D=Draft, I=Initial, R=Revision

10. Change History

Revision #	Change
2.0	Section: Water Quality Sampling • Changed 48 hours to 18 hours, added “each day for duration” statement. • Added statement for additional samples. • Added DCS-001 location point. • Added “if no flow present” statement. Update format to LAB Document Control Policies

11. Attachments

- SSMP – SSO_ Corrective Action Template
- SSMP – WQMP Sampling Collection Instructions
- SSMP – WQMP Chain of Custody (COC) Template

Valley Sanitary District

Environmental Compliance Dept – Laboratory Division

Sanitary Sewer Overflow – Water Quality Monitoring Program

Sampling Collection Instructions

PLEASE BE CAREFUL, CONTAINERS CONTAIN PERSERVATIVES. VSD Recommends the proper PPE be worn if needed due to preservatives that maybe harmful by contact or ingestion.

Note: If collection needs to occur on a weekend, Contact the contract laboratory 1st to ensure they can accept the samples. Not all contract laboratories are available on the weekends.

Laboratory Name	Phone Number	Address
Weck Labs	(626) 336-2139	14859 Clark Ave. Industry, CA 91745
Babcock Labs	(951) 653-3351	6100 Quail Valley Ct, Riverside, CA 92507

Reminder: the samples will need to be driven to the contract laboratory location before the end of the 6 hour holding time, sample cannot exceed 8 hours from collection time.

Procedure for Microbiological Sampling (each needs a 125mL bottle – 3 total bottles)
Total Coliform & E.coli MPN, Fecal Coliform MPN and Enterococcus MPN

1. Fill out the information on the label, the bottle should be a 125mL pre-preserved with $Na_2S_2O_3$ (Sodium Thiosulfate).
2. Open the sample bottle being careful **not to touch the inside of the lid or bottle**.
3. Fill the bottle to **just above the 100mL fill line**.
4. **Do not allow the bottle to overflow**, this will wash out the $Na_2S_2O_3$ preservative.
5. Place the sample bottle in a plastic bag and seal it. Keep the sample cool by placing it in a cooler on ice.
6. Fill out the chain of custody provided.
7. Drive the sample to the lab, the sample must reach the contract lab **within 6 hours from the time it is taken.**

Procedure for Ammonia Sampling

1. Collect the sample in a 500mL plastic container, pre-preserved with H_2SO_4.
2. During sample collection, containers should be filled slowly until sample reaches the bottom of the containers neck.
3. Complete the information on the sample label, including date, time, and location.
4. Keep the sample cool by placing it in a cooler on ice.
5. Fill out and sign the chain of custody with correct information.
6. Transport the sample to laboratory.

Sample rejection: Samples will be rejected from the laboratory for the following reasons.

1. Incomplete form, lack of information: date, time collected, collector's initials or signature.
2. Bottle does not contain the proper amount of sample.
3. **Out of Holding time**, when received at the laboratory.
4. Received to lab with at temperature >6°C (42.8°F).

Weck Laboratories, Inc.
Analytical Laboratory Services - Since 1964

14859 Clark Avenue : Industry : CA 91745
Tel 626-336-2139 ♦ Fax 626-336-2634 ♦ www.wecklabs.com

Standard CHAIN OF CUSTODY RECORD

WECK WKO#_____

CLIENT NAME: Valley Sanitary District

PROJECT: Sanitary Sewer Overflow (SSO)

ADDRESS: 45500 Van Buren St, Indio, CA 92201

PHONE: 760-238-5402 / 760-238-5416
FAX:
EMAIL: Anna Bell abell@valley-sanitary.org
Tito Moreno tito@valley-sanitary.org

PROJECT MANAGER: Anna Bell (VSD) & Rahul Nair (Weck)

SAMPLER

ANALYSES REQUESTED

SPECIAL HANDLING

- ☐ Same Day Rush 150%
- ☐ 24 Hour Rush 100%
- ☐ 48-72 Hour Rush 75%
- ☐ 4 - 5 Day Rush 30%
- ☐ Rush Extractions 50%
- ☐ 10 - 15 Business Days
- ☐ QA/QC Data Package

Charges will apply for weekends/holidays

Method of Shipment:

COMMENTS

ID# (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SMPL TYPE	Cl_2 Y/N	SAMPLE IDENTIFICATION/SITE LOCATION	# OF CONT.	Total Coliform & E. Coli - MPN	Fecal Coliform MPN	Enterococcus MPN	Ammonia (NH_3-N)							
			WW-G	N	Upstream (St1 _____ & St2 _____)	4	X	X	X	X							
			WW-G	N	Spill Point (St1 _____ & St2 _____)	4	X	X	X	X							
			WW-G	N	Downstream (S1 _____ & St2 _____)	4	X	X	X	X							
			WW-G	N	DCS (S1 _____ & St2 _____)	4	X	X	X	X							

*Please provide an MDL for all samples & methods

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME
RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME
RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME

SAMPLE CONDITION:

Actual Temperature:	Thermometer #:
Received On Ice	Y / N
Samples Preserved	Y / N
Evidence Seals Present	Y / N
Container Attacked	Y / N

SAMPLE TYPE CODE:

DW = Drinking Water
WW = Waste Water
GW = Ground Water
SF = Surface Water
SW = Sea Water
SO = Soild/Soil
SL = Sludge
OL = Oil
OT = Other Matrix

PRESCHEDULED RUSH ANALYSES WILL TAKE PRIORITY OVER UNSCHEDULED RUSH REQUESTS
Client agrees to Terms & Conditions at: www.wecklabs.com

SPECIAL REQUIREMENTS / BILLING INFORMATION

COC version 210806

Babcock Laboratories, Inc.
(951)653-3351 FAX (951) 653-1662
www.babcocklabs.com

Chain of Custody Sample Information Record

Client: Valley Sanitary District **Contact:** Anna Bell or Tito Moreno **Phone No.** Bell (760-238-5402) or Tito (760-238-5416)

FAX No. **Email:** abell@valley-sanitary.org tito@valley-sanitary.org

Project Name: Sanitary Sewer Overflow (SSO)

Project Location: Valley Sanitary District

Turn Around Time: Routine *3-5 Day Rush *48 Hour Rush *24 Hour Rush

***Lab TAT Approval:** By: *Additional Charges May Apply

Additional Reporting Requests
Include QC Data Package: ☐ Yes ☐ No
FAX Results: ☐ Yes ☐ No
Email Results: ☐ Yes ☐ No
State EDT: ☐ Yes ☐ No
(Include Source Number in Notes)

Sampler Information
Name: _____
Employer: Valley Sanitary District (VSD)
Signature: _____

Sample ID	Date	Time	Unpreserved	H2SO4	HCl	HNO3	Na2S2O3	NaOH	NaOH/ZnAcetate	NH4Cl	MCAA			Total # of Containers	Routine	Resample	Special	Total Coliform & E.Coli - MPN	Fecal Coliform MPN	Enterococcus MPN	Ammonia (NH3-N)						Matrix	Notes
Upstream (S1_____&S2_____)				X			X							4			X	X	X	X	X						WW - G	
Spill Point (S1_____&S2_____)				X			X							4			X	X	X	X	X						WW - G	*Please provide an MDL for all samples & methods
Downstream (S1_____&S2_____)				X			X							4			X	X	X	X	X						WW - G	
DCS (S1_____&S2_____)				X			X							4			X	X	X	X	X						WW - G	

Matrix
DW = Drinking Water
GW = Groundwater
WW = Wastewater
S = Source
SG = Sludge
L = Liquid
M = Miscellaneous

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (Sign)	Print Name / Company
	VSD			

(For Lab Use Only) **Sample Integrity Upon Receipt/Acceptance Criteria**

Sample(s) Submitted on Ice? Yes No
Custody Seal(s) Intact? Yes No N/A
Sample(s) Intact? Yes No
Temperature: _____ °C ☐ Cooler Blank
Sample Meets Laboratory Acceptance Criteria? Yes No
Permission to continue: Yes No
Deviation/Notes: _____
Signature/Date: _____

Lab No. _____

Logged in By/Date: _____

Page ____ **of** ____

6.0 Sanitary Sewer Spill Emergency Response Plan
SSMP ELEMENT UPDATE LOG

1. **8/5/13 The overflow response plan was revised and a Water Quality Monitoring Program was developed to meet the requirement of the revised MRP that was adopted in 2013. by Steve Shepard**
2. **6/12/14 Overflow Response Plan was revised to reflect changes to the organization chart. By Steve Shepard**
3. **4/13/17- Overflow Response Plan was revised to reflect changes to responding to Private Lateral Overflows. By Heberto Moreno**
4. **4/13/17- Revised organization chart to reflect personnel changes. By Heberto Moreno**
5. **3/14/19- Update of organizational chart to reflect personnel changes. Update vehicle and equipment list. By Heberto Moreno**
6. **3/31/21- Update to Appendix B and Overflow Emergency Response Plan, updated reporting requirements. Regional Water Quality Control Board Contact and notification requirements. By Heberto Moreno**
7. **3/31/21- Update Appendix A communication form to reflect current staff. By Heberto Moreno**
8. **2/6/23- Update element required revisions as mandated by the Reissued 2022 General Order. By Heberto Moreno**

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 7
Fats, Oils and Grease (FOG) Control Program

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This Section outlines the requirements of the Statewide Sanitary Sewer General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

7. Fats, Oils and Grease (FOG) Control Program: Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an Enrollee determines that a FOG program is not needed the Enrollee must provide justification as to why it is not needed. If FOG is found to be a problem, the Enrollee must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. This plan shall include the following as appropriate:

a. **An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;**
    - A FOG based article will be included in the District informational publication mailed to all VSD customers with the annual Newsletter. The Newsletter is published annually in April. The FOG publication will describe the impact of FOG and methods to prevent the disposal of FOG to the sanitary sewer.
    - FOG based literature shall be distributed to businesses and residents in areas where FOG problems are identified on an as needed basis. This literature would be in addition to the annual Newsletter publication information where proactive prevention methods are encouraged for FOG prevention.
    - The District will convey to restaurant kitchen staff best management practice educational material explaining the impact of FOG on the sewer system and the proper disposal of FOG.

b. A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer service area:

The District wastewater facility does not currently operate anaerobic digestion or other facilities capable of accepting and treating FOG from commercial haulers. The District provides a list of approved grease (FOG) hauling companies:

HAULER NAME	PHONE NUMBER
Imperial Western Products Inc.	(760) 398-0815 - Chris
Biotane Pumping	(877) 616-7310
Roto Rooter	(760) 346-1736
SMC Grease Specialist Inc.	(951) 788-6042 - Crystal, customerservice@smcgrease.com
S & G Pumping Service	(760) 404-6325 – Rick
J.C.'s Grease Buyers	(951) 781-4557
Hammer Plumbing & Pumping, Inc.	(760) 360-7448, (760) 321-7448, info@hammerplumbing.com
Liquid Environmental Services	(866) 694-7327
Pipe Maintenance Service, Inc.	(702) 642-9378
R.E. Commodities & Pumping	(951) 830-7315, (951) 385-9713, recommodities.office@gmail.com
Bakers Commodities, Inc.	(800) 427-0696 - Christian (Manager)
Darling Ingredients	(855) 327-7761, (927) 717-0300 (Office Manager)
JN Grease Service, Inc.	(951) 343-1221 / Jngrease@gmail.com
Sanco Pumping Service	(760) 327-8859
Asbury Environmental Services (World Oil)	(800) 974-8859
ASAP Pumping, Inc.	(760) 328-7887, (760) 365-4125, www. asappumping.com, asappumping@aol.com
Co-West Commodities	(909) 308-2641
CV Pipeline	(760) 610-5563

**Note: This list is furnished as a service to our customers and Valley Sanitary District does not endorse any of the listed companies nor does this list name all companies that provide grease services. Please refer to the yellow pages of your telephone book or internet as an additional resource.*

**Revision Date 05/07/21.*

c. **The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;**

- The District has the authority to prohibit flows and to take all actions necessary as described in Valley Sanitary District Development Design Manual 2016-1 (DDM), Sewer Construction Use Ordinance 2022-121, Article 1, General Provisions, 106, Authority.

d. **Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, Maintenance requirements, BMP requirements, Record keeping and reporting requirements;**

- VSD Development Design Manual 2016-1 (DDM), Sewer Construction Use Ordinance, Article 5, Facilities Requirements, 506, Gravity Separation Interceptor. In part this section states:

  "Any person so required by the General Manager shall install and maintain a gravity separation interceptor. Sanitary wastewater shall not be allowed to pass through the interceptor. The interceptor shall conform to approved District standards".

  As defined in this section of the Ordinance a Gravity Separation Interceptor/Grease Interceptor is a "A detention chamber that complies with District approved standards for removing fats, oils, grease (FOG) and solids from wastewater before said wastewater is discharged to the sewer collection system".

- The 2013 California Plumbing Code is used as the base reference document for grease interceptors. The use of indoor *grease traps* is prohibited by the County of Riverside Department of Environmental Health.

- Food Service Establishments are required to obtain a general discharge permit that has conditions that mandate minimum maintenance requirement for grease interceptors and Best Management Practices (BMP) requirements for kitchen staff including record keeping and staff training.

  A copy of the General Permit conditions for food service establishments is included in this section of the SSMP.

e. **Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;**

- The authority to inspect grease producing facilities is contained in the Development Design Manual 2016-1 (DDM), Sewer Construction Use

Ordinance 2022-121, Article 6, Monitoring, Reporting, Notification and Inspection Requirements, 601.1 Inspection and Sampling Conditions, paragraph A.

A. The District may inspect and sample the wastewater generating and disposal facilities of any user to ascertain whether the intent of this Ordinance is being met and the user is complying with all requirements.

- The authority to enter grease producing facilities is also contained in the DDM, Sewer Construction Use Ordinance 2022-121, Article 6, Monitoring, Reporting, Notification and Inspection Requirements, 601.2 Inspection and Sampling Conditions, Right of Entry.

B. The District shall have the right to place on the user's property or other locations as determined by the District, such devices as are necessary to conduct sampling or metering operations. Where a user has security measures in force, the user shall make necessary arrangements so that personnel from the District shall be permitted to enter without delay for the purpose of performing their specific responsibilities.

- Enforcement Authorities are empowered by Federal and State Laws grant the District the authority to prohibit flows and to take all actions necessary as described in DDM, Sewer Construction Use Ordinance 2022-121, Article 1, General Provisions, 106, Authority.

DDM, Sewer Use Ordinance 2022-121 addresses enforcement of sewer ordinance violations in Article 7, Enforcement, 703. ENFORCEMENT PROCEDURES AND APPLICABLE FEES.

The California Penal Code Section 374.2(a) also provides enforcement authority for the malicious discharge or dumping of substances into the sanitary sewer capable of causing substantial damage or harm to the operation of the public sewer.

f. An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section.

The collections department has identified areas where VSD has grease problems in the collection system and has developed a cleaning schedule to prevent sewer overflows. These areas are included in preventative maintenance schedules that may include weekly inspection and cleaning every 3 months as part of VSD's trouble spot maintenance program or cleaning every 12 or 18 months.

g. Development and implementation of source control measures for all sources of FOG discharges to the sanitary sewer system for each section identified in (f) above.

In residential areas where Fats, Oil and Grease (FOG) is discovered in the sewer system VSD implements a public education program that includes distributing educational material door to door that explains the negative effects of putting FOG into the sewer and the proper disposal of FOG.

In areas where there are food service establishments and FOG is discovered in the sewer system, VSD increases the inspection of these establishments by our FOG Control Inspector.

Document locations

- A copy of the Development Design Manual 2016-1 (DDM), Sewer Construction and Use Ordinance 2022-121, Food Service Establishment Discharge Permit, and Resolution 2022-1170 Industrial Wastewater Pollutant Limitations can be found in the SSMP and on the District website.

Valley Sanitary District
Food Service Establishment Wastewater Discharge Permit
General Permit Conditions

PART 1-EFFLUENT LIMITATION AND DISCHARGE RESTRICTIONS

Permittee is authorized to discharge wastewater into the District's sewer system, subject to the following effluent limitations and discharge restrictions:

A. EFFLUENT LIMITATION

Permittee shall not discharge into the sewer system Fats, Oils, and Grease (FOG) or any substance that may accumulate and/or cause or contribute to blockages in the sewer system or at the lateral, which connects the permittee's facility to the sewer system. The permittee shall not exceed any effluent limitations as outlined in the Valley Sanitary District Development Design Manual 2016-1, Sewer Construction Use Ordinance 2010-118 and Resolution 2019-1114.

B. DISCHARGE RESTRICTIONS

The following general prohibitions apply:

1. **Use of food grinders.** Installation of food grinders in the plumbing system of new constructions of Food Service Establishments is prohibited.

2. **Use of additives in lieu of interceptor pumping or maintenance.** Introduction of any additives into a Food Service Establishment's wastewater system for the purpose of emulsifying or biologically/chemically treating FOG for grease remediation or as a supplement to interceptor maintenance is prohibited.

3. **Disposal of waste cooking oil into drainage pipes.** All waste cooking oils shall be collected and stored properly in receptacles such as barrels or drums for recycling or other acceptable methods of disposal.

4. **Discharge of wastewater with temperatures in excess of 140°F into any grease interceptor.**

5. **Discharge of wastes from toilets, urinals, and other fixtures containing fecal matter to sewer lines intended for grease interceptor service.**

6. **Discharge of any waste including FOG and solid materials removed from the grease interceptor to the sewer system.** Grease removed from grease interceptors shall be waste hauled periodically as part of the operation and maintenance requirements for grease interceptors.

7. **Operation of grease interceptors with FOG and solids accumulation exceeding 25% of the design hydraulic depth of the grease interceptor.** Referred to as the 25% Rule, this requirement is to ensure that the minimum hydraulic retention time and required available volume is maintained to effectively intercept and retain FOG that would be discharged into the sewer system.

PART II - REQUIREMENTS FOR FOG CONTROL

Permittee shall comply with the following requirements to control the discharge of FOG to the sewer system:

A. BEST MANAGEMENT PRACTICES (BMPs)

Permittee shall implement BMPs in its operation to minimize the discharge of FOG to the sewer system. At a minimum, permittee shall implement the following BMPs when applicable:

1. Installation of drain screens. Drain screens shall be installed on all drainage pipes in food preparation areas.

2. Segregation and collection of waste cooking oil. All waste cooking oil shall be collected and stored properly in recycling receptacles such as barrels or drums. Such recycling receptacles shall be located and maintained properly to ensure that they do not leak or attract vermin. Licensed waste haulers or an approved recycling facility must be used to dispose of waste cooking oil.

3. Disposal of food waste. All food waste shall be disposed of directly into the trash or garbage, and not into sinks. Double-bagging food wastes that have the potential to leak in trash bins is highly recommended.

4. Employee training. Employees of the food service establishment shall be trained within 180 days of the effective date of this Permit, and twice each calendar year thereafter, on the following subjects:

   a) How to "dry wipe" pots, pans, dishware and work areas before washing to remove grease.

   b) How to properly dispose of food waste and solids in enclosed plastic bags prior to disposal into trash bins or containers to prevent leaking and odors.

   c) The location and use of absorption products to clean under fryer baskets and other locations where grease may be spilled or dripped.

   d) How to properly dispose of grease or oils from cooking equipment into a grease receptacle such as a barrel or drum without spilling.

   e) How to properly clean kitchen mats and dispose of wastewater.

5. Kitchen signage. Best management and waste minimization practices shall be posted conspicuously in the food preparation and dishwashing areas at all times.

Training shall be documented and employee signatures retained indicating each employee's attendance and understanding of the practices reviewed. Training records

shall be available for review at any reasonable time by a District's designee and the Riverside County Health Department.

B. FOG PRETREATMENT

1. Grease Interceptor Requirement. Permittee shall install, operate, and maintain an approved type and adequately sized grease interceptor. The grease interceptor shall be adequate to separate and remove FOG contained in wastewater discharges from the permittee's facility prior to discharge to the sewer system. Dishwasher shall be connected to the grease interceptor.

2. Grease Interceptor Maintenance Requirement. Grease Interceptors shall be maintained in efficient operating condition such that the combined FOG and solids accumulation does not exceed 25% of the design hydraulic depth of the grease interceptor. Any exceedance above 25% constitutes a violation of this permit. This requirement is to ensure that the minimum hydraulic retention time and required available volume is maintained to effectively intercept and retain FOG discharged to the sewer system.

3. Grease Interceptor Maintenance Frequency. Grease interceptors shall be maintained by periodic removal of the full content of the interceptor which includes wastewater accumulated FOG, floating materials, sludge, and solids. In general a Permittee shall fully pump out contents of the grease interceptor at a minimum of once per quarter (at least once every three months), unless a more frequent pumping schedule is required. The maintenance frequency may be adjusted if sufficient data have been obtained to establish a frequency consistent with the 25% Rule. The District may change the maintenance frequency at any time to reflect changes in actual operating conditions. Based on the actual generation of FOG from the Food Service Establishment, the maintenance frequency may increase or decrease; however, the interval between cleaning events shall not be greater than six months.

PART III - RECORD-KEEPING AND NOTIFICATION REPORTING REQUIREMENTS

A. RECORD-KEEPING REQUIREMENTS

Permittee shall keep records for at least two years and submit or make available for review, the following documents to the District, upon request:

1. A Record/Logbook of BMPs being implemented, including employee training.

2. Records of any spills and/or cleaning of the lateral or sewer system.

3. A logbook or record of grease interceptor cleaning and maintenance practices and activities.

4. Copies of records and manifests of waste hauling interceptor contents, which will include:

- Name of hauling company
- Name and signature of operator performing the pumpout
- Documentation of full pumpout with volume of water and FOG removed (e.g., 1,500 gallons)
- Documentation if repairs to the grease interceptor are required
- Identification of the facility where the hauler is planning to dispose of the waste

B. NOTIFICATION REQUIREMENTS

Permittee shall comply with the notification requirements:

1. Notification of Spill:

In case of a sewage spill, Permittee shall notify the District and the Riverside County Health Department immediately by phone.

Valley Sanitary District	(760) 238-5400
Riverside County Health Department	(760) 863-8287
Riverside County Health Department FAX	(760) 863-8303

Confirmation of this notification shall be made in writing to the Pretreatment Manager at the address specified in the Permit no later than five (5) working days from the date of the incident. The written notification shall state the date of the incident, the reasons for the discharge or spill, what steps were taken to immediately correct the problem, and what steps are being taken to prevent the problem from recurring. The Permittee is required to notify the Riverside County Health Department of all sewage spills.

2. Notification Regarding Planned Changes

Permittee shall notify the District at least 60 days in advance prior to any facility expansion/remodeling, or process modifications that may result in new or substantially increased FOG discharges or a change in the nature or volume of the discharge. Permittee shall notify the District in writing of the proposed expansion or remodeling and shall submit any information requested by the District for evaluation of the effect of such expansion on Permittee's FOG discharge to the sewer system.

PART IV - STANDARD CONDITIONS

A. NON-TRANSFERABILITY OF PERMIT

This Permit is issued specifically to the owner and facility location specified in this permit. This Permit is issued for a specific user, for a specific operation at a specific location, and creates no vested rights. Any permit that is

transferred to a new owner and/or operator or to a new facility is void. Permittee shall notify the District in writing prior to the transfer of ownership and shall give a copy of the existing permit to the new owner or operator. The new owner shall submit a permit application within 30 days of assuming ownership and/or operation of a facility.

B. ACCESS REQUIREMENTS

Access to all parts of the permittee's facility shall be granted to the District's personnel and/or its designee for the purpose of conducting compliance inspection during all times the facility is open, operating, or any other reasonable time. The District may conduct random, unannounced inspections to verify compliance with the terms and conditions of this permit.

C. PENALTIES

Any person who violates any provision of the FOG Rules and Regulations; or any permit condition, prohibition or effluent limitation; or any suspension or revocation order shall be civilly liable for a penalty pursuant to Section 711.D.6 of the Valley Sanitary District DDM, Sewer Use and Construction Ordinance 2010-118

D. SEVERABILITY

The provisions of this permit are severable. If any provision of these permits limitations and/or requirements, or the application thereof, to the Permittee is held invalid, the remainder of the permit limits and/or requirements shall remain in full force and effect.

E. TERMINATION OF SERVICE

The District, by Order of the General Manager, may physically terminate sewer service to any property on a term of any order of suspension or revocation of a permit or upon the failure of a person not holding a valid wastewater discharge permit to immediately cease discharge, whether direct or indirect, to the District's sewer facilities after due notification. All costs for physical termination shall be paid by the permittee as well as all costs for reinstating service.

7.0 Fats Oils & Grease
SSMP ELEMENT UPDATE LOG

1. **6/14/12- Changed reference to current Sewer Use Ordinance 2010-118. By Steve Shepard**
2. **3/27/19- Changed refrences to include Valley Sanitary District Development Design Manual 2016-1 to sections 7c,d,e,g of the SSMP. By Heberto Moreno**
3. **3/27/19- Implemented list of approved FOG haulers. By Heberto Moreno**
4. **5/14/19- Update of Resolution 2019-1114, Local Discharge Limits. By Heberto Moreno**
5. **6/10/21- Revised section 7a, removing FOG based articles being made available in the public information center at the Indio City Hall. By Heberto Moreno**
6. **6/10/21- Update FOG hauling companies contact list. By Heberto Moreno**
7. **4/17/23- Update of Resolution 2022-1170, Local Discharge Limits. Update reference to Board approved resolution 2022-121, Sewer Construction and Use Ordinance. By Heberto Moreno**

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 8
SYSTEM EVALUATION & CAPACITY ASSURANCE PLAN

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This Section outlines the requirements of the Statewide Sanitary Sewer General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

8. System Evaluation and Capacity Assurance Plan: the Enrollee shall prepare and implement a capital improvement plan that will provide hydraulic capacity of key sanitary sewer elements for dry weather, peak flow conditions as well as the appropriate design storm or wet weather event. At a minimum, the plan must:

> **8a. Evaluation: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limited capacity) and the major sources that contribute to the peak flow associated with overflow events.**
>
> Valley Sanitary District has never had an SSO as a result of hydraulic deficiency, however some portions of the Collection System flow at design capacity or above. For this reason VSD developed a collection system master plan. The most recent collection system master plan, The "Valley Sanitary District Collection System Master Plan" (Master Plan), was prepared in 2013 by an engineering consultant. The document identified existing and projected future flows. The existing flows were used in a hydraulic model to reflect flow conditions in the existing collection system. This model scenario identified hydraulic deficiencies in the existing collection system. A separate model scenario was created combining existing and future flows to determine future collection system needs from short term through ultimate build out. Flow hydraulic modeling is verified by physical system inspection by District Staff.
>
> Since 2013, economic factors have led to less growth than anticipated in the 2013 CSMP, and effective conservation measures have also contributed to lower than anticipated increase in sewerage flow. This Technical Memorandum (TM) presents the Collection System Master Plan Review 2018 (CSMP Review). This CSMP Review was initiated to refine earlier population projections, update the model with current observed flows from the Water Reclamation Facility (WRF) and recently added infrastructure improvements, and verify project recommendations from the CSMP. The CSMP Review is not intended to serve as a full update to the 2013 CSMP but is intended to help guide VSD in the

implementation of the remaining CIP recommendations. Tasks not included in the CSMP Review include flow monitoring or recalibration of the model.

The Valley Sanitary District service area is in an arid region of the State. The average annual rain fall is approximately 3 inches and during the wettest month an average of less than the 1 inch of rain falls. The collection department has a procedure for sealing manholes to prevent inflow in areas within the District that experience flooding. The sewer systems that are flowing at capacity have redundancy built into the system to help prevent any unexpected surge of flow from causing an overflow. Also during rain events the collection department monitors the collection system closely to help prevent any unexpected inflow.

8b. Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and design criteria exist for hydraulic deficiencies.

This criterion is a combination of methodologies and design concepts obtained from numerous sources including the District's Development Design Manual "Standard Specifications for Construction", sewer material manufacturers design criteria and recommendations, from registered civil engineers and industry accepted standards.

8c. Capacity Enhancement Measures: The steps needed to establish a short- and long- term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.

A capital improvement program based on this modeling information was provided in the Collection System Master Plan Review 2018 that addresses remedies for collection system deficiencies and the provision of capacity for future flow.

Areas of Concern (AOCs) were identified using the model results and sewer system capacity criteria discussed in the previous section. Areas of concern previously identified in the CSMP (2013) are verified by the CSMP Review (2018) and have been associated with a capital improvement project. New areas of concern identified in the CSMP Review do not have a capital improvement projects associated and should be monitored by VSD. **Table 7 and Figure 12** of the CSMP Review (2018), shows a summary of areas of concern by planning horizon i.e. existing conditions (2017), interim planning horizon conditions (2035), build-out conditions.

8d. Schedule: The Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a) – (c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D. 14 of the WDR.

A schedule for the estimated completion dates for all of the phases of the capital improvement program to increase the capacity of the collection systems that were outlined in the Collection System Master Plan Review 2018, **Table 7 and**

Figure 12 of the CSMP Review 2018. An outline of the funding source is contained in each year's annual budget. This schedule is updated annually.

The progress of these projects will be outlined in the biannual SSMP audit and also in the five year SSMP updates.

Document Locations

- A copy of the "Collection System Master Plan" can be located for reference in the Master Plan Section of the SSMP and on the District website.

- A copy of the Collection System Master Plan Review 2018 can be located for reference in the Master Plan section of the SSMP and on the District website.

- A copy of the most recent District budget including a time schedule and a plan for developing funds for long term and short term capital improvement projects can be located for reference in the Annual Budget Section of the SSMP and on the District website.

8.0 SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

SSMP ELEMENT UPDATE LOG

1. **6/04/14- Updated to most recent Collection System Master Plan from 2003 to 2013 version. By Heberto Moreno**
2. **6/18/14- Changes made to section 8c in regard to CIP projects based on 2013 Master Plan. By Heberto Moreno**
3. **3/15/19- Updated sections 8a and 8c; CSMP Review 2018, Areas of Concern by Planning Horizon. By Heberto Moreno**

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 9
MONITORING, MEASUREMENT & PROGRAM MODIFICATIONS

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This Section outlines the requirements of the Statewide Sanitary Sewer Overflow (SSO) General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

9.0 Monitoring, Measurement, and Program Modifications: The Enrollee Shall:

9a. Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;

A computerized asset management system is used to record and document collection system structural deficiencies, FOG and root problem areas identified by maintenance personnel. This management system is also used to generate and schedule work orders for the line maintenance crew. All information entered in the system database, including footage cleaned per day/month/year and the date it was cleaned, can easily be retrieved for viewing and review on a GIS Map. SSO occurrences recorded in this database contain time, date, cause, and volume and remedy information. All this information is analyzed and maintained by the Collection Supervisor.

9b. Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;

The Collection System Supervisor monitors the implementation of each element of the SSMP to prioritize each task. A biennial SSMP audit report will be prepared to illustrate the effectiveness of the SSMP and to also point out its deficiencies and what modifications will take place to correct them.

9c. Assess the success of the preventive maintenance program;

The condition of assets prior to and during preventative maintenance activity is noted in the asset management program. A follow up CCTV inspection is also preformed to assess the structural condition, that is also imported into the asset management program. This data is analyzed immediately following the completion of the work orders. Then it is determined whether further maintenance is required, if the frequency of maintenance needs to be increased or decreased in order to increase efficiency, or if a repair may be required.

In early 2018, the Collections System Design and Program Management Project was initiated. This capital improvement project will be divided into phases that

will span over the next 10 years or so. Harris and Associates was hired to be the Program Manager for the duration of the project and assist the District in categorizing and prioritizing the sewer pipes and manholes in the collection system for rehabilitation and replacement. This will be accomplished by analyzing new and existing CCTV data collected by VSD's collections crew and assigning risk ratings to all pipes within VSD's sewer collections system. Based upon the assigned ratings and other prioritization criteria, the Program Manager will establish immediate needs based on impacts of failure, maintenance priorities, and other risk-based assessments; pipes and manholes will be slated for rehabilitation, replacement, or regular maintenance.

9d. Update program elements, as appropriate, based on monitoring or performance evaluations; and

As sewer system Inspection data is analyzed and procedures and methods are evaluated to determine their efficiency, modifications are made to each relevant element of the SSMP.

9e. Identify and illustrate SSO trends, including: Frequency, Location, and Volume.

SSO reports that include all relevant information that is needed to report each spill to the State's online data base are prepared at the time of the sewage spill. This information includes but is not limited to the time, location, volume, cause, and remedy. This information is analyzed, and a determination is made whether the asset will require scheduled preventative maintenance or if the asset will need to be repaired. An outline showing the quantitative data of past years SSO's is included in the biennial SSMP Audit.

<u>Document Locations</u>

- A copy of the "Program Management Plan and Design for the Collection System Infrastructure" can be located for reference in the Program Management Plan section of the SSMP or in the District Website.

9.0 MONITORING, MEASUREMENT, & PROGRAM MODIFICATIONS

SSMP ELEMENT UPDATE LOG

1. **5/7/21- Updated section 9C, to include VSD's Program Management Plan and Design for the Collection System Infrastructure. By Heberto Moreno**

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 10
SSMP PROGRAM AUDITS

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This Section outlines the requirements of the Statewide Sanitary Sewer Overflow (SSO) General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

10.0 SSMP Program Audits: As part of the SSMP, the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the Enrollee's compliance with the SSMP requirements identified in this subsection (D.13) of the WDR, including identification of any deficiencies in the SSMP and steps to correct them.

Two Years from the date of the final completion and certification of the SSMP and biennially thereafter, staff will conduct an audit of each section of the SSMP, evaluating the effectiveness, ensuring compliance and identifying any deficiencies. The evaluation results and any changes to the SSMP section that are made to improve the program's performance will be outlined in a audit report and a copy of the report will be included in this section of the SSMP.

Valley Sanitary District (VSD)
Sewer System Management Plan (SSMP)
2021 Biennial Audit

The purpose of the Biennial SSMP audit is to evaluate the effectiveness of the Valley Sanitary District's SSMP, to ensure that all elements within the SSMP are up to date and that they are being implemented and managed appropriately. The SSMP audit is a critical process that promotes continuous improvement, ultimately resulting in the most efficient collection system management plan possible. This process includes the examination of events, experiences, and data from the previous two calendar years so that successes and challenges can be identified and correlated with strengths and weaknesses of the District's SSMP.

The audit reviews the twelve program elements for calendar years 2019 and 2020. Each element is assigned a status and recommendation(s) for improvement. Annual Performance and Sewer System Overflow (SSO) statistics for calendar years 2016 through 2020 are included in Table 1. Any changes that have taken place are reflected in the SSMP element update log located in each section of the SSMP.

1.0 GOALS

Status: The goals stated in the SSMP are still appropriate and accurate.
Recommendation: No action needed.

2.0 ORGANIZATION

Status: The organization charts are current, the chain of communication for SSO response and reporting is current and key personnel contact information is current.
Recommendation: To continue to update this section as staffing changes are made.

3.0 LEGAL AUTHORITY

Status: All of the required legal authority elements are addressed in the current Valley Sanitary District Development Design Manual 2016-1, Sewer Construction and Use Ordinance 2010-118. Resolution No. 2019-1114 was adopted by the District's Board of Directors, updating and establishing maximum concentration limits of industrial wastewater pollutants as listed in the District's Sewer Construction and Use Ordinance No. 2010-118 Section 208 E.
Recommendation: No action needed.

4.0 Operation and Maintenance

4a) Collection System Maps:

Status: The Collection System Arc GIS Map is up to date and as the sewer system maintenance is preformed the GIS map is verified for accuracy, any needed changes are made at the office. We have produced an updated paper version of our Sewer Atlas and developed a system to easily print the Atlas. The City of Indio owns the Storm Drain System in our service area. We have a paper map of the storm drain system, but it could use improvement. The City of Indio has provided an atlas that is compatible with our GIS system.

Recommendation: We are continuing to work on producing a GIS Atlas of the City's storm drain system by using the information obtained by the city and by observations out in the field. The storm drain GIS project will be a long-term project that will continue to be updated as we receive data.

4b) Preventative Operation and Maintenance:

Status: The Preventative Maintenance program is on schedule and the priority set for areas that require more frequent cleaning has prevented nearly all sewer main overflows. The CCTV program identifies and conducts the assessment of the existing collection system. In 2010, we developed a sewer main root foaming program to control root growth in sewer mains. The annual performance statistics are outlined in table 1 that shows the effectiveness of the preventative maintenance program.

Recommendation: Continue the preventative maintenance and CCTV program as scheduled and modify cleaning schedules as needed.

4c) Rehabilitation and Replacement Program:

Status: The CCTV inspection program has been affective in identifying defective sections of sewer pipe. The sections that are identified as being a high risk for collapse are repaired as they are discovered. The goal for the CCTV program is to televise the entire sewer system, the oldest sections first and import the data into our asset management program. In early 2018, the Collections System Design and Program Management Project was initiated. This capital improvement project will be divided into phases that will span over the next 10 years or so. Harris and Associates was hired to be the Program Manager for the duration of the project and assist the district in categorizing and prioritizing the sewer pipes and manholes in the collection system for rehabilitation and replacement. The annual performance statistics for sewer main

CCTV inspection, manhole inspections and sewer system repair and rehabilitation are outlined in Table 1.
Recommendation: Continue the sewer system rehabilitation program identifying sewer system asset condition through our inspection program and rehabilitating assets on a risk/priority system.

4d) Training:
Status: The collection staff continues to maintain CWEA Collection Tech Certifications and works toward obtaining higher certifications. Staff attends CWEA sponsored training seminars and workshops. Staff is also trained in house on all aspects of the proper operation of the collection system. Our standard operating procedures for collection system operations and the equipment used to maintain the collection system has been updated. We hold training sessions on these procedures on a regular basis. Documentation to support attendance to training classes is kept up to date and available in the collection's office.
Recommendation: Continue to train collection staff on a regular basis utilizing both CWEA sponsored seminars, workshops and in house training classes.

4e) Contingency Equipment and Replacement Inventories:
Status: We are maintaining back up equipment and repair parts for our assets.
Recommendation: Continue to replenish our inventory of replacement parts

5.0 Design and Performance Provisions

Status: Valley Sanitary District's Standard Specifications and Ordinances are now under the "Development and Design Manual" title. The districts Development Design Manual maintains standard specifications for construction and testing and a sewer use ordinance that includes standards for sewer construction. A revised Standard Specifications for the Construction of Sanitary Sewer has been completed and adopted by the Board of Directors.
Recommendation: Continue to implement revisions as needed.
Proposed WDR changes: No significant changes.

6.0 Overflow Emergency Response Plan:

Status: The Sanitary Sewer Overflow Emergency Response Plan has been updated with the most current information to reflect the newly adopted Sanitary Sewer Systems Waste Discharge Requirements Monitoring and Reporting Program, to include all of the latest requirements. All the Legally Responsible Officer's (LRO) and Data submitter information is current and up to date.

Recommendation: Continue to provide Sanitary Sewer Overflow Emergency Response Plan training.

7.0 FOG Control Program:

Status: The SSMP contains up to date information regarding the District's FOG Control Program. The annual performance statistics outlined in Table 1 shows the performance of the FOG program and its effectiveness in preventing SSOs.
Recommendation: Continue to implement the FOG Program.

8.0 System Evaluation and Capacity Assurance Plan:

Status: The District annually budgets for repairs, rehabilitation and increased capacity for the collection system. The FY 2021/2022 budget includes over $5,462,063 for collection system rehabilitation and $115,000 for collection system emergency repairs .

Requa Interceptor project was completed October 2017. During the progress of the Requa Interceptor project some of the following recommended improvements (AOC) as listed in the 2013 Collection System Master Plan Projects have been fulfilled:

- Requa Interceptor
- Shields Interceptor
- Monroe Interceptor
- Clinton Street

In 2018, VSD completed a Collection System Master Plan Review. Areas of concern previously identified in the CSMP (2013) are verified by the CSMP Review and have been associated with a capital improvement project. Table 7 and Figure 12 of the CSMP Review shows a summary of areas of concern by planning horizon existing conditions (2017), interim planning conditions (2035), and build-out conditions. The annual performance statistics outlined in Table 1 shows the performance of the System Evaluation and Capacity Assurance Plan and its effectiveness in preventing SSOs.
Recommendation: Update the SSMP to reflect any required changes and update CIP project status.

9.0 Monitor, Measure, and Program Modifications:

Status: The condition of the collection system assets are inspected during regular preventative maintenance and CCTV inspection. Then the information is brought into

the office and evaluated. At that time, the preventative maintenance schedule in the computer-based asset management program is modified as needed.

In early 2018, the Collections System Design and Program Management Project was initiated. This capital improvement project will be divided into phases that will span over the next 10 years or so. Harris and Associates was hired to be the Program Manager for the duration of the project and assist the district in categorizing and prioritizing the sewer pipes and manholes in the collection system for rehabilitation and replacement. The annual performance statistics outlined in Table 1 shows the performance of the SSMP and its effectiveness in preventing SSOs. This information is analyzed, and a determination is made whether the asset will require modification to the scheduled preventative maintenance or if the asset will need to be repaired. An outline showing the quantitative data of past years SSO's, and the cause is included.
Recommendation: Continue to monitor the performance of the SSMP and modify any of the programs to prevent any SSO's.

10.0 SSMP Program Audit:

Status: This SSMP audit evaluates the effectiveness of the SSMP, our compliance with the SSMP and recommended modifications to the SSMP. The annual performance statistics outlined in Table 1 shows the performance of the SSMP and its effectiveness in preventing SSOs.
Recommendation: Update the SSMP to reflect any required changes recommended by the audit or as needed to stay in compliance with the WDR and to prevent any SSO's.

11.0 Communication Program:

Status: The District's website has information about programs to assist the public to prevent SSO's. We also have information about our SSMP and how the public can provide input on the improvement of the SSMP.
Recommendation: Continue to update the SSMP information on the district website.

12.0 SSMP Completion and Certification:

Status: On July 23, 2019, the Collection System SSMP was adopted by our Board of Directors and recertified on the State Water Board CIWQ website
Recommendation: Update and recertify the SSMP within (5) years of the last certification or as required upon the adoption of new regulation.

Table 1 Annual Collection System Activity Statistics

Indicator	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Miles of gravity sewer	243	246	246	246	246	253	254	254	254	260
Number of Pump Stations	5	5	5	5	5	5	4	4	4	4
Number of Spill (total)	1	1	0	0	0	1	1	0	1	0
During Rain Event										
Number of Spill (by volume range)										
<10 gal	1								1	
10-99 gal		1								
100-999 gal						1				
1000-9999 gal							1			
≥10,000 gal										
Total Spill Volume	2	15	0	0	0	488	1195	0	4	0
Volume Reaching Surface Water	0	0	0	0	0	0	0	0	0	0
Volume Not Recovered but Not Reaching Surface Water	0	0	0	0	0	0	1195	0	0	0
Volume Recovered	2	15	0	0	0	488	0	0	4	0
Net Volume (total minus recovered)	0	15	0	0	0	0	1195	0	4	0
Number of Spills per 100 Miles of Sewer per Year	0.41	0.41	0	0	0	0.41	0.41	0	0.41	0
Volume of Spills per 100 Miles of Sewer per Year	0.8	6	0	0	0	192	470	0	2	0
Total Volume Conveyed to the Plant (billion gal)	2.3	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0
Number of Spill (by cause)										
Roots										
Grease (FOG)										
Debris										
Debris from Laterals	1									
Vandalizum						1				
Construction Debris										
Multiple causes										
Infrastructure failure										
Inflow & Infiltration										
Pump Station Failure										
Flow Capacity Deficiency										
Natural Disaster							1			
Bypass										
Other		1							1	
Average Emergency Response Time, minutes										
Business Hours	13	35	n/a	n/a	n/a	30	30	n/a	n/a	n/a
Non-Business Hours	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	45	n/a
Number of Private Lateral Spills[1]	1	4	7	3	0	1	3	4	2	2
Total Lateral Spill Volume[1]	11	5,551	280	112	0	83	408	186	146	302
Total Lateral Spill Volume Recovered[1]	11	5,551	230	112	0	83	408	186	146	302
Total Spill Lateral Volume Reaching Surface Water[1]	0	0	0	0	0	0	0	0	0	0
Maintenance Activities										
Footage Cleaned (Miles)	125.3	131.7	122.4	168.7	116.2	130.8	133.6	121.5	123.4	109
Mainline Root Foaming (Linear feet)	13,700	13,378	13,953	10,458	10,600	10,125	8,661	8,773	8,503	8,360
Televised Inspection (Miles)	18.5	25.1	25.1	35.5	20.4	33.5	32.9	47.1	35.3	30.8

Manholes Inspection (number)	1,662	1,748	1,680	2,381	1,417	1,945	1,770	1,728	1,763	1,474
Mainline Point Repairs(number)	0	0	2	1	0	3	2	0	0	0
Manholes Rehabed (number)	0	25	25	62	0	0	0	0	0	0
Mainline Lining Rehab (Linear feet)	6,268	0	0	0	0	0	0	0	2,250	0
Mainline Dig and Replace (Linear feet)	216	0	0	0	120	0	0	0	0	0
FOG Program Activities										
Approx. Number of Food Service Establishments Identified	227	234	228	228	228	244	250	255	246	246
Food Service Establishments Inspected	102	180	228	228	85	147	146	199	197	194
Food Service Establishments Being Monitored under FOG Program	115	119	228	228	228	244	250	255	249	249

Notes for Table 1:

1. The Lateral SSOs were reported to CIWIQ as District spills because at the time we did not have any documentation that defined the ownership of the sewer lateral from the property to the District sewer main. In Novermber 2010 the the District adopted a revised sewer use ordinance that clarified that sewer laterals are ownered by the owner of the property that they serve.

10.0 SSMP PROGRAM AUDITS
SSMP ELEMENT UPDATE LOG

1. **8/1/11 Added 2011 biannual audit report. By Steve Shepard**
2. **8/1/13 Added 2013 and removed 2011 biannual audit report. By Steve Shepard.**
3. **6/23/14 Updated Annual SSO Statistics Table. By Heberto Moreno**
4. **4/13/17 Added 2017 biannual audit report and removed 2013. By Heberto Moreno**
5. **4/13/17 Updated Annual SSO Statistics Table. By Heberto Moreno**
6. **3/20/19 Updated Annual Statistic Table. By Heberto Moreno**
7. **3/20/19 Updated 2019 biannual audit report and removed 2017. By Heberto Moreno**
8. **5/25/21 Updated Annual Statistics Table. By Heberto Moreno**
9. **5/25/21 Updated 2021 biannual audit report. By Heberto Moreno**
10. **4/17/23 Updated Annual Statistics Table(2022) from 5-year to a 10-year record. By Heberto Moreno**

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 11
COMMUNICATION PROGRAM

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This Section outlines the requirements of the Statewide Sanitary Sewer General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

11. Communication Program: The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The Communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented.

The Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system.

Approximately each year a newsletter will be sent out to all of the District's customers with information about the performance of the Sewer System Management Plan or Sewer Collection System.

A copy of the most recent newsletter (2022) is included in this section of the SSMP or on the District website.

In the future, the District website will be the primary outlet for sharing District information with the general public. Newsletters and/or doorhangers will be occasionally be used as well.

VALLEY SANITARY DISTRICT
INDIO, CALIFORNIA
VSD
Giving Water Another Chance

The DIGEST

Summer 2022

Welcome to our quarterly newsletter. *Bienvenido a nuestro boletín trimestral.*

Stay up to date with the District's latest news and receive alerts right to your inbox. Visit **valley-sanitary.org/subscribe**, or scan the QR code at the bottom of the page.

*Para mantenerse al día con las últimas noticias del Distrito y recibir alertas directamente en tu bandeja de entrada. Visite **valley-sanitary.org/subscribe** o escanee el código QR al final de la página.*

IN THIS ISSUE

Proper Wipes Disposal Keeps Wastewater Flowing

Valley Sanitary District successfully collects and treats about 6 ½ million gallons of wastewater from homes and businesses every day! However, one of the greatest threats to effective processing comes from wipes that are flushed down the toilet.

If the wipes make it through pipes without causing a major clog, they still pose serious problems at the treatment plant, where they can plug pumps and damage equipment.

Wipes cannot and should not be flushed – no matter what it says on the packaging. Putting wipes in the trash helps the District avoid expensive repairs and protect public assets, maintaining stable rates.

With your help, we can keep the system running smoothly.

La Eliminación Adecuada de Toallitas Mantiene el Flujo de Aguas Residuales

Valley Sanitary District recolecta y trata con éxito alrededor de 6 ½ millones de galones de aguas residuales de hogares y negocios todos los días. Sin embargo, una de las mayores amenazas para el procesamiento efectivo proviene de las toallitas que se tiran por el inodoro.

Aunque las toallitas pasan a través de las tuberías sin causar una obstrucción importante, presentan serios problemas en la planta de tratamiento, donde pueden tapar las bombas y dañar el equipo.

Las toallitas no pueden y no deben tirarse al inodoro sin importar lo que diga el empaque. Al tirar las toallitas a la basura, ayuda al Distrito a evitar reparaciones costosas y protege los bienes públicos, manteniendo tarifas estables.

Con su ayuda, podemos mantener el sistema funcionando sin problemas.

Did You Know?

We are developing a new and reliable water source!

Work is underway on the first phase of upgrades to VSD's Water Reclamation Facility, improvements that will provide clean water for replenishing the Coachella Valley Groundwater Basin. The three-phase project is overseen by the East Valley Reclamation Authority, a joint powers authority formed by the District and Indio Water Authority. After treatment, the water will be injected into the basin, the region's primary water source. The water will undergo natural filtration as it seeps into the ground and can be pumped out later when needed.

Stay tuned to The Digest and our social media posts for more information!

¿Sabía Qué?

¡Estamos Desarrollando Una Fuente de Agua Nueva y Confiable!

Se está trabajando en la primera fase de las actualizaciones de la Instalación de Recuperación de Agua de VSD, mejoras que proporcionarán agua limpia para reponer la Cuenca de Agua Subterránea del Valle de Coachella. El proyecto de tres fases es supervisado por East Valley Reclamation Authority, una autoridad de poderes conjuntos formada por el distrito e Indio Water Authority. Después del tratamiento, el agua se inyectará en la cuenca, la principal fuente de agua de la región. El agua se filtrará de forma natural a medida que se filtra en el suelo y se puede bombear más tarde cuando sea necesario.

¡Estén atentos a The Digest y nuestras publicaciones en las redes sociales para obtener más información!

Innovative Partnership Gives Students a Path into the Wastewater Industry

Coachella Valley students and those thinking about furthering their education can now work toward certificates that provide a more direct path to jobs in the wastewater and water fields through a program spearheaded by Valley Sanitary District.

The District partnered with Mt. San Jacinto College and College of the Desert to create a certificate program to train students for this line of work.

College of the Desert hosts the program, and Mt. San Jacinto College offers the classes online. Students who complete the 18 units are certified to work in entry-level training positions at Valley Sanitary District and participating agencies, including Coachella Valley Water District and Coachella Water Authority and Sanitary District.

"The Coachella Valley desperately needs training in this essential and fast-growing field," General Manager Beverli Marshall said. **"As the region's population grows, water and wastewater jobs will become even more important in protecting public health, the environment, and the economy."**

Visit **msjc.edu** for program details.

La Asociación Innovadora Brinda a los Estudiantes un Camino Hacia la Industria de las Aguas Residuales

Los estudiantes del Valle de Coachella y aquellos que estén pensando en continuar su educación ahora pueden trabajar para obtener certificados que brinden un camino más directo a los trabajos en los campos de agua y aguas residuales a través de un programa encabezado por Valley Sanitary District.

El distrito se asoció con Mt. San Jacinto College y College of the Desert para crear un programa de certificación para capacitar a los estudiantes en esta línea de trabajo.

College of the Desert es la sede del programa, y Mt. San Jacinto College ofrece las clases en línea. Los estudiantes que completan las 18 unidades están certificados para trabajar en puestos de capacitación de nivel de entrada en Valley Sanitary District y las agencias participantes, incluidos Coachella Valley Water District y Coachella Water Authority and Sanitary District.

"El Valle de Coachella necesita desesperadamente capacitación en este campo esencial y de rápido crecimiento", dijo la gerente general Beverli Marshall. **"A medida que crece la población de la región, los trabajos relacionados con el agua y las aguas residuales serán aún más importantes para proteger la salud pública, el medio ambiente y la economía".**

Visite **msjc.edu** para obtener detalles del programa.

New Rates Cover the Costs of Critical Public Service

Valley Sanitary District reminds customers of a sewer rate change effective July 1.

The Board of Directors approved a five-year schedule of changes to sewer use rates in May 2021. This is the second of five rate adjustments that are included on property tax bills.

The new rates are based on an independent cost-of-service study and will allow the District to:

- Maintain operational and financial stability
- Repair and update collection and treatment equipment
- Fund construction of a recycled water system to increase water supply reliability in the Coachella Valley

ANNUAL SEWER RATE SCHEDULE Programa anual de tarifas de alcantarillado	Current Actual	Effective July 1, 2022 Efectivo el 1 de julio de 2022
FIXED SERVICE CHARGE (Cargo Por Servicio Fijo) Rates per EDU (Tarifas por EDU)		
Single Family (Unifamiliar)	$342.72	$385.56
Multi-Family (Multifamilia)	$150.00	$168.75
Mobile Home (Casas Moviles)	$181.28	$203.94
RV Park (Parque RV)	$141.25	$158.91
Commercial-Low Strength (Baja Resistencia)	$199.03	$223.91
Commercial-High Strength (Alta Resistencia)	$607.00	$682.88
VOLUMETRIC RATE (Tarifas Volumetrica) $ per hcf average winter water consumption ($ por hcf consumo medio de aqua en invierno)		
Single Family (Unifamiliar)	$0.98	$1.10
Multi-Family (Multifamilia)	$0.98	$1.10
Mobile Home (Casas Moviles)	$0.98	$1.10
$/hcf annualized water consumption ($/hcf del consume de agua anualizado)		
RV Park (Parque RV)	$1.10	$1.23
Commercial-Low Strength (Baja Resistencia)	$0.88	$0.99
Commercial-High Strength (Alta Resistencia)	$2.00	$2.25

EDU – equivalent dwelling unit; one EDU is equal to an approximation of the amount of sewage generated by an average single-family residence.

hcf = hundred cubic feet; rate is per 748 gallons, or hcf, of sewage volume.

Nuevas Tarifas Cubren los Costos del Servicio Público Crítico

Valley Sanitary District recuerda a los clientes sobre un cambio en la tarifa de alcantarillado a partir del 1 de julio.

La Junta Directiva aprobó un cronograma de cinco años de cambios en las tarifas de uso de alcantarillado en mayo de 2021. Este es el segundo de cinco ajustes de tasas que se incluyen en las facturas de impuestos a la propiedad.

Las nuevas tarifas se basan en un estudio independiente de costo de servicio y permitirán al Distrito:

- Mantener la estabilidad operativa y financiera.
- Reparar y actualizar equipos de recolección y tratamiento
- Financiar la construcción de un sistema de agua reciclada para aumentar la confiabilidad del suministro de agua en el Valle de Coachella

EDU - unidad de vivienda equivalente; una EDU es igual a una aproximación de la cantidad de aguas residuales generadas por una residencia unifamiliar promedio.

hcf = cien pies cúbicos; la tarifa es por 748 galones, o hcf, de volumen de aguas residuales.

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45500 Van Buren Street
Indio, California 92201

VALLEY SANITARY DISTRICT
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We Want to Hear From YOU!

¡Queremos Saber de USTED!

Valley Sanitary District is working to improve how we engage with customers – from the way information is delivered to topics of interest. We hope you will share your input and suggestions about District communications by scanning the QR code and taking a brief survey.

Thanks in advance for your help!

Valley Sanitary District está trabajando para mejorar la forma en que interactuamos con los clientes, desde cómo se entrega la información hasta los temas de interés. Esperamos que comparta sus comentarios y sugerencias sobre las comunicaciones del distrito escaneando el código QR y respondiendo una breve encuesta.

¡Gracias de antemano por su ayuda!

Join Us at a Board Meeting! Hear the ins and outs of the work conducted by your Board of Directors and staff team – by attending a VSD board meeting. The meetings are held at 1 p.m. on the second and fourth Tuesdays of each month in the District Board Room, 45500 Van Buren Street in Indio.

¡Participe con nosotros en una reunión de la Junta! Escuche los pros y contras del trabajo realizado por su Junta Directiva y el equipo de personal, asistiendo a una reunión de la junta de VSD. Las reuniones se llevan a cabo a la 1:00 p. m. el segundo y cuarto martes de cada mes en la Sala de Juntas del Distrito, 45500 Van Buren Street en Indio.

VALLEY SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Section 12
SSMP COMPLETION & CERTIFICATION

In Compliance with
State Water Resource Control Board
Statewide General Waste Discharge Requirements
Order No. 2006-0003-DWQ

This Section outlines the requirements of the Statewide Sanitary Sewer General Waste Discharge Requirements (GWDR) order and describes how Valley Sanitary District Complies.

12. SSMP Completion and Certification: Both the SSMP and the Enrollee's program to implement the SSMP must be certified by the Enrollee to be in compliance with the requirements set forth above and must be presented to the Enrollee's governing board for approval at a public meeting. The Enrollee shall certify that the SSMP, and subparts thereof, are in compliance with the general WDRs within the time frames identified in the time schedule provided in subsection D.15 of the WDR, below.

In order to complete this certification, the Enrollee's authorized representative must complete the certification portion in the Online SSO Database Questionnaire by checking the appropriate milestone box, printing and signing the automated form, and sending the form to the State Water Board.

Valley Sanitary District has followed all the Certification procedures and has met all of the time frame schedules provided in Subsection D.15 of the WDR.

A copy of the documentation substantiating this is included in this Section.

Every five years the SSMP will be updated with the most up to date information and will be approved by the Board of Directors in a public meeting.

RESOLUTION NO. 2019-1120

A RESOLUTION OF THE BOARD OF DIRECTORS OF VALLEY SANITARY DISTRICT ADOPTING THE UPDATED VALLEY SANITARY DISTRICT SEWER SYSTEM MANAGEMENT PLAN (SSMP), AND AUTHORIZING THE GENERAL MANAGER AND DISTRICT ENGINEER TO SUBMIT THE ADOPTED SSMP TO THE STATE WATER RESOURCES CONTROL BOARD

WHEREAS, on July 7, 2005, the Regional Water Quality Control Board (RWQCB) issued a letter to sewer collection system agencies, including the Valley Sanitary District (the District) requiring the preparation of a Sewer System Management Plan (SSMP); and

WHEREAS, the RWQCB at that time directed that the District must also comply with sanitary sewer overflow (SS)) electronic reporting requirements issued in November 2004; and

WHEREAS, on May 2, 2006, the State Water Resources Control Board (SWRCB) issued Order No. 2006-0003-DWQ requiring all public wastewater collection system agencies in California with greater than one mile of sewer mains to be regulated under General Waste Discharge Requirements (WDR); and

WHEREAS, portions of the Order establishing the Statewide WDR related to monitoring and reporting were amended by Oder No. 2013-0058-EXEC, dated July 30, 2013 and effective on September 9, 2013 (the Amended MRP); and

WHEREAS, the Board of Directors originally approved the SSMP in April of 2007, and approved the updated SSMP in July 2014; and

WHEREAS, the intent of the SSMP is to comply with the RWQCB requirements, the WDR, and the MRP and an update has been prepared to document changes to policies and procedures employed by the District in the day-to-day operation of its wastewater enterprise since the approval of the April, 2007 SSMP, and approved the updated SSMP in July of 2014: and

WHEREAS, the importance of the District's compliance with these applicable and relevant regulations is such that adoption of the updated SSMP is respectfully requested by the General Manager and District Engineer.

NOW, THEREFORE, the Board of Directors of Valley Sanitary District **HEREBY RESOLVES** as follows:

Section 1: Adopts the attached updated Valley Sanitary District Sewer System Management Plan dated July 2019.

Section 2: Authorizes the General Manager and District Engineer to transmit the adopted updated SSMP to regulatory agencies as required.

PASSED, APPROVED, and **ADOPTED** this 25th day of June, 2019, by the following roll call vote:

AYES: Canero, Coleman, Duran, Sear, Teague
NAYES: None
ABSENT: None
ABSTAIN: None

Mike Duran, President

ATTEST:

Dennis Coleman, Secretary

July 8, 2019

State Water Resources Control Board
Division of Water Quality
Attn: SSO Program Manager
P.O. Box 100
Sacramento, CA 95812

Dear SSO Program Manager:

Enclosed is the copy of the automated certification form printed from the Online SSO Database that includes the date that VSD's Board of Directors approved the 5-year SSMP update and was signed by the Legally Responsible Officer (LRO) of Valley Sanitary District. If you have any questions or need further information, please do not hesitate to contact our office.

Sincerely,

Heberto Moreno
Collection System Supervisor, LRO

45-500 VAN BUREN STREET, INDIO CA 92201 (760)238-5400 FAX (800)750-2280

CIWQS

Menu | Help | Log out

Navigate to:

You are logged-in as: morenohp . If this account does not belong to you, please log out.

SSO - Sewer System Management Plan (SSMP) ?

SSO Menu

Regional Water Board:	Region 7 - Colorado River Basin
Agency:	Valley Sanitary District
Sanitary Sewer System:	Valley Sd - Npdes CS
WDID:	7SSO10540

Last Updated:	Mon Jul 08 10:16:14 PDT 2019

SSMP Upload:

File *	Document Type *	File Description	
Browse...			Upload File

File Name	Document Type	File Description	Date/Time Uploaded	Status

SSMP Element		
Development Plan and Schedule	10/24/2007	(Date Format: MM/DD/YYYY)
Section I - Goal	10/24/2007	(Date Format: MM/DD/YYYY)
Section II - Organization	10/24/2007	(Date Format: MM/DD/YYYY)
Section III - Legal Authority	04/10/2009	(Date Format: MM/DD/YYYY)
Section IV - Operation Maintenance Program	04/10/2009	(Date Format: MM/DD/YYYY)
Section V - Design Performance Provisions	07/28/2009	(Date Format: MM/DD/YYYY)
Section VI - Overflow Emergency Response Plan	04/10/2009	(Date Format: MM/DD/YYYY)
Section VII - FOG Control Program	04/10/2009	(Date Format: MM/DD/YYYY)
Section VIII - System Evaluation Capacity Assurance Plan	07/28/2009	(Date Format: MM/DD/YYYY)
Section IX - Monitoring, Measurement, and Program Modifications	07/28/2009	(Date Format: MM/DD/YYYY)
Section X - SSMP Program Audits	07/28/2009	(Date Format: MM/DD/YYYY)
Section XI - Communication Program	07/28/2009	(Date Format: MM/DD/YYYY)
Complete SSMP Implementation	07/28/2009	(Date Format: MM/DD/YYYY)

Note: 'Complete SSMP Implementation' is only available for input only if all its above sections filled.

Note: The Certification Note and Certified By fields disappear after certifying your SSMP.
Previous entries can be seen on the Historic SSMP Information screen.

Certification Note:		
5-Year Update	06/25/2019	(Date Format: MM/DD/YYYY)
SSMP Url:	www.valley-sanitary.org	
* Certified by:	Haberto Moreno	

Note: Questions with "*" are required to be answered before CERTIFY.

Certify

Historic

7-8-19

Development Design Manual

Developer / Engineer/ Contractor Handbook and Guidelines for Design and Construction of Sewer Facilities

Valley Sanitary District
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Indio, CA 92201
Phone: 760.238.5400
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Edition: 2016-1

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SECTION 1 DISTRICT AND MANUAL OVERVIEW

1.1 Valley Sanitary District Overview

Valley Sanitary District (VSD) provides wastewater collection and treatment and water reclamation services to an area of 12,768 acres, which includes a population of approximately 76,000, mainly serving the City of Indio, California. VSD was formed in 1925 under the State Sanitary District Act of 1923. The District believes in environmental stewardship and is also regulated by the California Regional Water Quality Control Board and the U.S. Environmental Protection Agency. A governing board of five members is elected from five general divisions for terms of four years each.

VSD boundaries encompass land within the eastern Coachella Valley, California. Most of this land is within the City of Indio, however the District also includes portions of County of Riverside, the City of Coachella and the City of La Quinta (Local Governing Agencies). The VSD Service Area Map is located in ***Appendix A***.

This manual and additional information regarding the District can be found on the VSD website at www.valley-sanitary.org.

1.2 Development Manual General Information

This Development Design Manual (DDM) provides comprehensive procedural and technical requirements for the planning, design and construction of VSD service infrastructure required for new development. The DDM is intended to be used by Developers, Planners, Engineers, and Contractors for their use in planning, engineering and constructing sewer collection systems within the VSD service boundary.

This manual will provide general information and the requirements for processing a new development, retrofitting of existing development, right-of-way (ROW) procedures, design criteria, drawing format and requirements, inspection requirements, FOG (fats, oils and grease) program and technical design standards. The Appendices provide more detailed information including checklists, construction notes, standard drawings, specifications, etc.

1.2.1 Abbreviations

The following are definitions, terms and abbreviations that are contained within this manual.

CC&R – Covenants, Conditions and Restrictions. Covenants, conditions and restrictions are limitations and rules placed on a group of homes or businesses by a builder, developer, neighborhood association, commercial condominium and/or homeowner association.

CEQA – The California Environmental Quality Act is a statewide policy of environmental protection. CEQA does not directly regulate land uses, but instead requires state and local agencies within California to follow a protocol of analysis and public disclosure of

environmental impacts of proposed projects and adopt all feasible measures to mitigate those impacts.

CVWD – Coachella Valley Water District. CVWD is a multi-faceted agency that delivers irrigation and domestic (drinking) water, collects and recycles wastewater, provides regional storm water protection, replenishes the groundwater basin and promotes water conservation within a large portion of the Coachella Valley.

DDM – Development Design Manual.

Developer – The lead party or owner responsible for the improvements associated with a parcel, parcels or larger development. For the purpose of this manual, a Developer may be a single family lot property owner, commercial business owner, and/or land Developer of a larger tract development.

District – Valley Sanitary District, VSD and District are all interchangeable to mean the agency responsible for providing wastewater collection and treatment services per the service area map provided in ***Appendix A***.

Engineer – Within the text of the DDM, Engineer shall pertain to the Developer's Engineer of Record providing the engineering planning and design for the required site improvements. This only pertains to the DDM; within the Standard Specifications, Engineer will pertain to the Valley Sanitary District's, District Engineer.

FOG –Acronym for fats, oil and grease. The State Water Resources Control Board (SWRCB) mandated sewer agencies that own sewer collection systems to implement a Sewer System Management Plan (SSMP). Part of this SSMP was implemented due to FOG related sewer pipeline stoppages. This program requires agencies including Valley Sanitary District, to evaluate the impact of FOG on the sewer system and implement policies and procedures to control the discharge of FOG into the sewer system.

Installation Agreement – Development Sanitation System Installation Agreement. An agreement between VSD and a developer/owner when public sewer improvements are installed by the developer/owner to be dedicated following formal acceptance to VSD.

IWA – Indio Water Authority. The Indio Water Authority was formed as a Joint Powers Authority to deliver domestic water to the City of Indio.

LAFCO – Local Agency Formation Commission. LAFCO carries out legislative duties through the consideration, approval or denial of boundary changes proposed by individuals or the local agencies.

Local Governing Agency – For the purpose of this Manual, Local Governing Agency shall be that local governing authority responsible for the maintenance and operations of the street/road network. Within the VSD boundary, most of this land is within the limit of the City of Indio, however the District also includes portions of County of Riverside, the City of Coachella and the City of La Quinta. It will be the responsibility of the developer/owner/engineer to determine the appropriate governing agency for their specific project location.

NPDES – National Pollutant Discharge Elimination System. As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

Owner - The owner responsible for the improvements associated with a parcel, parcels or large development. For the purpose of this manual, an owner may be a single family lot property owner, commercial business, and / or land developer of a larger development.

USBR – United States Bureau of Reclamation. The United States Bureau of Reclamation (USBR) is a federal agency under the U.S. Department of the Interior, which oversees water resource management, specifically as it applies to the oversight and operation of the diversion, delivery, and storage projects that it has built throughout the western United States for irrigation, water supply, and attendant hydroelectric power generation.

VSD – Valley Sanitary District, VSD and District are all interchangeable to mean the agency responsible for providing wastewater collection and treatment services per the service area map provided in ***Appendix A***.

1.3 General Project Design Process

1.3.1 Engineering Design

The Developer shall employ, at its sole expense, a qualified engineer or engineering firm, properly licensed to design and prepare detailed construction plans and specifications for the VSD service infrastructure in full and complete, in accordance with this DDM. All such planning, design work and plans performed and prepared by the Developer's engineer shall be subject to review and written approval by VSD prior to initiating any construction activities shown on said plans. The plans will conform to all applicable federal, state and local governmental rules, ordinances and regulations and all applicable environmental protection laws.

1.3.2 CEQA Clearance

The Developer shall, at Developer's sole cost and expense, be responsible for compliance with the CEQA and all other applicable state and federal environmental laws and all requirements of the Federal Endangered Species Act and the California Endangered Species Act arising out of or in connection with the design and construction of the standard and/or special facilities and for

compliance with all conditions and mitigation measures which must be satisfied in connection with the same. The Developer shall cause the appropriate public agency of the State of California to act as lead agency for the purposes of complying with CEQA. VSD may elect, but shall have no obligation, to act as lead agency. As part of its obligation to fund the CEQA process, the Developer shall prepare or cause to be prepared all instruments, documents, reports and other like or kind writings required to be prepared and/or filed by CEQA.

1.3.3 Right of Way

All new VSD service infrastructures are required to be installed in appropriate right-of-way (ROW) which can include:

- Land which VSD has fee title
- Easement-dedicated to VSD on the final map or by separate instrument
- Public ROW

Section 3 Right of Way & Easements provides the detailed information related to the acquisition and dedication of ROW and other related requirements.

Note, all public sewer facilities that are located within a gated community shall have a Knox key switch installed on all entry gates for VSD. Additionally, any public sewer facility that is located behind a locked gate shall have a Knox Pad lock installed on the gate for VSD.

1.4 Fats, Oil and Grease (FOG) Program

FOG is a combination of vegetable and animal fats from cooking, oil from salad dressings and dairy products including butter. The disposal of FOG into the sewer system from restaurants and homes can:

- Cause sewer stoppages and overflows that may pose a public health risk to all sewer system users not just those discharging FOG**;**
- Expose Valley Sanitary District to legal actions or fines for FOG related stoppages; and
- Increase collection system sewer and treatment plant operating costs.

In 2006 **t**he State Water Resources Control Board (SWRCB) mandated sewer agencies that own pipeline collection systems to implement a Sewer System Management Plan (SSMP). Part of this SSMP was implemented due to FOG related sewer pipeline stoppages. This program requires agencies including Valley Sanitary District, to evaluate the impact of FOG on the sewer system and implement policies and procedures to control the discharge of FOG into the sewer system. VSD maintains an active FOG program to stay in compliance with this requirement. Failure to remain in compliance with this program can subject Valley Sanitary District to fines; civil action or criminal prosecution.

SECTION 2 GENERAL PROJECT PLANNING/LAND DEVELOPMENT PROCESS

2.1 Pre-Entitlement Review

2.1.1 Will Serve Letter

At the very early stages of a development project, VSD will prepare a Will Serve Letter at the request of the County or City. This letter provides the County or City and the Developer with a basic description of the services that VSD will provide, notice of sewer service availability subject to VSD regulations along with any service concerns and potential conflicts with existing VSD infrastructure, policies or guidelines.

2.1.2 Development Project Reviews & Approval Process

After the Will Serve Letter has been issued, the Developer/Engineer can formally begin the Development Project Review & Approval Process. The Development Sanitation System Installation Agreement (Installation Agreement) will include detailed process requirements. The following sections describe the Development Project Review & Approval Process in general terms. Section 2.2 provides a general process for different types and sizes of development projects requiring sanitary sewer improvements.

2.1.2.1 Initial Contact & VSD Infrastructure Location

The primary VSD contact throughout the life of the development project will be with the Development Services Department. All inquiries should be directed to Development Services. Please refer to the following for guidance on submittal of plans for certain project types.

The Developer/Engineer should contact the VSD Staff to obtain existing utility infrastructure locations.

2.1.2.2 Initial Meeting with VSD

When preliminary development project plans are available, the Developer/Engineer should schedule an Initial Development Project Meeting with VSD to discuss District requirements. Representatives of all applicable VSD Departments will attend. Developer/Engineer should be familiar with the contents of this manual prior to the Initial Development Project Meeting.

After the Initial Development Project Meeting, the Developer/Engineer can formally begin the Development Project Review & Approval Process as outlined in the following subsections.

2.2 Plan Check Submittal Requirements

The processing of improvement plan check through VSD will slightly vary between different project types. All sewer improvements located within the public street right-of-way will require

consultation and possible approval from the Local Governing Agency Public Works and/or Transportation Department and the local domestic water agency (Indio Water Authority, City of Coachella Utility Department or CVWD). It will be the responsibility of the Developer to coordinate and obtain all approvals and encroachment permits from the Local Governing Agency and local domestic water agency provider on all proposed sewer improvements. It is strongly encouraged that the Developer meets with all of the above noted agencies prior to submittal of the initial plan review package and following any substantial changes in the location and/or design of the sanitary sewer system.

The following provides brief guidance on the processing of plan review checks for sanitary sewer improvement reviews through VSD within the City of Indio. It is highly recommended for the developer/engineer to consult with VSD prior to submittal for those projects located within the City of Coachella, City of La Quinta or Riverside County.

- ***New Commercial (Multi-Unit and Stand Alone Building) and High Density Residential***
  All plan submittals will need to be submitted and processed through the City of Indio, Building and Safety Department. Each plan review submittal shall include plans for all building plumbing systems, onsite sewer collection systems and offsite connections into the existing VSD facility system. Following the review of each submittal, VSD will provide the red-line plan review comments back to the City Building and Safety Department for disbursement back to the Developer/Engineer. All sewer improvement plans shall be developed and presented in conformance with the guidelines provided within this manual.

- ***New Single Family Residential Subdivision***
  All public sewer improvement plan submittals will be processed directly through VSD. Each plan review submittal shall include plans for the onsite and offsite public sewer collection systems. In addition to the sewer improvement plans, VSD will require the building plans for each home model of the current proposed phase. Following the review of each submittal, VSD will return the red-line plan review comments directly to the Developer. All sewer improvement plans shall be developed and presented in conformance with the guidelines provided within this manual.

- ***New Sewer Lateral or Sewer Lateral Upgrade for All Commercial / Residential Projects***
  All plan submittals shall be processed through the City of Indio, Building and Safety Department. Each plan review submittal will include the sewer upgrade/ replacement plans and all connections into the VSD facility system. Following the review of each submittal, VSD will return the red-line plan review comments to the City Building and Safety Department for disbursement back to the Developer/Engineer. All sewer improvement plans shall be developed and presented in conformance with the guidelines provided within this manual.

First Plan Check Submittal Requirements

For a timely processing of the first plan check submittal, the Developer shall submit with the plan submittal or have paid the plan check fee deposit (see ***Appendix D***). Please note the prior section on the agency for submittal of the specific project type and supporting plans for the sewer improvements.

For those projects with direct submittal to VSD, the Developer shall submit two (2) sets of sewer improvement plans (legible printed copies); size 24-inches x 36-inches. For those projects which are required to be processed through the City of Indio Building and Safety Department, refer to the requirements of the Building and Safety Department. Note the above discussion for guidance on the plan submittal requirements for each project type.

VSD will return one (1) red-lined set of the sewer improvement plans for corrections by the Developer's Engineer in a timely manner (typical review turnaround times will vary depending on the current VSD Staff workload and accuracy and completeness of the plans). See section 6 and appendix F for drawing formatting and content requirements.

Second Plan Check Submittal Requirements

Following the revisions on the first plan check comments, the Engineer shall submit the following items for second check:

- Two (2) hard copy sets of revised sewer improvement plans;
- Copy of the tract/parcel map (if applicable);
- Check print (copy of first plan check drawing(s) noting the corrections needed);
- Plan Check submittal addressing initial plan check comments and if and/or how comments were addressed; and
- Engineering quantities and cost estimate for only the public sewer improvements that VSD is responsible for maintaining.

VSD will return one (1) red-lined set of the sewer improvement plans for revisions/corrections by the Developer's Engineer. Review turnaround times will vary depending on the current VSD Staff workload, accuracy and completeness of the revised plans.

If at the end of the second plan check the plans are substantially complete and acceptable, with only minor revisions remaining, VSD may elect to bypass any additional plan check phases, request the minor revisions be made and require final submittal of a signed Mylar along with the red-lined plan set plan check comments back to VSD for final approval.

If the plans are deemed ready for approval and or approved, the Developer shall complete the necessary forms described herein. These forms shall be submitted to Development Services for review and approval before the fees are processed and following or concurrent with the Mylar improvement plans. VSD will prepare the Installation Agreement and provide sample

Performance and Payment Bond Forms for the sewer improvements that will be considered part of the public sewer system after VSD construction acceptance (refer to ***Appendix C*** for an example of the Installation Agreement). Final approval and execution of the Installation Agreement will not occur until the Sewer Improvement Plans have been fully approved and signed.

Third and Additional Plan Check Submittal Requirements
If significant corrections to the drawings are still needed following the second plan review, the review and revision process will be repeated, as necessary to the satisfaction of District Engineer. Minor corrections will be addressed on a case by case basis and may not require a re-submittal. Note, upon completion and approval of the improvement plans, the Developer will be responsible for the full cost of all plan checks. This cost will need to be paid to VSD prior to issuing permit.

Final Approval of Design Documents
Once the development review items are satisfactorily completed, VSD will notify the Developer by telephone and/or email that the final design plans can be produced and the Developer has their Engineer of Record sign the final design plans. For the final design plan submittal, VSD will require a signed bond copy of the final plans.

The Installation Agreement, Performance Bond and Payment Bond will be required for all sewer improvements that will be considered part of the public system after VSD's construction acceptance. The Developer executes the Installation Agreement, prepares the bonds, and submits (by mail or hand delivers) the original executed documents to VSD office located at 45-500 Van Buren Street, Indio, CA 92201. (Note: This process should be done concurrently when the final design plans are approved and ready to be signed by the Engineer.) The Installation Agreement will be signed by VSD officials after approval of the improvement plans and receipt of the required bonds. The Developer shall record the Installation Agreement with the County of Riverside, County Recorder after VSD executes the agreement. The final improvement plans will be signed and only released to the Engineer of Record immediately following VSD approval of the plans. VSD will require a hard copy and electronic PDF copy of the plans following the full approval of the plans. This will need to be provided to VSD staff prior to the scheduling of a Pre-Construction conference.

2.3 Construction Requirements

After approval of the plans and prior to the Pre-Construction meeting, the Developer must provide VSD an electronic version of the recorded tract map and/or dedication document.

Next, the Developer's contractor must schedule a Pre-Construction meeting with the Development Services Department a minimum of 7 calendar days prior to start of construction. The Developer and/or their Contractor must provide, prior to or at the beginning of the Pre-

Construction meeting, certification that the Contractor is properly licensed in the State of California, has a current T1 OSHA Trenching Permit, and that the Contractor performing the sewer improvements has the minimum VSD required insurance as applicable. In addition, the Developer/Contractor will need to provide the approved local jurisdiction Encroachment Permit, including the approved Traffic Control Plan. The inspection deposit shall be paid to VSD prior to the Pre-Construction meeting. See ***Appendix D*** for fee information.

All new public sewer service infrastructure will be constructed under direct VSD inspection. See ***Section 7 Inspection Requirements*** for detailed construction inspection requirements.

2.3.1 Progress for Service and Project Completion & Acceptance

When the base paving is complete, and testing has been completed and approved by VSD, the VSD service infrastructure can be progressed for service.

When base paving is complete, VSD Inspector will develop a final punch list. All punch list items must be corrected and the Developer must provide VSD a copy of the Final CC&Rs (if applicable) for the project prior to final acceptance. Upon final acceptance by VSD, the Developer will file a Notice of Completion with the County Recorder and provide VSD with the Bill of Sale conveying the facilities to VSD along with the final construction costs. Additionally, the Developer shall provide VSD with a final Record Drawing, which will be required for final acceptance. The submittal of the final Record Drawings shall be in accordance with ***Section 7.5.7*** of this DDM. Following full acceptance and receipt of all of the required information, the twelve (12) month warranty period begins.

2.3.2 Construction Delay

Construction must begin within one year of approved VSD service infrastructure plans. If more than one year has elapsed since plan approval, the Developer/Engineer shall resubmit the plans for review and approval. A new plan check fee deposit may be required.

2.4 Agreements

2.4.1 Development Sanitary System Installation Agreement (Installation Agreement)

Standard infrastructure includes those public facilities which will become the property and responsibility of VSD following acceptance of the system. A fully executed Installation Agreement will be required prior to the start of construction. See ***Appendix C*** for an example of an Installation Agreement.

2.4.2 Special Infrastructure - Development Sanitation System Installation Agreement

Special infrastructure includes offsite sewer mains, lift stations, force mains, etc., that will be necessary to provide proper sanitation service to the proposed development. An Installation Agreement will be required prior to the release of the plans. See ***Appendix C*** for an example of

an Installation Agreement. All special infrastructure plans must be reviewed and approved by the VSD General Manager.

2.5 Fees

Information regarding fees for connection to VSD facilities, usage charges, and other administrative fees are described in the ***Appendix D***. All applicable fees shall be paid by the applicant prior to the final approval of plans, installation of individual services, or at other times as requested by VSD.

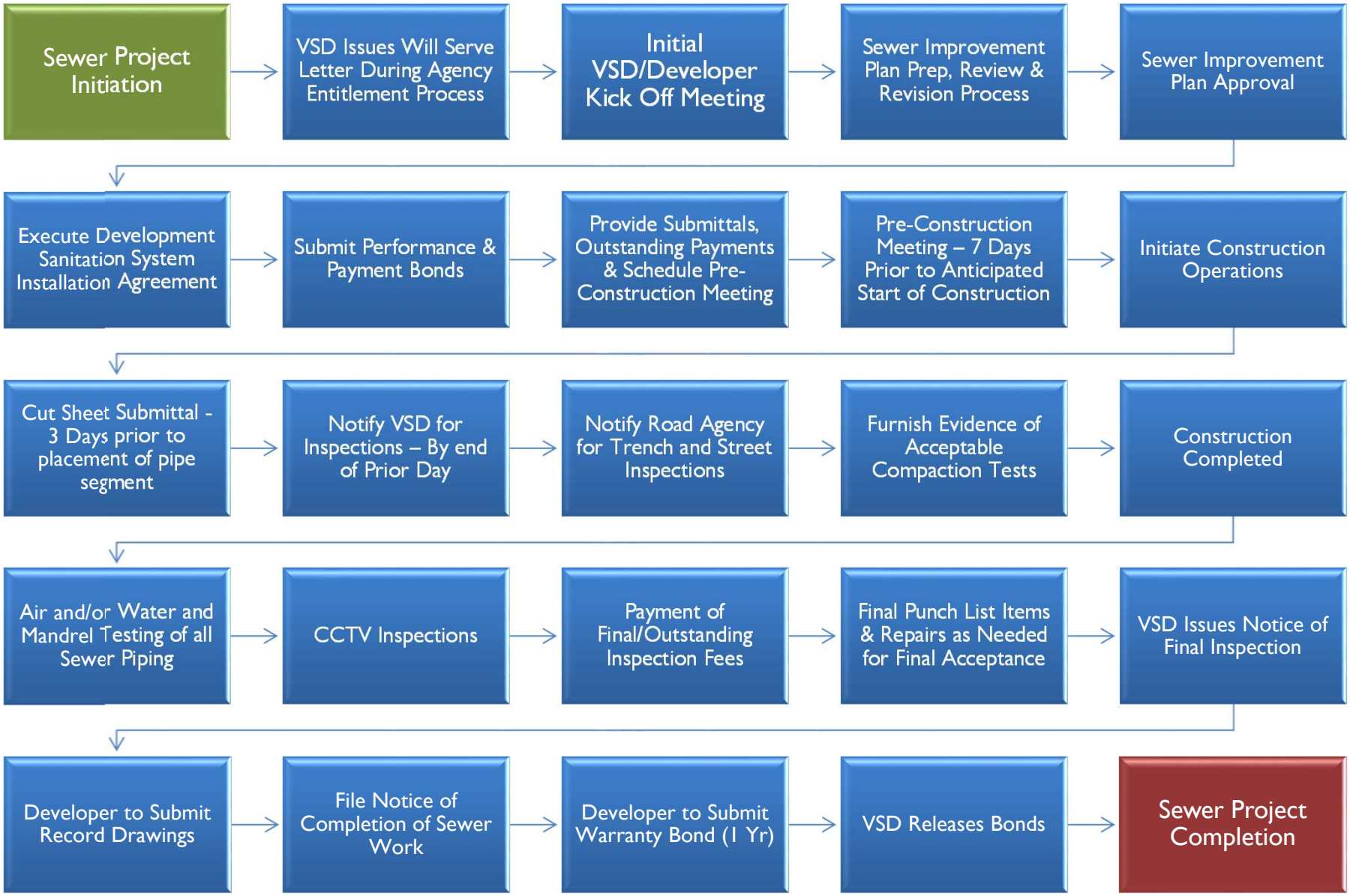
2.6 Annexations

VSD requires new developments within the VSD Sphere of Influence but outside of the existing District Boundary to be annexed into District for sanitation service through LAFCO. The annexation land shall be subject to all assessments, taxes and charges which may be levied within the Improvement District. It is strongly encouraged for the Developer to meet with VSD early within the project development to determine the appropriate steps to accommodate any annexation request.

2.7 General Development Process – Flow Chart

The following page contains a flow chart depicting the general Project Planning/Land Development Process for sanitary sewer service planning, design, construction and acceptance.

SEWER IMPROVEMENTS – PROJECT DESIGN DEVELOPMENT PROCESS



SECTION 3 RIGHT OF WAY & EASEMENTS

3.1 General

For the purposes of this section, Right of Way (R/W) is considered fee land and/or easement.

Of special note, the Coachella Valley Water District (CVWD) has unique R/W obligations related to the irrigation system within the VSD boundary. The irrigation system is comprised of the Coachella Branch of the All-American Canal, Protective Works (Flood Protection Dikes & Channels) and Irrigation Distribution System. The United States Bureau of Reclamation (USBR) owns these facilities and CVWD operates and maintains (O&M) them in perpetuity. Accordingly, CVWD is responsible for administering and protecting USBR R/W. All projects that encroach and/or cross USBR facilities will require coordination with CVWD. VSD staff will not be responsible for this coordination and/or project clearance with CVWD as it relates to these USBR facilities.

3.2 Dedication of Real Estate Assets

The Developer is required to dedicate to VSD real estate assets for a variety of utility purposes as a condition of development. This may include raw land and/or improved land for public sewer main lines, lift stations (only allowed by approval of the General Manager), treatment facilities, etc. There are two methods for dedicating real estate assets to VSD;

(1) Dedication by final map or
(2) Dedication by separate instrument.

In either case, the recorded instrument numbers and/or map book and page must be shown on the plans prior to release of the plans for construction.

The dedication of real estate assets will be defined in the Installation Agreement (see ***Section 2.4.2*** and ***Appendix C***). The Installation Agreement for special infrastructure defines the basic requirements of the real estate asset(s), e.g. size, type, general location, etc. and the timing of the dedication. Please note all CEQA compliance for new facility improvements is the responsibility of the Developer (see ***Section 1.3.2***).

VSD requires four items for each dedication by separate instrument; (1) Preliminary Title Report (PTR) and Title Insurance (TI), (2) Substitution of Trustee and Partial Reconveyance, (3) Proof of the signer's capacity to sign on the fee title owner's behalf (Corporate Resolution, Operating Agreement, etc.) and (4) Grant Deed. The PTR/TI ensures that the real estate asset(s) has no adverse encumbrances. The Partial Re-conveyance ensures that the real estate asset is not subject to beneficiary foreclosure. The Grant Deed includes Exhibit A (legal description) and Exhibit B (plat of the real estate asset(s)), both Exhibits are to be prepared by a California Licensed Surveyor. VSD will require a Record of Survey (including field survey and monument placement) and Certificate of Compliance to be filed if the parcel(s) are a part of a larger parcel.

3.3 Dedication of Easement

The Developer is required to dedicate an easement for a variety of utility purposes as a condition of development. Typically easements are dedicated for pipelines and appurtenances but could be dedicated for other facilities. The centerline of the sewer pipeline shall be located near or on the centerline of the easement. Easements must have a minimum width of twenty (20) feet. VSD may request a wider easement depending on the depth (to the pipe invert) of the sewer pipeline and other field conditions. If the depth of the pipe is over ten (10) feet, VSD may require an easement that is at least twice the depth. The easements will be clear of all proposed construction improvements such as but not limited to block walls, structures, and landscaping. All construction improvements within VSD easements shall be the responsibility of the underlying fee land owner to replace in the event of VSD maintenance, repair or replacement activities.

VSD requires easements to ensure the ability to properly operate and maintain its facilities. The general physical requirements for VSD easements are depicted in Table 3.1.

Table 3.1 Easement Width

Number of Pipes	Easement Width
Single Pipe	20 feet
Two Pipes[1]	32 feet (10' curbs/walls to pipe CL + 10' between pipe CL)

[1] The 12 foot pipe centerline (CL) offset applies when the sum of the inside diameters of the two pipes is 24-inches or less. If the sum of the two diameters is greater than 24-inches, then the separating distance between the outside edges (including bells) of the pipe shall be 10 feet.

If the above required easement is parallel with another utility easement, the required width of the VSD easement may be reduced by VSD following a formal written request by the Developer.

There are two methods for dedicating easements to VSD;

(1) Dedication by final map;

(2) Dedication by separate instrument.

Typically, easements for pipelines and appurtenances located within the final map development area are dedicated on the final map and off-site easements are dedicated by separate instrument. In either case, the recorded easement instrument numbers and/or map book and page must be shown on the plans prior to release of the plans for construction.

VSD requires a Preliminary Title Report (PTR) and Title Insurance (TI) for each easement dedication by separate instrument. The PTR/TI ensures that the real estate asset(s) has no adverse encumbrances. The Developer is responsible for providing these items at no cost to VSD. These are subject to VSD's review and approval. Please refer to the Title Insurance Steps for easements in ***Appendix G***.

VSD requires three items for each dedication by separate instrument: (1) Grant of Easement, (2) Proof of the signer's capacity to sign on the fee title owner's behalf (Corporate Resolution, Operating Agreement, etc.) and (3) Subordination Agreement, if required. The Grant of Easement includes Exhibit A (legal description) and Exhibit B (plat of the real estate asset(s)), both Exhibits to be prepared by a California Licensed Surveyor and are subject to the VSD Standards for Legal Descriptions and Plats. Examples of these documents are located in ***Appendix G***.

Dedication by final map is further elaborated in ***Section 3.5***.

3.4 Permit to Construct

VSD administers a "Permit to Construct" for all projects involving VSD facilities. Prior to issuance of the Permit, the Developer will need to provide to VSD the following items, as applicable:

- Information Sheet (see ***Appendix E***);
- Application for Wastewater Discharge Permit (as necessary) (see ***Appendix E***);
- Fees paid;
    - Remaining Plan Check fee not covered by initial deposit,
    - Inspection Fee Deposit, and
    - Connection Capacity Fee (based on Equivalent Dwelling Units (EDU))
- Fully signed plans
- Performance and Payment Bonds; (as necessary)
- Executed Development Sanitation System Installation Agreement; (as necessary)
- Copy of Recorded Parcel Map; (as necessary)
- Copy of Recorded Grant of Easement; (as necessary) and
- Lateral Agreement (as necessary).

VSD, following the plan check of the initial improvement plan submittal, will provide to the Developer a listing of those items noted above which will be required prior to issuance of the "Permit to Construct".

3.5 Final Map Review and Approval Process

Section 66436 of the Subdivision Map Act provides that a public entity or utility has the right to review and approve a tract or parcel map (final map). If the public entity or utility finds that the proposed activity as defined by the final map will reasonably interfere with the full and complete exercise of its ROW, then the public entity or utility can object to the recording of the final map. It is strongly suggested that the Developer/Engineer work with VSD to ensure the final map is

correct before filing. VSD will not release plans until the final map or separate instrument easements are recorded.

VSD reviews each final map in detail to ensure there will be no interference with existing and/or future VSD ROW. A typical final map has three sections of interest to VSD; (1) Proposed VSD easements and fee title parcels to be dedicated via the final map, (2) Signature Omissions-listing existing VSD easements and (3) Environmental Constraints. These are further elaborated below.

3.5.1 Proposed Easements

VSD will cross check the approved plans to ensure the proposed easements match with the proposed infrastructure plans.

3.5.2 Signature Omissions

All existing VSD easements must be shown on the final map.

If final map is filed without prior review and approval by VSD and interference is discovered, then VSD will issue an Interference Objection Letter with the City or County to ensure the final map is corrected.

3.6 Access to Public Sewer Facilities

All public sewer facilities that are located within a gated community shall have a Knox key switch installed on all entry gates for VSD. Additionally, any public sewer facility that is located behind a locked gate shall have a Knox Pad lock installed on the gate for VSD. The furnishing and installation of the Knox key switch and/or pad lock shall be the responsibility of the Developer. See ***Appendix G*** for the Knox switch and lock order form and specification sheet.

SECTION 4 DESIGN CRITERIA FOR SANITARY SYSTEM FACILITIES

4.1 General

The following section contains information on design criteria that shall be used in the design of proposed sanitary systems. The Developer and his engineer shall be responsible to ensure that submitted design plans are consistent with VSD's Standards, and generally accepted standards of good engineering practice. **Note the following section does contain information on sewer force mains and lift stations, however the use of these facilities within the Valley Sanitary District system is not allowed without approval by the General Manager.** The mention of lift stations and/or force main facilities in this manual does not imply VSD approval of use for such facilities. VSD currently has a no lift station policy that will not allow for lift stations or force mains on future development. VSD strongly encourages all Developers contemplating the use of a sewer lift stations and/or force mains on their proposed development, to meet with VSD staff early in the project development process.

4.1.1 Standard Requirements

The design and construction of all sanitary sewer system facilities to be operated and maintained by VSD shall be in accordance with the latest editions of VSD Standard Drawings and List of Approved Materials, California Waterworks Standards (Title 22, California Code of Regulations, Chapter 16), VSD Standard Specifications, and the VSD Development Design Manual. The Sanitary System design/construction standards and regulations for service are governed by the following documents:

- VSD Sewer Construction and Use Ordinance, ***Appendix B***
- Environmental Protection Agency (EPA)
- District Standard Specifications, ***Appendix J***
- District Standard Drawings and General Notes, ***Appendix I***
- "Greenbook" – Standard Specifications for Public Works Construction
- Uniform Plumbing Code / California Plumbing Code (UPC / CPC)
- State Water Resources Control Board (SWRCB)
- Regional Water Quality Control Board (RWQCB)

4.1.2 NPDES Requirements

The contractor is required to adhere to the provisions of the Federal Clean Water Act as regulated by the U.S. Environmental Protection Agency in Code 40, Code of Federal Regulations (CFR) Parts 122, 123, 124, the Porter-Cologne Act (California Water Code), the Waste Discharge Requirements for Municipal Storm Water Discharges (MS-4 Permit), Chapter 55 of the City of Indio Municipal Code, Chapter 13.16 of the City of Coachella Municipal Code and Chapter 13.12 of the County of Riverside Ordinances.

4.1.3 Master Plan

All sanitary sewer system design shall be engineered in accordance with the latest edition of the VSD Sewer Master Plan, and all other supplements and revisions thereto. If a proposed development increases the density of a current land use and/or changes the current land use, this may trigger the re-modeling of the sewer system in that area. The Developer will be responsible for a modeling fee to determine the full effects and possible upsizing of the trunk sewer mains within the VSD system. See ***Appendix D*** for current fee schedule.

4.2 Sanitary Sewer Design Capacity

In general, the sanitation sewer capacity should be designed for the estimated ultimate tributary area. Likewise, consideration should be given to the maximum anticipated capacity of different types of development.

Several factors shall be considered in determining the required capacity of sanitary sewers. The following are examples of factors to be considered:

- Maximum peak hourly domestic sewage flow;
- Additional maximum sewage or waste flow from developments;
- Inflow and ground water infiltration;
- Topography;
- Sewer pipeline depth;
- Lift Station requirements (Pumping)

When an area outside the development can be logically served by future extension of a proposed gravity sewer, the sewer shall extend to the tract boundary or to the end of a paved street in a manner to facilitate the future extension. Over sizing and extra depth of sewers will be required where such sewers can logically serve an upstream tributary area and extra size and/or depth are required for such future use.

VSD has developed a Collection System Hydraulic Model over the majority of the VSD wastewater collection system. This model will be utilized by VSD staff and/or a VSD consultant to size the sanitary system facilities required for each development at the Developers cost.

4.3 Design Flow Criteria

Taking into account the limited precipitation and the dry weather, the VSD sewer system shall be sized to accommodate the peak dry weather flow (PDWF) observed within the service area. Additional wet weather flow and insignificant inflows can be accommodated by the additional capacity available when the d/D (flow depth/sewer diameter) ratio is greater than 0.5. The recommended peak flow criteria for facility design and sizing is as follows.

- Average flow per EDU = 300 gpd
- For collector sewers up to 18-inch in diameter, the design peak flow should be equal to 2 times the average day flow.

- For trunk sewers greater than or equal to 18-inch in diameter, the design peak flow should be equal to 1.5 times the average day flow.

VSD may find that the capacity of certain new sewer mains within an area under development should be increased to accommodate existing or future additional development. In such case, the quantity of additional flow shall be determined by VSD. The flow resulting from the addition of the development and additional "computed peak flow" shall be used as the basis of design.

4.4 Sewer Pipeline Design Criteria

The criterion for the design of the sewer pipeline includes the design period, slope, depth of flow and velocity criteria. In no case shall mainline gravity sewer pipelines be less than 8 inches in diameter. Gravity sewers shall be stationed from the low point and increase uphill.

4.4.1 Slope and Velocity

Table 4.1 represents the minimum slope for various gravity sewer pipeline sizes.

Table 4.1 Minimum Pipe Slope

Sewer Dia. (Inches)	Slope (Ft / Ft) (Preferred)	Slope (Ft / Ft) (Min)	Slope (Ft / Ft) (Max)
8	0.0076	0.0033	0.0860
10	0.0060	0.0028	0.0610
12	0.0044	0.0020	0.0490
15	0.0036	0.0016	0.0360
18 and up	0.0024	0.0012	0.0290

Subsequent to the determination of the design flow the engineer shall use Manning's formula to calculate the required pipe size. The engineer shall quantify the relation of slope, design flow, velocity, diameter, and "n" value utilizing the criteria's set forth in **Table 4.1** "Minimum Pipe Slope" and **Table 4.2** "Pipe Velocity". The minimum "n" value shall not be less than 0.013 for plastic pipe.

Table 4.2 Pipe Velocity

Velocities	Design (fps)	Minimum (fps)	Maximum (fps)
Sewer Pipelines	3	2	10
Force Mains (if approved for use)	4 to 7	3	8
Inverted Siphons	4	3	5

4.4.2 Gravity Sewer Pipeline Sizing Criteria

Gravity sewer pipelines shall be sized such that the peak hourly dry weather flows, established in ***Section 4.3***, do not exceed the d/D ratios depicted in **Table 4.3**. The designer shall also check for adequacy of gravity pipelines during peak hourly wet weather flows. Surcharged conditions for the gravity pipelines are not acceptable during peak hourly wet weather flows.

Table 4.3 Depth to Diameter Ratios (d/D)

Gravity Sewer Pipeline Diameter (inches)	Maximum d/D[1]
8 – 18	d/D = 0.50, (1/2 D)
≥ 18	d/D = 0.75, (3/4 D)

[1] d = depth of flow & D = diameter of sewer pipe

4.4.3 Change in Pipe Size

When a smaller sanitary sewer joins a larger sewer pipeline, the invert of the larger sanitary sewer should be lower such that it maintains the same energy gradient. See **Section 4.6.1.3 "Manhole Invert Elevations"** for the minimum change in grade across the manhole.

4.5 Sewer Pipeline Location

Sewer pipelines shall be located within public right-of-way (R/W), easements dedicated by tract map or specific easements or fee title land granted in the favor of VSD. The design shall be adjusted to take into consideration utility conflicts, soils and any other factors. Wherever possible, gravity sewers shall be located in public streets parallel to street centerlines. Where the sewer can serve both sides of the street, the sewer shall be typically located six (6) feet away from the centerline for undivided street sections and six (6) feet away from median curb in divided street sections, if possible. Where the sewer serves only one side of the street, it may be located a greater distance from the centerline. In general, the sewer main should be installed on the north or east side of the street section and or according to the local governing jurisdiction standard plan. Prior to submittal of the final plans, the location of the sewer main along with all other proposed and existing utility facilities shall be plotted on an exhibit and submitted to the local governing jurisdiction for approval of the location.

4.5.1 Horizontal Alignment and Separation

Considering other design limitations and construction factors, a minimum separation between sewer pipeline and other infrastructures shall be maintained. **Table 4.4** represents the minimum horizontal separation from other infrastructure facilities.

Table 4.4 Minimum Horizontal Separation – Sewer Pipelines

Horizontal Separation from Sewer Pipeline	**Minimum Separation (feet)**
Water Pipeline	10
Non-Potable Pipeline	10
Storm Water Pipeline	10
Well	50
Curb (Lip of gutter)/Edge of Pavement	7
Horizontal Separation from Sewer Manhole or Lift Station	
Sewer Laterals	6
Domestic Service Line	10
Well	100
Horizontal Separation from Sewer Lateral	
Water Pipeline	10
Water Service Line	10
Well	50
Sewer Manhole	6
Sewer Lateral (Opposite Direction)	2
Sewer Lateral (Same Direction)	4
Storm Drain Catch Basin	4

Sewer pipeline and domestic water pipeline crossings and separations shall be in accordance with VSD Standard Drawings in ***Appendix I***.

Horizontal curves may be allowed by VSD; however, not encouraged except when necessary to maintain the required separation from other infrastructure. The use of horizontal curve will require approval from VSD. The Developer shall submit to VSD concurrently with plan check a clean copy of the manufacturer's recommendations for minimum pipeline radius for all requested sewer pipe material used on the project. The use of bends in lieu of pipeline radius may be considered by VSD, but their use will require a formal request by the Developer and approval by the VSD General Manager.

Shopping centers and commercial complexes shall comply with the following special requirements:

- All sewer pipelines shall be located in drive aisles;
- All sewer laterals shall be equipped with a cleanout, every 100 feet of lateral length and/or within 2.0' of the building point of connection;
- All sewer lateral cleanouts shall be located in a planter area or clear area of drive aisle;
- Grease interceptors as applicable.

4.5.2 Pipeline Cover and Vertical Separation

The typical minimum depth of a sewer pipeline, to the pipeline invert is 7.0 feet. VSD may allow shallower depths in special cases when approved by VSD. Depths greater than 25.0 feet are not allowed without VSD approval.

No vertical curves in mainline pipeline sewer shall be permitted.

Concrete encasement is required when outside pipe wall to outside pipe wall clearance between the new sewer pipe and any other structure is less than 36-inches above or 12-inches below or when required separation with a water line, irrigation line or storm drain mainlines cannot be maintained. Concrete encasement is required when the depth of cover to the top of pipe is less than three feet. **Table 4.5** represents the minimum vertical separation from other infrastructure facilities. The noted separation distances are measured between the outside edge (including the bells) of all pipes.

Table 4.5 Minimum Vertical Separation – Sewer Mains

Vertical Separation for New Sewer Mains	Separation Above		Separation Below	
	Desirable Minimum (feet)	Absolute Minimum (feet)	Desirable Minimum (feet)	Absolute Minimum (feet)
Water Pipeline	1.0 [1]	0.5 [2]	1.0 [1]	0.33 [2]
Non-Potable Pipeline	1.0 [1]	0.5 [2]	1.0 [1]	0.33 [2]
Storm Water Pipeline	1.0 [1]	0.5 [1]	1.0 [1]	0.5 [1]
Other Dry Utility Conduits	1.0	0.5	1.0	0.5

[1] Sewer main placed above existing or proposed water main shall be PVC C900 DR-14, C905 DR-14 or SDR-35 placed inside a ¼-inch steel sleeve with welded joints. If PVC C900 or C905 piping is used, the pipe shall be centered over the crossing pipeline.

[2] Separation distances listed are per Indio Water Authority (IWA) Standards. Engineer should verify absolute minimum separation distances for all non-IWA water agency facilities.

4.5.3 Pipe Material

Gravity sewers shall be polyvinyl chloride pipe (PVC) SDR-35 and/or SDR-26. Other pipe material may be allowed following a formal written request and approval by VSD.

4.5.4 Pipe Backfill and Bedding

VSD will require submittal of a geotechnical report from the Developer providing information on the general site material classification, expansiveness and high sulfate content. Backfill and bedding zones shall be as shown on VSD Standard Drawings located in ***Appendix I***. For the pipe backfill and bedding details, the Engineer shall refer to the current ASTM Standards as well as pipe manufacturer bedding recommendations on allowable pipe deflection and soils bearing pressure. It will be the responsibility of the Engineer to provide a recommended trench backfill and bedding detail to VSD for approval. The trench backfill and bedding shall be based on the site soil classification(s), depth of pipe, ASTM Standards per the specific pipe material, and the manufacturer's recommendations.

4.6 Gravity Sewer System Appurtenances

4.6.1 Manholes

Manholes shall be installed at the intersection of sanitary sewer lines; at all changes in grade, size or alignment; and at the end of any sewer main more than 200 feet in length from the last manhole.

4.6.1.1 Manhole Spacing

Manholes shall be installed on a spacing not to exceed 500 feet. Sanitary sewer mains with a radius greater than 400 feet shall be considered as straight with manhole spacing not to exceed 500 feet. Manhole spacing on curved sewer mains less than a 200 foot radius shall be 200 feet. Manhole spacing on curves between 200 and 400 feet shall be adjusted proportionately and approved by VSD. Sanitary sewer mains with reverse curves are required to have a manhole at the point of tangency of the curve. Standard manhole details are shown on VSD Standard Drawings in ***Appendix I***.

4.6.1.2 Manhole Depth and Size

The minimum manhole depth is to be 7 feet unless approved by VSD. The manhole depth is to be calculated from the proposed finished grade to the lowest pipe invert. The minimum manhole diameter size shall be as indicated in **Table 4.6** "Manhole Minimum Diameter".

Table 4.6 Manhole Minimum Diameter

Sewer Pipe Size (Inches)	MH Size (inches)
8 up to 24	48
24 & larger	60

4.6.1.3 Manhole Invert Elevation

For manholes with the same diameter pipeline connections, the invert elevation shall have a minimum of 0.20 foot drop between the inlet and outlet pipes in all directions. For manholes that join sewer mains with different sizes, the sewer mains should join at their respective spring lines plus 0.10 foot. For manholes that connect a sewer main to an 18-inch diameter or larger sewer main or to sewer mains with large quantity of flow, the sewer main should join at the three quarter depth plus 0.10 foot. VSD reserves the right to deviate from this guideline where necessary to meet system requirements.

4.6.1.4 Drop Manhole

Drop manholes shall be provided for sanitary sewers entering a manhole at an elevation of 5 feet or more above the manhole invert. Where the difference in elevation between the incoming sanitary sewer and the manhole invert is less than 5 feet, the slope of the incoming sanitary sewer shall be increased to eliminate the need for the drop. All manholes shall be constructed with an outside drop connection per VSD Standard Drawings in ***Appendix I***.

4.6.1.5 Special Manhole Construction Requirements

Any manhole determined to have a potential of generating excessive sulfide gases shall be epoxy coated. Manholes identified shall include, but are not limited to, the first manhole originating from a sewer trunk main 15-inches in diameter or larger, force main transition manholes, drop manholes, or as determined by VSD.

Residential properties with services located at the end of cul-de-sacs or when the sanitary sewer is greater than 10 feet deep may connect to manholes providing that no more than three (3) 4-inch house lateral are installed. The maximum angle between the residential 4-inch lateral and the manhole is 45 degrees.

Manholes located in rural, undeveloped areas shall have a sealed manhole frame and cover, bolted-down type, in accordance with VSD Standard Drawings in ***Appendix I*** and shall also be noted on the drawings.

4.6.2 Cleanouts

Cleanouts shall be installed at the end of a sewer if the distance from a manhole is less than 200 feet.

All house laterals shall be equipped with a clean-out located 2.0’ behind curb, 2.0’ behind sidewalk or 2.0’ behind public utility easement. If the City or County requires a clean-out at the curb or property line, it may be substituted for the required cleanout by VSD. The final construction drawings shall note Local Governing Agency required clean-out.

4.6.3 Sewer Laterals

A sewer lateral or building sewer is noted as the complete lateral beginning at the building clean out and extending to and including the connection to the public sewer main. The property owner shall be responsible for all costs related to the installation, connection, maintenance, repair, construction, abandonment or removal of lateral and/or private sewers. If a "common" private sewer lateral serves more than one property, the properties served by the common lateral own the lateral and are responsible for its maintenance and upkeep. Proposed sewer laterals will not be allowed to serve more than one property.

Any new or existing building with plumbing drain outlets at an elevation that is 12 inches or less above the ground surface of the next upstream manhole, the property owner shall install and maintain a backwater valve (sewer backflow prevention device).

Any new or existing building where the elevation of any floor is at or below the invert of the district sanitary main, or where a condition exists where a stoppage in the district sewer main will cause the hydraulic grade line to rise above the lowest floor level, the property owner shall install and maintain a backwater valve (sewer backflow prevention device).

Failure of the property owner to install and maintain a Backwater Valve for any of the required conditions, shall relieve VSD of any and all responsibilities for any and all damage caused by sanitary sewer flooding.

Sewer laterals shall be installed to each dwelling unit or commercial unit except for multi-story structures and apartments. Four-inch diameter sewer laterals shall be installed for single dwelling units and 6-inch diameter or larger sewer laterals shall be installed for other customers depending on sewage flow.

Depth of house laterals shall be sufficient to provide service to the lowest or most distant point to be served on each lot at a minimum grade of two percent with not less than 18 inches of cover over the top of the pipe. The minimum depth of the house lateral at the curb flowline or edge of pavement shall be 5.0 feet. The sewer lateral connection into a mainline pipe shall be installed at a 45° unless otherwise approved by VSD.

A single lateral may be utilized for both the buildings regular sewer and interceptor (grease, sand/oil) sewer discharge line provided the following criteria exists: 1) the regular sewer lateral (on-site sewer conveying only raw sewage) is connected between the interceptor and the end of lateral at the property line, 2) the combined flow does not exceed the flow rate approved in the regular sewer lateral, and 3) the building sewer lateral is for the purpose of one place of business.

4.6.4 Grease Interceptors

A grease interceptor shall be required for any business having the potential of discharging grease into a public sewer. Prior to service connection, an applicant shall submit to VSD an approval letter from the County of Riverside Environmental Health Department and stamped plans for Plumbing, Equipment, Fixtures and Drainage of building. VSD will review for approval, the

grease interceptor location, sizing and installation requirements. VSD will consider minimum requirements contained in the current edition of the California Plumbing Code when approving interceptors. The minimum size of a grease interceptor shall be determined by the County of Riverside Environmental Health Department. If the grease interceptor size determined by the Environmental Health Department is less than 1,000 gallons, VSD will require a minimum interceptor size of 1,000 gallons.

4.6.5 Oil/Sand Interceptors

Any type of business where oil/sand may be discharged into a public sewer shall have an oil/sand interceptor. VSD will review for approval, the oil/sand interceptor location, sizing and installation requirements. VSD will consider minimum requirements contained in the current edition of the California Plumbing Code when approving interceptors. The minimum size of an oil/sand interceptor shall be determined by the County of Riverside Environmental Health Department. If the oil/sand interceptor size determined by the Environmental Health Department is less than 1,000 gallons, VSD will require a minimum interceptor of 1,000 gallons.

4.6.5.1 Lint Trap

Any type of business where lint may be discharged into a public sewer shall have a lint trap. Prior to service connection, an applicant shall submit to VSD stamped plans for Plumbing, Equipment, Fixtures and Drainage of building. VSD will review for approval, the lint trap location, sizing and installation requirements. VSD will consider minimum requirements contained in the current edition of the California Plumbing Code when approving lint traps. The Developer shall submit Lint Trap Calculations to VSD for review and approval.

4.6.6 Facility Location Markers

Marker posts shall be installed at manholes, force mains and cleanouts located outside of paved areas in accordance with VSD Standard Drawings in ***Appendix I***.

4.7 Inverted Siphon

Inverted siphons are considered special structures and are designed to convey sewage flows (liquid and gas) under obstructions. These obstructions can be flood control channels, streams, highways, irrigation channels and other permanent structures. Every effort during design should be made to **avoid** sewer siphons due to high maintenance requirements and odor problems. Inverted siphons are known to have difficulty passing floating material and grease. These materials become easily trapped in the upstream manhole structure. When feasible, inverted siphons may include airlines (sometimes referred to as “air jumpers”) between the upstream and downstream manholes.

Inverted siphons shall be approved by VSD in concept prior to preparation of drawings. This initial concept review shall consist of a preliminary plan and profile design, with call outs for specific design elements, in addition to a hydraulic model of the siphon operations.

4.7.1 Inverted Siphon Location

Inverted siphons and airlines should be located completely within public right-of-way. If unavailable, an easement or other limited right-of-entry location may be adequate. In all cases, the R/W shall provide adequate clearances to not only contain the physical structures, but also allow vehicles, workers and equipment to enter and perform any construction, inspection, flushing, repair, maintenance and operational activity.

4.7.2 Inverted Siphon Design

The hydraulic capacity of an inverted siphon shall not be less than the capacity of the sewer system upstream of the inverted siphon. Hydraulically, inverted siphons shall be designed for the average daily flow with a preferred minimum velocity not less than 4 fps, and an absolute minimum velocity of 3 fps. Velocities less than these are non-self-cleaning velocities which may allow material to deposit in the conduit, which in turn will result in blockages, higher maintenance costs and a shorter life. The daily peak hour flow shall provide a minimum velocity of 4 fps at least once a day.

An inverted siphon may also require multiple barrels and air jumpers as determined by the Design Engineer and the hydraulic model of the siphon operations.

4.8 Expansive and Corrosive Soil Criteria

In the eastern portions of the District boundary area, there exists some areas of expansive and high sulfate soils. The Developer when obtaining geotechnical soils field data collection and recommendations shall test for both the presence of expansive and high sulfate soils before the placement of any concrete on the site. If the subgrade testing reveals the presence of expansive and/or high sulfate soils, the geotechnical and/or civil engineer shall make recommendations to the District on how to address the existing soils conditions.

If expansive soils are present and it is not addressed in the construction details, specifications or notes, this soil condition can cause the concrete to raise and/or separate from other improvements.

If the site has the presence of high sulfate soil and that condition is not addressed in the construction details, specifications or notes, this condition can cause the concrete to lose its “mortar”, which will cause the aggregate in the concrete to be exposed. For addressing the presence of high sulfate, refer to the City of Indio Standard Plan Number 175 for additional information.

SECTION 5 DESIGN CRITERIA FOR NON-POTABLE WATERSYSTEM FACILITIES (FUTURE)

SECTION 6 DRAWING FORMAT AND REQUIREMENTS

6.1 General

VSD performs sewer plan checks using the Sewer Improvement Plan Checklist as a guide. Refer to ***Appendix F*** for all required information and call outs necessary for VSD to approve sewer improvement plans.

All plans submitted to VSD for plan checking shall be submitted on 24-inch x 36-inch bond sheets and shall conform to the VSD CAD Standards. The plans shall also contain the information detailed in the following subsections. Use the following information as a checklist for plan preparation.

The format for Sewer Improvement Plans shall be in the same format as shown on the VSD "CAD Templates". Electronic copies of the CAD Templates are available on the Valley Sanitary District website at www.valley-sanitary.org.

6.2 Sheet Format

VSD service infrastructure drawings shall be of professional quality. Drawings shall be of standard engineering practice, well arranged, neat, legible and present the proposed construction in bold font without confusion. Drawings shall show both plan and profile, unless otherwise approved by VSD.

All drawings shall be 24-inch x 36-inch size. The horizontal scale shall be 1-inch = 40 feet (preferred) or 1-inch = 20 feet and the vertical scale shall be 1-inch = 4 feet (preferred) or 1-inch = 2 feet. Scale bars shall be provided denoting both vertical and horizontal scales.

Match lines and continuations from sheet to sheet shall be used and identified with applicable station points and cross reference. Stationing shall be provided along the centerline of pipe. New stationing shall start at 10+00.00.

A north arrow shall be clearly shown on all sheets of plans. The plan view area shall be oriented so that north is facing either towards the top or to the right side of the sheet. Indicate sheet number and total sheets on the drawings at bottom right corner, e.g. Sheet 1 of 3. Each sheet shall have a Standard Title Block including the following: revision block, block showing firm name, address, phone number and contact person of firm responsible for work, VSD approval block, VSD logo and address block, block showing project title, sheet name and project location including address and APN, and block showing drawing number, sheet number, date, and project number.

Provide details for special assemblies and complex connections. The detail shall be drawn to an appropriate scale showing pipe size and shall fully identify all the parts in the detail. The engineer shall note on the drawings all connections to existing VSD facilities.

6.2.1 Title Sheet

The first sheet is the "Title Sheet". The complete list of required information for this sheet is located in the Sewer Improvement Plans Checklist, refer to ***Appendix F***.

The project title and address shall be centered at the top of the page in large font. The vicinity map shall show the general area of the project location with cross streets clearly labeled. For larger projects, the location map shall contain the general outline of the sheets with sheet number over the full limits of the project. The list of quantities shall show all materials for the entire project and listed as "Furnish and Install". The sheet index shall be listed in tabular form. The title sheet should also contain a Manhole/Cleanout Schedule clearly indicating the Manhole (MH) and or Cleanout (CO) number, station, top of manhole/cleanout elevation, the elevations and directions (i.e. North) of all inverts into the MH or CO, the elevation and direction of the invert out of the MH or CO, and the depth of the MH or CO (calculated from the top of the rim of the MH or CO to the lowest invert elevation). The title sheet should also contain a typical section of each typical street section (if the street width and characteristics are different), showing overall street dimensions, locations and approximate depths of each existing utility and locations and approximate depths of each proposed utility.

6.2.2 Notes, Legend, and Abbreviations Sheet

The second sheet is titled "Notes, Legends, and Abbreviations". If space permits, the notes, legend and abbreviations may be placed on the title sheet. The complete list of required information for this sheet is located in the Sewer Improvement Plans Checklist, refer to ***Appendix F***.

General sewer notes shall be in accordance with the VSD CAD Standard Drawings. Abbreviations and a legend of symbols used on drawings shall be listed in tabular form.

6.2.3 Plan and Profile Sheets

Plan and Profile Sheet(s) shall immediately follow the Notes, Legends, and Abbreviations sheet. The complete list of required information for these sheets is located in the Sewer Improvement Plans Checklist, refer to ***Appendix F***.

6.2.3.1 Plan View

The plan view area shall be oriented so that north is facing either towards the top or to the right side of the sheet. This shall also apply to all text used on the plan sheet. Proposed facilities shall be called out in large bold font with type and size of facility. Leaders shall be used to offset facilities descriptions to improve drawing legibility as necessary. Distance from proposed facilities and roadway centerlines shall be clearly marked on plans. The horizontal scale shall be 1-inch = 40 feet (preferred) or 1-inch = 20 feet.

All connection points, crossings, and appurtenances shall be called out with stationing (i.e. manholes, laterals, clean outs). Separation between all facilities and roadway centerline shall be shown. Stationing shall be readable and shall follow pipeline centerline. Pipeline data shall be

placed in a table format on each corresponding sheet. On the pipeline data table, the distance shall be from the edge of the manhole and not from the centerline of the manhole.

No topographical or contour lines shall be added to drawings unless requested by VSD. Street names or line references shall be called out in large bold font and identified as public or private. No cross-hatching shall be used to represent asphalt removal, unless requested by the Engineer. Cross-hatching (light background) may be used to depict pipeline encasement. Easements shall be identified on all plan and profile sheets.

6.2.3.2 Profile View

Profile view(s) are required for all Sewer Improvement Plans. Profile view(s) shall show all existing and proposed surfaces and utility crossings over or under proposed facility. Profile view(s) shall line up with plan view stationing directly above plan view(s). Stationing shall be shown along bottom of profile at 100 foot intervals and elevations shall be clearly shown on both ends of profile sheet. Profile sheets shall be drawn at an exaggerated vertical scale of 1-inch = 4 feet (preferred) or 1-inch = 2 feet, and shall match the plan view scale.

Drawings shall show distances between manholes, top of manhole elevation, manhole number, stationing, depth and inverts in/out. All profile types shall show slope of pipeline, encasement, stationing of appurtenances and connection points with reference drawings called out.

6.2.4 Detail Sheet(s)

Detail sheet(s) shall follow Plan and Profile sheet(s). The complete list of required information for these sheets is located in the Sewer Improvement Plans Checklist, refer to ***Appendix F***.

All details shall be accurately scaled when feasible and appropriately cross referenced to other drawing on the plans. When applicable, VSD Standard Drawings shall be included on Detail sheet(s) or referenced appropriately and accurately.

6.3 Digital Submission Requirements

All engineers preparing improvement plans shall submit drawings in DWG and PDF formats after the design drawings have been approved and signed by the appropriate agencies. The PDF copy will be a scanned version of the fully approved plan sheets. The CAD data shall be layered as a minimum into the following features:

A. Existing sewer lines and appurtenances
B. Proposed sewer lines and appurtenances
C. Other existing and proposed utilities
D. Easement lines, right of way lines, and boundary data (boundary and lot lines)
E. Street centerlines and street names
F. Construction notes and labels (call-outs)

The coordinate system of data shall be the California State Plane Coordinate System (NAD 83).

Digital files shall be submitted to VSD on a thumb drive or other approved medium if size of file attachments exceeds 10 MB. Should any changes in the development project and or plans take place after submittal of the project plans, a revised digital drawing shall be provided to VSD immediately upon revision. See ***Section 6.4*** for further information.

6.4 Revision to Drawings

Drawings that are revised after approval by VSD shall be resubmitted for approval of the revision. Revisions to approved drawings need to be submitted by the Engineer of Record or with the Engineer of Record's written consent. The revised area should be identified by a cloud or other descriptive method. The revisions will be labeled with a triangle (numbered with the appropriate sequential number) and a brief description of the revision in the plan sheet border will be initialed by the District.

Revisions can be made in two forms:

- By hand on the original approved plan sheet
- Resubmit replacement plan sheet showing the revisions and marking the drawing "REPLACEMENT SHEET" in bold above the bottom border of the plan sheet.

If any modifications to the VSD service infrastructure are made after the drawings have been revised to "Record Drawing" by the District, the engineer shall provide to VSD a replacement sheet depicting the modifications.

SECTION 7 INSPECTION REQUIREMENTS

7.1 General

All sanitary sewer and related appurtenance construction activities shall be subject to inspection by VSD and shall be left uncovered until approved by the VSD Inspector. The contractor shall not proceed with any subsequent phase of work until the previous phase has been inspected and approved by VSD.

The contractor shall notify the VSD Inspector at least four (4) working days before construction begins and one days' notice prior to any continuing construction work associated with the sanitary sewer system throughout the duration of the project.

7.2 Material Submittals

All materials to be used during construction shall be submitted to Development Services for review and approval. This submittal shall be submitted to VSD Development Services prior to the scheduling of the project Pre-Construction Conference.

7.3 Performance and Payment Bond

A Performance Bond and a Payment Bond will be required for all sewer improvements that will be considered public after VSD acceptance. The Performance Bond will be in the amount of 100% of the approved Engineers Estimate, and the Payment Bond will be in the amount of 50% of the approved Engineers Estimate. The Developer will need to provide the requested bonds following the approval of the final design plans. The Development Agreement will be signed by VSD officials after VSD approves the agreement and bonds. The Bonds must be in place prior to VSD agreeing to a Pre-Construction Conference date. The requirement of providing a Performance Bond and a Payment Bond is for public sewer improvement systems and is not applicable for private sewer systems. A Letter of Credit or Certificate of Deposit are acceptable alternates to bonding. See Installation Agreement for VSD requirements.

7.4 Pre-Construction Conference

After the material submittals are approved, the Performance and Payment Bonds are received and prior to starting work, the Developer/Contractor shall contact VSD to schedule a mandatory pre-construction conference. Prior to scheduling a Pre-Construction Conference, the Developer/Contractor shall provide the following items, as applicable:

1. Information Sheet (see ***Appendix E***);
2. Application for Wastewater Discharge Permit (as necessary) (see ***Appendix E***);
3. Fees paid;
    a. Remaining Plan Check fee not covered by initial deposit,
    b. Inspection Fee Deposit, and
    c. Connection Capacity Fee (based on Equivalent Dwelling Units (EDU))
4. Fully signed plans
5. Performance and Payment Bonds; (as necessary)

6. Executed Development Sanitation System Installation Agreement; (as necessary)
7. Copy of Recorded Parcel Map; (as necessary)
8. Copy of Recorded Grant of Easement; (as necessary) and
9. Lateral Agreement (as necessary).

At the Pre-Construction Conference, the Developer/Contractor shall provide the following items, as applicable:

1. Copy of Contractors License showing ability to construct underground facilities;
2. OSHA trenching permit;
3. Approved traffic control plan;
4. City or County encroachment permit granting permission for the proposed sewer installation construction activities;
5. Proof of Insurance (See Installation Agreement in ***Appendix C***); and
6. Copy of Geotechnical Report, if available.

Note, the above mentioned encroachment permit from the controlling agency will permit the contractor to construct, repair and remove asphalt and concrete features within the public right of way. The Developer/Contractor will be responsible for coordinating and obtaining the permit from the controlling agency and all costs associated with the permit shall be the responsibility of the Developer/Contractor. In addition, a traffic control plan, a condition of all governing agencies encroachment permit application process, must be approved by the Local Governing Agency's Public Works or Transportation Department prior to commencement of work. The traffic control plan shall be in conformance with the latest edition of the California Manual of Uniform Traffic Control Devices (CAMUTCD) and per the local agencies requirements. It will be the Contractors responsibility to route and obtain approval of the traffic control plan from the local agency. All costs associated with the preparation and required deposits on the traffic control plan shall be the responsibility of the Developer/Contractor. With the above noted submittal, VSD will require a copy of the final is traffic control plan and subsequent encroachment permit.

A Pre-Construction Conference must be held at least four (4) working days before the start of construction. The contractor's job foreman and/or job superintendent, the Developer, and the VSD Inspector/Staff must be present. The purpose of this meeting will be to answer any questions regarding VSD specifications and requirements, to obtain the contractor's construction schedule and emergency phone numbers, and to discuss any circumstances that may affect construction work.

7.5 Field Inspection Procedures

Notice shall be given to VSD at least four (4) working days before initiating construction operations. In addition, the contractor's surveyor responsible for the construction staking shall provide applicable cut sheets a minimum of three (3) working days prior to initiating construction on the proposed section of upcoming scheduled sewer construction activities. After

the pre-construction conference, Contractors are required to call in and schedule inspection of all construction activities one working day in advance prior to 3:30 pm. A VSD inspector will visit the project and verify that the project is being constructed in conformance with the drawings and specifications.

7.5.1 Working Conditions

The following are working conditions which the Contractor will be required to follow for work on VSD public sewer improvements.

- Work hour schedule shall conform to the local jurisdictions approved work hour schedule but in general shall be between 7:00 a.m. and 4:30 p.m., unless prior written approval is given by local agency and VSD. No work shall be performed on weekends, VSD and/or agency observed holidays, or when VSD is closed. New construction activities shall be minimized and never initiated on any Friday.
- When inspection services are required during the progress of construction, the contractor shall notify the VSD Inspector the day prior to needing inspection. The VSD Inspector can be reached at VSD's Inspection line (760) 238-5400.
- The contractor shall notify Underground Service Alert at (800) 227-2600.
- The contractor is required to contact Coachella Valley Water District (CVWD), Indio Water Authority (IWA) and/or the Coachella Utilities Department for compliance with their requirements for all pipeline crossings and or other construction notices.
- Businesses and residents in the project area shall be notified in writing 48 hours prior to start of work.
- The contractor shall ensure that residents and businesses can access their properties at all times, to the extent possible.
- All equipment and/or material shall be removed from the street right-of-way (street and parkway) by the end of each working day unless prior written approval is obtained from VSD and the governing agency.
- The contractor shall protect all substructures during excavation operations. Substructures include, but not limited to, street light and traffic signal conduits, traffic detector loops, storm drain pipes, sewers, water lines and all major utilities. Detector loops damaged as a result of construction shall be replaced in kind to the satisfaction of the governing agency.
- Every effort shall be made to minimize damage to parkway landscaping. Parkway trees shall be protected in place and avoided to the extent possible. Restoration shall be made to the satisfaction of VSD and the governing agency.
- The contractor shall be responsible for alleviating all dust and nuisance conditions resulting from work being performed and be in full compliance with local agency's PM-10 program.
- Existing utility infrastructure damaged during construction shall be repaired immediately and to the satisfaction of VSD and/or the utility owner of damaged facility.
- No trenches or potholes shall remain open overnight or left unattended. All trenches and potholes shall be protected safely at all times. Under certain conditions, as determined solely by the VSD and the local governing agency, steel traffic plates may be used to

temporarily cover construction zones in roadways so that the roadway can continue to be used by motorists when the work area is not active. Traffic plates shall be placed and set in accordance with the local governing agency's standard and be of sufficient structural integrity to support the weight of the steel plate and traffic loads.

- At the end of each working day, the entire trench and/or pothole area and adjacent streets shall be swept and cleaned to the satisfaction of VSD and the local governing agency.
- The contractor shall be responsible for obtaining an adequate supply of water for construction and dust control. The contractor shall not use water from any fire hydrant without first submitting a Construction Meter Application to appropriate water agency (IWA, CVWD or Coachella Utility).

7.5.2 Sewer System Inspections – General Inspection Items

Inspection and approval shall be obtained during and/or at the completion of but not limited to the following portions of work:

- Trench excavation and pipe bedding installation;
- Base compaction due to over excavation;
- Placing pipe, fittings, and structures;
- Placing and compacting the pipe zone backfill;
- Backfilling of the trench to grade. Compaction test to be performed by a geotechnical consultant retained by contractor and approved by VSD. Copies of test results shall be given to VSD by the geotechnical consultant for approval before final acceptance of work;
- Air and/or water testing of all mains and laterals;
- Mandrel testing of all mains
- CCTV inspections for all main line sewer pipeline;
- Raising sewer manhole and clean out rims and covers to finished grade, including concrete collars;
- Interceptor/separator installation as applicable; and
- Batch plant tickets for concrete used on all concrete manhole and clean out collars.

Procedures and details for the above noted inspections are described in the Valley Sanitary District Standard Specifications, which can be found in ***Appendix J***. Note, inspections for all private sewer lines and laterals may also be under the authority of the local governing agency. The private sewer lateral starts at the sewer main wye and/or manhole connecting the service into the VSD system and ends at the building clean out.

7.5.3 VSD Staff Authority

VSD shall have access to the work at all times during construction and shall be furnished with every reasonable opportunity for ascertaining full knowledge of the progress, workmanship, and character of materials used and employed in the work. No pipe, fittings, or other materials shall

be installed or backfilled until inspected and approved by the VSD Inspector. The contractor shall give due notice in advance of backfilling to the VSD Inspector so that proper inspection may be provided.

Inspection of the work shall not relieve the contractor of any obligations to complete the work as prescribed by VSD Standards. Any defective work shall be corrected before testing or final inspection. Unsuitable materials and/or workmanship may be rejected at any time even if these items may have been previously overlooked by the VSD Inspector.

The VSD Inspector will refuse to inspect any work and will leave the premise for such time deemed necessary if the contractor fails to provide a safe work zone, carry out instructions given by the VSD Inspector, or to perform any required provisions of the plans and specifications. The contractor shall immediately comply with a written order of the VSD Inspector. The work shall resume when improper methods or defective work are corrected as ordered and approved in writing by the VSD Inspector.

7.5.4 Interpretation of Plans, Standard Drawings and Standard Specifications

Figured dimensions of the drawings shall govern, but work not dimensioned shall be as directed in this section. Work not particularly shown or specified shall be the same as similar parts that are shown or specified or as directed. Full size details shall take precedence over scale drawings as to shape and details of construction. Specifications shall govern as to material. Scaled drawings, full-size details, and specifications are intended to be fully cooperative and to agree; but should any discrepancy or apparent difference occur between plans and specifications, or should errors occur in projects being constructed by others affecting the work, and the contractor proceeds with the work affected without instruction from VSD, the contractor shall be fully responsible for any resultant damage, defect, and replacement of facilities affected. The contractor is advised to report any discrepancy between plans and specifications to the VSD Inspector.

7.5.5 System Activation

The sanitation system may be activated for service when the system has been mandreled, pressure tested and CCTV inspection has been completed and approved/accepted by VSD Inspection Staff. At this stage, base course paving is required and all System Activation Checklist items (exclusive of clean out and manhole covers being adjusted to final grade) must be complete. In addition, all required fees must be paid in full for all units in the approved phase. See ***Appendix E*** for the Progress For Service Checklist Items.

7.5.6 Project Completion and Acceptance

VSD Inspection Staff will develop a punch list after the VSD service infrastructure is activated for service per section 7.5.5. These items typically include final asphalt, raising of clean outs and manholes and placement of concrete collars and covers, etc. Also a part of the final completion and acceptance will be the receipt of the Record Drawings, per ***Section 7.5.7***. When all checklist items are complete, VSD will final the project utilizing the checklist for progress for

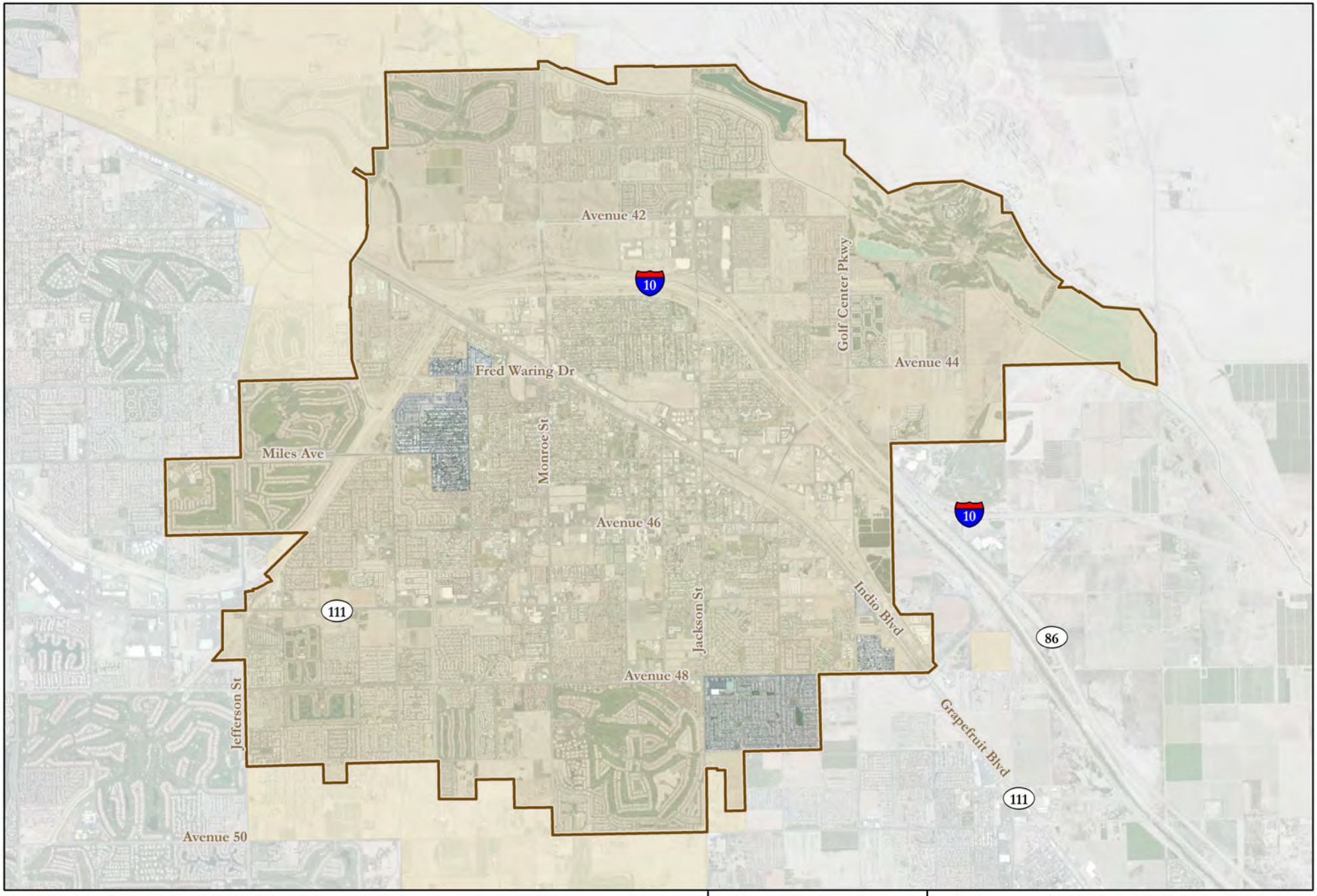
service. (See ***Appendix E***). In addition, the Developer shall prepare, obtain VSD approval and file the Certificate of Completion and Final Acceptance with County Recorder.

7.5.7 Record Drawings

The contractor is required to submit accurate record drawings of work upon completion of the project. The record drawings shall reflect all changes made in the working drawings during the construction process, and show the exact dimensions, geometry, and location of all elements of the work completed under the contract. The Developer shall submit redlined plans to both VSD and the Engineer of Record. The Engineer of Record shall update the original design drawings and resubmit one signed hard copy set of the revised record drawings to VSD. The Record Drawing sheets shall have a stamp signed by the Engineer of Record in accordance with VSD Standard Drawings in ***Appendix I***.

Appendix A

District Map



Key to Features

- Vally Sanitary District Boundary
- City of Indio

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Date: June 14, 2013

VSD DISTRICT BOUNDARY

Appendix B

VSD Sewer Construction and Use Ordinance

VALLEY SANITARY DISTRICT

SEWER CONSTRUCTION AND USE ORDINANCE

VSD

ORDINANCE NO. 2022-121

Adopted: September 27, 2022

VALLEY SANITARY DISTRICT

SEWER CONSTRUCTION AND USE ORDINANCE

TABLE OF CONTENTS

VALLEY SANITARY DISTRICT

SEWER CONSTRUCTION AND USE ORDINANCE

INTRODUCTION AND SUMMARY

Valley Sanitary District was formed in 1925 and now provides for collection, treatment and disposal of wastewater generated by the City of Indio, a portion of the City of Coachella, some unincorporated areas of Indio and the adjacent Cabazon Band of Mission Indians. Recognizing the need to control the quantity and quality of wastewaters discharged to the sewerage facilities and establish standards for public sewers, the District's Board of Directors adopted ordinances regulating the construction and use of the sewerage systems. This Ordinance sets forth uniform requirements for Users of the District's sewerage facilities and enables the District to comply with all applicable state and Federal laws including the Clean Water Act (33 U.S.C. 1251, et. seq.), and many of the requirements of the General Pretreatment Regulations (40 CFR 403). The objectives of this Ordinance are:

- To ensure that sewerage facilities connected to, and a part of the District's sewerage system provide for the maximum public benefit by meeting the District's standards.
- To ensure the District's compliance with the requirements of Federal, state, and local regulatory agencies and the National Pollutant Discharge Elimination System (NPDES).
- To prevent the introduction of pollutants into the District's sewerage facilities that may interfere with District operations, including but not limited to blockages caused by solids or fats, oils, and grease (FOG) or pollutants that contaminate the resulting sludge.
- To prevent the introduction of pollutants into the District's sewerage facilities that may pass through the District's sewerage facilities, inadequately treated, into receiving waters or otherwise be incompatible with the sewerage facilities.
- To ensure that the quality of the biosolids generated during treatment is maintained at a level that allows their use and disposal in compliance with applicable statutes and regulations.
- To improve the opportunity to recycle, reuse, and conserve non-renewable resources.
- To require waste minimization and material substitution by Industrial Users.
- To prevent exposure of the District's employees to chemical hazards created by industrial discharges.
- To establish an effective permitting, monitoring, and enforcement program for the control of industrial wastewaters.
- To equitably allocate treatment costs.

This Ordinance shall apply to all Users of the District's sewerage facilities. The Ordinance authorizes the issuance of Wastewater Connection Permits and Wastewater Discharge Permits; authorizes monitoring, compliance, and enforcement activities; establishes administrative review procedures; requires Industrial User reporting; and provides for the setting of fees for the equitable distribution of costs resulting from the program established herein.

Discharge to the sewer is a privilege and not a right. The privilege to discharge is controlled by this Ordinance. Individual control of a discharge is through the issuance of a permit. Issuance of a permit must be followed by enforcement of its provisions. Therefore, if a permit is issued, then the District is committed to make sure that the User follows the permit conditions or after working with the User to come into compliance, revoking the privilege and disconnecting sewer services.

Users of the District's sewerage facilities include a wide range of commercial and industrial facilities. While all Users are subject to the regulations contained herein and required to have a connection permit, only a few types of facilities require discharge permits. Of the five types of permits, two will be the most common. Class I Permittees are those whose discharge is likely to have an adverse effect on the District's sewerage system if not properly controlled. These dischargers may be federally regulated industries such as metal finishers, a discharge greater than 25,000 gallons per day such as a bottling plant, or they may discharge a regulated constituent in a quantity that may cause a problem in the District's collection or treatment facilities such as a grease recycling facility. Among other conditions, the permit may require the user to meet certain discharge limits and perform monitoring of its own discharge to establish that it is in compliance with applicable discharge limits.

Other commercial or industrial facilities such as food service establishments, radiator shops, and laundromats may be required to obtain a General Discharge Permit or a Class II discharge permit. These types of facilities will only be required to obtain a permit if the District suspects or knows that the discharge from a certain class of business is adversely affecting the District's sewerage facility. For example, if grease from food service establishments is causing a problem in the collection or treatment system, the District may decide to require all food service establishments to obtain permits. The permit may require proof of a properly sized and periodic maintenance of the grease interceptor. If the problem is not mitigated, the District may require discharge testing to prove compliance with a discharge limit.

Enforcement of the Ordinance is designed to allow those industries willing to comply to do so with an understanding from the District. Normally, if the User is cooperative, the District will work with the User to bring it into compliance with permit conditions taking the User through a series of stepped-up enforcement. However, the Ordinance is also flexible so that when extreme or hazardous conditions exist, the District can immediately stop the discharge from causing damage to the District's facilities.

AN ORDINANCE OF THE BOARD OF DIRECTORS OF

VALLEY SANITARY DISTRICT

ESTABLISHING WASTEWATER DISCHARGE

REGULATIONS ORDINANCE # 2022-121

The Board of Directors of Valley Sanitary District, California do hereby ORDAIN:

Section I: Wastewater Discharge Regulations governing the use of District sewerage facilities are hereby enacted to provide:

ARTICLE 1

GENERAL PROVISIONS

101. AUTHORIZATION

This Ordinance is enacted pursuant to authority contained in the Sanitary District Act of 1923, California Health and Safety Code, Sections 6400 et seq. and exercises authority conferred by law including, but not limited to, Health and Safety Code Sections 5400 through 5474, and California Government Code, Sections 54725 through 54740.6

102. PURPOSE AND POLICY

A. The purpose of this Ordinance is to provide for the maximum public benefit from the use of District's facilities. This shall be accomplished by regulating sewer use and wastewater discharges, by providing equitable distribution of costs in compliance with applicable Federal, State, and local Regulations, and by providing procedures that will allow the District to comply with requirements placed upon the District by other regulatory agencies.

B. This Ordinance shall be interpreted in accordance with the definitions set forth in Section 103. The provisions of the Ordinance shall apply to the direct or indirect discharge of all liquid wastes carried to facilities of the District.

C. To comply with Federal, State, and local policies and to allow the District to meet applicable standards of treatment plant effluent quality, biosolids quality, and air quality, provisions are made in this Ordinance for the regulation of wastewater discharges to the public sewer. This Ordinance establishes quantity and quality limits on all wastewater discharges that may adversely affect the District's sewerage systems, processes, effluent quality, biosolids quality, air emission characteristics, or inhibit the District's ability to beneficially reuse or dispose of its biosolids or meet biosolids discharge criteria. It is the intent of these limits to improve the quality of wastewater being received for treatment and to encourage water conservation and waste minimization by all users connected to a public sewer. It is the District's intent to limit future increases in the quantity (mass emission) of waste constituents being discharged. This Ordinance also provides for regulation of the degree of waste pretreatment required, the issuance of permits for wastewater discharge and connections and other miscellaneous permits and establishes penalties for violation of the Ordinance.

D. Since the District is committed to a policy of wastewater reclamation and reuse as an

alternate source of water supply, the implementation of programs for reclamation through wastewater treatment processes may necessitate more stringent quality requirements on wastewater discharges. In the event that more stringent quality requirements are necessary, the applicable Ordinance will be amended to reflect those changes.

E. Since the District is committed to a policy for the beneficial use of biosolids, the implementation of programs to land-apply or provide for the marketing and distribution of biosolids may necessitate more stringent quality requirements on wastewater discharges.

F. Since the District is also committed to meet applicable air quality goals established by the South Coast Air Quality Management District, more stringent quality requirements on wastewater discharges may be required to meet such goals.

103. DEFINITIONS

A. Unless otherwise defined herein, the testing procedures for waste constituents and characteristics shall be as provided in 40 CFR Part 136 (Code of Federal Regulations; Title 40; Protection of Environment; Chapter I, Environmental Protection Agency; Part 136, Test Procedures for the Analyses of Pollutants), or as specified.

Other terms not herein defined are defined as being the same as set forth in the current editions of the California Building Code and California Plumbing Code.

1. Applicant shall mean the person making application for a connection permit for a sewer or plumbing installation and shall be the owner, or authorized agent of premises to be served by the sewer for which a permit is requested.

2. Authorized or Duly Authorized Representative of the User:

a) If the User is a corporation:

1) The president, secretary, treasurer, or a vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

2) The manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiate and direct other comprehensive measures to ensure long-term environmental compliance with environmental laws and regulations; can ensure that the necessary systems are established or actions taken to gather complete and accurate information for individual wastewater discharge permit or general discharge permit requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

b) If the User is a partnership or sole proprietorship: a general partner or proprietor, respectively.

c) If the User is a Federal, State, or local governmental facility: a director or

highest official appointed or designated to oversee the operation and performance of the activities of the government facility, or their designee.

d) The individuals described in paragraphs 1 through 3 above may designate a Duly Authorized Representative if the authorization is in writing, the authorization specifies the individual or position responsible for the overall operation of the facility from which the discharge originates or having overall responsibility for environmental matters for the company, and the written authorization is submitted to the District.

3. Best Management Practices (BMPs) shall mean the schedule of activities, prohibition of practices, maintenance procedures, and other management practices to implement the prohibitions listed in 40 CFR 403.5 (a)(1) and (b). BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage of raw materials storage.

4. Biochemical Oxygen Demand (BOD) shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedures for five (5) days at 20 degrees centigrade, usually expressed as a concentration (e.g., mg/l).

5. Biosolids shall mean a primarily organic solid product, produced by wastewater treatment process that can be beneficially recycled.

6. Board shall mean the Board of Directors of Valley Sanitary District.

7. Building shall mean any structure used for human habitation or a place of business, recreation, or other purpose.

8. Building Drain shall mean the part of the lowest piping of a drainage system that receives the discharge of sanitary waste from drainage pipe inside the walls of the building and conveys it to the private sewer lateral beginning two feet outside the building wall.

9. Building Sewer See Private Sewer Lateral.

10. Bypass shall mean the intentional diversion of wastestreams from any portion of an industrial user's treatment facility.

11. Categorical Pretreatment Standards or Categorical Standard shall mean any regulation containing pollutant discharge limits promulgated by the U.S. EPA in accordance with Sections 307(b) and (c) of the Clean Water Act (33 U.S.C. 1317) that apply to a specific category of industrial users and appear in 40 CFR Chapter I, Subchapter N, Parts 405-471.

12. Chemical Oxygen Demand (COD) shall mean the measure of chemically oxidizable material in domestic or other wastewaters as determined by appropriate testing procedure and expressed in terms of milligrams per liter.

13. City shall mean the cities of Indio or Coachella, California, as served by the District.

14. Code of Federal Regulations (CFR) shall mean the codification of the general and permanent regulations published in the Federal Register by the executive departments and agencies of the Federal Government.

15. Composite Sample shall mean a collection of individual samples obtained at selected intervals based on an increment of either flow or time. The resulting mixture (composite sample) forms a representative sample of the wastestream discharged during the sample period. Samples will be collected when manufacturing, processing, or other industrial wastewater discharge occurs.

16. Connection Permit shall mean a permit issued by the District, upon payment of a capital facilities connection charge, authorizing the Permittee to connect directly to a District sewerage facility or to a sewer that ultimately discharges into a District sewerage facility.

17. Contractor shall mean an individual, firm, corporation, partnership, or association duly licensed by the State of California to perform the type of work to be done under the connection permit.

18. County shall mean County of Riverside, California, and the unincorporated areas of Riverside County within the District's service boundary.

19. Development shall mean parcel of land on which dwelling units, commercial or industrial buildings or other improvements are built.

20. Discharge or Indirect Discharge shall mean the introduction of pollutants into the District's facilities from any non-domestic source.

21. Discharger shall mean any person who discharges or causes a discharge of non-domestic wastewater directly or indirectly to a public sewer. Discharger shall mean the same as User.

22. District Sewerage Facility or System shall mean any property belonging to the District used in the treatment, reclamation, reuse, transportation, or disposal of wastewater, or biosolids.

23. District shall mean Valley Sanitary District.

24. Domestic Wastewater shall mean the liquid and solid waterborne wastes derived from the ordinary living processes of humans of such character as to permit satisfactory disposal, without special treatment, into the public sewer or by means of a private disposal system.

25. Dwelling Unit shall mean a single unit providing complete, independent living facilities for one or more persons, which may include permanent provisions for living, sleeping, eating, cooking and sanitation. For the purpose of this Ordinance, a mobile home shall be considered as a Dwelling Unit. More than one Dwelling Unit per structure and/or lot shall be deemed Multiple Dwelling Units.

26. Enforcement Compliance Schedule Agreement (ECSA) shall mean a mutual agreement between the District and Permittee amending the permit to require implementation of necessary pollution prevention or pretreatment practices and/or installation of equipment to ensure permit compliance.

27. Fats, Oils, and Grease (FOG) shall mean organic polar compound derived from animal and/or plant sources that contain multiple carbon chain triglyceride molecules. These substances are detectable and measurable using analytical test procedures established in 40 CFR 136, as may be amended.

28. Federal Regulations shall mean any applicable provision of the Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, Title 33, United States Code, Section 1251 and following, and any regulation promulgated by the US EPA under Title 40 CFR implementing that act.

29. Floor Area shall mean the area included within the surrounding exterior walls of a building or portion thereof, exclusive of ramps, docks, vent shafts, and courts. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above.

30. Flow Monitoring Facilities shall mean equipment and structures provided at the user's expense to measure, totalize, and/or record, the incoming water to the facility or the wastewater discharged to the sewer.

31. Food Service Establishment (FSE) includes, but is not limited to, any facility preparing and/or serving food for commercial use or sale. This includes restaurants, cafes, lunch counters, cafeterias, hotels, hospitals, convalescent homes, factory or school kitchens, catering kitchens, bakeries, grocery stores with food preparation, meat cutting and preparation, and other food handling facilities not listed above where fats, oils, and grease may be introduced into the sanitary sewers.

32. General Manager shall mean the General Manager of Valley Sanitary District, or the authorized representative of the General Manager of Valley Sanitary District.

33. Grab Sample shall mean a sample taken from a waste stream on a one-time basis without regard to the flow in the waste stream and without consideration of time.

34. Illicit Connection shall mean any man-made conveyance or drainage system, pipeline, conduit, inlet, or outlet through which the discharge of any Pollutant, Waste, Wastewater, or other material to the Public Sewer occurs or may occur, either directly or indirectly, other than discharges that comply with the requirements of this Ordinance.

35. Industrial User shall mean any user that discharges non-domestic wastewater.

36. Industrial Wastewater shall mean all liquid-carried wastes and wastewater of the community, excluding domestic wastewater, and shall include all wastewater from any producing, manufacturing, processing, agricultural, or other operation. These may also include wastes of human origin similar to domestic wastewaters.

37. Infectious Waste shall mean materials which are likely to transmit etiologic agents that cause, or significantly contribute to the cause of, increased morbidity or mortality of human beings, as more specifically set forth in Health and Safety Code Section 25117.5.

38. Inspector shall mean any person authorized by the General Manager to inspect any existing or proposed wastewater generation, conveyance, processing, and disposal facilities.

39. Interference shall mean any discharge which, alone or in conjunction with discharges from other sources, inhibits or disrupts the District's treatment

processes or operations, or its biosolids processes, use, or disposal; or is a cause of violation of the District's NPDES permit or prevents lawful biosolids use or disposal.

40. Intercepting Sewer shall mean a large sewer or conduit which receives the discharges from many smaller tributary sewers. Sometimes referred to as a trunk sewer.

41. Lateral Sewer see Private Sewer Lateral.

42. LEL (Lower Explosive Limit) shall mean the minimum concentration of combustible gas or vapor in air (usually expressed in percent by volume at sea level) that will ignite if an ignition source (sufficient ignition energy) is present.

43. Medical Waste shall mean isolated wastes, infectious agents, human blood and blood products, pathological wastes, sharps, body parts, formites, etiologic agents, contaminated bedding, surgical wastes, potentially contaminated laboratory wastes, dialysis wastes, hypodermic needles, syringes, instruments, utensils or any other paper or plastic items of disposable nature used for medically related purposes. The term “Medical Waste” shall exclude de minimis amounts of wastes, human blood and paper items of a disposable nature associated with domestic wastewater discharges.

44. Multiple Dwelling shall mean a building for residential purposes having facilities for the occupancy of more than one person or family, including, but not limited to, the following: hotels, motels, auto courts, trailer courts, apartment houses, duplex, rooming house, boarding house, and dormitories.

45. National Pretreatment Standard shall mean any regulation containing pollutant discharge limits promulgated by the EPA in accordance with section 307 (b) and (c) of the Clean Water Act, which applies to Industrial Users. This term includes prohibitive discharge limits established pursuant to 40 CFR 403.5.

46. New Construction shall mean any structure planned or under construction for which a connection permit has not been issued.

47. New Source shall mean those sources that are new as defined by 40 CFR 403.3(m) as revised.

48. Oil and Grease shall mean hexane extractable material that is polar and non-polar organic substances of animal, vegetable, and mineral nature. These substances are detectable and measurable using analytical test procedures established in 40 CFR Part 136, as may be amended.

49. Pass Through shall mean discharge through the District's sewerage facilities to waters of the state or U.S. which, alone or in conjunction with discharges from other sources, is a cause of a violation of the District' NPDES permit or other waste discharge requirements applicable to the District.

50. Permittee shall mean a person who has received a permit to discharge wastewater into the District's sewerage facilities subject to the requirements and conditions established by the District.

51. Person shall mean any human being, individual, firm, company, partnership, association, private corporations, and governmental entities.

52. pH shall mean a measure of the acidity or alkalinity of a solution, expressed in standard units.

53. Pollutant shall mean dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, medical wastes, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, municipal, agricultural, and industrial wastes, and certain characteristics of wastewater (e.g., pH, temperature, TSS, turbidity, color, BOD, COD, toxicity, or odor).

54. Program Manager shall mean that person duly designated by the General Manager to implement the District's Pretreatment Program and perform the duties as specified in this Ordinance.

55. Pretreatment shall mean the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater to a level authorized by the District prior to discharge of the wastewater into the District's sewerage system. The reduction or alteration can be obtained by physical, chemical, or biological processes or process changes by other means, except as prohibited by 40 CFR 403.6(d).

56. Pretreatment Requirement shall mean any substantive or procedural pretreatment requirement, other than a Pretreatment Standard, imposed on an Industrial User.

57. Pretreatment Standard shall mean any regulation containing pollutant discharge limits or prohibitions promulgated by EPA, the State of California, or the District, including but not limited to promulgated categorical standards; national prohibited discharge standards; general discharge prohibitions; and any specific local discharge limits established by the District.

58. Private Disposal System shall mean a septic tank with the effluent discharging into a subsurface disposal field or into one or more seepage pits.

59. Private Sewer Line shall mean a sewer that receives discharge from more than one building drain and extends to and includes the connection to the public sewer main.

60. Private Sewer Lateral (aka Lateral Sewer or Building Sewer) shall mean the portion of sewer system, beginning at the building drain, and extending to and including the connection to the public sewer. This includes a sewer that receives discharge from more than one building drain and extends to and includes the connection to the public sewer main, which may also be referred to as a Private Sewer Line.

61. Public Sewer shall mean a sewer owned and maintained by the District. Public sewer includes a factory formed stub that is an integral part of the public sewer mainline, but expressly does not include any portion of a building sewer, private sewer lateral or private sewer line which may lie within any public street or right of way.

62. Publicly Owned Treatment Works (POTW) shall mean Valley Sanitary District's Wastewater Treatment Plant and any other devices or systems used by the District in the collection, storage, conveyance (including all sewers, pipes, lift stations, and other conveyances which convey wastewater to the wastewater

treatment plant), treatment, recycling, and reclamation of municipal sewage.

63. RCRA shall mean Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901, et seq.) and as amended.

64. Regulatory Agencies shall mean those agencies having jurisdiction over the operation of the District including, but not limited to, the following:

    a) United States Environmental Protection Agency, Region IX, San Francisco and Washington, DC (EPA).

    b) California State Water Resources Control Board (SWRCB).

    c) California Regional Water Quality Control Board, Colorado River Basin Region (RWQCB).

    d) South Coast Air Quality Management District (SCAQMD).

    e) California Department of Health Services (DOHS).

65. Sample Point shall mean a location approved by the District, from which wastewater can be collected that is representative in content and consistency of the entire flow of wastewater being discharged.

66. Sampling Facilities shall mean structure(s) or equipment provided at the user's expense for the District or user to measure and record wastewater constituent mass, concentrations, collect a representative sample, or provide access to plug or terminate the discharge.

67. Sanitary Waste shall mean domestic wastewater, human excrement, and gray water (household showers, dish washing operations, etc.).

68. Septic Waste shall mean any sewerage from holding tanks such as chemical toilets, and septic tanks.

69. Sewage shall mean liquid and water carried wastes of the community from residences, business buildings, institutions and industrial establishments or permitted into a public sewer.

70. Sewer shall mean a conduit that carries sewage and to which storm, surface and ground waters are not intentionally admitted, which is intended to flow to the District's treatment works.

71. Significant Industrial User shall mean

    a) An Industrial User subject to Categorical Pretreatment Standards, or

    b) An Industrial User that

        1) Discharges 25,000 gallons per day or more of process wastewater to the sewer (excluding sanitary, non-contact cooling, and boiler blowdown);

        2) Contributes a process wastestream that makes up five percent or more of the District's dry weather hydraulic loading or organic

capacity at the POTW; or

3) Is designated as such by the Control Authority on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

72. Significant Non-compliance (SNC) shall mean a violation by any Significant Industrial User which meets one or more of the following criteria or any Industrial User which meets criteria in (c), (d), or (e):

Violations of wastewater discharge limits:

a) Chronic Violations. Sixty-six percent or more of all the measurements taken for the same pollutant parameter during a six-month period exceed (by any magnitude) a numeric limit, requirement, instantaneous limit, or Pretreatment Standard, as defined by 40 CFR 403.3(l).

b) Technical Review Criteria (TRC) Violations. Thirty-three percent or more of all the measurements for the same pollutant parameters during a six-month period exceed a numeric limit, requirement, instantaneous limit, or Pretreatment Standard as defined by 40 CFR 403.3(l) multiplied by the applicable TRC (TRC=1.4 for BOD, TSS, oil, and grease, and 1.2 for all other pollutants except pH).

c) Any other violation of a standard, requirement or Pretreatment Standard as defined by 40 CFR 403.3(l) (daily maximum or long-term average, instantaneous limit, or narrative standard) that caused, alone or in combination with other discharges, interference or pass through (including endangering the health of the POTW personnel or the public).

d) Any discharge of a pollutant that has caused imminent endangerment to human health or welfare or to the environment or has resulted in the POTW's exercise of its emergency authority to halt or prevent such a discharge.

e) Failure to meet, within ninety days after the schedule date, a compliance milestone contained in a local control mechanism or enforcement order for starting construction, completing construction, achieving final compliance.

f) Failure to provide, within 45 days after the due date, required reports such as baseline monitoring reports, 90-day compliance reports, periodic self-monitoring reports, and reports on compliance with compliance schedules.

g) Failure to accurately report non-compliance.

h) Any other violation or group of violations, which may include a violation of Best Management Practices, which the General Manager determines will adversely affect the wastewater operation or implementation of the Pretreatment Program.

73. Single Family Dwelling shall mean a single house that provides complete, independent living facilities for one single family, which may include permanent

provisions for living, sleeping, eating, cooking and sanitation. For the purpose of this Ordinance, recreational vehicle or park model shall not be considered as a single-family dwelling.

74. Slug Load or Slug Discharge shall mean any discharge at a flow rate or concentration, which could cause a violation of the prohibited discharge standards of this Ordinance. A Slug Discharge is any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge, which has a reasonable potential to cause Interference or Pass Through, or in any other way violate the POTW's regulations, Local Limits or Permit conditions.

75. Solid Wastes shall mean the non-liquid carried wastes normally considered to be suitable for disposal with refuse at sanitary landfill refuse disposal sites.

76. Spent Solutions shall mean any concentrated non-domestic wastewater i.e. (Static Rinse, Plating Solutions).

77. Spill Containment shall mean a protection system installed by the Permittee to prohibit the discharge to the sewer of slug discharges.

78. Standard Industrial Classification (S.I.C.) shall mean a system of classifying industries as identified in the S.I.C. Manual, 1987, or subsequent edition, as prepared by the United States Office of Management and Budget.

79. Standard Methods shall mean procedures described in the current edition of Standard Methods for the Examination of Water and Wastewater, as published by the American Public Health Association, the American Water Works Association and Water Environment Federation.

80. Standard Specifications shall mean design and construction standards for sewerage works which conform to the District's Standard Specifications for Construction.

81. Storm Sewer or Storm Drain shall mean a sewer which carries storm and surface or ground waters and drainage but excludes sewage and industrial wastewater.

82. Street shall mean any public highway, road, avenue, alley, or similar roadway.

83. Suspended Solids shall mean the insoluble solid matter suspended in wastewater that is separable from the liquid portion of the waste by laboratory filtration in accordance with the procedure described in Standard Methods.

84. Tributary Sewer shall mean a waste carrying conduit which empties directly or indirectly into an intercepting sewer.

85. Uncontaminated Water shall mean the same as unpolluted which is water of the community to which no pollutant has been added intentionally or accidentally. Examples include, but are not limited to, non-contact single pass cooling water, rainwater, and uncontaminated groundwater.

86. User shall mean any person who discharges or causes a discharge of wastewater directly or indirectly to a public sewer.

87. Waste shall mean sewage and any and all other waste substances, liquid, solid, gaseous or radioactive, associated with human activity or of human or animal nature, including such wastes placed within containers of whatever nature prior to and for the purpose of disposal.

88. Waste Manifest shall mean that receipt which is retained by the generator of hazardous wastes as required by the State of California or the United States Government pursuant to RCRA, or the California Hazardous Materials Act, or that receipt which is retained by the generator for recyclable wastes or liquid non- hazardous wastes as required by the District.

89. Wastewater Constituents and Characteristics shall mean the individual chemical, physical, bacteriological, and radiological parameters, including volume and flow rate and such other parameters that serve to define, classify, or measure the quality and quantity of wastewater.

B. Words used in this Ordinance in the singular may include the plural and the plural the singular. Use of masculine shall mean feminine and use of feminine shall mean masculine. Shall is mandatory; may is permissive or discretionary.

104. CONFIDENTIAL INFORMATION

All user information and data on file with the District shall be available to the public and governmental agencies without restriction unless the user specifically requests and is able to demonstrate to the satisfaction of the District that the release of such information would divulge information, processes or methods which would be detrimental to the user's competitive position. The demonstration of the need for confidentiality made by the User must meet the burden necessary for withholding such information from the general public under applicable State and Federal Law. Any such claim must be made at the time of submittal of the information by marking the submittal "Confidential Business Information" on each page containing such information. Information which is demonstrated to be confidential shall not be transmitted to anyone other than a governmental agency without prior notification and approval of the user. Information concerning wastewater quality and quantity shall not be deemed confidential.

105. TRANSFER OF PERMITS

A. Permits issued under this Ordinance are for a specific user, for a specific operation at a specific location or for a specific waste hauler and create no vested rights.

1. No permit may be transferred to allow a discharge to a public sewer from a point other than the location for which the permit was originally issued.

2. Except as expressly set forth herein, no permit for an existing facility may be transferred to a new owner and/or operator of that facility.

B. At least thirty (30) days prior to the sale or transfer of ownership of any business operating under a permit issued by the District, the Permittee shall notify the District in writing of the proposed sale or transfer. The successor owner shall apply to the District for a new permit at least fifteen (15) days prior to the sale or transfer of ownership in accordance with the provisions of this Ordinance. A successor owner shall not discharge any wastewater for which a permit is required by this Ordinance until a permit is issued by the District to the successor owner.

C. Notwithstanding the foregoing, the District may, in its discretion, allow the transfer of a permit to a new owner and/or operator, at the same location for which the permit was originally issued, if:

1. The existing Permittee and the proposed new owner and/or operator provide the District with written notification of the intended transfer at least thirty (30) days in advance of the transfer date; and

2. The District approves, in writing, the permit transfer prior to commencement of operations by the new owner and/or operator.

D. The written notification of intended transfer shall be in a form approved by the District and shall include a written certification by the new owner and/or operator which:

1. States that the new owner or operator has no immediate intent to modify the facility's operations and/or processes;

2. Identifies the specific date on which the transfer is to occur; and

3. Acknowledges that the new owner or operator is fully responsible for complying with the terms and conditions of the existing permit and all provisions of this Ordinance.

E. Except as expressly set forth in Section 105.C, any permit that is transferred to a new owner and/or operator or to a new facility is void.

106. AUTHORITY

The District is regulated by several agencies of the United States Government and the State of California, pursuant to the provisions of Federal and State Law. Federal and State Laws grant the District the authority to regulate and/or prohibit, by the adoption of ordinances or resolutions, and by issuance of construction and discharge permits, the discharge of any waste, directly or indirectly, to the District's sewerage facilities. This authority includes the right to establish limits, conditions, and prohibitions; to establish flow rates or prohibit flows discharged to the District's sewerage facilities; to require the development of compliance schedules for the installation of equipment systems and use of materials by all users; and to take all actions necessary to enforce its authority, whether within or outside the District's boundaries, including those users that are tributary to the District or within areas that the District has contracted to provide sewerage services.

The District also owns, maintains, and operates collection, treatment, recycle and disposal facilities. As authorized by State law, the District regulates the connections to its facilities through ordinances and resolutions and by issuance of connection permits.

The District has the authority pursuant to California Health and Safety Codes 5471 and 5474 to prescribe, revise, and collect all fees and charge for services and facilities furnished by the District either within or without its territorial limits.

107. DELEGATION OF AUTHORITY

Whenever any power is granted to or a duty is imposed upon the General Manager, the power may be exercised, or the duty may be performed by any person so authorized by the General Manager.

108. SIGNATORY REQUIREMENTS

Reports and permit applications required by this Ordinance shall contain the following certification statement:

"I certify under penalty of law that this document and all attachments were prepared under my

direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." The statement shall be signed by an authorized representative of the industrial user as defined in Section 103(A)(2) of this Ordinance.

109. <u>POWERS</u>

The General Manager or designee is authorized to:

A. Issue Connection Permits;

B. Issue Waste Discharge Permits;

C. Enter into Agreements;

D. Require the installation and maintenance of pretreatment and/or monitoring facilities and equipment;

E. Conduct inspections of facilities, including, but not limited to, inspecting and copying records;

F. Require monitoring and reporting of discharges to the public sewer system;

G. Monitor the quality of wastewater entering the sewer system;

H. Require the development of spill containment plans; slug load control plans and reporting of accidental discharges;

I. Require the development of a Slug Control Plan (per Title 40 of the Code of Federal Regulations (40 CFR) 403.8(f) (2) (vi).

J. Deny, approve or approve with conditions, new or increased discharges or change in the quantity or characteristics of discharges, when such discharges do not meet applicable pretreatment requirements as specified in 40 CFR 403.8(f)(1)(i);

K. Take enforcement actions against those who violate or cause violation of this Ordinance or discharge permit conditions. These actions may include, but are not limited to the following:

1. Issuing written warnings;

2. Issuing Notices of Violation;

3. Issuing Administrative Orders;

4. Issuing Cease and Desist Orders;

5. Initiating and conducting non-compliance meetings;

6. Initiating and conducting administrative hearings;

7. Petitioning the courts for injunctions or civil penalties;

8. Signing criminal complaints;

9. Terminating services;

10. Requiring payment of violation charges;

11. Revoking and/or suspending the discharge permit; and

12. Collecting the administrative and legal costs of enforcement from the violator.

110. PUBLIC PARTICIPATION

In accordance with the public participation requirements of 40 CFR part 25 in the enforcement of National Pretreatment Standards, the District shall include provision for at least annual public notification in a newspaper(s) of general circulation that provides meaningful public notice within the jurisdiction(s) served by the District of Industrial Users which, at any time during the previous 12 months, were in Significant Noncompliance with applicable Pretreatment Standards and Requirements.

ARTICLE 2

PROHIBITIONS AND LIMITS ON DISCHARGES

201. GENERAL PROHIBITIONS

A. No person shall construct or maintain any privy, privy vault, septic tank, cesspool, seepage pit or other facility intended or used for the disposal of sewage within the jurisdiction of the District, unless approved by the Board of Directors subject to criteria as detailed in Article 3, 301D.

B. No user shall introduce or cause to be introduced into the POTW any pollutant or wastewater which cause pass through or interference.

C. Illicit Connections: No person shall construct or maintain an illicit connection to the public sewer.

202. SPECIFIC PROHIBITIONS

A. No person shall discharge or cause to be introduced a quantity or quality of wastewater directly or indirectly to sewerage facilities owned by or tributary to the District's sewerage facilities which causes, or is capable of causing, either alone or by interaction with other substances:

1. Pollutants which create a fire or explosion hazard in the POTW, including, but not limited to, waste streams with a closed-cup flashpoint of less than 140 degrees Fahrenheit (60 degrees Centigrade) using the test methods specified in 40 CFR part 261.21;

2. Pollutants which will cause corrosion or structural damage to the POTW, but in no case with a pH lower than 5.5 or more than 11.0, or otherwise causing corrosive structural damage to the POTW or equipment;

3. Solid or viscous pollutants which will cause obstruction to the flow in the sewer system resulting in interference or damage to the sewerage facilities;

4. Danger to life or safety of any person;

5. Impairment of the effective maintenance or operation of the sewerage system;

6. Toxic gases, vapors, or fumes within the sewerage facilities in a quantity that may cause acute worker health and safety problems;

7. Any pollutant, including oxygen demanding pollutants (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which, either singly or by interaction with other pollutants, will cause Interference with the POTW;

8. The District's effluent to fail a toxicity test;

9. Discoloration, pass through, or any other condition that affects the quality of the District's influent or effluent in such a manner that inhibits the District's ability to meet receiving water quality, biosolids quality, or air quality requirements established by Regulatory Agencies;

10. Excessive foaming in the sewerage facilities; or

11. Conditions that violate any statute, regulation, or ordinance of any public agency or Regulatory Agency having jurisdiction over the operation of or discharge of wastewater through the sewerage facilities.

12. Having a temperature higher than 140 degrees Fahrenheit, (60 degrees Centigrade), or which will inhibit biological activity in the treatment plant resulting in Interference, but in case wastewater which causes the temperature at the treatment plant to exceed 104 degrees Fahrenheit (40 degrees Centigrade).

13. Containing oil, petroleum oil, non-biodegradable cutting or mineral oils or products of mineral oil origin in amounts that will cause interference or pass through.

14. Containing excessive animal or vegetable oils in amounts that may cause interference, pass through or excessive maintenance to the operation of District's facilities.

B. No person shall discharge wastewater, delivered by vehicular transport, rail car, or dedicated pipeline, directly or indirectly to the District's sewerage facilities which wastewater contains any substance that is defined as a hazardous waste by the Regulatory Agencies.

C. No person shall transport waste from one location or facility to another for the purpose of treating or discharging it directly or indirectly to the District's sewerage system without written permission from the District.

D. No user shall increase the contribution of flow, pollutants, or change the nature of pollutants where such contribution or change does not meet applicable standards and requirements or where such contribution would cause the District to violate any Federal, State, or local regulatory permit.

E. No User shall introduce or cause to be introduced into the POTW trucked or hauled pollutants, except at discharge points designated by the General Manager in accordance with Section 401.1 of this Ordinance.

203. PROHIBITION OF DILUTION

No user shall increase the use of water or in any other manner attempt to dilute a discharge as a partial or complete substitute for treatment to achieve compliance with this Ordinance and the user's permit or to establish an artificially high flow rate for permit mass emission rates.

204. PROHIBITION OF SURFACE RUNOFF, GROUNDWATER, AND UNPOLLUTED WATER

A. No person shall discharge groundwater, surface runoff, subsurface drainage, or uncontaminated water such as single pass cooling water from air conditioning units directly or indirectly to the District's sewerage facilities except as provided herein. Pursuant to Section 404, et seq., the District may approve the discharge of such water only when no alternate method of disposal is reasonably available or to mitigate an environmental risk or health hazard.

B. If a Special Purpose Discharge Permit is issued, pursuant to Section 404, for the discharge of such water into a public sewer, the user shall pay the applicable District charges relating to the treatment and disposal of such wastes and shall meet such other conditions as required by the District to further the purposes of this Ordinance.

205. PROHIBITION OF RADIOACTIVE WASTES

No person shall discharge radioactive waste unless:

A. The person is authorized to use radioactive materials by the State Department of Health or other governmental agency empowered to regulate the use of radioactive materials; and the waste is discharged in strict conformity with current California Radiation Control Regulations (California Code of Regulations, Title 17) for safe disposal; and

B. The person is in compliance with all rules and regulations of all other applicable regulatory agencies.

206. LIMITS ON THE USE OF GRINDERS

Waste discharged into a public sewer from industrial or commercial grinders shall be allowed as long as they do not restrict sewer flow and have been approved by the General Manager. Such grinders must shred the waste to a degree that all particles will be carried freely under normal flow conditions prevailing in the public sewer, with no particle greater than one-half inch in any dimension.

207. PROHBITION ON POINT OF DISCHARGE

No person, except the District involved in maintenance functions of sanitary sewer facilities, shall discharge any wastewater directly into a manhole or other opening in a sewer other than through an approved private sewer lateral, unless approved by the District upon written application by the user and payment of the applicable fees and charges established herein.

208. LIMITS ON WASTEWATER STRENGTH AND CHARACTERISTICS

A. No person shall discharge wastewater in excess of the District's Local Limits, as adopted and amended from time to time by District Resolution, limiting the concentrations of wastes discharged by a user or any limit listed in the User's discharge permit. Further, no person shall discharge wastewater in violation of any applicable Federal or State discharge regulations.

B. No user shall discharge or cause to be discharged wastewater to the sewerage system:

1. Having a pH at a volume and concentration that causes the pH of the influent to the treatment plant to be less than 6.0 or greater than 9.0.

2. Containing flow or pollutants, including, but not limited to, ammonia, chemical oxygen demand, total organic carbon, suspended solids, oil and grease of animal or vegetable origin, total dissolved solids, and phenolic compounds released in a discharge at a flow rate and/or pollutant concentration that, either singly or by interaction with other pollutants, will cause pass through or interference with the POTW.

3. Producing a gaseous mixture that is 10% or greater of the lower explosive limit (LEL) or having a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21.

4. Containing petroleum oil, non-biodegradable cutting or mineral oils or products of mineral oil origin in amounts that will cause interference or pass through.

5. Containing excessive oil and grease animal or vegetable oils in amounts that may cause interference, pass through or excessive maintenance to the

operation of District's facilities.

6. Containing material that will readily settle or cause an obstruction to flow in the sewer resulting in interference, such as, but not limited to, sand, mud, glass, metal filings, diatomaceous earth, cat litter, asphalt, pool plaster, dead animals, wood, bones, hair, and fleshings.

7. In violation of any applicable Federal Categorical Pretreatment Standards, State standards or other local regulations covering wastewater disposal or operations.

C. Water Softener Policy

1. No Industrial User shall install, replace, enlarge, or use any apparatus Water Conditioning Device for softening all or any part of the water supply to any premises when such apparatus is an ion-exchange softener or demineralizer of the type that is regenerated at the site of use with the regeneration wastes being discharged to the POTW unless the Water Conditioning Device apparatus is in compliance with the following conditions:

   a. The wastewater discharge from device complies with all applicable local wastewater discharge limitations;

   b. The wastewater discharge is monitored for TDS with the results provided to the District; and

   c. The Industrial User shall maintain an electrical conductivity-controlled discharge valve in proper operating condition at all times. The industrial user shall notify the General Manager within twenty-four (24) hours in the event of a valve failure and immediately cease the discharge of all wastewaters to the POTW associated with the soft water regenerating processes. A written report documenting the cause of the failure and the corrective actions taken shall be submitted to the District, within five calendar days after discovery of the electrical conductivity valve failure.

2. Residential Water Softening shall be regulated in accordance with California Health and Safety Code Sections 116775-116795 and amendments thereto, which are hereby incorporated by reference.

3. Any person installing or operating a Water Conditioning Device apparatus of any kind shall make such apparatus device accessible for inspection at reasonable times.

4. The District may limit the availability, or prohibit the installation, of any residential Water Conditioning Device water softening or conditioning appliances that discharge to the POTW if the General Manager makes all of the following findings:

   a. The POTW is not in compliance with the discharge or water reclamation requirements specified in the Waste Discharge Requirements issued by the Regional Water Quality Control Board;

   b. Limiting the availability, or prohibiting the installation, of the Water Conditioning Device appliances is the only available means of achieving compliance with Waste Discharge Requirements issued by the Regional Board; and

   c. All nonresidential sources are limited to the volumes and concentrations

of saline discharges to the POTW to the extent technologically and economically feasible.

D. Swimming Pool Policy

1. Discharges from non-saltwater swimming pools, wading pools, spas, whirlpools, and therapeutic pools may be discharged to the District's sewer system on a case-by-case basis as determined by the District. Each person who desires to drain a swimming pool, wading pool, spa, whirlpool, or therapeutic pool shall first obtain permission from the District prior to discharging any of these waters. Permission may be granted by the District if the discharge will:

   a. Not cause hydraulic overload conditions in any of the District's sewer lines;

   b. Meets all applicable specific limitations for wastewater quality as established by the District, including but not limited to pH, TDS, chloride, sodium, BOD, and TSS; and

   c. Commence at a time of day and rate of flow that minimizes the impact of the wastewater system.

2. The discharge of saltwater pools to the District's Sewer System is prohibited without prior review and is subject to approval on a case-by-case basis. Written approval may contain specific conditions and must be received prior to initiating any discharge to the District's sewer.

E. Specific Local Limits

1. Except as specifically allowed by the General Manager on a temporary basis or as provided herein, no Class I or Class II User shall discharge or cause to be discharged to the POTW any wastewater unless it conforms to all applicable local discharge limits as set forth by Resolution of the District's Board of Directors. Said discharge limits are amended from time to time as needed to protect the POTW and comply with current and future state and federal regulatory requirements.

2. Local discharge limits apply at the point where the wastewater is discharged to the POTW. The General Manager may impose average daily, monthly and/or mass limits in addition to the concentration-based limits set forth by Resolution of the District.

3. The General Manager may authorize the discharge of non-domestic wastewater to the POTW which contains pollutants in concentrations exceeding the specific local pollutant concentration limits adopted by Resolution, when said concentration, in combination with a measured discharge flow rate, do not exceed specific local mass emission rate limits which are computed for the individual discharger on the basis of the local pollutant concentration limits and the discharger's permitted discharge flow rate limit, and which are issued to the discharger as part of the discharger's permit.

F. Categorical Pretreatment Standards

1. Promulgated National Categorical Pretreatment Standards in 40 CFR Chapter I, Subchapter N, Parts 405-471, are incorporated into this Ordinance. Upon promulgation of new or revised Categorical Pretreatment Standards, the new or

revised Categorical Pretreatment Standards shall be immediately deemed incorporated herein. The General Manager shall notify affected users of applicable reporting requirements under 40 CFR, Chapter I, subchapter N, Parts 401, et seq.

2. No user subject to Categorical Pretreatment Standards shall discharge or cause to be discharged to the POTW any wastewater which is not in conformance with the discharge limits set forth in the Categorical Pretreatment Standards, including any revision thereof. Notwithstanding the foregoing, a user may obtain a variance from a Categorical Pretreatment Standard in accordance with the provisions of 40 CFR 403.13 and by establishing to the satisfaction of the General Manager, that the discharge will not adversely affect POTW operations and maintenance.

3. In the event that a Categorical Pretreatment Standard establishes a discharge limit which conflicts with a local discharge limit, the more stringent discharge limit shall apply.

209. PROHIBITION ON MEDICAL WASTE

No person shall discharge to the POTW medical wastes from hospitals, clinics, offices of medical doctors, convalescent homes, medical laboratories, other medical facilities, or any other locations except where prior written authorization for such discharges is given by the General Manager following the General Manager's determination that the discharge will not alone or in conjunction with other discharges, adversely affect the operation and maintenance of the POTW. If written authorization for such a discharge is given, the General Manager shall have the authority to require that any discharge of an infectious waste to the sewer be rendered non-infectious prior to discharge if the infectious waste is deemed to pose a threat to the public health and safety or will result in any violation of applicable waste discharge requirements.

210. PROHIBITION ON DISPOSAL OF SPENT SOLUTIONS AND SLUDGES

Spent solutions, sludges, and materials of quantity or quality in violation of, or prohibited by this Ordinance, or any permit issued under this Ordinance must be disposed of in a legal manner at a legally acceptable point of disposal as defined by the District or appropriate regulatory agency. All waste manifests shall be retained for a minimum of three years and made available to the District upon request.

211. MASS EMISSION RATE DETERMINATION

A. Mass emission rates for pollutants that are present or anticipated in the user's wastewater discharge may be set for each user and made an applicable part of each user's permit. These rates shall be based on the District's Local Discharge Limits, or Federal Categorical Pretreatment Standards, and the user's average daily wastewater discharge for the past three years, the most recent representative data, or other data acceptable to the General Manager.

B. To verify the user's operating data, the District may require a user to submit an inventory of all wastewater streams and/or records indicating production rates, water uses and water evaporation rates.

C. The District may revise limits or mass emission rates previously established in the discharger's permit at any time, based on: current or anticipated operating data of the discharger or the District; the District's ability to meet NPDES limits; or changes in the requirements of Regulatory Agencies.

D. The excess use of water to establish an artificially high flow rate for mass emission rate determination is prohibited.

212. RIGHT OF REVISION

The District reserves the right to establish by Ordinance, Resolution, or in wastewater discharge permits, more stringent standards, or requirements on discharges to the District's POTW.

ARTICLE 3

SEWER CONSTRUCTION

301. INTRODUCTION

A. To provide for maximum public benefit, written authorization for connection to and construction of the District's collection and conveyance systems is required. Standards and regulations established herein and by other District Ordinances provide performance requirements for connecting private sewer laterals, public sewers, and sewers from outside the District.

B. No building, industrial facility or other structure shall be occupied until the owner of the premises has complied with all rules and regulations of District and applicable regulations of the County, or city in which the property is located.

C. Any user located within the District shall at the user's expense and in accordance with this Ordinance, connect the discharge from the building directly to the public sewer within ninety (90) days after the date of official notice to do so. Notice will be given in the event the user has received more than one notice in a 365-day period from a regulatory agency responsible for protecting the public health, the environment, or as determined by the District to protect the public's or the District's interests.

D. Criteria for a variance:
A developer within the District may apply for a variance from immediate connection to District sewer upon application to the General Manager. The Board may approve a variance subject to the following findings and conditions.

Exceptions, connections to the public sewer will be required: A variance for a building and or project that is located within 1,000 feet of an existing District trunkline, or that has potentially more than five units of service may not be considered.

Required finding: The variance will not create a threat to health and safety or the welfare of the immediate property or to the adjoining properties by having a septic system. A favorable recommendation to the District from the Riverside County Environmental Health Department, the Regional Quality Control Board and the City Building Department shall be required before a finding can be made in favor of a variance.

E. Conditions of an agreement for conditional variance shall include, but may not be limited to the following:

1. That a recorded agreement shall be entered into that requires connection to the public sewer when the project exceeds ten units of service due to any future expansion.

2. The "project" may be one or more lots, or one or more buildings. "Project" shall be defined in the agreement.

3. The agreement shall require the installation of a "dry sewer" to the public street as a means to connect to future public sewer. Single family projects with lots of 2 ½ net acres shall not have to comply.

4. The agreement shall also require all future owners to connect to the public sewer when it becomes available. That they pay connection capacity fees as required at the time of connection. That they will pay a pro-rata charge set by

the District for the public sewer that is installed to provide their service.

5. Failure of the septic system shall be cause for an order to connect to the public sewer.

6. And other conditions that the District may consider necessary to protect the health and safety and welfare of the public.

302. BUILDING SEWERS, LATERALS, AND CONNECTIONS

A. No person shall construct a private sewer lateral, also referred to as a building sewer, connecting with any public sewer without first obtaining a written permit from the District and paying all required fees and connection charges.

B. Design and construction of private sewer laterals and their connection to the public sewer shall be in accordance with the requirements of the District, the District's Standard Specifications and at the expense of the applicant.

C. Cleanouts in private sewer laterals shall be provided in accordance with the California Plumbing Code and the District's Standard Specifications. Cleanouts shall be maintained watertight by the user.

D. All private sewer laterals shall be tested by the applicant or duly appointed representative during construction in accordance with the District's Standard Specifications. At any time when a private sewer lateral is found not to meet the District's Standard Specifications or more stringent requirements as determined by the District's General Manager to protect the District's facilities and public health, the District may require the user to modify, repair or replace the sewers to bring them into compliance with the District's requirements.

E. Connection to the public sewer involving an existing private sewer lateral shall be inspected, tested, and approved by the District's Inspector prior to final approval of construction. Any damage to the public sewer shall be repaired in conformance with District's Standard Specifications at the cost of the applicant.

F. Any private sewer lateral that is too low to permit gravity flow to the public sewer shall be lifted by artificial means approved by the General Manager and discharged to the public sewer at the expense of the owner.

G. Private sewer laterals and private sewers are owned by the owner of the property receiving service through said lines. The property owner shall be responsible for all cost related to the installation, connection, maintenance, repair, construction, abandonment or removal or private sewer laterals and private sewers. If a "common" private sewer lateral serves more than one property, the properties served by the common lateral own the lateral and are responsible for its maintenance and upkeep.

H. Upon approval of the District, existing buildings located on property belonging to the same owner may be served with the same tributary sewer lateral during the period of said ownership. However, upon subsequent subdivision or sale of a portion of said property, the owner of said portion not directly connected to a public sewer shall apply for a connection permit and construct a separate private sewer lateral to the public sewer in accordance with District's standards. If said property includes a tenant that is a Class I Permittee (see Article 4), the District may require a separate connection to accurately ascertain the tenant's compliance with discharge standards or assess surcharge fees for use of the sewer.

I. Any new or existing building with fixtures installed on any floor level that is lower than the ground surface of the next upstream public sewer manhole, the property owner shall have and maintain a backwater valve (sewage backflow prevention device).

J. Failure of the property owner to install and maintain a Backwater Valve for any of the required conditions, including I of this Section, shall relieve the District of any and all responsibilities for any and all damage caused by sanitary sewer flooding.

K. Should the District become aware of a sewage discharge from a leak, rupture, or other breach in the integrity of the conveyance system from private property to a public right-of- way that, in the District's opinion, may endanger human health or the environment, the District may take the actions necessary to clean-up the sewage spill, take other necessary steps to stop the discharge, and remediate the area to prevent an immediate endangerment. District will assess a fee to the private property owner to recover the costs of the clean-up and remediation in accordance with the District's fee schedule for such services.

303. PUBLIC SEWER CONSTRUCTION

All public sewers shall be permitted, design and constructed in accordance with the District's standards and in accordance with the provisions of this article.

A. No person shall construct, alter, extend, or connect to any public sewer without first obtaining a written permit from the District and paying all fees and connection charges and furnishing bonds, as required. The provision of this Section requiring permits shall not be construed to apply to contractors constructing sewers and appurtenances under contracts awarded and entered into with the District.

B. Minimum standards for the design and construction of sewers within the District shall be in accordance with the District's Standard Specifications adopted by the Board. Copies will be on file at the District's office. The General Manager may permit modifications or may require higher standards where unusual conditions are encountered or when necessary to protect the District's facilities.

C. The Plans, Profiles and Specifications required shall be in accordance with the District's Standard Specifications for Construction.

D. The requirements of Section 303 A and B of this Ordinance shall be fully complied with before any final subdivision map shall be approved by the General Manager. The final subdivision map shall provide for the dedication for public use of streets, easements, or rights of way in which public sewer lines are constructed.

E. In the event that an easement is required for the extension of the public sewer or the making of connections, the applicant shall procure and obtain Board acceptance of a proper easement or grant of right of way having a minimum width of twenty (20) feet and being sufficient in law to allow the laying and maintenance of such extension or connection.

F. Only properly licensed contractors shall be authorized to perform the work of public sewer construction within the District. All terms and conditions of the permit issued by the District to the applicant shall be binding on the contractor.

G. Any person constructing a sewer within a street shall comply with all Federal, State, City and County laws, ordinances, rules, and regulations pertaining to the curing of pavement; opening, barricading, lighting, and protecting of trenches; backfilling, and repaving thereof and shall obtain all permits and pay all fees required prior to the

issuance of a permit by the District.

H. The District shall require that before final acceptance of any public sewer and before commencement of any waste discharge from a structure to the sewerage system:

1. The applicant or the contractor on the applicant's behalf, file with the District, "record" drawings showing the actual location of all mains, structures, wyes, laterals, manholes and other changes to the construction drawings; and

2. The sewerage works shall be tested and shall be complete in full compliance with all requirements of the District's Standard Specifications, including final clean-up and removal of all construction debris, to the satisfaction of the General Manager.

304. OUT OF DISTRICT SEWERS

A. The District may grant permission to connect any lot or parcel of land outside the District to any public sewer in or under the jurisdiction of the District. The granting of permission for outside areas to connect to District sewers shall be at the option of the Board, subject to state and federal law.

B. In no event shall such permission be granted unless the applicant shall first enter into a written contract whereby binding self, successors and assignees to abide by all ordinances, rules and regulations in regard to the manner in which such the sewer shall be used and the manner of connection therewith, and also shall agree to pay all fees required for securing the permit and an annual fee in the amount set by District for the privilege of using such sewer.

C. By entering into a contract with the District, all users connected to the District's facilities agree to the jurisdiction and authority of the District. The authority includes the right to establish limits, conditions, and prohibitions; to establish flow rates or prohibit flows discharged to the District's sewerage facilities; to require the development of compliance schedules for the installation of equipment systems and materials by all users; and to take all actions necessary to enforce its authority. By a separate Agreement or within the Contract to connect, the District may establish a program such that an entity regulating the use of the sewers within the lot or parcel of land outside the District can cooperatively and/or jointly administer a program to ensure compliance with the District's regulations. The Agreement or Contract shall not prevent the District from enforcing its authority on users in non-compliance with this Ordinance.

ARTICLE 4

PRETREATMENT DISCHARGE PERMITS FOR NON-DOMESTIC SEWAGE DISCHARGE

401. INTRODUCTION

A. The wastewater discharge permit shall be in one of five forms and is dependent upon the type of discharger, volume, and characteristics of discharge. The four discharge permit types are:

1. **Class I Wastewater Discharge Permit**. Class I Permits are issued to all users meeting the criteria established for Class I Users as defined in this Ordinance.

2. **Class II Wastewater Discharge Permit**. Class II Users as defined in this Ordinance will be issued a Class II Permit. If any Class II User or group of Users is determined by the General Manager to individually or as a group, cause or contribute to pass through or interference with, the District's facilities, said user(s) will be issued a Class I Permit.

3. **Special Purpose Discharge Permit**. Special Purpose Discharge Permits are issued for short time durations and are generally for ground water clean-up projects, nuisance waters, and other waters that are determined to be suitable for discharge to the sanitary sewer system.

4. **General Wastewater Discharge Permit.** When it has been established that a group of similar type businesses (i.e., food service establishments, photo processing, car washes, dental offices, and automotive repair, etc.) are better regulated using Best Management Practices (BMPs), a general wastewater discharge permit may be issued with conditions and BMP requirements that have been established for a specified business group.

B. All discharge permits shall contain at a minimum the following:

1. Duration of the permit as defined by each permit type.

2. Prohibition of transferability.

3. Effluent limits including Best Management Practices.

4. Permit application and reapplication due dates as defined by each permit type.

5. Permit modification as defined by 402.4.

6. Self-monitoring requirements.

7. Reporting and notification requirements.

8. Recordkeeping requirements.

9. Statement of applicable civil and criminal penalties for violation of permit and/or ordinance requirements and standards.

401.1 Hauled Wastewater

A. Septic tank waste may be introduced into the POTW only at locations designated by the

General Manager, and at such times as are established by the General Manager. Such waste shall not violate Article 2 of this Ordinance, or any other requirements established by the District. The General Manager may require septic tank waste haulers to obtain individual wastewater discharge permits or general permits.

B. The General Manager may require haulers of industrial waste to obtain individual wastewater discharge permits or general permits. The General Manager may require generators of hauled industrial waste to obtain individual wastewater discharge permits or general permits. The General Manager also may prohibit the disposal of hauled industrial waste. The discharge of hauled industrial waste is subject to all other requirements of this Ordinance.

C. Industrial waste haulers may discharge loads only at locations designated by the General Manager. No load may be discharged without prior consent of the General Manager. The General Manager may collect samples of each hauled load to ensure compliance with applicable Standards. The General Manager may require the industrial waste hauler to provide a waste analysis of any load prior to discharge.

D. Industrial waste haulers must provide a waste-tracking form for every load. This form shall include, at a minimum, the name and address of the industrial waste hauler, permit number, truck identification, names and addresses of sources of waste, and volume and characteristics of waste. The form shall identify the type of industry, known or suspected waste constituents, and whether any wastes are RCRA hazardous wastes.

402. CLASS I WASTEWATER DISCHARGE PERMITS

A. No user requiring a Class I permit shall discharge wastewater without obtaining a Class I Wastewater Discharge Permit.

B. Class I Wastewater Discharge Permits shall be expressly subject to all provisions of this Ordinance and all other regulations, charges for use, and fees established by the District. The conditions of wastewater discharge permits shall be enforced by the District in accordance with this Ordinance and applicable State and Federal Regulations.

C. All Class I users proposing to discharge directly or indirectly into the District's sewerage facilities shall obtain a wastewater discharge permit by filing an application pursuant to Section 402.1 and paying the applicable fees pursuant to Section 402.3. For purposes of this Ordinance, a Class I user is any user:

1. Meeting the Significant Industrial User definition; or

2. Discharging five percent or more of the District’s current effluent mass loading of any regulated constituent.

3. Has in its wastes toxic pollutants as defined pursuant to Section 307 of the Clean Water Act; or Discharging wastewater which may cause, as determined by the General Manager, pass through or interference with the District's sewerage system.

402.1 Class I Wastewater Discharge Permit Application

A. Any person required to obtain a Class I Wastewater Discharge Permit shall complete and file with the District, at least ninety (90) prior to commencing discharge, an application on the form prescribed by the District. The discharger shall submit, in units and terms appropriate for evaluation, the following information.

1. Name, address, assessor's parcel number(s), S.I.C. number(s), description of the manufacturing process or service activity.

2. (Whichever is applicable) name, address of any and all principals/ owners/major shareholders of company; Articles of Incorporation; most recent Report of the Secretary of State; Business License.

3. Volume of wastewater to be discharged.

4. Name of individual who can be served with notices other than officers of corporation.

5. Name and address of property owner, landlord and/or manager of the property.

6. Water supplier and water account numbers.

7. Measurement of Pollutants.

    a. The Categorical Pretreatment Standards applicable to each regulated process and any new categorically regulated processes for existing sources.

    b. The results of sampling and analysis identifying the nature and concentration, and/or mass, where required by the standard or by the District, of regulated pollutants in the discharge from each regulated process. The constituents and characteristics shall be determined by a laboratory selected by the discharger and acceptable to the District.

    c. Instantaneous, daily maximum, and long-term average concentrations, or mass, where required, shall be reported.

    d. The sample shall be representative of daily operations and shall be analyzed in accordance with procedures set out in Section 103.A of this Ordinance. Where the Standard requires compliance with a BMP or pollution prevention alternative, the user shall submit documentation as required by the District or the applicable Standards to determine compliance with the Standard.

    e. Sampling must be performed in accordance with procedures set out in Section 601.1 of this Ordinance.

8. Time and duration of discharge.

9. Number of employees and average hours of work per employee per day.

10. Waste minimization and water conservation practices.

11. Brief description of the nature of operations and average rate of production (including each product produced by type, amount, processes, and rate of production). This description should include a schematic process diagram, which indicates points of discharge to the POTW from the regulated processes.

12. Types of wastes generated, and a list of all raw materials and chemicals used or stored at the facility which are, or could accidentally or intentionally be, discharged to the PTOW.

13. Type and amount of raw materials processed (average and maximum per day).

14. Landscaped area in square feet, if applicable.

15. Tons of cooling tower capacity, if applicable.

16. EPA Hazardous Waste Generator Number, if applicable.

17. Slug Load Control Plan (SLCP), which at a minimum, lists the chemicals used or stored on-site, spill prevention, notification procedures, and response procedures necessary to prevent slug discharges or excess flow volumes from entering the District's sewer system.

18. A list of any environmental control permits held by or for the facility that will be covered by the permit.

19. Any other information as may be deemed necessary by the District to evaluate the permit application.

B. Dischargers may be required to submit site plans, floor plans, mechanical and plumbing plans, and details to show all sewers, floor drains, spill containment, clarifiers, pretreatment equipment, and appurtenances by size, location, and elevation and all points of discharge.

C. Dischargers may also be required to submit information related to the discharger's business operations, processes, and potential discharge as may be requested by the District to properly evaluate the permit application.

D. After evaluation of the data, the District may issue a wastewater discharge permit, subject to terms and conditions set forth in this Ordinance and as otherwise determined by the General Manager to be appropriate to protect the District's sewerage facilities.

E. The permit application may be denied if the discharger fails to establish to the District's satisfaction that adequate pretreatment equipment is included within the discharger's plans to ensure that the discharge limits will be met or if the discharger has, in the past, demonstrated an inability to comply with applicable discharge limits.

402.2 <u>Class I Permit Conditions and Limits</u>

A. A Class I permit shall contain the following conditions or limits:

1. Mass emission rates and concentration limits, including Best Management Practices, regulating pollutants in accordance with Federal, State and District discharge limits.

2. Requirements to notify the District in writing prior to modification to processes or operations through which industrial wastewater may be produced or when there may be any substantial change in the volume or character of pollutants in their discharge including but not limited to the potential for a slug discharge or the discharge of hazardous waste as per 403.12(p) and as revised.

3. Location of the user's on-site sampling point.

4. Requirements to self-monitor the discharge and submit technical reports, production data, discharge reports, documentation associated with Best Management Practices and/or waste manifests, including but not limited to the

requirements set forth in 40 CFR section 403.12(o) and as revised.

5. Requirements for maintaining, for a minimum of three years, plant records relating to wastewater discharge, documentation associated with Best Management Practice, and waste manifests as specified by District.

6. Requirements to submit copies of tax and water bills.

7. A requirement that all new source dischargers install and start up any necessary pollution control equipment before beginning discharge and comply with applicable Federal Categorical Pretreatment Standards within (30) days of the commencement of the discharge.

8. A requirement that all new source dischargers submit monitoring information that meets the requirements of 40 C.F.R section 403.12(d) within ninety (90) days of commencement of the discharge.

9. A requirement that the Permittee notify the District immediately of all discharges that could cause problems to the District's operations, including any slug loadings, as defined by 40 C.F.R. section 403.5(b).

10. A requirement to notify the District in the event of any discharge that may cause a problem to the District's facilities.

11. A requirement to report all monitoring results from the designated sampling and monitoring location(s).

12. Requirements and conditions in Section 401.B of this Ordinance.

B. A Class I permit may contain any of the following conditions or limits:

1. Requirements for the user to construct and maintain, at the user's own expense, appropriate pretreatment equipment, pH control, flow monitoring facilities, and sampling facilities.

2. Limits on rate and time of discharge or requirements for flow regulation and equalization.

3. Requirements to self-monitor.

4. Assumed values for COD and suspended solids characteristics that typify the discharger's effluent for determination of the charge for use.

5. Requirements to develop, submit for approval, and implement such a plan or take such other action that may be necessary to control slug discharges.

6. Other terms and conditions that may be appropriate to ensure compliance with this Ordinance.

7. Other terms and conditions determined by the General Manager to be appropriate to protect the sewerage system.

402.3 <u>Class I Permit Fee</u>

A. The Class I permit fee shall be in an amount adopted by resolution or Ordinance, as appropriate, of the Board of Directors. The permit fee shall be payable at the time a

permit application is submitted for the issuance of a new permit or a renewed permit. Payment of permit must be received by the District prior to issuance of either a new permit or a renewed permit. Permittee shall also pay any delinquent invoices in full prior to permit renewal.

B. Any permit issued for a location wherein the Permittee is not the property owner may be conditioned upon depositing financial security to guarantee payment of all annual fees and charges to be incurred, in accordance with the provisions of the current District's resolution or Ordinance for fees and charges.

C. Class I Permit Charge for Use. The purpose of a charge for use is to ensure that each recipient of sewerage service from the District pays its reasonably proportionate share of all the costs of providing that sewerage service. Fees and charges for use shall be in accordance with the current District's resolution or Ordinance, as appropriate, for fees and charges.

402.4 <u>Class I Permit Modification of Terms and Conditions</u>

A. The terms and conditions of an issued permit may be subject to modification and change in the sole determination by the General Manager during the life of the permit based on:

1. The discharger's current or anticipated operating data;

2. The District's current or anticipated operating data;

3. Changes in the requirements of Regulatory Agencies that affect the District; or

4. A determination by the General Manager that such modification is appropriate to further the objectives of this Ordinance.

B. New source indirect dischargers shall be required to install and start up any necessary pollution control equipment before beginning discharge and comply with applicable Federal Categorical Pretreatment Standards not to exceed thirty (30) days after the commencement of discharge.

C. Permittee may request a modification to the terms and conditions of an issued permit. The request shall be in writing stating the requested change, and the reasons for the change. The District shall review the request, make a determination on the request, and respond in writing.

D. Permittee shall be informed of any change in the permit limitations, conditions, or requirements at least forty-five (45) days prior to the effective date of change. Any changes or new conditions in the permit shall include a reasonable time schedule for compliance.

402.5 <u>Class I Permit Duration and Renewal</u>

Class I permits shall normally be issued for a period not to exceed two (2) years but in no case for a period of greater than 5-years. At least 45 days prior to the expiration of the permit, the user shall apply for renewal of the permit in accordance with the provisions of this Article 4.

403. <u>CLASS II WASTEWATER DISCHARGE PERMITS</u>

A. No user requiring a Class II permit shall discharge wastewater without obtaining a wastewater discharge permit.

B. Class II Wastewater Discharge Permits shall be expressly subject to all provisions of this Ordinance and all other regulations, charges for use and fees established by the District. The conditions of wastewater discharge permits shall be enforced by the District in accordance with this Ordinance and applicable State and Federal Regulations.

C. All Class II users proposing to discharge directly or indirectly into the District sewerage facilities shall obtain a wastewater discharge permit by filing an application pursuant to Section 403.1 and paying the applicable fees pursuant to Section 403.3. For purposes of this Ordinance, a Class II user is any user:

1. Discharging waste other than sanitary; and

2. Not otherwise required to obtain a Class I permit.

D. EXEMPTIONS: A discharger may qualify for an exemption from the requirement to obtain a Class II Discharge Permit by obtaining the General Manager's approval of a "Best Management Practices Plan of Action". An exemption shall be valid for 5 years. To qualify for an exemption the discharger shall:

1. Not discharge in excess of any discharge limit as set forth in Section 208 of this Ordinance or of any wastewater limitation established by Resolution of the District's Board of Directors.

2. Shall segregate concentrated and dilute waste streams.

3. Use "Dry" versus "Wet" clean-up methods.

4. Use water conservation methods.

5. Maintain all records of waste disposal.

6. Allow District reasonable access to facilities and records for inspection.

7. Implement an approved "Best Management Practices Plan of Action".

8. Upon a determination by the General Manager that the user has failed to comply with the forgoing criteria, the exemption shall be invalid, and the user shall obtain a Class II Discharge Permit.

403.1 Class II Wastewater Discharge Permit Application

A. Any person required to obtain a Class II Wastewater Discharge Permit shall complete and file with the District, prior to commencing discharge, an application on the form prescribed by the District. The discharger shall submit, in units and terms appropriate for evaluation, all necessary information as described in Section 402.1.A. (1-18).

B. Dischargers may be required to submit site plans, floor plans, mechanical and plumbing plans, and details to show all sewers, spill containment, clarifiers, pretreatment facilities, and appurtenances by size, location, and elevation for evaluation.

C. Dischargers may also be required to submit other information related to the discharger's business operations, processes, and potential discharge as may be requested to properly evaluate the permit application.

D. After evaluation of the data furnished, the District may issue a wastewater discharge permit, subject to terms and conditions set forth in this Ordinance and as otherwise

determined by the General Manager to be appropriate to protect the District's system.

E. The permit application may be denied if the discharger fails to establish to the District's satisfaction that adequate pretreatment equipment is included within the discharger's plans to ensure that the discharge limits will be met or if the discharger has, in the past, demonstrated an inability to comply with applicable discharge limits.

403.2 <u>Class II Permit Conditions and Limits</u>

A. A Class II permit shall contain all of the following conditions or limits:

1. Requirements to notify the District in writing prior to modification to processes or operations through which industrial wastewater may be produced.

2. Location of the user's on-site sample point.

3. Requirements for submission of technical reports, production data, discharge reports, and/or waste manifests pursuant to Section 402.2. A.4.

4. Requirements to submit copies of tax and water bills.

5. Requirements and conditions in Section 401.B of this Ordinance.

B. A Class II permit may contain any of the following conditions or limits:

1. Requirements for the user to construct and maintain, at the user's own expense, appropriate pretreatment equipment, pH control, flow monitoring and/or sampling facilities.

2. Limits on rate and time of discharge or requirements for flow regulation and equalization.

3. Assumed values for COD and suspended solids characteristics that typify the discharger's effluent for determination of the charge for use.

4. Requirements to self-monitor.

5. Requirements for maintaining, for a minimum of three years, plant records relating to wastewater discharge, and waste manifests as specified by District.

6. Other provisions that may be appropriate to ensure compliance with this Ordinance.

7. Other terms and conditions determined by the General Manager to be appropriate to protect the District's sewerage system.

403.3 <u>Class II Permit Fee</u>

A. The Class II permit fee shall be in an amount adopted by resolution or Ordinance, as appropriate, of the Board of Directors. The permit fee shall be payable at the time a permit application is submitted for the issuance of a new permit or a renewed permit. Payment of permit must be received by the District prior to issuance of either a new permit or a renewed permit. Permittee shall also pay any delinquent invoices in full prior to permit renewal.

B. Any permit issued for a location wherein the Permittee is not the property owner may be

conditioned upon depositing financial security to guarantee payment of all annual fees and charges to be incurred, in accordance with the current District's resolution or Ordinance, as appropriate, for fees and charges.

C. Class II Permit Charge for Use. The purpose of a charge for use is to ensure that each recipient of sewerage service from the District pays its reasonably proportionate share of all the costs of providing that sewerage service. Fees and charges for use shall be in accordance with the current District's resolution or Ordinance, as appropriate, for fees and charges.

403.4 Class II Permit Modification of Terms and Conditions

A. The terms and conditions of an issued permit may be subject to modification and change in the sole determination by the General Manager during the life of the permit based on:

1. The discharger's current or anticipated operating data;

2. The District's current or anticipated operating data;

3. Changes in the requirements of Regulatory Agencies that affect the District; or

4. A determination by the General Manager that such modification is appropriate to further the objectives of this Ordinance.

B. The Permittee shall request a modification to the terms and conditions of an issued permit prior to increasing the contribution of flow, pollutants, or changing the nature of pollutants where such contribution or change will cause the Permittee to be in violation of their permit or this Ordinance. The request shall be in writing stating the requested change, and the reasons for the change. The District shall review the request, make a determination on the request, and respond in writing. The District's approval may be granted or denied.

C. Permittee shall be informed of any change in the permit limitations, conditions, or requirements at least forty-five (45) days prior to the effective date of change. Any changes or new conditions in the permit shall include a reasonable time schedule for compliance.

403.5 Class II Permit Duration and Renewal

Class II permits shall be issued for a period not to exceed five (5) years. At least 45 days prior to the expiration of the permit, the user shall apply for renewal of the permit in accordance with the provisions of this Article 4.

404. SPECIAL PURPOSE DISCHARGE PERMITS

A. No user requiring a Special Purpose Discharge Permit shall discharge wastewater without obtaining a Special Purpose Discharge Permit.

B. Special Purpose Discharge Permits shall be expressly subject to all provisions of this Ordinance and all other regulations, charges for use, and fees established by the District. The conditions of wastewater discharge permits shall be enforced by the District in accordance with this Ordinance and applicable State and Federal Regulations.

C. All Special Purpose Discharge Permit users proposing to discharge directly or indirectly into the Districts' sewerage facilities shall obtain a wastewater discharge permit by filing an application pursuant to Section 404.1 and paying the applicable fees pursuant to

Section 404.3. This discharge permit may be granted when no alternative method of disposal is reasonably available, or to mitigate an environmental risk or health hazard.

404.1 Special Purpose Discharge Permit Application

A. Dischargers seeking a Special Purpose Discharge Permit shall complete and file with the District, prior to commencing discharge, an application in the form prescribed by the District. This application shall be accompanied by the applicable fees, plumbing plans, a detailed analysis of the alternatives for water disposal, or other data as needed by the District for review.

B. The permit application may be denied if the discharger fails to establish to the District's satisfaction that adequate pretreatment equipment is included within the discharger's plans to ensure that the discharge limits will be met if the discharger has, in the past, demonstrated an inability to comply with applicable discharge limits.

404.2 Special Purpose Discharge Permit Conditions and Limits

A. If monitoring is required because the discharge may impact the District's facilities, the monitoring requirements for the discharge shall be for those pollutants known or suspected to exist in the discharge.

B. The District may specify and make part of each Special Purpose Discharge Permit specific pretreatment requirements or other terms and conditions determined by the General Manager to be appropriate to protect the District's sewerage facilities, to comply with Regulatory Agencies' requirements, to ensure compliance with this Ordinance, and to assess user charges.

C. Requirements and conditions in Section 401.B of this Ordinance.

404.3 Special Purpose Discharge Permit Fee

The special purpose discharge permit fee shall be paid by the discharger in an amount adopted by resolution or Ordinance, as appropriate, of the Board of Directors. Payment of permit fees must be received by the District prior to issuance of either a new permit or a renewed permit. Each Permittee shall also pay delinquent invoices in full prior to permit renewal.

A charge for use to cover all costs of the District for providing sewerage service and monitoring shall be established by the General Manager. A deposit determined by the General Manager to be sufficient to pay the estimated charges for use shall accompany the Special Purpose Discharge Permit application and said deposit shall be applied to the charges for use.

404.4 Special Purpose Discharge Permit Modification of Terms and Conditions

A. The terms and conditions of an issued permit may be subject to modification and change in the sole determination by the District during the life of the permit based on:

1. The discharger's current or anticipated operating data;

2. The District's current or anticipated operating data;

3. Changes in the requirements of Regulatory Agencies that affect the District; or

4. A determination by the General Manager that such modification is appropriate to further the objectives of this Ordinance.

B. A Permittee may request a modification to the terms and conditions of an issued permit. The request shall be in writing stating the requested change, and the reasons for the change. The District shall review the request, make a determination on the request, and respond in writing.

C. A Permittee shall be informed of any changes in the permit at least forty-five (45) days prior to the effective date of the change. Any changes or new conditions in the permit shall include a reasonable time schedule for compliance.

404.5 Special Purpose Discharge Permit Duration And Renewal

Special purpose discharge permits shall be issued for a period not to exceed three (3) years but may be renewed as determined by the General Manager. Users seeking permit renewal shall comply with all provisions of this Article 4.

405. GENERAL DISCHARGE PERMIT

The General Discharge Permit contains standard conditions and requirements that are the same for all Users with a specific business classification that are determined by the District to have similar process wastewater producing streams and can be regulated using a common permit. The District may issue a General Discharge Permit when:

A. The General Discharge Permit will regulate the same or substantially similar types of operations;

B. The Permittees will discharge the same type of wastes;

C. The discharges require the same effluent limitations, including Best Management Practices;

D. The discharges require the same or similar monitoring and reporting requirements; and

E. In the opinion of the District, the Permittees are more appropriately controlled under a general control mechanism than under individual control mechanisms.

Typical business operations that may fall into a General Discharge Permit category include, but are not limited to, food service establishments; automotive repair shops; car washes; dental offices; and film photo-processing operations. Facilities with a General Discharge Permit will typically be regulated using Best Management Practices that are established for each specific business type.

405.1 General Discharge Permit Application

A. Any person required to be covered under a General Discharge Permit shall complete and file with the District prior to commencing discharge, an application in a form prescribed by the District.

B. Dischargers may be required to submit mechanical and plumbing plans, and details to show all spill containment internal baffles and valving, clarifiers and appurtenances by size, location, and elevation for evaluation.

C. Dischargers may be required to submit other information related to the discharger's business operations and potential discharge as may be requested to properly evaluate the permit application.

D. After evaluation of data furnished, the District may issue a General Wastewater permit,

subject to terms and conditions set forth in this Ordinance and as otherwise determined by the General Manager to be appropriate to protect the District's sewerage system.

E. The permit application may be denied if the discharger fails to establish to the District's satisfaction that adequate pretreatment equipment is included within the discharger's plans to ensure that the discharge limits will be met or if the discharger has, in the past, demonstrated an inability to comply with applicable discharge limits.

405.2 General Discharge Permit Conditions and Limits

The issuance of a General Discharge Permit may include any of the following conditions or limits:

A. Requirements to develop and implement Best Management Practices as determined by the General Manager to be appropriate to protect the District's sewerage system.

B. Requirements to develop, submit for approval, and implement such a plan or take such action that may be necessary to control slug discharges.

C. Requirements for the User to construct and maintain, at the user's own expense, appropriate pretreatment equipment, pH control, flow monitoring facilities and sampling facilities.

D. Other terms and conditions which may be applicable to ensure compliance with this Ordinance.

E. Other terms and conditions determined by the General Manager to be appropriate to protect the District's sewerage system.

F. Requirements and conditions in Section 401.B of this Ordinance.

405.3 General Discharge Permit Fee

A. The General Discharge Permit fee shall be in an amount adopted by resolution, or Ordinance, as appropriate, of the Board. The permit fee shall be payable within forty-five (45) days of invoicing by the District. Payment of permit fees must be received by the District prior to issuance of either a new permit or a renewed permit. Permittee shall also pay any delinquent invoices in full prior to permit renewal.

B. Any permit issued may be conditioned upon depositing financial security to guarantee payment of all annual fees and charges to be incurred, in accordance with the provisions of Section 717 of this Ordinance.

C. General Discharge Permit Charge for Use. A charge for use to cover all costs of the District for providing sewerage service and monitoring shall be established by the General Manager and the board of directors through the most current fee resolution named 'A Resolution of the Board of Directors of Valley Sanitary District Amending Fees and Charges For District Services'. A deposit determined by the General Manager to be sufficient to pay the estimated charges for use shall accompany the General Discharge Permit application and said deposit shall be applied to the charges for use.

405.4 General Discharge Permit Modifications of Terms and Conditions

A. The terms and conditions of an issued permit may be subject to modification and change in the sole determination by the General Manager during the life of the permit based on:

1. The discharger's current or anticipated operating data;

2. The District's current or anticipated operating data;

3. Changes in the requirements of Regulatory Agencies that affect the District; or

4. A determination by the General Manager that such modification is appropriate to further the objectives of this Ordinance.

B. The Permittee shall request a modification to the terms and conditions of an issued permit prior to increasing the contribution of flow, pollutants, or changing the nature of pollutants where such contribution or change will cause the Permittee to be in violation of their permit or this Ordinance. The request shall be in writing stating the requested change, and the reasons for the change. The District shall review the request, make a determination on the request, and respond in writing. The District's approval may be granted or denied.

C. Permittee shall be informed of any change in the permit limits, conditions, or requirements at least forty-five (45) days prior to the effective date of change. Any changes or new conditions in the permit shall include a reasonable time schedule for compliance.

405.5 General Discharge Permit Duration and Renewal

General Discharge Permit shall be issued for a period not to exceed five (5) years but may be renewed as determined by the General Manager. Users seeking permit renewal shall comply with all provisions of this Article 4.

ARTICLE 5

FACILITIES REQUIREMENTS

501. DRAWING SUBMITTAL REQUIREMENTS

A. Persons wishing to construct a public sewer as defined by Section 303 shall submit to the District, the Plans, Profiles and Specifications in accordance with District Standard Specifications for Construction.

B. Applicants or users discharging non-domestic wastewater may be required to submit three copies of detailed facility plans. The submittal shall be in a form and content acceptable to the District for review of existing or proposed pretreatment facilities, spill containment facilities, monitoring facilities, metering facilities, and operating procedures. The review of the plans and procedures shall in no way relieve the user of the responsibility of modifying the facilities or procedures in the future, as necessary to produce an acceptable discharge, and to meet the requirements of this Ordinance or any requirements of other Regulatory Agencies.

C. As a minimum, the drawings shall depict the manufacturing process (waste generating sources), spill containment, monitoring or metering facilities, and pretreatment facilities.

D. The applicant or user shall submit a schematic drawing of the pretreatment facilities, piping and instrumentation diagram, and wastewater characterization report or equivalent as determined by the General Manager.

E. Users and applicants may also be required to submit for review, site plans, floor plans, mechanical and plumbing plans, and details to show all sewers, spill containment, clarifiers, and appurtenances by size, location, and elevation for evaluation.

F. The District may require the drawings be prepared by a California Registered Architect, Chemical, Mechanical, or Civil Engineer.

502. PRETREATMENT FACILITIES

A. All users shall provide wastewater treatment as necessary to comply with this Ordinance and shall achieve compliance with Local Limits and all Categorical Pretreatment Standards within the time limitations specified by EPA, the State, or District, whichever is more stringent. Any facilities necessary for compliance shall be provided, operated, and maintained at the user's expense. Detailed plans describing such facilities and operating procedures shall be submitted to the District for review and shall be acceptable to the District before such facilities are constructed. The review of such plans and operating procedures shall in no way relieve the user from the responsibility of modifying such facilities as necessary to produce a discharge acceptable to the District under the provisions of this Ordinance.

B. Any user required to treat or transport wastewater shall ensure that pretreatment facilities are maintained by a qualified operator and in proper operating condition at the user's expense.

C. All users may also be required by the District to submit waste analysis plans, contingency plans, and meet other necessary requirements to ensure proper operation of the pretreatment facilities and compliance with permit limits and this Ordinance.

D. No user shall increase the use of water or in any other manner attempt to dilute a discharge as a partial or complete substitute for treatment to achieve compliance with

this Ordinance and the user's Permit.

503. SPILL CONTAINMENT FACILITIES/ACCIDENTAL SLUG CONTROL PLANS

A. All users shall provide spill containment for protection against discharge of prohibited materials or other wastes regulated by this Ordinance. Such protection shall be designed to secure the discharges and to prevent them from entering into the system in accordance with reasonable engineering standards. Such facilities shall be provided and maintained at the user's expense.

B. The General Manager may require any industrial user to develop and implement an accidental discharge/slug control plan.

C. The General Manager shall evaluate whether each SIU needs an accidental discharge/slug control plan or other action to control slug discharges. An accidental discharge/slug control plan shall address, at a minimum, the following:

1. Description of discharge practices, including nonroutine batch discharges;

2. Description of stored chemicals;

3. Procedures for immediately notifying the General Manager of any accidental or slug discharge; and

4. Procedures to prevent adverse impact from any accidental or sludge discharge. Such procedures include, but are not limited to, inspection and maintenance of storage areas, handling, and transfer of materials, loading and unloading operations, control of plant site runoff, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants, including solvents, and/or measures and equipment for emergency response.

504. MONITORING/METERING FACILITIES

A. The District may require the user to construct and maintain in proper operating condition at the user's sole expense, flow monitoring, constituent monitoring and/or sampling facilities.

B. The monitoring or metering facilities may be required to include a security closure that can be locked with a District provided hasp lock or the equivalent, during sampling or upon termination of service.

C. The location of the monitoring or metering facilities shall be subject to approval by the District.

D. The user shall provide immediate, clear, safe, and uninterrupted access to the District to the user's monitoring and metering facilities.

E. The District may at its sole discretion, install its own monitoring or metering facilities. The cost of constructing and maintaining the facilities shall be borne by the user.

505. WASTE MINIMIZATION REQUIREMENTS

The District may require the user to provide waste minimization plans to conserve water, investigate product substitution, provide inventory control, implement employee education, and other steps as necessary to minimize waste produced.

506. GREASE INTERCEPTOR

In accordance with Section 502, a User may be required to install pretreatment facilities to assure that the wastewater is acceptable to the District. Grease Interceptors may be required to remove solids and floating grease that may interfere with the District's facilities. Grease Interceptors are defined as a structural chamber approved by the local authorities and the District to remove fats, oils, and grease (FOG) and solids from wastewater prior to discharge to the District's sewer collection system.

A. Grease Interceptors are typically required for food service establishments. Discharges from new facilities must have their plumbing plans reviewed and approved by the appropriate plumbing official and reviewed by the District to determine if a grease interceptor is required and if it is appropriately sized for the flow and loading generated by the User's discharge.

B. Sanitary wastewater shall not be allowed to pass- through the grease interceptor.

C. Grease Interceptors shall be operated and maintained in a satisfactory manner which includes cleaning to remove all solids and floatable FOG once every three months, when 25% or more of the volumetric capacity of the chamber is occupied by settled or floatable materials, or when determined by the District, whichever occurs first. Users are required to maintain cleaning records for three years.

D. District may reduce the cleaning requirements only after the User demonstrates to the satisfaction of the General Manager that the grease interceptor can operate at a different cleaning frequency. The User shall submit a demonstration plan for District's approval that includes effluent testing to demonstrate that the grease interceptor cleaning frequency can be changed. The User shall execute the plan and submit the results for District's review and approval prior to changing the cleaning frequency.

E. All chambers of the grease interceptor shall be immediately accessible at all times for the purpose of inspection and cleaning. At no time shall any material, debris, obstacles, or obstructions be placed in such a manner so as to prevent immediate access to the interceptor.

F. All interceptors shall be equipped with a sample chamber located downstream of the interceptor and the sample chamber shall conform to approved District standards.

G. If the General Manager finds that a grease interceptor is inadequate for removing floatable or settleable material or is structurally incomplete, the General Manager shall notify the User that the grease interceptor does not meet the requirements of this section and shall require the User to install, at the user's expense, an acceptable interceptor.

H. The use of chemicals, enzymes, or mechanical means to dissolve or emulsify grease is specifically prohibited.

Accumulated sediment and floating material from the grease interceptor shall be removed and legally disposed of and shall not be discharged to the sewer.

ARTICLE 6

MONITORING, REPORTING, NOTIFICAITON, AND INSPECTION REQUIREMENTS

601. MONITORING AND REPORTING CONDITIONS

A. Monitoring for Annual Charge for Use

The wastewater constituents and characteristics of a discharger needed for determining the annual charge for use shall be submitted in the form of self-monitoring reports by the user to the District, if requested and as set forth in their permit. The frequency of analyses and reporting shall be set forth in the user's permit. The analyses of these constituents and characteristics shall be by a laboratory acceptable to the District, and at the sole expense of the permittee. Analyses performed by District's personnel may be used in the determination of the annual charge for use.

B. Monitoring for Compliance with Permit Conditions or Reporting Requirements

The District may require reports for self-monitoring of wastewater constituents and characteristics of the discharger needed for determining compliance with any limit or requirements as specified in the user's permit, Federal or State Regulations, or this Ordinance. These reports include:

1. Baseline Monitoring Reports as defined by 40 CFR 403.12(b).

2. Compliance Schedule Progress Reports as defined by 40 CFR 403.12(c).

3. 90-Day Compliance Reports as defined by 40 CFR 403.12(d).

4. Periodic Reports on continued compliance, including but not limited to report(s) of continued compliance with categorical standards in accordance with 40 CFR 403.12(e) and other specified limitations (e.g. local limits) in accordance with 40 CFR 403.12 (h).

5. Notification of the Discharge of Hazardous Waste as per 40 CFR 403.12(p) and as revised.

6. Other reports as required by the District, including but not limited to a report of compliance with any categorical deadline(s) in accordance with 40 CFR 403.12(d).

Monitoring reports of the analyses of wastewater constituents and characteristics shall be in a manner and form approved by the District and shall be submitted upon request of the District. When applicable, the self-monitoring requirement and frequency of reporting may be set forth in the user's permit as directed by the District. The analyses of wastewater constituents and characteristics and the preparation of the monitoring report shall be done at the sole expense of the user.

Failure by the user to perform any required monitoring, or to submit monitoring reports required by the District constitutes a violation and may result in determining whether the permittee is in significant non-compliance, as defined in this Ordinance. Any and all expenses incurred by the District to determine compliance with any limits and requirements specified in the user's permit or in this Ordinance shall be the responsibility of said user.

601.1 Inspection and Sampling Conditions

A. The District may inspect and sample the wastewater generating and disposal facilities of any user to ascertain whether the intent of this Ordinance is being met and the user is complying with all requirements.

B. The District shall have the right to place on the user's property or other locations as determined by the District, such devices as are necessary to conduct sampling or metering operations. Where a user has security measures in force, the user shall make necessary arrangements so that personnel from the District shall be permitted to enter without delay for the purpose of performing their specific responsibilities.

C. In order for the District to determine the wastewater characteristics of the discharger for purposes of determining the annual use charge and for compliance with permit requirements, the user shall make available for inspection and copying by the District all notices, self-monitoring reports, waste manifests and records including, but not limited to, those related to production, wastewater generation, wastewater disposal, and those required in the Federal Pretreatment Requirements without restriction, but subject to the confidentiality provision set forth in Section 104 herein. All such records shall be kept by the user a minimum of three (3) years.

D. The user is responsible for maintaining all user required flow and sampling equipment and maintaining the designated sampling location free from debris. Debris removed from the sampling location is considered waste and shall be pretreated and disposed of properly.

E. Samples collected to satisfy reporting requirements must be based on data obtained through appropriate sampling and analysis performed during the period covered by the report, based on data that are representative of conditions occurring during the reporting period.

F. All wastewater samples must be representative of the User's discharge. Wastewater monitoring and flow measurement facilities shall be properly operated, kept clean, and maintained in good working order at all times. The failure of a User to keep its monitoring facility in good working order shall not be grounds for the User to claim that sample results are unrepresentative of its discharge.

G. If a User subject to the reporting requirement in this section monitors any regulated pollutant at the appropriate sampling location more frequently than required by the General Manager or designated representative, using the procedures prescribed in this section of this Ordinance, the results of this monitoring shall be included in the report.

H. Except as indicated in Section I and J below, the User must collect wastewater samples using 24-hour flow-proportional composite sampling techniques, unless time-proportional composite sampling or grab sampling is authorized by the General Manager. Where time-proportional composite sampling or grab sampling is authorized by the District, the samples must be representative of the discharge. Using protocols (including appropriate preservation) specified in 40 CFR Part 136 and appropriate EPA guidance, multiple grab samples collected during a 24-hour period may be analyzed individually or composited prior to the analysis as follows: for cyanide, total phenols, and sulfides the samples may be composited in the laboratory or in the field; for volatile organics and oil and grease the samples may be composited in the laboratory. In addition, grab samples may be required to show compliance with instantaneous limits.

I. Samples for oil and grease, temperature, pH, cyanide, total phenols, sulfides, and volatile organic compounds must be obtained using grab collection techniques.

J. For sampling required in support of baseline monitoring and 90-day compliance reports, a minimum of four grab samples must be used for pH, cyanide, total phenols, oil and grease, sulfide, and volatile organic compounds. The General Manager may authorize a lower minimum for facilities for which historical sampling data are available.

601.2 Right of Entry

Persons or occupants of premises where wastewater is created or discharged shall allow the District, or its representatives, reasonable access to all parts of the wastewater generating and disposal facilities for the purposes of inspection and sampling during all times the discharger's facility is open, operating, or any other reasonable time. No person shall interfere with, delay, resist, or refuse entrance to authorized District's personnel attempting to inspect any facility involved directly or indirectly with a discharge of wastewater to the District's sewerage system

601.3 Notification of Spill or Slug Loading

A. In the event the discharger is unable to comply with any permit condition due to a breakdown of equipment, accidents, or human error, or the discharger has reasonable opportunity to know that the discharge will exceed the discharge provisions of the user's permit, Section 208, or any local wastewater discharge limitations adopted by the District, the discharger shall immediately notify the District by telephone. If the material discharged to the sewer has the potential to cause or result in a fire or explosion hazard, the discharger shall immediately notify the local fire department and the District.

B. Confirmation of this notification shall be made in writing no later than five (5) working days from the date of the incident. The written notification shall state the date of the incident, the reasons for the discharge or spill, what steps were taken to immediately correct the problem, and what steps are being taken to prevent the problem from recurring.

C. Such notification shall not relieve the user of any expense, loss, damage, or other liability which may be incurred as a result of damage or loss to the District or any other damage or loss to person or property; nor shall such notification relieve the user of any fees or other liability which may be imposed by this Ordinance or other applicable law.

601.4 Notification of Bypass

A. Bypass of industrial wastewater to the sewerage system is prohibited. The District may take enforcement action against the user, unless:

1. Bypass was unavoidable because it was done to prevent loss of life, personal injury, or severe property damage;

2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, elective slow-down or shut-down of production units or maintenance during periods of production downtime. This condition is not satisfied if adequate backup equipment could have been feasibly installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventative maintenance; and

3. The permittee submitted notices as required under Article 601.4 (B).

B. If a permittee knows in advance of the need for a bypass, it shall submit a written request to allow the bypass to the District, if possible, at least ten (10) days before the date of the bypass.

C. The District may approve an anticipated bypass at its sole discretion after considering its adverse effects, and the District determines that the conditions listed in 601.4 (A) (1-3) are met.

D. A permittee shall provide telephone notification to the District of an unanticipated bypass that exceeds its permitted discharge limits within four (4) hours from the time the permittee becomes aware of the bypass. A written report shall also be provided within five (5) days of the time the permittee becomes aware or could reasonably have been aware of the bypass. The report shall contain a description of the bypass and its cause; the duration of the bypass, including exact dates and times, and, if the bypass has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass. Failure to submit oral notice or written report may be grounds for permit revocation.

ARTICLE 7

ENFORCEMENT

701. PURPOSE AND SCOPE

A. The Board finds that in order for the District to comply with the laws, regulations and rules imposed upon it by Regulatory Agencies and to ensure that the District's sewerage facilities and treatment processes are protected and are able to operate with the highest degree of efficiency, and to protect the public health and environment, specific enforcement provisions must be adopted to govern the discharges to the District's sewerage system.

B. To ensure that all interested parties are afforded due process of law and that non-compliance and violations are resolved as soon as possible, the general policy of the District is that:

1. Any determination relating to a permit application, permit violation, Probation Order, or Enforcement Compliance Schedule Agreement (ECSA) will be made by the Program Manager, with a right of appeal by the permittee to the General Manager pursuant to the procedures set forth in Section 713.

2. A user, permittee, or applicant for a permit may request the Board to hear an appeal of the General Manager's decision pursuant to Section 715, except as set forth in Section 715.B. Such request may be granted or denied by the Board except where civil penalties have been awarded.

3. Actions and decisions by the Program Manager are made pursuant to a delegation of authority by the General Manager as authorized by Section 107 of this Ordinance.

C. The District, at its discretion, may utilize any one, combination, or all enforcement remedies in accordance with the District’s enforcement response plan to any permit or Ordinance violation. However, the District may take other action against any User when the circumstances warrant. Further, the District is empowered to take more than one enforcement action against any noncompliant user.

702. DETERMINATION OF NON-COMPLIANCE

A. Sampling Procedures

1. Sampling of all permittees shall be conducted in the time, place, manner, and frequency determined at the sole discretion of the District.

2. Non-compliance with mass emission rate limits, concentration limits, permit discharge conditions, or any discharge provision of this Ordinance may be determined by an analysis of a grab or composite sample of the effluent of a user. Non-compliance with mass emission rate limits shall be determined by an analysis of a composite sample of the user's effluent, except that a grab sample may be used to determine compliance with mass emission rate limits when the discharge is from a closed (batch) treatment system in which there is no wastewater flow into the system when the discharge is occurring, the volume of wastewater contained in the batch system is known, the time interval of discharge is known, and the grab sample is homogeneous and representative of the discharge.

3. All wastewater samples must be representative of the User's discharge. Wastewater monitoring and flow measurement facilities shall be properly operated, kept clean, and maintained in good working order at all times. The failure of a User to keep its monitoring facility in good working order shall not be grounds for the User to claim that sample results are unrepresentative of its discharge.

703. ENFORCEMENT PROCEDURES AND APPLICABLE FEES

A. Self-Monitoring Requirements as a Result of Non-Compliance

1. If analysis of any sample obtained by the District or by a permittee or user shows non-compliance with the applicable wastewater discharge limits set forth in the Ordinance or in the permittee's discharge permit, the District may impose self-monitoring requirements on the permittee or user.

2. A user shall perform required self-monitoring of constituents in a frequency, at the specific location, and in a manner directed by the District.

3. All analyses of self-monitoring samples shall be performed by an independent laboratory acceptable to the District and submitted to the District in a form and frequency determined by the District.

4. All self-monitoring costs shall be borne by the user.

5. Nothing in this section shall be deemed to limit the authority of the District to impose self-monitoring as a permit condition.

B. Purpose of Non-Compliance Sampling Fees

The purpose of the non-compliance sampling fee is to compensate the District for costs of additional sampling; monitoring, laboratory analysis, sample treatment, disposal, and administrative processing incurred as a result of the non-compliance and shall be in addition to and not in lieu of any penalties as may be assessed pursuant to Sections 711 and 712. Non-compliance fees are established by Resolution and are amended from time to time to reflect the cost of providing additional oversight to remedy non-compliance with the provisions of this Ordinance or wastewater discharge permit.

C. Non-Compliance Sampling Fees for Composite Samples

1. Each violation of a permittee's permit discharge limit or condition is a violation of this Ordinance. If analysis of any composite sample of a permittee's discharge obtained by the District shows a violation by the permittee of the mass emission rates or concentration limits specified in the permittee's discharge permit or in this Ordinance, then the District may impose non-compliance sampling fees pursuant to fee schedules adopted by the District's Board of Directors.

2. The fees specified in District's resolution for fees and charges 2021-1143, or as superseded, shall be imposed for each date on which the District conducts sampling as a result of a violation by a permittee.

D. Non-Compliance Sampling Fees for Grab Samples and Self-Monitoring Results

1. If analysis of any grab sample analysis of a permittee's discharge shows non-compliance with any concentration limits as set forth in the user's permit or in Section 208, the District may impose non-compliance sampling fees, pursuant

to fee schedules adopted by the District's Board, for sampling conducted by the District as a result of a violation by the permittee.

2. If any self-monitoring analysis of a permittee's discharge shows non-compliance with any concentration limits or mass emission rates as set forth in the user's permit or in this Ordinance, the District may impose non-compliance sampling fees, pursuant to fee schedules adopted by the District's Board of Directors, for sampling conducted by the District as a result of a violation by the Permittee.

E. Requirement to Resample

In accordance with 40 CFR 403.12(g)(2), if sampling performed by a User indicates a violation, the User shall notify the District within 24 hours of becoming aware of the violation. The User shall also repeat the sampling and analysis and submit the results of the repeat analysis to the District within 30 days after becoming aware of the violation. Where the District has performed the sampling and analysis in lieu of the User, the District must perform the repeat sampling and analysis unless it notifies the User of the violation and requires the User to perform the repeat analysis.

703.1 Administrative Orders

A. Cease and Desist Orders

Whenever the General Manager finds that a violation of this Ordinance, or the provisions of any discharge permit issued pursuant to this Ordinance has occurred, the General Manager may issue a Cease-and-Desist Order and direct that those persons not complying with such prohibitions, limitations, requirements or provisions:

1. Cease discharge immediately; or

2. Comply immediately; or

3. Comply in accordance with a time schedule set forth by the District.

703.2 Probation Order

A. Grounds

In the event the General Manager determines that a User has violated any provisions of this Ordinance, or the terms, conditions, and limits of its discharge permit, or has not made payment of all amounts owed to the District for user charges, non-compliance fees or any other fees, the General Manager may issue a Probation Order, whereby the user must comply with all directives, conditions, and requirements therein within the time prescribed.

B. Provisions

The issuance of a Probation Order may contain terms and conditions including but not limited to, installation of pretreatment equipment and facilities, requirements for self-monitoring, submittal of drawings or technical reports, operator certification, audit of waste minimization practices, payment of fees, limits on rate and time of discharge, or other provisions to ensure compliance with this Ordinance.

C. Probation Order-Expiration

A Probation Order issued by the General Manager shall be in effect for a period not to

exceed ninety (90) days.

703.3 Enforcement Compliance Schedule Agreement (ECSA)

A. Grounds

Upon determination that a User is in non-compliance with the terms, conditions or limits specified in its permit or any provision of this Ordinance, and needs to modify, construct and/or acquire and install equipment and/or facilities, the General Manager may require the User to enter into an ECSA. An ECSA will, upon the effective date of the ECSA, amend a permittee's permit. The ECSA shall contain terms and conditions by which a User must operate during its term and shall provide specific dates for achieving compliance with each term and condition for construction, modification and/or acquisition and installation of required equipment.

B. Provisions

The issuance of an ECSA may contain terms and conditions including but not limited to requirements for self-monitoring, modification and/or installation of equipment and/or facilities, submittal of drawings or reports, operator certification, audit of waste minimization practices, payment of fees, limits on rate and time of discharge, deposit of performance guarantee, or other provisions to ensure compliance with this Ordinance.

C. ECSA - Payment of Amounts Owed

The District shall not enter into an ECSA until such time as all amounts owed to the District, including user fees, non-compliance sampling fees, deposits, or other amounts due are paid in full, or an agreement for deferred payment secured by collateral or a third party, is approved by the General Manager. Failure to pay all amounts owed to the District shall be grounds for enforcement action to include but not limited to permit suspension or permit revocation as set forth in Section 704 and 705.

D. ECSA - Discharge Suspension/Revocation

If compliance is not achieved in accordance with the terms and conditions of an ECSA during its term, the General Manager may issue an order suspending or revoking discharge privileges and/or a user's discharge permit pursuant to Section 704 and 705 of this Ordinance.

704. SUSPENSION OF DISCHARGE

A. Grounds

The General Manger may suspend any discharge and/or permit when it is determined that a user:

1. Fails to comply with the terms and conditions of an Enforcement Compliance Schedule Agreement (ECSA.)

2. Knowingly provides a false statement, representation, record, report, or other document to the District.

3. Refuses to provide records, reports, plans, or other documents required by the District to determine permit terms, conditions or limits, discharge compliance, or compliance with this Ordinance.

4. Falsifies, tampers with, or knowingly renders inaccurate any monitoring device or sample collection method.

5. Fails to report significant changes in operations or wastewater constituents and characteristics.

6. Violates a Probation Order.

7. Refuses reasonable access to the user's premises for the purpose of inspection and monitoring.

8. Does not make timely payment of all amounts owed to the District for user charges, non-compliance sampling fees, permit fees, or any other fees imposed pursuant to this Ordinance.

9. Violates any provision of the District's Ordinance or any condition or limit of the user's discharge permit.

B. Notice/Hearing

When the General Manager has reason to believe that grounds exist for discharge suspension, the General Manager shall give written notice thereof by personal service or certified mail to the user setting forth a statement of the facts and grounds deemed to exist, together with the time and place where the charges shall be heard by the General Manager's designee. The hearing date shall be not less than fifteen (15) calendar days nor more than forty-five (45) calendar days after the mailing of such notice.

1. At the suspension hearing, the user shall have an opportunity to respond to the allegations set forth in the notice by presenting written or oral evidence. The hearing shall be conducted in accordance with procedures established by the General Manager and approved by the District's General Counsel.

2. After the conclusion of the hearing, the General Manager's designee shall submit a written report to the General Manager setting forth a brief statement of facts found to be true, a determination of the issues presented, conclusions, and a recommendation.

   Upon receipt of the written report, the General Manager shall make the determination, and should the General Manager find that grounds exist for suspension of the discharge shall issue a decision and order in writing within thirty (30) calendar days after the conclusion of the hearing by the designee. The written decision and order of the General Manager shall be personally served or sent by certified mail to the user or its legal counsel/representative at the user's address. In the event that the General Manager determines not to suspend the discharge, the General Manager may order other enforcement actions as appropriate to prevent non-compliance with Ordinance or the user's discharge permit.

C. Effect

1. Upon an order of suspension by the General Manager becoming final, the user shall immediately cease and desist its discharge and shall have no right to discharge any wastewater, directly or indirectly to the District's sewerage system for the duration of the suspension. All costs for physically terminating and reinstating service shall be paid by the user.

2. Any owner or responsible management employee of a business entity or permittee shall be bound by the order of suspension.

3. An order of discharge suspension issued by the General Manager shall be final in all respects on the sixteenth (16th) day after it is personally served or mailed to the user unless a request for hearing is filed with the Board pursuant to Section 715 no later than 4:00 p.m. on the fifteenth (15th) day following such personal service or mailing.

705. PERMIT REVOCATION

A. Grounds

The General Manager may revoke any permit when it is determined that a permittee:

1. Knowingly provides a false statement, representation, record, report, or other document to the District.

2. Refuses to provide records, reports, plans, or other documents required by the District to determine permit terms, conditions, or limits, discharge compliance, or compliance with this Ordinance.

3. Falsifies, tampers with, or knowingly renders inaccurate any monitoring device or sample collection method.

4. Fails to report significant changes in operations or wastewater constituents and characteristics.

5. Fails to comply with the terms and conditions of an ECSA, permit suspension or probation order.

6. Discharges effluent to the District's sewerage system while its permit is suspended.

7. Refuses reasonable access to the permittee's premises for the purpose of inspection and monitoring.

8. Does not make timely payment of all amounts owed to the District for user charges, non-compliance sampling fees, permit fees, or any other fees imposed pursuant to this Ordinance.

9. Causes interference with the District's collection, treatment, or disposal system.

10. Fails to submit oral notice or written report of bypass occurrence.

11. Violates any condition or limit of its discharge permit or any provision of the District's Ordinance.

B. Notice/Hearing

When the General Manager has reason to believe that grounds exist for the revocation of a permit, the General Manager shall give written notice by personal service or certified mail thereof to the permittee setting forth a statement of the facts and grounds deemed to exist together with the time and place where the charges shall be heard by the General Manager's designee. The hearing date shall be not less than fifteen (15) calendar days nor more than sixty (60) calendar days after the personal service or

mailing of such notice.

1. At the hearing, the permittee shall have an opportunity to respond to the allegations set forth in the notice by presenting written or oral evidence. The revocation hearing shall be conducted in accordance with the procedures established by the General Manager and approved by the District's General Counsel.

2. After the conclusion of the hearing, the General Manager's designee shall submit a written report to the General Manager setting forth a brief statement of facts found to be true, a determination of the issues presented, conclusions, and a recommendation.

3. Upon receipt of the written report, the General Manager shall make the determination, and should the General Manager find that grounds exist for permanent revocation of the permit, shall issue a decision and order in writing within thirty (30) calendar days after the conclusion of the hearing by the designee. The written decision and order of the General Manager shall be personally served or sent by certified mail to the permittee or its legal counsel/representative at the permittee's business address.

4. In the event the General Manager determines to not revoke the permit the General Manager may order other enforcement actions, including, but not limited to, a temporary suspension of the permit, under terms and conditions that are deemed appropriate.

C. Effect

1. Upon an order of revocation by the General Manger becoming final, the permittee shall permanently lose all rights to discharge any industrial wastewater directly or indirectly to the District's system. All costs for physical termination shall be paid by the permittee.

2. Any owner or responsible management employee of the permittee shall be bound by the order of revocation.

3. Any future application for a permit at any location within the District by any person subject to an order of revocation will be considered by the District after fully reviewing the records of the revoked permit, which records may be the basis for denial of a new permit.

4. An order of permit revocation issued by the General Manger shall be final in all respects on the sixteenth (16th) day after it is personally served or mailed to the permittee unless a request for hearing is filed with the Board pursuant to Section 715 no later than 4:00 p.m. on the fifteenth (15th) day following such personal service or mailing.

706. DAMAGE TO FACILITIES OR INTERRUPTION OF NORMALOPERATIONS

A. Any person who discharges any waste which causes or contributes to any obstruction, interference, damage, or any other impairment to the District's sewerage facilities or to the operation of those facilities shall be liable for all costs required to clean or repair the facilities together with expenses incurred by the District to resume normal operations. Such discharge shall be grounds for suspension of discharge or permit revocation. A service charge of twenty-five percent (25%) of District's costs shall be added to the costs and charges to reimburse the District for miscellaneous overhead, including

administrative personnel and record keeping. The total amount shall be payable within forty-five (45) days of invoicing by the District.

B. Any person who discharges waste which causes or contributes to the District,

1. violating its discharge requirements established by any Regulatory Agency; or

2. incurring additional expenses or suffering losses or damage to the facilities,

shall be liable for any costs or expenses incurred by the District, including regulatory fines, penalties, and assessments made by other agencies or a court.

707. INDUSTRIAL WASTE PASS THROUGH

Any person whose discharge results in a pass-through event affecting the District or its sewerage facilities shall be liable for all costs associated with the event, including treatment costs, regulatory fines, penalties, assessments, and other indirect costs. The discharger shall submit to the District plans to prevent future recurrences to the satisfaction of the District.

708. TERMINATION OF SERVICE

A. The District, by order of the General Manager, may physically terminate sewerage service to any property as follows:

1. On a term of any order of emergency suspension or revocation of a permit; or

2. Upon the failure of a person not holding a valid discharge permit to immediately cease discharge, whether direct or indirect, to the District's sewerage facilities.

B. All costs for physical termination shall be paid by the user as well as all costs for reinstating service.

709. EMERGENCY SUSPENSION ORDER

A. The District may, by order of the General Manager, suspend sewerage service when the General Manager determines that such suspension is necessary in order to stop an actual or impending discharge which presents or may present an imminent or substantial endangerment to the health and welfare of persons, or to the environment, or may cause interference to the District's sewerage facilities, or may cause the District to violate any State or Federal Law or Regulation. Any discharger notified of and subject to an Emergency Suspension Order shall immediately cease and desist the discharge of all industrial wastewater to the sewerage system.

B. As soon as reasonably practicable following the issuance of an Emergency Suspension Order, but in no event more than five (5) days following the issuance of such order, the General Manager shall hold a hearing to provide the user the opportunity to present information in opposition to the issuance of the Emergency Suspension Order. Such a hearing shall not stay the effect of the Emergency Suspension Order. The hearing shall be conducted in accordance with procedures established by the General Manager and approved by the District's General Counsel. The General Manager shall issue a written decision and order within two (2) business days following the hearing, which decision shall be personally served or sent by certified mail to the user or its legal counsel/ representative at that user's business address. The decision of the General Manager following the hearing shall be final and not subject to appeal.

710. INJUNCTION

Whenever a discharger of wastewater is in violation of or has the reasonable potential to violate any provision of this Ordinance, permit condition, or any Federal Pretreatment Standard or requirement as set forth in 40 CFR Section 403.8 et seq., fails to submit required reports, or refuses to allow the District entry to inspect or monitor the user's discharge, the District may petition the appropriate court for the issuance of a preliminary or permanent injunction, or both, as may be appropriate to restrain the continued violation or to prevent threatened violations by the discharger.

711. CIVIL PENALTIES

A. Authority

All users of the District's sewerage system and facilities are subject to enforcement actions administratively or judicially by the District, U.S. EPA, State of California Regional Water Quality Control Board, or the County of Riverside District Attorney. Said actions may be taken pursuant to the authority and provisions of several laws, including, but not limited to:

1. Federal Water Pollution Control Act, commonly known as the Clean Water Act (33 U.S.C. Section 1251 et seq.);

2. California Porter-Cologne Water Quality Act (California Water Code Section 13000 et seq.);

3. California Hazardous Waste Control Law (California Health & Safety Code Sections 25100 to 25250);

4. Resource Conservation and Recovery Act of 1976 (42 U.S.C. Section 6901 et seq.); and

5. California Government Code, Sections 54739-54740.6.

B. Recovery of Fines or Penalties

In the event the District is subject to the payment of fines or penalties pursuant to the legal authority and actions of other regulatory or enforcement agencies based on a violation of law or regulation or its permits, and said violation can be established by District, as caused by the discharge of any user of the District's sewerage system which is in violation of any provision of the District's Ordinance or the user's permit, District shall be entitled to recover from the user all costs and expenses, including, but not limited to, the full amount of said fines or penalties to which it has been subjected.

C. Ordinance

Pursuant to the authority of California Government Code Sections 54739-54740.6, any person who violates any provision of this Ordinance; any permit condition, prohibition or effluent limit; or any suspension or revocation order shall be liable civilly for a sum not to exceed $25,000.00 per violation for each day in which such violation occurs. Pursuant to the authority of the Clean Water Act, 33 U.S.C. Section 1251 et seq., any person who violates any provision of this Ordinance, or any permit condition, prohibition, or effluent limit shall be liable civilly for a sum not to exceed $25,000.00 per violation for each day in which such violation occurs. The General Counsel of the District, upon order of the General Manager, shall petition the appropriate court to impose, assess, and recover such penalties, or such other penalties as the District may impose, assess, and recover

pursuant to Federal and/or State Legislative authorization.

D. Administrative Civil Penalties

1. Pursuant to the authority of California Government Code Sections 54740.5 and 54740.6, the District may issue an administrative complaint to any person who violates:

   a) any provision of this Ordinance;

   b) any permit condition, prohibition, or effluent limit; or

   c) any suspension or revocation order.

2. The administrative complaint shall be served by personal delivery or certified mail on the person and shall inform the person that a hearing will be conducted and shall specify a hearing date within sixty (60) days following service. The administrative complaint will allege the act or failure to act that constitutes the violation of the District's requirements, the provisions of law authorizing civil liability to be imposed, and the proposed civil penalty. The matter shall be heard by the General Manager or designee. The person to whom an administrative complaint has been issued may waive the right to a hearing, in which case a hearing will not be conducted.

3. At the hearing, the person shall have an opportunity to respond to the allegations set forth in the administrative complaint by presenting written or oral evidence. The hearing shall be conducted in accordance with the procedures established by the General Manager and approved by the District's General Counsel.

4. After the conclusion of the hearing, the General Manager's designee shall submit a written report to the General Manager setting forth a brief statement of the facts found to be true, a determination of the issues presented, conclusions, and a recommendation.

5. Upon receipt of the written report, the General Manager shall make a determination, and should the General Manager find that grounds exist for assessment of a civil penalty against the person, shall issue a decision and order in writing within thirty (30) calendar days after the conclusion of the hearing by the designee.

6. If, after the hearing or appeal, if any, it is found that the person has violated reporting or discharge requirements, the General Manager or Board may assess a civil penalty against that person. In determining the amount of the civil penalty, the General Manager or Board may take into consideration all relevant circumstances, including but not limited to the extent of harm caused by the violation, the economic benefit derived through any non-compliance, the nature and persistence of the violation, the length of time over which the violation occurs, and corrective action, if any, attempted or taken by the person involved.

7. Civil penalties may be assessed as follows:

   a) In an amount which shall not exceed two thousand dollars ($2,000.00) for each day for failing or refusing to furnish technical or monitoring reports;

b) In an amount which shall not exceed three thousand dollars ($3,000.00) for each day for failing or refusing to timely comply with any compliance schedules established by the District;

c) In an amount which shall not exceed five thousand dollars ($5,000.00) per violation for each day of discharge in violation of any waste discharge limit, permit condition, or requirement issued, reissued, or adopted by the District;

d) In any amount which does not exceed ten dollars ($10.00) per gallon for discharges in violation of any suspension, revocation, cease and desist order or other orders, or prohibition issued, reissued, or adopted by the District.

8. An order assessing administrative civil penalties issued by the General Manager shall be final in all respects on the thirty-first (31st) day after it is served on the person unless an appeal and request for hearing is filed with the Board pursuant to Section 715 no later than the thirtieth (30th) day following such personal service or mailing. An order assessing administrative civil penalties issued by the Board shall be final upon issuance.

9. Copies of the administrative order shall be served on the party served with the administrative complaint, either by personal service or by registered mail to the person at the business or residence address, and upon other persons who appeared at the hearing and requested a copy of the order.

10. Any person aggrieved by a final order issued by the Board, after granting review of the order of the General Manager, may obtain review of the order of the Board in the Superior Court, pursuant to Government Code Section 54740.6, by filing in the court a petition for writ of mandate within thirty (30) days following the service of a copy of the decision or order issued by the Board.

11. Payment of any order setting administrative civil penalties shall be made within thirty (30) days of the date the order becomes final. The amount of any administrative civil penalties imposed which have remained delinquent for a period of sixty (60) days shall constitute a lien against the real property of the discharger from which the discharge resulting in the imposition of the civil penalty originated. The lien shall have no effect until recorded with the county recorder. The District may record the lien for any unpaid administrative civil penalties on the ninety-first (91st) day following the date the order becomes final.

12. No administrative civil penalties shall be recoverable under Section 711.D for any violation for which the District has recovered civil penalties through a judicial proceeding filed pursuant to Government Code Section 54740.

712. CRIMINAL PENALTIES

Any person who violates any provision of this Ordinance is guilty of a misdemeanor, which upon conviction is punishable by a fine not to exceed $1,000.00, or imprisonment for not more than thirty (30) days, or both pursuant to Health and Safety Code Section 6523. Each violation and each day in which a violation occurs may constitute a new and separate violation of this Ordinance and shall be subject to the penalties contained herein.

713. APPEALS TO GENERAL MANAGER

A. General

Any user, permit applicant or permittee affected by any decision, action or determination made by the General Manager's authorized representative may file with the General Manager a written request for an appeal hearing. The request must be sent by certified mail or hand delivered to be received by the District within thirty (30) days of mailing of notice of the decision, action, or determination of the District to the appellant. The request for hearing shall set forth in detail all facts supporting the appellant's request.

B. Notice

The General Manager shall, within fifteen (15) days of receiving the request for appeal, and pursuant to Section 713.A, provide written notice to the appellant of the hearing date, time, and place. The hearing date shall not be more than thirty (30) days from the mailing of such notice by certified mail to the appellant unless a later date is agreed to by the appellant. If the hearing is not held within said time due to actions or inactions of the appellant, then the staff decision shall be deemed final.

C. Hearing

At the hearing, the appellant shall have the opportunity to present information, supporting its position concerning the staff's decision, action, or determination. The hearing shall be conducted in accordance with procedures established by the General Manager and approved by the District's General Counsel.

D. Written Determination

After the conclusion of the hearing, the General Manager (or other designee) shall prepare a report setting forth a brief statement of facts found to be true, a determination of the issues presented, conclusions, and a recommendation whether to uphold, modify or reverse the staff's original decision, action, or determination. The General Manager shall make a determination and shall issue a decision and order within thirty (30) calendar days of the hearing by the designee. The written decision and order of the General Manager shall be personally served or sent by certified mail to the appellant or its legal counsel/representative at the appellant's business address.

The order of the General Manager shall be final in all respects on the thirty-first (31st) day after it is mailed to the appellant unless a request for hearing is filed with the Board pursuant to Section 715, no later than 5:00 p.m. on the thirtieth (30th) day following such mailing.

714. PAYMENT OF CHARGES

A. Except as otherwise provided, all fees, charges and penalties established by this Ordinance are due and payable upon receipt of notice thereof. All such amounts are delinquent if unpaid forty-five (45) days after date of invoice.

B. Any charge that becomes delinquent shall have added to it a penalty in accordance with the following:

1. Forty-six (46) days after date of invoice, a basic penalty of ten percent (10%) of the base invoice amount, not to exceed a maximum of $1,000.00; and

2. A penalty of one and one-half percent (1.5%) per month of the base invoice

amount and basic penalty shall accrue from and after the forty sixth (46th) day after date of invoice.

C. Any invoice outstanding and unpaid after ninety (90) days shall be cause for immediate initiation of permit suspension or revocation proceedings.

D. Penalties charged under this Section shall not accrue to those invoices successfully appealed, provided the District receives written notification of said appeal prior to the payment due date.

E. Payment of disputed charges is still required by the due date during District review of any appeal submitted by permittees.

715. APPEALS TO THE BOARD

A. General

Any user, permit applicant, or permittee adversely affected by a decision, action, or determination made by the General Manager may, prior to the date that the General Manager's order becomes final, file a written request for hearing before the Board accompanied by an appeal fee in the amount established by a separate resolution of the District's Board. The request for hearing shall set forth in detail all the issues in dispute for which the appellant seeks determination and all facts supporting appellant's request.

No later than sixty (60) days after receipt of the request for hearing, the Board shall either set the matter for a hearing or deny the request for a hearing.

A hearing shall be held by the Board within sixty-five (65) days from the date of determination granting a hearing unless a later date is agreed to by the appellant and the Board. If the matter is not heard within the required time, due to actions or inactions of the appellant, the General Manager's order shall be deemed final.

B. Granting Request for a Civil Hearing.

The Board shall grant all requests for a hearing on appeals concerning permit suspension, revocation, or denial, and civil administrative penalty awards. Whether to grant or deny the request for a hearing on appeals of other decisions of the General Manager shall be within the sole discretion of the Board.

C. Appeal Fee Refund

The appeal fee shall be refunded if the Board denies a hearing or reverses or modifies, in favor of the appellant, the order of the General Manager. The fee shall not be refunded if the Board denies the appeal.

D. Written Determination

After the hearing, the Board shall make a determination whether to uphold, modify, or reverse the decision, action, or determination made by the General Manager.

The decision of the Board shall be set forth in writing within sixty-five (65) days after the close of the hearing and shall contain a finding of the facts found to be true, the determination of the issues presented, and the conclusions. The written decision and order of the Board shall be personally served or sent by certified mail to the appellant or its legal counsel/representative at the appellant's business address.

The order of the Board shall be final upon its adoption. In the event the Board fails to reverse or modify the General Manager's order, it shall be deemed affirmed.

715.1 Appeals of Charges and Fees

Any user, permit applicant, or permittee affected by any decision, action, or determination by the District, relating to fiscal issues of the District in which the user, applicant, or permittee is located, including but not limited to the imposition and collection of fees, such as connection charges, sewer use charges, and special purpose discharge use charges, may request that the District reconsider imposition of such fees or charges. Following review of such a request, the District shall notify the user, permit applicant, or permittee by personal service or certified mail of the District's decision on the reconsideration request. Any user, permit applicant, or permittee adversely affected by the District's decision on the reconsideration request may file an appeal which shall be heard by the Board. The notice of appeal must be received by the District within thirty (30) days of the personal service or mailing of the District's decision on the reconsideration request.

Notwithstanding the foregoing, appeals of non-compliance sampling fees shall be made pursuant to the appeal procedures set forth in Sections 713 and 715.

716. RECOVERY OF COSTS INCURRED BY DISTRICT

In the event any person violates any of the terms and conditions of this Ordinance, or any order, permit, or agreement issued pursuant to this Ordinance, the District shall be entitled to all costs incurred correcting the violation, including but not limited to all construction spill response costs, and reasonable attorney's fees and costs which may be incurred in order to enforce any of said terms and conditions, with or without filing proceedings in court.

717. FINANCIAL SECURITY/AMENDMENTS TO PERMIT

A. Compliance Deposit

Users that have been subject to enforcement and/or collection proceedings may be required to deposit with the District an amount determined by the General Manager as necessary to guarantee payment to District of all charges, fees, penalties, costs, and expenses that may be incurred in the future, before permission is granted for further discharge to the sewer.

B. Delinquent Accounts

The District may require an amendment to the permit of any permittee who fails to make payment in full of all fees and charges assessed by the District, including reconciliation amounts, delinquency penalties, and other costs or fees incurred by Permittee.

C. Bankruptcy

Every Permittee filing any legal action in any court of competent jurisdiction, including the United States Bankruptcy court, for purposes of discharging its financial debts or obligations or seeking court-ordered protection from its creditors, shall, within ten (10) days of filing such action, apply for and obtain the issuance of an amendment to its permit.

D. Permit Amendments

The District shall review and examine Permittee's account to determine whether previously incurred fees and charges have been paid in accordance with time

requirements prescribed by this Ordinance. The District may thereafter issue an amendment to the User's permit in accordance with the provision of Article 4 and Section 717 (E) of this Ordinance.

E. Security

An amendment to a waste discharge permit issued pursuant to Sections 717 (B), (C), and (D), may be conditioned upon the Permittee depositing financial security in an amount equal to the average total fees and charges for two (2) calendar quarters during the preceding year. Said deposit shall be used to guarantee payment of all fees and charges incurred for future services and facilities furnished by District and shall not be used by the District to recover outstanding fees and charges incurred prior to the Permittee filing and receiving protection from creditors in the United States Bankruptcy Court.

F. Return of Security

In the Event the Permittee makes payment in full within the time prescribed by this Ordinance of all fees and charges incurred over a period of two (2) years following the issuance of an amendment to the permit pursuant to Sections 717 (B), (C), and (D), the District shall either return the security deposit posted by the Permittee or credit it's account.

718. JUDICIAL REVIEW

A. Purpose and Effect

Pursuant to Section 1094.6 of the California Code of Civil procedure, the District hereby enacts this section to limit to ninety (90) days following final decisions in adjudicatory administrative hearings the time within which an action can be brought to review such decisions by means of administrative mandamus.

B. Definitions

As used in this Section, the following terms and words shall have the following meanings:

1. Decision shall mean and include adjudicatory administrative decisions that are made after hearing, after an award of civil penalties pursuant to Section 711.D, after revoking, suspending, or denying an application for a permit or a license, or after other administrative hearings required to enforce this chapter.

2. Complete Record shall mean and include the transcript, if any exists, of the proceedings, all pleadings, all notices and orders, any proposed decision by the General Manager, the final decision, all admitted exhibits, all rejected exhibits in the possession of the District or its offices or agents, all written evidence, and any other papers in the case.

C. Time Limit for Judicial Review

Judicial review of any decision of the District or its officer or agent may be made pursuant to Section 1094.5 of the Code of Civil Procedure only if the petition for writ of mandate is filed not later than the ninetieth (90th) day following the date on which the decision becomes final. If there is no provision for reconsideration in the procedures governing the proceedings or if the date is not otherwise specified, the decision is final on the date it is made. If there is provision for reconsideration, the decision is final upon

the expiration of the period during which such reconsideration can be sought; provided that if reconsideration is sought pursuant to such provision the decision is final for the purposes of this Section on the date that reconsideration is rejected.

D. Preparation of the Record

The complete record of the proceedings shall be prepared by the District officer or agent who made the decision and shall be delivered to the petitioner within ninety (90) days after the petitioner has filed written request, therefore. The District may recover from the petitioner its actual costs for transcribing or otherwise preparing the record.

E. Extension

If the petitioner files a request for the record within ten (10) days after the date the decision becomes final, the time within which a petition, pursuant to Section 1094.5 of the Code of Civil Procedure, may be filed shall be extended to not later than the thirtieth (30th) day following the date on which the record is either personally delivered or mailed to the petitioner or the petitioner's attorney of record, if appropriate.

F. Notice

In making a final decision, the District shall provide notice to the person (s) subject to the administrative decision, that the time within which judicial review must be sought is governed by Section 1094.6 of the Code of Civil Procedure.

G. Administrative Civil Penalties

Notwithstanding the foregoing in Section 718, and pursuant to Government Code Section 54740.6, judicial review of an order of the Board imposing administrative civil penalties pursuant to Section 711.D may be made only if the petition for writ of mandate is filed not later than the thirtieth (30th) day following the day on which the order of the Board becomes final.

ARTICLE 8

SEVERABILITY

801. SEVERABILITY

If any provision of this Ordinance or the application to any person or circumstances is held invalid, the remainder of the Ordinance or the application of such provision to other persons or other circumstances shall not be affected.

ARTICLE 9

REPEAL

901. REPEAL

Ordinance No. 2010-118 is hereby superseded in its entirety on the effective date hereof and shall be of no further force or effect. All Ordinances, resolutions, policies, rules, and regulations which are inconsistent with this Ordinance are hereby superseded to the extent that they are inconsistent with the provisions of this Ordinance.

ARTICLE 10

EFFECTIVE DATE

1001 EFFECTIVE DATE

The effective date of this Ordinance shall be September 27, 2022.

ADOPTED this 27th day of September, 2022

Scott A. Sear
President of the Board

September 27, 2022

I HEREBY CERTIFY that the foregoing is a full, true, and correct copy of Ordinance No 2022-121 adopted by the Board of Directors of Valley Sanitary District of Riverside County at its Regular Meeting held September 27, 2022.

Debra A. Canero
Vice President of the Board

ATTEST:

Dennis M. Coleman
Secretary/Treasurer

Appendix C

Correspondence & Agreements

VALLEY SANITARY DISTRICT
REQUIRED PROOF OF CAPACITY TO SIGN LEGAL DOCUMENTS

In order for VSD to complete the processing of your documents, please furnish the following documents, as applicable:

If you hold title or will be taking title as a Corporation, please provide the following:

1. If incorporated outside of California, a current Certificate of Good Standing from the Secretary of State where incorporated
2. In an ecclesiastical corporation, submission of Articles of Incorporation and By-Laws, along with any additional documentation that may be required pursuant to our review
3. If not an ecclesiastical corporation, any instrument in writing in the name of the corporation may be relied upon if it is signed by any one of the following officers:
    a. The Chairman of the Board of Directors
    b. The President
    c. The Vice President

PROVIDED IT IS ALSO SIGNED BY ANY ONE OF THE FOLLOWING ADDITIONAL OFFICERS:

a. The Secretary
b. Any Assistant Secretary
c. Chief Financial Officer
d. Assistant Treasurer

If the above combination of signatures is not provided, an acceptable Corporate Resolution must be submitted that approves the contemplated transaction and sets forth the authorized corporate officer(s) approved to execute the documents.

If you hold title or will be taking title as a Limited Liability Company, please provide the following:

1. Full copy of Operating Agreement and all amendments
2. If filed outside of California, a current Certificate of Good Standing from the Secretary of State where filed

If you hold title or will be taking title as a General Partnership, please provide the following:

1. Full copy of Partnership Agreement and all amendments; or a copy of its GP-1 and all amendments filed with Secretary of State, if applicable

If you hold title or will be taking title as a Limited Partnership, please provide the following:

1. Full copy of Partnership Agreement and all amendments
2. If filed outside of California, a current Certificate of Good Standing from the Secretary of State where filed

If you hold title in a Trust, and any of the original or successor trustees are now deceased or mentally incapacitated, or if the trust is other than a family trust for the benefit of the trustees, please provide the following:

1. Full copy of the Trust and any amendments
2. Any additional documentation that may be required pursuant to our review of the Trust

RECORDING REQUESTED BY AND
WHEN RECORDED MAIL TO:
Valley Sanitary District
45-500 Van Buren
Indio, CA 02201

_____ (Space above this line for Recorder's Use)

PLEASE TYPE ALL INFORMATION

DEVELOPMENT--SANITATION SYSTEM INSTALLATION AGREEMENT

Date of Agreement_____

Name of Developer_____
(Referred to as "Developer")

Project Name_____

Location_____
(also attach a vicinity map with legal)

City/County_____

Improvement Plans for the _____

_____

This Agreement is made and entered into by and between Valley Sanitary District, a public agency of the State of California, hereafter referred to as District, and the Developer.

RECITALS

1. Developer has presented to District for approval plans for a development project with_____Units of Service that have approval of the City of Indio.

2. Developer is desirous of having District provide domestic sanitary sewer service to said project and is willing to install, complete and transfer to District the sanitary sewer system necessary therefore after the construction of the system, at Developer's own expense, in accordance with District's regulations. District is willing to accept such transfer and to provide domestic sanitary sewer service to said project on the terms and conditions set forth herein.
3. Complete Improvement Plans for the construction, installation, and completion of the improvements have been prepared by Developer and approved by the District. The Improvement Plans as referenced in this Agreement are on file in the District offices and are incorporated into this Agreement by this reference.
4. An estimate of the cost for construction and improvement for purposes of security is $_____ as set by bid or District estimate_____.

5. The District has adopted standards for the construction and installation of improvements within the District. The Improvement Plans were approved on the_____day of

_____, 2013 in conformance with District Standard Specifications.

6. Developer recognizes that approval of the project confers substantial rights to sell or lease parts of said project. As a result, District will be damaged to the extent of the cost of installation of improvements by Developer's failure to perform its obligations under this Agreement. District shall be entitled to all remedies available to it pursuant to this Agreement and law in the event of a default by Developer.

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. Developer's Obligation to Construct Improvements.

DEVELOPER SHALL:

A. Comply with all the requirements of the District's specifications for construction of sewer system, including, manholes, pipelines, laterals, pump stations and appurtenances. Developer shall construct the improvements in accordance with the District standards in effect at the time of the issuance of permits and execution of this Agreement. District reserves the right to modify the standards applicable to the project and this Agreement, when necessary to protect the public safety or welfare or comply with applicable State or federal law.

B. Obtain all required permits. The contractor employed to construct the sanitary sewer system shall be licensed by the State of California for these types of construction.

C. Complete at Developer's own expense, all the public improvement work required in conformance with the Improvement Plans and specifications.

D. Acquire and dedicate all rights-of-way, easements and other interests in real property for construction, installation of the public improvements, and maintenance of the improvements, free and clear of all liens and encumbrances.

E. In the event exercise State Eminent Domain Law is required, an order of possession shall be obtained and the Developer shall comply with all aspects of the order.

2. Security:

Developer shall at all times guarantee Developer's performance of this agreement by furnishing to District, and maintaining, good and sufficient security as required by District for the purposes and in the amounts as follows:

A. to assure faithful performance of this Agreement in regard to said improvements in an amount of 100% of the estimated cost of the sewer improvements; and

B. to secure payment to any contractor, subcontractor, persons renting equipment, or furnishing labor and or materials for the improvements required to be constructed or installed pursuant to this Agreement in the additional amount of 50% of the estimated cost of the sewer improvements; and

C. to guarantee or warranty the work done pursuant to this Agreement for a period of one year following acceptance thereof by the District against any defective work or

labor done or defective materials furnished in the additional amount of 10% of the estimated cost of the improvement.

A security may be a Surety bond acceptable to the District; or, an irrevocable standby letter of credit or certificate of deposit from a bank or savings and loan located and doing business in the State of California. The security shall name the District as sole beneficiary and with the sole right of withdrawal for the purposes cited in this Agreement within ten (10) days notice by certified mail to the Developer at the address shown herein.

The securities required by this agreement shall be kept on file with the District Secretary. The terms of the security documents are incorporated into this Agreement by reference. f any security is replaced by another approved security, the replacement shall be deemed to have been made a part of and incorporated into this Agreement. Upon filing of a replacement security with the District, the former security may be released.

3. Alterations to Improvement Plans.

Any Changes, alterations or additions to the improvement plans and specifications or to the improvements, not exceeding 10% of the original estimated cost of the improvement, which are mutually agreed upon by the District and Developer, shall not relieve the improvement security given for faithful performance of this Agreement. In the event changes, alterations, or additions exceed 10% of the original estimated cost of the improvement, Developer shall provide improvement security for faithful performance as required by Paragraph 2 of this Agreement for 100% of the total estimated cost of the improvement as changed, altered, or amended, minus any completed partial releases allowed by Section 5 of this Agreement.

4. Inspection.

Developer shall at all times maintain proper facilities and safe access for inspection of the public improvements by District inspectors. Upon completion of the work the Developer shall request final inspection by the District Inspector. If the District Inspector certifies that the work has been completed in accordance with this Agreement, then the General Manager shall certify the completion of the public improvements. No improvements shall be finally accepted unless all aspects of the work have been inspected and determined to have been completed in accordance with the Improvement Plans and District standards. Developer shall bear all costs of inspection and certification.

5. Release of Securities.

The securities required by this Agreement shall be released as follows:

A. Security given for faithful performance of any act, obligation, work or agreement shall be released upon the final completion and acceptance of the act or work, subject to the provisions of subsection (b) hereof.

B. The General Manager may release a portion of the security given for faithful performance of improvement work as improvement progresses upon application therefore by the Subdivider. Provided, however, that no such release shall be for an amount less than 25% of the total improvement security given for faithful performance of the improvement work and that the security shall not be reduced to an amount less than 50% of the total improvement security given for faithful

performance until final completion and acceptance of the improvement work. In no event shall the General Manager authorize a release of the improvement security which would reduce such security to an amount below that required to guarantee the completion of the improvement work and any other obligation imposed by this Agreement.

C. Security given to secure payment to the contractor, his or her subcontractors and to persons furnishing labor, materials or equipment shall, six months after the completion and acceptance of the work, be reduced to an amount equal to the total claimed by all claimants for whom lien have been filed and of which notice has been given to the District Board, plus an amount reasonably determined by the General Manager to be required to assure the performance of any other obligations secured by the Security. The balance of the security shall be released upon the settlement of all claims and obligations for which the security was given.

D. No security given for the guarantee or warranty of work shall be released until the expiration of the warranty period and until any claims filed during the warranty period have been settled. The warranty period shall not commence until final acceptance of all the work and improvements by the General Manager.

E. The District may retain from any security released, an amount sufficient to cover costs and reasonable expenses and fees, including attorneys' fees.

6. Injury to Public Improvements, Public Property or Public Utilities Facilities.

Developer shall replace or have replaced, or repair or have repaired, as the case may be, all public improvements, public utilities, facilities and surveying or subdivision monuments which are destroyed or damaged as a result of any work under this Agreement. Developer shall bear the entire cost of replacement or repairs of any and all public or public utility property damaged or destroyed by reason of work done under this Agreement, whether such property is owned by the United States or any agency thereof, or the State of California, or any agency or political subdivision thereof, or by the District, public or private utility corporation or by any combination of such owners. Any repair or replacement shall be to the satisfaction and subject to the approval of the General Manager.

7. Default of Developer:

A. Default of Developer shall include, but not be limited to, Developer's failure to timely commence construction of the improvements; Developer's failure to timely cure any defect in the improvements; Developer's failure to perform substantial construction work for a period of 30 calendar days after commencement of work; Developer's insolvency, appointment of a receiver, or filing of any petition in bankruptcy either voluntary or involuntary which Developer fails to discharge within 30 days; the commencement of a foreclosure action against the Project or a portion thereof, or any conveyance in lieu or in avoidance of foreclosure; or Developer's failure to perform any other obligation under this Agreement.

B. The District reserves to itself all remedies available to it at law or in equity for breach of Developer's obligations under this Agreement. The District shall have the right, subject to this section, to draw upon or utilize the appropriate security to mitigate District's damages in event of default by Developer. The right of District to draw upon

or utilize the security is additional to and not in lieu of any other remedy available to District. It is specifically recognized that the estimated costs and security amounts may not reflect the actual cost of construction or installation of the improvements and, therefore, District's damages for Developer's default shall be measured by the cost of completing the required improvements. The sums provided by the improvement security may be used by the District for the completion of the public improvements in accordance with the improvement plans and specifications contained herein.

C. In the event of the Developer's default under this Agreement, Developer authorizes District to perform such obligation twenty days after mailing written notice of default to Developer and to Developer's Surety, and agrees to pay the entire cost of such performance by the District within said period the District and Developer may agree on a plan to cure the default.

D. Pursuant to Subparagraph C, the District may take over the work and prosecute the same to completion, by contract or by any other method District may deem advisable, for the account and at the expense of Developer, and Developer's Surety shall be liable to District for any excess cost or damages occasioned District thereby; and, in such event, District, without liability for so doing, may take possession of, and utilize in completing the work, such materials, appliances, plant and other property belonging to Developer as may be on the site of the work and necessary for performance of the work.

E. In the event that Developer fails to perform any obligation hereunder, Developer agrees to pay all costs and expenses incurred by District in securing performance of such obligations, including costs of suit and reasonable attorney's fees.

F. The failure of District to take an enforcement action with respect to a default, or to declare a breach, shall not be construed as a waiver of that default or breach or any subsequent default or breach of Developer.

8. Warranty.

Developer shall guarantee or warranty the work done pursuant to this Agreement for a period of one year after final acceptance by the District of the work and improvements against any defective work or labor done or defective materials furnished. If within the warranty period any work or improvement or part of any work or improvement done, furnished, installed or constructed by Developer fails to fulfill any of the requirements of this Agreement or the improvement plans and specifications referred to herein, Developer shall without delay and without any cost to District, repair or replace or reconstruct the work or structure. Should Developer fail to act promptly or in accordance with this requirement, Developer hereby authorizes District, at District's option, to perform the work twenty days after mailing written notice of default to Developer and to Developer's Surety, and agrees to pay the cost of such work by District. Should the District determine that an urgency requires repair or replacements to be made before Developer can be notified, District may, in its sole discretion, make the necessary repairs or replacement or perform the necessary work and Developer shall pay to District the cost of such repairs.

9. Developer not Agent of District.

Neither Developer nor any of Developer's agents or contractors are or shall be considered to be agents of District in connection with the performance of Developer's obligations under this Agreement.

10. Injury to Work.

Until such time as the improvements are accepted by District, Developer shall be responsible for and bear the risk of loss to any of the improvements constructed or installed. Until such time as all improvements required by this Agreement are fully completed and accepted by District, Developer will be responsible for the care, maintenance of, and any damage to such improvements. District shall not, nor shall any officer or employee thereof, be liable or responsible for any accident, loss or damage, regardless of cause, happening or occurring to the work or improvements specified in this Agreement prior to the completion and acceptance of the work or improvements. All such risks shall be the responsibility of and are hereby assumed by Developer.

11. Reimbursement Agreement. (See Attachment)

12. Developer's Obligation to Warn Public During Construction.

Until final acceptance of the improvements, Developer shall give good and adequate warning to the public of each and every dangerous condition existent in said improvements, and will take all reasonable actions to protect the public from such dangerous condition.

13. Vesting Ownership.

Upon acceptance of the work on behalf of the District and recordation of the Notice of Completion, ownership of the improvements constructed pursuant to this Agreement shall vest in District.

14. Final Acceptance of Work.

Acceptance of the work on behalf of District shall be made by the District Board of Directors for subdivisions, and by the General Manager for other development projects. Acceptance shall not constitute a waiver of defects by District.

15. Indemnity/Hold Harmless.

District or any officer or employee thereof shall not be liable for any injury to persons or property occasioned by reason of the acts or omissions of Developer, its agents or employees in the performance of this agreement. Developer further agrees to protect and hold harmless District, its officials and employees from any and all claims, demands, causes of action, liability or loss of any sort, because of, or arising out of, acts or omissions of Developer, its agents or employees in the performance of this Agreement, including all claims, demands, causes of action, liability, or loss because of, or arising out of, in whole or in part, the design or construction of the improvements. This indemnification and agreement to hold harmless shall extend to injuries to persons and damages or taking of property resulting from the design or construction of said project, and the public improvements as provided herein, and in addition, to adjacent property owners as a consequence of the diversion of waters from the design or construction of public drainage systems, streets or other public improvements. Acceptance by the District of the improvements shall not

constitute an assumption by the District of any responsibility for any damage or taking covered by this paragraph. District shall not be responsible for the design or construction of the improvements covered by this Agreement, regardless of any negligent action or inaction taken by the District in approving the plans and specifications, unless the particular improvement design was specifically required by District over written objection by Developer submitted to the General Manager before approval of the improvement design, which objection indicated that the particular improvement design was dangerous or defective and suggested an alternative safe and feasible design. After acceptance of the improvements, the Developer shall remain obligated to eliminate any defect in design or dangerous condition caused by design or construction defect; however Developer shall not be responsible for routine maintenance. Provisions of this paragraph shall remain in full force and effect for ten years following acceptance of improvements by the District. It is the intent of this section that Developer shall be responsible for all liability for design and construction of the improvements installed or work done pursuant to this Agreement and District shall not be liable for any negligence, nonfeasance, misfeasance or malfeasance in approving, reviewing, checking, or correcting any plans or specifications or in approving, reviewing or inspecting any work or construction. The improvement security shall not be required to cover the provisions of this paragraph.

16. Sale or Disposition of Subdivision or Project.

Sale of other disposition of the property or project will not relieve Developer from the obligations set forth herein. If Developer sells the property or any portion of the property within the Project to any other person, the Developer may request a novation of this Agreement and a substitution of security. Upon approval of the novation and substitution of the securities, the Developer may request a release or reduction of the securities required by this Agreement. Nothing in the novation shall relieve the Developer of the obligations under section 15 for the work or improvement done by Developer.

17. Time for Commencement of Work/Time Extensions.

Developer shall commence substantial construction of the improvements required by this agreement not later than six months and completion within 18 months from the date of approval. In the event good cause exists for an extension of time for commencement or completion of the improvements, the General Manager may grant the extension in writing. Any such extension may be granted without notice to Developer's Surety and shall not affect the validity of this Agreement or release the Surety or Sureties on any security given for this Agreement. The General Manager shall be the sole and final judge as to whether or not good cause has been shown to entitle Developer an extension. Delay, other than delay in commencement of work, resulting from an act of the District or another governmental agency, or by an act of God, or by strikes, boycotts, similar actions by employees or labor organizations, shall constitute good cause for an extension of time for completion. As a condition of such extension, the General Manager may require new security as necessary to compensate for any increase in construction costs.

18. Certificates of Insurance

Certificates of Insurance and Additional Insured endorsements shall be obtained from all subcontractors, for general liability and worker's compensation. Developer to initial here for verification_____. Valley Sanitary District reserves the right to inspect the Developers certification file.

19. Notices.

All notices required or provided for under this Agreement shall be in writing and delivered in person or sent by mail, postage prepaid and addressed as provided in this Section. Notice shall be effective on the date it is delivered in person, or, if mailed, on the date of deposit in the United States Mail. Notices shall be addressed as follows unless a written change of address is filed with the district:

Notice to District: Valley Sanitary District
45-500 Van Buren
Indio, Ca. 92201

Notice to Developer:

Notice to Surety:

20. Severability.

The provisions of this Agreement are severable. If any portion of this Agreement is held invalid by a court of competent jurisdiction, the remainder of the agreement shall remain in full force and effect unless amended or modified by the mutual consent of the parties.

21. Captions.

The captions of this Agreement are for convenience and reference only and shall not define, explain, modify, limit, exemplify, or aid in the interpretation, construction or meaning of any provisions of this Agreement.

22. Mediation/Arbitration.

If a controversy or claim arises out of or relates to this agreement, the parties agree to try first to settle the dispute by mediation under the Construction Industry Mediation Rules of the American Arbitration Association. If not resolved by mediation, the dispute shall be settled by arbitration in accordance with Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof.

23. Incorporation of Recitals.

The Recitals to this Agreement are hereby incorporated into in the terms of this Agreement.

24. Heirs and assigns.

This Agreement is binding on the assigns of the District and on the assigns, successors and

representatives of the Developer.

25. Reimbursement Agreement

26. Entire Agreement.

This Agreement constitutes the entire agreement of the parties with respect to the subject matter. All modifications, amendments, or waivers of the terms of these Agreement's must be in writing and signed by the appropriate representatives of the parties. In the case of the District, the appropriate party shall be the General Manager.

IN WITNESS WHEREOF, this Agreement is executed by District, by and through its General Manager

Company:_____

Address: _____

By: _____ Title:_____

Dated: _____

VALLEY SANITARY DISTRICT

By: _____ Title: General Manager

ATTEST: _____

By: _____ Title:_____

(Proper Notarization of Developer's signature is required and shall be attached).

Attachments: Reimbursement Agreement Format

Exhibit “A” Off-Site/On Site Improvement Map

Exhibit “B” Oversize Credit Formula

Exhibit “C” Capital Recovery Fee Zones

Exhibit “D” Reimbursement Formula

Exhibit “E” Oversize Credit Form

Exhibit “F” Credit for Oversize Sewer Main Narrative

Exhibit “G” Reimbursement Apportionment Narrative

Exhibit “H” Reimbursement Apportionment Parcel Map

EXHIBIT "E"

CREDIT FOR OVERSIZE MAINS

PROJECT:_____

Credit for the difference in construction cost, exclusive of engineering, inspection and surveying between and_____inch diameter gravity sewer pipeline and a_____ inch gravity sewer main.

Bid #l by_____ $

Bid #2 by_____ $

Bid #3 by_____ $

District will review and approve these bids as a basis of allowing credit.

Allowable credit toward Capital Impact Fee/ sewer trunk line component: $_____

Allowable credit of 6% of engineering and surveying costs for oversize trunk-line portion of the project: $_____

Allowable credit for excess capacity in sewer pump station: $_____

TOTAL CREDIT $_____

This Exhibit is hereby approved and made a part of the Agreement between

_____ and Valley Sanitary District.

VALLEY SANITARY DISTRICT:

General Manager:_____

DEVELOPER: _____

Title: _____

EXHIBIT "F"

CREDIT FOR OVERSIZE MAINS

“In order to distribute credits relatively evenly, and to protect the capital improvement fund for the treatment plant project expansion, the following qualification shall apply: When credits are given for an oversize main the amount shall be totaled in a "bank" of credits. At such time as a unit of service is paid from the project, 20% of each unit service will be deducted as credit from the project bank until the full credit for oversizing is paid.

Bond No._____

PERFORMANCE BOND

WHEREAS the Valley Sanitary District (VSD) ("Public Agency") located at 45500 Van Buren Avenue, Indio, CA 92201, and _____
_____
(Name and address of Contractor)

("Principal"), have entered into a Performance Bond ("Bond") under which Principal is to comply with the requirements of the VSD Ordinance No. 2010-118, Sewer Construction and Use Ordinance for the _____ ("Project") located in _____.

WHEREAS, said principal is required under the terms of said Agreement to furnish a bond for the faithful performance of the principal's obligations under VSD Ordinance No. 2010-118 for the Project.

NOW, THEREFORE, we, the Principal and _____ a corporation duly authorized to do business in the State of California, as surety are held and firmly bound unto the Public Agency, in the penal sum of _____ _____ ($_____), lawful money of the United States, for the payment of which sum well and truly made, we bind ourselves, our heirs, successors, executors and administrators, jointly and severally, firmly presents.

The condition of this obligation is such that if above bounded principal, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, well and truly keep and perform the covenants, conditions and provisions in said Agreement and any alteration thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless City, its officers, agents and employees as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect and may be forfeited as specified in said Agreement.

As part of the obligation secured hereby and in addition to the face amount specified thereof, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Agreement or to the work to be performed thereunder or the specifications accompanying

the same shall in any way affect its obligation on this bond, and said surety does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Agreement or to the work or to the specifications.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: _____

"Principal"	"Surety"
_____	_____
_____	_____
By:_____	By:_____
Its	Its
By:_____	By:_____
Its	Its
(Seal)	*(Seal)*
APPROVED AS TO SURETY AND PRINCIPAL AMOUNT	APPROVED AS TO FORM:
By:_____	By:_____
Insurance Administrator	Public Agency Attorney

Note: This bond must be executed in duplicate and dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached.

 Bond No._____

PAYMENT BOND
(LABOR AND MATERIALS)

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS Valley Sanitary District, Indio, California ("Public Agency"), located at 45500 Van Buren Avenue, Indio, CA 92201, and _____
_____
(Name and address of Contractor)

("Principal"), have entered into an agreement whereby Principal agrees to install and complete certain designated public improvements, which said agreement, dated _____, 20____, entitled "_____," is hereby referred to and made a part thereof; and

WHEREAS, under the terms of said agreement, Principal is required before entering upon the performance of the work, to file a good and sufficient Contractor's Payment Bond with Valley Sanitary District to secure the claims to which reference is made in Title 15, (commencing with Section 3082) of Part 4 of Division 3 of the Civil Code of the State of California.

NOW, THEREFORE, we, the undersigned Principal, and _____
_____,
(Name and address of Surety)

("Surety") duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the Public Agency and all subcontractors, laborers, material persons, and other persons employed in the performance of the Contract in the penal sum of _____
_____
Dollars ($_____) ("Penal Sum"), this amount being not less than one hundred percent (100%) of the total Contract price, in lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the hereby bounded Principal, his, her or its heirs, executors, administrators, successors or assigns, or subcontractors shall fail to pay any of the persons named in Section 3181 of the California Civil Code, or any amounts due under the Unemployment Insurance Code with respect to work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the

Employment Development Department from the wages of employees of the Principal and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to work or labor performed under the Contract, the Surety will pay for the same in an amount not exceeding the Penal Sum specified in this bond; otherwise, this obligation shall become null and void.

This bond shall inure to the benefit of any of the persons named in Section 3181 of the California Civil Code so as to give a right of action to such persons or their assigns in any suit brought upon the bond. In case suit is brought upon this bond, Surety further agrees to pay, in addition to the Penal Sum, all costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by the Public Agency in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

Further, the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, addition or modification to the terms of the Contract, or of the work to be performed there under, or the specifications for the same, shall in any way affect its obligations under this bond, and it does hereby waive notice of any such change, extension of time, alteration, addition, or modification to the terms of the Contract or to the work or to the specifications there under. Surety hereby waives the provisions of California Civil Code 2845 and 2849.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: _____

Bond No._____

"Principal"	"Surety"
_____	_____
_____	_____
By:_____	By:_____
Its_____	Its_____
By:_____	By:_____
Its_____	Its_____
(Seal)	*(Seal)*

APPROVED AS TO SURETY AND PRINCIPAL AMOUNT

By:_____
Insurance Administrator

APPROVED AS TO FORM:

By:_____
Public Agency Attorney

Note: This bond must be executed in duplicate and dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached.

RELEASE OF PAYMENT BOND CLAIM NOTICE

(CA CIVIL CODE §§ 8030, 8150-8154, 9550-9556)

In consideration and upon receipt of payment in the sum of:

_____ ($_____),

_____ ("Claimant") HEREBY FULLY RELEASES AND DISCHARGES _____, ("Surety"), from and against all claims, demands, cause or causes of action whatsoever, including those from common law or statutory bad faith or otherwise relating to the work of improvement identified as:

_____

_____,

arising out of Bond No(s) _____ and executed by _____, as Surety, for _____,("Principal").

To the extent the claim and payment set forth herein includes work, labor, equipment, and/or materials provided to the undersigned by its subcontractors, suppliers, laborers and lessors, Claimant hereby represents and warrants that said subcontractors, suppliers, laborers and lessors have been paid in full for such labor, equipment and/or materials.

Claimant hereby represents and warrants that it has not before been paid from other sources any portion of the claim which is the subject of this Release of Payment Bond Claim.

This Release of Payment Bond Claim is a compromise of a disputed matter and may not be construed as an admission of liability by Surety or Principal.

This release shall be construed and interpreted in accordance with the laws of the State of California.

Dated: _____ Claimant

By: _____

Title: _____

Note: If Surety requires any notary acknowledgement or other attachment, be sure to attach same. Contact Surety directly to determine what additional materials it may require.

Appendix D

Fees

RESOLUTION NO. 2016-1084
A RESOLUTION OF THE BOARD OF DIRECTORS OF VALLEY SANITARY DISTRICT RATES FOR SEWER USE

WHEREAS, pursuant to Ordinance 94-115 the Board of Directors established the authority under State law to collect fees and charges for costs reasonably borne and charges levied by the District; and,

WHEREAS, California Government Code Sections 66016, 66018 and 66010, state that the setting or adjusting of fees shall be cause for public notice and hearing before the Board in conjunction with the annual budget process; and,

WHEREAS, on April 12, 2016, the Board of Directors held a duly advertised public hearing on the proposed fees contained in this resolution, and at that time invited oral and written comments from the public.

NOW, THEREFORE, the Board of Directors of Valley Sanitary District **HEREBY RESOLVES:**

SECTION 1: DOMESTIC SEWER USE FEE

Definition: "Equivalent Dwelling Unit" (EDU) shall mean the numerical value designation where 1 EDU represents an average sewage flow of 300 gallons per day from one single family household. For non-household uses, the value of equivalency to a household is for purposes of computing uniform financial obligations.

Formula for the EDU User Fee of Domestic Wastewater: The formula for setting the annual EDU Rate for sewer use charges shall be as follows:

FUND 11 ONLY:

Total revenues needed for O&M budget, Capital and O&M Reserve	$	13,736,161
LESS: Tax, Interest, Other income & Depreciation		- 2,919,000
BALANCE OF REVENUE TO BE COLLECTED:	$	10,817,161

Estimated EDU's on Tax rolls and Accounts Receivable 34,530

BALANCE OF REVENUE TO BE COLLECTED ÷ Estimated Equivalent Dwelling Units

$10,817,161 ÷ 34,530 = $ 313.27

2016/2017 EQUIVALENT DWELLING UNIT FEE: **$313.00 per year**

The EDU fee as determined by the above formula shall be applicable to each equivalent dwelling unit, and the same shall be due at the time the user connects to the collection system as determined by the General Manager based on best available data. Users shall be billed directly for service that is not collected by the County Tax Collector. Prorated fees will be assessed from issuance of final permit through June 30, 2017.

On or before the 10th day of August of each year, the District Secretary shall file with the Auditor of the County of Riverside a copy of said report with a statement endorsed thereon over his/her signature that it had been finally adopted by the Board of Directors of the Valley Sanitary District and the Auditor of the County of Riverside shall enter the amounts of the charges against the respective lots or parcels of land as they appear on the current assessment roll.

SECTION 2: ASSIGNMENT OF EQUIVALENT DWELLING UNITS

The following dwelling unit equivalents are hereby fixed and established for the classifications of types of property and use. Any use that is not on this schedule may be calculated by the Uniform Plumbing Code or other appropriate authority.

UNIT OF SERVICE SCHEDULE

User Classification	NUMBER OF UNITS
Single Family Dwellings Condominiums/Townhouses/Apartments/Permanent Mobile Homes/Duplex units	1 each
Recreation Vehicle/Motel Rooms/Hotel Rooms	½ each
Recreation Vehicle (Mobile Unit) with permanent structure connected to sewer service	1 each
Library/Church	1 each
Church with Kitchen	2 each
Professional Building (Tenant)	1 each
Administrative Offices-city, county, state	1 each (5 employees)
Hospital	1 each (2 beds)
Rest Homes	1 each (3 beds)
Laundry/Laundromat	1 each (3 washers)
Restaurant/Tavern	3
Restaurant and Tavern or Drive-Thru	4
Gas Station	2
Gas Station with Wash Rack	3
Car Wash	3
Animal Hospital/Clinic/Kennel	3
Barber Shop/Beauty Shop	1 each (2 sinks)
Retail Stores	1 each (2000 sq. ft. or fraction thereof)
Warehousing	1 each restroom
Food Markets Plus	1 each (2000 sq. ft. or fraction thereof) 12 each (food grinder)

SCHOOLS

Pre-School, K-5	1 each (23 students)
Junior High/High/Continuation/Adult	1 each (14 students)

INDUSTRIES/MANUFACTURING

Shall mean all structures designed for the purpose of providing permanent housing for an enterprise engaged in the production, manufacturing, or processing of material. The EDU for Industrial/Manufacturing shall be determined as follows:

A.	For domestic wastewater: 20 gallons per fixture unit flow per day. Fixture units as defined by Uniform Plumbing Code.
B.	For non-domestic wastewater, compute the information contained on the industrial waste permit, using the non-domestic wastewater formula in Section 2.

INSTITUTIONAL

A.	County Sheriff Substation/County Jail	1 each (3.5 employees)
	County Juvenile Hall	1 each (5 employees)
B.	County administration, courts, clinics, mental health NOTE: Or, calculated based on actual flow metering of discharge from a specific facility	20 gal./fixture
C.	Restrooms in parks	1 EDU per restroom

CABAZON BAND OF MISSION INDIANS FACILITIES

A.	All users specifically on this schedule shall be charged the same EDU as others.
B.	Casino Facilities: 20 Gallons per day per fixture unit per the Uniform plumbing code for a 365 day year, or based on direct flow metering of the discharge.

MOVIE THEATERS

Theaters	1 each (100 seats)
Other theaters	1 each (100 seats allowed by Uniform Fire Code)

RV DUMP STATIONS

Recreational vehicle park without hook-ups, but with dump station	1/6 each (per space)
Recreational "rally field" with dump stations:	1/2 each (per acre)
Dump stations for RV's and buses:	15 each (per station)

NONRESIDENTIAL SURVEY/PRE-TREATMENT PERMITS

A.	Survey/Application: Make deposit based on cost estimate for consultant and district staff time. Final invoice will be based on actual cost to the District.
B.	Monitoring Program: Fee to be established as part of the permit. Based on 100% cost recovery to the District.

CHANGES IN USE

When a change in use of a property or building is reported to the District, a new determination will be made about the classification in use for the EDU fee and the connection capacity fee. The new EDU fee shall be effective on the date the new certificate of occupancy is issued based on official records of a public agency. Any other change in use not covered under a certificate of occupancy shall become effective on the date the District is notified. Such notification is to be made within 30 days of the change. When calculating the EDU for purposes of the connection capacity fee, there shall be credit given for the existing or past use on record for the building. Change in use shall include increased discharges in excess of a property's or a facility's permitted volume. It is the responsibility of the property owner to notify the District of a proposed change in use.

SECTION 3: NON-DOMESTIC SEWER USE FEE

A Wastewater Discharge Permit fee shall be paid to the District upon receipt thereof. The frequency of analysis and reporting shall be set forth in the discharge permit. The treatment surcharge shall be based on the Valley Sanitary District's sewer system total maintenance, operation and capital expenditures for providing industrial wastewater collection, treatment and disposal services. Except as otherwise provided, all fees, charges and penalties established by this Resolution are due and payable upon receipt of notice thereof.

Penalties charged under this section shall not accrue to those invoices successfully appealed, provided the District receives written notification of said appeal prior to the payment due date.

Payment of disputed charges is still required by the due date during District review of any appeal submitted by permittees.

Payment of permit fees must be received by the District prior to the issuance of either a new permit or a renewed permit. Each permittee shall also pay delinquent invoices in full prior to new permit issuance. Prorated fees will be assessed from issuance of final permit through June 30, 2017.

Any permit issued may be conditional upon financial security to guarantee payment of all annual fees and charges to be incurred, in accordance with the provisions of Section 717 of the District's Sewer Construction and Use Ordinance.

Abbreviations. The following abbreviations have the designated meanings:

COD - Chemical Oxygen Demand

gpd - Gallons per day

mg/L - Milligrams per liter

Q - Flow

SS - Suspended Solids

The industrial wastewater treatment surcharge shall be computed by the following formula:

Rate Basis: Equivalent Dwelling Unit (EDU)

Definition: 1 EDU: Flow = 300 GPD: COD = 500 mg/L SS = 240 mg/L

EDU Formula: $\# EDU = \frac{Q}{300} [.42 + .36 \frac{(COD)^{*}}{500} + .22 \frac{(SS)^{**}}{240}]$

(A) (B) (C)

Where,

Q = Daily sewage flow in gallons

COD = Quarterly 92-day Average, COD concentration in mg/L for COD in excess of 500 mg/L.

SS = Quarterly 92-day Average, SS concentration in mg/L for SS in excess of 240 mg/L.

*COD = Concentrations of 500 mg/L or less will be calculated at 500 mg/L.

**SS = Concentrations of 240 mg/L or less will be calculated at 240 mg/L.

(A) = The total Collection System Expenses + ½ of Treatment Personnel Expenses + ½ of Treatment Electric Expenses + ⅓ General Plant Expenses + ⅓ Laboratory Expenses + ⅓ Administration Expenses + ⅓ Reserve Funding.

(B) = Deduct ½ of Treatment Personnel and Treatment Electric Expenses from Treatment O & M Budget Expenses + ⅓ General Plant Expenses + ⅓ Laboratory Expenses + ⅓ Administration Expenses + ⅓ Reserve Funding.

(C) = To the Sludge O & M Budget Expenses + ⅓ General Plant Expense + ⅓ Laboratory Expense + ⅓ Administration Expense + ⅓ Reserve Funding.

Example:

Average daily flow	=	60,000 gpd
Average COD loading for 92 days	=	3,530 mg/L
Average SS loading for 92 days	=	266 mg/L

$$\frac{60{,}000 \text{ gpd}}{300 \text{ gpd/EDU}} [.42 + (.36) \frac{3{,}530 \text{ mg/L}}{500 \text{ mg/L}} + (.22) \frac{266 \text{ mg/L}}{240 \text{ mg/L}}]$$

200 EDU [.42 + 2.54 + 0.24]

200 EDU [3.20]

$$640 \text{ EDU} \frac{(\$313.00 * EDU)}{4 \text{ qtr/yr}} = \underline{\$50{,}080/qtr}$$

The quantities for quarterly total flows, COD, and suspended solids used in the above formula may be established by engineering estimation, short term sampling, analysis and flow measurement extrapolated to a quarterly total; or by extensive sampling, analysis and flow measurement; all as approved by the District Manager. The District Manager shall set the minimum requirements for sampling, analysis and flow measurement by the discharger necessary to establish quantities to be used in the above formula. Sampling and flow monitoring equipment shall be installed and maintained by the discharger. Costs incurred by the District for sample collection and analysis of the industrial discharge shall be recovered from the discharger.

Industrial dischargers may be restricted to discharging during specified periods of the day to protect the discharge from adversely affecting District operations.

SECTION 4: ADMINISTRATION, APPEALS, AND EFFECTIVE DATE

A. Administration: The General Manager shall be responsible for the administration and implementation of this resolution.

B. Appeals: Appeals of an administrative decision related to this resolution may be made in writing to the Board of Directors.

C. Effective Date: This resolution shall become effective sixty (60) days after its adoption by the Board of Directors. Effective date: July 1, 2016, for the fiscal year 2016/2017.

PASSED, APPROVED, and **ADOPTED** this 12th day of April, 2016, by the following roll call vote. A summary notice thereof has been published twice in a newspaper of general circulation in the Valley Sanitary District prior to said hearing as required by law. Resolution 2015-1072 is hereby repealed at the effective date of this resolution.

AYES: York, Duran, Wiseman, Teague, Davenport
NAYES: None
ABSENT: None
ABSTAIN: None

Douglas A. York, President

ATTEST:

Merritt Wiseman, Secretary-Treasurer

RESOLUTION NO. 2016-1088
A RESOLUTION OF THE BOARD OF DIRECTORS OF VALLEY SANITARY DISTRICT AMENDING FEES AND CHARGES FOR DISTRICT SERVICES

WHEREAS, pursuant to Ordinance 94-115 the Board of Directors established the authority under State law to collect fees and charges for costs reasonably borne and charges levied by the District; and,

WHEREAS, pursuant to California Government Code Section 66016, 66018 and 66010, the setting or adjusting of fees shall be cause for public notice and hearing before the Board in conjunction with the annual budget process; and,

WHEREAS, on June 14, 2016, the Board of Directors held a duly advertised public hearing on the proposed fees contained in this resolution, and at that time invited oral and written comments from the public.

NOW, THEREFORE, the Board of Directors of Valley Sanitary District **HEREBY RESOLVES:**

SECTION 1: The Following fees and charges are applicable:

ADMINISTRATIVE/DEVELOPMENT SERVICES

Copies of Board minutes and agenda (mailed)	$ 75.00/year
Copies of agendas only (mailed) (NOTE: reciprocal agreements with other agencies-no charge)	$ 24.00/year
VSD Standard Specifications for Construction of Sanitary Sewers	$ 12.00/each
Copies of plans or maps	$ 5.00/sheet ($10.00/sheet color)
Bid documents (or amount specified in Bid Documents)	$ 25.00/each
Photocopies 8 ½" X 11" – 8 ½" X 14" black & white	$ .25/page
Photocopies 11" X 17" black & white	$ .40/page
Photocopies 8 ½" X 11" – 8 ½" X 14" color	$ .40/page
Photocopies 11" X 17" color	$ .80/page
Copy of Board meeting recording	$ 15.00/recording
Notary fee	$ 10.00/each signature
Returned Check Fee-Non-sufficient funds check or closed account check	$ 25.00/check
Inspections (By District Staff depending on availability):	
• Laterals, single ($240.00 initial deposit required before inspections)	$ 80.00/hour with one hour minimum
• Laterals, multiple ($55.00 initial deposit per lateral or $240.00 minimum deposit)	$ 80.00/hour with one hour minimum
• Mainline ($500.00 minimum deposit required before inspections)	$ 80.00/hour with one hour minimum
• Disconnect inspection/permit ($240.00 initial deposit required before inspections)	$ 80.00/hour with one hour minimum
Inspections (By Contract Inspector):	
• Laterals, mainline or any sewer related inspections (actual cost + expenses)	$125.00/hour (estimated)
Plan Check & Developmental Services	
• District Staff (minimum $150.00 initial deposit required for single residence. All other project categories minimum $500.00 deposit)	$150.00/hour with one hour minimum
• District Contract Engineer-(billed at actual cost) ($150.00 initial deposit required for single residence. All other project categories minimum $1,000.00 deposit.)	$150.00/hour with one hour minimum plus $15.00 administration fee per set of plans
• GIS/Collection System hydraulic model update fee ($1,000.00 minimum deposit required)	Billed at actual cost
• Any services not covered in this schedule shall be billed at actual cost ($1,000.00 minimum deposit required)	Billed at actual cost
• Miscellaneous Administrative Costs not otherwise listed	Billed at actual cost

SECTION 2: CAPITAL IMPACT/CONNECTION CAPACITY FEE

Pursuant to the Connection Capacity Fee Study (AB 1600 Nexus Study) dated April 2006, adjusted annually by the Engineering News Record (ENR) 20 City Average Construction Cost Index from February 2012 to February 2015, the fee for connecting to the collection and treatment system is justified in increasing to $4,619 per equivalent dwelling unit (EDU), however in consideration of the rate increase in January 2013, the fee will remain at $4,265 per EDU.

SECTION 3: ADMINISTRATION

A. Administration: The General Manager shall be responsible for the administration and implementation of this resolution.

PASSED, APPROVED and **ADOPTED** this 14th day of June, 2016, by the following roll call vote. A summary notice thereof has been published twice in a newspaper of general circulation in the Valley Sanitary District prior to said hearing as required by law. Resolution 2015-1070 is hereby repealed at the effective date of this resolution.

AYES: Davenport, Duran, Teague, Wiseman, York
NAYES: None
ABSENT: None
ABSTAIN: None

Douglas A. York, President

ATTEST:

Merritt Wiseman, Secretary-Treasurer

Appendix E

Construction Forms and Inspection Checklist

VALLEY SANITARY DISTRICT
PROJECT INFORMATION SHEET

NAME OF PROJECT: _____

TRACT NUMBER:_____ PHASE: _____

NO: _____ APN: _____

ANNEXATION NO: _____

OWNERS NAME: _____

ADDRESS: _____

PHONE: _____ FAX: _____

EMAIL: _____

DEVELOPERS NAME: _____

ADDRESS: _____

PHONE: _____ FAX: _____

EMAIL: _____

ARCHITECTURAL FIRM: _____

PRIMARY CONTACT:_____

PHONE: _____ EMAIL: _____

ENGINEERING FIRM: _____

PRIMARY CONTACT:_____

PHONE: _____ EMAIL: _____

UNDERGROUND CONTRACTOR NAME: _____

ADDRESS: _____

PHONE: _____ FAX: _____

ADDRESS: _____

SUPERINTENDANT NAME: _____

PHONE: _____ FAX: _____

EMAIL: _____

All of the above information will be required by Valley Sanitary District prior to permitting of any project through VSD. Please type all information requested above.

VALLEY SANITARY DISTRICT

WASTEWATER SURVEY FOR NONRESIDENTIAL ESTABLISHMENT
APPLICATION FOR WASTEWATER DISCHARGE PERMIT
PLEASE TYPE ALL INFORMATION

SECTION A – GENERAL INFORMATION

A.1 Company name:_____

Company Address:_____

_____

Telephone:_____

A.2 Address of production or manufacturing facility. If same as above, check ☐.

_____

A.3 Name, title and telephone number of person authorized to represent this firm in official dealings with the Sewer Authority and/or city:

_____ _____

Name Title Telephone

A.4 Alternate person to contact concerning information provided herein:

_____ _____

Name Title Telephone

A.5 Identify the type of business conducted (auto repair, machine shop, electroplating, warehousing, painting, printing, meatpacking, food processing, etc.)

_____

Note to Signing Official: In accordance with Title 40 of the Code of Federal Regulations Part 403 Section 403.14, information and data provided in this questionnaire that identifies the nature of frequency of discharge shall be available to the public without restriction. Request for confidential treatment of other information shall be governed by procedures specified in 40 CFR Part 2. Should a discharge permit be required for your facility, the information in this questionnaire will be used to issue the permit.

This statement is to be signed by an authorized official of your company after adequate completion of this form and review of information by the signing official.

"I have personally examined and am familiar with the information submitted in this document and attachment. Based upon my inquiry of those individuals immediately responsible for obtaining the information reported herein, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and/or imprisonment."

_____

Signature of Official (Company Seal if applicable) Date

_____

Name and Title (Type)

A.6 Provide a brief narrative description of the manufacturing, production, or service activities of your company:

_____

_____

_____

A.7 Standard Industrial Classification Number(s) (SIC Code) for your facilities:

_____ _____ _____ _____ _____ _____

A.8 This facility generates the following types of wastewater (check all that apply):

		Average gallons per day		
1)	☐ Domestic wastewater	_____	☐ estimated	☐ measured
2)	☐ Noncontact cooling water	_____	☐ estimated	☐ measured
3)	☐ Boiling/cooling tower water	_____	☐ estimated	☐ measured
4)	☐ Contact cooling water	_____	☐ estimated	☐ measured
5)	☐ Process wastewater	_____	☐ estimated	☐ measured
6)	☐ Equipment/facility wash down	_____	☐ estimated	☐ measured
7)	☐ Air pollution control unit	_____	☐ estimated	☐ measured
8)	☐ Storm water runoff to sewer	_____	☐ estimated	☐ measured
9)	☐ Other (describe)	_____	☐ estimated	☐ measured
	Total A.8.1 thru A.8.9:	_____		

A.9 Wastewater are discharged to (check all that apply):

1)	☐ Sanitary sewer	_____	☐ estimated	☐ measured
2)	☐ Storm sewer	_____	☐ estimated	☐ measured
3)	☐ Surface water	_____	☐ estimated	☐ measured
4)	☐ Ground water	_____	☐ estimated	☐ measured
5)	☐ Waste haulers	_____	☐ estimated	☐ measured
6)	☐ Evaporation	_____	☐ estimated	☐ measured

Provide name and address of waste hauler(s), if used:_____

_____

A.10 Has Spill Prevention Control and Countermeasure Plan or a Hazardous Materials/Waste Contingency Plan been prepared for the facility? ☐ yes ☐ no

Note: If your facility <u>did not</u> check one or more of the items listed in A.8.4 through A.8.9 above, then you need not to complete any further sections in this survey/application. If any items A.8.4 through A.8.9 <u>were checked</u>, complete the remainder of this survey/application.

SECTION B – FACILITY OPERATION CHARACTERISTICS

B.1 Number of employees shift worked per 24-hour day is_____

Average number of employees per shift is _____

B.2 Starting times of each shift: 1st_____am/pm 2nd_____am/pm 3rd_____am/pm

Note: The following information in this section must be completed for each product line.

B.3 Principal product produced:_____

B.4 Raw materials and process additives used:_____

_____

_____

B.5 Production process is:

☐ Batch ☐ Continuous ☐ Both _____% batch _____% continuous

B.6 Hours of operation: _____am to _____pm ☐ continuous

B.7 Is production subject to seasonal variation: ☐ yes ☐ no

If yes, briefly describe seasonal production cycle: _____

_____

_____

B.8 Are any process changes or expansions planned during the next three years?

☐ yes ☐ no

If yes, describe the nature of planned changes or expansions. Use additional sheets if necessary. _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

SECTION C – WASTEWATER INFORMATION

C.1 If your facility employees processes in any of the 34 industrial categories of business activities listed below and any of these process generate wastewater or waste sludge, place a check beside the category or business activity (check all that apply).

A. 34 Industrial Categories

1. ☐ Adhesives
2. ☐ Aluminum Forming
3. ☐ Auto & Other Laundries
4. ☐ Battery Manufacturing
5. ☐ Coal Mining
6. ☐ Coil Coating
7. ☐ Copper Forming
8. ☐ Electric & Electronic Components
9. ☐ Electroplating
10. ☐ Explosive Manufacturing
11. ☐ Foundries
12. ☐ Gum & Wood Chemicals
13. ☐ Inorganic Chemicals
14. ☐ Iron & Steel
15. ☐ Leather Tanning & Finishing
16. ☐ Mechanical Products
17. ☐ Nonferrous Metals
18. ☐ Ore Mining
19. ☐ Organic Chemicals
20. ☐ Paint & Ink
21. ☐ Pesticides
22. ☐ Petroleum Refining
23. ☐ Pharmaceuticals
24. ☐ Photographic Supplies
25. ☐ Plastic & Synthetic Materials
26. ☐ Plastics Processing
27. ☐ Porcelain Enamel
28. ☐ Printing & Publishing
29. ☐ Pulp & Paper
30. ☐ Rubber
31. ☐ Soaps & Detergents
32. ☐ Steam Electric
33. ☐ Textile Mills
34. ☐ Timber

B. Other Business Activity

☐ Air flotation
☐ Centrifuge
☐ Chemical precipitation
☐ Chlorination
☐ Cyclone
☐ Filtration
☐ Flow Equalization
☐ Grease or oil separation: type_____
☐ Grease trap
☐ Grit removal
☐ Iron exchange
☐ Neutralization, pH correction
☐ Ozonation
☐ Reverse osmosis

- ☐ Screen
- ☐ Sedimentation
- ☐ Septic tank
- ☐ Solvent separation
- ☐ Spill protection
- ☐ Sump
- ☐ Biological treatment, type:_____
- ☐ Rainwater diversion or storage:_____
- ☐ Other chemical treatment, type:_____
- ☐ Other, type:_____
- ☐ No pretreatment provided:_____

C.3 If any wastewater analyses have been performed on the wastewater discharge(s) from your facilities, attach a copy of the most recent data to this questionnaire. Be sure to include the data of the analysis, name of laboratory performing the analysis, and location(s) from which sample(s) were taken (attach sketches, plans, etc., as necessary).

C.4 Priority Pollutant Information: Please indicate by checking the appropriate box by listed chemical whether it is "Known to be Absent", "Suspected to be Present", or "Known to be Present" in your manufacturing or service activity or generated as a by-product.

Chemical Compound	Known Present	Suspected Present	Known Absent	Known or Suspected Concentration/day
I. METALS & INORGANICS				
1. Antimony	☐	☐	☐	_____
2. Arsenic	☐	☐	☐	_____
3. Asbestos	☐	☐	☐	_____
4. Berylium	☐	☐	☐	_____
5. Cadmium	☐	☐	☐	_____
6. Chromium	☐	☐	☐	_____
7. Copper	☐	☐	☐	_____
8. Cyanide	☐	☐	☐	_____
9. Lead	☐	☐	☐	_____
10. Mercury	☐	☐	☐	_____
11. Nickel	☐	☐	☐	_____
12. Selenium	☐	☐	☐	_____
13. Silver	☐	☐	☐	_____
14. Thallium	☐	☐	☐	_____
15. Zinc	☐	☐	☐	_____

Chemical Compound	Known Present	Suspected Present	Known Absent	Known or Suspected Concentration/day
II. PHENOL AND CRESOLS				
16. Phenol(s)	☐	☐	☐	_____
17. Phenol, 2-chloro	☐	☐	☐	_____
18. Phenol, 2,4-dichloro	☐	☐	☐	_____
19. Phenol, 2,4,6-trichloro	☐	☐	☐	_____
20. Phenol, pentachloro	☐	☐	☐	_____
21. Phenol, 2-nitro	☐	☐	☐	_____
22. Phenol, 4-nitro	☐	☐	☐	_____
23. Phenol, 2,4-dinitro	☐	☐	☐	_____
24. Phenol, 2.4-dimethl	☐	☐	☐	_____
25. M-Cresol, p-Chloro	☐	☐	☐	_____
26. O-Cresol, 4,6-dinitro	☐	☐	☐	_____
III. MONOCYCLIC AROMATICS (EXCLUDING PHENOLS, CRESOLS & PHTHALATES)				
27. Benzene	☐	☐	☐	_____
28. Benzene, chloro	☐	☐	☐	_____
29. Benzene, 1,2-dichloro	☐	☐	☐	_____
30. Benzene, 1,3-dichloro	☐	☐	☐	_____
31. Benzene, 1,4-dichloro	☐	☐	☐	_____
32. Benzene, 1,2,4-trichloro	☐	☐	☐	_____
33. Benzene, hexachloro	☐	☐	☐	_____
34. Benzene, ethyl	☐	☐	☐	_____
35. Benzene, nitro	☐	☐	☐	_____
36. Toluene	☐	☐	☐	_____
37. Toluene, 2,4-dinitro	☐	☐	☐	_____
38. Toluene, 2,6-dinitro	☐	☐	☐	_____
IV. PCBs & RELATED COMPOUNDS				
39. PCB-1016	☐	☐	☐	_____
40. PCB-1221	☐	☐	☐	_____
41. PCB-1232	☐	☐	☐	_____
42. PCB-1242	☐	☐	☐	_____
43. PCB-1248	☐	☐	☐	_____
44. PCB-1254	☐	☐	☐	_____
45. PCB-1260	☐	☐	☐	_____
46. 2-Chloronaphthalene	☐	☐	☐	_____

Chemical Compound	Known Present	Suspected Present	Known Absent	Known or Suspected Concentration/day
V. ETHERS				
47. Ether, bis (chloromethly)	☐	☐	☐	_____
48. Ether, bis (2-chloronethyl)	☐	☐	☐	_____
49. Ether, bis (2-chlorosopropy)	☐	☐	☐	_____
50. Ether, 2-chlorocthyl vinyl	☐	☐	☐	_____
51. Ether, 4-bromophenyl	☐	☐	☐	_____
52. Ether, 4-chlorophenyl	☐	☐	☐	_____
53. Bis (2-chloroethoxy) methane	☐	☐	☐	_____
VI. NITROSAMINES AND OTHER NITROGEN CONTAINING COMPOUNDS				
54. Nitrosamine, dimethyl	☐	☐	☐	_____
55. Nitrosamine, diphenyl	☐	☐	☐	_____
56. Nitrosamine, di-n-proply	☐	☐	☐	_____
57. Benzidine	☐	☐	☐	_____
58. Benzidine, 3,3'-dichenyl	☐	☐	☐	_____
59. Hydrazine, 1,2-dephenyl	☐	☐	☐	_____
60. Acrylonitrile	☐	☐	☐	_____
VII. HALOGENATED ALIPHATICS				
61. Methane, bromo	☐	☐	☐	_____
62. Methane, chloro	☐	☐	☐	_____
63. Methane, dichloro	☐	☐	☐	_____
64. Methane, chlorodibromo	☐	☐	☐	_____
65. Methane, dichlorobromo	☐	☐	☐	_____
66. Methane, tribromo	☐	☐	☐	_____
67. Methane, trichloro	☐	☐	☐	_____
68. Methane, tetachloro	☐	☐	☐	_____
69. Methane, trichlorofluror	☐	☐	☐	_____
70. Methane, diclorofluoro	☐	☐	☐	_____
71. Ethane, 1,1-dichloro	☐	☐	☐	_____
72. Ethane, 1,2-dicloro	☐	☐	☐	_____
73. Ethane, 1,1-trichloro	☐	☐	☐	_____

Chemical Compound	Known Present	Suspected Present	Known Absent	Known or Suspected Concentration/day
74. Ethane, 1,1,2-trichloro	☐	☐	☐	_____
75. Ethane, 1,1,2,1-icirachloro	☐	☐	☐	_____
76. Ethane, hexachloro	☐	☐	☐	_____
77. Ethene, chloro	☐	☐	☐	_____
78. Ethene, 1,1-dichloro	☐	☐	☐	_____
79. Ethene transdichloro	☐	☐	☐	_____
80. Ethene, trichloro	☐	☐	☐	_____
81. Ethene, tetrachloro	☐	☐	☐	_____
82. Propene, 1,2-dichloro	☐	☐	☐	_____
83. Propene, 2,4-dichloro	☐	☐	☐	_____
84. Butadiene, hexachloro	☐	☐	☐	_____
85. Cyclopentaldiene hexachloro	☐	☐	☐	_____
VIII. PHTHALATE ESTERS				
86. Phthalate, di-o-methyl	☐	☐	☐	_____
87. Phthalate, di-n-ethyl	☐	☐	☐	_____
88. Phthalate, di-n-butyl	☐	☐	☐	_____
89. Phthalate, di-n-octyl	☐	☐	☐	_____
90. Phthalate, bis (2-ethyhexyl)	☐	☐	☐	_____
91. Phthalate, butyl benzy	☐	☐	☐	_____
IX. POLCYCLIC AROMATIC HYDROCARBONS				
92. Accnaphthlene	☐	☐	☐	_____
93. Accnaphthylene	☐	☐	☐	_____
94. Anthracene	☐	☐	☐	_____
95. Benzo(a)anthracene	☐	☐	☐	_____
96. Benzo(b)fluranthene	☐	☐	☐	_____
97. Benzo(k)fluranthene	☐	☐	☐	_____
98. Benzo(ghi)perylene	☐	☐	☐	_____
99. Benzo(a)pyrene	☐	☐	☐	_____
100. Chrysene	☐	☐	☐	_____
101. Dibenzo(a,n)	☐	☐	☐	_____
102. Fluoranthene	☐	☐	☐	_____
103. Fluorene	☐	☐	☐	_____

Chemical Compound	Known Present	Suspected Present	Known Absent	Known or Suspected Concentration/day
104. Indeno (1,2,2-cd)	☐	☐	☐	_____
105. Naphthalene	☐	☐	☐	_____
106. Phenanthrene	☐	☐	☐	_____
107. Pyrene	☐	☐	☐	_____
X. PESTICIDES				
108. Acrolein	☐	☐	☐	_____
109. Aldrin	☐	☐	☐	_____
110. BHC (Alpha)	☐	☐	☐	_____
111. BHC (Beta)	☐	☐	☐	_____
112. BHC (Gamma) or Lindana	☐	☐	☐	_____
113. BHC (Delta)	☐	☐	☐	_____
114. Chlordane	☐	☐	☐	_____
115. DDD	☐	☐	☐	_____
116. DDE	☐	☐	☐	_____
117. DDT	☐	☐	☐	_____
118. Dieldrin	☐	☐	☐	_____
119. Endosulfan (Alpha)	☐	☐	☐	_____
120. Endosulfan (Beta)	☐	☐	☐	_____
121. Endosulfan Sulfate	☐	☐	☐	_____
122. Endrin	☐	☐	☐	_____
123. Endrin aidehyde	☐	☐	☐	_____
124. Heptachlor	☐	☐	☐	_____
125. Hetachlor epoxide	☐	☐	☐	_____
126. Isophorone	☐	☐	☐	_____
127. TCDD (or Dioxin)	☐	☐	☐	_____
128. Toxaphene	☐	☐	☐	_____

SECTION D – OTHER WASTES

D.1 Are any liquid wastes or sludge from this firm disposed of by other than discharge to the sewer system?

☐ yes ☐ no

If "no", skip remainder of Section D.
If "yes", complete items D.2 and D.3.

D.2 These Wastes may best be described as:

☐ Acids and alkalies
☐ Heavy metal sludges
☐ Inks/dyes
☐ Oil and/or grease
☐ Paints
☐ Pesticides
☐ Planting waste
☐ Pretreatment sludge
☐ Solvents/thinners
☐ Other hazardous waste (specify) _____

_____

☐ Other waste (specify) _____

_____

D.3 For the above checked waste, does your company practice:

☐ On-site storage
☐ Off-site storage
☐ On-site disposal
☐ Off-site disposal

Briefly describe the method(s) of storage or disposal checked above.

_____
_____
_____
_____
_____

VALLEY SANITARY DISTRICT
CHECKLIST FOR "PROGRESS FOR SERVICE"

File No. _____

Submitted by: _____

_____
Project (Tract)

Date: _____

SEWER SYSTEM:

After all appurtenances are installed, the following must be complete:

___1. Copies of acceptable compaction test results on sewer system backfill.

___2. All sections of sewer system must pass air testing.

___3. New sewer system must be jet cleaned and pass video inspection.

___4. New sewer system must pass mandrel testing.

___5. All clean outs and manhole frame & covers must be accessible with concrete support collar in paved areas and in non-paved areas.

___6. Mechanical plugs must be removed.

___7. An "s" must be chiseled on curb face at all sewer lateral locations.

_____
VSD Inspector

Date: _____

VALLEY SANITARY DISTRICT
PUNCH LIST

File No. _____
Date: _____
Inspection No. _____

Project Title: _____

Work Order No. _____ Drawing No. _____Spec. No. _____

Developer: _____ Contractor: _____

_____ _____

_____ _____

An inspection was made on the above project and the following corrections are required.

ITEM	CORRECTIONS TO BE MADE

(Use additional sheets for additional items.)

Distribution:
Original – Developer/Contractor
Copy – Development Services/File

Prepared by: _____

Title: _____

Appendix F

Plan Checklist and Drawing Examples

VALLEY SANITARY DISTRICT
SEWER PLAN CHECKLIST

Tract/Parcel No. _____ Date: _____

Project Common Name: _____

Developer: _____ Phone: _____

Engineer: _____ Phone: _____

Engineer Signature: _____ Print Name: _____

Return signed checklist with your next submittal.

**How will easements be dedicated to VSD? Please check one of the following:*

Tract Map Grant of Easement (Instrument number)

Grant of Easements must be approved by VSD prior to Mylar approval.

Legend:
X = Data appears to meet standards
NA = Not Applicable or not on plans
? = Not shown but maybe required
O = Data is missing or not to standard, see what is circled or see comments.

GENERAL TO ALL SHEETS

___1. Drawings are 24 inches by 36 inches.
___2. Benchmark elevation of monument and location.
___3. Geographic data block to include type of plans, (quarter section, section, township and range), project city, tract number and project name. Geo data should be in the title block in lower right corner and should match the data on the top in the title on the cover sheet.
___4. Engineer's/Consultant's data to include name, address, phone number, FAX number.
___5. Engineer's stamp with signature required on Mylar. Check to make sure date on license is current and valid.
___6. Page number (i.e. sheet 1 of 5) in large font in lower right corner.
___7. USA with phone number 1-800-227-2600.
___8. North arrow.
___9. Bar scale to match scale sized.
___10. Call out all streets in project as public or private. On private streets, call out VSD easements.

***NOTE: Engineer please initial by all areas on checklist that are not to standard, indicating corrections have been made to plans.**

Comments for All Plan Sheets: _____

_____

_____

_____

COVER/TITLE SHEET

___1. Show project title centered on top of page in large font listing: type of plans, (quarter section, section, township and range), project city, county, state, tract number and project name.

___2. Show a vicinity map showing the general area with cross streets labeled. Not to Scale (NTS) is also acceptable as long as it is listed. Map needs to show section lines and section numbers on all sides and adjacent tract numbers.

___3. Show an index map showing the overall project including all existing and proposed domestic water, sewer, irrigation and drainage systems with materials and sizes including above ground appurtenances. Section numbers and APNs. Bar scale shall be between 1 inch = 200 feet through 1-inch = 500 feet. No TOPO elevation lines are allowed on drawings.

___4. Show a typical street cross section showing all existing and proposed domestic water mains, sewer mains, irrigation mains and drainage systems for each street with depths and separation. Show curbs, sidewalks, walls, catch basins, all dry utilities / PUE, easements and right-of-ways.

___5. Show a list of quantities of materials with construction notes for the entire project.

___6. Show symbol legend showing manholes, clean-outs, all wet and dry utilities with appurtenances.

___7. Show abbreviations used on drawing listed in tabular form.

___8. Show VSD General Sanitation Notes.

___9. Show owners/Developer's name, address, phone number, FAX number, and contact person.

___10. Show elevation conversion note (if applicable) – "TO CONVERT TO NATIONAL GEODETIC VERTICAL DATUM OF 1929, SUBTRACT 500 FROM ALL ELEVATIONS SHOWN ON THESE PLANS."

___11. Show sheet index in tabular form.

___12. Show utility contacts in tabular form.

___13. Basis of bearings.

Comments for Cover/Title Sheet: _____

_____

_____

_____

PLANS – PLAN VIEW

___1. Verify sewer ends for future tie-ins with Development Services.

___2. Must show existing VSD facility stationing, elevation and drawing number to verify connection depth. New stationing should start with STA 10+00.00.

___3. Scale 1 inch = 20 feet to 1 inch = 40 feet (Preferred).

___4. Call out 100 foot stationing along new mainline from the low point and increase uphill. Sewer main is installed following stationing and pipe is always installed uphill.

___5. Pipeline tangent data to include bearing, length, material, size, street and sheet numbers.

___6. Call out centerline of road versus the section line. Show dimensions off the centerline to all wet and dry utilities, curbs, easements and right-of-ways.

___7. Call out edge of pavement, curb and gutter, sidewalks and walls.

___8. Call out all existing wet and dry utilities in general area, especially IID electrical lines. Also any dry utilities that will encroach on a VSD easement area.

___9. Call out location of existing and proposed structures, trees, retention basins, islands, guardhouses and decorative concrete, etc., in the general area. Note on drawing stating: "No permanent structures within VSD easements. VSD will not be responsible for replacing and/or maintaining any decorative concrete and/or landscaping installed over sewer lines or laterals."

___10. Shade easement areas. Easements should be a minimum of 20 feet for sewers up to 10 feet deep. Sewers over 10 feet deep may require an easement that is at least twice the depth.

___11. Call out structural encasements for crossing of water, irrigation or storm drain mainlines per VSD Standard Detail and requirement of the DDM.

___12. Call out lot lines and lot numbers. Show driveways or entrance ways if known. Sewer laterals are not allowed in the driveways.

___13. Call out street names or line references.

___14. Call out all existing and proposed sewer laterals, sewer/drainage manholes, water services, valves, fire hydrants, air/vac units, storm drain/catch basins, irrigation baffles, irrigation standpipes, division boxes and irrigation meters and their respective sizes.

___15. Call out match line with stationing and INV elevation on both sheets list corresponding sheet number. Make sure the match line is clearly identified on plan view.

___16. Call out a separate detail for special construction (i.e. existing manhole connections, siphons, pipeline crossings and utility crossings) not shown on profile view showing depths and separation.

___17. All standard PVC mainlines shall be 8, 10, 12, 15 and 18 inches in diameter. Four-inch diameter house laterals installed for single dwelling units and 6-inch diameter house laterals installed for all others (i.e. commercial buildings) with clean-outs at property lines. Suites in buildings and restaurants need to have their own lateral.

___18. Cleanouts may be installed at the end of a sewer if the distance from a manhole is less than 200 feet.

___19. Cleanouts are not allowed under parking spaces, they must be located in planter area or in a clear area of the drive aisle.

___20. Four-inch diameter house laterals may be installed into manholes at cul-de-sacs only.

___21. Typical depth of a residential sewer is 7.0 feet. Bedding detail(s) is required on drawings.

___22. Minimum separation between a sewer main and curb and gutter or edge of paving shall be a minimum of 7 feet.

___23. Minimum separation between a house lateral from the centerline of a manhole shall be 6 feet.

___24. Minimum separation between house laterals installed in opposite directions shall be 2 feet.

___25. Minimum separation between house laterals installed in the same direction shall be 4 feet.

___26. Minimum separation between domestic water and sewer pipelines shall be 10 feet (outside to outside).

___27. Minimum distance between a domestic water service line and a sewer manhole or sewer lateral shall be 10 feet.

___28. Minimum separation between a sewer pipeline or a sewer lateral and a domestic water well site shall be 50 feet. Measure from the center of the well site.

___29. Minimum separation between a sewer manhole or a sewer pump station and a domestic water well site shall be 100 feet.

___30. Manholes for up to 24-inch or smaller sewers shall be a minimum of 48 inches in diameter.

___31. Manholes for 24-inch or larger sewers shall be a minimum of 60 inches in diameter.

___32. Bolt down manhole lids in unimproved areas.

___33. Note the finished floor elevation on house pads.

Comments for Plan View: _____

_____

_____

_____

PLANS – PROFILE

___1. The vertical scale shall be either 1-inch = 4 feet or 1-inch = 2 feet.
___2. Typical depth of a residential sewer is 7.0 feet. Sewers under 7 feet or over 12 feet deep – need approval from Development Services.
___3. Slope of mainline shall be labeled. Ensure pipeline meets minimum slopes.
___4. Depth of all existing and proposed wet and dry utility and storm drain crossings.
___5. Manholes not to exceed 500 feet spacing. Call out distance between manholes.
___6. Call out manhole numbers, manhole depth, all invert elevations and top of manhole elevation.
___7. Show all manhole and clean-out locations with stationing listed.
___8. Show structural encasements if sewer main is less than 3 feet above or 1 foot below in separation.
___9. Show special construction or pipeline crossings of other utilities.
___10. Show water, irrigation and storm drain/catch basin crossings.
___11. Show wall crossing and describe future access to pipeline.
___12. Match line with station and INV elevation.
___13. Flow through manholes with sewers of the same diameter shall have a minimum of 0.2 foot drop from the inlet to the outlet.
___14. Call out elevations with existing drawing numbers and existing STA number at connection points.

Comments for Profile View: _____

_____

_____

_____

Appendix G

Right of Way Forms

Valley Sanitary District
Title Insurance Steps

1) A Preliminary "Title" Report (PTR) must be provided for all easement and real property dedications and conveyances.
2) The PTR must be issued based upon the legal description of the easement or real property description only, not a PTR that covers an entire project.
3) VSD will determine the value of easement or real property for the title policy amount.
4) VSD approves the legal description and plat for the easement or real property.
5) Project Proponent's title company will issue a Title Commitment to VSD.
6) Title Company will specify what documentation they will require from the Project Proponent.
7) VSD reviews the Title Commitment and Project Proponent must clear and have removed any encumbrances/exceptions not approved by VSD (Schedule B items).
8) VSD identifies any deeds of trust or liens that require the title company to have beneficiary (ies) subordinate their rights to VSD's easement or reconvey rights on real property.
9) VSD records the grant of easement or deed and provides a conformed copy to the Title Company or Project Proponent.
10) Title Company issues the title policy based upon the Title Commitment VSD previously approved.

VALLEY SANITARY DISTRICT STANDARDS FOR LEGAL DESCRIPTIONS AND PLATS

The following is the procedure for processing legal descriptions and plats (exhibits) for grants of easements, grant deeds, quitclaim deeds, agreements, leases, etc.

All documents will be reviewed and approved processed by VSD Development Services Department. Upon approval developer will have the document recorded by the Riverside County Recorder's Office.

The following items are to be submitted to the Development Services Division by the surveyor/ engineer and/or applicant:
Note: Any document or attachments for recording must be 8 ½" x 11" in size.

A. Legal description (8½" x 11" in size) legally describing the area to be acquired, dedicated, conveyed, encumbered, etc.

B. Plat (8½" x 11" in size) depicting the area to be acquired, dedicated, conveyed, encumbered, etc., delineated by a bold border and hatched if necessary for clarity.

C. Legal description and plat must be "wet signed", sealed, and dated by a Professional Land Surveyor or qualified Civil Engineer.

D. A current Preliminary Report (within 1 month) to be issued as a title insurance policy once the easement or deed has been recorded, if applicable.

E. A copy of the grant deed or current vesting deed.

F. Payment made payable to Valley Sanitary District for the required document review fee(s).

G. A copy of the statement of partnership, articles of incorporation, corporate resolution, etc., indicating those officers/individuals authorized to sign legal documentation on the applicant's behalf, shall be required for documents executed by banks, corporations, partnerships, etc.

H. Closure calculations, when applicable.

Note: If there is a deed of trust or lien on the property, subordination or reconveyance may be required.

It is the responsibility of the surveyor/engineer and/or applicant to have the document properly executed, notarized, and returned to the Development Services for acceptance by the

District's Board of Directors, when applicable, and for recordation. Surveyor/engineer and/or applicant will supply a conformed copy of the recorded document to the District.

LEGAL DESCRIPTION STANDARDS

The following describes the requirements for legal descriptions.

A. Legal descriptions must be on 8½" x 11" paper with 1" margins.

B. Font must be size 11 point or larger. Font must be "Arial" or similar style. Use only solid font for legibility purposes.

C. **EXHIBIT "A"** (letter as appropriate) must be labeled at the top of the page in bold, and/or in a larger size font.

D. Reference the project and the type of dedication, conveyance, etc., in the heading, below/beneath the label **EXHIBIT "A"** (letter as appropriate). Example:

EXHIBIT "A"
TERRA LAGO
SANITARY SEWER PIPELINE(S)
EASEMENT

E. Do not place any additional data that includes numbers, such as dates and work order numbers, on the legal description. This information can be included on the plat.

F. Legal descriptions must be "wet signed," sealed, and dated by a Professional Land Surveyor or qualified Civil Engineer, on the last page of multiple pages.

G. Double space between each course on the legal description (begin a new paragraph with each thence); single space between lines within the same course.

H. The preamble must include the quarter section(s), section, township, and range, in which the described property is located.

I. **Commencing, Beginning, Point of Beginning, True Point of Beginning, Point of Termination, etc.** must be in bold.

J. List the area of the property being described. List the acreage to the nearest hundredth of an acre, if ¼ acre or more. List the square footage if less than ¼ acre (e.g., 10,890 sq. ft.).

K. All curves must be identified as being tangent, non-tangent, etc. and must include a radial bearings where not a tangent curve. Radial calls should be referenced as coming from the radius to the curve.

L. Use "along", "to" and "leaving" calls when applicable. Tie into record documents when applicable.

M. When referencing record maps with three or more pages use "inclusive" after the last page number. Example: Book 157, of Maps, Pages 24 through 37, inclusive.

N. Do not use the terms “future”, “proposed”, “temporary”, “to be”, etc., as a reference or as part of a description. Said terms can be shown on the plat only.

O. Include a reference to the plat exhibit at the end of the legal description. Example: “See **Exhibit “B”** (letter as appropriate) attached hereto and by this reference made a part hereof.”

P. Data in the legal description shall agree with data shown on the plat. If associated with a final map, both legal description and plat shall agree with data shown on the final map.

Q. If associated with a final map, shall use the same basis of bearings on the legal description and plat, as is used on said final map.

R. Number each page of the legal description and its relation to the total number of pages. Example: Page 1 of 3

S. Strip descriptions must be in the following format: “A strip of land 50 feet in width, lying 25 feet on each side of the following described line:” These must include “lengthen or shorten” calls when applicable.

T. Abbreviations within the legal description are not desirable.

U. All references shall include the complete title of the reference document and recording/filing information. Example: Being a portion of the Grant of Easement/Pipeline recorded May 7, 1990 as Instrument No. 095735.

PLAT STANDARDS

The following describes the requirements for plats.

A. Plats must be on 8½" x 11" paper with ½" borders. The borders must be kept clear of any drafting or notations.

B. Font must be size 10 or larger. In some instances, smaller size font may be acceptable. Font must be “Arial” or similar style. Use only solid font for legibility purposes.

C. **Exhibit “B”** (letter as appropriate) must be labeled at the top of the page in bold and/or in a larger size font.

D. Reference the project and the type of dedication, conveyance, etc., on the plat, below/beneath the label **Exhibit “B”** (letter as appropriate). Example:

EXHIBIT “B”
TERRA LAGO
SANITARY SEWER PIPELINE(S)
EASEMENT

E. Keep any data that is not relevant to the description, such as company name, work order numbers, etc. in a title block at the bottom of the plat.

F. Number each page of the plat and its relationship to the total number of pages. Example: Sheet 1 of 3.

G. Plats must be "wet-signed," sealed, and dated by a Professional Land Surveyor or qualified Civil Engineer, on the first sheet of multiple sheets.

H. The plat must include the quarter section(s), section, township, and range, and Assessor Parcel No(s) in which the described property is located.

I. Delineate the area being acquired, dedicated, conveyed, etc., with a distinctive, bold, solid border/boundary and hatch if necessary for clarity.

J. Show all survey data: bearings, distances, and dimensions of the acquisition, dedication, conveyance, etc.

K. Show the relationship to all existing, adjoining, or overlapping/intersecting easements.

L. Include radial bearings on curves at points that are non-tangent, reverse, compound, etc. This includes any points on a curve that intersect a record, surveyed line. Radial calls should be reference as coming from the radius to the curve.

M. Label the **POB, POC, TPOB, POT** etc., in **bold** on the plat. N.

All plats shall have a north arrow and graphic scale.

O. The plat shall be oriented with north to the top or side of the page. Printed information (e.g., bearings, distances, descriptions) should be oriented the same so that they will read left to right when looking North. In the case of courses that run considerably off cardinal or in the case of curved courses, the above orientation should apply as nearly as practical. In no case should information be placed so that data on the plat would have to be read looking South.

P. The use of the terms "future", "proposed", "temporary", "to be", etc., shall be shown to demonstrate relationship to the area being dedicated, conveyed, etc.

Q. Include surveyor's/engineer's notes if necessary.

R. A vicinity map is required unless the nearest cross-streets are shown on the plat. S.

Use details when necessary for clarity.

T. The entire legally described area shall be shown on one sheet. Additional sheets may be used to show individual parcels, details, or portions of the area when necessary to show all required data and to avoid cluttering.

U. Data on the plat shall agree with data shown on the legal description. If associated with a final map, both legal description and plat shall agree with data shown on the final map.

V. If associated with a final map, shall use the same basis of bearings on the legal description and plat, as is used on said final map.

No Recording Fees
Required Per Government
Code Section 27383

RECORDING REQUESTED BY AND WHEN
RECORDED MAIL TO:

VALLEY SANITARY DISTRICT
District Engineer
45500 Van Buren
Indio, California 92201

(Space above this line is for Recorders Use)

GRANT OF SANITARY SEWER EASEMENT

APN:_____

Project: _____

_____, its successors and assigns, ("GRANTOR") hereby grants to the VALLEY SANITARY DISTRICT (VSD), a governmental entity and its successors and assigns, ("GRANTEE"), a perpetual exclusive easement and right-of-way upon, in, across, over, and under the lands described below, to erect, install, construct, repair, replace, and maintain sewer pipeline(s) and/or mains, manholes, sewer lateral pipelines, and all structures and appurtenances incidental thereto, (hereinafter "pipeline(s) and related facilities"), above and below ground, at such location(s) within the easement as GRANTEE may from time to time determine.

Said easement is located in the City of _____, County of Riverside, State of California, and is more particularly described on Exhibits A and B attached hereto and incorporated herein by this reference.

GRANTOR grants the right of unconditional ingress and egress to GRANTEE to and from said easement by reasonable routes to carry out the purposes of this easement, together with the right to use the easement for GRANTEE's access to adjacent property.

GRANTOR reserves to itself, and its successors and assigns, the right of ingress and egress across the easement surface at all times except during construction, repair, or maintenance of the pipeline(s) and related facilities. GRANTOR additionally reserves to itself and its successors and assigns the right to erect and maintain gate(s) within or to the easement as long as GRANTEE is provided with a key at all times to said gate(s), if locked.

GRANTOR shall keep the easement graded flat and unobstructed at all times, and shall not plant any landscaping (including trees), or construct any structures or improvements (including paving) within the easement without the prior written consent of GRANTEE. GRANTOR will be responsible for all such landscaping or improvements (including paving) consented to by GRANTEE within the easement and GRANTEE will not be liable for any damage thereto.

Thereafter, GRANTOR shall maintain said surface improvements in good condition at all times and GRANITE shall maintain said pipeline(s) and related facilities in good condition at all times.

Notwithstanding any consent granted by GRANTEE, GRANTEE shall have the right, upon reasonable notice, to remove any such landscaping or other improvements, including paving, as necessary for maintenance or repair purposes, or which interfere with GRANTEE's ability to otherwise exercise its rights under this easement, provided that GRANTEE shall repair and/or replace any paving removed or damaged by resurfacing the immediate area as near as practicable to its preexisting condition. Further notwithstanding any consent granted, GRANTEE shall have the right, at its sole expense, to permanently trim or permanently remove any landscaping or other improvement within the easement that unreasonably interferes with GRANTEE's ongoing exercise of its easement rights and GRANTOR waives any right to compensation with respect to any such permanent removal.

All terms and conditions of this easement shall be binding upon the parties, their successors and assigns. The benefits and burdens herein are intended, and shall, run with the land. In the event of litigation to interpret or enforce the terms and provisions of this easement, the prevailing party shall be entitled to recover reasonable attorney fees, expert fees, including engineering fees, and investigative fees, in addition to costs. This easement represents the entire agreement between the parties and shall not be modified except by a written instrument signed by the parties and recorded.

GRANTOR expressly warrants and represents that it has the power to grant this easement in accordance with its terms.

IN WITNESS WHEREOF, GRANTOR executed this Easement on this _____ day of _____, _____.

GRANTOR(S)

By _____

_____
Printed Name

By _____

_____
Printed Name

STATE OF CALIFORNIA)

) ss.

COUNTY OF RIVERSIDE)

On _____, before me, _____ (here insert the name and title of the officer), personally appeared _____, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

_____

Notary Public

CERTIFICATE OF ACCEPTANCE

This is to certify that the interest in real property conveyed by the Deed or Grant dated _____ from _____ to Valley Sanitary District, a political corporation and/or governmental agency, is hereby accepted by order of the Board of Directors of Valley Sanitary District on: _____ .

(Or by the undersigned officer or agent on behalf of the Board of Directors of Valley Sanitary District pursuant to authority conferred by the Grantee consents to recordation thereof by its duly authorized officer)

Dated: _____

_____

General Manager
Valley Sanitary District

No Recording Fees
Required Per
Government Code
Section 27383

RECORDING REQUESTED BY AND
WHEN RECORDED MAIL TO:

VALLEY SANITARY DISTRICT
45500 Van Buren
Indio, California 92201

APN: FILE:

SUBORDINATION AGREEMENT

NOTICE:

THIS SUBORDINATION AGREEMENT RESULTS IN YOUR SECURITY INTEREST IN THE PROPERTY BECOMING SUBJECT TO AND OF LOWER PRIORITY THAN THE LIEN OF SOME OTHER OR LATER SECURITY INTEREST.

THIS AGREEMENT ("Agreement"), is made this day_____of _____, 20___ by and between VALLEY SANITARY DISTRICT, a public agency of the State of California ("VSD") and _____("Subordinating Party").

RECITALS:

A. _____ is the owner of certain real property located in the County of Riverside, California, and legally described on **Exhibit "A"** attached hereto and by this reference incorporated herein ("Property").

B. VSD is the Grantee under that certain GRANT OF EASEMENT/ PIPELINE(S) ("Document") providing VSD a perpetual, nonexclusive easement and right-of-way to install, construct, enlarge, survey, reconstruct, remove and replace, operate, maintain, repair, improve and relocate underground pipeline(s) over, under, along and across the Property. A copy of the Document is attached hereto as **Exhibit "B"** and by this reference incorporated herein.

C. Subordinating Party is the beneficiary of a _____dated _____ ("Subordinating Document") recorded _____ as Instrument No. _____ _____ , Official Records of Riverside County, California. The Subordinating Document is recorded against the Property.

D. Subordinating Party is desirous of executing this Agreement.

E. Subordinating Party is willing that the Document shall, when recorded, constitute a charge upon the Property, which is unconditionally prior and superior to the Subordinating Document.

NOW, THEREFORE, IN CONSIDERATION OF THE MUTUAL BENEFITS ACCRUING TO THE PARTIES HERETO AND OTHER VALUABLE CONSIDERATION, THE RECEIPT AND SUFFICIENCY OF WHICH CONSIDERATION IS HEREBY ACKNOWLEDGED, IT IS HEREBY DECLARED AND UNDERSTOOD AND AGREED AS FOLLOWS:

1. The Document shall unconditionally be and remain at all times a charge on the Property, prior and superior to the lien of the Subordinating Document.

2. This Agreement shall be the whole and only agreement with regard to the subordination of the lien of the Subordinating Document to the lien or charge of the Document and shall supersede and cancel, but only insofar as would affect the priority between the Document and Subordinating Document, any prior agreements as to such subordination.

3. Subordinating Party declares, agrees and acknowledges that it intentionally and unconditionally waives, relinquishes and subordinates the lien or charge of the Subordinating Document to the Document.

4. This Agreement may be executed in counterpart but shall be without force or effect unless and until all parties hereto have executed this Agreement, or a counterpart.

VALLEY SANITARY DISTRICT, a public agency of the State of California

By:_____

Its:_____

SUBORDINATING PARTY

By:_____

Its:_____

_____
(mailing address)

_____
(city) (state) (zip code)

Doc. No. _____

ACKNOWLEDGMENTS

STATE OF CALIFORNIA)
) ss
COUNTY OF _____)

On _____, before me, _____ Notary Public, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature:_____ (Seal)

STATE OF CALIFORNIA)
) ss
COUNTY OF _____)

On _____, before me, _____ Notary Public, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature:_____ (Seal)

EXHIBIT “A”

DESCRIPTION OF PROPERTY

EXHIBIT “B”

DOCUMENT

No Recording Fees
Required Per
Government Code
Section 27383

RECORDING REQUESTED BY AND
WHEN RECORDED MAIL TO:

VALLEY SANITARY DISTRICT
45500 Van Buren
Indio, California 92201

SUBSTITUTION OF TRUSTEE AND PARTIAL RECONVEYANCE

WHEREAS, _____was the original Trustor, _____, the original Trustee and _____, the Beneficiary under that certain Deed of Trust and Security Agreement ("Deed of Trust") dated _____ and recorded _____ as Instrument No. _____ in the Official Records of the County of Riverside, State of California; and

WHEREAS, the undersigned Beneficiary desires to substitute a new Trustee under said Deed of Trust in place and stead of _____;

NOW, THEREFORE, the undersigned hereby substitutes itself as Trustee under said Deed of Trust and does hereby reconvey without warranty, to the person or persons legally entitled thereto, that portion of the Estate described on Exhibit "A" and shown on Exhibit "B" attached hereto and by this reference incorporated herein.

Dated: _____, _____

BENEFICIARY:	SUBSTITUTED TRUSTEE:
_____	_____
a _____	a _____
By _____	By _____
Its: _____	Its: _____

KNOX® Rapid Entry System Fire • EMS • Law Enforcement • Government

Effective January 1, 2014

2014 AUTHORIZATION ORDER FORM

14-150242

800-552-5669 • 623-687-2300 • Fax: 623-687-2290 • WWW.KNOXBOX.COM

Section 1 ORDERED BY ☐ CONTRACTOR ☐ PROPERTY OWNER ☐ GOV. AGENCY

COMPANY / AGENCY

DATE ORDERED

STREET

SUITE / BUILDING

CITY, ST, ZIP CODE

CONTACT NAME

P.O. NUMBER (GOV. AGENCIES ONLY)

PHONE NUMBER

E-MAIL ADDRESS

Section 2 ORDER WILL NOT BE PROCESSED Without Authorized Signature

NO SIGNATURE REQUIRED

Valley Sanitary District
45500 VAN BUREN ST
INDIO CA 92201-3435

Authorized Agency Signature and Date

Print Name Clearly

SS-01-0685-06-05

System Code

IMPORTANT NOTE - Knox® Master Keys are provided to authorized agencies or other registered entities on an as-needed basis solely for use with the Knox Rapid Entry System. No other use of the Knox Master Keys or their associated codes is authorized or permitted. Knox Master Keys and Key Codes associated with the Knox Master Keys and Keyways remain the exclusive property of the Knox Company. Key Codes associated with the Knox Master Keys and Keyways are maintained by the Knox Company in Phoenix, Arizona. For questions regarding this policy, contact Knox at 800-552-5669.

Authorizing Agency Approval Signature Required to Sub-master Items

☐ Check here to Sub-master

Sub-master fee $7.00 per keyed item.

Authorized Agency Signature

Section 3 PRE-PAYMENT INFORMATION REQUIRED

☐ Check or Money Order made payable to:
KNOX COMPANY Federal I.D. #95-3617858

VISA MasterCard DISCOVER AMERICAN EXPRESS

EXP. DATE (MM / YY)

CARD NUMBER

Credit Card Orders can be FAXED or scanned and emailed to: orders@knoxbox.com

NAME ON CARD

Cardholder Signature

Section 4 ORDER PRODUCT HERE – USE ATTACHED PRICE LIST

Quantity	Part#	Weight Ea.	Price Ea.	Extended Price
			$	$
			$	$
			$	$

Sub-master Fee (If required, $7.00 ea.) $

Shipping and Handling $

Subtotal $

CA TAX Required

Sales Tax $

Pre-payment Total $

Ground Shipping & Handling

1 lb.	to	7 lbs.	$14.00
8 lbs.	to	16 lbs.	$26.00
17 lbs.	to	30 lbs.	$40.00
31 lbs.	to	50 lbs.	$50.00
51 lbs.	to	75 lbs.	$60.00

Please call Knox for quote: 75 lbs.+ and/or Alaska, Hawaii, Canada

Section 5 INSTALLATION ADDRESS - REQUIRED BY AUTHORIZED AGENCY ☐ NEW CONSTRUCTION ☐ RETROFIT

BUILDING NAME (WHERE ITEM WILL BE INSTALLED) - PLEASE TYPE ADDITIONAL INSTALLATION ADDRESSES ON A SEPARATE SHEET (REQUIRED BY FIRE DEPT.)

STREET ADDRESS (NO P.O. BOXES)

CITY, ST, ZIP CODE

Section 6 SHIP TO ADDRESS IS REQUIRED ☐ SAME AS INSTALL ADDRESS

SHIP TO CONTACT NAME

COMPANY NAME

SUITE

STREET ADDRESS (NO P.O. BOXES)

CITY, ST, ZIP CODE

RUSH? Call for Rates and Check Box: ☐ Next Day Air ☐ 2nd Day Air

OFFICE USE ONLY

O/N

REC'D

Send this form with payment to:
KNOX COMPANY
1601 W. Deer Valley Road
Phoenix, AZ 85027

Knox® Rapid Entry System Product Catalog

Shunt Trip Control Station

#4506

Now Available – Knox® Remote Shunt Trip Control Station

The 4500 Series Remote Shunt Trip Control Station houses an electrical service disconnect switch that can be used by first responders during an emergency. The control switch is designed to remotely operate the building's shunt trip switch which will disconnect all electrical power to the building. It can also be used to disconnect power to HVAC controls, industrial equipment lockout or photovoltaic/solar powered systems.

SECURITY UL 1037 UL 437 UL 1610 UL 1332 UL 508 LISTED EQUIPMENT

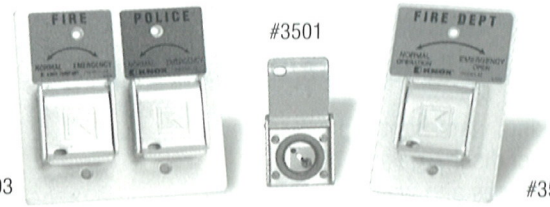
Features:
- Allen-Bradley Type 4/13 Watertight Selector Switch
- NEMA Type 2, 3R electrical enclosure
- Lock Out/Tag Out Posts

- Dimensions: Surface: 7"H x 7"W x 7-1/4"D
  Recessed: 9-1/2"H x 9-1/2"W Flange
- Electrical Ratings: Main Switch: 24-480VAC, 125VA MAX, PILOT DUTY, PER CONTACT BLOCK
  Tamper Switch: 24VDC, 50mA, general use
  Enclosure Rating: Type 2, 3R
- **Ship Weight: 35 lbs.**
- Material: 1/4" steel housing, 5/8" thick steel door
- Color: Red, Black, Aluminum, Dark Bronze
- Finish: Knox-Coat® Proprietary Coating System; UL1332 Outdoor Electrical Use

Options:
- Available in Surface and Recessed configurations
- Alarm tamper switches
- Single or dual locks

Can also be used in remote solar/wind electrical control applications.

Key Switches



#3503 #3501 #3502

LISTED Lock Core UL437

- Electric override for perimeter gates, parking garages and gated communities
- For fire, EMS & law enforcement
- Single or dual-key options
- All stainless steel dust cover
- **Ship Weight: 1 lb.**

Padlocks

Knox® Padlocks

LISTED Lock Core UL437

AGENCY ID LABEL INCLUDED

Exterior - All Weather Conditions

#3770

- Secures perimeter and fire access gates, and other fire department equipment
- Heavy duty brass body, stainless steel 7/16" diameter shackle
- Protective EPDM boot with shackle seal
- Metal keyway cover

Shrouded - All Weather Conditions
- Shrouded shackle resists pry and cut attacks for added security
- Heavy duty brass body, stainless steel 7/16" diameter shackle
- Protective LDPE boot
- LDPE keyway cover

Ship Weight: 2 lbs.

#3772

Interior - Light Duty
- Brass body and hardened steel 5/16" diameter shackle

#3771

WARNING: Before ordering, measure hasp fittings to ensure proper shackle size.

Prices in U.S. Dollars. Prices and availability subject to change.

● Included
– Not Included

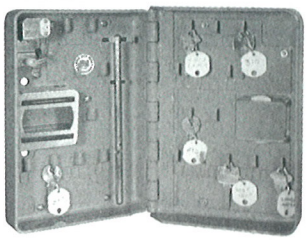
Knox® Elevator/Lobby Box

1400 Series
1450 Series

Ship Weight: Standard = 14 lbs.; Mini = 9 lbs.

Standard Elevator Box 1400 Series

Mini Elevator Box 1450 Series



#1404 with #1449 Expansion Panel

Standard color is Deep Red with "Fire Dept. Use Only" banner to meet latest IFC and NFPA 1 standards. Black also available, call.

1400 Series Knox Standard Elevator/Lobby Box

Part	Tamper Switch	Color	Part Number	Price
Standard Elevator Box	–	Deep Red	**1403**	$295.00
Standard Elevator Box	●	Deep Red	**1404**	$335.00
Standard Elevator Box	–	Aluminum	**1433 / 1409***	$295.00
Standard Elevator Box	●	Aluminum	**1434 / 1410***	$335.00
Standard Elevator Box	–	Dark Bronze	**1437 / 1413***	$295.00
Standard Elevator Box	●	Dark Bronze	**1438 / 1414***	$335.00
13 Hook Expansion Panel		Red/Alum/Brz	**1449**	$40.00
13 Hook Alternate Left Panel		No charge if ordered initially. Call for details and part numbers.		

1450 Series Knox Mini Elevator/Lobby Box

Mini Elevator Box	–	Deep Red	**1453**	$274.00
Mini Elevator Box	●	Deep Red	**1454**	$314.00
Mini Elevator Box	–	Aluminum	**1457 / 1455***	$274.00
Mini Elevator Box	●	Aluminum	**1458 / 1456***	$314.00
Mini Elevator Box	–	Dark Bronze	**1461 / 1459***	$274.00
Mini Elevator Box	●	Dark Bronze	**1462 / 1460***	$314.00

**Part number for box without "Fire Dept. Use Only" banner on door.*

Knox® Remote Shunt Trip Control Station

4500 Series

Ship Weight = 35 lbs.

#4506

Lock Type	Mount Type	Tamper Switch	Color/Part Number		Price
Single Lock	Surface Mount	–	Red/**4505**	Black/**4501**	$694.00
		●	Red/**4506**	Black/**4502**	$734.00
		–	Aluminum/**4509**	Dk. Bronze/**4513**	$704.00
		●	Aluminum/**4510**	Dk. Bronze/**4514**	$744.00
	Recess Mount	–	Red/**4534**	Black/**4530**	$744.00
		●	Red/**4535**	Black/**4531**	$784.00
		–	Aluminum/**4539**	Dk. Bronze/**4543**	$754.00
		●	Aluminum/**4540**	Dk. Bronze/**4544**	$794.00
Dual Lock	Surface Mount	–	Red/**4507**	Black/**4503**	$754.00
		●	Red/**4508**	Black/**4504**	$794.00
		–	Aluminum/**4511**	Dk. Bronze/**4515**	$764.00
		●	Aluminum/**4512**	Dk. Bronze/**4516**	$804.00
	Recess Mount	–	Red/**4536**	Black/**4532**	$804.00
		●	Red/**4537**	Black/**4533**	$844.00
		–	Aluminum/**4541**	Dk. Bronze/**4545**	$814.00
		●	Aluminum/**4542**	Dk. Bronze/**4546**	$854.00

Knox® Key Switch

Ship Weight = 1 lb.

#3503

#3501

#3502

Part (includes all stainless steel dust cover)	Part Number	Price
Key Switch	**3501**	$73.00
Key Switch on Mounting Plate	**3502**	$91.00
Double Key Switch on Mounting Plate	**3503**	$145.00

Knox® Padlock

Ship Weight = 2 lbs.

#3772

#3770

#3771

Part	Part Number	Price
Shrouded - All Weather Conditions 7/16" diameter stainless steel shackle, 3/4" H shackle clearance	**3772**	$99.00
Exterior - All Weather Conditions 7/16" diameter stainless steel shackle, 1-13/16" H shackle clearance	**3770**	$85.00
Interior - Light Duty 5/16" diameter hardened steel shackle, 2-3/8" H shackle clearance	**3771**	$62.00

Appendix H

Sewer Force Main Design Information

The following sections discuss elements necessary for sewer force mains, however the use of these facilities within the Valley Sanitary District system is not allowed without approval by the General Manager. It is strongly encouraged for any development contemplating the use of a sewer force main, to meet with VSD staff at the earliest time. Sewer force mains and lift stations will only be allowed under unusual conditions, in locations that cannot be served by a gravity sewer. It is the responsibility of the Developer to demonstrate that a sewer force main and lift station are the most practical means for conveying sewage into the existing VSD sanitation system.

H.1 Force Mains

Sewer force mains will only be allowed under unusual conditions in locations that cannot be served by a gravity sewer. It is the responsibility of the Engineer to demonstrate that a sewer lift station in combination with a sewer force main is the most practical means for conveying sewage into the existing VSD sanitation system. VSD will need to approve the use of all sewer force mains.

The size of the sewer force main shall be determined during the design phase of the lift station. Force mains shall be designed for peak hour wet weather flow, as indicated in **Table H.1**. If the initial capacity of the lift station is considerably less than ultimate, consideration should be given to the undesirable effect of prolonged detention times within the force main. The engineer shall evaluate in these situations the feasibility of installing dual force mains to accommodate initial and ultimate flows. In no case shall a force main be less than 6-inches in diameter unless otherwise approved by VSD. The discharge from the lift station shall be into another force main, lift station receiving wet well, a receiving gravity sewer manhole or into the waste water treatment plant. Force mains that discharge directly to a receiving manhole shall be epoxy coated on the interior or PVC lined for corrosion protection.

The force main and lift station design shall also consider and include facilities to eliminate or sufficiently dampen transient forces and/or surging in the event of power failure or an immediate station shutdown. Lift stations designed with a total dynamic head above 100 feet or force main velocity above 4 feet per second shall be evaluated to determine the need for hydraulic cushion check valves. If indicated, check valves shall be equipped with a hydraulic cushion to dampen the valve closing action. The hydraulic-cushion check valve shall be fully adjustable to control the valve closing speed. Details shall be included in the improvement plans.

The Engineer shall evaluate the need for odor control facilities for all force mains.

H.1.1 Force Main Pipeline Sizing Criteria

The force main velocity criteria is used in order to provide velocities that re-suspend solids when the duty pump or pumps are in operation. The maximum velocity for force mains are used to

prevent scour, excessive water hammer, and minimize electrical usage. Force main velocities design criteria and limits are listed in Table H.1.

Table H.1 Sewer Force Main Design Criteria

Design Criteria	**Standard**		
Velocity	Minimum (ft/s)	Recommended (ft/s)	Maximum (ft/s)
Any Size	3	4 to 7	7 to 8
Maximum Head loss			
18 inches & larger	1 psi /1,000 feet of pipeline		
Pressure			
Operating	40 to 80 psi		

A Hazen-Williams Coefficient ("C") value to be used for calculating force main friction losses shall be "C"=130 for old pipes and "C"=150 for clean new pipes. The pumping plant and force main must be designed to accommodate variations expected during the life of the system (as in flows, service area, age of pipe etc.). The Hazen-Williams Coefficient shall be determined on a case by case basis by VSD.

H.1.2 Force Main Cover and Alignment

Force mains shall have a minimum cover of 4.0 feet and a maximum cover of 12.0 feet from the proposed finish grade to the top of pipe. High points in the force main should be minimized along the alignment. A wastewater air release and air/vacuum valve shall be installed in a vault and shall be located at each high point on the force main. At major low-points a manually controlled drain valve shall be installed in a manhole to allow for cleaning or draining. The force main shall discharge at an elevation not more than 2 feet above the invert of a separate receiving manhole having no upstream gravity sewer connections.

The design of the force main alignment shall use 45-degree elbow fittings to reduce the potential for stoppages where a 90-degree change of direction in the force main is required. The engineer shall show and specify two 45-degree elbows on the improvement plans. Thrust blocks are to be used at all bends on the force main and they shall be constructed against undisturbed soil.

All PVC force mains shall utilize an Electronic Marker System (EMS) manufactured by 3M or an approved equal. Mid-range pipe locators shall be placed on the force main at 500 foot intervals, at horizontal changes in alignment and as directed by the VSD.

H.1.3 Force Main Pipe Material

All sewer force mains shall be polyvinyl chloride pipe (PVC) pipe meeting AWWA C-900 or C-905. Force mains shall be water pressure tested in accordance with Section 306-1.4.5 of the Green Book. In locations where the sewer system is to be installed in non-corrosive soils and in unimproved areas or in parking lots, construction shall comply with the following special requirements:

a) Pipelines smaller than 12-inches shall be a minimum of C900, Class 150 DR18 PVC pipe in accordance with AWWA C900

b) Pipelines 18-inch through 36-inch diameter shall be a minimum of C905, CL165 DR25 PVC pipe in accordance with AWWA C905.

H.1.4 Force Main Valves

Force main valves smaller than 36-inch shall be ball-centric plug valves by Dezurik or approved equal. Any valves required for pipelines larger than 36-inch will be as directed by VSD. Marker posts are required if valves are to be installed outside of paved areas. No valves shall be installed in decorative paving areas. All valves shall be installed perpendicular to final grade.

H.1.5 Force Main Fittings

Fittings for force main pipelines shall be made to fit appropriate size and corrugation patterns and shall comply with Sanitation Standard Specification (see ***Appendix I***). Fittings include in-line joint fittings such as couplers, bends, tees or reducers. Fittings shall not reduce or impair the overall integrity or function of the pipeline. Drawings shall depict all fittings, including all stationing and types.

H.1.6 Combination Air and Vacuum Relief Valves

Air vacuum valve assemblies shall be installed at all high points along the pipeline as directed and approved by VSD. At the high point of all vertical deflections, an air/vacuum valve will be required on the high side of the siphon.

Two-inch combination air and vacuum relief valve assemblies shall be installed on all sewer force mains greater than 8-inches in diameter. Larger sized combination air and vacuum relief valves will be required as directed by VSD.

H.1.7 Thrust Restraint – Force Mains

Thrust restraint shall be designed by the Engineer, reviewed and approved by VSD.

H.2 Lift Stations

The following represents the general design criteria for a sewage lift station facility. It is essential that the Engineer meet and confer with the District prior to any analysis or preliminary lift station design. Each phase shall be reviewed and approved by VSD from capacity analysis to preliminary and final design. The District reserves the right to modify, change and/or supplement

the following in an effort to accommodate changing regulatory requirements, location restrictions, and/or provide for lift station expansion.

H.2.1 Lift Station Location

The lift station should be located at least 100 feet from any buildings or houses and a buffer zone of at least 25 feet should be established between the lift station fence and its surrounding environment.

No portion of the site shall be located within the floodway zone. All parts of the station and the access roadway shall be located a minimum of 2 feet above the 100 year floodplain elevation as shown on FEMA FIRM maps, unless otherwise approved by VSD.

Rural lift stations shall have an access road of a minimum of 20 feet wide with a 6-inch layer of class II aggregate base. Urban lift stations shall have the same access width and the access road shall be paved with asphalt concrete. The lift station property shall be adequately sized to provide sufficient space for future bio filter beds & odor control equipment. All lift stations shall have a minimum vehicle turning radius of 42 feet. At stations requiring the use of a crane to pull pumps and other equipment, the turn-around provisions and access points shall be revised accordingly.

The lift station site, including all slabs, equipment, and utilities shall be enclosed within the minimum height block wall of 7 feet. All items located within the lift station shall be at least five feet from the wall.

The station shall include one high pressure sodium type security light mounted on a pole at least 15 feet above the ground, or as directed by VSD.

At locations where water is available, a ¾-inch hose bib shall be provided for washing down the wet well. All water services shall include a backflow prevention device in an above-ground enclosure. The lift station site plans shall clearly identify the proposed lift station equipment, future lift station equipment and existing topo features as called out in this section.

H.2.2 Lift Station Capacity

Lift stations shall be designed for the peak hour wet weather flow with the largest pump unit out of service. During the design phase, the future flow capacity shall be compared to the initial project design flows capacities, special consideration shall be given to wet well retention time and pumping equipment operational parameters so that they are not exceeded.

The engineer shall provide to the District the complete hydraulic analysis and calculations for the above criteria. Included with the submitted calculations shall be the system and pump curves and the required capacities for initial and ultimate flows.

H.2.3 Lift Station Design

Pumps shall be capable of passing 4-inch diameter solids. All pump equipment will be manufactured and supplied by the same company.

Each submersible pump shall utilize a base elbow connection and stainless steel dual tubular sliding guide rail system. The guide rail system shall be designed to permit the installation and removal of the pump from the base elbow discharge connection without having personnel enter the wet well. Each pump shall be fitted with a stainless steel cable or chain of sufficient strength and length to permit the installation or removal of the pump for maintenance and or inspection.

Table H.2 Lift Stations

Lift Station	
Capacity	Peak Hourly Wet Weather Flow
Emergency Storage	2 hours at peak hour design flow above high water alarm to invert of influent sewer (Storage time not allowed with in influent sewer line)
Operation	Lead/lag
Maximum Pump Cycles	6 cycles/hour
Pump Discharge Piping	4 to 10 fps

H.2.4 Wet Well Design

The wet well for dual pumps shall be a minimum of 8’ diameter or 6’x 8’ concrete vault, three pumps shall be a minimum of 10’ diameter or 8’ x 10’ concrete vault of precast concrete pipe or cast-in-place concrete constructed watertight, with concrete base and cover. All metal appurtenances inside the wet well shall be stainless steel or aluminum, unless otherwise directed by VSD.

The wet well design and detention time shall be such that the deposition of solids is minimized and the sewage does not become septic. An interior protective coating shall be required for the prevention of hydrogen sulfide corrosion of the structure.

A grout fillet shall be properly designed and constructed around the full circumference of the wet well’s bottom to direct grit and other solids to the pumps. The slope of this fillet shall be at least 1:1. The inner diameter of this “grout circle” shall be as recommended by the pump manufacturer for the specified pump and approved by VSD, but in general should be as small as possible without creating a vortex condition around the pumps. The inner “grout circle” shall be centered on the pumps.

The wet well shall also incorporate an emergency storage design sufficient to provide at least two hours of storage at peak hour design flow from the high water alarm to the invert of the influent sewer. In no case shall this distance be less than six feet.

No more than one influent sewer shall enter the wet well, and it shall be located opposite the pumps.

Located adjacent to the wet well shall be a concrete pump wash down pad. The wash down pad shall be provided with a drain and P-trap that drains directly back into the wet well. The pump wash down pad and the discharge manifold slab can be designed together (see ***Section H.2.5***) as long as there is sufficient space.

H.2.5 Discharge Piping and Valves

Discharge piping from each pump shall exit the wet well to a valve vault or if specifically approved by the District to an above ground discharge manifold for easy access to the valves, piping and flow meter. The above ground piping and valves shall be painted gray to indicate it as a sewage (wastewater) line. A by-pass shall also be furnished with a valve connection to the force main beyond the pump isolation valves for emergency pumping. The manifold shall have a concrete slab that slopes to a 6-inch drain with a stainless steel drain cover. The slab drain shall connect directly to the wet well with an inline P-trap. The slab shall be designed to insure that any liquid from seepage, routine piping and valve maintenance will be drained back to the wet well.

Each lift station shall be provided with a magnetic flow metering device to monitor the discharge flow from the lift station. The discharge piping shall be configured with a straight run of piping (no valves, tees, or reducers) equal to 10 diameters upstream and at least six diameters downstream of the flow meter or as directed by the flow meter manufacturer to achieve an acceptable flow pattern through the flow meter.

H.2.6 Odor Control

The engineer shall consider the need for odor control facilities in the design of the lift station (i.e. bio filter bed, air scrubbers, chemical additives, aeration). Additionally, the engineer shall provide odor analysis considering the average and maximum detention time in the wet well. Each odor control analysis shall include the Districts preferred bio filter beds odor control system as one of its alternatives. The odor control analysis shall be provided to the District with the District selecting the final odor control system. If odor control is determined not to be required, the lift station shall be designed for the addition of future odor control facilities (i.e. ventilation pipe stubbed out from the wet well).

H.2.7 Control and Telemetry

The sewer lift station pump operation will automatically alternate the pump sequencing (lead/lag operation) to balance pump wear during operation. Pumps set points are to be actuated at predetermined wet well levels as defined in the engineers design report for the lift station. The wet well levels and alarms shall be controlled by a redundant control system.

The lift station shall incorporate a radio or phone telemetry system that is to be capable of automatically contacting the District in cases of emergency (i.e. power failure or pump failure).

H.2.8 Emergency Standby Power Facilities

The project site shall include providing adequate space for a diesel fueled standby generator in a recessed concrete structure. The generator shall be sized to operate connected load (full site load) of the designed station. The standby power project fees shall include applicable Air Quality Management application fees, one-full fuel tank, sound attenuation enclosure testing and installation of District specified equipment.

The concrete recessed structure (approximately 32’ x 18’) shall include but is not limited to exterior lighting, receptacles, safety rails, stairs, drain sump pumps, automatic sump pump controls and drain filtration system (manufactured to controlled infiltration of oils and etc. from entering the ground water system). The recessed structure shall provide reduced viewable generator height from the public. Vehicle access (20-foot) shall be available on one 32-foot side of the recessed structure.

In order for the internal combustion engine to operate the electric generator, a permit to construct and operate must be obtained from the Air Quality Management District having jurisdiction. Permitting fees and engine procurement are greater if the project site is within 1,000-foot of an existing school.

The internal combustion engine operated generator shall be enclosed in a weather resistant sound attenuated metal enclosure. The metal enclosure shall reduce the engine noise to 75-dBA at 23-feet from the generator when operating at full load in all directions from the generator. When a block building is constructed to house the booster pumps and other equipment, the generator shall be incorporated inside the block building.

The generator shall be equipped with a fuel tank mounted on the same base rails as the generator and its metal enclosure. The fuel tank shall be sized to allow full load operating condition for a period not less than 12-hours minimum.

The engine generator shall be supplied in accordance with District specifications for each specific project deemed necessary and shall be capable of supplying power to the connected of the designed station.

Appendix I
Standard Drawings and General Notes

VALLEY SANITARY DISTRICT
STANDARD DETAILS

TABLE OF CONTENTS

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				TABLE OF CONTENTS	
				APPROVAL DATE: June 2016	S-TC

STANDARD SYMBOLS AND LINESTYLES

DESCRIPTION	SYMBOL
PROPOSED SEWER MAIN	S — S — X" PVC — S
PROPOSED SEWER MANHOLE	S — MH # — S — S
PROPOSED SEWER CLEAN OUT	S — CO — S — S
PROPOSED DEAD END	S — CO
PROPOSED STUB	S — CO
PROPOSED CONCRETE ENCASEMENT	S — S
PROPOSED CUT OFF WALL	S — S
PROPOSED SEWER LATERAL	CO
PROPOSED SEWER FORCE MAIN	SFM — SFM — SFM
PROPOSED EDGE OF PAVEMENT	
EX. EDGE OF PAVEMENT	
EX. SEWER	S — S — X" PVC/VCP — S
EX. WATER MAIN	DW — DW — X" DIP — DW
EX. SEWER LATERAL	CO
EX. WATER SERVICE AND METER	M WM
GAS LINE	G — G — G
GAS LINE HIGH PRESSURE	G HP — G HP — G HP
ELECTRICAL CONDUIT	E — E — E
ELECTRICAL OVERHEAD	EOH — EOH — EOH
CABLE TV CONDUIT	TV — TV — TV
CABLE TV OVERHEAD	TV OH — TV OH — TV OH
COMMUNICATIONS CONDUIT	COM — COM — COM
COMMUNICATIONS OVERHEAD	COM OH — COM OH
MISC. UTILITY MANHOLE	MH
STORM DRAIN	SD — SD — SD
STORM DRAIN MANHOLE	SD MH
POWER POLE & GUY WIRE	PP
SIGN	
STREET LIGHT	
FENCE	X — X — X — X — X — X — X
TRAFFIC SIGNAL SYSTEM	
MISC. UTILITY VALVE	
FIRE HYDRANT	F.H.
RIGHT OF WAY	R/W
EASEMENT	
PROPERTY LINE	PL
CENTERLINE	CL
EX. STREET FEATURE (C&G, SIDEWALK, ...)	

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				STANDARD SYMBOLS	
				APPROVAL DATE: June 2016	S-1A

STANDARD ABBREVIATIONS

DESCRIPTION	ABBREVIATION
ASPHALT CONCRETE	AC
CATCH BASIN	CB
CENTERLINE	CL, C/L
CONCRETE	CONC
CURB & GUTTER	C&G
CURB FACE	CF
DOMESTIC WATER	DW
DRIVEWAY	DWY
EDGE OF PAVEMENT	EP
EASEMENT	ESMT
EXISTING	EX
EXISTING GRADE	EG
FINISHED GRADE	FG
FINISHED SURFACE	FS
FINISHED FLOOR	FF
FLOW LINE	FL
FUTURE	FUT
GRADE BREAK	GB
HIGH POINT	HP
INVERT	INV
LOW POINT	LP
MANHOLE	MH
POINT OF INTERSECTING GUTTER	PIG
POLYVINYL CHLORIDE	PVC
PORTLAND CEMENT CONCRETE	PCC
POWER POLE	PP
PROPERTY LINE	PL
PROPOSED	PROP
PUBLIC UTILITY EASEMENT	PUE
REINFORCED CONCRETE PIPE	RCP
RIGHT OF WAY	R/W
SANITARY SEWER	SWR
TELEPHONE BOX	VER
TOP OF CLEAN OUT	TCO
TOP OF CURB	TC
TOP OF PAVEMENT	TP
VAULT	VLT
VITRIFIED CLAY PIPE	VCP
WATER METER	WM
WATER VALVE	WV

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				STANDARD ABBREVIATIONS	
				APPROVAL DATE: June 2016	S-1B

VSD SEWER NOTES

1. VSD APPROVAL OF THE PLANS DOES NOT RELIEVE THE APPLICANT, APPLICANT'S ENGINEER, OR CONTRACTOR FROM RESPONSIBILITY FOR THE CORRECTION OF ERRORS OR OMISSIONS DISCOVERED DURING OR AFTER CONSTRUCTION. IN ADDITION, APPROVAL OF THIS PLAN BY VSD DOES NOT CONSTITUTE A REPRESENTATION OF THE ACCURACY OF THE LOCATION OF AND/OR THE EXISTENCE / NON-EXISTENCE OF ANY UNDERGROUND FACILITY WITHIN THE LIMITS OF THIS PROJECT.
2. ALL DESIGN, MATERIALS AND CONSTRUCTION WORK SHALL CONFORM TO THE CURRENT EDITION OF THE VALLEY SANITARY DISTRICT (VSD) SEWER STANDARDS, TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK), UNIFORM PLUMBING CODE (UPC) AND THE REGIONAL STANDARD DRAWINGS. IN THE EVENT OF CONFLICTING STANDARDS, THE VSD SEWER STANDARDS SHALL GOVERN. CONSTRUCTION AND MATERIALS FOR THE ONSITE AND OFFSITE SEWER IN PUBLIC RIGHT-OF-WAY SHALL CONFORM TO THE CURRENT STANDARD SPECIFICATIONS OF THE VALLEY SANITARY DISTRICT. THE ONSITE SEWER SYSTEM ON PRIVATE PROPERTY SHALL CONFORM TO THE CURRENT EDITION OF THE "UNIFORM PLUMBING CODE".
3. OSHA SAFETY ORDERS AND OSHA CONFINED SPACE ENTRY REQUIREMENTS SHALL BE FOLLOWED AT ALL TIMES WITHOUT EXCEPTION. ENTRY INTO ALL MANHOLES MUST BE DONE IN ACCORDANCE WITHIN CAL-OSHA CONFINED SPACE STANDARDS.
4. ALL PLAN SHEET REVISIONS SHALL BE APPROVED BY VSD IN WRITING PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL HAVE A COPY OF THE VSD STANDARD SPECIFICATIONS FOR CONSTRUCTION OF SANITARY SEWERS ON THE JOBSITE AT ALL TIMES.
6. THE CONTRACTOR SHALL GUARANTEE ALL WORK FOR A PERIOD OF ONE YEAR AFTER THE DATE OF FINAL ACCEPTANCE BY VSD AND SHALL REPAIR AND/OR REPLACE ANY WORK THAT MAY PROVE DEFECTIVE IN WORKMANSHIP AND/OR MATERIALS WITHIN THE ONE YEAR PERIOD WITHOUT EXPENSE WHATSOEVER TO VSD. DURING THIS WARRANTY PERIOD, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DISCHARGES OR OVERFLOWS.
7. PRIOR TO THE START OF CONSTRUCTION:
   - THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS REPRESENTING ALL MATERIALS NOTED IN THE PLANS TO VSD FOR REVIEW AND ACCEPTANCE. WORK SHALL NOT COMMENCE UNTIL SUCH SUBMITTALS ARE ACCEPTED BY VSD.
   - VSD SHALL BE FURNISHED ONE SET OF CUT SHEETS, A MINIMUM OF THREE (3) DAYS PRIOR TO INSTALLATION OF PIPE SEGMENT.
   - THE CONTRACTOR SHALL SECURE A VSD PERMIT FOR CONSTRUCTION. IN ADDITION, THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING 7 DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION.
   - NO WORK SHALL COMMENCE UNTIL ALL PERMITS HAVE BEEN OBTAINED FROM THE JURISDICTIONAL CITY, COUNTY AND/OR OTHER PERMITTING AGENCIES.
   - THE CONTRACTOR SHALL PROVIDE THE DISTRICT WITH A COPY OF THEIR VALID OSHA TRENCHING PERMIT PRIOR TO BEGINNING ANY SEWER WORK.
8. CONTRACTOR SHALL NOTIFY VALLEY SANITARY DISTRICT FOURTY-EIGHT (48) HOURS PRIOR TO THE START OF CONSTRUCTION AND TWENTY-FOUR (24) HOURS PRIOR TO ALL REQUIRED INSPECTIONS.
9. GRAVITY SEWER PIPE MATERIAL SHALL BE PVC SDR-35 AND/OR SDR-26, WITH SCHEDULE 40 FITTINGS. OTHER PIPE MATERIALS MAY BE ALLOWED FOLLOWING APPROVAL BY VSD.
10. ALL MANHOLE FRAME AND COVERS SHALL BE CLEANED TO REMOVE ALL DEBRIS. THE MANHOLE FRAME AND COVER SHALL HAVE A BITUMINOUS OR RUST-OLEUM PRIMER PAINT COATING.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				VSD SEWER NOTES	
				APPROVAL DATE: June 2016	S-2A

VSD SEWER NOTES, CONT.

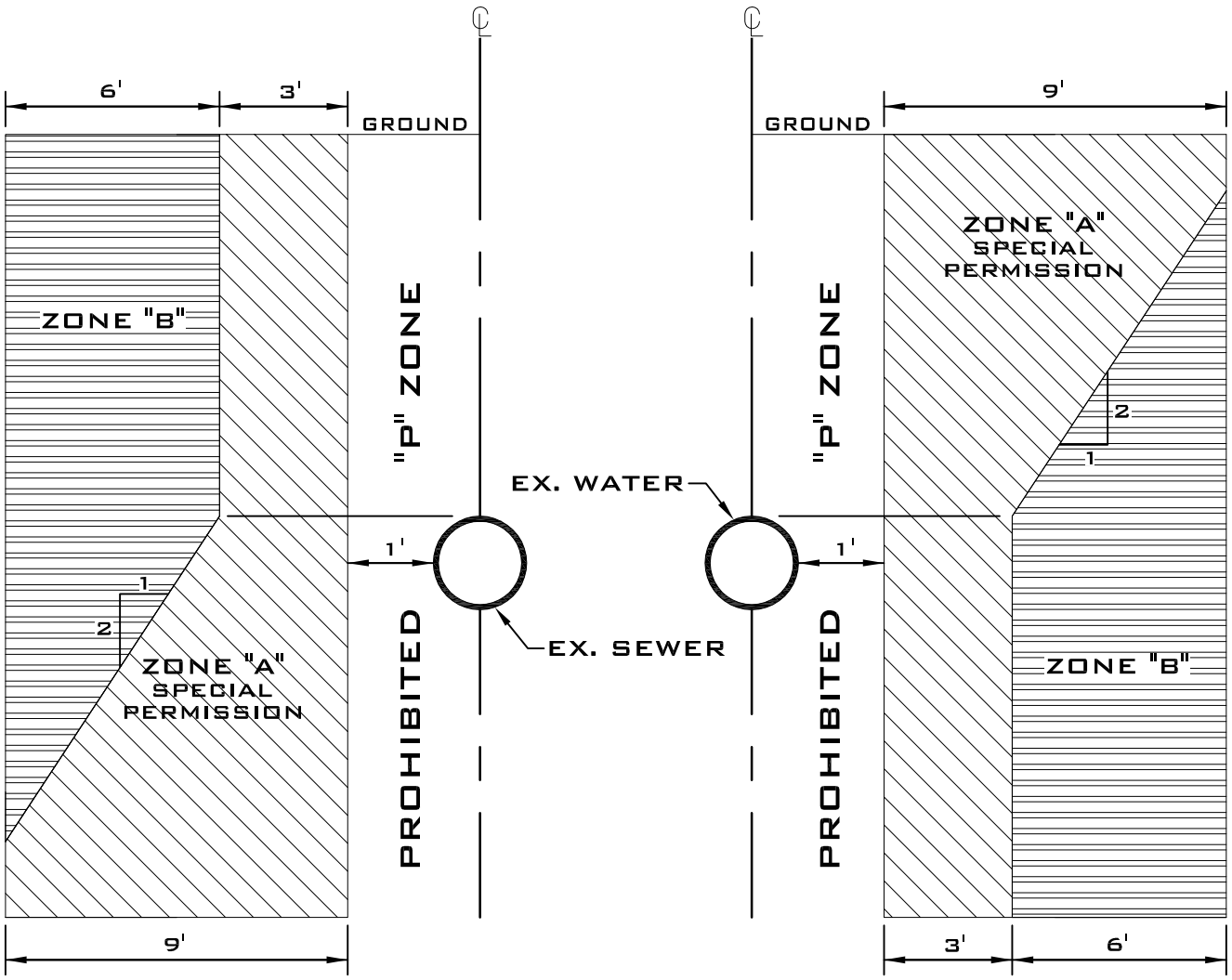
11. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES SHOWN ON THE IMPROVEMENT PLANS WAS OBTAINED BY AVAILABLE RECORDS SEARCH BY THE APPLICANT'S ENGINEER. ATTENTION IS CALLED TO THE POSSIBLE EXISTENCE OF OTHER UTILITIES OR STRUCTURES NOT SHOWN, OR IN A DIFFERENT LOCATION FROM THAT SHOWN ON THE PLANS. THE CONTRACTOR SHALL TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN ON THE PLANS AND OTHER MEASURES TO PROTECT THE EXISTING UTILITIES NOT SHOWN ON THE PLANS BUT INDICATED IN THE FIELD BY UTILITY MARKINGS. DAMAGE CAUSED BY THE CONTRACTOR TO ALL UTILITIES NOTED ON THE PLANS AND/OR INDICATED IN THE FIELD THROUGH PRE-EXCAVATION UTILITY MARKINGS SHALL BE AT THE SOLE EXPENSE OF THE CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THE SEWER CONTRACTOR TO LOCATE ALL EXISTING UTILITIES, VERIFY ELEVATIONS AND NOTIFY ALL UTILITY COMPANIES AT LEAST FOURTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION.
12. CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT AS REQUIRED BY STATE LAW. ALL UTILITY CROSSINGS SHALL BE POTHOLED PRIOR TO THE START OF ALL EXCAVATION OPERATIONS.
13. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL LOCAL, STATE AND FEDERAL SAFETY REGULATIONS INCLUDING BUT NOT LIMITED TO, TRENCH SAFETY AND CONFINED SPACE ENTRY.
14. THE APPLICANT SHALL SUBMIT TO VSD A MATERIALS AND COMPACTION REPORT PREPARED BY A LICENSED SOILS ENGINEER WHICH CERTIFIES THAT THE TRENCH BACKFILL WAS COMPACTED AS DIRECTED BY THE SOILS ENGINEER IN ACCORDANCE WITH THE ONSITE SOILS CONDITIONS, VSD STANDARDS SPECIFICATIONS AND DAILY COMPACTION REPORTS, DOCUMENTING ADEQUATE AND PROPER COMPACTION.
15. SEWER ELEVATIONS SHOWN ON THE IMPROVEMENT PLANS ARE NOTING INVERT ELEVATION (I.E.) OF THE INSIDE BOTTOM OF THE PIPE. SEWER LENGTHS ARE NOTED FROM THE INSIDE OF THE MANHOLE TO THE INSIDE OF THE MANHOLE.
16. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING A COMPLETE RECORD OF ALL CHANGES TO THE PLANS AND SHALL MAKE SUCH RECORD AVAILABLE TO VSD AS ANY TIME DURING THE COURSE OF CONSTRUCTION AND TO THE APPLICANT'S ENGINEER AT THE COMPLETION OF CONSTRUCTION. THE APPLICANT'S ENGINEER SHALL PROVIDE RECORD DRAWINGS TO VSD FOR REVIEW AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF THE PROJECT. THE RECORD DRAWINGS SHALL CONTAIN A RECORD DRAWING STAMP PER STANDARD NO. S-23. THE RECORD DRAWINGS SHALL BE PROVIDED TO VSD IN A DIGITAL PDF AND BOND COPIES.
17. LENGTH OF OPEN TRENCH SHALL BE LIMITED TO 1,320 FEET, INCLUDING COLLECTOR PIPE AND LATERALS. UNLESS OTHERWISE APPROVED IN WRITING BY VSD AND THE LOCAL GOVERNING AGENCY, OPEN TRENCHES SHALL BE PLATED AT THE CONCLUSION OF EACH WORK DAY.
18. TRENCH WORK SHALL NOT BE COVERED UNTIL APPROVAL HAS BEEN PROVIDED BY VALLEY SANITARY DISTRICT INSPECTOR.
19. THE CONTRACTOR SHALL PROTECT ALL EXISTING SURVEY MONUMENTATION. IF ANY SURVEY MONUMENTS ARE DISTURBED OR DESTROYED DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL RETAIN A LICENSED SURVEYOR TO RE-ESTABLISH AND RECORD THE MONUMENT CHANGE PER STATE LAW. VSD AND THE LOCAL GOVERNING AGENCY SHALL BE SUPPLIED WITH COPIES OF ALL RECORD SURVEY DOCUMENTS.
20. CONNECTIONS TO EXISTING SEWER PIPE OR MANHOLES SHALL BE DONE IN THE DIRECT SUPERVISION OF THE A VSD INSPECTOR. NEW SEWER SHALL NOT BE CONNECTED OR ALLOWED TO FLOW TO EXISTING SEWER UNTIL THE INSTALLATION HAS BEEN APPROVED BY VSD.
21. ALL SERVICE LATERALS SHALL BE LOCATED AT RIGHT ANGLES TO THE SEWER MAIN UNLESS OTHERWISE SHOWN AS APPROVED BY VSD ON THE PLANS.
22. A 2-INCH HIGH "S" SHALL BE INSCRIBED ON THE CURB FACE AT EACH LATERAL LOCATION BY THE CONTRACTOR.
23. LOCATING TAPE SHALL BE BURIED OVER EACH LATERAL AND SANITARY SEWER MAIN. TAPE SHALL BE PLACED IN THE TRENCH A MINIMUM OF TWO FEET ABOVE THE TOP OF THE PIPE.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				VSD SEWER NOTES	
				APPROVAL DATE: June 2016	S-2B

VSD SEWER NOTES, CONT.

24. ALL PIPE SHALL BE HANDLED AND INSTALLED SO AS TO PROTECT THE PIPE, JOINTS, LINING AND COATING AT ALL TIMES. THE PIPE SHALL BE CAREFULLY BEDDED TO PROVIDE CONTINUOUS BEARING AND PREVENT UNEVEN SETTLEMENT. PIPE SHALL BE PROTECTED AGAINST FLOTATION AT ALL TIMES. OPEN ENDS OF THE PIPE SHALL BE SEALED AT ALL TIMES WHEN CONSTRUCTION IS NOT IN PROGRESS.
25. SEWER PIPE ZONE AND TRENCH BACKFILL SHALL BE PER THE VSD SEWER STANDARDS. WATER JETTING SHALL NOT BE ALLOWED.
26. ALL LATERALS SHALL BE CONSTRUCTED CLEAR OF DRIVEWAYS WHENEVER POSSIBLE.
27. ON-SITE MIXING OF CONCRETE IS NOT ALLOWED WITHOUT EXCEPTION.
28. MANHOLE BASES SHALL BE MONOLITHICALLY PLACED, FINISHED AND COMPLETED AT THE TIME OF INITIAL PLACEMENT. SETTING OF THE MANHOLE RINGS SHALL NOT BE ALLOWED FOR 24 HOURS AFTER CONCRETE PLACEMENT.
29. ALL SEWER MANHOLE FRAMES AND COVERS SHALL BE LEFT 6" BELOW SUBGRADE. SEWER CONTRACTOR SHALL RAISE THE FRAMES AND COVERS TO FINISH GRADE UPON COMPLETION OF SURFACING AS PER VALLEY SANITARY DISTRICT STANDARD DRAWING. MANHOLE COVERS SHALL BE CLEANED OF ALL DEBRIS. COVERS SHALL HAVE A BITOMASTIC SEALER APPLIED TO THE SURFACE OF THE MANHOLE FRAME AND COVER.
30. ALL SEWER MAINLINE AND LATERAL PIPES SHALL BE MANDRELED AND AIR TESTED, PER THE "GREENBOOK" SPECIFICATIONS, AT THE APPLICANT/CONTRACTOR'S EXPENSE, PRIOR TO FINAL ACCEPTANCE BY VSD. VSD WILL REQUIRE TELEVISED INSPECTION AT THE CONTRACTOR'S EXPENSE UNLESS OTHERWISE DIRECTED.
31. ALL SEWER MAINLINE AND LATERAL PIPES SHALL BE INPLACE AND SHALL HAVE FINAL APPROVAL BY VSD PRIOR TO PAVING.
32. FOR PLACEMENT OF ALL CONCRETE AND AGGREGATE MATERIALS, THE CONTRACTOR SHALL PROVIDE VSD WITH THE MIX DESIGN, PRIOR TO PLACEMENT OF THE MATERIALS AND DELIVERY TICKETS, AT THE TIME OF PLACEMENT.
33. WHEN MAKING CONNECTIONS BETWEEN PIPES OF THE SAME (AT NON-JOINT LOCATIONS) OR DIFFERENT MATERIALS, CONTRACTOR SHALL USE AN APPROPRIATE STRONG BACK COUPLER (FERNCO 1000 RC OR 5000 RC SERIES COUPLING, OR VSD APPROVED EQUAL) PER EACH PIPE MATERIAL.
34. WHEN MAKING SEWER LATERAL CONNECTIONS INTO EXISTING SEWER MAIN, CONTRACTOR SHALL USE AN APPROPRIATE FLEXIBLE TAP SADDLE (FERNCO SADDLE OR VSD APPROVED EQUAL). BORE HOLE IN MAIN LINE PIPE SHALL BE MADE WITH INSERTA TEE, OR APPROVED EQUAL, HOLE SAW, OF THE APPROPRIATE SIZE TO ACCOMMODATE THE NEW SEWER LATERAL.
35. RECORD DRAWINGS SHALL BE SUBMITTED TO VALLEY SANITARY DISTRICT PRIOR TO FINAL ACCEPTANCE.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				VSD SEWER NOTES	
				APPROVAL DATE: June 2016	S-2C



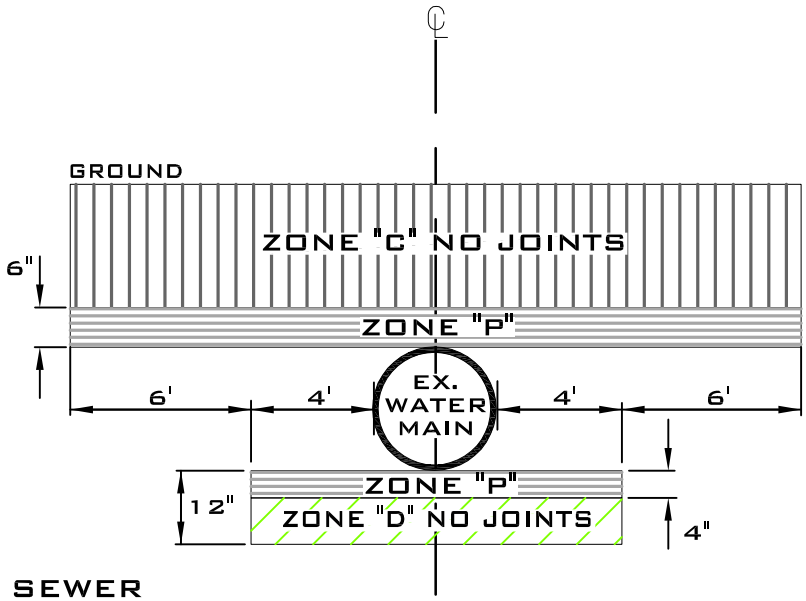
NEW WATER MAIN
EXISTING SEWER LINE
NOT TO SCALE

NEW SEWER MAIN
EXISTING WATER LINE
NOT TO SCALE

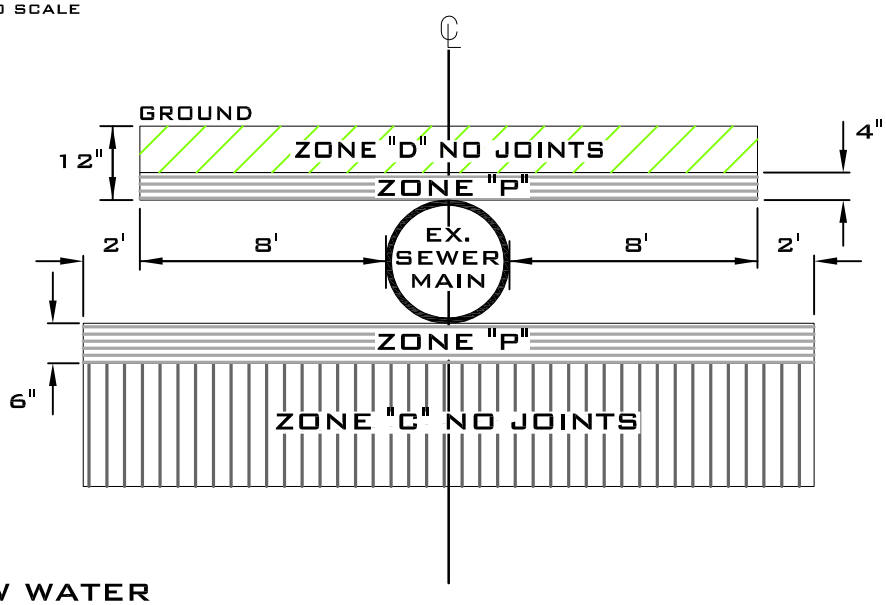
NOTES:

1. ZONE "P" IS A PROHIBITED ZONE PER SECTION 64572(a)(2) CALIFORNIA CODE OF REGULATIONS, TITLE 22.
2. ZONE "A" IS A NO CONSTRUCTION ZONE WITHOUT APPROVAL FROM RESPONSIBLE HEALTH AGENCY AND WATER SUPPLIER.
3. ZONE "B" NEW WATER MAIN WILL BE CONSTRUCTED IN ACCORDANCE WITH LOCAL WATER AGENCY REQUIREMENTS.
4. ZONE "B" NEW SEWER LINE TO COMPLY WITH CDPH REQUIREMENTS.
5. REFER TO IWA STANDARD PLAN NO. 711 OR CVWD STANDARD DWG NO. W-1 FOR ADDITIONAL DETAILS.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				SEWER AND WATER MAIN SEPARATION - PARALLEL	
				APPROVAL DATE: June 2016	S-3



NEW SEWER
EXISTING WATER LINE
NOT TO SCALE

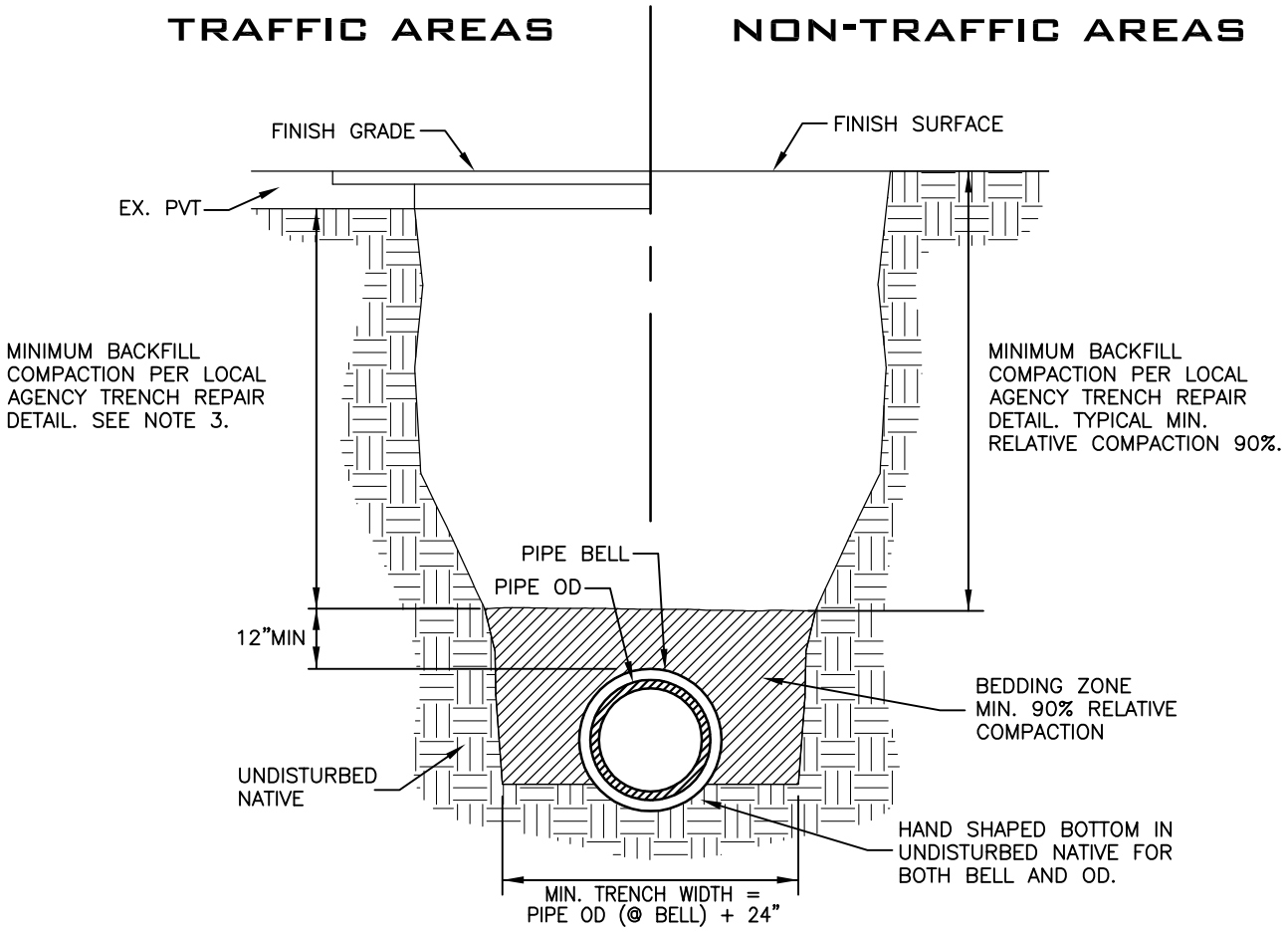


NEW WATER
EXISTING SEWER LINE
NOT TO SCALE

NOTES:

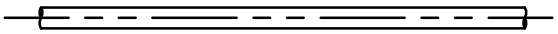
1. ZONE "P" IS A PROHIBITED ZONE PER SECTION 64572(a)(2) CALIFORNIA CODE OF REGULATIONS, TITLE 22.
2. ZONE "C", NEW WATER MAIN WILL BE CONSTRUCTED IN ACCORDANCE WITH LOCAL WATER AGENCY REQUIREMENTS.
3. ZONE "C", NEW SEWER LINE WILL BE CONSTRUCTED PER VSD APPROVED MATERIALS.
4. ZONE "D", NEW WATER MAIN WILL BE CONSTRUCTED IN ACCORDANCE WITH LOCAL WATER AGENCY REQUIREMENTS.
5. WATER MAIN PIPE, COATING AND LINING SHALL BE IN ACCORDANCE WITH LOCAL WATER AGENCY REQUIREMENTS.
6. ALL AWWA STANDARDS REFER TO LATEST EDITION.
7. RESTRAINED JOINTS FOR ALL WATER MAINS SHALL BE USED FOR ALL CROSSINGS.
8. REFER TO IWA STANDARD PLAN NO. 712 OR CVWD STANDARD DWG NO. W-2 FOR ADDITIONAL DETAILS.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				SEWER AND WATER MAIN SEPARATION - CROSSING	
				APPROVAL DATE: June 2016	S-4



STANDARD PIPE INSTALLATION

NOT TO SCALE

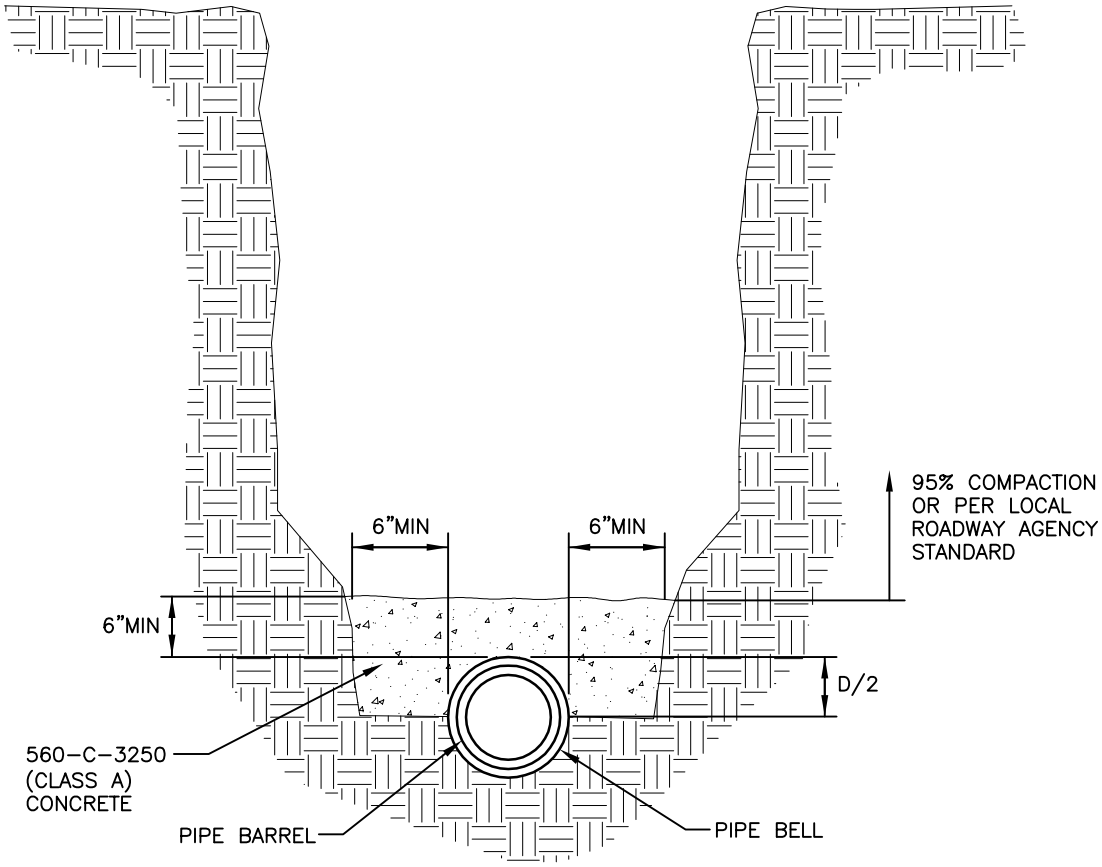


LEGEND ON PLAN

NOTES:

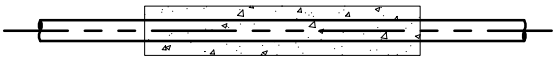
1. ALL PIPING SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321.
2. FOR TRENCHING IN IMPROVED STREETS, SEE THE LOCAL AGENCY'S STANDARD DRAWINGS FOR TRENCH REPAIR AND SURFACING REQUIREMENTS (INDIO STD. 171 & 172, AND RIVERSIDE COUNTY STD. 818).
3. THE BACKFILL ZONE ABOVE THE BEDDING ZONE SHALL BE COMPACTED PER THE LOCAL AGENCY'S STANDARD FOR TRENCH REPAIR (INDIO STD. 172 AND RIVERSIDE COUNTY STD. 818).

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				PIPE BEDDING & TRENCH BACKFILL	
				APPROVAL DATE: June 2016	S-5



SECTION

NOT TO SCALE

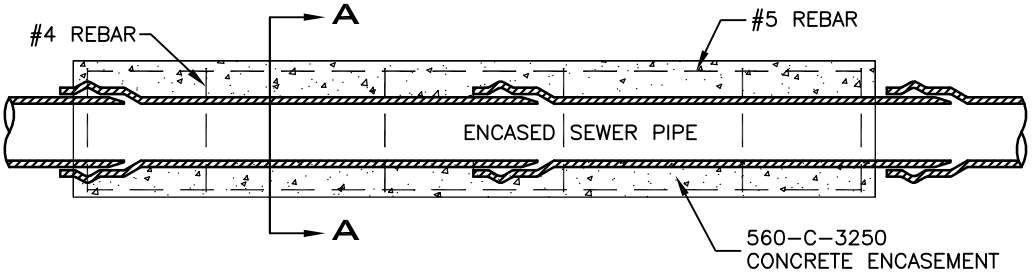


LEGEND ON PLAN

NOTES:

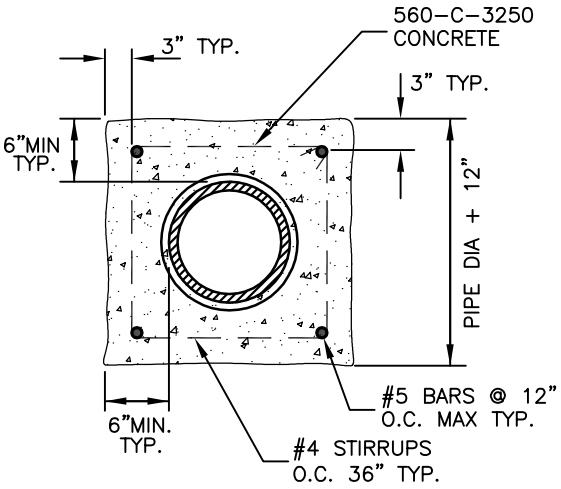
1. CONCRETE SHALL BE A MINIMUM OF 6" IN WIDTH FROM THE PIPE BELL.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				CONCRETE CROWN PROTECTION FOR EXISTING SEWER PIPE	
				APPROVAL DATE: June 2016	S-6



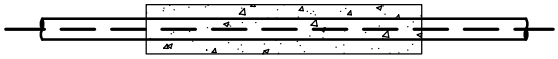
PLAN VIEW

NOT TO SCALE



SECTION A-A

NOT TO SCALE

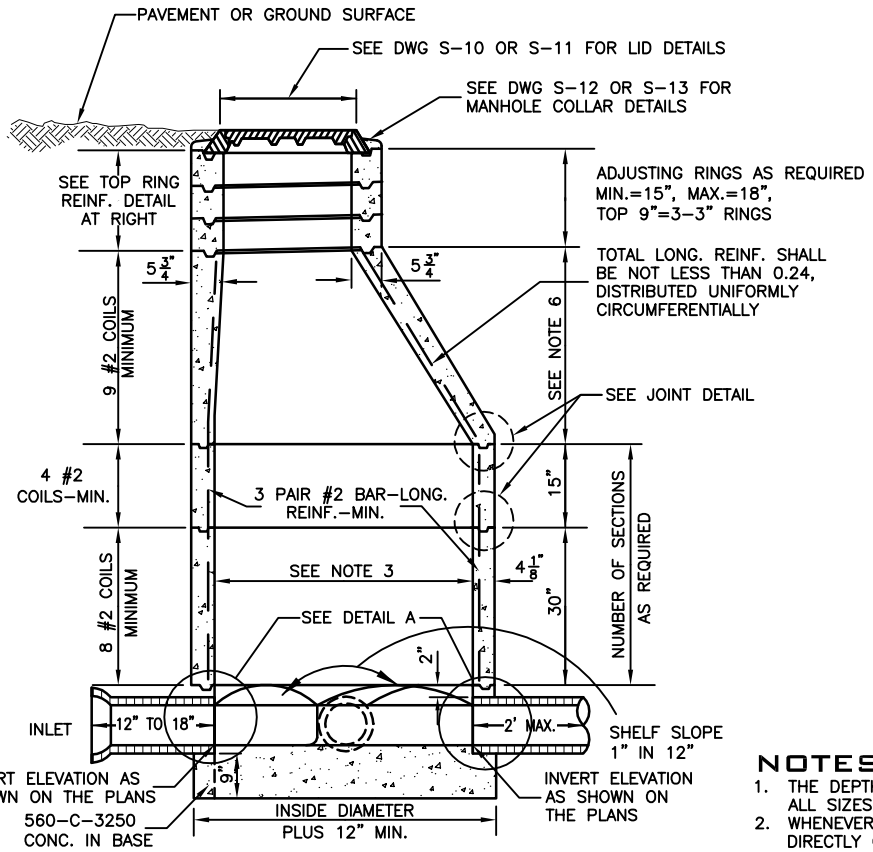


LEGEND ON PLAN

NOTES:

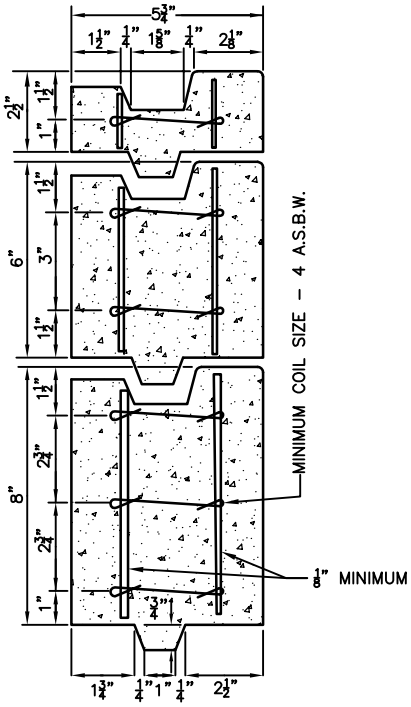
1. VERTICAL STIRRUPS SHALL BE #4 BARS WITH THE END SPACING OF 24" FROM THE END OF THE ENCASEMENT AND 36" O.C. BEYOND THE ENCASEMENT END.
2. EXTEND BOTH ENDS OF CRADLE OR ENCASEMENT TO A POINT ONE INCH SHORT OF FIRST PIPE JOINT BEYOND LOCATIONS SPECIFIED ON PLAN.
3. APPLY FORM OIL, THIN PLASTIC SHEET, OR OTHER ACCEPTABLE MATERIAL TO PIPE TO PREVENT BOND BETWEEN PIPE AND CONCRETE.
4. EXPANSION JOINTS MUST BE PLACED AT 20' INTERVALS, AT THE PIPE JOINT ON CONTINUOUS ENCASEMENT OR CRADLE.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				CONCRETE ENCASEMENT	
				APPROVAL DATE: June 2016	S-7



SECTIONAL ELEVATION A-A

NOT TO SCALE

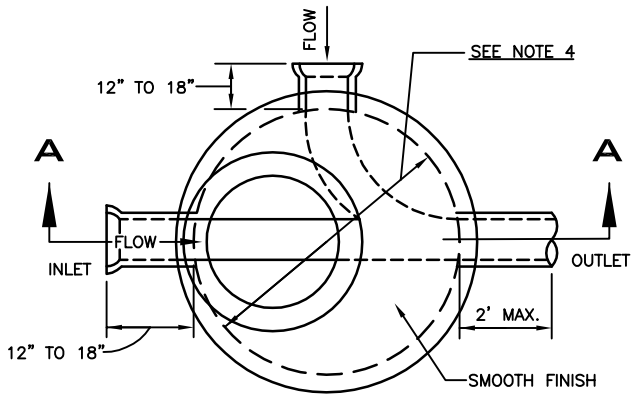


TOP RING DETAIL

NOT TO SCALE

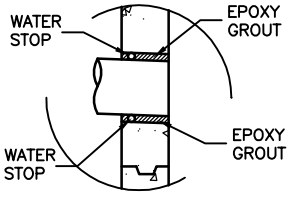
NOTES

1. THE DEPTH OF CHANNEL SHALL EQUAL THE PIPE DIAMETER FOR ALL SIZES OF PIPE.
2. WHENEVER PRACTICAL THE FRAME AND COVER SHALL BE PLACED DIRECTLY OVER THE INLET OF THE STRUCTURE EXCEPT AS OTHERWISE NOTED ON PLANS.
3. 48" DIA. FOR 21" DIA. OR SMALLER PIPE. (MINIMUM SIZE) 60" DIA. FOR 24" DIA. OR LARGER PIPE. (MINIMUM SIZE)
4. LARGER DIAMETER MANHOLES MAY BE REQUIRED FOR 27" DIA. OR LARGER PIPE. CHECK WITH ENGINEER.
5. MANUFACTURING METHODS AND MATERIALS FOR PRE CAST UNITS SHALL CONFORM TO ASTM C-478.
6. TAPERED HEIGHT 30" MIN. FOR 48" DIA. TAPERED HEIGHT 24" MIN. FOR 60" DIA. OR GREATER.
7. STRUCTURAL ELEMENTS OF MANHOLE SHALL MEET ALL APPROPRIATE ASTM STANDARDS.
8. SEE MANHOLE FRAME AND COVER STD. DETAIL FOR SIZE AND TYPE.



PLAN OF BASE

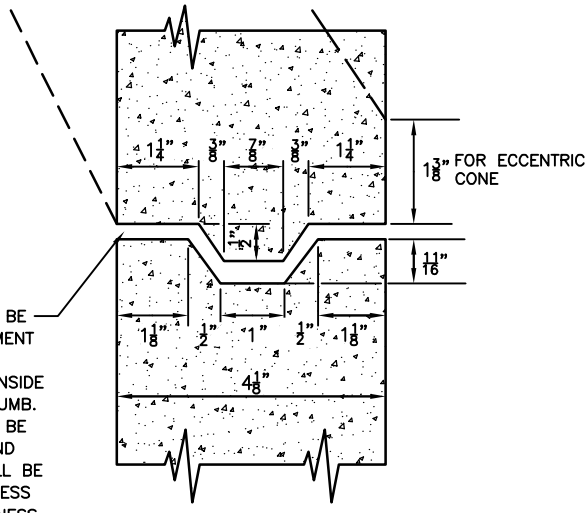
NOT TO SCALE



DETAIL A

NOT TO SCALE

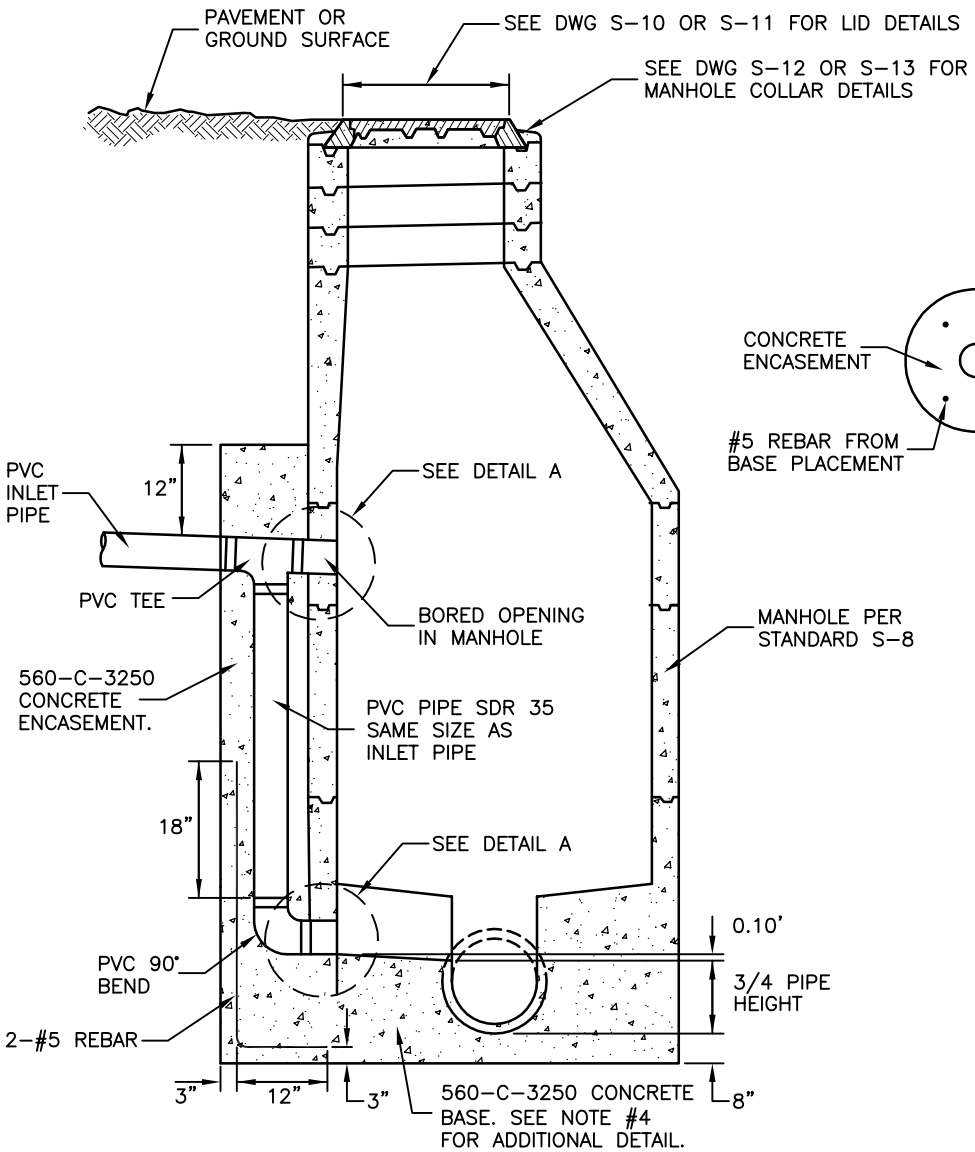
ALL JOINTS SHALL BE SET IN A BED CEMENT MORTAR TROWELED SMOOTH ON THE INSIDE AND SHALL BE PLUMB. ALL JOINTS SHALL BE NEATLY STRUCK AND POINTED AND SHALL BE A MINIMUM THICKNESS OF 3/8" IN THICKNESS



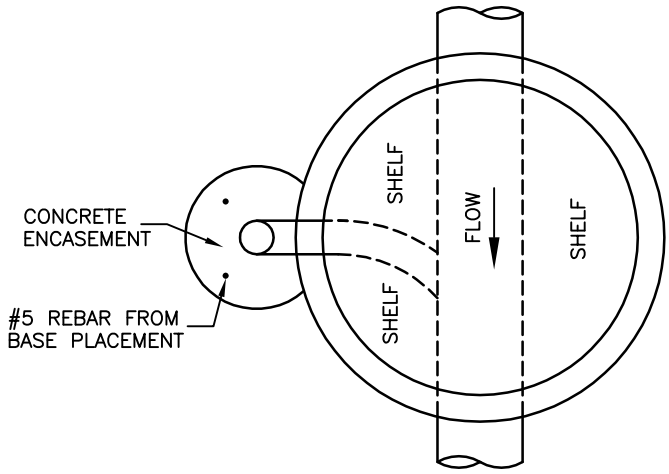
JOINT DETAIL

NOT TO SCALE

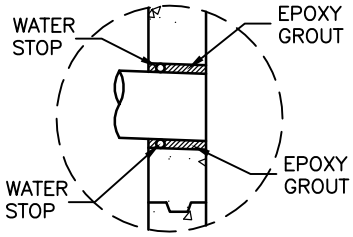
REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				REINFORCED PRECAST CONCRETE MANHOLE	
				APPROVAL DATE: June 2016	S-8



DROP MANHOLE DETAIL
5.0' OR MORE DROP
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

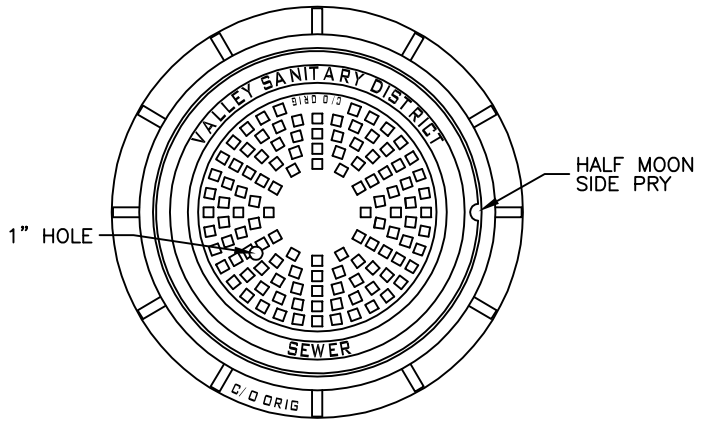


DETAIL A
NOT TO SCALE

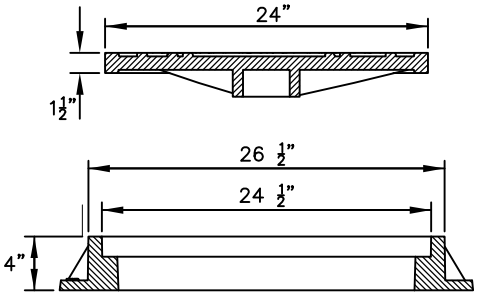
NOTES:

1. MANHOLE, EXCLUDING THE BASE CONSTRUCTION, FOR DROP SEWER CONNECTION SHALL CONFORM TO STANDARD S-12, EXCEPT FOR PIPE DETAILS AS SHOWN ABOVE.
2. THE DROP SEWER CONNECTION SHALL ENTER THE MANHOLE IN THE BARREL SECTION.
3. DROP SEWER CONNECTION SHALL ENTER THE MANHOLE ON THE VERTICAL SECTION OF THE ECCENTRIC CONE.
4. MANHOLE BASE ALONG WITH DROP SEWER PIPE ENCASEMENT SHALL BE MONOLITHICALLY PLACED. CONTRACTOR SHALL USE 560-C-3250 CONCRETE FOR MONOLITHIC CONCRETE PLACEMENT.

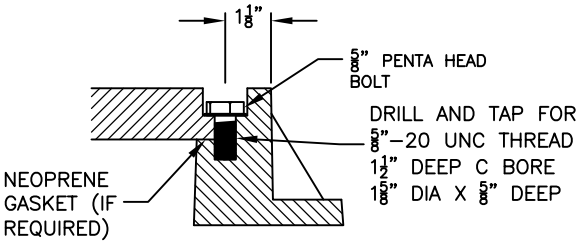
REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				DROP SEWER MANHOLE CONNECTION	
				APPROVAL DATE: June 2016	S-9



PLAN
NOT TO SCALE



SECTION
NOT TO SCALE

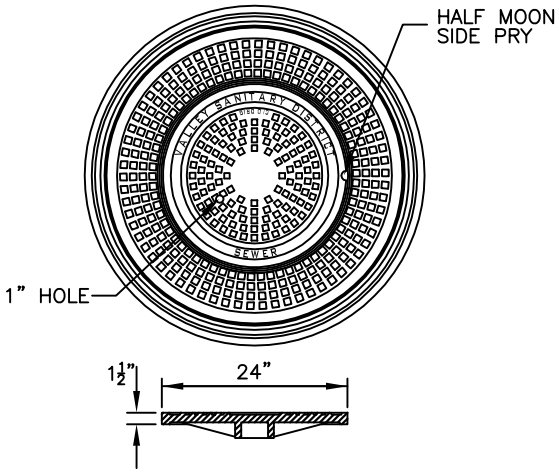


BOLT DOWN
NOT TO SCALE

NOTES:

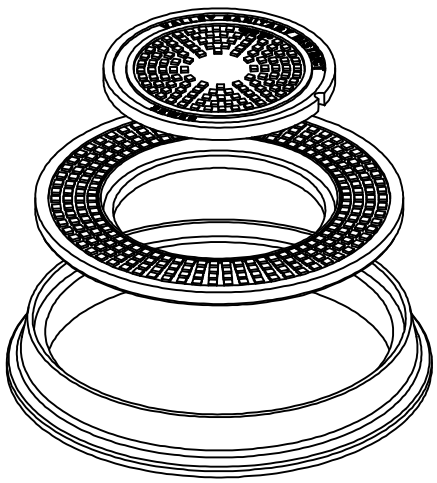
1. ALL MATERIALS SHALL CONFORM TO ASTM A-48-CL35B.
2. FRAME AND COVER SHALL BE MACHINED TO ENSURE CLOSE AND QUIET FIT
3. CASTING SHALL BE DIPPED IN BLACK BITUMINOUS PAINT.
4. CASTING SHALL MEET FEDERAL SPECIFICATION NO. RRF621.
5. FRAME AND COVER SHALL BE MARKED SEWER AS REQUIRED.
6. FRAME AND COVER SHALL HAVE AGENCY IDENTIFICATION "VALLEY SANITARY DISTRICT".
7. BOLT DOWN LID SHALL HAVE TWO (2) BOLT DOWN LOCATIONS PLACED 180° APART.
8. BOLT DOWN LID IS REQUIRED IN REMOTE LOCATIONS AS DIRECTED BY VSD STAFF.

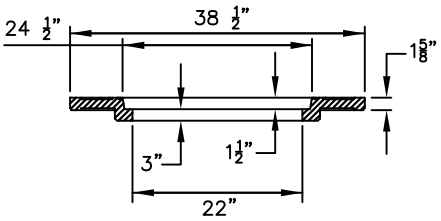
REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				STANDARD MANHOLE FRAME & COVER - TYPE "A"	
				APPROVAL DATE: June 2016	S-10



STANDARD MANHOLE COVER (INNER COVER)

NOT TO SCALE

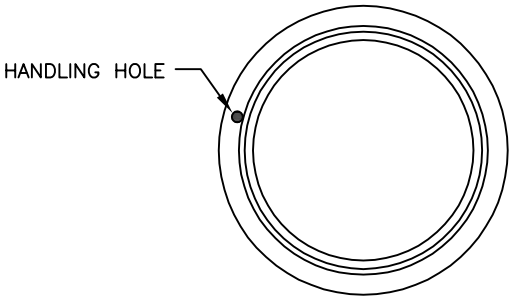




SECTION OF COVER

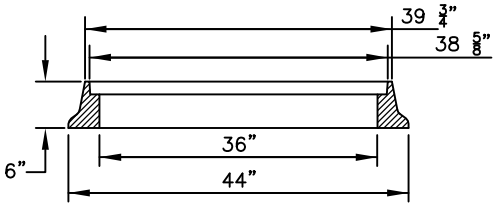
NOT TO SCALE

SET WEIGHT:	
LARGE FRAME	330 LBS
LARGE COVER	320 LBS
STANDARD COVER	155 LBS
TOTAL	805 LBS



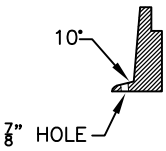
FRAME TOP VIEW

NOT TO SCALE



FRAME SECTION

NOT TO SCALE



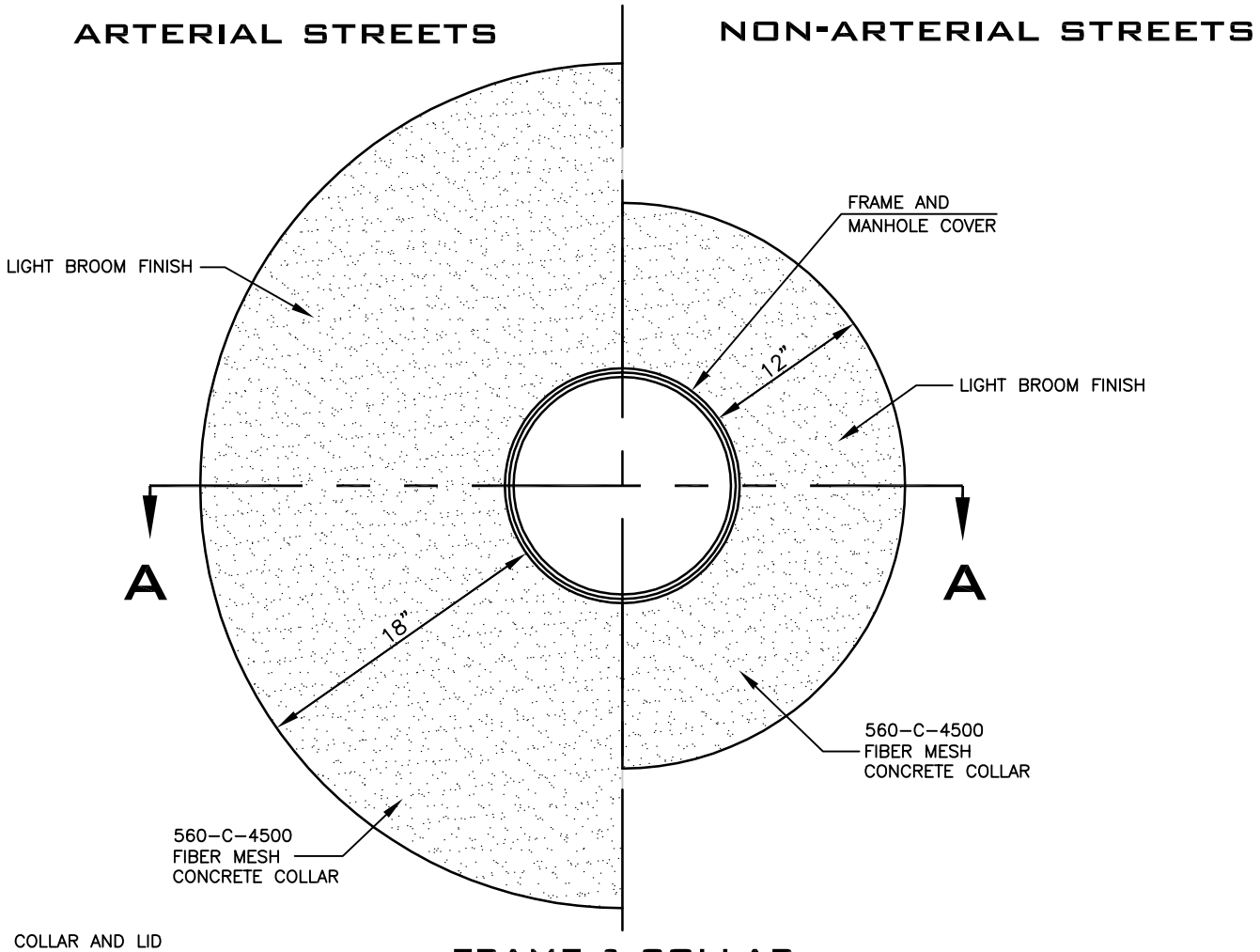
HANDLING HOLE DETAIL

NOT TO SCALE

NOTES:

1. ALL MATERIALS SHALL CONFORM TO ASTM A-48-CL35B.
2. FRAME AND COVER SHALL BE MACHINED TO ENSURE CLOSE AND QUIET FIT
3. CASTING SHALL BE DIPPED IN BLACK BITUMINOUS PAINT.
4. CASTING SHALL MEET FEDERAL SPECIFICATION NO. RRF621.
5. FRAME AND COVER SHALL BE MARKED SEWER AS REQUIRED.
6. FRAME AND COVER SHALL HAVE AGENCY IDENTIFICATION "VALLEY SANITARY DISTRICT".

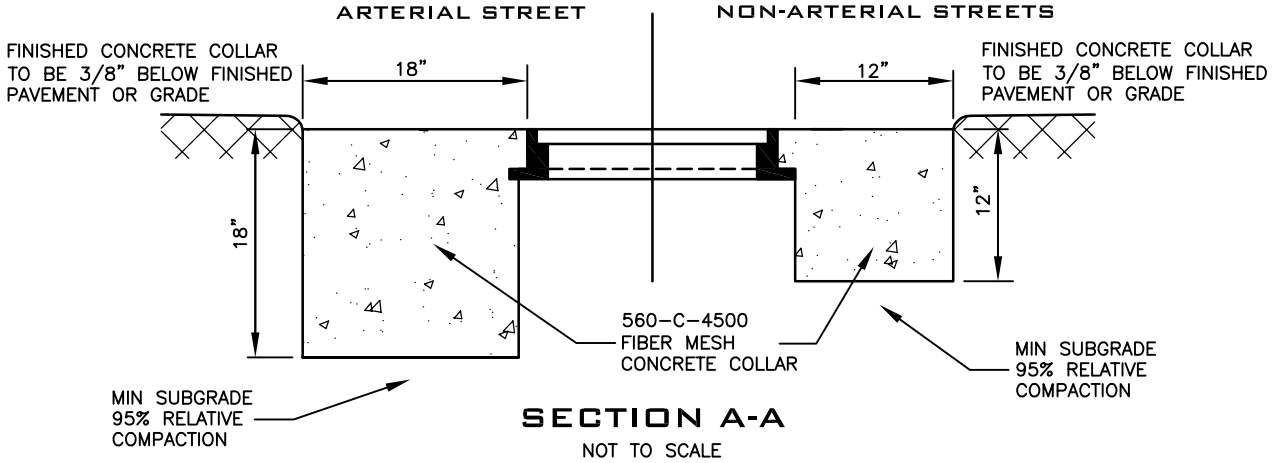
REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				MANHOLE FRAME & COVER - TYPE "B"	
				APPROVAL DATE: **June 2016**	S-11



COLLAR AND LID ASSEMBLY TO BE CONCENTRIC

FRAME & COLLAR

NOT TO SCALE

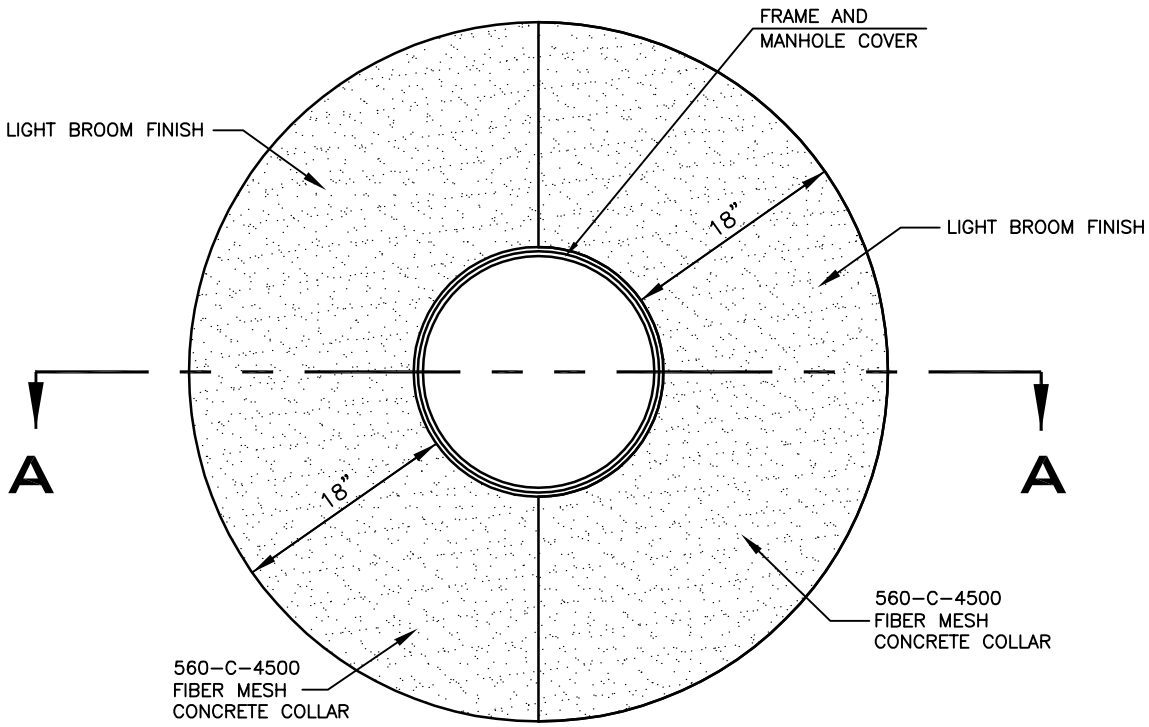


SECTION A-A

NOT TO SCALE

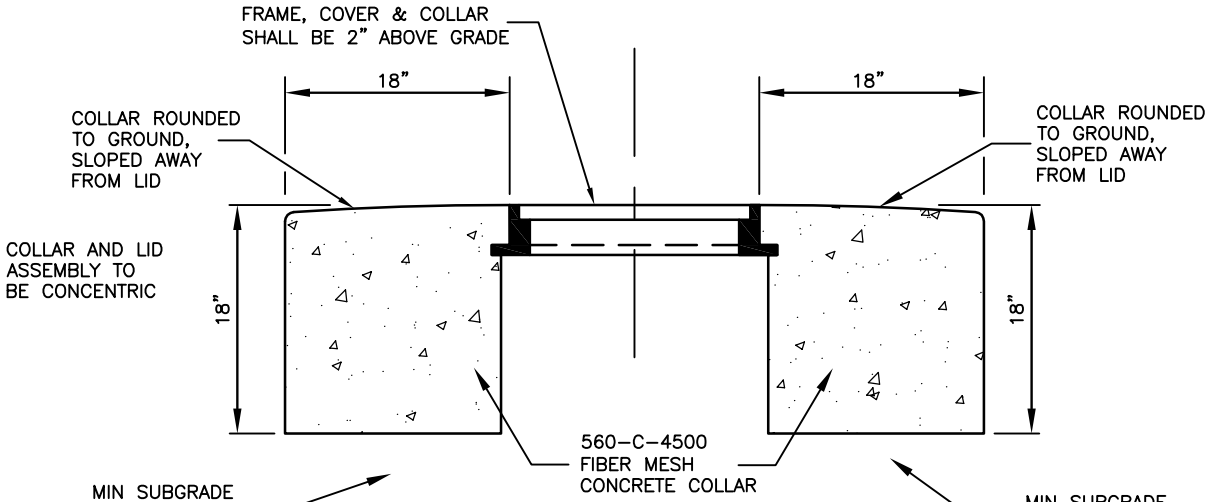
REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				MANHOLE COLLAR IN ARTERIAL AND NON-ARTERIAL STREETS	
				APPROVAL DATE: June 2016	S-12

OUT OF PAVEMENT



FRAME & COLLAR

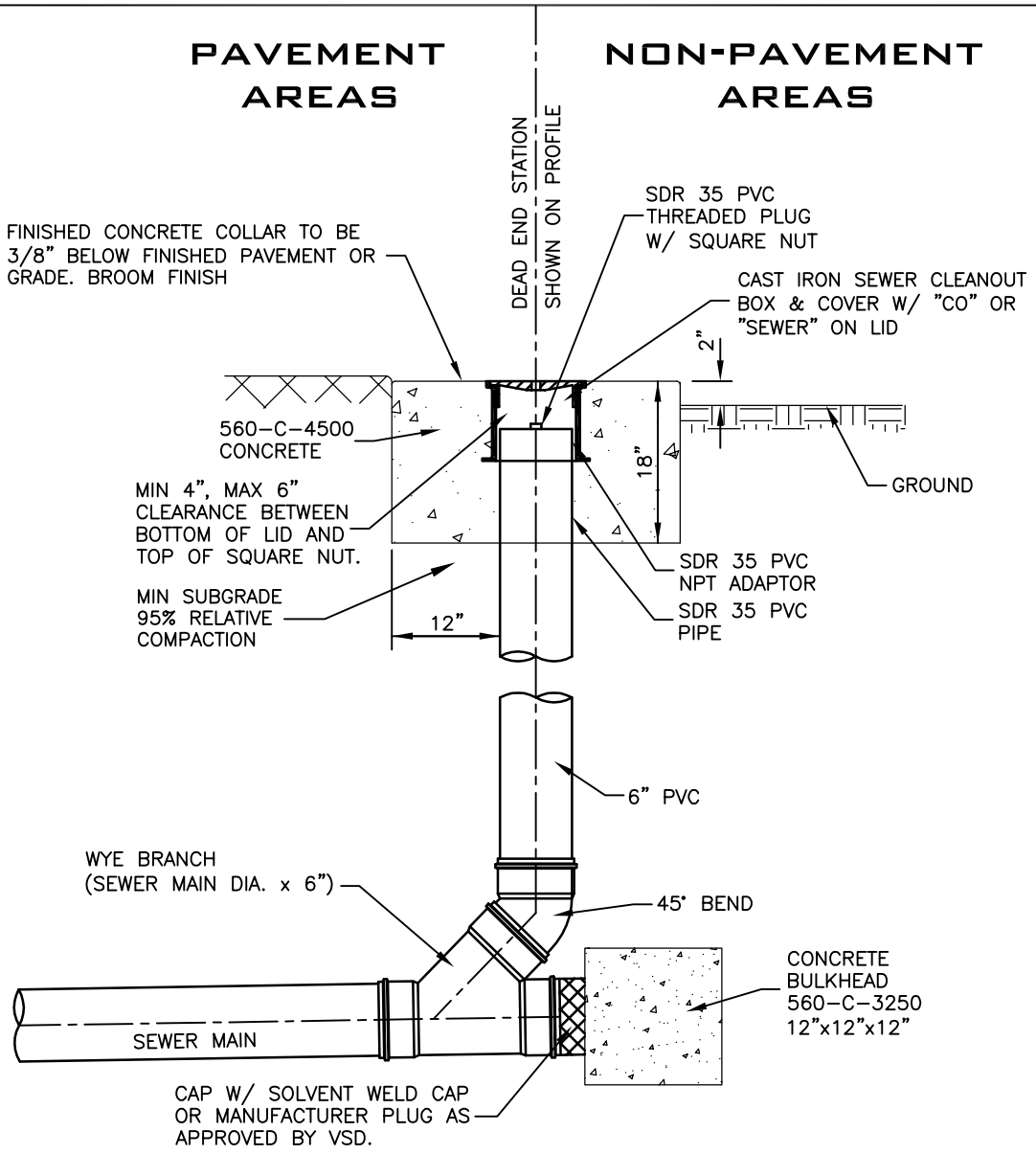
NOT TO SCALE



SECTION A-A

NOT TO SCALE

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				MANHOLE COLLAR OUT OF PAVEMENT	
				APPROVAL DATE: June 2016	S-13



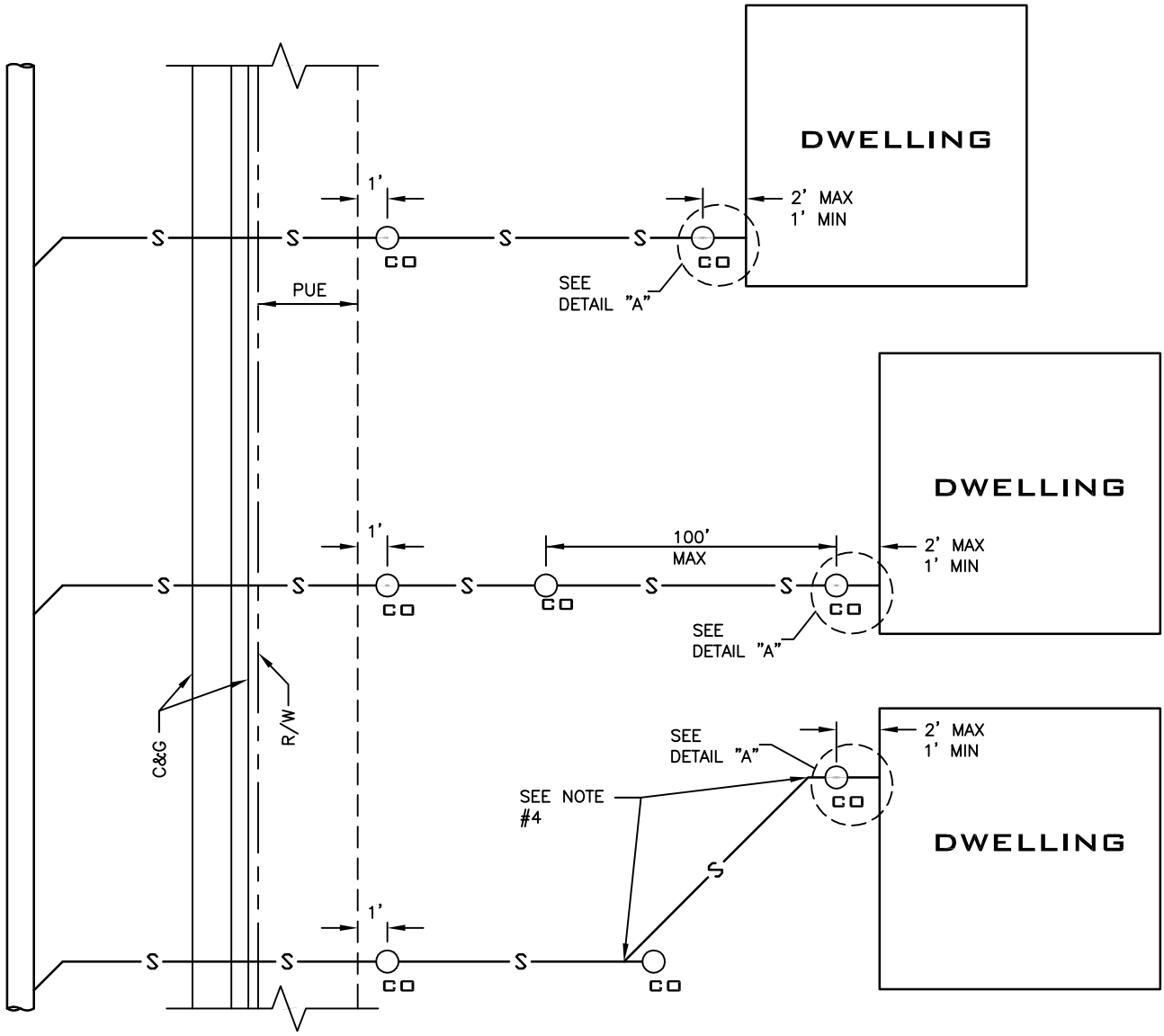
SECTION VIEW

NOT TO SCALE

NOTES:

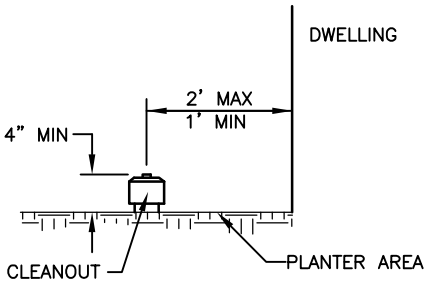
1. THE TRENCH FOR A DEAD END CLEAN OUT SHALL BE EXCAVATED ONLY TO SUBGRADE AND SHAPED TO ACCEPT THE SEWER PIPE IN ACCORDANCE WITH STD. DWG. S-5. SHOULD THE TRENCH BOTTOM EXCAVATION EXCEED THE DEPTH OF THE PIPE BEDDING ELEVATION, ROCK OR GRAVEL SHALL BE PLACED UNDER THE PIPE AND COMPACTED TO A MINIMUM OF 95% COMPACTION. UNDER CONDITIONS WHERE AN ACCEPTABLE PIPE BEDDING IS NOT ATTAINABLE, A CONCRETE PIPE CRADLE MAY BE INSTALLED.
2. CLEANOUT COLLAR SHALL BE CENTERED IN A CONCRETE COLLAR.
3. CLEANOUTS THAT TERMINATE IN STREETS WHERE MINIMUM COVER IS ACHIEVED, THE FULL CLEANOUT HEIGHT SHALL BE CONCRETE ENCASED.
4. CLEANOUTS ENCASED IN CONCRETE SHALL BE CAPS THAT EXTEND PAST THE ENCASEMENT.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				MAINLINE CLEANOUT (DEAD END)	
				APPROVAL DATE: June 2016	S-14



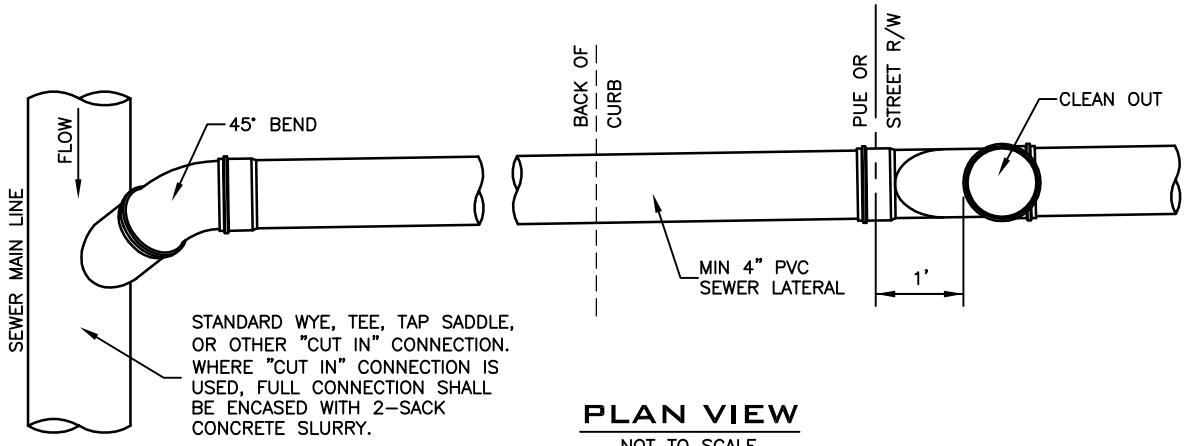
NOTES:

1. ALL CLEANOUTS ON PRIVATE PROPERTY SHALL BE PROTECTED BY CONCRETE BOXES UNLESS PLACED WITHIN A LANDSCAPE/PLANTER AREA PER DETAIL "A" HEREON.
2. CLEANOUTS LOCATED IN A TRAFFIC AREA SHALL BE PROTECTED WITH CAST IRON RING & COVER (TRAFFIC INCLUDES VEHICLE AND PEDESTRIAN; DRIVEWAY, SIDEWALK, PATIO).
3. CLEANOUT SHALL BE PROVIDED AT A MAXIMUM OF 2 FEET AND A MINIMUM OF 1 FOOT OUT FROM THE DWELLING AND 1 FOOT BEHIND THE BACK OF PUBLIC UTILITY EASEMENT.
4. CLEANOUTS SHALL BE PROVIDED FOR EACH AGGREGATE HORIZONTAL CHANGE IN DIRECTION EXCEEDING 135° AND WHERE DISTANCES BETWEEN CLEANOUTS EXCEED 100 FEET.
5. MINIMUM SLOPE FOR A 4 INCH LATERAL SHALL BE $\frac{1}{4}$" PER FOOT (2%).
6. SEWER LATERAL SHALL BE PLACED AT A MINIMUM DEPTH OF 5 FEET BELOW CURB AND GUTTER.
7. SEWER LATERAL SHALL BE PVC SCHEDULE 40 PIPE, 4 INCH MINIMUM DIAMETER.
8. SEWER LATERAL SHALL HAVE A MINIMUM 10 FOOT SEPARATION FROM ALL WATER SERVICES.
9. PLACEMENT OF BOTH THE SEWER LATERAL AND CLEANOUT MAY VARY IN COUNTY ESTATES LAND USE ZONE DESIGNATIONS WITHOUT CURB AND OR SIDEWALK.
10. CLEANOUTS IN PAVED AREAS SHALL HAVE A 12" CONCRETE COLLAR AROUND THE CLEANOUT.



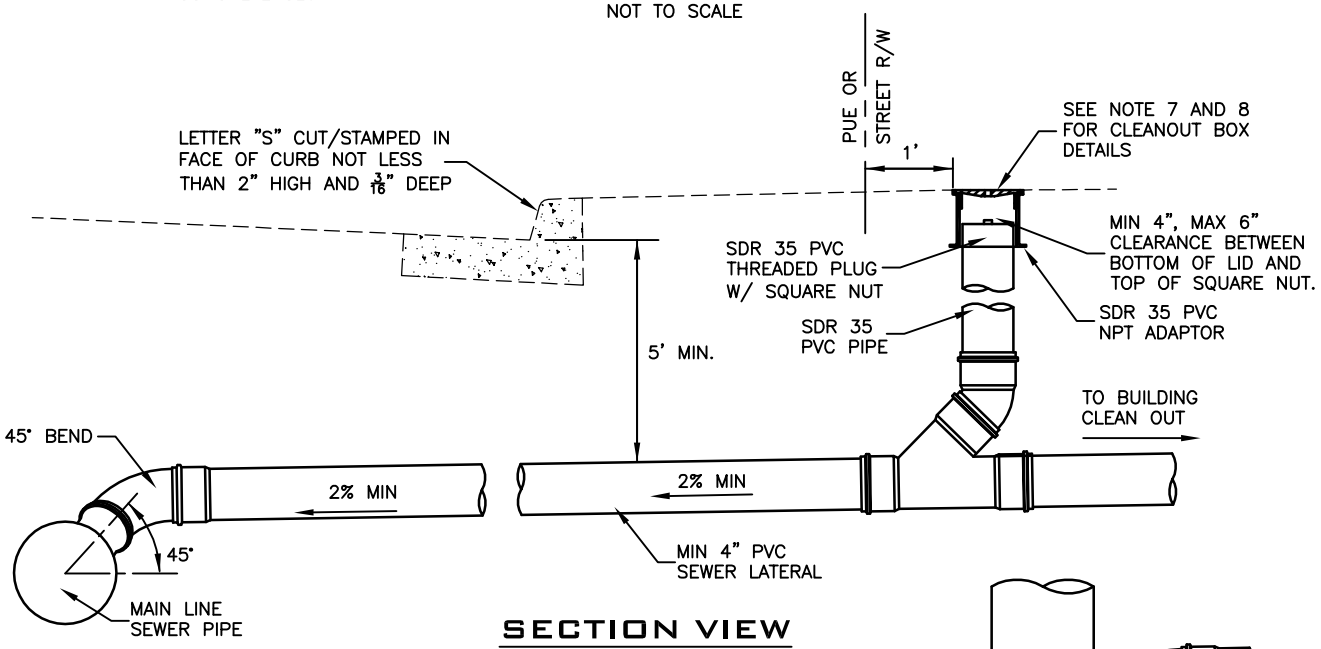
DETAIL "A"
NOT TO SCALE

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				CLEANOUT DETAIL FROM HOUSE TO SEWER MAIN	
				APPROVAL DATE: June 2016	S-15



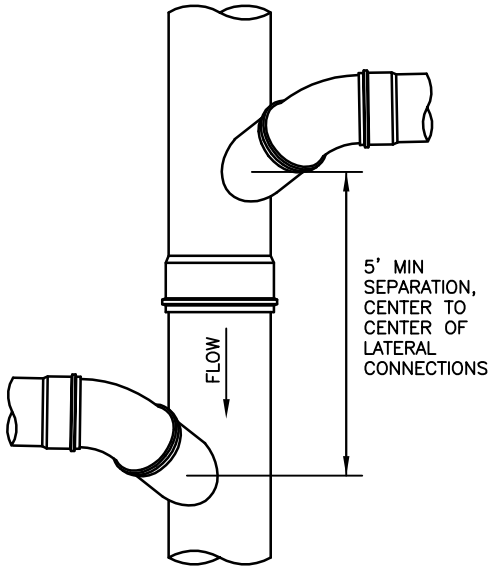
PLAN VIEW

NOT TO SCALE



SECTION VIEW

NOT TO SCALE



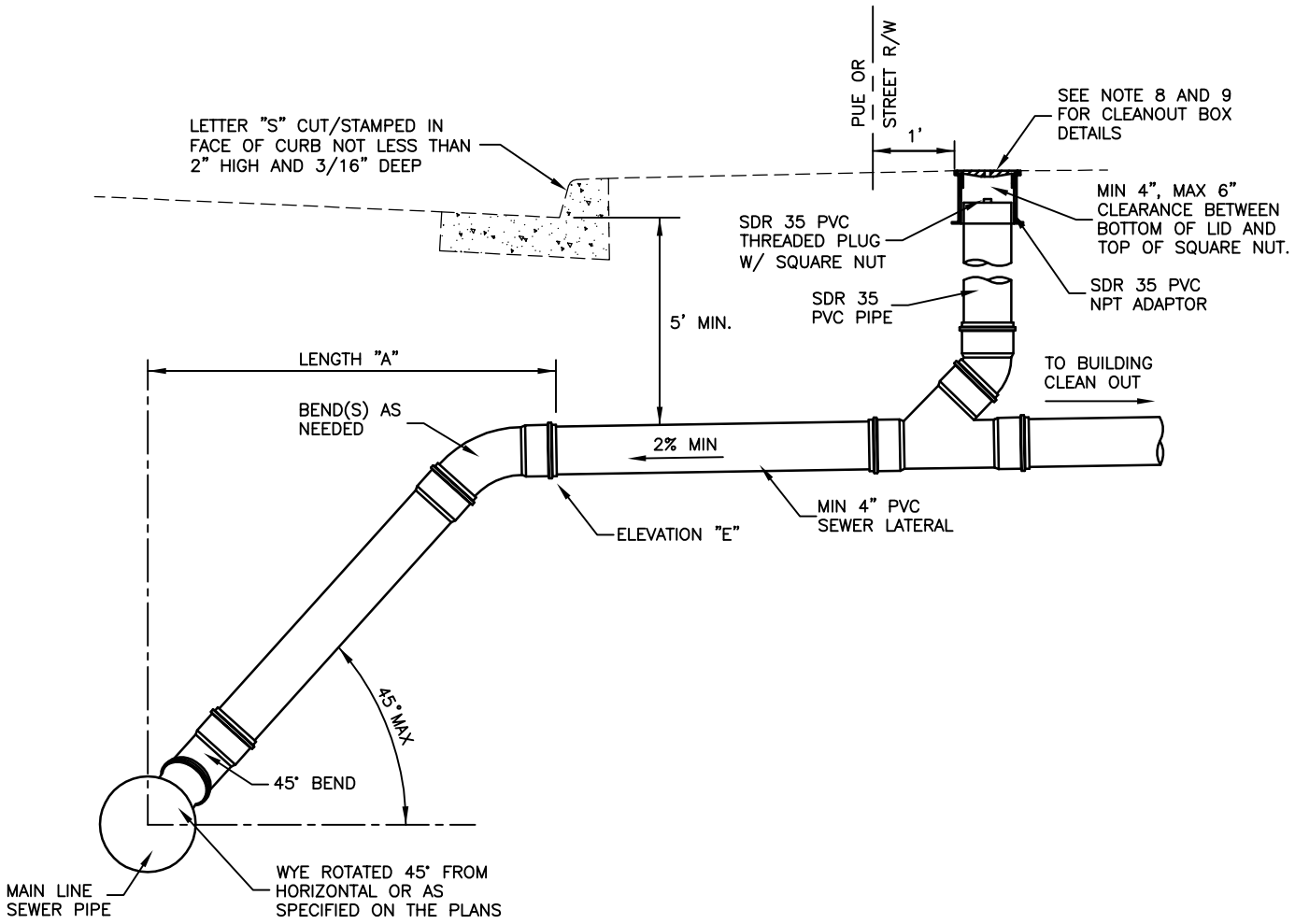
LATERAL CONNECTION SEPARATION

NOT TO SCALE

NOTES:

1. CONNECTION OF THE SEWER LATERAL TO THE TOP OF THE SEWER MAIN IS NOT ALLOWED IN ANY CONDITION.
2. SEWER LATERALS SHALL HAVE A MINIMUM SLOPE OF 2%.
3. ALL JOINTS ON SEWER LATERAL PIPE SHALL BE COMPRESSION TYPE OR APPROVED SOLVENT WELD.
4. LATERAL SHALL EXTEND BEYOND PUBLIC UTILITY EASEMENT OR STREET RIGHT OF WAY UNLESS OTHERWISE NOTED ON THE PLANS.
5. LOCATING TAPE SHALL BE PLACED A MINIMUM OF 1' ABOVE THE TOP OF ALL SEWER LATERAL PIPES.
6. CLEANOUT RISER PIPE SHALL HAVE A SCREW CAP ASSEMBLY.
7. CLEANOUTS LOCATED IN TRAFFIC AREAS SHALL HAVE A CAST IRON FRAME AND LID ALONG WITH "CO" OR "SEWER" ON LID AND A CONCRETE COLLAR PER STD. DWG S-14.
8. CLEANOUTS LOCATED IN NON TRAFFIC AREAS MAY HAVE A CONCRETE BOX.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				HOUSE CONNECTION (SEWER LATERAL)	
				APPROVAL DATE: June 2016	S-16



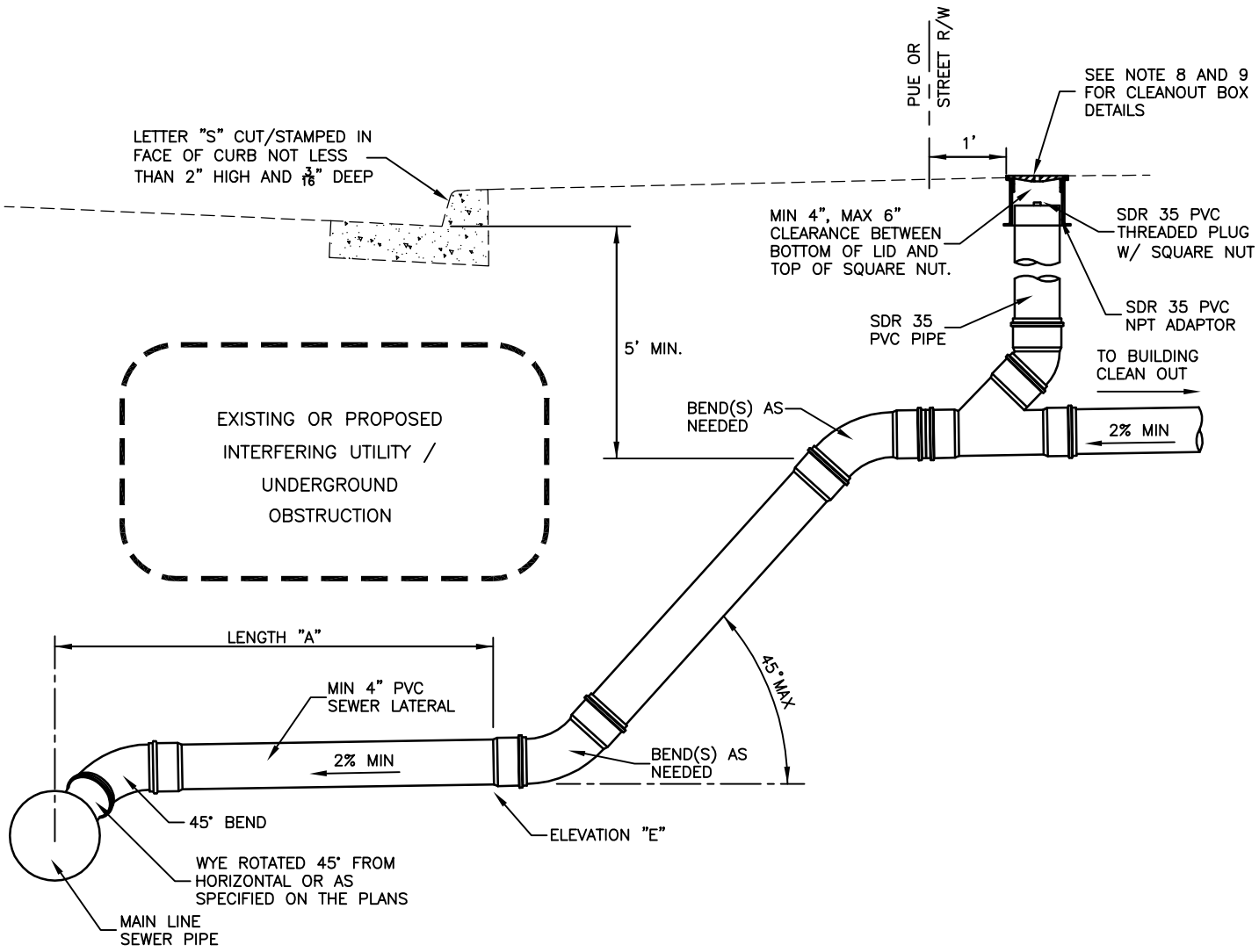
SECTION VIEW

NOT TO SCALE

NOTES:

1. SEE SEWER CONSTRUCTION PLANS FOR LENGTH "A" AND ELEVATION "E".
2. CONNECTION OF THE SEWER LATERAL TO THE TOP OF THE SEWER MAIN IS NOT ALLOWED IN ANY CONDITION.
3. SEWER LATERALS SHALL HAVE A MINIMUM SLOPE OF 2%.
4. ALL JOINTS ON SEWER LATERAL PIPE SHALL BE COMPRESSION TYPE OR APPROVED SOLVENT WELD.
5. LATERAL SHALL EXTEND BEYOND PUBLIC UTILITY EASEMENT OR STREET RIGHT OF WAY UNLESS OTHERWISE NOTED ON THE PLANS.
6. LOCATING TAPE SHALL BE PLACED A MINIMUM OF 1' ABOVE THE TOP OF ALL SEWER LATERAL PIPES.
7. CLEANOUT RISER PIPE SHALL HAVE A SCREW CAP ASSEMBLY.
8. CLEANOUTS LOCATED IN TRAFFIC AREAS SHALL HAVE A CAST IRON FRAME AND LID ALONG WITH "CO" OR "SEWER" ON LID AND A CONCRETE COLLAR PER STD. DWG S-14.
9. CLEANOUTS LOCATED IN NON TRAFFIC AREAS MAY HAVE A CONCRETE BOX.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				DEEP HOUSE CONNECTION W/O UTILITY CROSSING	
				APPROVAL DATE: June 2016	S-17



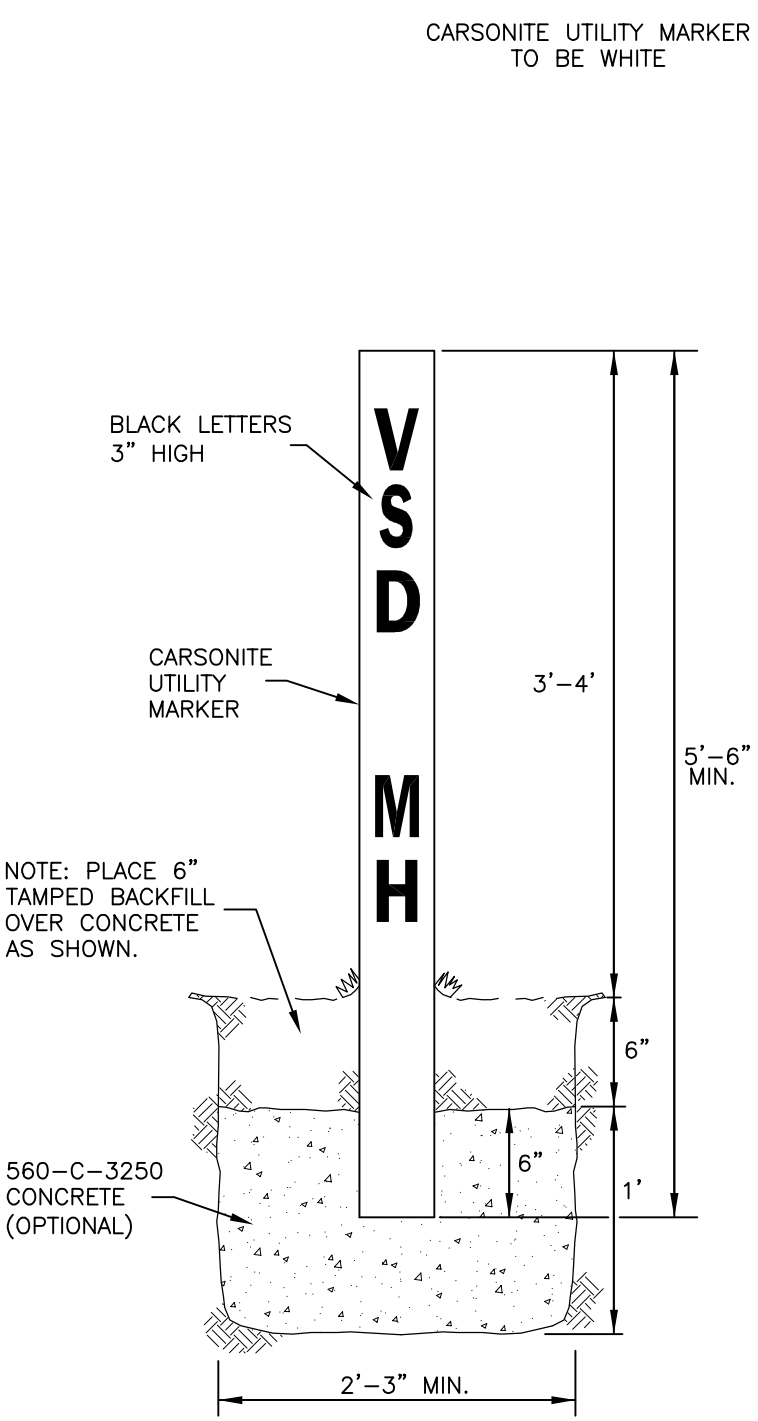
SECTION VIEW

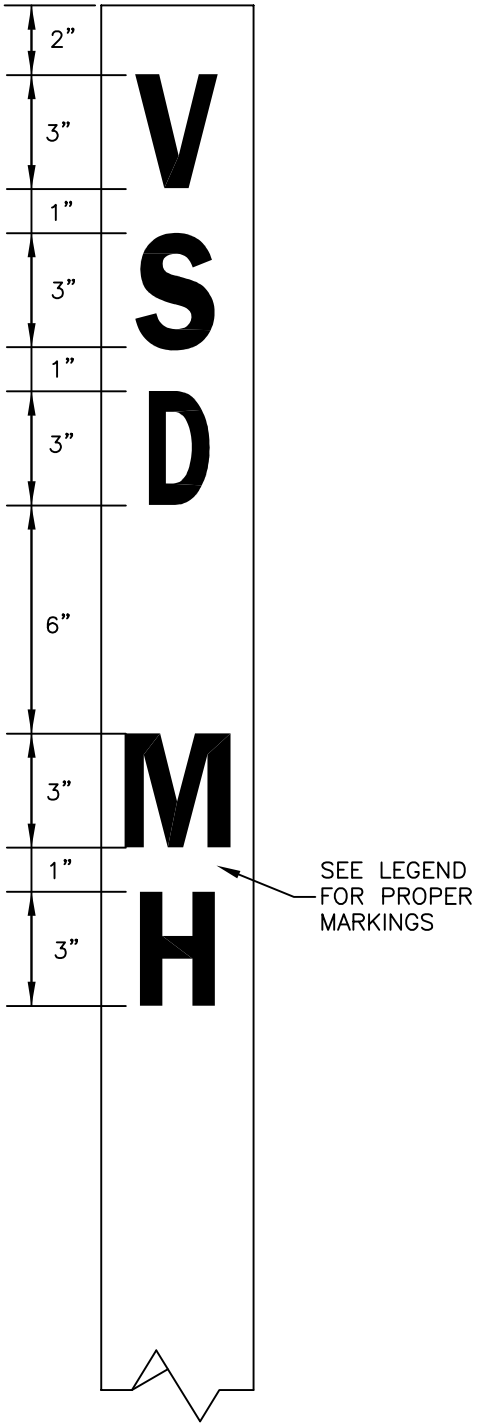
NOT TO SCALE

NOTES:

1. SEE SEWER CONSTRUCTION PLANS FOR LENGTH "A" AND ELEVATION "E".
2. CONNECTION OF THE SEWER LATERAL TO THE TOP OF THE SEWER MAIN IS NOT ALLOWED IN ANY CONDITION.
3. SEWER LATERALS SHALL HAVE A MINIMUM SLOPE OF 2%.
4. ALL JOINTS ON SEWER LATERAL PIPE SHALL BE COMPRESSION TYPE OR APPROVED SOLVENT WELD.
5. LATERAL SHALL EXTEND BEYOND PUBLIC UTILITY EASEMENT OR STREET RIGHT OF WAY UNLESS OTHERWISE NOTED ON THE PLANS.
6. LOCATING TAPE SHALL BE PLACED A MINIMUM OF 1' ABOVE THE TOP OF ALL SEWER LATERAL PIPES.
7. CLEANOUT RISER PIPE SHALL HAVE A SCREW CAP ASSEMBLY.
8. CLEANOUTS LOCATED IN TRAFFIC AREAS SHALL HAVE A CAST IRON FRAME AND LID ALONG WITH "CO" OR "SEWER" ON LID AND A CONCRETE COLLAR PER STD. DWG S-14.
9. CLEANOUTS LOCATED IN NON TRAFFIC AREAS MAY HAVE A CONCRETE BOX.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				DEEP HOUSE CONNECTION WITH UTILITY CROSSING	
				APPROVAL DATE: June 2016	S-18

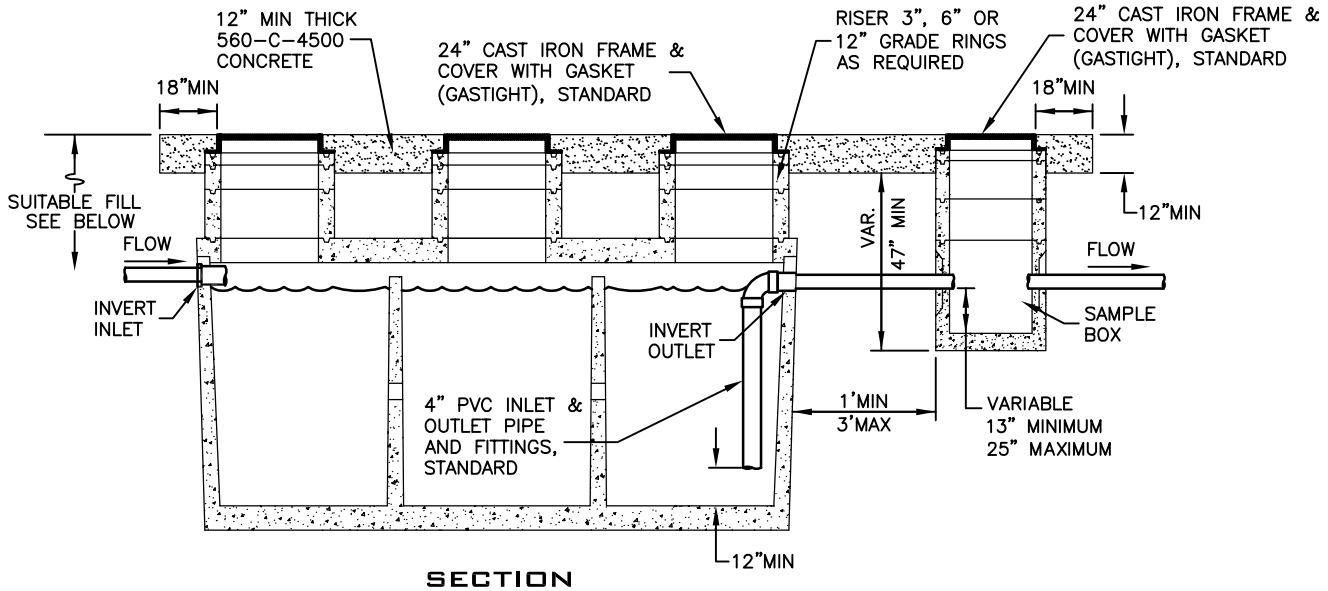




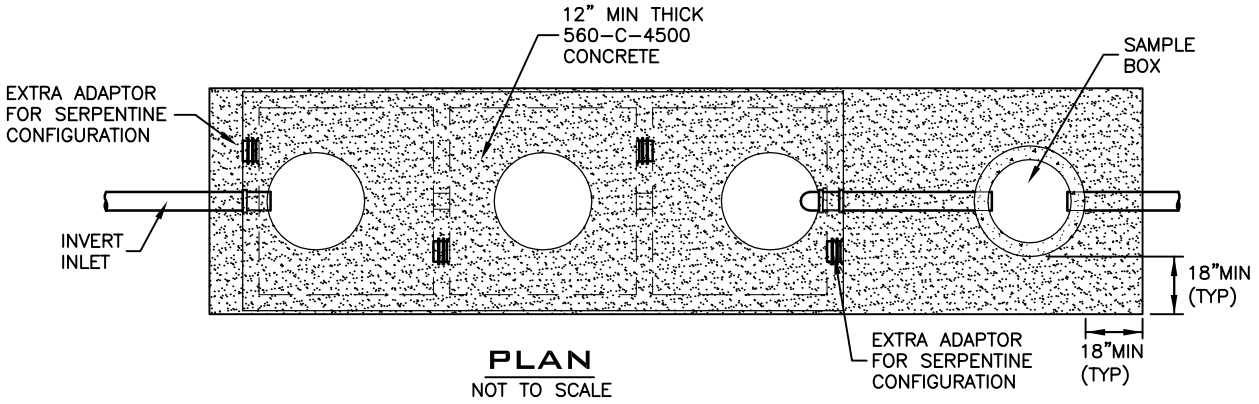
LEGEND:

CO CLEAN OUT
MH MANHOLE
AV AIR–VAC RELIEF VALVE

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				SEWER MANHOLE MARKER POST	
				APPROVAL DATE: June 2016	S-19



SECTION
NOT TO SCALE

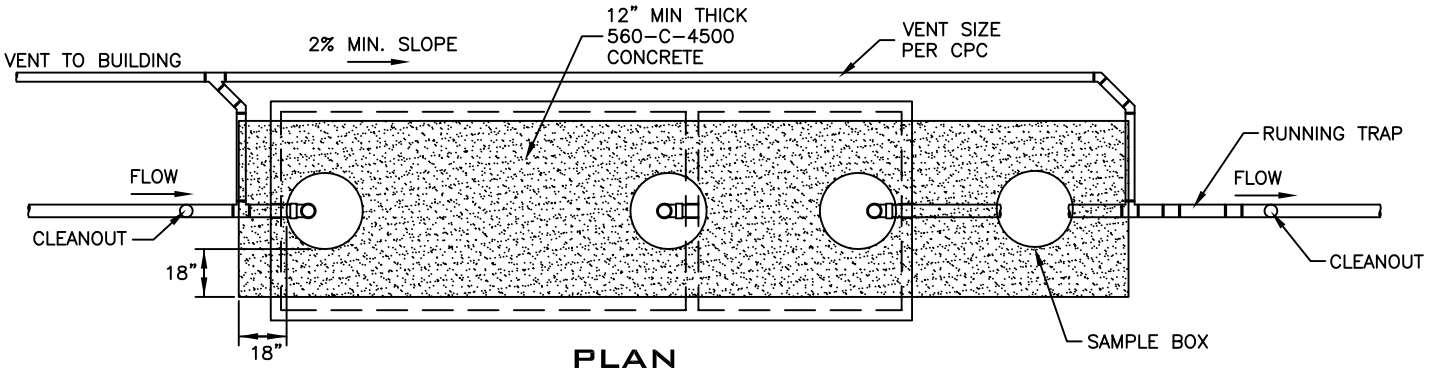


PLAN
NOT TO SCALE

NOTES:

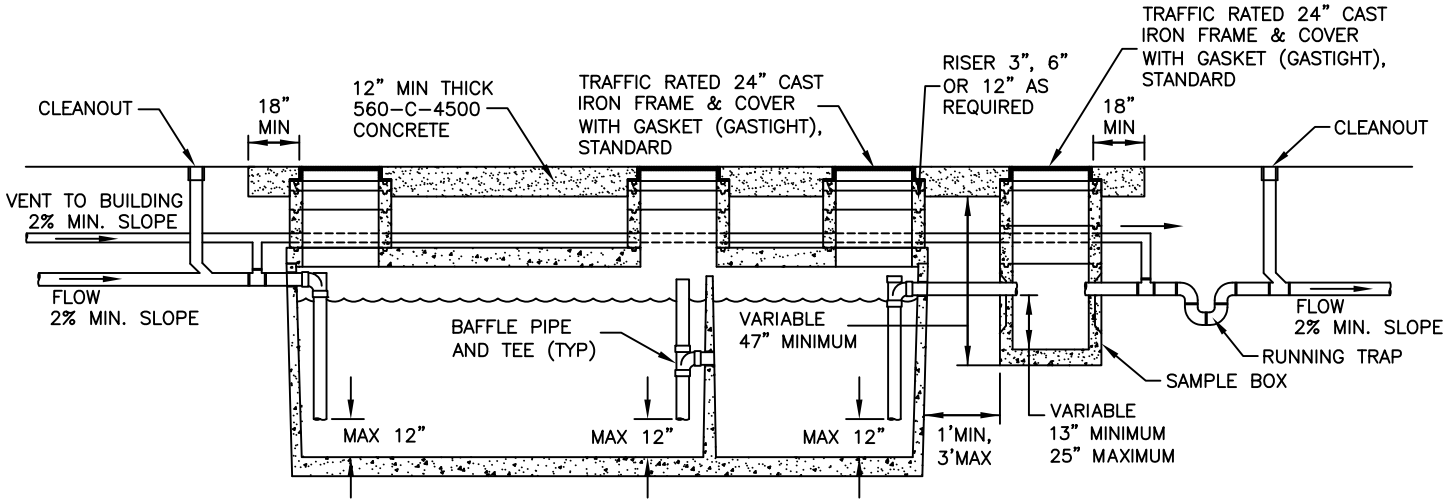
1. TANK DESIGNED FOR H-20 TRAFFIC WHEEL LOAD WITH DRY SOIL CONDITIONS (WATER TABLE BELOW TANK).
2. SUITABLE NATIVE OR SUB-BASE SHALL BE PREPARED TO HANDLE ANTICIPATED LOADS. THE EXCAVATION SHALL BE BEDDED WITH SUITABLE GRANULAR MATERIAL AND SHALL BE COMPACTED TO 90% MAXIMUM DRY DENSITY IN NON PAVEMENT AREAS AND 95% MAXIMUM DRY DENSITY IN PAVEMENT AREAS, OR TO REQUIREMENTS OF THE PROJECT GEOTECHNICAL ENGINEER.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				CLARIFIER DETAIL	
				APPROVAL DATE: June 2016	S-20



PLAN

NOT TO SCALE



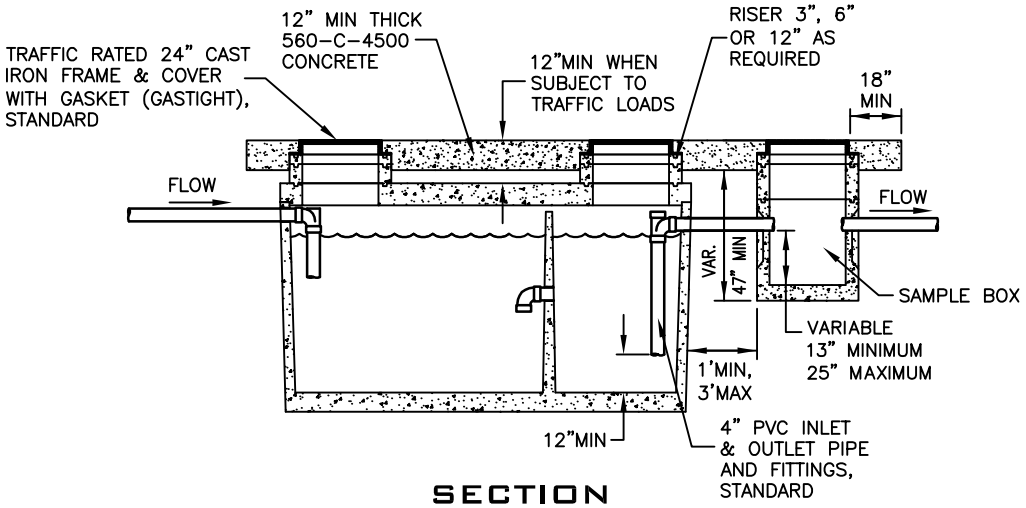
SECTION

NOT TO SCALE

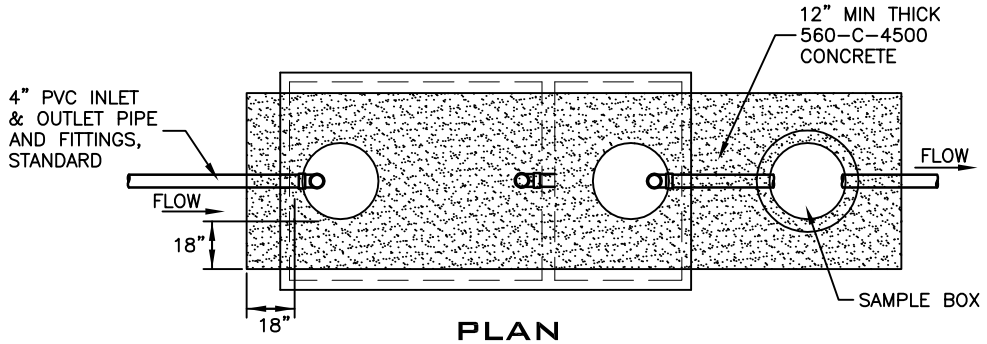
NOTES:

1. TANK DESIGNED FOR H-20 TRAFFIC WHEEL LOAD WITH DRY SOIL CONDITIONS (WATER TABLE BELOW TANK).
2. SUITABLE NATIVE OR SUB-BASE SHALL BE PREPARED TO HANDLE ANTICIPATED LOADS. THE EXCAVATION SHALL BE BEDDED WITH SUITABLE GRANULAR MATERIAL AND SHALL BE COMPACTED TO 90% MAXIMUM DRY DENSITY IN NON PAVEMENT AREAS AND 95% MAXIMUM DRY DENSITY IN PAVEMENT AREAS, OR TO REQUIREMENTS OF THE PROJECT GEOTECHNICAL ENGINEER.
3. MINIMUM SIZE FOR ALL GREASE INTERCEPTORS SHALL BE 1,000 GALLONS.
4. CONSTRUCTION MATERIALS SHALL BE PRECAST CONCRETE.
5. 24" DIAMETER SANITARY MANHOLE FRAME AND COVER SHALL BE INSTALLED TO GRADE OVER BOTH THE INLET BAFFLE AND OUTLET SANITARY TEES AS WELL AS ALL BAFFLE TEES FOR INSPECTION PURPOSES.
6. INLET AND OUTLET PIPES SHALL BE A 4" OR LARGER SCHEDULE 40 ABS OR PVC AND THE INLET SHALL BE 2" HIGHER THAN THE OUTLET PIPE.
7. ALL MANHOLES, CLEANOUTS AND SAMPLE BOX ACCESS SHALL BE ACCESSIBLE AT GRADE AND SHALL BE CAPPED OR GASKET VAPOR TIGHT.
8. ALL COMMERCIAL BUILDINGS THAT CONTAIN COOKING FACILITIES, SERVICES AUTOMOBILES OR WHERE GREASE AND/OR OIL IS UTILIZED SHALL INSTALL A GREASE AND/OR SAND INTERCEPTOR.
9. THE COUNTY HEALTH DEPARTMENT SHALL SET THE REQUIRED SITE SPECIFIC SIZE OF THE GREASE INTERCEPTOR.
10. COVER LOCATIONS SHALL BE LOCATED SUCH THAT ALL INTERNAL PLUMBING AND FITTING ARE ACCESSIBLE FOR SERVICE AND CLEANING.
11. GREASE INTERCEPTORS SHALL BE PERMANENTLY AND BE LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR TRADEMARK, MODEL NUMBER AND LIQUID RETENTION CAPACITY. UNIT SHALL ALSO BEAR THE UNIFORM CODE CERTIFICATION MARK.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				GREASE INTERCEPTOR DETAIL	
				APPROVAL DATE: June 2016	S-21



SECTION
NOT TO SCALE



PLAN
NOT TO SCALE

NOTES:

1. TANK DESIGNED FOR H-20 TRAFFIC WHEEL LOAD WITH DRY SOIL CONDITIONS (WATER TABLE BELOW TANK).
2. SUITABLE NATIVE OR SUB-BASE SHALL BE PREPARED TO HANDLE ANTICIPATED LOADS. THE EXCAVATION SHALL BE BEDDED WITH SUITABLE GRANULAR MATERIAL AND SHALL BE COMPACTED TO 90% MAXIMUM DRY DENSITY, OR TO REQUIREMENTS OF THE PROJECT GEOTECHNICAL ENGINEER.
3. CONSTRUCTION MATERIALS SHALL BE PRECAST CONCRETE.
4. 24" DIAMETER SANITARY MANHOLE FRAME AND COVER SHALL BE INSTALLED TO GRADE OVER BOTH THE INLET AND OUTLET TEES FOR INSPECTION PURPOSES.
5. ALL MANHOLES, CLEANOUTS AND SAMPLE BOX ACCESS SHALL BE ACCESSIBLE AT GRADE AND SHALL BE CAPPED OR GASKETED VAPOR TIGHT.
6. ALL COMMERCIAL BUILDINGS THAT CONTAIN COOKING FACILITIES, SERVICES AUTOMOBILES OR WHERE GREASE AND/OR OIL IS UTILIZED SHALL INSTALL A GREASE AND/OR SAND INTERCEPTOR.
7. COVER LOCATIONS SHALL BE LOCATED SUCH THAT ALL INTERNAL PLUMBING AND FITTING ARE ACCESSIBLE FOR SERVICE AND CLEANING. GREASE INTERCEPTOR SIZE MAY REQUIRE MORE THAN 2 ACCESS COVERS.
8. SAND AND OIL SEPARATOR SHALL BE PERMANENTLY AND BE LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR TRADEMARK, MODEL NUMBER AND LIQUID RETENTION CAPACITY. UNIT SHALL ALSO BEAR THE UNIFORM CODE CERTIFICATION MARK.

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				SAND AND OIL SEPARATOR DETAIL	
				APPROVAL DATE: June 2016	S-22

SUBSTITUTE SHEET

THIS SHEET SUPERSEDES THE PREVIOUSLY APPROVED SHEET, APPROVED ON _____ AND IS IDENTICAL EXCEPT FOR THOSE REVISIONS "CLOUDED" AND LABELED WITH REVISION TRIANGLE(S). #

SIGNED: _____ DATE: _____

LICENSED ENGINEER, PE
RCE XXXXX, EXP XX/XX/XX

RECORD DRAWING

I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE, THE IMPROVEMENTS SHOWN ON THIS SHEET HAVE BEEN INSTALLED AND CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE PLANS, ALL APPROPRIATE STANDARDS AND ANY DISCRETIONARY APPROVAL(S) FOR THE PROJECT.

SIGNED: _____ DATE: _____

LICENSED ENGINEER, PE
RCE XXXXX, EXP XX/XX/XX

REV.	DATE	BY	REVISION	VALLEY SANITARY DISTRICT	
				SUBSTITUTE SHEET & RECORD DRAWING CERTIFICATION	
				APPROVAL DATE: June 2016	S-23

Appendix J

District Standard Specifications

SANITARY SEWER STANDARD SPECIFICATIONS

SECTION 100 – TRENCH EXCAVATION, BACKFILLING AND COMPACTION:

100.1 Description

The work covered by this specification consists of furnishing all plant, labor, equipment, appliances and materials, and performing all operations in connection with the excavation and backfilling of trenches for a single pipe installation in accordance with the plans and special provisions, except for the installation of high density polyethylene pipe (HDPE).

Excavation for appurtenance structures, such as manholes, inlets, transition structures, junction structures, vaults, valve boxes, catch basins, etc., shall be deemed to be in the category of trench excavation.

All sanitary sewer construction shall conform to the latest version of the "Greenbook", and shall meet or exceed all applicable ASTM Standards, unless otherwise specifically approved by the District and the Engineer.

100.2 Excavation

100.2.1 General: The Contractor shall perform all excavation of every description and of whatever substances encountered, to the depths indicated on the plans, and including excavation ordered by the Engineer of compacted backfill for the purpose of making density tests on any portion of the backfill.

All excavation shall be open cut unless otherwise shown on the plans or approved by the Engineer.

100.2.2 Trench Widths: Trenches for sanitary sewer mains and laterals shall conform to the dimensions specified in the special provisions, indicated on the plans, and/or approved by the Engineer.

The width of the trench shall not be greater than the maximum indicated on the plans, and/or approved by the Engineer at and below the level of the top of the pipe. The width of the trench above that level may be made as wide as necessary for sheeting and bracing, and for proper installation of the work. If the maximum trench width as specified in plans and specifications is exceeded at the top of the pipe, the Contractor shall provide the necessary additional load bearing capacity by means of bedding, having a higher bedding factor than that specified, higher strength pipe, a concrete cradle, cap or encasement, or by other means approved in writing by the Engineer.

100.2.3 Trench Grade: Alignment and elevation stakes shall be furnished by the Contractor at 25 foot intervals and agreed upon offsets. Contractor shall provide cut sheets to the District a minimum of three (3) working days prior to initiating construction on a proposed section of the upcoming scheduled sewer construction activities. In all cases where elevation stakes are furnished by the District, the District will also furnish the Contractor with cut sheets.

For all pipe 12 inches or greater in diameter, the Contractor shall excavate for and provide an initial granular bedding at least 4 inches thick and at least 6 inches for pipe 24 inches or larger. This bedding material shall be placed at a uniform density with minimum compaction and fine graded

as specified below.

Bell or coupling holes shall be dug after the trench bottom has been graded. Such holes shall be of sufficient width to provide ample room for proper sealing of the pipe joints. Holes shall be excavated only as necessary to permit accurate work in the making of the joints and to insure that the pipe will rest upon the prepared bottom of the trench, and not be supported by any portion of the joint.

Depressions for joints, other than bell-and-spigot, shall be made in accordance with the recommendations of the joint manufacturer for the particular joint used.

100.2.4 Fine Grading: Unless otherwise specified in the plans and/or special provisions, the bottom of the trench shall be accurately graded to provide uniform bearing and support of the pipe at every point along its entire length, except for portions of the pipe where it is necessary to excavate for bells and for proper sealing of the pipe joints.

100.2.5 Over-excavation: Except at locations where excavation of rock from the bottom of the trench is required, care shall be taken not to excavate below the depth indicated.

Excavation below the specified grade line shall be refilled and compacted to a uniform density of not less than 95 percent of the maximum density. Material shall conform to aggregate bedding specifications found in the "Greenbook" for the specific construction pipe material.

Whenever rock is encountered in the trench bottom, it shall be over excavated to a minimum depth of six inches below the outside diameter (O.D.) of the pipe. Over excavated trenches shall be corrected under the written direction of the soils engineer or geologist.

Whenever unsuitable soil incapable of supporting the pipe is encountered, the Contractor will notify the Engineer and a field determination will be made as to the depth of over excavation and the granular fill required.

100.2.6 Excavation for Manholes and Other Structures: The Contractor may excavate to place the concrete structure directly against the excavated surface, provided that the faces of the excavation are firm and unyielding and are at all points outside the structure lines shown on the plans. If the native material is such that it will not stand without sloughing or if precast structures are used, the Contractor shall over excavate to place the structure and this over excavation shall be backfilled with the same material required for the adjoining pipe line trench and compacted. Any unnecessary excavation below the elevation indicated for the foundation of any structure shall be replaced with the same class of concrete specified for the structure or with controlled low strength material. Controlled Low Strength Material (CLSM) is a mixture of cementitious materials, aggregates, admixtures\additives, and water that, as the cementitious materials hydrate, forms a soil replacement. CLSM is a self-compacting, flowable, cementitious material primarily used as a backfill, structural fill, or a replacement for compacted fill or unsuitable native material. When the replacement material is structural concrete, the material shall be placed at the same time as the structure. However, when using controlled low strength material, placement of the material shall require a time lag as directed by the engineer, geologist

or as required by the local road jurisdictional agency, between the material and the structural concrete.

100.2.7 Pavement and Concrete Cutting and Removal: Where trenches lie within the Portland cement concrete of streets, alleys, driveways, or sidewalks, etc., such concrete as required by the local road jurisdictional agency shall be sawcut to neat, vertical, true lines in such a manner that the adjoining surface will not be damaged.

All Concrete and asphalt surfaces and pavement shall be clean-cut, with approved equipment and by approved methods in accordance with the requirements of the local road jurisdictional agency of the concrete or asphalt area.

No ripping or rooting will be permitted outside limits of cuts. Surfacing materials removed shall be hauled from the job site immediately, and will not be permitted in the backfill.

100.2.8 Grading and Stockpiling: All grading in the vicinity of trench excavation shall be controlled to prevent surface water from flowing into the trenches. Any water accumulated in the trenches shall be removed by pumping or by other approved methods.

During excavation, material suitable for backfilling shall be piled in an orderly manner, a sufficient distance back from the edges of trenches, to avoid overloading and to prevent slides or cave-ins. Material unsuitable for backfilling, or excess material, shall be hauled from the job site and disposed of by the Contractor.

The Contractor shall, prior to final acceptance of the work, submit a letter to the local road jurisdictional agency stating the location of each disposal site for all excess or unsuitable material and certify that he has obtained the property owner's permission for the disposal of all such materials.

Where the plans and/or special provisions provide for segregation of topsoil from underlying material for purposes of backfill, the material shall not be mixed.

100.2.9 Shoring and Sheeting: The Contractor shall do such trench bracing, sheathing, or shoring necessary to perform and protect the excavation as required for safety and conformance to governing laws. The bracing, sheathing, or shoring shall not be removed in one operation but shall be done in successive stages as determined by the Engineer to prevent overloading of the pipe during backfilling operations. All shoring and sheeting deemed necessary to protect the excavation and to safeguard employees, shall be installed. The District requires the contractor to submit a current Cal-OSHA permit for all trench excavation, pipe laying or backfilling work exceeding 5’.

100.2.10 Open Trench: Except where otherwise noted in the special provisions, or approved in writing by the Engineer, the maximum length of open trench, where the construction is in any stage of completion (excavation, pipe laying or backfilling), shall not exceed 1,320 feet in the aggregate at any one location or in accordance with the local road jurisdictional agency requirements. Any excavated area shall be considered open trench until all aggregate base for pavement replacement has been placed and compacted. With the approval of the Engineer, pipe

laying may be carried on at more than one location on the subject project area, with the restrictions on open trench applying to each location. Trenches across streets shall be completely backfilled as soon as possible after pipe laying.

Substantial steel plates with adequate trench bracing shall be used to bridge across trenches at street crossings where trench backfill and temporary patches have not been completed during regular work hours or via an approved method by allowed by the local road jurisdictional agency. Safe and convenient passage for pedestrians shall be provided. The Engineer may designate a passage to be provided at any point he deems necessary. Access to hospitals, fire stations and fire hydrants must be maintained at all times.

100.3 Protection of Existing Utilities

100.3.1 Utilities: Unless otherwise shown on the plans or stated in the specifications, all utilities, either underground or overhead, shall be maintained in continuous service throughout the entire contract period. The Contractor shall be responsible and liable for any damages to or interruption of service caused by the construction.

If the Contractor desires to simplify his operation by temporarily or permanently relocating or shutting down any utility or appurtenance, he shall make the necessary arrangements and agreements with the facility owner and shall be completely responsible for all costs concerned with the relocation or shutdown and reconstruction. All property shall be reconstructed in its original or new location as soon as possible and to a condition at least as good as its previous condition. This cycle of relocation or shutdown and reconstruction shall be subject to inspection and approval by both the Engineer and the owner of the utility.

The Contractor shall be entirely responsible for safeguarding and maintaining all conflicting utilities that are shown on the plans. This includes overhead wires and cables and their supporting poles whether they are inside or outside of the open trench. If, in the course of work, a conflicting utility line that was not shown on the plans is discovered, the District will either negotiate with the owner for relocation, relocate the utility, change the alignment and grade of the trench or as a last resort, declare the conflict as “extra work” to be accomplished by the Contractor in accordance with plans and specifications.

100.3.2 Irrigation Ditches, Pipes and Structures: The Contractor shall contact the owners of all irrigation facilities, and make arrangements for necessary construction clearances and/or dry-up periods.

All irrigation ditches, dikes, head gates, pipe, valves, checks, etc., damaged or removed by the Contractor, shall be restored to their original condition or better.

100.3.3 Building, Foundations and Structures: Where trenches are located adjacent to buildings, foundations, and/or structures, the Contractor shall take all necessary precaution against damage to them. The Contractor shall be liable for any damage caused by the construction.

Except where authorized in the special provisions or in writing by the Engineer, water settling of

backfill material in trenches adjacent to structures will not be permitted.

100.3.4 Permanent Pipe Supports: Permanent pipe supports for the various types and sizes of sewer, water and utility lines shall conform to the Standard Details or the details shown on the plans. Such pipe supports shall be erected at the locations shown on the plans and/or at any other locations as necessary as determined by the Engineer.

100.3.5 Electronic, Telephonic, Telegraphic, Electrical, Oil and Gas Lines: Underground facilities shall be adequately supported by the Contractor. All support shall be in full compliance with the individual utility company specifications and requirements. If a utility agency does not utilize specific support requirements, plastic pipes shall be supported continuous along the bottom of the pipe and support for metal and electrical pipes may be continuously supported or nylon webbing may be used for suspension for up to ten-foot intervals.

The Contractor shall avoid damaging the plastic pipe, pipe ways or other conduits during trench backfilling and during the placement of any foundation and/or bedding.

100.4 Foundation, Bedding, Backfilling and Compaction

100.4.1 Foundation: The material upon which the pipe or structure is to be placed shall be accurately finished to the grade or dimensions shown on the plans or as directed by the Engineer. The bottom portion of the trench shall be brought to grade so that the pipe or structure will be continuously in contact with the material on which it is being placed.

100.4.2 Bedding: Bedding shall consist of granular material containing no pieces larger than 1½ inches and free of broken concrete, broken pavement, wood or other deleterious material. Open graded rock will not be used without the written approval of the Engineer.

Where mechanical compaction is used, the moisture content shall be such that the specified compaction can be obtained. The first lift shall be 8 inches or two-thirds of the distance to the springline whichever is greater. Succeeding lifts shall not exceed 2 feet loose and extreme care will be taken to prevent damage to or movement of the pipe by the compaction equipment.

100.4.3 Backfill: Backfill shall be as specified on the approved plans and as required by the local road jurisdictional agency, sound earthen material free from broken concrete, broken pavement, wood or other deleterious material. Unless otherwise specified, this may be native material with no piece larger than 4 inches, select material or aggregate base course. Unless otherwise noted, backfill under single curb, curb and gutter, sidewalk, driveways, valley gutters, etc. shall be the same as the adjacent street pavement as approved by the local road jurisdictional agency.

Where mechanical compaction is used, backfill shall be placed in lifts the height of which shall not exceed that which can be effectively compacted depending on the type of material, type of equipment and methods used, and under no circumstances shall exceed 4 feet.

Backfill, around utilities that are exposed during trench excavation, shall be placed in accordance

with the bedding methods.

100.4.4 Compaction Densities: Trench backfill shall be thoroughly compacted and shall conform to the provisions in Section 306-1 of the "Greenbook". All compaction discussed within this section shall be performed within 2 percentage points of optimum moisture content unless otherwise noted in the project plans or project specifications.

The density required will depend on the backfill type(s) shown on the plans and/or called for in the special provisions.

100.4.5 Compaction Methods: Jetting, flooding and water consolidation methods are not acceptable without prior written approval by the District, the local road jurisdictional agency, and the Engineer.

100.4.6 Specifications for Granular Material: For purposes of this specification, granular material shall mean material for which the sum of the plasticity index and the material passing a No. 200 sieve shall not exceed 23% as certified by the soil Geologist.

100.4.7 Rights-Of-Way Belonging to Others: Backfill and compaction shall be accomplished in accordance with the local road jurisdictional agency permit and/or specifications.

100.4.8 Test Holes: Boring logs shown on the plans do not constitute a part of the contract and are included for the Contractor's convenience only. It is not intended to imply that the character of the material is the same as that shown on the logs at any point other than that where the boring was made. The Contractor shall satisfy himself regarding the character and amount of rock, gravel, sand, silt, clay and water to be encountered in the work to be performed.

100.5 PAVEMENT REPLACEMENT AND SURFACE RESTORATION

100.5.1 Grading: The Contractor shall do such grading in the area adjacent to backfilled trenches and structures as may be necessary to leave the area in a neat and satisfactory condition approved by the Engineer and the local road jurisdictional agency.

100.5.2 Restoring Surface: All streets, alleys, driveways, sidewalks, curbs, or other surfaces, in which the surface is broken into or by the installation of the new work, shall be resurfaced in kind or as specified to the satisfaction of the Engineer and the local road jurisdictional agency. The Contactor shall refer to the local road jurisdictional agency for their specifications and requirements for trench repair and possible "T" topping.

100.5.3 Cleanup: The job site shall be left in a neat and acceptable condition. Excess soil, concrete, etc., shall be removed from the premises.

100.5.4 Temporary Pavement: The Contractor shall install temporary asphalt pavement or the first course of permanent pavement replacement immediately following backfilling and compaction of trenches that have been cut through existing pavement. Except as otherwise provided in the plans and specifications this preliminary pavement shall be maintained in a safe

and reasonably smooth condition until required backfill compaction is obtained and final pavement replacement is ordered by the Engineer.

100.5.5 Final Pavement: The Contactor shall refer to the local road jurisdictional agency for their specifications and requirements for trench repair and possible "T" topping.

END OF SECTION

SECTION 200 – SEWER LINE CONSTRUCTION

200.1 Description

The construction or extension of sewer lines shall conform to the applicable standard specifications and details, except as otherwise required on the plans or as modified in the special provisions. All sanitary sewer construction shall conform to the current edition of the "Greenbook" and shall meet or exceed all applicable ASTM Standards, unless otherwise specifically approved by the District and the Engineer.

200.2 PVC Sewer Pipe and Fittings

PVC Standard Dimension Ratio (SDR) 35 pipe for gravity sewer and surface water applications with a pipe stiffness of 46 shall be the standard sewer pipe for the District. This product is intended for gravity applications where the operating temperature will not exceed 140°F.

Pipe shall be manufactured from virgin rigid PVC (polyvinyl chloride) vinyl compounds with a cell class of 12364 as identified in ASTM D 1784. The requirements of this specification are intended to provide pipe suitable for non- pressure drainage and surface water.

PVC SDR 35 pipe shall conform to ASTM D 3034 for gasket or solvent weld pipe with a minimum pipe stiffness of 46. Gaskets shall conform to ASTM F 477.

Installation shall comply with all applicable plumbing, and building requirements. Buried pipe shall be installed in accordance with ASTM D2321 and ASTM F1668. Solvent cement joints shall be made in a two-step process with primer conforming to ASTM F656 and solvent cement conforming to ASTM D 2564. The pipe shall be protected from chemical agents, plasticized vinyl products, or other aggressive chemical agents not compatible with PVC compounds. Systems shall be hydrostatically tested after installation.

Referenced Standards:

ASTM D1784	Rigid Vinyl Compounds
ASTM D3034	PVC Gravity Sewer Pipe (SDR) 35 PS 46
ASTM D2855	Joints for Sewer Pipe Using Solvent Cement
ASTM D2564	Solvent Cements For PVC Sewer Pipe
ASTM D2321	Underground Installation of Thermoplastic Pipe (non- pressure applications)
ASTM F477	Elastomeric Seals (Gaskets) For Joining Plastic Pipe
ASTM F656	Primers for PVC Pipe and Fittings
ASTM F1668	Procedures for Buried Plastic Pipe

Pipe shall have an integral bell and spigot joint. Wall thickness shall be SDR 35, or SDR 26 for ASTM D 3034 pipe. Wall thickness shall be T-1 for ASTM F 679 pipe. If for any reason the depth of cover on SDR 35 pipe becomes greater than 15 feet, the contractor shall immediately notify the design engineer.

Joint tightness shall conform to ASTM D 3212. Joints shall be push-on type only with the bell-end grooved to receive a gasket. Elastomeric seal (gasket) shall have a basic polymer of synthetic rubber conforming to ASTM F 477. Natural rubber gaskets will not be accepted.

200.3 Laying Pipe

Pipe shall be of the type, class, and size called for on the plans. All pipe shall be protected during handling against impact shocks and free falls. No damaged or defective pipe shall be installed in the work. Pipe shall be kept clean at all times, and as the work progresses, the interior of the pipe shall be cleared of all dirt and superfluous materials of every description.

The laying of the pipe shall be in finished trenches free from water or debris, and shall be commenced at the lowest point, with the spigot ends pointing in the direction of the flow. Each pipe shall be laid firmly and true to line and grade, in such manner as to form a close concentric joint with the adjoining pipe and to prevent sudden offsets of the flow-line. Any adjustment to line and grade shall be made by scraping away or filling in under the body of the pipe, never by wedging or blocking under the pipe ends.

The alignment and grade of each length of pipe shall be checked after setting by measurement from the string line, laser beam target or other means approved by the Engineer.

Contractor shall have a transit level on site at all times while installing pipe and make the level available to the inspector to verify and document the accuracy of the installation.

At all times when work is not in progress, open ends of the pipe and fittings shall be securely closed to the satisfaction of the Engineer, so that no water, earth or other substance will enter the pipe or fittings.

END OF SECTION

SECTION 300 – PVC SEWER PIPE AND FITTINGS

300.1 General
This specification covers the requirements of polyvinyl chloride (PVC) plastic sewer pipe and fittings for gravity flow sewers and building connections. When noted on the plans or in the special provisions, gravity sanitary sewers may be constructed using PVC pipe for diameters not exceeding 30 inches. Pipe, fittings, couplings and joints shall be in conformance with the requirements of ASTM D3034, SDR-35, except as modified herein.

300.2 Caps and Plugs
Caps and plugs for building connections shall be PVC.

300.3 Gaskets
Rubber gaskets shall be manufactured from a synthetic elastomer and shall comply in all respects with the physical requirements specified in ASTM F477.

300.4 Lubricant
The lubricant used for assembly shall have no detrimental effect on the gasket or on the pipe.

300.5 Joints
The piping system and fittings shall consist of an integral bell gasketed joint designed so that when assembled, the elastomeric gasket located within the bell is compressed radially on the pipe or fitting spigot to form a positive seal. The joint shall be designed so to prevent displacement of the gasket from the joint during assembly and when in service. All pipe shall have a home mark on the spigot end to indicate proper penetration when the joint is made.

The bell and spigot configurations for the fittings shall be compatible to those used for the pipe. Joints shall provide a permanent seal against exfiltration and infiltration. All surfaces of the joint upon which the gasket may bear shall be smooth and free of any imperfections which could adversely affect sealability. The assembly of the joints shall be in accordance with the pipe manufacturer's recommendations.

300.6 Fittings
PVC pipe may include elbows, wyes, double bell couplings, manhole adapter rings, plugs, caps, adapters. All 4 inch or smaller plastic fittings must be schedule 40.

300.7 Manhole Connections
A manhole adapter gasket or approved equivalent method shall be provided at manhole entry or connection to prevent infiltration and exfiltration. Where precast manholes are used, entrance holes shall be large enough to allow for proper grouting around the manhole ring.

300.8 Certification
A certificate from the manufacturer shall be furnished certifying that the all pipe and fittings meet the requirements of ASTM D3034, and all SDR deflection regardless of the size.

300.9 Imperfections

That which in the opinion of the Engineer may adversely affect the performance of the pipe or joints shall be cause for rejection.

END OF SECTION

SECTION 400 – VITRIFIED CLAY PIPE

400.1 General

PVC is the preferred pipe material, however VCP may submitted as an option which will need approval from the District. Vitrified clay pipe (VCP), 30 inch diameter or less, shall be extra strength in accordance with the requirements set forth in ASTM C700, except as modified herein. Pipe larger than 30 inches shall be of the type specified in the Special Provisions.

400.2 Manufacturer Requirements

400.2.1 Shape: Pipe ends shall be square with the longitudinal axis, and sockets shall be true, circular, and concentric with the barrel of the pipe.

The ends of the pipe shall be so formed that when the pipes are laid together and the joints made, they shall constitute a continuous and uniform line of pipe and shall have a smooth and regular interior surface.

400.2.2 Stoppers, Branches, and Ends: Stoppers shall be used with all branch pipes that are to be left unconnected. Stoppers for branch pipes having flexible compression joints may be either clay discs with flexible compression joints, factory applied, that will mate with the branch joint; or, a resilient material of controlled design and dimensions for mating with the branch pipe to which it is to be applied; or, of other material approved by the Engineer. Wooden stoppers will not be accepted.

Branches shall be furnished with connections of the sizes specified, securely and completely fastened to the barrel of the pipe in the process of manufacture.

"Y" branches shall have their axis 45 degrees (unless otherwise specified) from the longitudinal axis of the pipe, measured from the socket end.

All branches shall terminate in sockets. Barrel of the branch shall be of sufficient length to permit making proper joint when the connecting pipe is inserted in the branch socket.

400.2.3 Imperfections: The following additional imperfections in a pipe or fittings will be considered injurious and cause for rejection:

A. Any surface crack in the ends of the spigot or bell which exceeds 1 inch in length.
B. Any piece broken from the bell end of the pipe or fittings when it adversely affects the performance of the joint or connection.

400.2.4 Certification: A certificate from the manufacturer shall be furnished attesting that the pipe meets the requirements of this specification, including test reports for the hydrostatic pressure test and the loading test herein specified.

400.3 Installation of Vitrified Clay Pipe

Pipe and fittings shall be handled carefully to protect from damage. Carefully examine each pipe and fitting before installation, for soundness and specification compliance. Pipe accepted may be plainly marked by the inspector. Rejected pipe shall not be defaced, but shall be replaced with pipe that meets specification.

Handle pipe so that pre-molded jointing surfaces or attached couplings do not support the weight of the pipe. Do not damage the jointing surfaces or couplings by dragging, contact with hard materials, or by use of hooks.

Clean joint contact surfaces immediately prior to joining. Use joint lubricants and joining methods, as recommended by the pipe manufacturer. Unless otherwise required, lay all pipe straight between changes in alignment and at uniform grade between changes in grade. Excavate bell holes for each pipe joint. When joined in the trench, the pipe shall form a true and smooth line.

Straight lengths of pipe may be used for horizontal or vertical curves by uniformly deflecting each joint. Whenever practicable, start pipe laying at the lowest point and install the pipe so that the spigot ends point in the direction of flow to prevent bedding material from entering the joint.

After each pipe has been brought to grade, aligned, and placed in final position, deposit and shovel slice or spade bedding material under the pipe haunches. Wyes and tees shall be bedded to prevent shear loading. Pipe that is bedded in a concrete cradle or encased in concrete, shall be placed in proper position on temporary supports.

When necessary, rigidly anchor or weight the pipe to prevent flotation as concrete is placed. Place concrete for cradles, arches, or encasement uniformly on each side of the pipe and deposit at approximately its final position. Concrete placed beneath the pipe shall be sufficiently workable so that the entire space beneath the pipe can be filled without excessive vibration.

Where pipe connects with outside faces of manhole walls or the outside faces of the walls of other structures, provide a pipe joint such that slight flexibility or motion can take place in or near the plane of the wall face. A pipe stub 12 to 18 in. (305 to 455 mm) in length shall be extended from manhole or other wall faces. The pipe stub shall be bedded in the same manner as the pipe.

Initial backfill need not be compacted to develop field supporting strength of the pipe. Final backfill shall require compaction to prevent settlement of the ground surface. Backfill trenches as soon as practicable after the pipe is laid. In the case of concrete bedding, delay backfilling until the concrete has set sufficiently to support the backfill load.

END OF SECTION

SECTION 500 – HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS FOR SANITARY SEWER

500.1 General

This specification covers the requirements of profile-reinforced and corrugated (Type S or Type D) high density polyethylene (HDPE) pipe manufactured per ASTM F894, AASHTO M-252 or AASHTO M-294 for gravity flow, low pressure sanitary sewer systems. When noted on the plans or in the special provisions, gravity flow, and low pressure sanitary sewers may be constructed using HDPE pipe. The HDPE pipe will be of the sizes 8 inch diameter through 120 inch diameter. For the purpose of this specification, low pressure is defined as the test pressures of 3.5 psi of air or 4 feet of water as specified. Also refer to the "Greenbook" Section 207-18 for additional specifications.

All pipe joints shall conform to the controlled pressure test of 10.8 psi of air or 25 feet of water as stipulated in ASTM D3212.

The size and class of the HDPE pipe to be furnished shall be designed by the Engineer and shown on the plans or in the project specifications. At no time will the class designed be less than RSC-63 for HDPE pipe, or minimum equivalent Pipe Stiffness (PS) for corrugated pipe per the requirements of AASHTO M-252 or AASHTO M-294.

500.2 Materials

HDPE pipe materials and fittings conform to the provisions in The "Greenbook", Section 207-18 and other noted standards with the noted "Greenbook" section(s).

500.3 Markings

Markings on pipe shall be per ASTM F894, AASHTO M-252 or AASHTO M-294. These markings shall be clearly shown on the pipe at intervals of approximately 12 feet and include but not limited to the following: the manufacturer's name or trademark, nominal size, the specification designation, plant designation code, date of manufacture or an appropriate code.

All fittings shall be marked with the designation number of the specification and with the manufacturer's identification symbol. In addition, manufacturers of corrugated HDPE, AASHTO M-294, shall print on or affix the appropriate Plastic Pipe Institute Program Mark on each length of pipe produced that meets the requirements of the program.

500.4 Care of Pipe and Materials

All pipe and materials shall be manufactured, handled, loaded, shipped and unloaded in such manner as to be undamaged and in sound condition, in the completed work. Particular effort shall be exercised to protect the ends of pipe. Repairs on damaged pipe shall be made to the satisfaction of the Engineer otherwise they shall not be used in the work and shall be replaced with an equal pipe or special in an acceptable condition. At all times rubber gaskets shall be stored in a cool, dark place until ready for use.

HDPE profile reinforced RSC type pipe in shipping or storage shall not be stacked higher than three rows for pipes 21 inches in diameter or less, nor higher than two rows for pipes 24 to 36 inches in diameter inclusive. Pipe shall not be stacked, shipped, or stored with weight on the bells of the pipe.

Corrugated HDPE pipe in shipping and storage shall be stacked per manufacturer's recommendation, but in no case higher than 5 rows for pipe 24 inches or less in diameter, or 3 rows for pipe greater than 24 inches in diameter.

Pipe that is gouged, marred or scratched forming a clear depression shall not be installed and shall be removed if damaged in the installation.

500.5 Excavation
Excavation and trench widths shall comply with plans and specifications. Trench widths for HDPE pipe, meeting ASTM F894, will be designed by the Engineer and included on the plans or in the special provisions.

500.6 Foundation, Bedding, Backfilling and Compaction for HDPE Pipe

500.6.1 Foundation: Foundation shall comply with plans and specifications.

500.6.2 Bedding: Coarse aggregate shall be used for bedding of large-diameter profile HDPE pipe. Coarse aggregate shall be in accordance with the plans and specifications for size, type, and gradation. Bedding for HDPE pipe shall conform to "Greenbook" Section 207-18.

Bedding material shall be carefully deposited in 8 inches or less loose lifts, thoroughly and carefully compacted around the pipe, equally around both sides of the pipe, with approved vibratory compactors or other tools or equipment when applicable, or by shovel slicing as approved by the Engineer. This shall be repeated until enough material is placed and compacted to provide a minimum of one (1) foot cover over the top of profile HDPE pipe, or to the top of corrugated HDPE pipe.

500.6.3 Compaction Methods: Compaction for HDPE pipe shall conform to "Greenbook" Section 306-1. For large-diameter HDPE pipe installations where the backfill and bedding material is coarse aggregate, mechanical compaction shall be the only method for consolidating backfill and bedding.

<u>Water consolidation shall not be used as a method of compaction for coarse aggregate whether used as a foundation, bedding or backfill material.</u>

500.7 Preparing and Installing HDPE Pipe

500.7.1 Storage and Handling: Pipe shall be stored and handled in such a way to minimize out-of-roundness. Pipe shall be stored in shaded areas to minimize adverse effects of thermal, and ultraviolet exposure.

Pipe that is out-of-round in excess of 3% of the nominal pipe diameter as specified shall not be installed and shall be removed if installed.

500.7.2 Strutting: Strutting of Profile HDPE pipe will be required when the diameter is 42 inches or larger. For Profile HDPE pipe with diameters smaller than 42 inches, strutting may be required at the discretion of the Engineer. Strutting of Corrugated HDPE pipe is not required.

Strutting consists of placing wood struts, whose length is typically 3% longer than the nominal pipe diameter, inside the pipe. A minimum of three (3) sets of struts are placed in each pipe length, oriented vertically, spaced equally throughout the length of pipe and set so as not to interfere with the jointing of the pipe. The struts shall be kept in place until the bedding material is placed and compacted around the pipe. The struts must be removed before any backfill or bedding is placed above the pipe. The procedure of strutting the pipe shall not damage the pipe in any way. If the pipe is out of round, the struts will be placed in the long direction of the out-of-round. If the strut cannot be held in place by the pipe, the pipe will be removed from the job site.

500.7.3 Orienting: If the pipe is out-of-round, the pipe should be oriented so that the long axis is placed vertically when installed in the trench. When struts are used, the struts shall be oriented vertically when pipe is installed in the trench.

500.7.4 Installing Pipe: HDPE pipe and fittings shall be installed in accordance with ASTM D2321 or manufacturer's recommendation. HDPE pipe shall be handled so as not to damage the pipe. Hoisting shall be accomplished with cloth belt slings or ropes. The pipe shall be protected by wood blocking when jointing is accomplished by pipe jacking, back hoe bucket, come-along, or cable pipe puller.

END OF SECTION

SECTION 600 – TRENCHLESS INSTALLATION

600.1 Description
The Contractor shall furnish all labor, material and equipment as required for the trenchless operation to install steel casing using horizontal earth auger boring, hand tunneling or pipe ramming.

600.2 Materials
The steel casing shall consist of steel plates rolled and welded into a cylinder. Plate material shall meet the minimum requirements of ASTM A283. Shop and field joints shall be butt welded in accordance with the minimum requirements of American Welding Society (AWS) D1.1/D1.1M. Welding shall be performed by AWS D1.1 certified personnel.

The steel casing for pressurized carrier pipes shall be a minimum of 12-inches larger than the largest OD of the carrier line including pipe bells and flanges or the size indicated on the plans, whichever is greater.

The steel casing for gravity carrier pipes shall be a minimum of 18-inches larger than the largest OD of the carrier line including pipe bells and flanges or the size indicated on the plans, whichever is greater.

600.3 Trenchless Operations
Before starting trenchless pipe installation operations, the Contractor shall submit in accordance with plans and specifications, detailed shop drawings of the bore pit and receiving pit shoring, the casing, bulkheads, carrier pipe installation method, and welder certifications. The bore and reception pits for the trenchless operation shall be shored to safeguard existing sub-structures and surface improvements and to protect against ground movement.

600.3.1 Steel casing 37-inches (ID) or larger: Grout connections shall be provided at a maximum spacing of every 20-feet located at 12 o'clock in the steel casing. Upon completion of the boring operation, the contractor shall inspect each grout hole to determine if grouting is required. Any void greater than 2 inches outside the casing will require the boring contractor to grout fill the void. After grouting, the grout holes shall be closed with a threaded plug.

600.3.2 Steel casing 36-inches (ID) or smaller: Installed by horizontal earth auger boring, hand tunneling or pipe ramming will not require outside grouting unless caving or earth movement occurs.

600.4 Dewatering
All water encountered during the trenchless operation shall be disposed of by the Contractor in a manner that will not damage public or private property or create a nuisance or health problem.

600.5 Carrier Pipe Placement

The tolerances allowed for the alignment and grade of carrier pipe shall comply with requirements of plans and specifications as applicable. The Contractor shall be responsible to obtain the required line and grade for the carrier pipe. The carrier pipe shall not contact or rest on the casing.

Pressurized carrier pipes, (i.e. water, gas, force main) shall be placed using casing spacers, wood skids or steel pipes for rails. Casing spacers shall be installed 3 per joint minimum with 8-foot maximum spacing. The annular space between the casing and carrier line shall be left empty unless otherwise directed. When the annular space is to be filled, 1 sack slurry shall be used.

Gravity carrier pipes, (i.e. sewer, storm drain, irrigation) shall be placed using wood skids or steel pipes for rails. The annular space between the casing and carrier line shall be left empty unless otherwise directed. When the annular space is to be filled, 1 sack slurry shall be used.

Bulkheads consisting of brick and mortar or concrete shall be constructed on the ends of the casing; bulkheads shall be a minimum of 8-inches thick. Alternative casing end closures may be substituted for brick and mortar or concrete bulkheads if approved by the engineer.

PVC conduits for dry utilities, (i.e. communications, fiber, electric) shall be placed using non-metallic PVC casing spacers. The annular space between the casing and carrier line shall be filled as indicated in the contract documents.

After completing the carrier pipe installation, the Contractor shall remove all loose and disturbed material in the bore pits and backfill the pits in accordance with the “Greenbook” specifications for backfill and compaction of excavated areas.

600.6 Cured-In-Place-Pipe (CIPP):

600.6.1 General:

It is the intent of this specification to provide for the reconstruction of pipelines and conduits by the installation of a resin-impregnated flexible tube, which is tightly formed to the original conduit. The resin is cured using either hot water under hydrostatic pressure or steam pressure within the tube. The Cured-In-Place Pipe (CIPP) will be continuous and tight fitting.

These Specifications cover all work necessary to furnish and install, the (CIPP). The Contractor shall provide all materials, labor, equipment, and services necessary for traffic control, bypass pumping and/or diversion of sewage flows, cleaning and television inspection of sewers to be lined, liner installation, reinstatement of service connections, all quality controls, provide samples for performance of required material tests, final television inspection, testing of lined pipe system and warranty work.

The CIPP may be designed as a liner to rehabilitate the existing pipe or as a fully structural stand alone pipe-within-a-pipe. Where specified in the contract documents the installed CIPP

shall be a structurally designed pipe within a pipe, meet or exceed all contract specified physical properties, fitting tightly within the existing pipe all within the tolerances specified. The installed CIPP shall withstand all applicable surcharge loads (soil overburden, live loads, etc.) and external hydrostatic (groundwater) pressure, if present, for each specific installation location.

The CIPP shall be designed for a life of 50 years or greater. The installed CIPP shall have a long term (50 year) corrosion resistance to the typical chemicals found in domestic sewage.

All existing and confirmed active service connections and any other service laterals to be reinstated as directed by the Owner shall be re-opened robotically or by hand in the case of man-entry size piping, to their original shape and to 95% of their original capacity. All over-cut service connections will be properly repaired to meet the requirements of these specifications.

Work may need to be scheduled around the business hour of any business that may be affected by the CIPP installation. The flow from the business may be bypassed if possible.

600.6.2 Referenced Documents:
This specification references standards from the American Society for Testing and Materials:, such as: ASTM F1216 (Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube), ASTM F1743 (Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)), ASTM D5813 (Cured-in-Place Thermosetting Resin Sewer Pipe), ASTM D790 (Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials), and D2990 (Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics) which are made a part hereof by such reference and shall be the latest edition and revision thereof. In case of conflicting requirements between this specification and these referenced documents, this specification will govern.

600.6.3 Submittals:
The following items shall be submitted to VSD prior to initiation of any CIPP activities.

- The design parameters outlined in Section 600.6.5 used to design the liner section.
- The diameter, wall thickness and type of material to be used. Pipe strength determination shall include calculations based on new material properties and long term properties.
- The manufacturer's certificates of compliance with provisions of the referenced standards and these specifications.
- Both the rehabilitation manufacturing and installation processes shall operate under a quality management system which is third-party certified to ISO 9000 or other recognized organization standards. Define responsibilities, of the Contractor's personnel, for assuring that all quality requirements, for this contract, are met. These shall be assigned, by the Contractor, to specific personnel. Proof of certification shall be submitted.

- A copy of the license or certificates verifying the manufacturer's or licensor's approval of the installer.
- Evidence of the Installer having at least five (5) years active experience in the commercial installation. In addition, the Installer must have successfully installed at least 250,000 feet of cured-in-place product in wastewater collection systems. Also the Installer's project managers must have a minimum of two (2) years of CIPP installation experience and must be on-site during the installation of the CIPP produce.
- A detailed installation plan describing all preparation work, cleaning operations, pre-CCTV inspection, by-pass pumping, traffic control, installation procedure, method of curing, service reinstatement, quality control.
- A detailed public notification plan shall be prepared and submitted including detailed staged notification to residences affected by the CIPP installation.
- Repair/replacement procedures shall be as recommended by the CIPP system manufacturer and shall be submitted.

600.6.4 Materials

600.6.4.1 Tube

The sewn Tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F1216, Section 5.1 or ASTM F1743, Section 5.2.1 or ASTM D 5813, Sections 5 and 6. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections. The tube may also contain felt layers reinforced with glass or carbon fibers.

The wet out Tube shall have a relatively uniform thickness that when compressed at installation pressures will equal or exceed the calculated minimum design CIPP wall thickness.

The Tube shall be manufactured to a size that when installed will tightly fit the internal circumference and length of the original pipe. Allowance should be made for circumferential stretching during installation.

The outside layer of the Tube shall be coated with an impermeable, flexible membrane that will contain the resin and allow the resin impregnation (wet out) procedure to be monitored.

The Tube shall contain no intermediate or encapsulated elastomeric layers. No material shall be included in the Tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident.

The wall color of the interior pipe surface of CIPP after installation shall be a relatively light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.

Seams in the Tube shall be stronger than the non-seamed felt material.

The Tube shall be marked for distance at regular intervals along its entire length, not to exceed 5 ft. Such markings shall include the Manufacturers name or identifying symbol.

600.6.4.2 Resin
The resin system shall be a corrosion resistant polyester or vinyl ester system including all required catalysts, initiators that when cured within the tube create a composite that satisfies the requirements of ASTM F1216, ASTM D5813 and ASTM F1743, the physical properties herein, and those which are to be utilized in the submitted and approved design of the CIPP for this project. The resin shall produce a CIPP that will comply with the structural and chemical resistance requirements of this specification.

600.6.5 Structural Requirements:

The CIPP shall be designed as per ASTM F1216, Appendix X.1. The CIPP design shall assume no bonding to the original pipe wall.

The Contractor must have performed long-term testing for flexural creep of the CIPP pipe material installed by his Company. Such testing results are to be used to determine the long-term, time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (Tube and Resin) and general workmanship of the installation and curing as defined within the relevant ASTM standard. A percentage of the instantaneous flexural modulus value (as measured by ASTM D790 testing) will be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, will be verified by this testing. Retention values exceeding 50% of the short-term test results shall not be applied unless substantiated by qualified third party test data to the Owner's satisfaction. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in the CIPP design.

The Enhancement Factor 'K' to be used in 'Partially Deteriorated' Design conditions shall be assigned a value of 7.

The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If the layers separate during field sample testing, new samples will be required to be obtained from the installed pipe. Any reoccurrence may cause rejection of the work.

The cured pipe material (CIPP) shall conform to the structural properties, as listed below.

MINIMUM CIPP PHYSICAL PROPERTIES

Property	Test Method	Cured Polyester Composite min. per ASTM F1216	Cured Polyester Composite Enhanced Resin
Modulus of Elasticity	ASTM D790	250,000 psi	400,000 psi
Flexural Stress	ASTM D790	4,500 psi	4,500 psi

The required structural CIPP wall thickness shall be based as a minimum, on the physical properties in Section 5.5 or greater value if substantiated by independent lab testing and in accordance with the design equations in the Appendix X1. Design Considerations of ASTM F1216 and the following design parameters:

Design Safety Factor (typically used value)	**= 2.0**
Retention Factor for Long-Term Flexural Modulus to be used in Design	**= 50% - 75%**
(As determined by long-term tests described in Section 600.6.5 and approved by the Owner)	
Ovality (calculated from (X1.1of ASTM F1216)	**= 2%**
Enhancement Factor, K	**= See Sect. 600.6.5**
Groundwater Depth (above invert of existing pipe)	**= 0 ft.**
Soil Depth (above crown of existing pipe)	**= 10 ft.**
Soil Modulus	**= 750 psi**
Soil Density	**= 120 pcf**
Live Load	**= H20 Highway**
Design Condition (partially or fully deteriorated)	**= Fully**

600.6.6 Testing Requirements:

600.6.6.1 Chemical Resistance
The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical-testing requirements.

600.6.6.2 Hydraulic Capacity
Overall, the hydraulic cross-section shall be maintained as large as possible. The CIPP shall have a minimum of the full flow capacity of the original pipe before rehabilitation. Calculated capacities may be derived using a commonly accepted roughness coefficient for the existing pipe material taking into consideration its age and condition.

600.6.6.3 CIPP Field Samples
When requested by the Owner, the Contractor shall submit test results from field installations of the same resin system and tube materials as proposed for the actual installation. These test results must verify that the CIPP physical properties specified in Section 600.6.5 have been achieved in previous field applications. Samples for this project shall be made and tested as described in Section 600.6.10 of this document.

600.6.7 Installation Responsibilities for Incidental Items:
It shall be the responsibility of the Owner to locate and designate all manhole access points open and accessible for the work, and provide rights-of-access to these locations. The Owner shall also provide free access to water hydrants for cleaning, installation and other process related work items requiring water.

600.6.7.1 Cleaning of Sewer Lines
The Contractor, when required, shall remove all internal debris out of the sewer line that will interfere with the installation of CIPP. The Contractor shall be responsible for correcting any damage to the host pipe caused by the cleaning process that will prevent the installation process. The Owner shall also provide a dumpsite for all debris removed from the sewers during the cleaning operation. Unless stated otherwise, it is assumed this site will be at or near the sewage treatment facility to which the debris would have arrived in absence of the cleaning operation. Any hazardous waste material encountered during this project will be considered as a changed condition.

600.6.7.2 Bypassing Sewage
The Contractor, when required, shall provide for the flow of sewage around the section or sections of pipe designated for repair. Plugging the line at an existing upstream manhole and pumping the flow into a downstream manhole or adjacent system shall make the bypass. The pump(s) and bypass line(s) shall be of adequate capacity to accommodate the sewage flow. The Owner may require a detail of the bypass plan to be submitted.

600.6.7.3 Inspection of Pipelines
Inspection of pipelines shall be performed by experienced personnel trained in locating breaks, obstacles and service connections using close circuit television (CCTV) inspection techniques. The pipeline interior shall be carefully inspected to determine the location of any conditions that may prevent proper installation of CIPP. These shall be noted and corrected. A videotape and suitable written log for each line section shall be produced for later reference by the Owner.

600.6.7.4 Line Obstructions
It shall be the responsibility of the Contractor to clear the line of obstructions such as solids and roots that will prevent the insertion of CIPP. If pre-installation inspection reveals an obstruction such as a protruding service connection, dropped joint, or a collapse that will prevent the installation process, that was not evident on the pre-bid video and it cannot be removed by conventional sewer cleaning equipment, then the Contractor shall make a point repair excavation to uncover and remove or repair the obstruction. Such excavation shall be approved

in writing by the Owner's representative prior to the commencement of the work and shall be considered as a separate pay item.

600.6.7.5 Public Notification
The Contractor shall make every effort to maintain sewer service usage throughout the duration of the project. In the event that a connection will be out of service, the longest period of no service shall be 8 hours. A public notification program shall be implemented, and shall as a minimum, require the Contractor to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer will be off-line. The Contractor shall also provide the following:

- **A.** Written notice to be delivered to each home or business the one week prior to the beginning of work being conducted on the section, and a local telephone number of the Contractor they can call to discuss the project or any potential problems.
- **B.** Personal contact and written notice in the form of a door hanger or handout the day prior to the beginning of work being conducted on the section relative to the residents of business affected. All contact shall be documented including the name, address date and time contact was made.
- **C.** Personal contact with any home or business which cannot be reconnected within the time stated in the written notice.

600.6.7.6 Locating of Service Connections
The Contractor shall be responsible for confirming the locations of all branch service connections prior to installing the CIPP.

600.6.8 Installation
CIPP installation shall be in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6, with the following modifications:

600.6.8.1 Resin Impregnation
The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the potential loss of resin during installation through cracks and irregularities in the original pipe wall, as applicable.

600.6.8.2 Tube Insertion
The wet out tube shall be positioned in the pipeline using either the inversion or a pull-in method as defined within relevant ASTM standards previously stipulated. If pulled into place, a power winch or its equivalent should be utilized and care should be exercised not to damage the tube as a result of pull-in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.

600.6.8.3 Temperature gauges
Temperature gauges shall be placed between the tube and the host pipe's invert position to monitor the temperatures during the cure cycle.

600.6.8.4 Curing
Curing shall be accomplished by utilizing hot water under hydrostatic pressure or steam pressure in accordance with the manufacturer's recommended cure schedule. A cool-down process shall be conducted that complies with the resin manufacturer's specification.

600.6.9 Reinstatement of Branch Connections:
It is the intent of these specifications that branch connections to buildings be re-opened without excavation, utilizing a remotely controlled cutting device, monitored by a CCTV.

The Contractor shall certify a minimum of two complete functional cutters plus key spare components are on the job site before each installation or are in the immediate area of the jobsite and can be quickly obtained.

Unless otherwise directed by the Owner or his authorized representative, all laterals will be reinstated (see last paragraph of Section 600.6.9, below).

If the contractor is unable to re-establish the service connection from inside the pipe and excavation is necessary, no additional payment will be made for excavations for the purpose of reopening connections and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work.

The Contractor shall be responsible for confirming the locations of all branch service connections prior to installing and curing the CIPP. If required in the contract documents, dye testing shall be performed to determine whether or not the connection is live or abandoned. The cost for dye testing of existing service connections shall be compensated at the unit price bid in the Proposal for Dye Testing of Existing Service Connections. In the event the status of a service connection cannot be adequately defined, the Owner will make the final decision, prior to installation and curing of the liner, as to the status. Typically, only service laterals deemed "active" or connected to a structure shall be reopened by the Contractor.

600.6.10 Inspection:
CIPP samples shall be prepared for each installation designated by the owner/engineer or approximately 20% of the project's installations. Pipe physical properties will be tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed. The flexural properties must meet or exceed the values listed in the table on of this specification, Table 1 of ASTM F1216 or the values submitted to the Owner/engineer by the contractor for this project's CIPP wall design, whichever is greater.

Wall thickness of samples shall be determined as described in paragraph 8.1.6 of ASTM F1743. The minimum wall thickness at any point shall not be less than 87½% of the submitted

minimum design wall thickness as calculated in Section 600.6.5 of this document.

Visual inspection of the CIPP shall be in accordance with ASTM F1743, Section 8.6.

600.6.11 CIPP Repair/Replacement:
Occasionally installation of a CIPP will result in the need to repair or replace a defective CIPP. The Contractor shall outline specific repair or replacement procedures for potential defects that may occur in the installed CIPP. Repair/replacement procedures shall be as recommended by the CIPP system manufacturer and shall be submitted.

Defects in the installed CIPP that will not affect the operation and long term life of the product shall be identified and defined.

Repairable defects that may occur in the installed CIPP shall be specifically defined by the Contractor based on manufacturer's recommendations, including a detailed step-by-step repair procedure, resulting in a finished product meeting the requirements of these contract specifications.

Un-repairable defects that may occur to the CIPP shall be clearly defined by the Contractor based on the manufacturer's recommendations, including a recommended procedure for the removal and replacement of the CIPP.

600.6.12 Clean-Up:
Upon acceptance of the installation work and testing, the Contractor shall restore the project area affected by the operations to a condition at least equal to that existing prior to the work.

600.6.13 Warranty:
The materials used for the project shall be certified by the manufacturer for the specified purpose. The manufacturer shall warrant the liner to be free from defects in raw materials for one (1) year from the date of installation and acceptance by the Owner. The Contractor shall warrant the liner installation for a period of one (1) year. During the Contractor warranty period any defect, which may materially affect the integrity, strength, function and/or operation of the pipe, shall be repaired at the Contractor's expense in accordance with procedures included in Section 600.6.3 and Section 600.6.11 of this document.

END OF SECTION

SECTION 700 – FATS, OILS, GREASE SEPARATION FACILITIES

700.1 GREASE INTERCEPTOR

Whenever a commercial and/or retail food preparation operation, regardless of size, generates animal/vegetable fats, oils or grease waste, which causes a visible sheen or accumulations in the effluent, to be discharged to the sanitary sewer, pre-treatment is required. A grease interception device as specified by the Valley Sanitary District Standard Details, and/or other biological, chemical, or other pretreatment device approved by the District, shall be installed by the owner. Effluent discharged from any grease interceptor shall not contain a visible sheen or accumulations, and shall be in compliance with the Valley Sanitary District wastewater regulations for discharge to the sanitary sewer. Grease Traps are prohibited under any circumstance.

700.2 SAND/OIL SEPARATOR

Grease interceptors, grease recovery devices, sand/oil separators, and grease converters are plumbing devices designed to intercept most greases and solids before they enter a wastewater disposal system. Whenever an industrial or commercial business generates mineral/petroleum/non-biodegradable cutting oils exceeding 25 milligrams per liter to be discharged to the sanitary sewer, pre-treatment is required. Selection and sizing of a sand/oil separator shall be subject to approval by the District. Water discharged from any oil/sand separator to the sanitary sewer system shall not contain in excess of 25 milligrams per liter of petroleum oil, non-biodegradable cutting oil and mineral products, and shall be in compliance with the Valley Sanitary District wastewater regulations for discharge to the sanitary sewer.

700.3 STRUCTURE

A. Sizing of an interceptor/separator facility shall be based upon maximum available flow to the separator and provision of a forty-five minute retention time in the separator at that flow, with a minimum capacity of at least 1000 gallons.

B. The interceptor/separator shall be covered with removable sections. Access and inspection covers, weighing not more than 30 lbs. and with suitable hand holds, are to be provided directly above inspection “tee” and oil/grit collection compartments.

C. Only waste water from floor drains shall drain to the interceptor/separator. The location and design shall minimize or eliminate the possibility of storm water reaching the separator -- areas open to rainfall shall not drain to the separator. Sewage from restrooms and shower facilities shall not drain to the interceptor/separator. See Standard Details for additional information.

D. Concrete will be the only allowable material for construction of the tank and baffle walls.

E. The separator shall be located such that it can be accessed by a maintenance vehicle and located as close to the building as possible.

F. A sampling box shall be located on the outlet as shown on the Standard Details. Access to the separator shall be maintained free for inspection and compliance determination sampling at all times.

G. The effluent discharged from any interceptor/separator to the sanitary sewer shall not exceed 25 parts per million total oil.

H. When pre-treatment is no longer required, the inlet and outlet pipes shall be permanently plugged, the separation chambers pumped out, and the vault removed, or filled with compacted crushed rock or controlled density fill per California Plumbing Code.

END OF SECTION

SECTION 800 – SUBMITTALS

800.1 Submittals from Contractor

Submittals shall ensure compliance with the project specifications. In addition, they provide the basis for monitoring details of the project. These submittals, or portions of, can be provided at various points during the procurement and construction process.

800.1.2 Material: Submittals shall include shop drawings, catalog data, and manufacturers technical data showing complete information on material composition, physical properties, and dimensions of new pipe and fittings. A certificate of compliance with specifications for materials needs to be furnished. Manufacturer's recommendations for handling, storage, and repair of pipe and damaged fittings should also be included.

800.1.3 Construction Method: Submittals shall include method of construction and restoration of existing service connections. This should include detail drawings and written description of the entire construction procedure to install pipe, bypass flow and reconnection to service connections. A methodology statement should explain the operation of the equipment. The submittals should include all details of the equipment. If lubricant is planned for the project, the contractor should submit information on the type of lubricant to be used and any environmental implications associated with its use or migration away from the pipe alignment. Submittals should include material safety data sheets (MSDS) on material, a description of where the material will be used, and the purpose in the construction process.

800.1.4 Bypassing: The contractor needs to submit information on how the temporary diversion for the pipeline will be provided, and verify that the pumps and by-pass lines shall be of adequate capacity and size to handle all necessary flows during the period the line is out of service. Continuous service of connections to the line during the execution of work is expected to be a responsibility of the contractor, as well as clean-up, repair and property damage cost and claims due to bypassing failures.

800.1.5 Site Layout: Construction site layout information is important to the owner to verify that the operations do not infringe on personal property or unnecessarily interfere with any public or private operations. A sketch should be submitted indicating storage areas, equipment set-up areas, construction staging areas, and locations of all major supporting equipment.

800.1.6 Contractor Qualifications: The contractor must provide verification of qualifications to the owner. The contractor should furnish background information on key personnel to allow the owner to ensure they have adequate experience. For prior job references, complete names, affiliations, addresses, and telephone numbers should be furnished so the owner may contact the references to verify satisfactory prior performance. Supporting financial data on the company should also be submitted to ensure that the contractor and pipe supplier will be available to support the product in the long-term.

801.1.7 Quality Assurance/Control Plan: The submittals should address how the specification requirements on quality control items will be satisfied. Quality control procedures for materials and construction procedures, and methods of performance testing of the finished product should be included. These submittals should clarify the monitoring of quality control over suppliers, manufacturers, products, services, site conditions, and workmanship.

When required in individual specifications, a material or product suppliers' or manufacturers' technical representative should be provided to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, operator training, test, adjust, and balance of equipment as applicable, and to initiate operation, as required. If defined in individual specifications, the minimum time requirements for start-up operations and operator training should be met and documented.

The contractor may also be required to verify that the as-replaced condition/performance of the completed pipeline is satisfactory. If television inspection of the replaced line is specified, the contractor is to provide videotape of the entire length of the pipe to show that the line is free of visual defects.

800.1.8 Safety Plan: The safety plan is to ensure that the public and workers are protected from construction hazards. The Contractor shall submit their injury, illness prevention plan (IIPP).

800.1.9 Construction Records: Various submittals are required during the construction process to monitor the project progress, problems encountered and to document the work carried out. These include the following: pre-construction survey reports, documented as-built conditions, construction logs, materials installed, extent and causes of delays, locations of affected areas, and unusual problems or conditions encountered.

800.2 Contractor Certification of Installation Procedures

When requested in the Special Provisions or by the Engineer prior to installation, the Contractor shall furnish to the District an affidavit (certification) from the pipe manufacturer (or his designee) stating that the Contractor is familiar with the manufacturer's suggested installation methods, procedures, the installation complies with those procedures and is consistent with District requirements.

Also, when required in the Special/Technical Provisions or requested by the Engineer, the pipe manufacturer or his designee will review the Contractor's methods and procedures for pipe installation in the field. The Contractor will make any adjustments in the installation as recommended by the manufacturer or his representative.

If necessary, the Contractor may be required to reinstall or provide corrections to pipe installed prior to the field review. Once the manufacturer or his representative has reviewed the Contractor's installation methods and the Contractor has adjusted his installation methods as

recommended by the same, the manufacturer or his representative shall furnish to the District an affidavit (certification) that the Contractor's installation methods and procedures, at the time of the review, complied with the manufacturer's installation practices. The affidavit must provide the name of the manufacturer's representative witnessing the pipe installation.

END OF SECTION

SECTION 900 – CONTROLLED LOW STRENGTH MATERIAL

900.1 Description

The work covered by this specification consists of furnishing all materials, labor and equipment for the placement of controlled low strength material (CLSM) and shall conform to Section 201-6 of the "Greenbook" and the following specifications.

The type of backfill to be used shall be as specified in the special provisions or plans by the Engineer.

900.2 Materials

CLSM shall conform to the requirements of the "Greenbook" and shall meet or exceed all applicable ASTM Standards, unless otherwise specifically approved by the District and the Engineer. Ready-mixed concrete shall not be used in lieu of CLSM without prior approval from the Engineer and shall be subject to rejection.

900.3 Placement

The controlled low strength material shall be placed directly into the excavation. The CLSM shall be placed in a uniform manner that will prevent voids in or segregation of the material. Foreign material which falls into the trench prior to and during placing of the CLSM shall be immediately removed. The CLSM shall have consistency, workability, plasticity, flow characteristics and pumpability (when required) such that the material when placed is self-compacting. Mechanical compaction or vibration may be used to consolidate around structures, pipes, multiple pipes, etc., otherwise no mechanical compaction or vibration shall be required. The total elapsed time between the initial addition of water to the CLSM and the completed placement shall not exceed 90 minutes.

CLSM shall not be used in pipe bedding zone without prior written approval by the Engineer. Where CLSM is used for backfill around pipes, the CLSM shall be placed equally on both sides of pipe or pipe to prevent lateral displacement. Also, the CLSM shall be placed in lifts. The height of each lift shall not exceed the depth that will cause floating of the pipe. When placing the CLSM in greater lift depths, sufficient anchorage shall be provided so the pipe will not float.

Where CLSM is used for backfill around pipes with a depth less than 20 feet, the width of the excavation shown on the plans or in the specifications may be reduced with prior written approval from the District and the Engineer so that the minimum clear distance between the outside of the pipe or pipe and the side of the excavation (each side) shall be 12 inches for pipes 42 inches and larger, 6 inches for pipes between 4 inches and 42 inches and 3 inches for pipes 4 inches and smaller.

For long trenches or installations which require a large amount of CLSM, bulkheads of wood, dirt, sand bags, etc. can be used to control the material's flowability. The bulkhead shall be removed prior to the continuation of the backfilling.

CLSM shall NOT be permitted to come in contact with any aluminum, copper or brass materials, e.g., aluminum pipes or culverts, copper water pipe, saddles, fittings, etc. Protection shall be any combination of the following: place a layer of noncorrosive material around the pipe e.g., native material, import material, etc. or provide a protective covering or wrapping such as polyethylene wrap. Pipes smaller than 4 inches can be completely wrapped with tape as per manufactures specifications or approved equal.

900.4 Performance Testing

CLSM placed within the traveled way or otherwise to be covered by paving or embankment materials, shall not be covered until one of the following performance criteria have been met:

(A) When a person of average weight and shoe size can walk on the surface of the CLSM without creating greater than 1/8-inch indents in the material, or
(B) When the in-place CLSM has reached a strength of 30 psi, when tested in accordance with ASTM D4832, or
(C) When a ball drop indentation of 3-inches or less is obtained, when tested in accordance with ASTM D6024, or
(D) When a penetration resistance reading of 650 is achieved, when tested in accordance with ASTM C403.

Additionally, CLSM shall not be covered if proof rolling by pneumatic-tired or steel wheel vibratory roller results in the bringing of free water to the surface or results in surface undulation (pumping).

When CLSM is placed in foundation excavations, the material shall be protected from foundation loading and placement of foundation concrete prior to having reached initial set per ASTM C403, or allowed to set in place for 24 hours, whichever occurs first.

900.5 Acceptance

CLSM shall be considered deficient and may be rejected at the discretion of the Engineer if the CLSM aggregate gradation is outside the limits specified in the plans and specifications.

Rejected material not placed shall be immediately removed from the job site. Rejected material placed shall be removed and replaced with acceptable material.

END OF SECTION

SECTION 1000 – MANHOLE AND DROP SEWER CONNECTION CONSTRUCTION

1000.1 Description

1000.1.1 Sewer Manholes: Construction shall consist of furnishing all materials and constructing manholes complete in place, as detailed, including foundation walls, manhole frames, covers, and any incidentals thereto, at locations shown on the plans. All sanitary sewer construction shall conform to the current edition of the "Greenbook", and shall meet or exceed all applicable ASTM Standards, unless otherwise specifically approved by the District and the Engineer.

1000.1.2 Drop Sewer Connections: Construction shall consist of furnishing all materials and constructing drop sewer connections complete in place as detailed, including foundation materials, pipe, and any incidentals thereto, at locations shown on the plans.

1000.2 Materials

Unless otherwise shown on the plans, specified in the special provisions, or as list in the "Greenbook", materials to be used shall conform to the following:

Cement mortar for manholes	Class D*
Concrete for manholes	Class A*
Concrete for drop sewer connection	Class C*

*All Cement and mortar must be a minimum 560-C-3250 min.

Pipe material used in manholes or drop sewer connections shall comply with all pipe requirements of the plans and specifications.

1000.3 Construction Methods

1000.3.1 Manholes: Manholes shall be constructed of precast or cast in place concrete, frames and covers, in accordance with the standard details. The invert channels shall be smooth and semi-circular in shape, conforming to the inside of the adjacent sewer. Changes in direction of flow shall be made with a smooth curve, having a radius as large as the manhole will permit. Changes in size and grade of the channels shall be made gradually and evenly.

Invert channels may be formed of concrete having a smooth mortared surface, half tile laid in concrete or by laying full section of sewer pipe through the manhole and breaking out the top half after the surrounding concrete has hardened. The floor of the manhole outside the channels shall be smoothed and shall slope towards the channels.

A concrete foundation of Class A concrete shall be poured in accordance with the Plans and Details.

Frame and Cover. All machined surfaces on the frame and cover shall be such that the cover will lie flat in any position in the frame and have a uniform bearing through its entire circumference. Any frame and cover which creates any noise when passed over by automobiles shall be replaced. Frames shall be set firmly in a bed of mortar true to line and grade, all as shown on the plans and as called for in these specifications.

Backfilling shall be done in accordance with the requirements for trench backfilling.

1000.3.2 Drop Sewer Connections: Drop sewer connections shall be constructed in conformance with standard details and per Section 1000.3.1 Manholes, herein.

Backfilling shall be done in accordance with the requirements for trench backfilling.

1000.4 Manholes and Special Structures

Both the bell and spigot ends of the manhole sections shall set in mortar or approved equal and shall conform current edition of the "Greenbook" and shall meet or exceed all applicable ASTM Standards.

Eccentric cone sections shall be used unless noted otherwise on the plans.

Frame and Cover shall conform to the requirements of Valley Sanitary District Standard Detail, and shall conform to ASTM A48, Class 35 B, ASUTO M396 and KCMO Standard MH-RC. Castings shall be clean and without surface defects.

Plugging or filling of holes or other defects will not be permitted. Parting fins and pouring gates shall be removed. Bearing surfaces between the ring and cover shall be machine finished or ground to assure interchangeability and non-rocking fit in any position.

Bolt-down type manhole rings shall be anchored to the manhole walls with not less than four (4) three-fourths (3/4) inch (M18x2.5) diameter steel bolts embedded a minimum of four (4) inches, (100 mm), plus or minus one-half (1/2) inch, (10 mm), into the cone section of the manhole, except where the entire ring is embedded in a concrete top slab.

Rings and bolt-down covers shall be provided with machined surfaces, 0-ring or T-ring gaskets and cam locks. Camlock bolt heads shall fit flush or below the top of the cover. The 0-ring or T-ring rubber gasket shall be neoprene or other synthetic material, sixty (60) plus or minus five (5) hardness when measured by ASTM D 2240 type durometer.

Poured-in-place bases shall have a minimum thickness of twelve (12) inches. When poured-in-place bases are used, the invert shall be poured monolithically with the base. The bottom wall sections shall be embedded in the base section a minimum of three (3) inches. The bottom precast wall section shall not be set upon a previously poured base. Solid concrete blocks shall be used for supporting and leveling the wall section prior to pouring the base.

Poured-in-place bases shall extend to the first joint from the manhole when vitrified clay pipe is used as any connection pipe.

Waterproofing shall be applied after the mortar coating has set forty- eight (48) hours. Minimum dry thickness of the coating shall be 14.0 mils. Do not backfill until the coating has set. Repair all damaged coating prior to final backfill. The joint between the manhole and the casting shall be wrapped when required by the Engineer.

Precast sections shall be cleaned of all dirt, grass, and other deleterious matter. Sections shall be placed such that steps are aligned but without rotation or damage to seal integrity. Lift holes shall be patched and the area between the pipe and precast section packed with non-shrink grout.

All adjustment rings shall be covered with an adhesive wrap of elastomeric and/or rubber materials (minimum thickness 0.065 inch), as approved by the Engineer. The wrap shall overlap the joint between the bottom of the casting and the upper adjustment ring and be continuous to the joint between the lower ring and manhole. The minimum overlap of a joint shall be 1 inch.

Inverts shall be structural concrete and steel-troweled to produce a dense, smooth finish and joint with the pipes, which shall project inside the manhole at all points, but not more than 6 inches at any point. The invert channel shall be “U” shaped invert and shall extend upward for the full inside pipe diameter.

1000.5 Subgrade for Concrete Structures

Each subgrade upon which concrete is placed shall be firm and free from water. Ground water shall be kept several inches below subgrade until the concrete has set. When the subgrade is in dry earth, it shall be moistened with water from a spray nozzle immediately before concrete is placed.

When the design details for the project provide for the construction of filter or drain material consisting of gravel or combination of gravel and sand, which material becomes subgrade for concrete, the placing of steel reinforcement and placement of concrete shall follow the placing of the filter or drain material as closely as practical. The filter or drain material shall be kept dewatered to the extent necessary to prevent any portion of concrete materials being carried away before the concrete has attained its final set.

When concrete is to rest on rock, the rock shall be fully uncovered. The surface of the rock shall be removed to a depth sufficient to expose sound rock. Bedrock shall be roughly leveled off or cut to approximately horizontal and vertical steps. Seams in the rock shall be grouted as directed by the Engineer and the base for structures shall be slush grouted or otherwise treated as the Engineer may direct.

Minor structures, as defined when furnished as precast structures, shall be placed on a compacted layer of Structure Backfill at least 6 inches in depth that conforms to the material requirements. The layer shall be shaped to fit the bottom surface of the precast unit and

compacted to not less than 95% maximum density.

The structure backfill shall be at or near optimum moisture content, as approved by the Engineer. After the unit has been initially set in place and checked for line and grade, it shall be removed, and any defects in its bearing area or line and grade shall be corrected by trimming, placing and compacting similarly moistened structure backfill and then the unit reset in place. Precast units shall be installed on compacted, shape-conformed structure backfill in reasonable conformity with the lines and grades shown on the project plans.

1000.6 Adjustment of Manhole Frame and Cover

Sewer manholes and clean out covers and frames within an area to be paved or graded will need to be lowered prior to the noted construction activity and raised after the final paving or surfacing operations in conformance with Section 301-1.6 of the "Greenbook", VSD Standards and the following.

The Contractor shall furnish all labor, materials, and equipment necessary to adjust all frames, covers and valve boxes as indicated on the plans or as designated by the Engineer. The frames shall be set to grades established by the Engineer and/or the City.

The Contractor may elect to remove old frames, covers, and valve boxes and then install new frames and/or boxes in accordance with standard detail drawings.

The Contractor shall be responsible for maintaining an accurate description and location of all items to be adjusted. The locations shall be referenced with map documentation by the use of swing ties or GPS locations. This information shall be supplied to the Engineer and utility owner(s) prior to taking any action that would hide or restrict access to the items to be adjusted.

Any missing or defective frames, covers, valve boxes or related hardware shall be reported to the Engineer in writing during the initial location process to allow for timely replacement. The Engineer shall be responsible for providing replacement items to the contractor. The contractor is responsible for providing items required to accomplish the required adjustments such as additional adjusting rings, and clean out box extensions.

1000.6.1 Lowering Procedure:

If required, manholes and clean outs located within the paved areas to be milled or reconstructed shall be lowered to an elevation that will allow required work to be accomplished without damaging the facilities. Debris shields shall be used to prevent debris from entering sanitary sewers. Care shall be taken to prevent entrance of any material into the lowered facilities. Lowering shall be to a depth that will prevent damage to the utility during the construction activities. Brick manholes shall be lowered to a level brick elevation.

All manhole frames and related items removed by the contractor during the lowering process shall be maintained in a secure area, and the contractor shall bear full responsibility for the material. Any hardware items lost or damaged by the contractor shall be replaced in kind by the

Contractor. All manhole frames and covers that have been removed to facilitate pavement reconstruction or paving operations shall be temporarily covered with a steel plate. After placing the steel plate, but before fill material is place on top of the plate, the inside of the manhole shall be inspected by VSD to verify that no debris is impeding the flow.

Preparation for Milling: Temporary asphalt concrete shall be placed over the steel plate filling the excavated area. The temporary pavement shall be maintained until removed during the adjustment to final grade. Cold mix or other approved product may be used for temporary pavement. Plated manholes shall not remain plated or covered for extended lengths of time. Contractor to provide a schedule indicating the paving process and length of time the manholes will be plated and covered.

1000.6.2 Adjusting Frames:
The Contractor shall loosen frames in such a manner that cleanouts and manholes will not be disturbed or damaged. Debris shields shall be used to prevent debris from entering sanitary. All loose material and debris shall be removed from the excavation and the interiors of structures prior to resetting frames. If dirt or debris enters the sewer system, the contractor shall be responsible for cleaning the sewer system for a minimum of one reach (the next downstream structure from the contamination point.)

Adjustments of utilities, if located within the asphalt pavement, shall be made after placing the final surface course when there is only a single lift of pavement required. When there are multiple lifts of pavement required, adjustments may be made before the final surfacing or as directed by the Engineer. After removal of the temporary asphalt pavement in the area of adjustment, and prior to placement of the final concrete collar ring, the asphalt pavement in proximity of the adjustment shall be rolled with a self-propelled steel wheel roller if requested by the Engineer and/or City.

1000.6.3 Adjusting Manhole and Clean Out Covers with Adjustment Rings:
Adjusting rings may be used to raise manhole covers. The amount of and slope will be considered when using adjusting rings. Each location where an adjusting ring is used must have a sufficient depth of asphalt to assure the proper installation and operation of the ring. The rings shall be made of a concrete and installed per the manufacturer's specifications. The rings shall be approved by the Engineer. The grade rings and frame shall be set in mortar. When brick manholes have an inside diameter too large to fully support a standard manhole grade ring, a precast reducer can be used to reduce the size of the top of the manhole to a standard size. A concrete collar shall be poured around the frame and cover per VSD standards.

Traffic shall not be allowed on the concrete collars until the concrete had reached a minimum compressive strength of 2500 psi on residential and 3000 psi on collector and major streets. On major streets, the contractor shall use "high-early" in the concrete mix, approved by the Engineer and/or City, to minimize delay in reopening the street(s) to traffic.

END OF SECTION

SECTION 1100 – LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

1100.1 Compliance with Laws

All work, construction, documentation and/or process connected with all sanitary sewer work, repair, or construction, shall conform to the current edition of the "Greenbook" and shall meet or exceed all applicable ASTM Standards, unless otherwise specifically approved by the District and the Engineer.

The Contractor shall keep fully informed of, observe and comply with all Federal and State laws, County and City ordinances, regulations, codes and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any way affect the conduct of the work.

The Contractor warrants that all items supplied and work performed under the contract have been sold, produced, delivered and furnished in strict compliance with all such laws, ordinances, regulations, codes, orders and decrees to which the items, work and Contractor are subject.

Upon request, Contractor shall execute and deliver to the District such documents as may be required by the District to evidence compliance with such laws, ordinances, regulations, codes, orders and decrees. The Contractor shall protect and indemnify the District and its representatives against any claim or liability arising from or based on the violation of such, whether by the Contractor or the Contractor's employees.

1100.2 Permits

Permits, bonding and insurance requirements shall be as required by statutes, codes, ordinances or regulations.

It is the duty of the Contractor to determine that all necessary permits have been obtained. The Contractor shall, at the Contractor's own expense, obtain all the required permits which have not been furnished. The Contractor shall comply with all permit requirements until the Contract is completed or the permit is closed-out or transferred. The Contractor shall be responsible to close out all permits except those authorized by special provision to be transferred.

In all cases, the Contractor or the person supervising the authorized work shall notify the appropriate permit agency so as to insure proper inspection by the agency concerned.

1100.3 Patented Devices, Materials and Processes

If the Contractor employees any design, device, material, or process covered by letters of patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner. The Contractor and the surety shall indemnify and save harmless the District, any affected third party or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the District for any costs, expenses, and damages which it may be obligated to pay by reason of any infringement, at any time during the prosecution or after the completion of the work.

1100.4 Archaeological Reports

Attention is directed to California Revised Statues. In view of the above, it shall be a provision of every contract that when archaeological features are encountered or unearthed in the excavation of material pits or of the roadway prism, or other excavation, the Contractor shall report promptly to the Director of the California State Museum and the District. The Contractor will be allowed extra time as appropriate in accordance with the provisions.

1100.5 Safety, Health and Sanitations Provisions

The Contractor shall provide and maintain in a neat, sanitary condition such accommodations for the use of his employees as may be necessary to comply with the requirements and regulations of the California State Department of Health or as specified by the Health Department, Sanitary Code.

The Contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions, on his own responsibility or as the Engineer may determine, reasonably necessary to protect the life and the health of employees on the job, the safety of the public and to protect property in connection with the performance of the work covered by the contract. Precaution shall be exercised by the Contractor at all times for the protection of persons (including employees) and property. The Contractor shall comply with the provisions of all applicable laws, pertaining to such protection including all Federal and State occupational safety and health acts, and standards and regulations promulgated there under.

1100.6 Public Convenience and Safety

The Contractor shall at all times conduct his work as to assure the least possible obstruction to traffic and adjacent residents. The safety, convenience, and the protection of persons and property, of the general public and residents along the street, highway, and areas adjacent to the work area shall be provided for by the Contractor.

1100.6.1 Contractor's Yard: If the Contractor or his subcontractor utilizes property outside the limits of the project in the performance of the contract, the Contractor/subcontractor shall comply with the following:

1100.6.1.2 Contractor’s Yard when the District is the Contracting Party:

- **(A)** Prior to occupying the property, the Contractor shall provide written notification as to the number and location of all properties to be used. The notification shall specify in detail how the Contractor proposes to use each property and how he proposes to comply with (B) through (D) below. Also, the Contractor shall provide a statement, signed by the property owner(s), which gives the Contractor permission to use the property.
- **(B)** The property(s) shall be adequately maintained to control dust, mud, trash and other pollutants from leaving the property.
- **(C)** Work on the property(s) shall be scheduled so as to comply with the Agency Noise Ordinance.

(D) Use of the property(s) such as location of stored materials, service of equipment, etc., shall be conducted to minimize impact on adjacent properties.

(E) The Contractor shall leave the property in a condition, as determined by the Property Owner, equivalent to that which existed prior to entry. In no case shall any use cause, or allow to remain, any negative impact to adjoining properties or right-of-way unless such impact existed prior to the Contractors' use.

(F) The Contractor shall obtain a written release signed and dated from each property owner after completion of use. Each release shall state that, at the time of signing, the owner accepts the property in its present condition from the Contractor and relieves the Contractor and the District from any or all claims for the use or damage to said property. A copy of each release shall be submitted to the Engineer.

(G) These standards also apply to all levels of subcontractors who will need to obtain marshaling yards for the project, which will be separate from that of the Contractor. It will be the responsibility of the Contractor to obtain copies of the various documents from the subcontractors, as required above, and provide them to the Engineer.

110.6.1.3 Contractor's Yard when the District is not the Contracting Party (private development, utility work, subdivision construction, etc.): All conditions will apply except that the permit holder will be responsible for obtaining all documents. The permit holder will retain the documents and make them available to the District upon request.

1100.6.2 Construction Noise: The Contractor shall comply with the District concerning work hours and noise level during construction.

1100.7 Barricades and Warning Signs

The Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs and other traffic control devices, and shall take all necessary precautions for the protection of the work and safety of the public in accordance with the local road jurisdictional agency approved plan, in addition to any directions by said street/highway governing agencies to the Contractor to correct and/or adjust the placed traffic control items.

1100.8 Protection and Restoration of Property and Landscaping

The Contractor shall be responsible for the preservation of all public and private property and shall protect carefully from disturbance or damage all land monuments and property marks until the Engineer has witnessed or otherwise referenced their location and shall not move them until directed.

The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any act, omission, neglect, or misconduct in his manner or method of executing the work, or at any time due to defective work or materials, and said responsibility will not be released until the project shall have been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by

or on account of any act, omission, neglect, or misconduct in the execution of the work, or in consequence of the non-execution thereof by the Contractor, he shall restore, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring as may be directed, or he shall make good such damage or injury in an acceptable manner. Such damage will include but not be limited to landscaped areas. The contractor shall re-grade the disturbed area as directed and restore the surface material to match existing in type and quality.

When construction is within temporary construction easements, the Contractor shall restore all disturbed areas to a condition equal to or better than the existing improvements. Such restoration will include but not be limited to asphalt, walkways, fences, lights, sprinklers, landscaping, etc. In the case of landscaping, the Contractor may remove and store sod and plant material. If, in the determination of the Engineer, the sod and/or plant material did not survive the transplanting in good condition, the Contractor shall replace the sod and/or plant material to match in type and quality. Also, the Contractor may salvage any sprinkler system materials, lighting materials, etc. In the event that it is not feasible to reinstall the salvaged material, new material shall be installed.

The Contractor shall not dump spoil or waste material on private property without first obtaining from the owner written permission for such dumping. All such dumping shall be in strict conformance with the Grading and Drainage Ordinance of the local road jurisdictional agency.

Access to private property shall be maintained to keep any inconvenience to the property owner to a minimum. Prior to any construction in front of driveways the Contractor shall notify the property owner 24 hours in advance. Inconvenience caused by construction across driveways and sidewalks shall be kept to a minimum by restoring the serviceability as soon as possible. If it is necessary to leave open excavation for a long period of time, the Contractor shall provide structurally adequate steel plates to bridge the excavation.

1100.9 Contractor's Responsibility for Work

The Contractor shall properly guard, protect, and take every precaution necessary against injury or damage to all finished or partially finished work, by the action of the elements or from any other cause until the entire project is completed and accepted by the Engineer. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work before final acceptance.

In case of suspension of the work for any cause whatever, the Contractor shall be responsible for the project and shall take such precautions as may be necessary to prevent damage to the project and shall erect any necessary temporary structures, signs, or other facilities.

1100.10 Contractor's Responsibility for Utility Property and Services

At points where the Contractor's operations are adjacent to properties of utility firms or other property, damage to which might result in considerable expense, loss, or inconvenience, work shall not commence until all arrangements necessary for the protection thereof have been made.

The Contractor shall cooperate with the owners of any underground or overhead utilities in their removal and rearrangement operations in order that these operations may progress in a reasonable manner, that duplication of work may be reduced to a minimum, and that services rendered by those parties will not be unnecessarily interrupted.

If any utility service is interrupted as a result of accidental breakage, the Contractor shall promptly notify the proper authority and shall cooperate with the said authority in the restoration of service. No work shall be undertaken around fire hydrants until provisions for continued service have been approved by the local fire authority.

The Contractor shall expose all underground utilities and structures which might interfere with the construction of the project, in order to permit survey location prior to construction.

The Contractor shall assume full responsibility for damages to any underground facility/utility as a result of failing to obtain information as to its location, failing to excavate in a careful, prudent manner or failing to take measures for protection of the facilities/utilities. The Contractor is liable to the owner of the underground facility/utility for the total cost of the repair.

1100.11 Personal Liability of Public Officials
In carrying out any provisions of these specifications, or in exercising any power or authority granted to them by or within the scope of the contact, there shall be no liability upon the District, Engineer, or their authorized representatives, either personally or as officials of the District, it being understood that in all such matters they act solely as agents and representatives of the District.

1100.12 No Waiver of Legal Rights
Upon completion of the work, the District will expeditiously make final inspection and notify the Contractor of acceptance. Such final acceptance, however, shall not preclude or stop the District from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the District be precluded or stopped from recovering from the Contractor or his surety, or both, such overpayment as it may sustain, or by failure on the part of the Contractor to fulfill his obligations under the contract. A waiver on the part of the District of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor, without prejudice to the terms of the contract and in addition to any specific remedy provided the District in the contract documents, shall be liable to the District for latent defects, fraud or such gross mistakes as may amount to fraud, or as regards the District's rights under any warranty or guaranty or remedy.

END OF SECTION

SECTION 1200 – TESTING

Sanitary sewers and pipe lines shall be subject to acceptance testing after backfilling has been completed but prior to the placement of the finished surface material.

The Contractor shall provide proper ventilation of sewer lines and manholes during any test or inspection procedure. The Contractor shall be responsible for providing all equipment and personnel necessary to comply with OSHA confined space regulations.

All testing and acceptance shall conform to the current edition of the "Greenbook" and shall meet or exceed all applicable ASTM Standards, unless otherwise specifically approved by the District and the Engineer.

Gravity Sewer Pipe Leakage Testing: If there is no ground water above the top of the pipe the sewer line shall be low pressure air tested. Each test shall be performed as follows:

Low Pressure Air Test: Testing will be accomplished by the means of "Low Pressure Air Testing." Tests may be conducted by the Contractor or an independent testing firm. However, acceptance tests shall be made only in the presence of a staff member of the District or a legitimate representative appointed by the District. For mainline pipeline air pressure testing shall conform to Section 306-1.4.4 and for sewer laterals the air testing shall conform to Section 500-4.4.4 of the "Greenbook".

1200.1 TESTING PROCEDURES

1200.1.1 Air Pressure Test: Air pressure testing shall conform to Section 306-1.4.4 for mainline pipe and Section 500-4.4.4 for laterals of the "Greenbook" and the following provisions.

(1) Before testing, the pipe shall be thoroughly cleaned.
(2) The Contractor shall seal off the section of pipe to be tested at each manhole connection. Test plugs must be securely braced within the manholes.
(3) A minimum of two connecting hoses to link the air inlet test plug with an above ground test monitoring panel must be provided.
    (a) One hose is to induce air through the test plug and into the test chamber.
    (b) The second hose is for the purpose of monitoring the test pressure from within the enclosed pipe.
(4) UNDER NO CIRCUMSTANCES ARE WORKERS TO BE ALLOWED IN THE CONNECTING MANHOLES WHILE A PRESSURE TEST IS BEING CONDUCTED.
(5) Appropriate repairs must then be completed and the line retested for acceptance.

1200.1.2 Deflection Test for PVC Pipe

The Contractor shall perform a deflection test on the system as directed by the Engineer. Any part of the installation which shows deflection in excess of maximum percentage allowed for

each specific pipe per “Greenbook” Section 306-1.2.12 for PVC pipe, shall be corrected.

The Contractor shall verify the new pipe after installation for ovality and deflection using a mandrel specifically sized, shaped, and designed to physically stop at any ovality or deflection that exceeds design tolerance. Acceptance tests shall be made only in the presence of the Engineer or a legitimate representative appointed by the Engineer.

Following completion of backfill, the pipe shall be tested for deflection with a mandrel sized as defined in Section 306-1.2.12.2 of the ”Greenbook”. The mandrel shall be pulled through each section of pipe from manhole to manhole. The mandrel must slide freely through the pipe with only a nominal hand force applied. No mechanical device shall be used in pulling the mandrel. Any pipe which refuses the mandrel shall be removed and replaced or re-rounded and the bedding shall be properly constructed as specified to prevent excessive deflection. Such sections shall be re-tested for deflection after completion of backfill.

Mandrel shall be stamped or engraved on a segment other than the runner, with the pipe material specification, nominal size, and mandrel OD (e.g. PVC D3034-200mm; ABS Composite D2680-250mm-243.43mm; PVC D3034-8”-7.366”; Composite D2680”-9.584”).

1200.1.3 Closed Circuit Video Inspection
This section covers the furnishing of all materials and equipment and performing all operations necessary to produce a video recording of the closed circuit television inspection for sewer mains and for lateral connections on new and existing sewer mains.

Equipment. Camera equipment shall include the camera, monitor, cables, power source, lights and other equipment necessary to the videoing operation. The camera, monitor and other components of the video system shall be capable of producing a minimum 350 line resolution color video picture.

Video Camera. The camera shall be specifically designed and constructed for operation in connection with sewer inspection. The camera shall be operative in one hundred percent (100%) humidity conditions and shall be capable of viewing ninety percent (90%) to the axis to be inspected so that service connections can be properly inspected.

Lighting. Lighting for camera shall minimize reflective glare. Camera and lighting quality shall be suitable to provide a clear, continuously in-focus picture of the entire inside periphery of the sewer pipe for all conditions encountered during the work.

Remote Footage Counter. The remote footage counter shall be accurate to two-tenths of a foot (0.2') over the length of the particular section being inspected and shall be mounted over the monitor.

Video. The video shall be high quality color and recorded in HD. Any out of focus video recordings, or portions thereof, shall be cause for rejection of the video recording and will

necessitate re-videoing.

General Requirements. All Closed Circuit Video Inspection of sewer line shall be performed by a NASCO certified operator in PACP format. A District Inspector or designated person shall be present during the entire televised inspection process. After recording, the Contractor shall turn over the original video to the inspector. The lines shall be videoed after completion of trench backfill, mandreling, air testing and cleaning, but prior to placement of pavement and acceptance of the job, unless otherwise approved by the District. The Contractor shall have the line videoed a second time no earlier than sixty (60) days but no later than thirty (30) days prior to the expiration of the maintenance bond. The television camera shall be equipped with a measuring device so that the depth of any sag can be accurately determined. All videoing shall be recorded in color with audio explanations and a written log.

The grade of all gravity sewers shall be within +/- .02 feet of the elevations and grades shown on the plans with the provision that in no event shall a gravity sewer be allowed to have a sag or standing water greater than .05 feet. Defects including, but not limited to, sags as outline above, leaks, breaks, excessive pipe deflection, debris, etc., shall be promptly corrected by the Contractor at no expense to the District. After corrections of the defect or defects found by the television inspection the corrections shall be re-televised at the Contractor's expense.

The Contractor shall be responsible for the preparation of the sewer before televising. If the flow is such that bypassing of the sewage is required, the contractor shall make appropriate arrangements with the District to bypass the sewage flow. The Contractor shall perform the bypass operation or secure a Subcontractor to perform the bypass operation under District supervision.

Execution. Videoing shall be done one section at a time: each section isolated from the remainder of the sewer line as required. Sufficient water shall be supplied to cause drainage within the isolated section and observed flowing through the downstream manhole prior to televising.

The camera shall be moved through the line in either direction at a uniform rate, stopping when necessary to ensure proper documentation of the condition of the sewer line but in no case shall the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, video cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer line conditions shall be used to move the camera through the sewer line. If, during the televising operations, the television camera will not pass through an entire manhole section, the Contractor shall re-set his equipment in a manner so that the inspection can continue opposite the obstruction. If the Video camera encounters an obstruction within a section not accessible to a manhole, the Contractor shall remove the obstruction by excavation or other appropriate means, replace whatever pipe is necessary, and re-televise the entire section.

Whenever non-remote powered and controlled winches are used to pull the television camera

through the line, telephones, radios, or other suitable means of communication shall be set up between the two (2) manholes of the section being inspected to ensure that adequate communications exist between members of the crew. The importance of accurate distance measurements is emphasized. Measurement for location of defects shall be above ground by means of a meter device. Marking on the cable, or the like, which would require interpolation for depth of manhole, will not be acceptable.

The accuracy of the measurement meters shall be checked daily be use of a walking meter, roll-a-tape, or other suitable device. Footage measurements shall begin at the center line of the upstream manhole, unless permission is given to do otherwise. Footage shall be shown on the video data view at all times.

Documentation - Audio and written documentation shall accompany all video recordings.

Labels - The DVD and the DVD container shall have printed labels containing the report number, tape number, date of video inspection, location, upstream and downstream manhole or station numbers.

Audio - The audio portion of the tape shall include date of inspection, description of the pipe size, type and pipe joint length, upstream and downstream manhole or station numbers, description and location of each defect, including cracked pipe, protruding service taps, off-set joints, collapsed sections, presence of scale, corrosion and roots.

Written Documentation - A written report is required which shall include date of inspection, tape number, location, size type and length of pipe, direction of flow, beginning and end tape counter numbers, sketch showing street and cross streets where the TV inspection was made, description and location of each defect, such as misalignment, offset joints, protruding service connections, cracked pipe, and split pipe.

END OF SECTION

VALLEY SANITARY DISTRICT
MINUTES OF REGULAR BOARD MEETING
June 28, 2016

A regular Board Meeting of the Governing Board of Valley Sanitary District (VSD) was held at the District offices, 45-500 Van Buren Street, Indio, California, on Tuesday, June 28, 2016.

CALL TO ORDER, ROLL CALL

1. PRESIDENT YORK called the meeting to order at 1:01 p.m. Those in attendance were as follows:

DIRECTORS PRESENT:	Douglas A. York, Mike Duran, Merritt Wiseman, William Teague, and Eric Davenport
DIRECTORS ABSENT:	None
STAFF PRESENT:	Joseph Glowitz, General Manager, Holly Gould, Ron Buchwald, Nicholas Castaneda and Andy Boyd
GUESTS:	Dr. Bruce Underwood, Healthy Futures

CONSENT ITEMS

a. Consideration of the June 14, 2016 Regular Board Meeting Minutes

b. Approval of Summary of Cash & Investments for May 2016

c. Approval of Expenditures for June 9, 2016 to June 22, 2016

Check numbers 33989 to 34032 totaling $118,937.66 and a transfer of $515,228.66 were issued, as well as $84,817.34 in payroll transfers.

ACTION TAKEN:
MOTION: DIRECTOR TEAGUE made a motion to approve the minutes for the Regular Board Meeting held June 14, 2016, to approve the Summary of Cash & Investments for May 2016 and to pay the disbursement items as presented. DIRECTOR DURAN seconded the motion. Motion carried by the following vote: 5 yes

MINUTE ORDER NO. 2016-2560

PUBLIC COMMENTS

Dr. Bruce Underwood of Healthy Futures presented an overview of the District's Wellness Program. He gave an update of the program's attendance from what was stated to the Board at the last board meeting.

EMPLOYEE RECOGNITION

2. Presentation of Employee Anniversary Pin
   - Andy Boyd – 7 years
   - Nicholas Castaneda – 2 years

The Board presented Andy and Nicholas with their anniversary pins and thanked them for their contribution and years of service to the District.

NON-HEARING ITEMS

3. Adopt the 2016 Valley Sanitary District's Development Design Manual

---

Staff has been working with a consultant to develop an update to the District's Development Standards and Specifications that stipulates how developers design and construct sewer systems for the District.

ACTION TAKEN:
MOTION: DIRECTOR TEAGUE made a motion to adopt the 2016 Valley Sanitary District's Development Design Manual. DIRECTOR DURAN seconded the motion. Motion carried by the following roll call vote:

AYES:	Director(s) Davenport, Duran, Teague, Wiseman, York
NOES:	None
ABSENT:	None
ABSTAIN:	None

MINUTE ORDER NO. 2016-2561

4. Solar PV Project – Electrical Engineering & Inspection Services

---

The Solar PV project is owned and operated by Solar City. However, since the solar project will be connected to the Imperial Irrigation District's transformer and grid, electrical plan review and inspection will be required. MWH is currently performing construction management services for the District on the Requa Interceptor Project. MWH has personnel who can perform the required electrical engineering and inspection services. MWH provided a proposal to perform this work for a not to exceed cost of $16,840.

ACTION TAKEN:
MOTION: DIRECTOR WISEMAN made a motion to authorize the General Manager to enter into a professional services agreement with MWH Global, Inc., (MWH) for a not to exceed fee of $16,840 for electrical engineering and inspection services. DIRECTOR DAVENPORT seconded the motion. Motion carried by the following roll call vote:

AYES:	Director(s) Davenport, Duran, Teague, Wiseman, York
NOES:	None
ABSENT:	None
ABSTAIN:	None

MINUTE ORDER NO. 2016-2562

5. Requa Interceptor Project Report Number 1

The Requa Interceptor project is just getting started. Potholing for utility conflicts has begun. Survey staking has been completed. The baseline construction schedule has been submitted and accepted. Actual excavation work is set to begin during the week of July 18, 2016, pending pipe material arrival, City traffic control approval, and other coordination work. Staff continues to meet with project stakeholders. A preconstruction meeting was held on June 15, 2016 to discuss the project with utility companies, City of Indio staff, and other project stakeholders. Staff plans to attend two upcoming Town Hall meetings on June 30, 2016 at the Boys and Girls Club and July 21, 2016 at the Senior Center, both at 6 PM. Staff did a presentation for the City Council and was well received. VSD staff has negotiated a change order to account for the delay in releasing the Notice to Proceed, as well as adding a four day delay to account for the new concert series the first two weekends in October. DCI, Inc. submitted a progress payment request for work completed to date.

ACTION TAKEN:

MOTION: DIRECTOR DURAN made a motion to approve Change Order No. 1 and approve a progress payment to DCI, Inc. for $422,594.51 and $46,954.95 to be placed in a retention account. DIRECTOR TEAGUE seconded the motion. Motion carried by the following roll call vote:

AYES: Director(s) Davenport, Duran, Teague, Wiseman, York
NOES: None
ABSENT: None
ABSTAIN: None

MINUTE ORDER NO. 2016-2563

6. Front Wall & Entrance Improvement Project Report Number 5

The Front Wall and Entrance Improvement Project is complete as of this progress payment, excluding a portion of the work listed in Change Order No.5 (extending the wrought iron fence northerly to the north property line). The Contractor has made all the corrections to deficient work found during the final job walk inspection. The remaining 135 lineal feet of wrought iron fence will be installed after the completion of the Solar Project and the portion of the Requa alignment on the north end of District's property. This work is estimated to be installed in September 2016. Change Order No. 6 to add a timer on the southerly gate is recommended for approval.

ACTION TAKEN:

MOTION: DIRECTOR DAVENPORT made a motion to approve Change Order No. 6 and approve a progress payment to RDP/SCI, Inc. for $84,097.61 and $4,426.19 to be placed in a retention payable account. DIRECTOR DURAN seconded the motion. Motion carried by the following roll call vote:

AYES: Director(s) Davenport, Duran, Teague, Wiseman, York
NOES: None
ABSENT: None
ABSTAIN: None

MINUTE ORDER NO. 2016-2564

7. California Special Districts Association (CSDA) 2016 Board Elections

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It was the consensus of the Board to elect Bill Nelson for the CSDA Board of Directors Southern Network; Seat B.

ACTION TAKEN:
MOTION: DIRECTOR TEAGUE made a motion to elect Bill Nelson for the CSDA Board of Directors Southern Network; Seat B. DIRECTOR WISEMAN seconded the motion. Motion carried by the following roll call vote:

AYES: Director(s) Davenport, Duran, Teague, Wiseman, York
NOES: None
ABSENT: None
ABSTAIN: None

MINUTE ORDER NO. 2016-2565

8. Local Agency Formation Commission (LAFCO) 2016 Elections

It was the consensus of the Board to elect Nancy Wright as Regular Special District Member and Robert Stockton as Alternate Special District Member for the Local Agency Formation Commission.

ACTION TAKEN:
MOTION: DIRECTOR TEAGUE made a motion to elect Nancy Wright as Regular Special District Member and Robert Stockton as Alternate Special District Member of the Local Agency Formation Commission. DIRECTOR DAVENPORT seconded the motion. Motion carried by the following roll call vote:

AYES: Director(s) Davenport, Duran, Teague, Wiseman, York
NOES: None
ABSENT: None
ABSTAIN: None

MINUTE ORDER NO. 2016-2566

9. General Manager's Report

The generator from recently demolished TFP Building has been sold as surplus. The old house has been painted to match the rest of the buildings on site. Interviews for the Maintenance Supervisor position are underway. The new Associate Engineers will start on July 11, 2016. Two of the ponds at the Wetlands have been drained. Nests are clear.

DIRECTORS' ITEMS
Directors' items not listed are for discussion only; no action will be taken without an urgency vote pursuant to State law.

INFORMATIONAL ITEMS
The Board received and acknowledged the copy of the Combined Monthly Account Summary for expenses incurred by the District in May 2016.

ADJOURNMENT

There being no further business to discuss, the meeting was adjourned at 1:45 p.m., and the next Regular Board Meeting will be held July 12, 2016.

Respectfully submitted,

Joseph Glowitz, General Manager
Valley Sanitary District

VALLEY SANITARY DISTRICT
MINUTES OF REGULAR BOARD MEETING
September 27, 2022

A regular Board Meeting of the Governing Board of Valley Sanitary District (VSD) was held on Tuesday, September 27, 2022, at 45-500 Van Buren St., Indio, CA 92201.

1. CALL TO ORDER

President Sear called the meeting to order at 1:00 p.m.

1.1 Roll Call

Directors Present:
Debra Canero, Dennis Coleman, Mike Duran, Scott Sear, William Teague

Staff Present:
Beverli Marshall, Holly Gould, Jeanette Juarez, Ron Buchwald, Anna Bell, Ivan Monroy, Tino Tijerina, Daniel Mills, Bob Hargreaves and Joseph Sanchez, Best Best & Krieger

1.2 Pledge of Allegiance

2. PUBLIC COMMENT

Please notify the Secretary in advance of the meeting if you wish to speak on a non-hearing item or any item not appearing on the agenda.

None.

3. CONSENT CALENDAR

3.1 Approve Minutes for September 13, 2022, Regular Meeting

3.2 Approve Warrants for September 8 through September 21, 2022

3.3 Monthly Financial Report for August 30, 2022

3.4 Receive and File Credit Card Report for August 30, 2022

3.5 Authorize Tuition Reimbursement for Beverli A. Marshall, General Manager, Per District Policy, for $1,000

ACTION TAKEN:
MOTION: Director Teague motioned to approve the consent calendar as presented. Director Duran seconded the motion. Motion carried by the following roll call vote:
AYES: Canero, Coleman, Duran, Sear, Teague
NOES: None
MINUTE ORDER NO. 2022-3230

4. PUBLIC HEARING

4.1 Adopt Ordinance No. 2022-121 Amending Sewer Construction and Use Ordinance and Rescind Ordinance No. 2010-118

President Sear asked Ms. Marshall to summarize the actions leading up to the Public Hearing. Ms. Marshall stated that pursuant to Government Code Section 6062a, a notice of the Public Hearing was published in the Desert Sun newspaper on September 15, 2022, and September 21, 2022. President Sear read the procedures to be followed during the hearing and asked Ms. Marshall to summarize any written communications regarding the proposed Sewer Construction and Use Ordinance 2022-121. Ms. Marshall informed the Board that no written communication had been received. President Sear declared the Public Hearing open at 1:05 p.m. and asked Ms. Marshall to give a brief staff report followed by any public testimony. Being no comments from the public, President Sear declared the Public Hearing closed at 1:07 p.m. Staff reported that the amended ordinance completed the 45-day review with the Regional Board with no comment.

"AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE VALLEY SANITARY DISTRICT AMENDING THE SEWER CONSTRUCTION AND USE ORDINANCE"

ACTION TAKEN:
MOTION: Director Duran motioned to approve the amended Sewer Construction and Use Ordinance 2022-121. Vice President Canero seconded the motion. Motion carried by the following roll call vote:
AYES: Canero, Coleman, Duran, Sear, Teague
NOES: None
ORDINANCE NO. 2022-121

5. NON-HEARING ITEMS

5.1 Adopt Resolution No. 2022-1170 Amending and Updating the Maximum Concentration Limits for Wastewater Discharges

---

In accordance with the Sewer Construction and Use Ordinance updates, a discharge limits study was conducted using the Environmental Protection Agency (EPA) July 2004 Local Limits Development Guidance Document. The study identified 15 Pollutants of Concern (POC) based on EPA's "National" constituents list. The current limits were found to be sufficiently protective. Changes to the local limits

were administrative updates, including formatting, consistent with significant figures and language. Resolution 2022-1170 updates the reference to Ordinance No. 2022-121 and reflects the updated NPDES Order No. R7-2020-0007.

"A RESOLUTION OF THE BOARD OF DIRECTORS OF VALLEY SANITARY DISTRICT ESTABLISHING MAXIMUM CONCENTRATION LIMITS FOR WASTEWATER DISCHARGES TO THE VALLEY SANITARY DISTRICT WASTEWATER RECLAMATION FACILITY"

ACTION TAKEN:

MOTION: Director Teague motioned to adopt Resolution No. 2022-1170, Establishing Maximum Concentration Limits for Wastewater Discharges to the Valley Sanitary District Wastewater Reclamation Facility. Director Duran seconded the motion. Motion carried by the following roll call vote:
AYES: Canero, Coleman, Duran, Sear, Teague
NOES: None
RESOLUTION NO. 2022-1170

5.2 Authorize the General Manager to Issue a Purchase Order for Fuel Tank Repairs in an Amount Not to Exceed $182,321.06

In August 2022, staff submitted a proposal (RFP) for a fuel management system for two onsite fueling stations and a replacement 1000-gallon diesel fuel tank. The RFP closed on August 31, 2022, with no responses. The District's current diesel fuel tank is a 32-year-old single-wall styled tank on stilts. It is recommended to replace the tank with a ConVault tank, similar to the districts existing unleaded fuel tank, to have parts and equipment compatible for both tanks. Implementing a fuel management system that will allow VSD to monitor costs, usage better, and quantity of fuel is also recommended. Due to no bids being received from the RFP, Orange Coast Petroleum, Inc. provided staff with a proposal for an amount not to exceed $182,321.06.

ACTION TAKEN:

MOTION: Director Duran motioned to authorize the purchase of a replacement diesel tank and fuel management system from Orange Coast Petroleum Equipment, Inc. for an amount not to exceed $182,321.06. Vice President Canero seconded the motion. Motion carried by the following roll call vote:
AYES: Canero, Coleman, Duran, Sear, Teague
NOES: None
MINUTE ORDER NO. 2022-3231

5.3 Authorize the General Manager to Execute a Contract with Trimax to Replace Plant Blower System Master Control Panel and Three Local Control Panel Programmable Logic Controllers (PLC) in an Amount Not to Exceed $86,110

The Blower System, installed in 2006, has had some components replaced due to failure. Due to supply chain issues and electronics shortages, these replacement parts have an extended delivery time. Staff has identified that the Master Control Panel and three Local Control Panel equipment need to be upgraded for operational continuity. Trimax is the sole SCADA integrator for the District. Staff recommends upgrading all blower system electronic equipment related to the PLC and SCADA system in an amount not to exceed $86,110.

ACTION TAKEN:

MOTION: Vice President Canero motioned to authorize the General Manager to execute a contract with Trimax to upgrade all blower system electronic equipment related to the PLC and SCADA system in an amount not to exceed $86,110. Secretary/Treasurer Coleman seconded the motion. Motion carried by the following roll call vote:
AYES: Canero, Coleman, Duran, Sear, Teague
NOES: None
MINUTE ORDER NO. 2022-3232

5.4 Authorize the General Manager to Execute a Contract with Trimax to Replace Programmable logic Controller (PLC) Central Processing Unit and Input/Output Modules for PLC600 and PLC 460 in an Amount Not to Exceed $102,975

The PLC 600, located at the Hypochlorite Building, and PLC 460, located at the Pond Aeration Building, were installed in 2006. Some components have been replaced due to failure. Due to supply chain issues and electronics shortages, the replacement parts have an extended delivery time. Staff recommends replacing PLC 600 and PLC 460 for operational continuity. Trimax is the sole SCADA integrator for the District. Staff recommends executing a contract with Trimax to upgrade PLC 600 and PLC 460 relating to the network and SCADA system in an amount not to exceed $102,975.

ACTION TAKEN:

MOTION: Director Duran motioned to authorize the General Manager to execute a contract with Trimax to upgrade PLC 600 and PLC 460 relating to the network and SCADA system in an amount not to exceed $102,975. Director Teague seconded the motion. Motion carried by the following roll call vote:
AYES: Canero, Coleman, Duran, Sear, Teague
NOES: None
MINUTE ORDER NO. 2022-3233

5.5 Authorize the General Manager to Negotiate and Execute a Sewer Service Agreement Between the District and the Cabazon Band of Cahuilla Indians

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The original sewer service agreement between the Valley Sanitary District and the Cabazon Band of Mission Indians was executed on September 10, 1985, and expired on June 30, 1995. The District has continued to provide sewer service to the Tribe since then. The Tribe has subsequently changed its

name to the Cabazon Band of Cahuilla Indians. The District adopted a new rate structure and methodology as of July 1, 2021. As part of the new methodology, the calculation for all connections was changed from a flat rate to a combination of fixed and volumetric charges. The impact on the Tribe was notable, primarily due to the volumetric component of the rate calculation. The new agreement reflects the change in calculation methodology while providing for the District to modify the calculation methodology as needed during the term of the agreement. Staff has had numerous discussions with the Tribe about the volumetric calculation and has recommended that the Tribe install flow meters in the lateral connections to the District's system. The metered flow could then be used to calculate the volumetric flow for the rates instead of the current water meter data. If the Tribe installs flow meters, the District will use that information to calculate future service charges instead of the current water meter data.

ACTION TAKEN:

MOTION: Director Duran motioned to authorize the General Manager to negotiate and execute a sewer service agreement between the District and the Cabazon Band of Cahuilla Indians. Vice President Canero seconded the motion. Motion carried by the following roll call vote:
AYES: Canero, Coleman, Duran, Sear, Teague
NOES: None
MINUTE ORDER NO. 2022-3234

5.6 Approve Third Amendment to the Employment Agreement with Beverli A. Marshall, General Manager, Increasing the General Manager's Salary to Reflect the Cost-of-Living Adjustment Pursuant to Section 3 of the Agreement

---

On May 24, 2022, the Board adopted Resolution No. 2022-1163, which included a cost-of-living adjustment of 5% for all District employees effective July 1, 2022. The employment agreement with the General Manager includes language providing a cost-of-living adjustment that is the same as provided to all employees of the District. Per California Government Code § 54956(b), the Board cannot adjust the General Manager's salary, salary schedule, or benefits unless done at a regular meeting of the Board. In addition, California Government Code § 54953(c)(3) requires that an oral report summarizing the proposed action be made at the same meeting as the action taken. The language included in this third amendment reflects the new biweekly pay rate of $10,140, which is 5% higher than the General Manager's current pay rate of $9,657. The effective date of the amendment is July 1, 2022, to coincide with the COLA provided to all other District employees.

ACTION TAKEN:

MOTION: Director Teague motioned to approve the third amendment to the General Manager employment agreement, supporting a 5% cost-of-living increase effective July 1, 2022. Vice President Coleman seconded the motion. Motion carried by the following roll call vote:
AYES: Canero, Coleman, Sear, Teague
NOES: Duran

MINUTE ORDER NO. 2022-3235

5.7 Adopt Resolution No. 2022-1171 Amending the Valley Sanitary Wage Schedule Effective July 1, 2022, and Rescind Resolution No. 2022-1163

On May 24, 2022, the Board of Directors adopted Resolution 2022-1163 amending the VSD Bi-Weekly Wage Schedule to reflect a cost-of-living adjustment (COLA) of 5% and various special compensation and benefits for District employees effective July 1, 2022. The Employment Agreement between VSD and the General Manager includes a COLA that is the same as approved for employees. The amended Wage Schedule reflects this salary adjustment. In addition to amending the Wage Schedule, Resolution No. 2022-1171 officially changes the lateral certification incentive pay as determined by the Board at its August 30, 2022, meeting.

ACTION TAKEN:

MOTION: Director Teague motioned to adopt Resolution No. 2022-1171, amending the Bi-Weekly Wage Schedule effective July 1, 2022, and rescinding Resolution No. 2022-1163. Director Duran seconded the motion. Motion carried by the following roll call vote:
AYES: Canero, Coleman, Sear, Teague
NOES: Duran
RESOLUTION NO. 2022-1171

6. GENERAL MANAGER'S ITEMS

None.

7. COMMITTEE REPORTS

None.

8. DIRECTOR'S ITEMS

8.1 Verbal Report on Special District Leadership Academy in Napa,

President Sear and Vice President Canero commented on their attendance at the CSDA Special District Leadership Academy in Napa, CA. They both stated it was a great conference with many networking opportunities.

9. INFORMATIONAL ITEMS

None.

10. PUBLIC COMMENT

Please notify the Clerk of the Board in advance of the meeting if you wish to speak on an item to be discussed in Closed Session.

None.

President Sear called for a short recess at 1:54 p.m. The Board of Directors reconvened at 2:03 p.m. Roll call was taken, and all Directors were present.

11. CONVENE IN CLOSED SESSION

Items discussed in Closed Session comply with the Ralph M. Brown Act.

11.1 PUBLIC EMPLOYEE PERFORMANCE EVALUATION
Pursuant to Government Code Section 54957(b)(1)
Title: General Manager

The Board adjourned to Closed Session at 2:03 p.m.

12. CONVENE IN OPEN SESSION

Report out on Closed Session items

The Board reconvened in open session at 3:19 p.m. President Sear stated nothing to report.

13. ADJOURNMENT

There being no further business to discuss, the meeting adjourned at 3:20 p.m. The next regular Board meeting will be on October 11, 2022.

Respectfully submitted,

Holly Gould, Clerk of the Board
Valley Sanitary District

RESOLUTION NO. 2022-1170
A RESOLUTION OF THE BOARD OF DIRECTORS OF VALLEY SANITARY DISTRICT ESTABLISHING MAXIMUM CONCENTRATION LIMITS FOR WASTEWATER DISCHARGES TO THE VALLEY SANITARY DISTRICT WASTEWATER RECLAMATION FACILITY

WHEREAS, Order No. R7-2020-0007, NPDES Permit No. CA0104477 issued to Valley Sanitary District (referred to hereinafter as the District) by the State of California contain specific discharge limitations designed to prevent pass through and/or interference in accordance with all provisions of 40CFR403.5 and 403.6; and

WHEREAS, the District is required to establish technically based and legally defensible local discharge limits to prevent pass through and/or interference in accordance with 40CFR403.5 and 403.6; and

WHEREAS, the District intends to establish specific wastewater limitations through Resolution rather than by Ordinance to better facilitate anticipated revisions in the future; and

WHEREAS, the District adopted Ordinance No. 2022-121 which references local wastewater discharge limitations for commercial and industrial users by Resolution; and

NOW, THEREFORE BE IT RESOLVED that the Board of Directors of Valley Sanitary District of Riverside County does hereby adopt the following maximum concentration limits of industrial wastewater pollutants listed in the attached Table I, for the Valley Sanitary Wastewater Treatment Plant in accordance with Section 208 E of District Ordinance No. 2022-121, "Sewer Construction and Use Ordinance".

RESOLUTION NO. 2019-1114 is hereby rescinded.

PASSED, APPROVED, and **ADOPTED**, this 27th day of September 2022, by the following roll call vote:

AYES: Canero, Coleman, Duran, Sear, Teague
NAYES: None
ABSENT: None
ABSTAIN: None

Scott A. Sear, President

ATTEST:

Dennis Coleman, Secretary/Treasurer

TABLE 1

UNIFORM CONCENTRATION INDUSTRIAL USER EFFLUENT LIMITS[1]

POLLUTANT	LOCAL LIMIT Daily Max (mg/L)
Arsenic	4.0
Cadmium	0.4
Chromium	14.0
Copper	12.0
Lead	3.0
Mercury	0.1
Nickel	7.0
Silver	5.0
Zinc	15.0
Cyanide (Total)[3]	5.0
Cyanide (Amenable)[3]	1.0
Polychlorinated Biphenyls	0.01
Pesticides	0.01
Sulfide[4]	5.0
Oil & Grease[3]	400
Total Petroleum Hydrocarbons[3]	25.0

[1] User subject to Federal Categorical Pretreatment Standards shall meet the requirements of 40CFR Chapter I Subchapter N Parts 405-471 in addition to the standards set forth above.

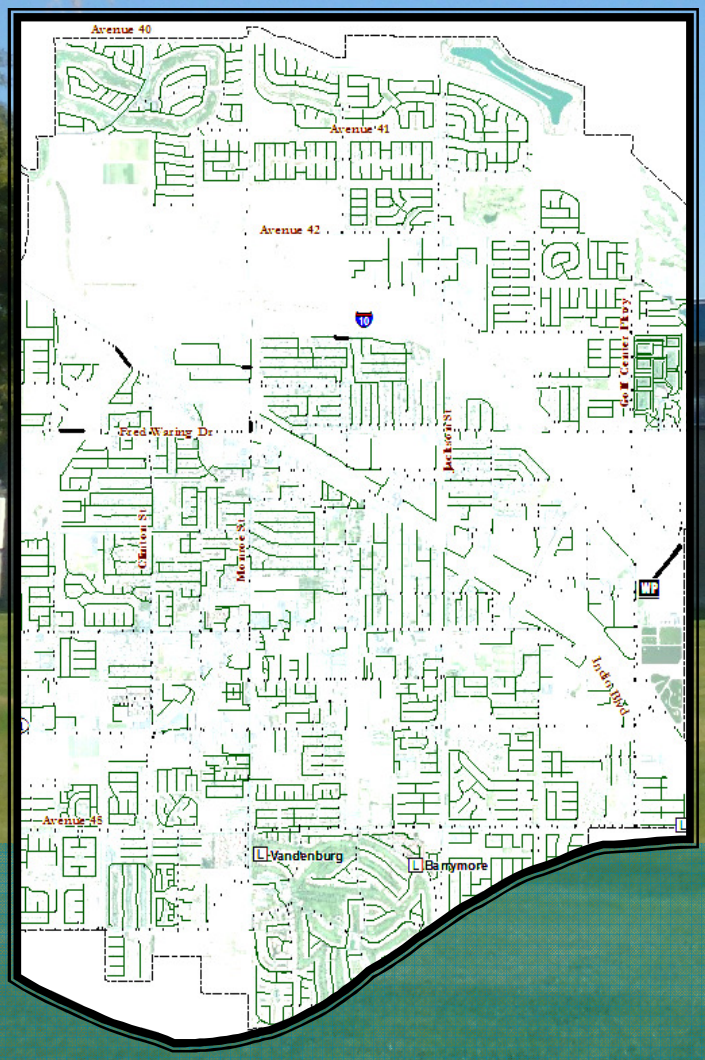
[2] Average daily maximum concentration shall be applied to a composite sample taken over the hours of industrial discharge. Values are subject to review during the permitting process to determine if high flow volumes from any user at the stated concentrations would cause pass-through of pollutants which is prohibited. In such cases, the General Manager may change the local limits to protect the facilities.

[3] A minimum of four grab samples collected at least 15 minutes apart. The average will be used to determine compliance with the concentration limit.

[4] A single grab sample will be used to determine compliance with the concentration limit.

Collection System Master Plan
Draft Report

Valley Sanitary District
Indio, Calif.



June 2013

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Section 1
Introduction

This section of the Collection System Master Plan (Master Plan) report for Valley Sanitary District (VSD) provides an overview of the Master Plan project. A brief description of the project background, the scope of work, and a description of the report organization follow, and a listing of abbreviations and definitions used in this report are included in this section.

1.1 AUTHORIZATION

This Master Plan has been developed under Task Authorization No. 1 between VSD and MWH Americas, Inc. (MWH) dated May 30, 2012. All work under this Task Order is governed by the provisions of the Master Services Agreement for Environmental Engineering and Planning Consulting Services between VSD and MWH, dated April 19, 2012.

1.2 PROJECT BACKGROUND

The VSD service area primarily consists of residential areas with moderate commercial, industrial, and public land use encompassing much of the City of Indio, portions of the City of La Quinta and City of Coachella, and unincorporated areas of the County of Riverside. VSD provides collection system services to a population of approximately 76,000. The original Sewer Master Plan was prepared in 2003 by Dudek & Associates, Inc. Since then, growth and infrastructure improvements to support growth within the VSD service area have demonstrated the need to update the previous Sewer Master Plan. The intent of the updated Master Plan is to assist VSD in planning for near-term and build-out development.

As part of the Master Plan, a sewer hydraulic model is developed to evaluate the collection system capacity for existing, near-term, as well as future flow conditions. A Capital Improvement Program (CIP) is developed based on hydraulically deficient pipes identified by the model. The purpose of the CIP is to help VSD identify the prioritized collection system infrastructure projects required to support the growth expected to occur within the VSD service area. It is recommended that VSD update this Master Plan every five years to account for changes in the growth pattern that could impact the sewer flows, which in turn could impact the infrastructure requirements.

1.3 OBJECTIVE AND SCOPE OF WORK

The key objectives of the Master Plan are to:

- Provide an update to the 2003 Sewer Master Plan
- Create and calibrate a computer-based hydraulic model
- Evaluate the existing sewer collection system
- Address system deficiencies for existing conditions, as well as build-out and 5-year (i.e., year 2018) interim conditions.

- Develop a phased capital improvement program with an emphasis on flow, age, and material deficiencies from the hydraulic model.

The scope of work for this Master Plan consists of the following tasks:

- Task 1: Provide Project Management, Communication and Meetings
- Task 2: Data Collection and Modeling Review
- Task 3: Hydraulic Sewer Model Development
- Task 4: Flow Monitoring and Sewer Model Calibration
- Task 5: Sewer Model Analysis
- Task 6: Sewer System Improvements
- Task 7: Collection System Master Plan Report

1.4 DATA SOURCES

In preparation of this Master Plan, VSD staff provided several reports, maps, electronic files, and other sources of information. In addition, material was obtained from outside sources, including the City of Indio, Riverside County, and the United States Census Bureau. Pertinent material included planning and development information, aerial photography, and sewer system GIS information. In addition, multiple meetings and extended interaction with VSD staff were conducted throughout the master planning process to obtain a thorough understanding of the District's information and needs.

Various reference documents including previous studies were used for the preparation of this report. A list of references is provided in **Appendix A**.

1.5 ACKNOWLEDGEMENTS

MWH wishes to acknowledge and thank all VSD staff for their support and assistance in completing this project. Special thanks to Joseph Glowitz (General Manager), Ron Buchwald (District Engineer), Mike Butvidas (Development Services Supervisor), and Steve Shepard (Collection System Supervisor).

1.6 PROJECT STAFF

The following MWH staff was principally involved in the preparation of this Collection System Master Plan:

Project Manager:	Alok Pandya, P.E., PMP
Project Engineer:	Jinny Huang, P.E.
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	Jackie Silber, GISP
Technical Review:	Raniah Ziadah, P.E.
	Ajit Bhamrah, P.E.

1.7 COLLECTION SYSTEM MASTER PLAN ORGANIZATION

This Master Plan is divided into seven sections, similar to the tasks performed in the scope of work. Section 2 provides a description of the VSD service area. Section 3 discusses the existing sewer system. Section 4 provides an overview of the development of the hydraulic model as well as a discussion on calibration. Section 5 describes the proposed collection system and the evaluation of the system using the hydraulic model. Section 6 presents the recommended improvements for the VSD collection system, and, Section 7 presents the Capital Improvement Program (CIP) along with anticipated costs.

1.8 ACRYONYMS AND ABBREVIATIONS

To conserve space and improve readability, abbreviations have been used in this report. Each abbreviation has been spelled out in the text the first time it is used. Subsequent usage of the term is usually identified by its abbreviation. The abbreviations used in this report are shown below.

F°	Degrees Farenheit
AM	Abandoned Manhole
AOC	Area of Concern
Ave.	Avenue
Blvd.	Boulevard
CIP	Capital Improvement Program
CVAG	Coachella Valley Association of Governments
CVWD	Coachella Valley Water District
Dr.	Drive
DS	Downstream
DSMAN	Downstream Manholes
EDU	Equivalent Dwelling Unit
EL	Elevation
ENR	Engineering News Record
EPA	Environmental Protection Agency
ESRI	Environmental Systems Research Institute, Inc.
d/D	Depth to diameter ratio
FM	Force Main
E.I.T.	Engineer-in-Training
ft.	Feet
GIS	Geographic Information System
GISP	Geographic Information Systems Professional
gpd	Gallons per Day
gpm	Gallons per Minute
hgl	Hydraulic Grade Line
hp	Horsepower
Hwy	Highway
ID	Identification
in.	Inch
INV	Invert

JCT	Junction
Master Plan	Collection System Master Plan
mgd	Million Gallons per Day
MH	Manhole
min	Minute
MSA	MSA Consultants, Inc.
MWH	MWH Inc.
NA	Not Applicable
NAD83	North American Datum of 1983
NAVD29	North American Vertical Datum of 1929
NAVD88	North American Vertical Datum of 1988
O&M	Operation and Maintenance
P.E.	Professional Engineer
PMP	Project Management Professional
PMP-#	Pump
PS	Pump Station
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance and Quality Control
Rd.	Road
sec	Second
SCAG	Southern California Association of Governments
sq. ft.	Square Feet
St.	Street
STN	Station
SWMM	Storm Water Management Model
TDH	Total Dynamic Head
TM	Technical Memorandum
U.S.	United States
USGS	United States Geological Survey
USMAN	Upstream Manhole
VCP	Vitrified Clay Pipe
VSD	Valley Sanitary District
WW	Wet Well
WWTP	Wastewater Treatment Plant

Section 2
Service Area Description and Population

This section describes the Valley Sanitary District's (VSD) existing service area. A discussion of population, land use, climate, and geography within the service area is presented in this section.

2.1 VALLEY SANITARY DISTRICT SERVICE AREA

VSD was formed in 1925 and primarily serves the city of Indio, California. The city of Indio encompasses approximately 96 percent of the VSD service area, while the remaining 4 percent is comprised of portions of the City of La Quinta and City of Coachella, as well as unincorporated land in Riverside County.

VSD operates and maintains 246 miles of sanitary sewer line, and delivers over 6 million gallons per day (gpd) of wastewater to its 11 million gallons per day (mgd) wastewater treatment plant (WWTP) on Van Buren Street and Enterprise Way. The City boundary and the sewer service area boundaries are shown in **Figure 2-1**.

2.2 EXISTING GEOGRAPHICAL DESCRIPTION

The size of the VSD service area is approximately 19.9 square miles. VSD sits mostly within the city of Indio which borders the cities of Coachella, Bermuda Dunes, and La Quinta. VSD sits at an average elevation of 18 feet (ft.) above sea level, with a high elevation of 142 ft. above sea level and a low elevation of 54 ft. below sea level. VSD and the City of Indio are bordered by three mountain ranges which contribute to its warm climate. VSD is approximately 20 miles from the city of Palm Springs, 15 miles from the Salton Sea, and 134 miles from the city of Los Angeles.

2.2.1 Climate

VSD is located in a desert region where temperatures typically range between 60 to 90 degrees Fahrenheit (°F) as shown in **Table 2-1**. The warmest month of the year is July with an average maximum temperature of about 107.3 (°F), while December is the coldest month of the year with an average minimum temperature of 44.2 (°F). VSD's climate is affected by its proximity to the three mountain ranges that surround the area, which keep temperatures warmer throughout the year. Humidity is relatively low during high temperatures.

Table 2-1 shows the average monthly temperatures in Indio, California. Annual precipitation data from the last ten years (i.e., 1993 to 2012) is presented in **Table 2-2**.

VSD experiences an average of approximately 2.9 inches of rainfall each year (based on annual precipitation data from 1912 to 2012). Precipitation is especially sparse between the months of April and July. The greatest rainfall occurs during the winter months. On average, January is the

wettest month of the year with an average rainfall of approximately 0.61 inches. Average monthly precipitation that occurs in the area is shown in **Table 2-1**. The annual amount of rainfall listed in **Table 2-2** is based from 20 years of data, whereas monthly averages in **Table 2-3** are based on 100 years of data (i.e., 1912 through 2012).

Table 2-1
Average Monthly Temperatures

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Max °F	71.9	75.3	81.3	87.5	95.7	103.1	107.3	106.6	102.0	91.9	79.6	71.0	**89.5**
Mean °F	58.3	61.6	68.1	74.1	81.7	88.6	93.8	93.4	88.0	77.8	65.7	57.6	**75.8**
Min °F	44.6	48.0	54.8	60.7	67.7	74.2	80.3	80.3	74.0	63.7	51.8	44.2	**62.1**

Source: National Oceanic and Atmospheric Administration National Data Center Climatological Normals Data Tables for Station USC00044259 (Indio Fire Station).

Table 2-2
Annual Precipitation

Year	Rainfall (inch)
1993	**6.40**
1994	**1.57**
1995	**4.39**
1996	**1.19**
1997	**1.64**
1998	**Non Detect**
1999	**1.11**
2000	**0.59**
2001	**1.04**
2002	**0.98**
2003	**1.63**
2004	**2.87**
2005	**1.15**
2006	**Non Detect**
2007	**Non Detect**
2008	**Non Detect**
2009	**1.12**
2010	**5.08**
2011	**1.48**
2012	**1.83**

Source: U.S. Historical Climatology Network, data from station 044259, INDIO FIRE STATION, California

Table 2-3
Average Monthly Precipitation

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Rainfall (in)	0.61	0.46	0.30	0.10	0.05	0.01	0.12	0.25	0.31	0.21	0.24	0.49

Source: U.S. Historical Climatology Network, data from station 044259, INDIO FIRE STATION, California. Based on data from 1912 to 2012.

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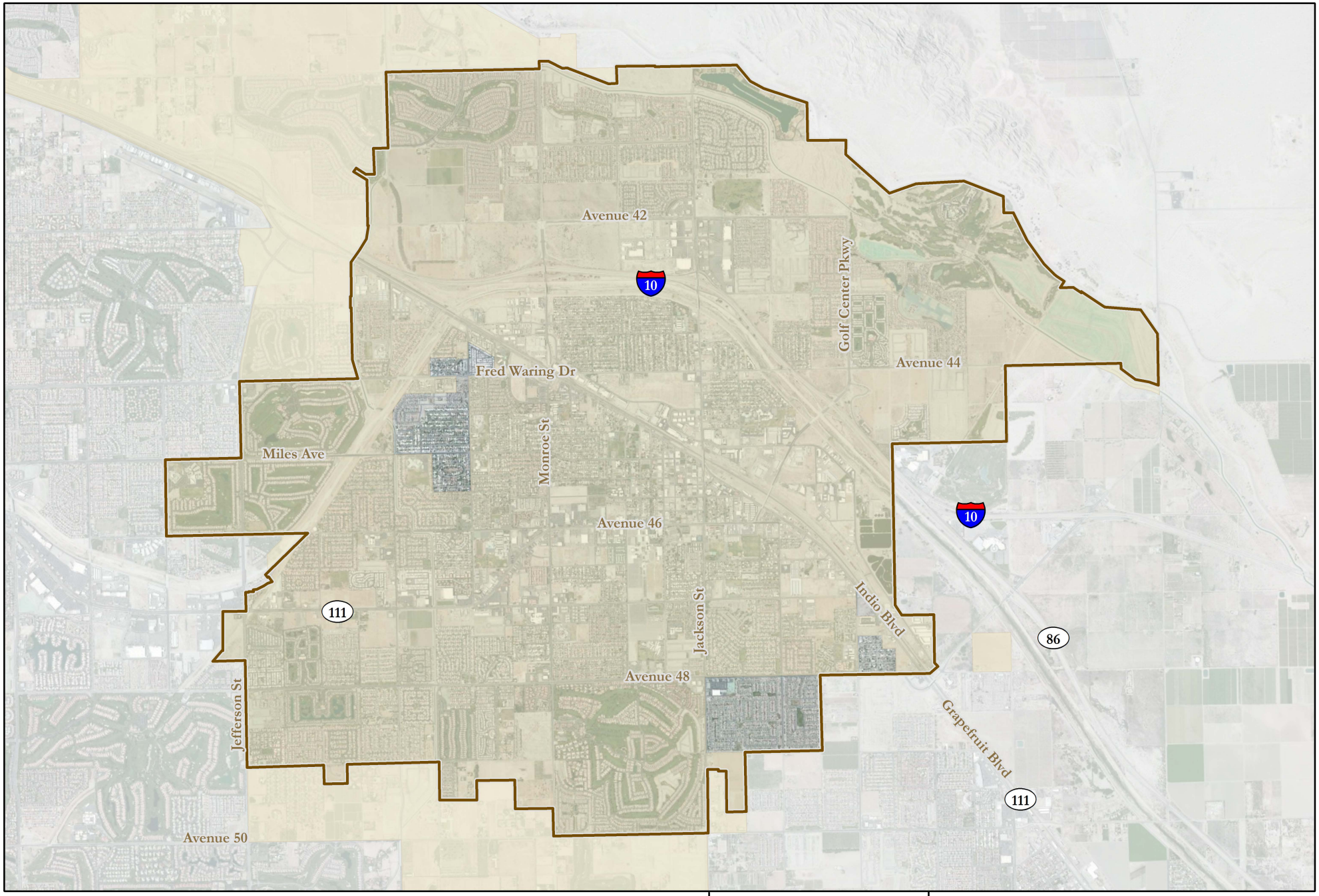

Key to Features

- Vally Sanitary District Boundary
- City of Indio

N

0 0.25 0.5 1 Miles

Document: \\Uspas1s01\muni\Clients\Valley San District\IDIQ As-Needed\Task 1 -Sewer System MP\14 Electronic Files - Modeling_MXDs\VSDBoundary.mxd

Date: June 14, 2013

District and City Boundary

Figure 2-1

MWH

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2.2.2 Existing Land Use

The City of Indio is largely open space which encompasses 52.5 percent of the land based on the zoning land-use Geographic Information System (GIS) information from the City of Indio. Zoning information is verified for this Collection System Master Plan (Master Plan) by overlaying the land use data with aerial imagery, and adjusting any areas within the City to the appropriate land use category. For areas where land use may not have been available from the City of Indio information, such as City of La Quinta or City of Coachella parcels, land use was assigned from aerial imagery. The original land use information provided by VSD contained 22 different categories, which are listed in **Figure 2-2**. MWH reviewed VSD's land use data and consolidated it into eight distinct categories: Commercial, Industrial, Mixed Use, Residential (high, medium, and low density), Open, and Public (a final category for vacant areas and septic was created, but it is assumed these area are not contained in the future land use categories). During calibration these categories were further subcategorized to reflect different regions in the model. This generalized land use for the existing system is mapped in **Figure 2-3**.

MWH reviewed existing land use information and observed inconsistencies between the land uses designated in the general plan and aerial images. Existing land use for the VSD area was refined to appropriately match one of the land use categories developed during the calibration process.

Based on the land use, about 19.2 percent of the VSD service area is residential low (i.e., low-density residential), 8 percent is residential medium (i.e., medium-density residential such as townhomes, multi-family homes, condominiums, mobile homes), and 7.7 percent is residential high (i.e., high-density residential such as apartment buildings).

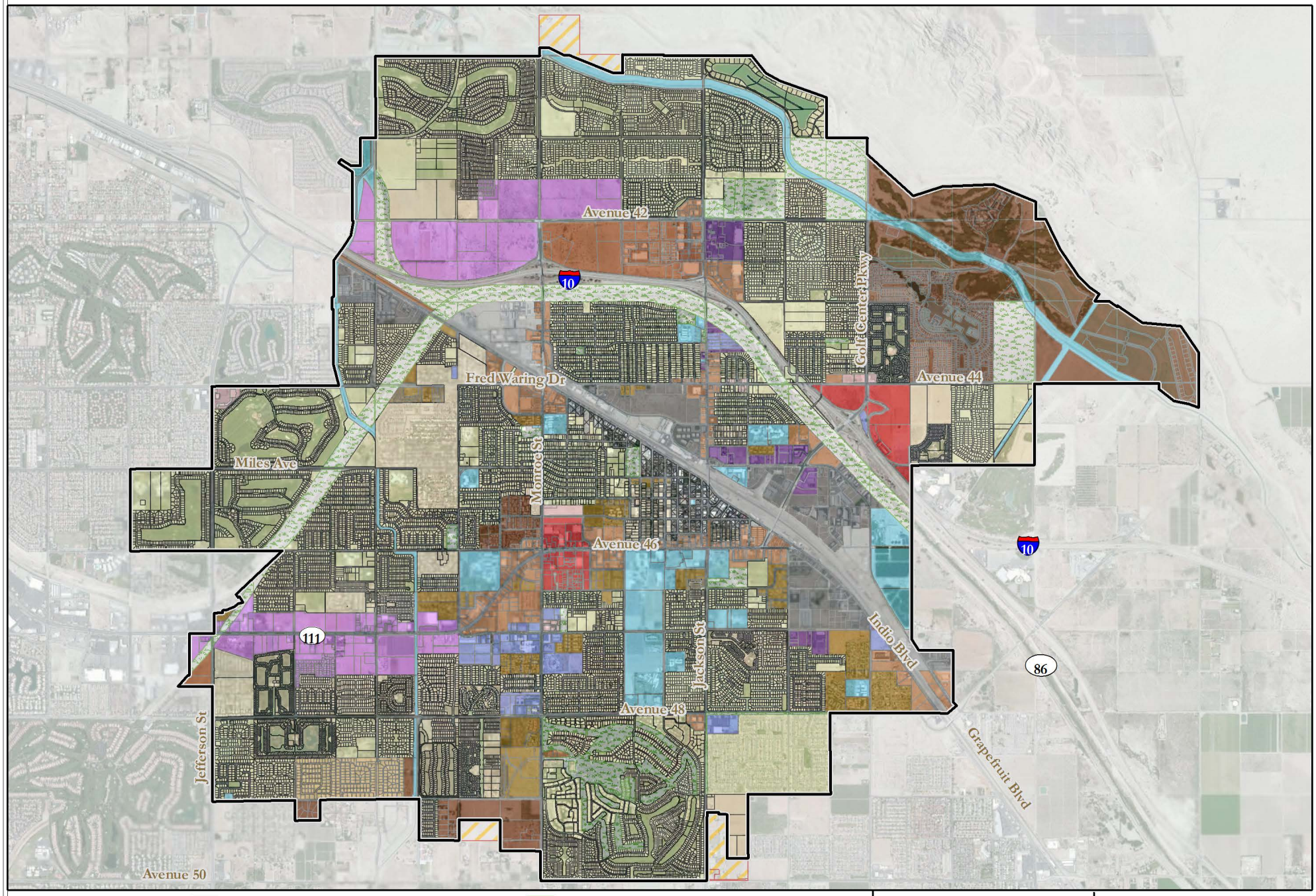
The second largest land use category is commercial which comprises 4.8 percent of VSD. Commercial land use includes shops, garages, restaurants, malls, offices, and schools. Industrial land use makes up 3.3 percent of the VSD service area. **Table 2-4** shows the breakdown of generalized land use category and the percentage of area each category that occupies the existing VSD service area.

VSD also provided a zoning map for build-out of the service area. This zoning map is shown on **Figure 2-4**. Similar to the process utilized for the existing system, the land use categories shown on **Figure 2-4** were also categorized into the eight generalized categories mentioned above. A map of the generalized build-out use is shown **Figure 2-5**.

Table 2-4
Existing Land Use

Land Use	Area (acres)	Area (sq. mi.)	Percentage of Total Area of VSD (%)
Commercial	617	0.96	4.8
Industrial	425	0.66	3.3
Mixed Use	119	0.19	0.9
Open	6,763	10.57	52.5
Public	359	0.56	2.8
Residential High	987	1.54	7.7
Residential Low	2,475	3.87	19.2
Residential Medium	1,030	1.61	8.0
Vacant and Septic[1]	107	0.17	0.8
Total	**12,882**	**20.13**	**100.0**

[1] : This category is not present in the Build-out Land Use (**Table 2-6**) as there is not anticipated to be any septic or vacant land in the projected scenario as a conservative estimate.



Key to Features

- Valley Sanitary District Boundary
- Future Annexation
- Business Park
- Commercial Office
- Community Commercial
- Country Estates
- Country Estates Transitio
- Downtown Commerce
- Industrial Park
- Manufacturing
- Mixed Use (DA)
- Mixed Use (SP)
- Neighborhood Commercial
- Open Space
- Public
- Regional Commercial
- Residential - High
- Residential - Low
- Residential - Medium
- Roadway

N

0 0.25 0.5 Miles

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Date: August 19, 2013

General Land Use

Figure 2-2

MWH

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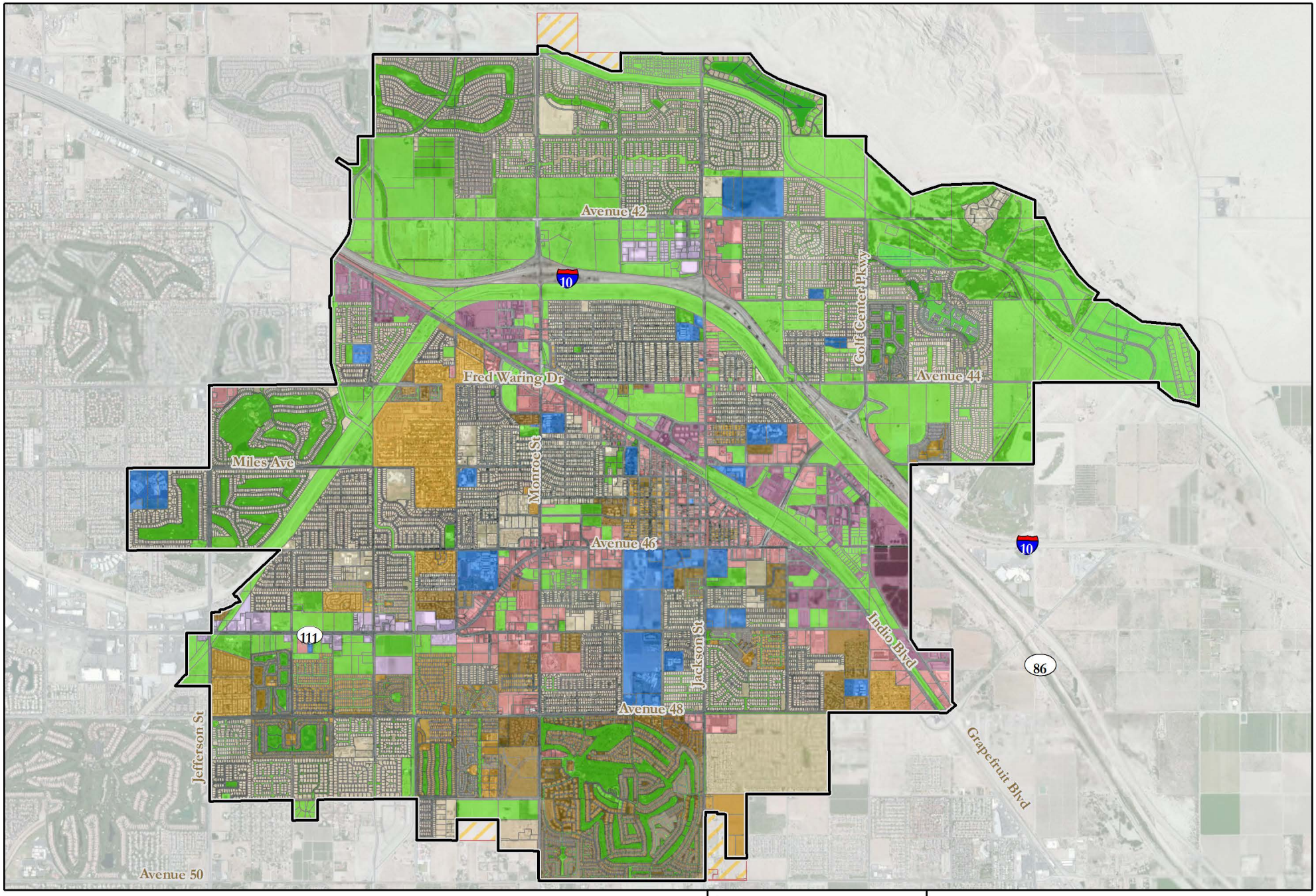

Key to Features

- Valley Sanitary District Boundary
- Commercial
- Industrial
- Mixed Use
- Open Space
- Public
- Residential High
- Residential Medium
- Residential Low
- Future Annexation

N

0 0.25 0.5 Miles

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Date: August 19, 2013

Generalized Existing Land Use

Figure 2-3

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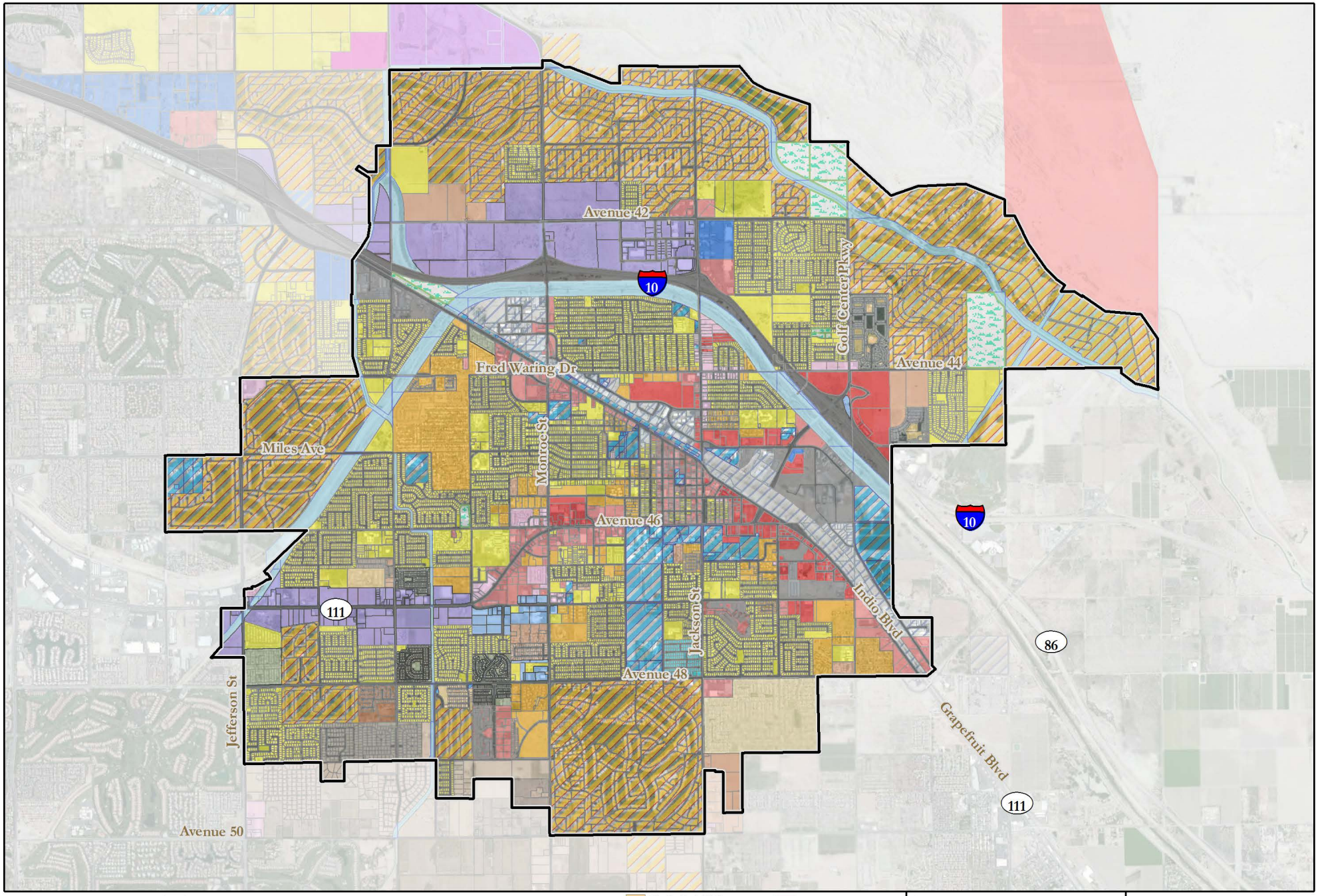

Key to Features

- Valley Sanitary District Boundary
- AAC - Accessway
- BP - Business Park
- CC - Community Commercial
- CE-2 - Country Estates 2
- CE-PD - County Estates Planned Development
- CEIR -1 - Country Estates Indio Ranchos – 1
- CEIR -1/2 - Country Estates Indio Ranchos – 1/2 (CEIR-1/2)
- CEIR -2 - Country Estates Indio Ranchos – 1/2
- CET - Country Estates Transition
- CO - Commercial Office
- CO - PMP - Commerical Office Project Master Plan
- EE - Equestrian Estates
- IP - Industrial Park
- M - Manufacturing
- MHPD - Mobile Home Planned Development
- MU (DA) - Mixed Use Development Agreement
- MU (SP) - Mixed Use Specific Plan
- MUSP 300 - Mixed Use
- NC - Neighborhood Commercial
- OS - Open Space
- P - Public
- PMP - Project Master Plan
- RC - Regional Commercial
- RH - Residential High
- RL - Residential Low
- RLCI - Residential Low Central Indio
- RM - Residential Medium
- RM-MH - Residential Medium (Mobile Home Park/R.V. Park)
- RM-SP - Residential Medium - Specific Plan
- RM/MHPD - Residential Medium (Mobile Home Planned Development)
- RR - Resource Recovery
- SP - Specific Plan
- ST - Streets
- VILLAGE CO - Village Core
- WSC - Water way

N

0 0.25 0.5 1 Miles

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Date: August 19, 2013

Existing Zoning (2010)

Figure 2-4

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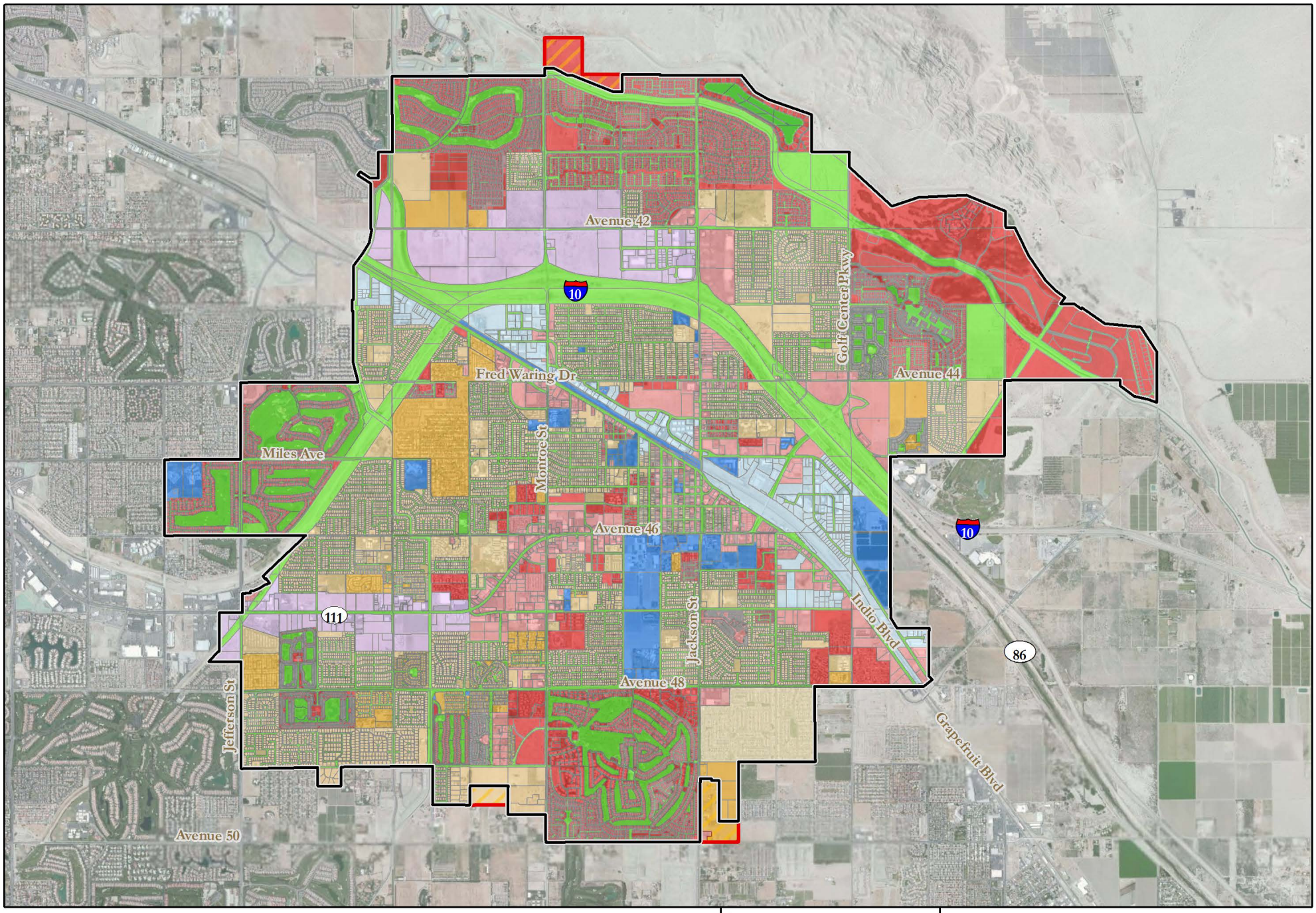

Key to Features

- Valley Sanitary District Boundary
- Future Valley Sanitary District Boundary
- Future Annexation
- Commercial
- Industrial
- Mixed Use
- Open
- Public
- Residential High
- Residential Medium
- Residential Low

N

0 0.275 0.55 Miles

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Date: August 19, 2013

Generalized Future Zoning

Figure 2-5

MWH

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2.2.3 Existing Population

According to the 2010 U.S. Census Bureau, the City of Indio has a population of 76,036 with an average of 3.22 persons per household between 2007 and 2010. The 2000 Census cited a population of 49,166 in 2000, a change of 26,920 people, or 54.8 percent. According to the Southern California Association of Governments (SCAG), "During this 10-year period, the city's population growth rate of 54.8 percent was higher than the Riverside County rate of 41.7 percent," and "in 2010 the city's population was ranked 8th out of 27 cities in the county."

In addition to the residents of Indio, large annual festivals such as the Coachella Music Fest and local attractions such as golfing and spas draw thousands of visitors to Indio each year. Higher population densities are found in the central portion of VSD, north of Avenue 48 and south of the 10 freeway (I-10).

Population information is used to verify flow data for the VSD system, and to determine the increase in flow generation within the area based on growth rate of the population. Population information is provided by 2010 U.S. Bureau of Census data and population projections are based 2012 Coachella Valley Association of Governments (CVAG) data for the City of Indio. Since projections are not available for unincorporated areas within the VSD service area, this area is assumed to have a similar growth rate as the City of Indio. Population projection data is provided for each Census tract and evaluated from year 2010 through 2035 in five year increments, as shown in **Table 2-5**. Population within the VSD service area is expected to increase almost 60 percent from year 2010 to 2035.

Table 2-5
Existing and Projected Population within VSD Service Area

Year	VSD Population
2010	76,036
2015	87,486
2020	100,387
2025	106,923
2030	113,681
2035	120,676

Source: 2012 Coachella Valley Association of Governments

Because future zoning information for VSD was available, future land use was used to project demand for the build-out scenario. Population projections developed are used to verify these projected flows.

2.3 PROJECTED FUTURE CONDITIONS

Future conditions consider anticipated future developments and build-out conditions within the VSD service area. Data from the City of Indio's and Riverside County General Plan land use GIS information is used to develop build-out conditions, and planned development information gathered from VSD staff is used to develop a projected 5-year conditions. Sewer flows are

predicted based on land use and individual development information, and are input into the sewer hydraulic model to assess the needs of VSD's sewer system to meet growth-related increases.

2.3.1 Future Land Use

The City of Indio currently has roughly 52.5 percent open space. Much of this land becomes utilized in the projected build-out scenario and changes land use categories. In addition, conversion of lower density development to higher density land use leads to more flow in the VSD system. Information has been collected on major developments within VSD's boundary that are in various stages of the development process. These development areas were provided by VSD and are shown in **Appendix B** and are in the following processes:

- Developments that have applied for a permit
- Developments that have completed the conceptual review
- Developments that are in the process for entitlement
- Developments that have entitlements granted
- Developments are in the process of having the plans checked
- Developments that are under construction as of July 2013

Twenty-one (21) specific developments were identified by VSD for this Master Plan.

Build-out zoning information is also based on the City of Indio and Riverside County general plans, and grouped into the same categories as developed during calibration. In reviewing the future zoning, oddities in select areas of the system were observed, where land use in the general plan was modified from a high density type land use to lower density type land use (e.g., residential to open space or residential to commercial). In this case, MWH would select the land use with the higher density land use type as the modified future zone. Selecting a higher density land use for the build-out scenario would provide for a more conservative estimation of flow for that area. A major difference between existing land use and future zoning includes the decrease in the amount of open land which decreases from about 52 percent to less than 28 percent of the overall district area. There are also areas of existing residential low land use that is zoned for residential high in the future, which decreases residential low from about 19.2 to 9.9 percent. Conversely, high density residential land use increases from 7.7 to 34.5 percent in the build-out scenario. Future land use information used for this Master Plan is presented in **Figure 2-4** and **Figure 2-5**. **Table 2-6** summarizes land use for the build-out scenario.

Table 2-6
Build-out Land Use

Land Use	Area (acres)	Area (sq. ft.)	Percentage of Total Area of VSD (%)
Commercial	1,063	1.66	8.25
Industrial	542	0.85	4.21
Mixed Use	777	1.21	6.03
Open	3,574	5.58	27.74
Public	457	0.71	3.54
Residential High	4,437	6.93	34.45
Residential Low	1275	1.99	9.90
Residential Medium	758	1.18	5.88
Total	**12,882**	**20.13**	**100**

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Section 3
Existing Sewer System

This section describes VSD's existing sewer infrastructure. The existing wastewater collection system consists of over 246 miles of pipes, 5 active pump stations, 8 siphons, and a wastewater treatment plant (WWTP). The collection system is comprised primarily of polyvinyl chloride (PVC) and vitrified clay pipe (VCP). The oldest known sewer pipes that are still in operation were connected to the system in 1935. Roughly half of VSD's pipes have been built within the last 20 years. The location of the existing sewer system is shown in **Figure 3-1**.

3.1 GRAVITY SYSTEM

Information described in this section for the wastewater collection system is based upon VSD's GIS database received on June 2012. The attributes of the gravity pipes used from the GIS data include the diameter, depths, invert elevations, conduit material, and year of connection.

During the development of the Master Plan, gaps in the GIS database were found through the system. These gaps included missing invert elevations, pipe diameters, pipe material, and ground elevation. These data are essential to perform a hydraulic simulation of the sewer system. Gaps within the system were worked through with VSD staff and are discussed in **Section 4**. In other instances, assumptions were made to fill in the missing information by reviewing pipe profiles, and interpolating and extrapolating invert and ground surface elevations.

3.1.1 Pipes

The collection system consists of pipes ranging from 4- to 54-inches in diameter. 8-inch or smaller diameter pipes make up roughly 75 percent of the gravity sewer system. **Table 3-1** presents the distribution of pipe sizes for the VSD collection system. The entire gravity system colored by the size of the gravity main is shown in **Figure 3-2**. Pipes without given diameters in the provided GIS information were identified and assigned pipe diameter by VSD.

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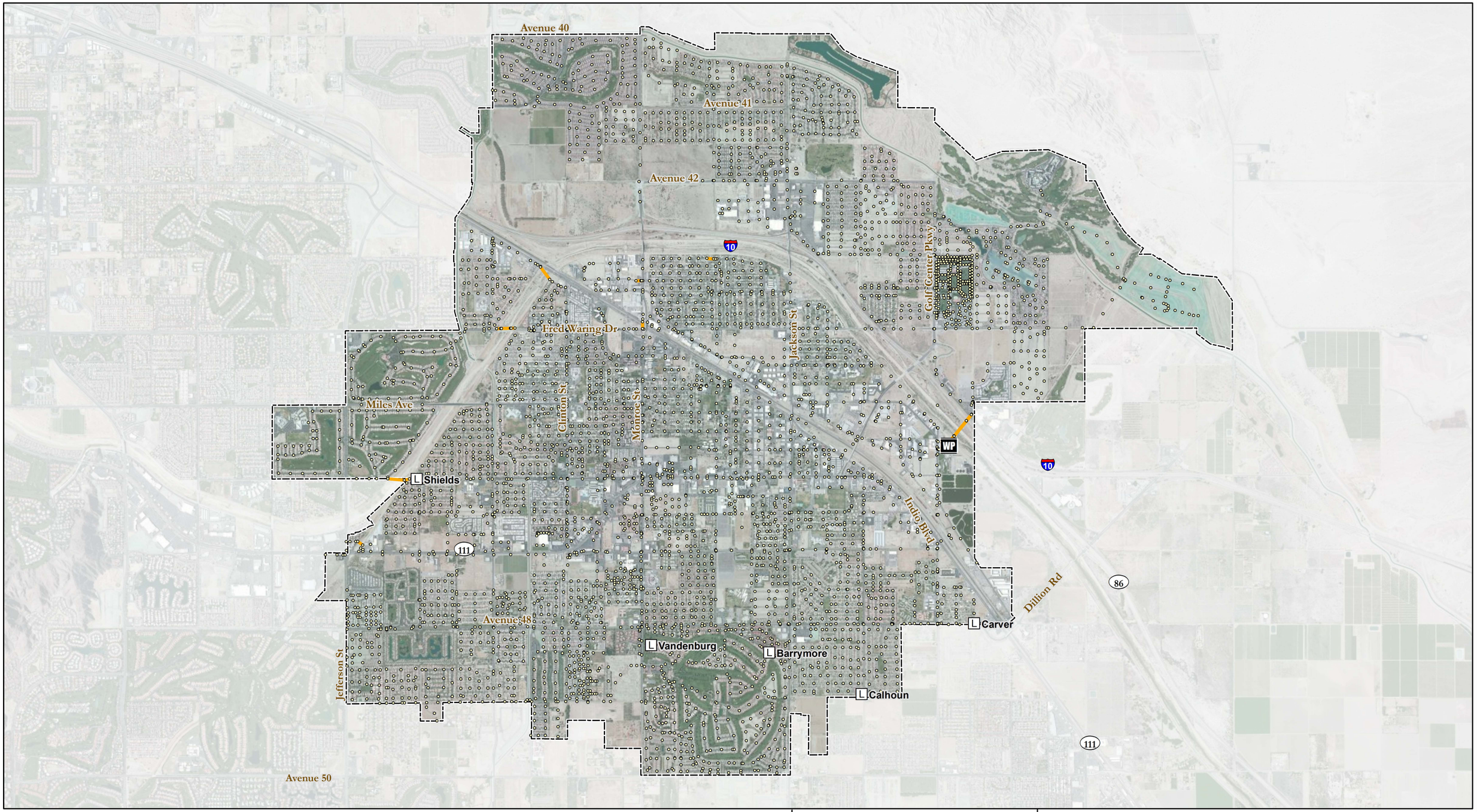

Key to Features

- Manhole
- Lift Station
- Wastewater Treatment Plant
- Siphon
- Sewer Pipeline
- Valley Sanitary District Boundary

N

0 0.5 1 Miles

Document: \\Uspas1s01\muni\Clients\Valley San District\IDIQ As-Needed\Task 1 -Sewer System MP\14 Electronic Files - Modeling_MXDs\SewerSystem10_29_2012.mxd

Date: June 14, 2013

Valley Sanitary District Sewer System

Figure 3-1

MWH

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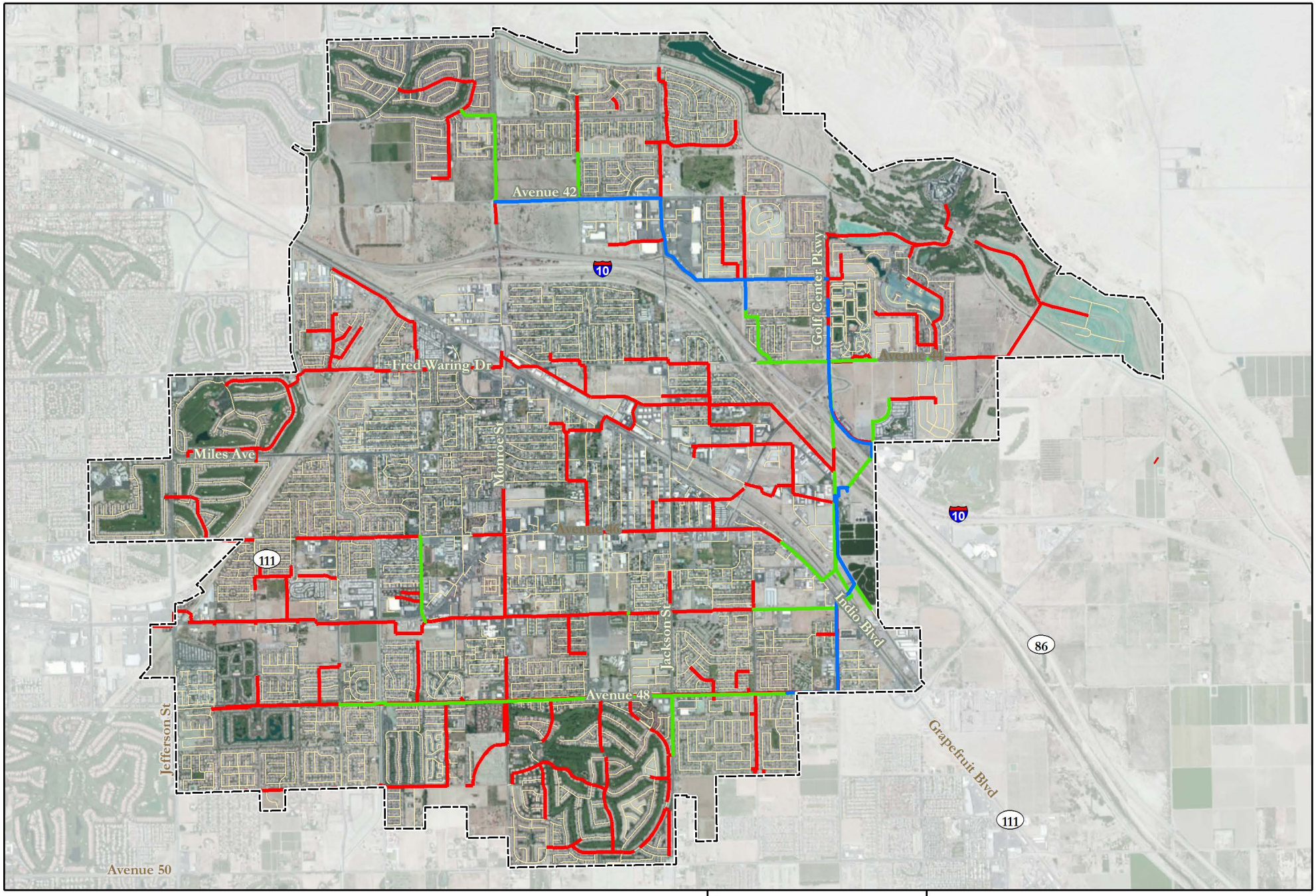

Key to Features

- Less than 8-inch
- 9-inch to 15-inch
- 16-inch to 24-inch
- Greater than 24-inch
- Valley Sanitary District Boundary

N

0 0.25 0.5 Miles

Document: \\Uspas1s01\muni\Clients\Valley San District\IDIQ As-Needed\Task 1 -Sewer System MP\14 Electronic Files - Modeling_MXDs\PipeDiameter.mxd

Date: August 19, 2013

Valley Sanitary District Gravity Sewer by Diameter

Figure 3-2

MWH.

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Table 3-1
Pipes by Diameter Summary

Diameter (in)	Total Length (feet)	Total Length (miles)	Percentage of Total Length (%)
8 or less	970,454	183.8	75%
10	114,208	21.6	9%
12	57,873	11.0	4%
15	74,482	14.1	6%
16	1,271	0.2	0%
18	34,681	6.6	3%
21	3,942	0.7	0%
24	12,491	2.4	1%
27	15,439	2.9	1%
30	2,730	0.5	0%
36	7,113	1.3	1%
42	708	0.1	0%
48	3,253	0.6	0%
54	117	<1	<1%
TOTAL	**1,298,762**	**246.0**	**100%**

The majority of VSD's pipes were installed within the last 20 years as shown in **Table 3-2**. Over 52 percent of the sewers were installed after 1989, and 42 percent were installed between 2000 and 2009. **Figure 3-3** graphically depicts the number of pipe segments installed by year.

Table 3-2
Pipes by Connection Year

Period (years)	Length (feet)	Length (miles)	Percentage of Total Length (%)
1935-1959	160,863	30.5	12%
1960-1969	104,748	19.8	8%
1970-1979	147,683	28.0	11%
1980-1989	141,170	26.7	11%
1990-1999	137,659	26.1	11%
2000-2009	601,227	113.9	46%
2010-present	5,412	1.0	0%
Total	**1,298,762**	**246.0**	**100**

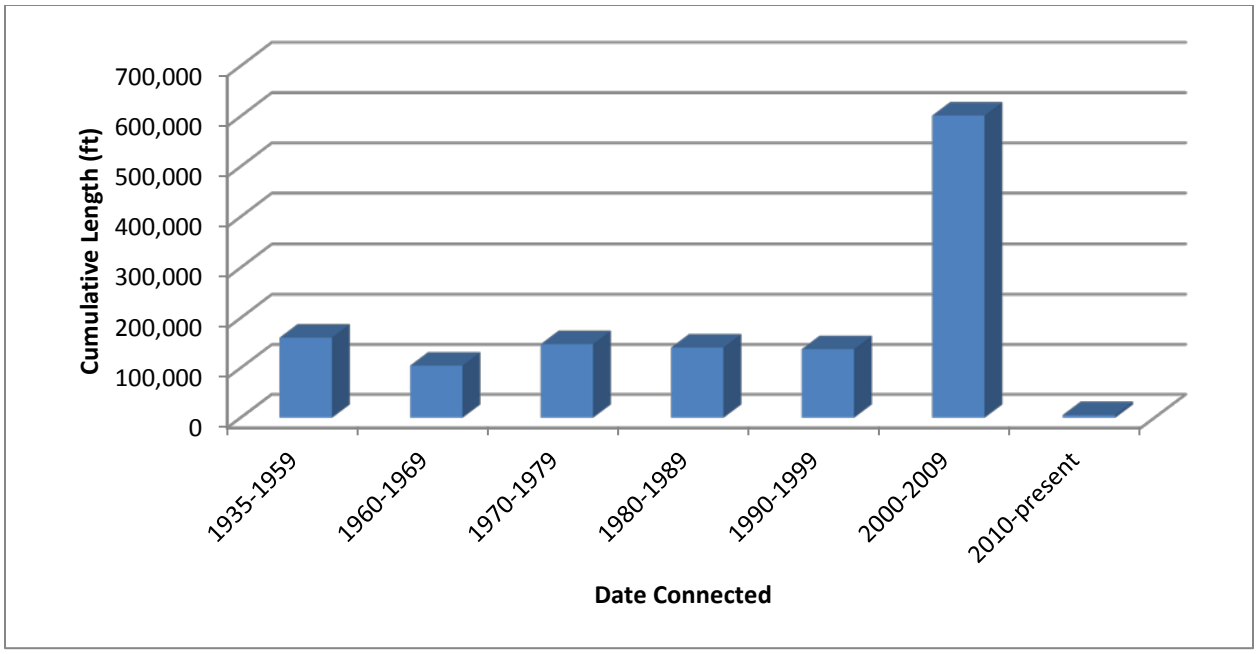

Figure 3-3
VSD Sewers by Connection Year

Figure 3-4 shows the gravity sewer breakdown by age range. Roughly 20 percent of the pipes were installed before 1970, and about 46 percent of VSD pipes have been connected since 2000. Because of high percentage of pipes added to the system in this century, it is recommended that replacement of pipes be planned in a phased manner, preferably starting before the expected lifespan of the pipes. The amount of pipes added to the system between 2001 and today represents a huge portion of the overall system and if replacement is left until they begin to fail, they could all fail at around the same time which could represent an extremely costly period for VSD.

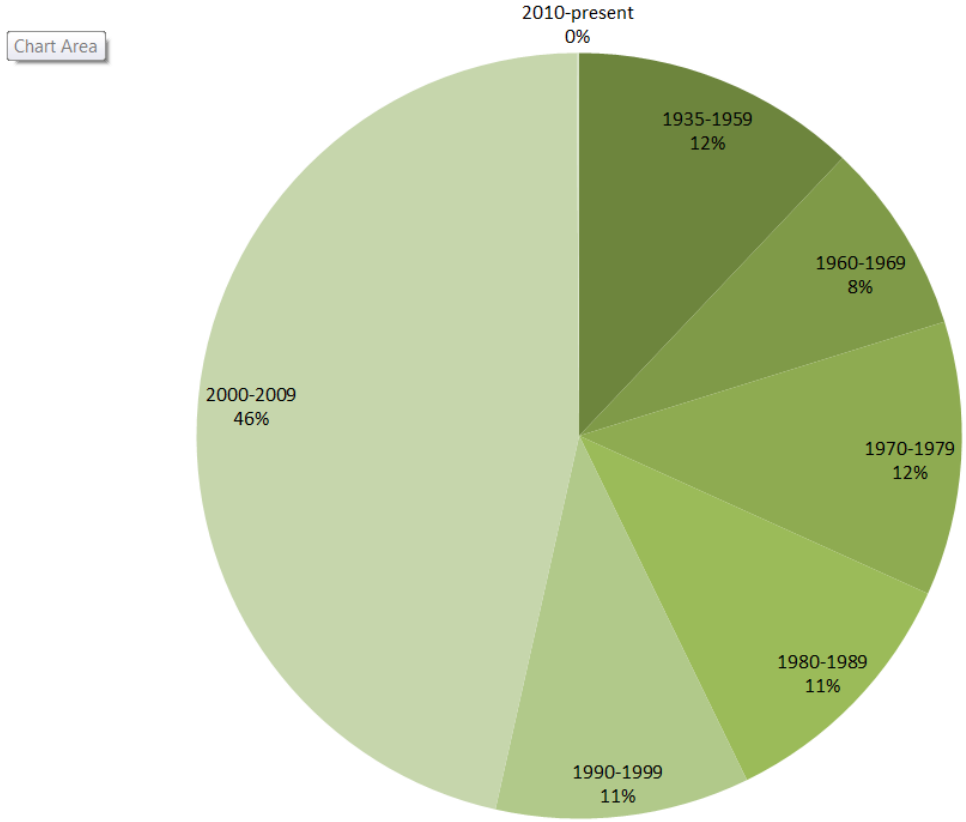

Figure 3-4
VSD Sewer Distribution by Connection Age

3.1.2 Siphons

The VSD collection system has eight inverted siphons. Inverted siphons are essentially a gravity pipe with an uphill section of vertical jump that are used to carry flow under a channel, river, or other interfering structure. Gravity flow is maintained by the upstream head that provides the energy required for flow through the siphon.

Inverted siphons can be comprised of one or multiple barrels. All siphons in the VSD system are single barrel pipes with the exception of the triple barrel pipes crossing the Coachella Valley Water District (CVWD) stormwater channel located east of Van Buren Street and 45th Avenue. This siphon includes one 16-inch, one 20-inch, and one 24-inch diameter pipe. Based on the record drawings of this siphon, there is a fourth barrel designated for future recycled water (16-inch) which is not included in the sewer model. **Table 3-3** lists the siphons for the VSD system that are input into the sewer model.

Table 3-3
Summary of VSD Siphons

No.	Siphon Start Node	Siphon Stop Node	Siphon Model ID	Diameter (in)	No. of Barrels	Location
1	10B-M035	10B-M040	10B-M035_10B-M040	15	1	Northeast of Jefferson St. and Highway 111
2	9C-M265	9C-M270	9C-M265_9C-M270, CDT-11	12	1	East of Westward Ho Dr. and Spyglass Hills St.
3	6D-M115	6D-M120	6D-M115_6D-M120, CDT-21, CDT-23, CDT-25	15	1	Along Fred Waring Dr. east of Madison St.
4	5D-M072	5E-M005	5D-M072_5E-M005	12	1	South of Indio Blvd., north west of the intersection of Jonquil Ave. and Wild Rose St.
5	6F-M330	6F-M335	6F-M330_6F-M335	15	1	Avenue 44 and Indio Blvd., west of Monroe St., running under Railroad tracks
6	6F-M030	6F-M205	6F-M030_6F-M205, CDT-17, CDT-19	8	1	Intersection of Oleander Ave. and Monroe St.
7	5G-M080	5G-M085	5G-M080_5G-M085, CDT-13, CDT-15	8	1	On Crest Ave. between Grove St. and Arabia St.
8	8J-M125	8J-M130	8J-M125_8J-M130_3, CDT-43, 8J-M125_8J-M130_2, CDT-35, CDT-45, CDT-37, CDT-29, CDT-31, CDT-33	16,20,24	3	CVWD stormwater channel east of Van Buren St. and 45th Ave.

3.1.3 Flow Diversion

The VSD system has several places where flow has been diverted to relieve the original pipe when it can no longer accommodate peak flow. Flow is splits between sewers at interconnection points that may occur at a common manhole or a connecting section of sewer line constructed between the parallel sewers.

Flow splits were identified throughout the VSD system and verified with VSD staff. Several areas that appear to have flow splits were confirmed to be currently be non-existent due to operational measured requiring flow to be blocked and preventing diversion of flows. This

review resulted in identification of six flow division areas. These locations are listed in **Table** 3-4. Flows at these locations are separated based on system hydraulics.

Table 3-4
Major Flow Split Locations

Manhole ID	Inflow Pipe Size (in)	Street	Flow Description
13H-M020	15	On Barrymore St. south of Odlum Dr.	13H-M020_13H-M021 is a dry overflow with all flow typically found in 13H-M020_13H-M025
6E-M225	8	Corner of Clinton St. and Fred Waring Dr.	6E-M067_6E-M215 is a dry over flow with all flow typically found in 6E-M067_6E-M225
12I-M090	8	La Playa St. and Del Mar	12I-M090_12I-M245 is a dry over flow with all flow typically found in 12I-M090_12I-M100
6G-M265	10	Sola Street and Avenue 44	Flow found in both 6G-M265_6G-M285 and 6G-M265_6G-M270
6E-M067	8	Corner of Clinton St. and Fred Waring Dr.	6E-M225_6E-M090 is a dry over flow with all flow typically found in 6E-M225_6E-M230
10I-M125	18	Tamarisk Avenue and Indio Blvd.	Pipes between 10I-M125 and 10I-M142 are a two-way dry overflow for lines along Indio Blvd. and Dr. Carreon Blvd.

3.2 COLLECTION PUMP STATIONS

Collection pump stations help carry flow from one pipe to another pipe at a higher elevation. VSD currently operates five pump stations (PS) within its sewer system, including Calhoun PS, Carver PS, Shields PS, Vandenberg PS, and Barrymore PS. The locations of these pump stations are shown in **Figure 3-1**.

3.2.1 Pump Stations

VSD operates all 5 of the 6 pump stations within its collection system. There are two pumping units for each pump station, with varying capacity from 2 to 15 horsepower (hp). VSD's two largest pump stations are the Calhoun Pump Station at 15 hp and Barrymore Pump Station at 10 hp.

The Shadow Hills Pump Station, located between Avenue 43 and Hopi Avenue, south of Calhoun Street, was reported in the 2003 Sewer Master Plan by Dudek and Associates as being taken offline in 2006. Wastewater flows that were previously sent to the Shadow Hills Pump Station are now diverted to a 36-inch diameter gravity pipe along Golf Center Parkway to the east. Additionally, Calhoun Pump Station located in the south east section of VSD's service area

came online in 2005, after the previous 2003 Sewer Master Plan. Pump station information is based on record drawings, as-builts, GIS information, pump manufacturer information, previous students, and discussion with VSD staff.

Table 3-5
Pump Stations

Station No.	Station Name	Year Installed	No. of Pumps	Horsepower Per Pump	Pump Capacity	Modeled (Y/N)
1	Calhoun	2005	2	15	630	Y
2	Carver	1967	2	5	320	Y
3	Shields	2001	2	8.7	300	Y
4	Vandenberg	2007	2	2	110	Y
5	Barrymore	1979	2	10	800	N

3.2.2 Force Mains

Force mains are pressurized pipes that carry flow from a pump station to a discharge point, usually a gravity sewer manhole. The VSD collection system contains approximately 1,325.8 ft. of force main ranging from 4- to 12-inches in diameter. These force mains service the five pump stations described above. Force main information based on VSD's GIS database is provided in **Table 3-6**.

Table 3-6
VSD Collection System Force Main

Pump Station	Size (inch)	Length (ft.)
Carver	6	38.3
Calhoun	6	99.1
Barrymore	8	379.4
Vandenberg	4	129.1
Shields	6	679.9

3.3 WASTEWATER TREATMENT PLANT

The VSD collection system all flows to one outfall, the Wastewater Treatment Plant (WWTP) located at the north-east intersection of Van Buren Street and Enterprise Way, just southwest of Interstate 10. The current capacity of the WWTP is 11 million gallons per day (MGD). The WWTP is currently undergoing improvements that are expected to increase capacity to 13.5 MGD by the end of the year. Ultimately, the plant is expected to have an 18 MGD capacity. As part of the data collection task of this project, historical flows for the WWTP were provided by VSD. **Figure 3-5** shows flows for the WWTP for 2010, the last year for which complete data was given.

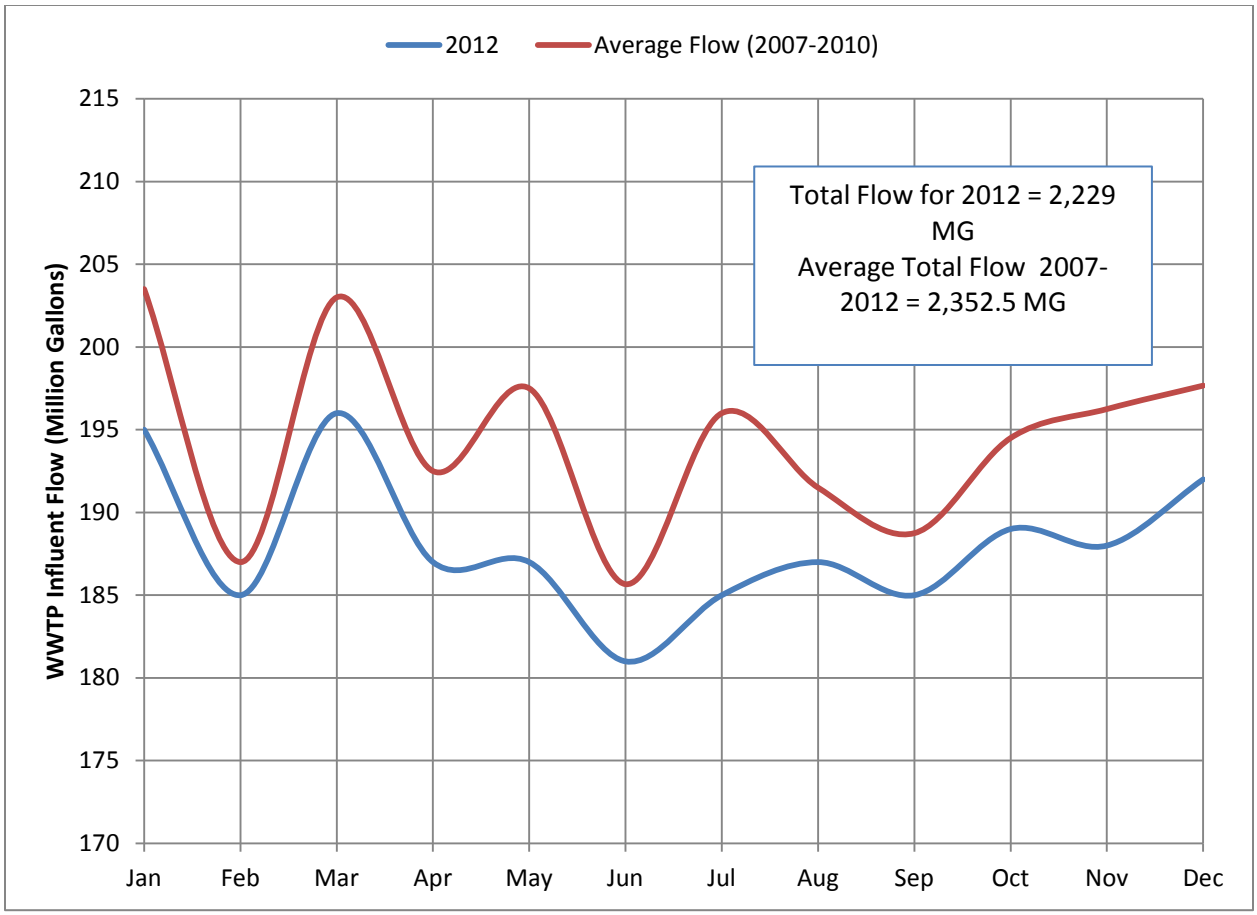

Figure 3-5
Wastewater Treatment Plant Inflow

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Section 4
Model Development and Calibration

This section describes the steps involved in developing the model, including data collection, model construction, and flow allocation. The discussion of data collection includes information on how data was prioritized and used for the model, and also discusses the assumptions and methods used for filling in missing or incomplete data. This section details the creation of different elements of the model, including siphons and sewer facilities such as pump stations. The process of creating sewersheds in the model, which are used in allocating flow throughout the system and projecting future flows based on land use, is also discussed in this section. Finally, a discussion on calibration of the model is contained in this section.

4.1 MODEL DEVELOPMENT

Bentley's SewerGEMS® V8i, SELECTseries 2 software is used to model the VSD sewer system. SewerGEMS is a fully dynamic model based upon EPA SWMM 5 engine, and utilizes the explicit solutions of the St. Venant equations, which permits accurate analysis of reverse flows and backwater conditions. SewerGEMS can be run in the ESRI ArcGIS, Version 10 environment, which allows for a modeling system that can be fully integrated with (Geographic Information System) GIS software and permits all the advanced ArcGIS functions to be utilized. The VSD model is built using the ArcGIS integrated version of SewerGEMS. SewerGEMS includes several tools used throughout model development including ModelBuilder to construct the model using GIS asset information and LoadBuilder to allocate flow.

4.1.1 Data Collection

VSD provided detailed information for the development of the model. Key information included:

- GIS file of sewer manholes
- GIS file of sewer mains
- GIS file of pump stations
- GIS file of 2- foot elevation contours
- GIS file for the VSD service area boundary
- GIS files for street centerlines and parcels
- GIS information for land use general plan
- Digital aerial photography coverage for VSD
- Topographical data for VSD
- Pump station information including design drawings, pump curves, and set points
- Design drawings of siphons
- Sewer atlas maps
- Previous sewer studies for different areas within the system
- Information on annexation areas and major planned developments
- 2003 Sewer Master Plan prepared by Dudek and Associates, Inc.

A full list of reference for this report can be found in **Appendix A.**

4.1.2 Model Construction

The first step in the model development process is to create the existing sewer network and to locate the various sewer system facilities. The sewer network is built using GIS files of the sewer pipes, manholes, and other sewer facilities in GIS shapefile format (.shp). These shapefiles are projected in the State Plane Coordinate System North American Datum of 1983 (NAD83), California Zone VI. The attribute information from shapefiles are organized into categories known as fields, which contain information such as names, installation year, material, lengths or depths, invert elevations, and other attributes of a pipelines or manhole. The ModelBuilder tool is used to import shapefiles into the model, and link data from its shapefile fields to the appropriate SewerGEMS model attributes. The names of the shapefiles used to create the model and the field mapping to the model are shown in **Table 4-1**.

Since part of the VSD service area is below sea level (i.e., negative ground and invert elevations), a value of 500 feet (ft.) is applied to all nodes in the model to prevent potential confusion in converting between negative and positive elevation values. Therefore, the true elevation of any junction in a model will be the elevation displayed in the model minus 500 ft.

Since the start of the building the VSD system, two different datum for referencing the elevation of the system has been recorded. Originally, a North American Vertical Datum of 1929 (NAVD29) was used in the system, though this was eventually replaced by the North American Vertical Datum of 1988 (NAVD88). A majority of the elevations in the VSD system is based on NAVD88, though there may be instances where some elevations use NAVD29. The difference in elevation between the two references was found to be roughly 2.4 ft. These discrepancies have been resolved during the development of the model through elevation adjustments and interpolation.

Table 4-1
GIS Shapefile Field Mapping to Sewer Model

VSD Shapefile Name	Shapefile Description	Field Title	Description	SewerGEMS Attribute
SWNETMHG.shp	VSD Manholes	MAG_MANHOL	Manhole name	Label
		MAG_DEPTH	Manhole depth	Elevation (invert)[1]
		MAG_RIM_EL	Manhole Rim Elevation	Elevation (Rim)
SWNETG.shp	VSD Pipes	NTG_USMAN	Upstream manhole name for pipe	Start Node
		NTG_DSMAN	Downstream manhole name for pipe	Stop Node
		NTG_DIA	Pipe diameter	Diameter (in)
		NTG_US_INV	Upstream invert elevation for pipe	Start node invert elevation (ft.)
		NTG_DS_INV	Downstream invert elevation for pipe	Stop node invert elevation (ft.)
		NTG_SLOPE	Pipe slope	Slope (ft./ft.)
SWSTATNG.shp	VSD Pump Stations	SNG_STN_NA	Station name	Property Label

[1] Manhole Depth provided in GIS was subtracted from rim elevation to obtain invert elevation

4.1.3 Nomenclature

Easy identification of model elements is important as it provides for better understanding and use of the model. The model requires a unique identification value for each element. Identification for the manholes in the model is based on VSD's manhole ID. Identification for the pipes in the model is based on its connecting upstream and downstream manhole ID or node ID. For example, a pipe with upstream node 7G-M310, and downstream node 7G-M315, the assigned nomenclature is 7G-M310_7G-M315. Facilities in the model are labeled by its facility name followed by the element type. The nomenclature PMP-# and WW is used to define a pump and wet well, respectively. For example, the Carver Lift Station facility is composed of two pumps and a wet well; in the model the pumps are labeled CarverPMP-1 and CarverPMP-2, while the wet well is labeled CarverWW.

In the model, pipes are represented as links and manholes are represented as nodes. Not every node in the model will represent a manhole. Additional nodes may need to be added along a pipe to model changing invert elevations or offsets that do not occur at a manhole, such as the case of siphons. New nodes in the model that are not associated to a VSD manhole are labeled as JCT-##, where the ## represent a value designed by the SewerGEMS software.

4.1.4 Model Cleanup and QA/QC

Once GIS information is input into the model using ModelBuilder, a thorough quality assurance and quality control (QA/QC) of the entire system is conducted of the pipeline and manhole data. This QA/QC step is critical as a number of areas were found in the VSD existing GIS information that had incorrect elevation data, missing GIS information, or disagreement of information from multiple sources supplied by VSD. In order to execute this QA/QC process, a number of tools within the SewerGEMS model were employed, including Hydraulic Reviewer Tool, TRex Wizard, Profile Manager, and the validation tool. In addition to these proprietary functions of the SewerGEMS software, manual checks of data are performed to ensure accuracy. The following QA/QC checks were performed:

- Review pipes with missing manhole connections
- Delete abandoned manholes
- Verify pipe lengths
- Verify manhole information (e.g., rim elevations and manhole depths)
- Verify pipeline information (e.g., upstream and downstream invert elevations, upstream and downstream rim elevations, zero diameter)
- Review inconsistencies between rim elevation and invert elevation from the conduit and manhole information
- Profile check of all pipelines in the system

Discrepancies with the VSD GIS data and any issues with integrating to the SewerGEMs model were resolved and discussed below.

Review Pipes with Missing Manhole Connections

Pipes and manholes are connected by spatial proximity using a tolerance of one foot. For pipes that do not have a manhole within the tolerance area of one of its ends, a node is created by SewerGEMS, since all pipes in a model must have a connecting node. SewerGEMS identified 37 pipes with a missing manhole connection thereby automatically creating 37 nodes. The connectivity between pipes with missing manholes connections and its appropriate manhole is determined through atlas maps and manhole IDs designated within the GIS database for the pipe in question. Once the correct connection between the pipe and manhole is made in the model, any nodes that were automatically created by SewerGEMS are then deleted, so that only known manholes from the GIS are represented in the model.

Delete Abandoned Manholes

Once all pipe and manhole connections are verified, any manholes and associated pipes that had been abandoned are identified and deleted from the model. VSD marks these manholes in their GIS data with an “AM” in the name (e.g. “12D-AM160”). Forty-three manholes were identified as abandoned based on this nomenclature, and were removed from the model. Pipes connected to abandoned manholes were also removed from the model.

Manholes with a “C” in their name in place of an “M” are classified as cleanouts (e.g. “4I-C015”). There are 229 manholes in the model that are classified as cleanouts by VSD’s GIS data.

These manholes were left in the model based on the fact that some of them were vital to the connectivity of certain areas of the system, and removing them would have left sections of the system hydraulically isolated. Flows are not assigned to cleanouts.

Verify Pipe Lengths

Pipe lengths are verified in the model against the pipe lengths supplied through the GIS data. The SewerGEMS software calculates length of pipes during the ModelBuilder import data step. These calculated lengths are compared against the lengths defined in the GIS data to verify proper integration of the GIS data into the model. Manual comparison of these lengths shows comparable values for all pipe lengths within a tolerance of 0.75 ft., with 98.9% of lengths within 0.1 ft. from each other. Also, the few pipes exceeding the tolerance did not have major differences between the calculated model length and GIS data, thereby not having a significant impact on the hydraulics of the system.

Verify Manhole and Pipe Information

Once connectivity and pipe length are verified, it is necessary to verify all elevations assigned in the model. These values include invert elevation of the downstream and upstream end of a pipe; rim elevation of a manhole; ground elevation of a manhole; and invert elevation of a manhole. Based on the pipe and manhole shapefile information, the following missing information was reviewed and fixed in the model:

- Manholes (4,810 total manholes)
  - 750 manholes without rim elevations
  - 1,105 manholes without depths
- Pipes (4,985 total pipelines)
  - 408 pipes missing upstream invert elevations
  - 404 pipes missing downstream invert elevations
  - 428 pipes missing rim elevation of connecting upstream manhole
  - 424 pipes missing rim elevation of connecting downstream manhole
  - 18 pipes with 0 diameter

Each issue was individually evaluated and missing data is populated based on GIS information of the surrounding pipes and manholes. Pipes with missing sizes were checked using the atlas maps and verified with VSD staff as shown in **Table 4-2**.

Table 4-2
Pipes with Missing Sizes in GIS Data

Pipe ID	Diameter in Model (inches)
10G-M225_10H-M215	8
12G-M290_12G-M225	(Pump Discharge in Barrymore Pump Station)
12G-M295_12G-M290	15 (Feed pipe to Barrymore Pump Station)
12H-M395_12H-M370	8
13G-M180_13G-M025	8
13H-M020_13H-M021	15
13H-M021_13H-M022	15
13H-M022_13H-M035	15
13H-M060_13H-M015	15
14G-M155_14G-M190	15
4H-M145_4H-M040	8
5J-M635_5J-M630	12
5J-M610_5J-M605	36
6F-M350_6F-M365	15
6J-M780_6J-M775	36
6K-M135_6K-M110	8
7D-M095_7D-M090	8
8H-M210_9H-M245	6

Review Inconsistencies in Data

There are also areas in VSD's GIS data with redundant information for the same point. For instance, pipe data provides most rim elevations for the upstream and downstream manholes the pipe connects to, and in some cases these elevations would conflict with the rim elevation reported for the connecting manhole(s). There are 532 occurrences identified where a pipe's GIS information includes a rim elevation for an upstream or downstream manhole that conflicts with the rim elevation reported for that corresponding manhole's GIS information.

The majority of these inconsistencies were resolved when reviewing missing elevation information for both manholes and pipes. In the case where two values are provided for the same data point, the most conservative value is used in the model. For example, if depth values for a manhole (i.e., distance between the invert elevation and ground level) conflict between the data provided in the manhole shapefile and pipe shapefile, the lower depth value or most shallow depth is modeled.

For areas where invert elevation data is not provided or cannot be determined or interpolated using GIS data from neighboring pipes or manholes, these elevations are calculated using the nearest known invert elevation along the pipeline and a minimum design slopes as shown in **Table 4-3**. This would be applied in areas at the upstream end of a pipe network, in which the invert elevation of the most upstream manhole is missing along with several manholes downstream along the pipe.

Table 4-3
Minimum Design Slope for Pipes

Pipe Diameter (inches)	Minimum Slope
4	2.0%
6	0.5%
8	0.4%
10 or greater	0.3%

Global Pipe Profile Check

The last QA/QC check performed is a manual profile check for each pipe in the VSD sewer network. This process involves visually verifying segments of pipes and manholes utilizing the "Profiles" function of SewerGEMS. Each profile is checked to ensure that:

- Elevation data is filled in and displaying properly in the model
- Pipes connect to an upstream and downstream manhole
- Manholes have a rim elevation that is greater than the invert elevation
- Offsets from a pipe's downstream or upstream invert elevation and a manholes invert elevation does not potentially cause a flow interruption or unrealistic flow regime
- Flow slopes in a downhill direction unless a pump station is present to provide energy to the system.

4.1.5 Assigning Ground Elevations

Upon completion of the model cleanup and QA/QC, ground elevations are assigned to all nodes in the system. SewerGEMS includes an elevation for the manhole rim and an elevation for the ground elevation. Ground elevations are assigned in the model using the 2-foot contour shapefile supplied by VSD and TRex Wizard tool in SewerGEMS. Rim elevations supplied from the pipe and manhole GIS data are compared to the ground elevations determined in the model.

When comparing the rim elevations and ground elevation, roughly 28 percent of all modeled nodes are within 2 ft. of each other, while the remaining 72 percent of manholes had a rim/ground elevation difference of greater than 2 ft. Possible causes of this elevation difference could include inaccuracy of the contour layer, inaccuracy of the manhole shapefile, and improper projection of the contour layer in SewerGEMS. It is not thought that the vertical datum has anything to do with this discrepancy. Regardless of the cause, the lowest elevation between the rim and ground elevations is used to model the node as a conservative estimate.

4.1.6 Summary of Model Development

The digitized network contains approximately 4,800 manholes and 5,000 pipe segments, which extend over 246 miles within the City of Indio and unincorporated areas of Riverside County. The analyzed database includes all collection system pipelines 10-inches in diameter and greater. Additional pipes with diameters smaller than 10-inches are added in order to capture flow from a larger network of small pipes. There are approximately 200 miles of pipelines smaller than 10-

inches in diameter in the sewer system. The modeled database includes approximately 76 miles of pipeline, which is approximately 29 percent of the entire network. All information imported from the VSD GIS information described above, and any additional information taken from atlas maps or through discussion with VSD staff, is included in the SewerGEMS database.

4.2 SEWER FACILITIES

The modeled VSD sewer system includes five lift stations: Barrymore, Vandenberg, Carver, Calhoun, and Shields. There are also eight siphons and one outfall at wastewater treatment plant on Van Buren Street in the VSD system. A description of how these sewer facilities are modeled in SewerGEMS is described below.

4.2.1 Pump Stations

Pump stations (PS) are modeled with a wet well, a pump, a discharge node and a force main as shown in **Figure 4-1**. Details on modeling the wet well and pump station in the model are described below.

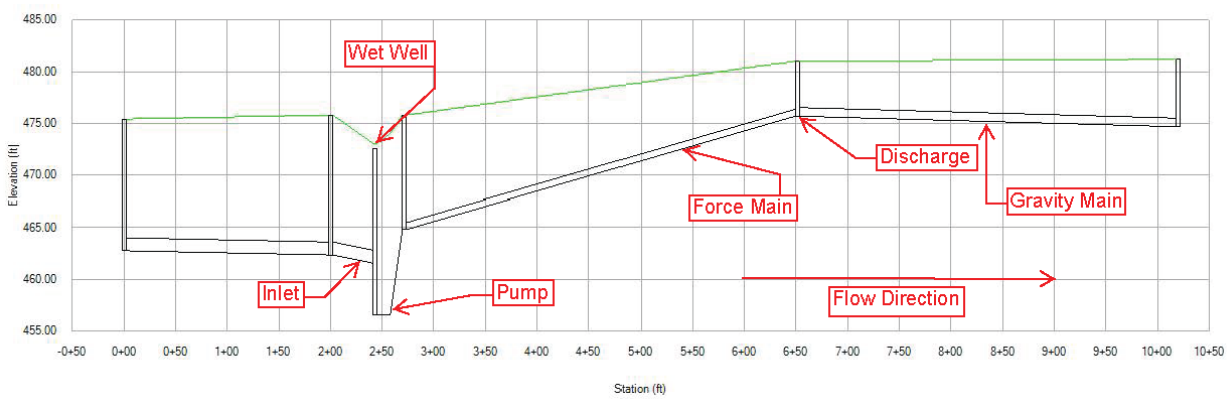


Figure 4-1
Profile of a Lift Station in SewerGEMS

Wet Well

Information necessary to modeling a wet well includes its layout, geometry, area of the wet well as a function of depth, the invert (base) elevation, and the ground elevation or elevation at the top of the well. This information is obtained from record drawings, GIS information, exhibits, and discussion with VSD staff.

Invert elevations of the inlet and outlet pipes of the pump station are also needed to calculate the downstream and upstream offset to accurately simulate any storage utilized by backing up into the inlet pipe. Four of the five wet wells in the system are modeled as circular wells with a constant area versus depth since the height of the wet well is uniform, with Barrymore PS being the exception. The wet well at Barrymore PS is modeled with a variable area to depth curve type well based on its geometry as shown in **Figure 4-2**. Information of the modeled wet wells is presented in **Table 4-4**.

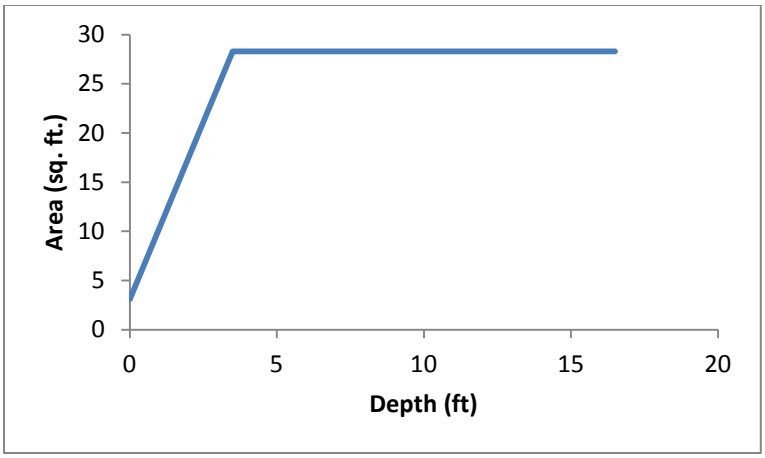


Figure 4-2
Depth-Area Curve for Barrymore Pump Station

Table 4-4
Wet Wells in VSD Model

Model ID	Description	Invert Elevation (ft.)	Maximum Depth[1] (ft.)	Wet Well Area (sq. ft.)
BarrymoreWW	VSD Wet Well at Barrymore Lift Station	456.56	16.50	**Figure 4-2**
CalhounWW	VSD Wet Well at Calhoun Lift Station	435.75	34.65	113.1
CarverWW	VSD Wet Well at Carver Lift Station	447.60	7.30	38.5
ShieldsWW	VSD Wet Well at Shields Lift Station	515	21	50.3
VandWW	VSD Wet Well at Vandenberg Lift Station	484.75	15.25	28.3

[1]: Calculated by subtracting invert (base) elevation from ground elevation

Pumps

Flow from the wet well is transferred via pumping units. Each pumping unit in the model is defined by the pump's start and stop levels, as well as its pump curve. The model includes a total of ten pumps (i.e., two pumps for each lift station). Each pump is modeled with a multi-point curve based on the manufacturer's pump curve data provided by VSD, manufacturer's data, or best available information and knowledge. Pump curves were available for Shields PS, Calhoun PS, and Vandenberg PS. Pump curves for Barrymore PS and Carver PS are obtained from the pump manufacturer, Smith and Loveless.

Other information needed to model a lift station include the elevations for the point connecting the pump unit and force main, as well as the elevation of the discharge point (elevation leaving

the force main). The discharge node is taken from the force main record drawings, which ensures that the appropriate total dynamic head (TDH) is simulated. After the discharge node, flow is carried by gravity again as depicted in **Figure 4-1**. Information of the modeled pumping units is presented in **Table 4-5**.

Table 4-5
Pumping Units in VSD Model

Model ID	Description	Year of Pump Curve	Model Pump ID Curve	Startup Depth (ft.)	Shutoff Depth (ft.)
BarrymorePMP-1	Lead Pump for Barrymore Lift Station	Not provided (Pump Installed 1967)	Barrymore Curve	461.56	459.56
BarrymorePMP-2	Lag Pump for Barrymore Lift Station	Not provided (Pump Installed 1967)	Barrymore Curve	461.56	459.56
CalhounPMP-1	Lead Pump for Calhoun Lift Station	2005	Calhoun Curve	445.75	443.75
CalhounPMP-2	Lag Pump for Calhoun Lift Station	2005	Calhoun Curve	445.75	443.75
CarverPMP-1	Lead Pump for Carver Lift Station	Not provided (Pump Installed 1979)	Carver Curve	451.6	449.1
CarverPMP-2	Lag Pump for Carver Lift Station	Not provided (Pump Installed 1979)	Carver Curve	451.6	449.1
ShieldsPMP-1	Lead Pump for Shields Lift Station	2001	Shields Curve	522.65	520.65
ShieldsPMP-2	Lag Pump for Shields Lift Station	2001	Shields Curve	522.65	520.65

4.2.2 Siphons

The VSD sewer model includes eight inverted siphons. Locations and profiles of these siphons are provided by VSD. A summary of the siphons modeled for the VSD sewer system is provided in **Table 3-3**. Sections of pipe along a siphon are separated by nodes in the model. Nodes that do not represent an actual manhole are modeled as bolted junctions to prevent surcharging at these points. A profile of a typical siphon in the model is shown in **Figure 4-3**.

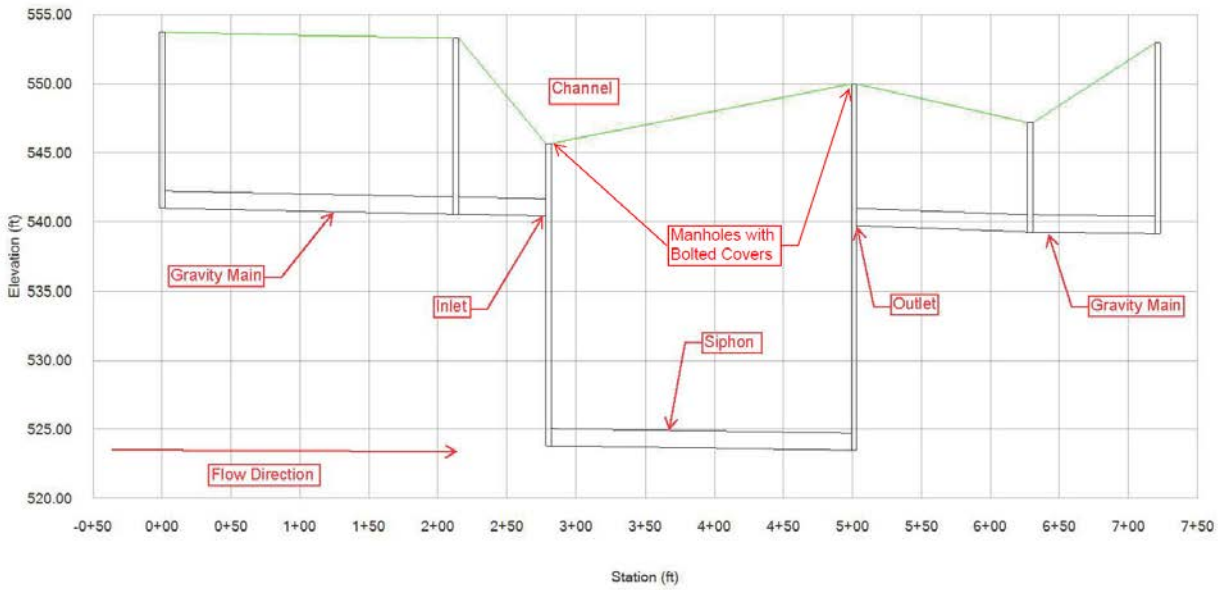


Figure 4-3
Profile of Modeled Siphon

4.2.3 Wastewater Treatment Plant

All flow in a hydraulic model must have at least one outfall towards which it is flowing. In the VSD system, the outfall for the system is the wastewater treatment plant (WWTP) located at the north-east intersection of Van Buren Street and Enterprise Way, just southwest of Interstate 10. The WWTP is modeled as an outfall with an elevation of 447.50 ft., the elevation of the WWTP's inlet pipe.

In addition to the flow monitoring data, VSD provided flow data from the wastewater treatment plant that served as further verification of modeled results. The data included flows from the weeks that flow monitoring was conducted and an average flow volume and hourly flows were recorded from the data. This data was compared to modeled results from the outfall of the system to ensure overall flows for the system were comparable to actual flows.

4.3 BASE DRY WEATHER WASTEWATER FLOWS

Dry weather flows, commonly referred to as base flows, are flows that occur in a sewer system when there is no contribution to flow from wet weather conditions (infiltration of surface water). Wastewater base flow is usually comprised of the following primary components:

- Residential domestic sewage
- Commercial sewage
- Industrial sewage
- Groundwater infiltration

Sewage generation is allocated in the SewerGEMS model using the LoadBuilder function. LoadBuilder allows a user to assign loading data to nodes when the data is not already associated with individual nodes. The parameters used to generate flow in the VSD model are land use, flow patterns for the different land uses, and the unit flow rates for each land use. The allocation of both existing and future sewer flow generation is discussed below. Base wastewater flow within the model is calculated in the following manner for each catchment:

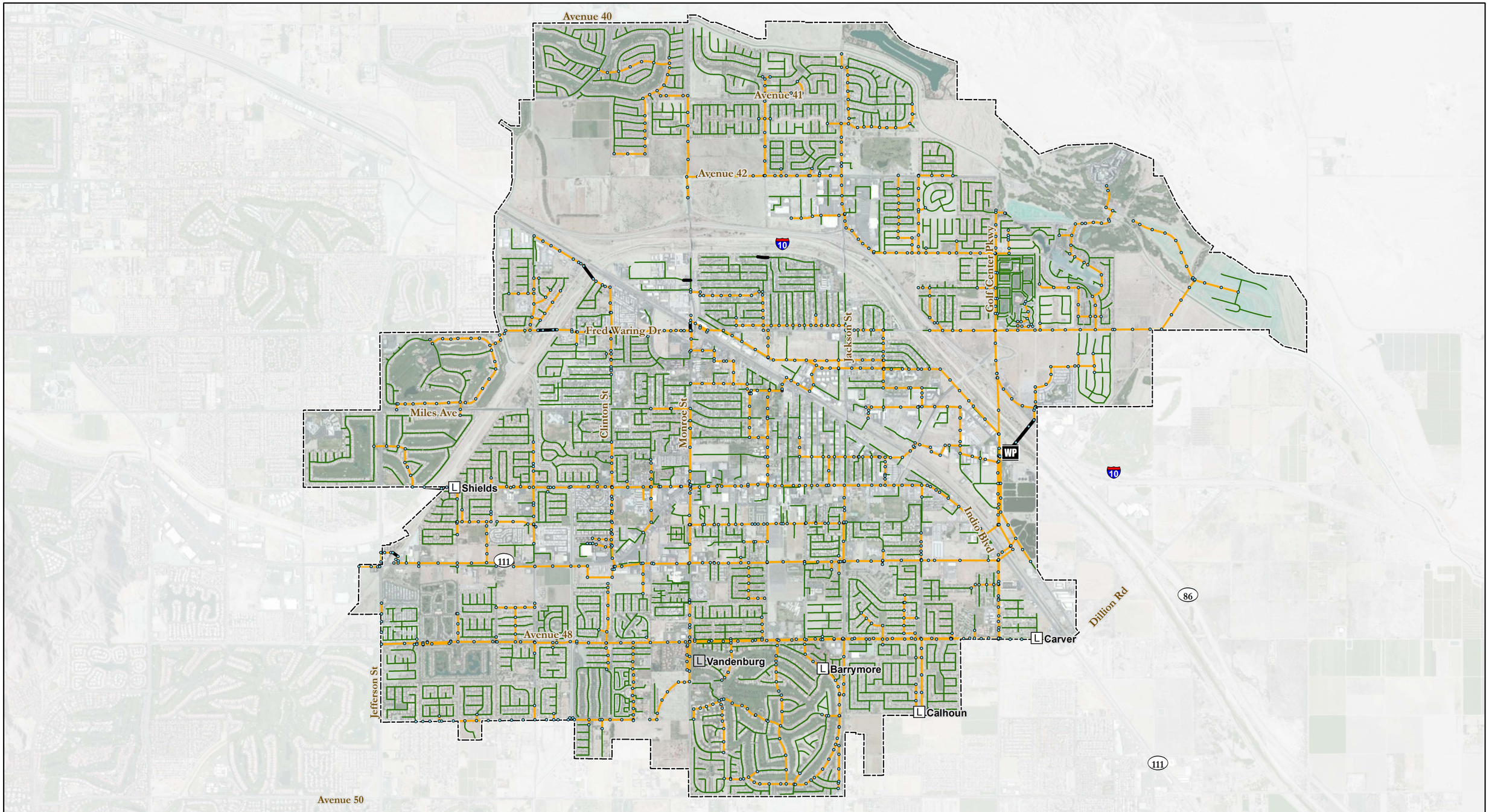
> Total Flow = ∑ (area of land use × unit flow rate factor (gallons per acre) of land use × diurnal multiplier) + groundwater infiltration

As discussed in the base wastewater sections below, dimensionless diurnal patterns are developed for all base flow sources such that the model can predict the full dry weather flow cycle for typical 24-hour period. A unit factor of gallons per acre per day of sewer generation for all land use categories is determined from flow calibrations. Variations in the wastewater flow are ultimately captured by the different diurnal patterns for each land use category.

4.3.1 Allocation of Wastewater Flows

To allocate flows of the existing sewer system, hydraulic units of land known as sewersheds divide the entire service area. Flows within each sewershed are assigned to a single discharge point, with one receiving node (discharge point) associated with each subcatchment. The subcatchments are created to define sewershed areas that will encapsulate the entire service area.

The hydraulic model is divided into 404 polygon subcatchments averaging approximately 31.5 acres in size, with a median size of 23.5 acres. This sewershed size provides a sufficient level of resolution to uniformly apply the wastewater flow components (diurnal curve, land use, etc.). The receiving node of each sewershed is the most downstream node and is selected to receive the flows collected within the sewershed. **Figure 4-4** highlights the pipelines that are being analyzed in the model, while the sewersheds defined in the SewerGEMS model are shown in **Figure 4-5**.



Key to Features

- WP Wastewater Treatment Plant
- L Lift Station
- L Modeled Lift Station
- Sewer Pipeline
- Siphon
- Modeled Sewer Pipeline
- Modeled Manholes
- Valley Sanitary District Boundary

N

0 0.5 1 Miles

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Date: June 14, 2013

Valley Sanitary District Modeled Sewer System

Figure 4-4

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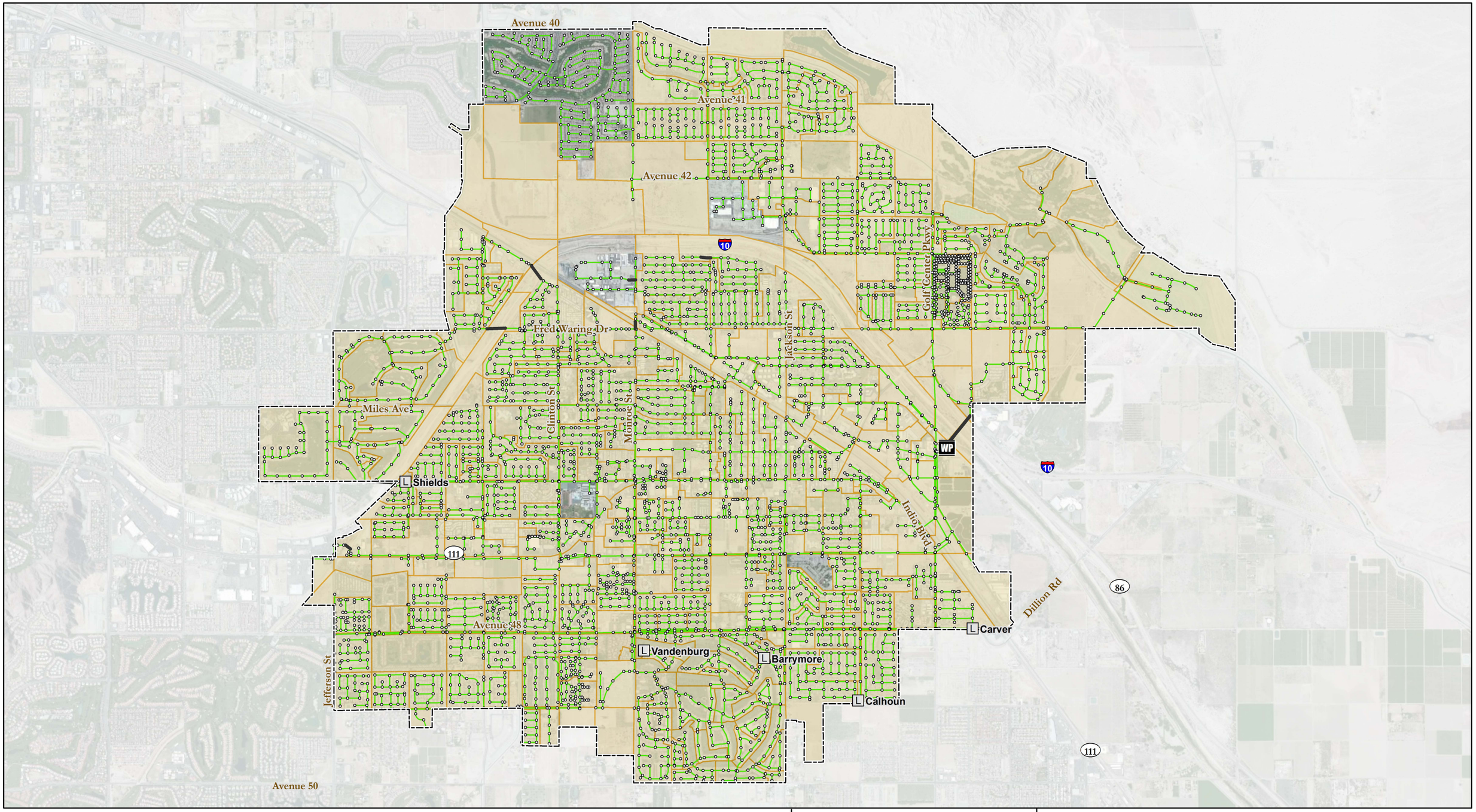

Key to Features

- Manhole
- Modeled Lift Station
- Wastewater Treatment Plant
- Siphon
- Sewer Pipeline
- Sewershed
- Valley Sanitary District Boundary

N

0 0.5 1 Miles

Document: \\Uspas1s01\muni\Clients\Valley San District\IDIQ As-Needed\Task 1 -Sewer System MP\14 Electronic Files - Modeling_MXDs\SewerSheds10_29_2012.mxd

Date: June 14, 2013

Valley Sanitary District Sewersheds

Figure 4-5

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The VSD model began with eight different land use categories: low-density residential, medium-density residential, high-density residential, commercial, industrial, open, public, and mixed use. For the VSD system, the industrial land use category is a catch-all term that covers light industrial, agricultural processing, etc. The open use category includes areas that do not contribute any wastewater flows to the sewer system, such as existing vacant land, access ways, streets, waterways, parks, and select public areas with vacant land. Therefore, the flow generation for open land is zero. A summary of existing dry weather base flows allocated to the model is approximately 5,645 gallons per minute (gpm) or 8.13 million gallons per day (mgd) as shown in **Table 4-6**.

By applying the same wastewater duty factors and diurnal adjustments developed above to the future land use in SewerGEMS, the future dry weather base flow is calculated to be about 13,830 gpm or 19.9 mgd, as shown in **Table 4-7**. The "fixed" land use category listed in **Table 4-7** is used to add point loads to system. In the case of the build-out system, the jail expansion for the detention facility on Highway 111 is given a point load as specific loading data was provided by VSD. Point loads are also used for any known developments in the 5-year planning scenario.

Table 4-6
Existing Dry Weather Flow Allocation

Land Use	Load (gpm)
Commercial Central	462
Commercial High_FM	40
Commercial North	155
Commercial North Central	28
Commercial North Central High	40
Commercial South	154
Commercial South Central	301
Commercial Subtotal	**1180**
Industrial North Central	134
Industrial South Central	31
Industrial Subtotal	**165**
Residential 13C-M085	59
Residential Central	439
Residential High	501
Residential North	1,030
Residential North Central	134
Residential South	711
Residential South Central	291
Residential South Low	476
Residential Subtotal	**3641**
Existing Jail	50
Mixed Use	356
Open	0
Public	252
Total	**5,645**

Table 4-7
Future Dry Weather Flow Allocation

Land Use	Load (gpm)
Fixed	107
Commercial Central	611
Commercial High_FM	40
Commercial North	509
Commercial North Central	98
Commercial South	252
Commercial South Central	477
Commercial Subtotal	2,094
Residential Central	341
Residential High	5,130
Residential North	758
Residential North Central	146
Residential South	1,635
Residential South Central	670
Residential Subtotal	8,680
Industrial	407
Mixed Use	2,330
Open	0
Public	320
Total	**13,830**

A flow generation profile is associated with each land use. Seven different diurnal profiles are created and input into the model to simulate flow generation variations over a 24-hour period. Open land use does not require a pattern as flow is not generated from open areas. These profiles were created with data collected during a one-week flow monitoring period from January 5th to January 11th, 2013, thus representing a typical winter day.

4.3.2 Infiltration

The final component of base flow generation is infiltration. Groundwater infiltration is water that leaks into sewer systems from either burst water mains or naturally occurring elevated groundwater levels. The amount of groundwater infiltration can be significantly affected by such variables as pipe condition, construction practices and standards (i.e., pipe seal types, puddle clay versus gaskets), proximity to surface waters, seasonal conditions, natural groundwater table levels, or burst water mains.

VSD typically experiences insignificant infiltration and inflows (I/I) through the year due to its dry climate. For systems similar to VSD, I/I are accounted for using conservative per capita flows. Based on discussion with VSD, areas within the system may receive more inflow during winter storm events. Sources of inflow can include uncapped cleanouts, misconnections to

stormwater collection laterals (e.g., rain gutter downspout, outdoor drains, and storm drain), and uncovered manholes. Studies have also shown that for newly-constructed sewers, the infiltration component is insignificant. Manholes located in low-lying areas should be watertight in their design to avoid inflow problems caused by flash-floods. For the purposes of this sewer model, I/I flows were not evaluated.

4.3.3 Known Developments

Based on discussion with VSD staff, several existing major facilities may contribute a significant amount of wastewater flow to the collection system. Wastewater flows for future developments will be individually assessed based on conversations with VSD staff. These additional flows are added to the 5-yr projection scenario. For the build-out scenario, these known developments (with the exception of the County of Riverside Indio Jail Facility Expansion) are not included as point loads and the excess flow they contribute is captured by the future land use. In order to verify this assumption, flows for the 5-year scenario and the build-out scenario were compared to ensure the build-out scenario showed equal or greater flow for all areas that have known developments in the future. Some of the developments discussed with VSD staff are listed below:

- County of Riverside Indio Jail Facility Expansion
- Fantasy Springs Casino
- John F. Kennedy Memorial Hospital
- Indian Palms Country Club
- Indio County Date Festival
- Annexation: north of 50th Avenue and east of Jackson Street
- Annexation: 40th Avenue and east of Monroe Street
- Annexation: south of 49th Street and west of Monroe Street

A full map of known development as provided by VSD staff is shown in **Appendix B**. Known development were given an equivalent dwelling unit (EDU) approximation by VSD staff. In order to assign loads in gpm based on these EDUs, the flow generation from one EDU needed to be calculated for the City of Indio.

4.4 CALIBRATION

Once the model is developed, it is calibrated to dry weather flow conditions based on flow monitoring data. Ten sites throughout the VSD service area are selected to gather flow data. Three major objectives guide the locations of the flow monitors:

1. Capture as much flow as possible.
2. Isolated areas of residential or industrial/commercial land uses to the extent possible to help develop unit flows and diurnal profiles during model calibration.
3. Select areas of known hydraulic issues based on results from the 2003 Sewer Master Plan, such as choosing locations that were previous monitored or select areas to investigate possible flow splitting.

Flow monitoring data is used to determine a typical flow pattern generated from different types of land uses, and then to calibrate the entire system. Five of the flow monitors are strategically placed to capture flow from a particular land use. For example, a flow monitoring site whose sewershed predominately includes low-density residential homes will exhibit a pattern that may be unique to that land use, and can be applied to other low-density residential areas in the system. The calibration process and results are discussed below.

4.4.1 Flow Monitoring

- A flow monitoring program was implemented in order to correlate the actual collection system sewer flows with the estimated flows in the hydraulic model. The objectives of the flow monitoring program included: Develop flow generation rates for various land use categories;
- Develop the diurnal curve for various land use categories;
- Collect representative sewer flows in the collection system to calibrate the hydraulic model to the dry weather flow conditions.

The locations of the ten flow monitors are shown on **Figure 4-6**. Flow Monitors No. 1 through No. 5 obtain flows for specific land use types, while Flow Monitors No. 6 through No. 10 obtains flows from large sewershed areas and are used for calibrating the model. Details on each monitored location and further information on the flow monitoring program is presented in **Appendix C**. Flow monitoring was conducted for a consecutive two-week period from January 5, 2013 through January 18, 2013. Flow monitoring data collected from all ten locations are shown in a report provided by US3 and shown in **Appendix D**.

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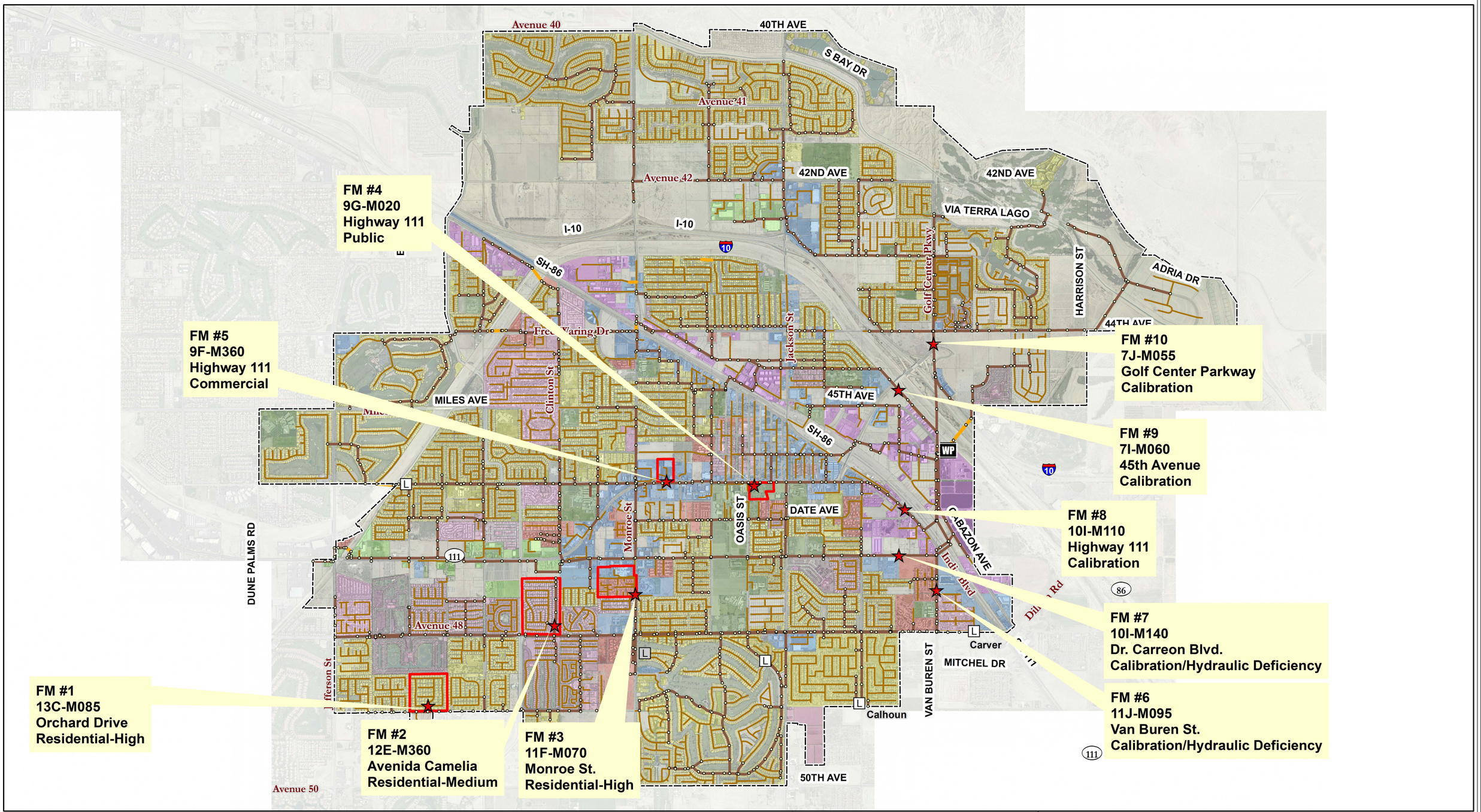

Key to Features

- FlowMeterLocations
- Lift Station
- Modeled Lift Station
- Wastewater Treatment Plant
- Manhole
- FlowMeterCatchmentAreas
- Valley Sanitary District Boundary
- Siphon
- Modeled Sewer Pipeline
- Sewer Pipeline

N

0 0.5 1 Miles

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Date: June 14, 2013

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Valley Sanitary District Flow Monitoring Sites

Figure 4-6

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4.4.2 Diurnal Patterns and Peaking Factors

Flow patterns for general land use types used for the VSD sewer system are generated from the flow monitoring data specific to the VSD system. Based on data provided by US3, diurnal patterns and peaking factors were developed for the VSD system. The following subsections describe how these patterns and peaking factors were developed. A summary of the land use types for the flow monitoring location is shown in **Table 4-8**.

Table 4-8
Flow Monitoring Locations

Monitor No.	Purpose	Location	Manhole ID	Pipe Diameter
1	Residential – Low Density Land Use	Orchard Drive and 49th Avenue	13C-M085	8
2	Residential – Medium Density Land Use	Avenida Camelia and Calle Diamante	12E-M360	15
3	Residential – High[1] Density Land Use	Monroe Street, 500 ft. north of Victoria Street	11F-M070	10
4	Public Land Use	South of Highway 111, 200 ft. east of Oasis Avenue	9G-M020	8
5	Commercial Land Use	Highway 111, 500 ft. west of Rubidoux Street	9F-M360	8
6	Calibration/ Hydraulic Deficiencies[2]	Van Buren Street, 150 ft. north of Manila Avenue	11J-M095	30
7	Calibration/ Hydraulic Deficiencies[2]	Dr. Carreon Blvd, 1,300 ft. east of Calhoun Street	10I-M140	18
8	Calibration	Highway 111, 300 ft. south of Maple Avenue	10I-M110	18
9	Calibration	Northeast area of Golf Center Parkway and 45th Avenue intersection, and west of Whitewater River	7I-M060	15
10	Calibration	Golf Center Parkway, 400 ft. south of 44th Avenue	7J-M055	36

1 Captures some commercial land use.
2 Hydraulically deficient based on 2002 Sewer Master Plan.

Diurnal Curves

As part of creating diurnal patterns and peaking factors for calibration of the modeled system, a representative weekday and weekend day must be selected. Over the two-week flow monitoring period, flow versus time graphs were plotted, as shown on **Figure 4-7** and **Figure 4-8**. From these plots, week one was determined to have the highest flow and most pronounced peaks. Thus, week one was used to select the representative weekday and weekend day. The corresponding weekday and weekend day from week two was used for validation of calibrated flows. Comparison graphs from Flow Monitors No. 1 through No.5 for week one and week two are shown on **Figure 4-7** and **Figure 4-8**, respectively. From these graphs, it can be clearly seen that week one represents a higher overall flow for the system and thus a more conservative estimate of representative flow.

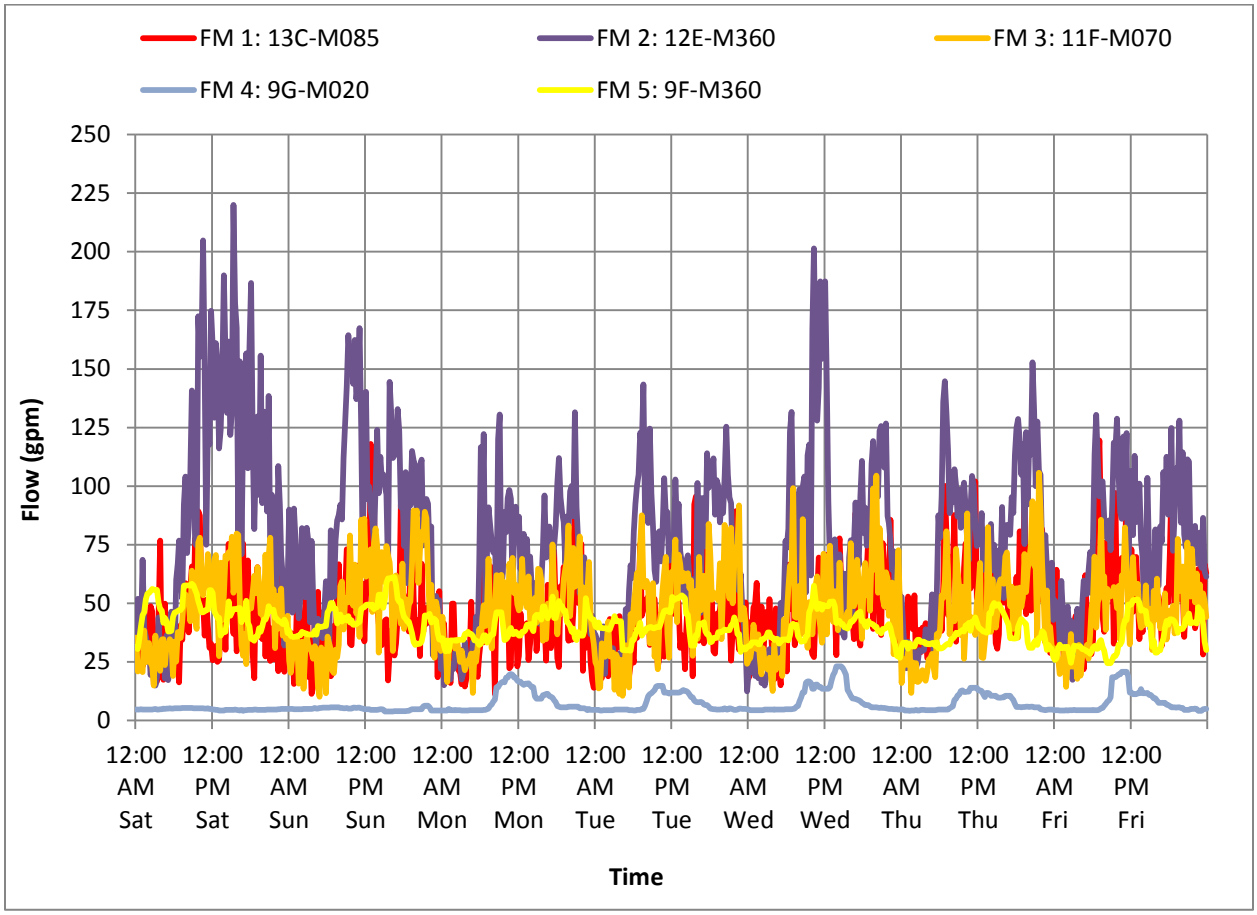

Figure 4-7
Comparison of Week One Flows from FM 1 – FM 5

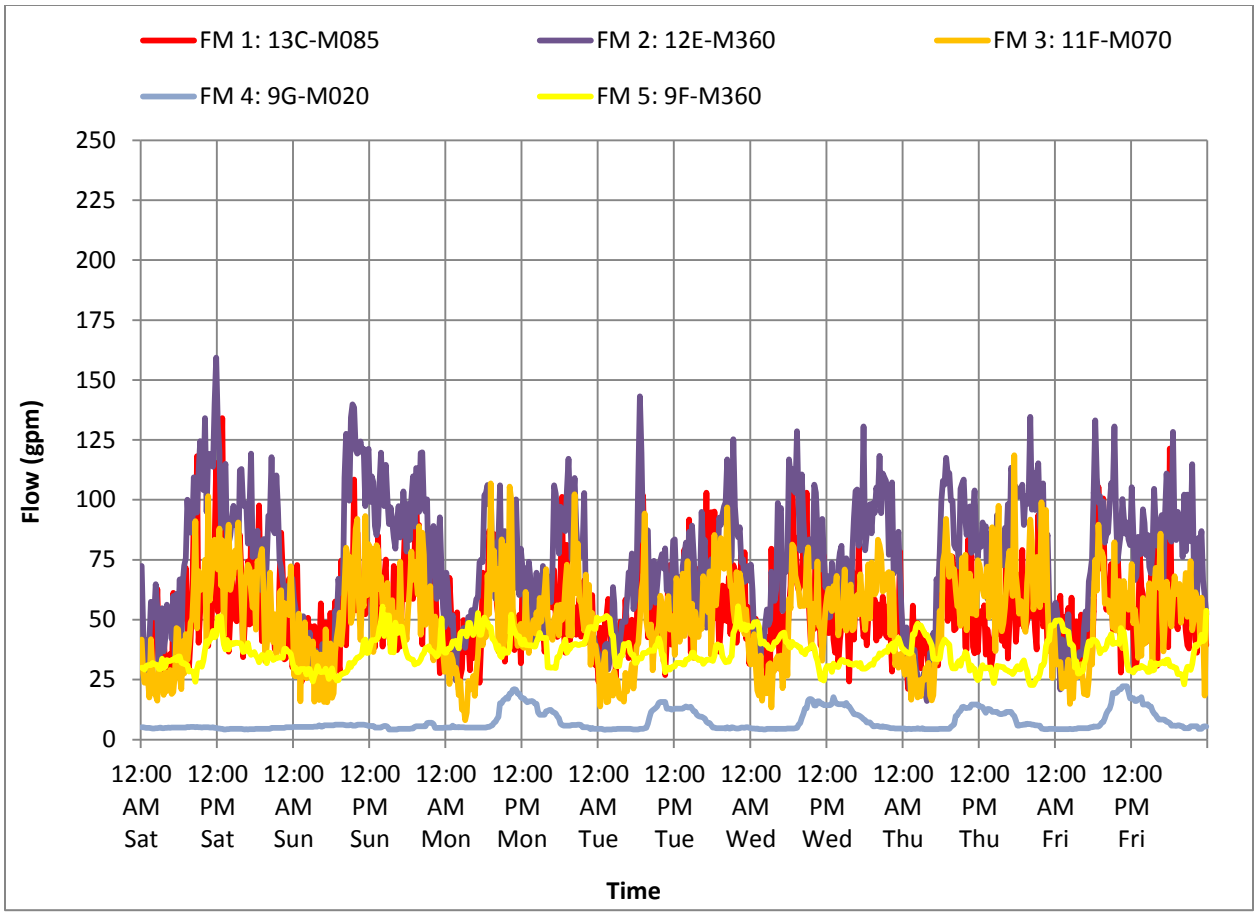

Figure 4-8
Comparison of Week Two Flows from FM 1 – FM 5

Once a representative week was selected, one typical weekday and one typical weekend day is selected to represent flows in the system. Each monitor has different days that show the highest flow. Therefore, a day was selected that showed higher flows for the largest majority of the flow monitors. In order to select the representative weekday and weekend day, flows for each day in week one were graphed for each flow monitor, and the highest flow day was selected from these plots. In order to compare flows uniformly, flow was converted to a dimensionless flow, Q, by taking the average flow for each hour and dividing it by the average flow for that day.

The days selected for calibration days are Sunday, January 6th, and Tuesday, January 8th. Sunday, January 13th and Tuesday, January 15th were therefore selected as validation days. Flows generated in the model were calibrated to week one flows, and were then also compared to validation day flows to ensure that the modeled flows were within tolerance limits for both days.

During the two week period that flow monitoring was conducted, no significant rainfall occurred in the VSD system. Thus, all data collected during the flow monitoring period is considered base dry weather flow, and the analysis of the system assumed a negligible contribution for surface water infiltration.

Patterns for each land use category were developed from flow monitoring data through Flow Monitor No.'s 1 through No.5. **Table 4-9** shows the land use categories for each flow monitor.

Table 4-9
Diurnal Pattern Allocation

Land Use	Flow Monitor Number	Monitor ID
Open	N/A[1]	N/A
Public	4	9G-M020
Commercial	5	9F-M360
Industrial[2]	5	9F-M360
Residential Low Density	1	13C-M085
Residential Medium Density	2	12E-M360
Residential High Density	3	11F-M070
Mixed Use	Average of Residential Medium and Commercial	Average of 12E-M360 and 9F-M360

[1]: A fixed pattern with a constant multiplier of 1 was used for open as no flow is assigned to this land use type and thus no pattern is necessary.
[2]: the industrial land use category is a catch-all term that covers light industrial, agricultural processing, etc.

Once these patterns were input into the model along with base flow for each land use, a calibration run was done to assess the accuracy of the modeled system compared to the real data. From the results of this comparison, the diurnal patterns above were adjusted for each land use, and additional land uses were added where necessary for different areas of the system. **Figure 4-9** through **Figure 4-14** shows the final diurnal patterns for each land use category that were used in the existing system calibration. It is of note that due to the necessity of altering each pattern in an iterative process of calibrating flows for all monitors, the final diurnal patterns presented in **Figure 4-9** through **Figure 4-14** may not average to a dimensionless value of 1.0. This means that average flows for each land use category must be multiplied by the average dimensionless value for their respective pattern in order to get the effective average daily flow for each land use. **Appendix E** presents the diurnal multiple and description for each land use category, as well as the calibration results discussed below.

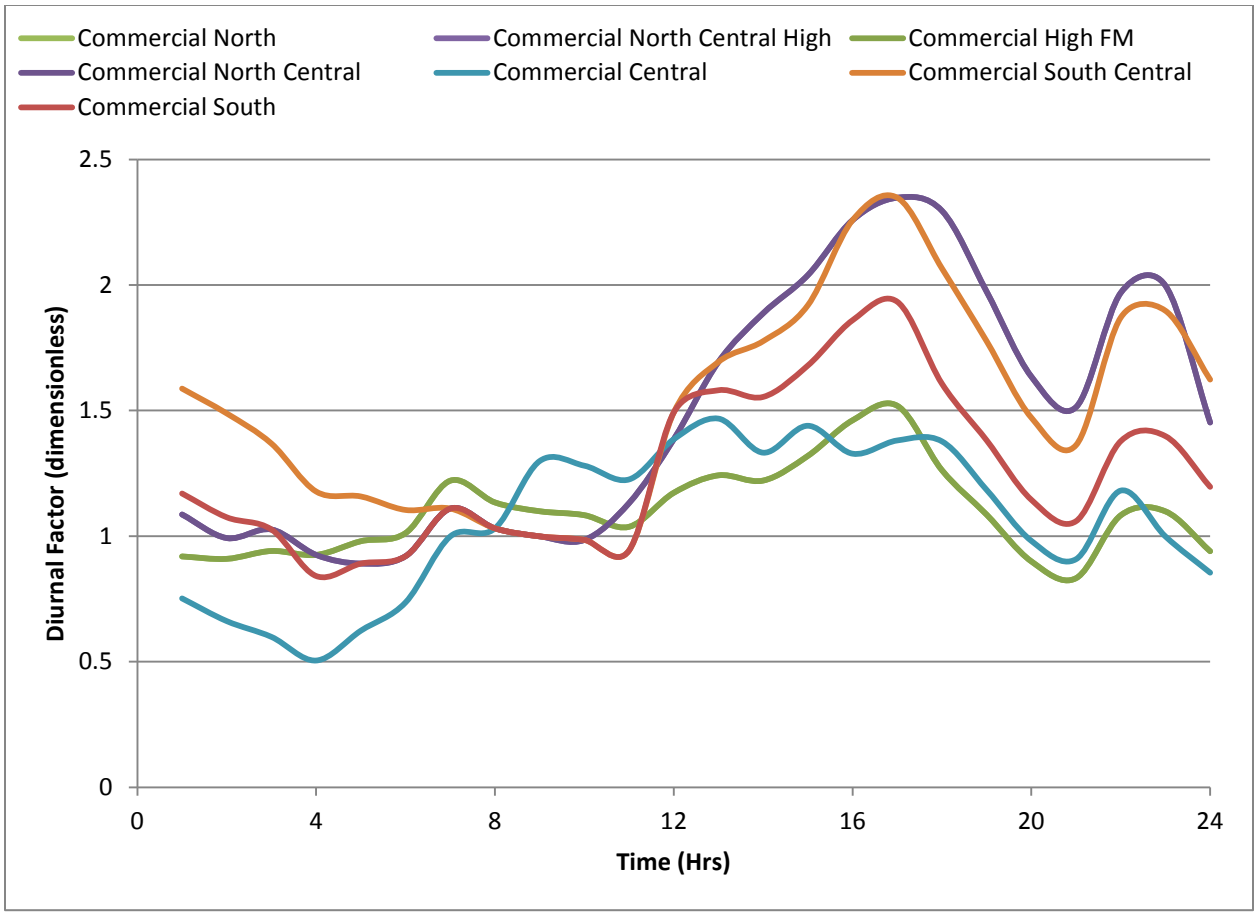

Figure 4-9
Commercial Diurnal Curves, Weekend Calibration Day

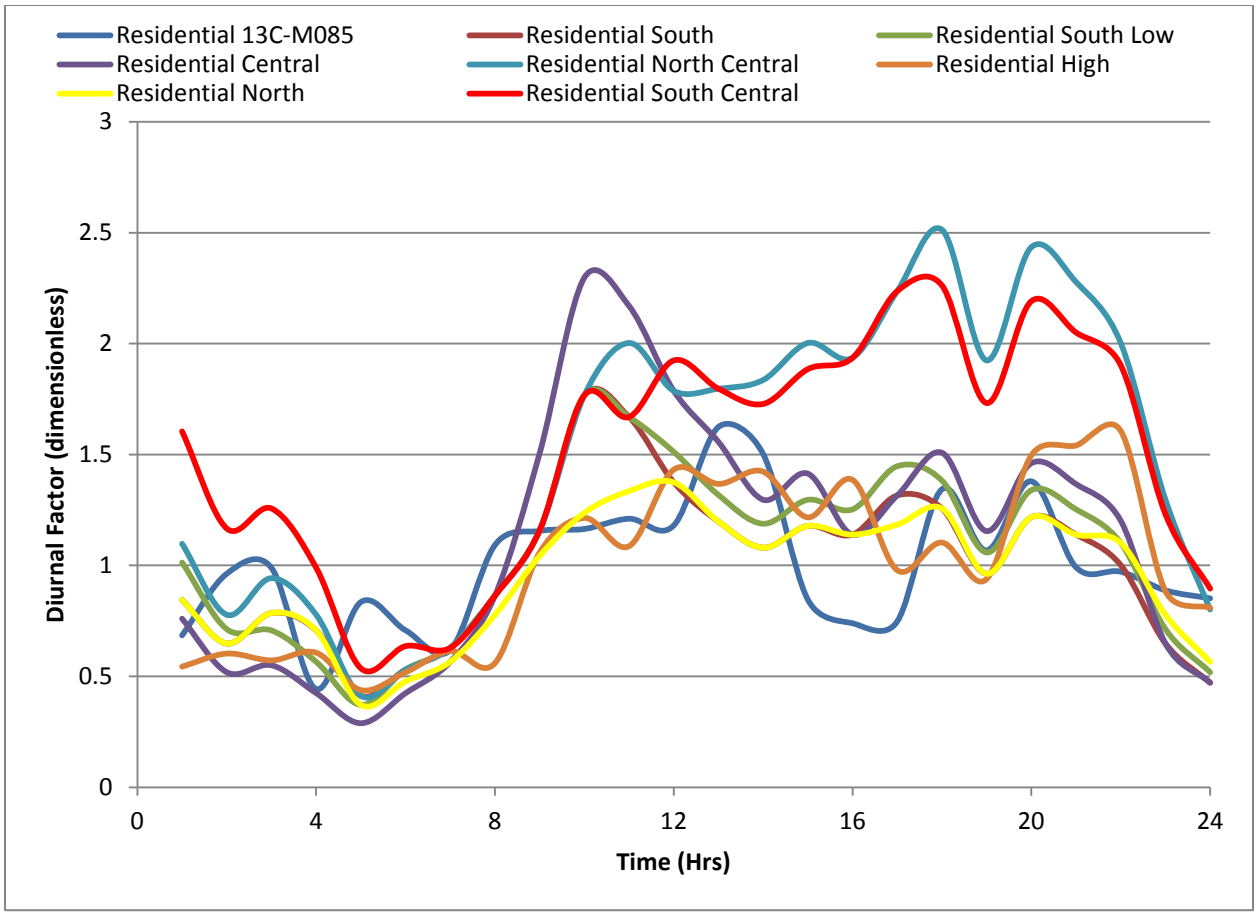

Figure 4-10
Residential Diurnal Curves, Weekend Calibration Day

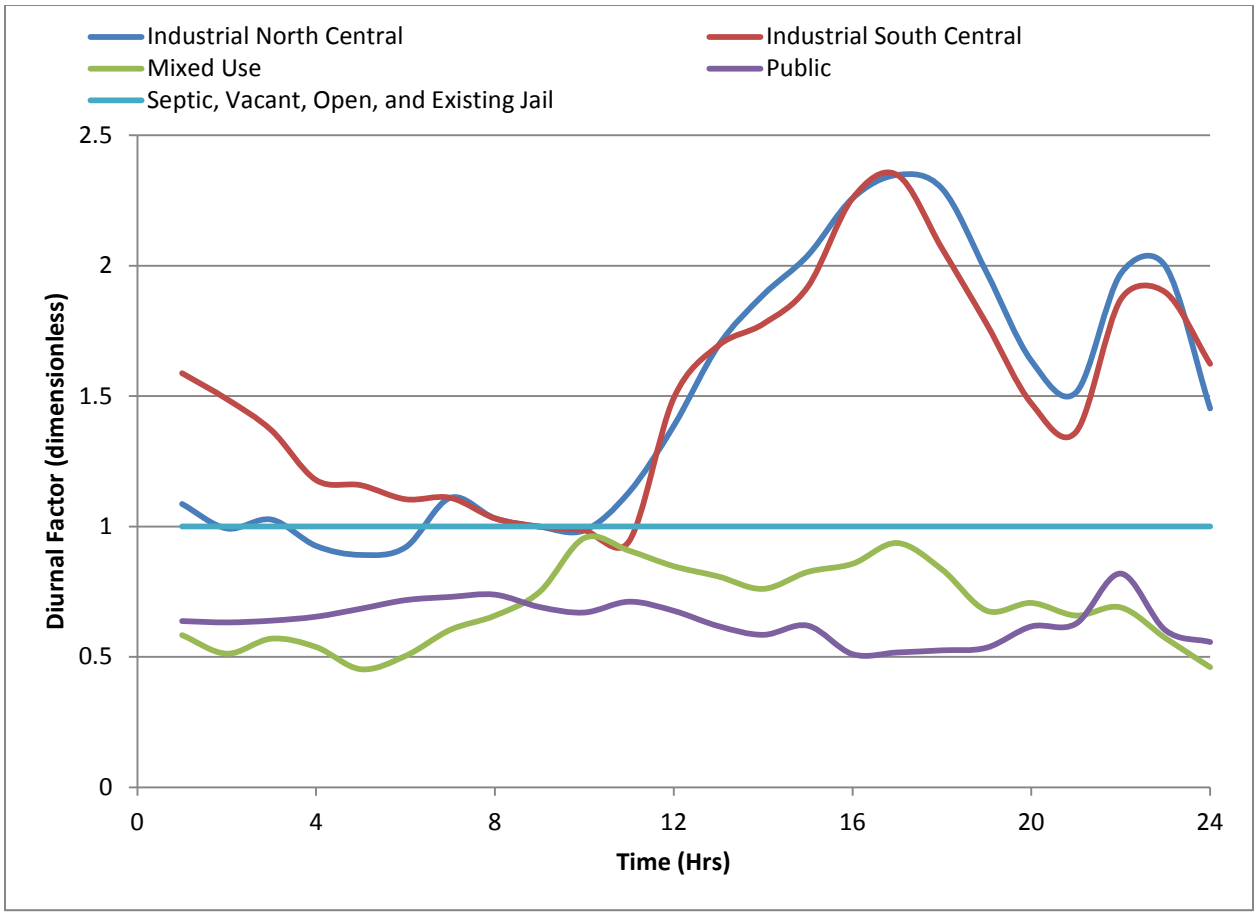

Figure 4-11
Other Diurnal Curves, Weekend Calibration Day

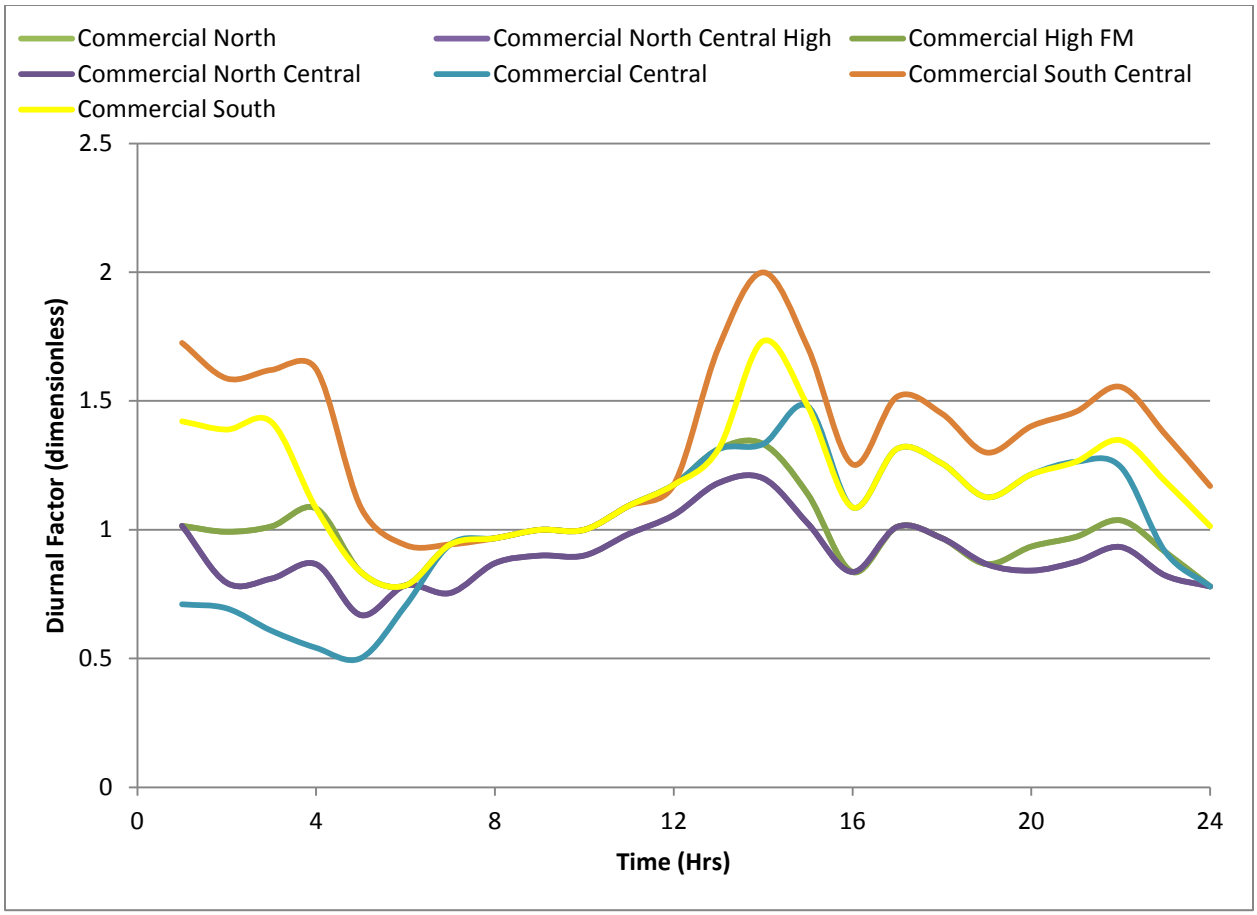

Figure 4-12
Commercial Diurnal Curves, Weekday Calibration Day

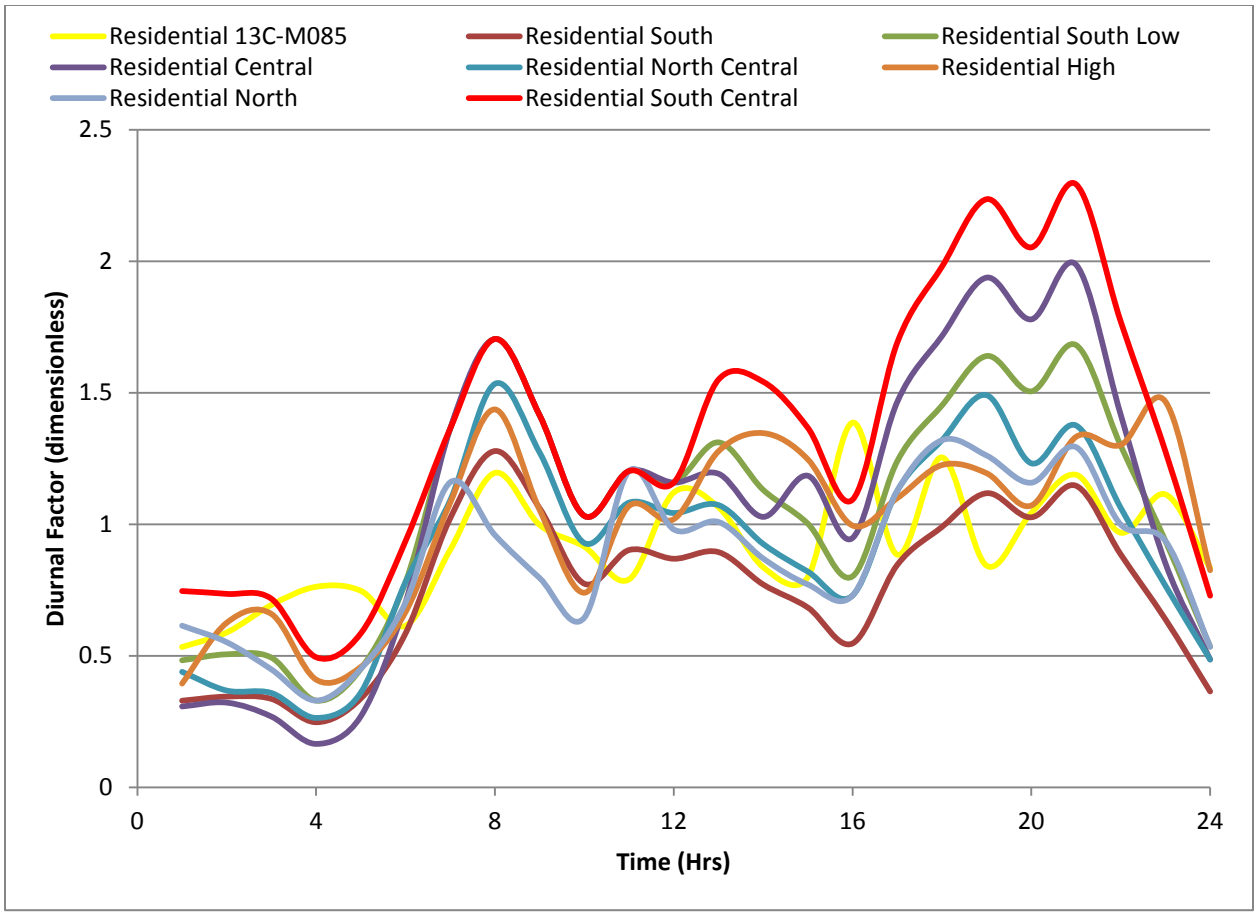

Figure 4-13
Residential Diurnal Curves, Weekday Calibration Day

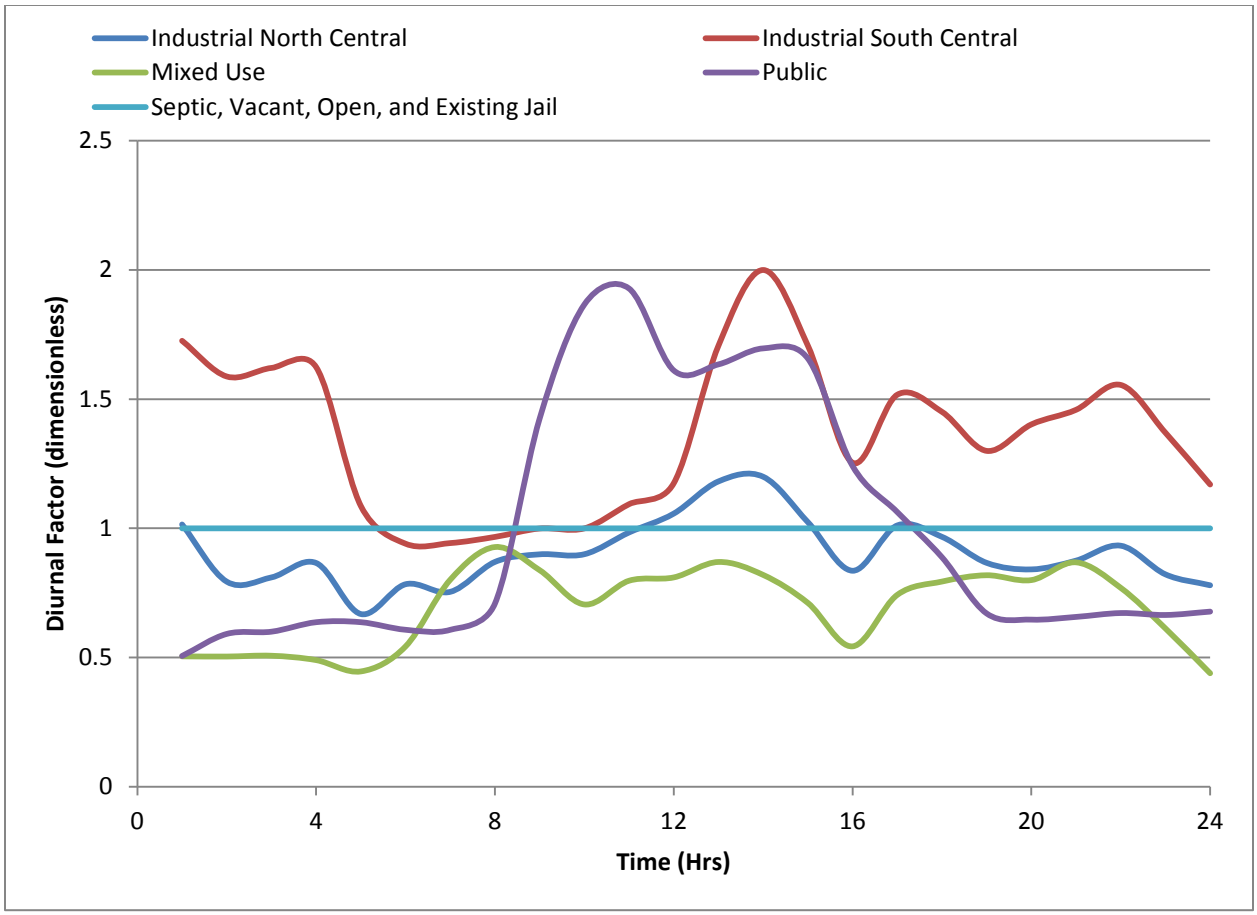

Figure 4-14
Other Diurnal Curves, Weekday Calibration Day

4.4.3 Calibration Results

Once all diurnal curves had been altered and input into the system, a final run was done to assess the difference between modeled results and the flow monitoring data. A threshold value of 15 percent was used to calibrate flows, meaning the diurnal curves and duty factors would be adjusted until modeled results were within 15 percent of the flow monitoring data. One exception to this rule is FM 8, which reports roughly 20 percent higher flows than monitored data. This 20 percent is acceptable as an overestimation of flow due to the importance of matching maximum flow for each calibration FM. In other words, changing this one FM to match the flow monitoring data would adversely affect several other FM points, and thus this overestimation was seen as acceptable so as to get the closest match between monitored and calibrated flows for all 10 monitors.

Table 4-10 and **Table 4-11** summarize calibration results for the modeled weekend and weekday, respectively. Calibration plots for each flow monitor for the weekend and weekday calibration day can be found in **Appendix E**.

Table 4-10
Weekend Day Calibration Results

Flow Monitor Number	Monitor ID	Purpose	Calibration Day Average Flows (gpm)	Model Average Flows (gpm)	Difference Between Calibration Day and Flow Monitor Data (%)
1	13C-M085	Low Density	44.7	49.1	9%
2	12E-M360	Medium Density	69.3	75.4	9%
3	11F-M070	High Density	48.9	57.6	16%
4	9G-M020	Public	4.9	4.9	1%
5	9F-M360	Commercial	43.6	43.9	1%
6	11J-M095	Calibration	1290.0	1466.1	13%
7	10I-M140	Calibration	1700.2	1518.2	-11%
8	10I-M110	Calibration	519.1	638.6	21%
9	7I-M060	Calibration	459.6	425.2	-8%
10	7J-M055	Calibration	952.8	918.1	-4%
N/A	Outfall-1	Calibration	4848.1	5642.8	15%

Table 4-11
Weekday Calibration Results

Flow Monitor Number	Monitor ID	Purpose	Calibration Day Average Flows (gpm)	Model Average Flows (gpm)	Difference Between Calibration Day and Flow Monitor Data (%)
1	13C-M085	Low Density	41.9	44.1	5%
2	12E-M360	Medium Density	53.2	56.7	6%
3	11F-M070	High Density	48.2	55.3	14%
4	9G-M020	Public	7.3	7.7	5%
5	9F-M360	Commercial	39.6	40.1	1%
6	11J-M095	Calibration	1212.0	1271.8	5%
7	10I-M140	Calibration	1587.5	1453.6	-9%
8	10I-M110	Calibration	514.6	626.1	20%
9	7I-M060	Calibration	367.8	380.3	3%
10	7J-M055	Calibration	875.4	828.1	-6%
N/A	Outfall-1	Calibration	4564.2	5098.7	11%

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Section 5
Sewer System Capacity Evaluation

This section summarizes the known (reported) hydraulic condition of the VSD collection system and the modeled (predicted) performance of the system. The section concludes with an overall characterization of the performance of the system based on the results of the reported condition, the predicted condition, and other available data. Evaluation of the collection system capacity is based on the planning and sewer design criteria developed for this Master Plan and provided in **Appendix F**.

5.1 SYSTEM EVALUATION

The sewer system hydraulic model is used to assess the existing system performance. In addition to evaluating the existing system during dry weather conditions, the model is able to evaluate operation of the system during future projected flow conditions (5-year planning and build-out scenarios). Wet weather conditions were not observed during the flow monitoring period; therefore, the model is primarily based on dry weather assessment criteria.

5.1.1 System Evaluation Criteria

Evaluation of a collection system during dry weather involves evaluation of both the capacity and general operational issues. Issues that might lead to dry weather problems include blockages due to roots, fats, oils, and grease. These problems can be exacerbated by the lack of sufficient flushing velocity in the pipe. Due to the random nature of these problems, it is impossible to accurately simulate their effects in a hydraulic model without site specific information. However, there is general information from the model that can assist with the identification of potential problem areas due to these causes. While there are many reasons for line blockages, one major component is that solids and debris will settle out in sewers that experience low velocities during dry weather. The hydraulic model can be used to identify potential problem areas within the sewer system.

System capacity evaluation criteria were established for the VSD system to determine the level of service the collection system must meet. Criteria are shown in the Sewer System Planning and Design Criteria Technical Memorandum (TM) shown in **Appendix F**. These evaluation criteria are used to evaluate the hydraulic model results.

The model is used to evaluate three different conditions: existing conditions, 5-year planning horizon, and future conditions. Future conditions attempt to model the worst case scenario (i.e. the system under full build-out conditions). For the VSD model, the existing weekend flow is slightly greater than the existing weekday flow and is therefore considered the worst case scenario. The criteria used to evaluate dry weather flow for all the flow conditions include:

- All modeled pipes in the existing and 5-year scenario with a d/D ratio (depth of flow in pipe divided by the pipe diameter) greater than the design criteria (d/D ratio of 0.5 or less

for pipes smaller than 18 in. in diameter, ratio of 0.75 or less for pipes 18-in. or greater in diameter) are documented and reviewed

- All modeled pipes in the build-out scenario with a d/D ratio equal to or greater than 0.9 are reviewed for potential improvement

5.1.2 Existing System Evaluation

The VSD hydraulic model was used to evaluate the system deficiencies for the existing system. In order to evaluate the system, the model was run under the known existing conditions and flows, as calibrated to the flow monitoring data. Once the model was run, the maximum d/D for each pipe in the system that received flow was analyzed, and any pipes that flowed over design capacity were identified.

Pipes 18-inches or more in diameter with a d/D greater than 0.75, and pipes less than 18-inches in diameter that with a d/D over 0.50 were identified in the hydraulic model. Furthermore, any pipes with a d/D greater than 1.0 were identified as a surcharged pipe. **Table 5-1** shows the results of this analysis for each of the three scenarios for both a typical weekend day and weekday under existing conditions.

Table 5-1
Summary of Surcharged and Impacted Pipes

	Existing Scenario	5-Year Scenario	Build-out Scenario
Number of Surcharged Pipes	81	108	409
Number of Pipes above Design Capacity	235	295	832
Total Number of VSD Modeled Pipes	3422	3422	3422
% of Surcharged Pipes	2.4%	3.2%	12.0%
% of Pipes above Design Capacity	6.9%	8.6%	24.3%

Surcharged and over capacity areas are investigated to determine the significance of the overrun. Some surcharged areas reported in the model may be artificial due to insufficient data in an area or assumptions made during the model development process. Some examples are presented below:

1. Missing data for pipe inverts often results in interpolation of incorrect invert elevations which may cause surcharge in pipelines during a model simulation.
2. Other pipes reported as surcharged in the model may be due to flows from an upstream tributary area being loaded onto a single manhole that marks the start of the downstream modeled pipe network. While all the flow from such a tributary area may be accounted for in the model, all of the individual pipes in this area may not be modeled due to the pipes not being the most downstream node in their respective sewershed. Under this configuration, the model does not include the same natural attenuation of peak flows that would normally occur as flow is routed through the upstream pipe network. If the model

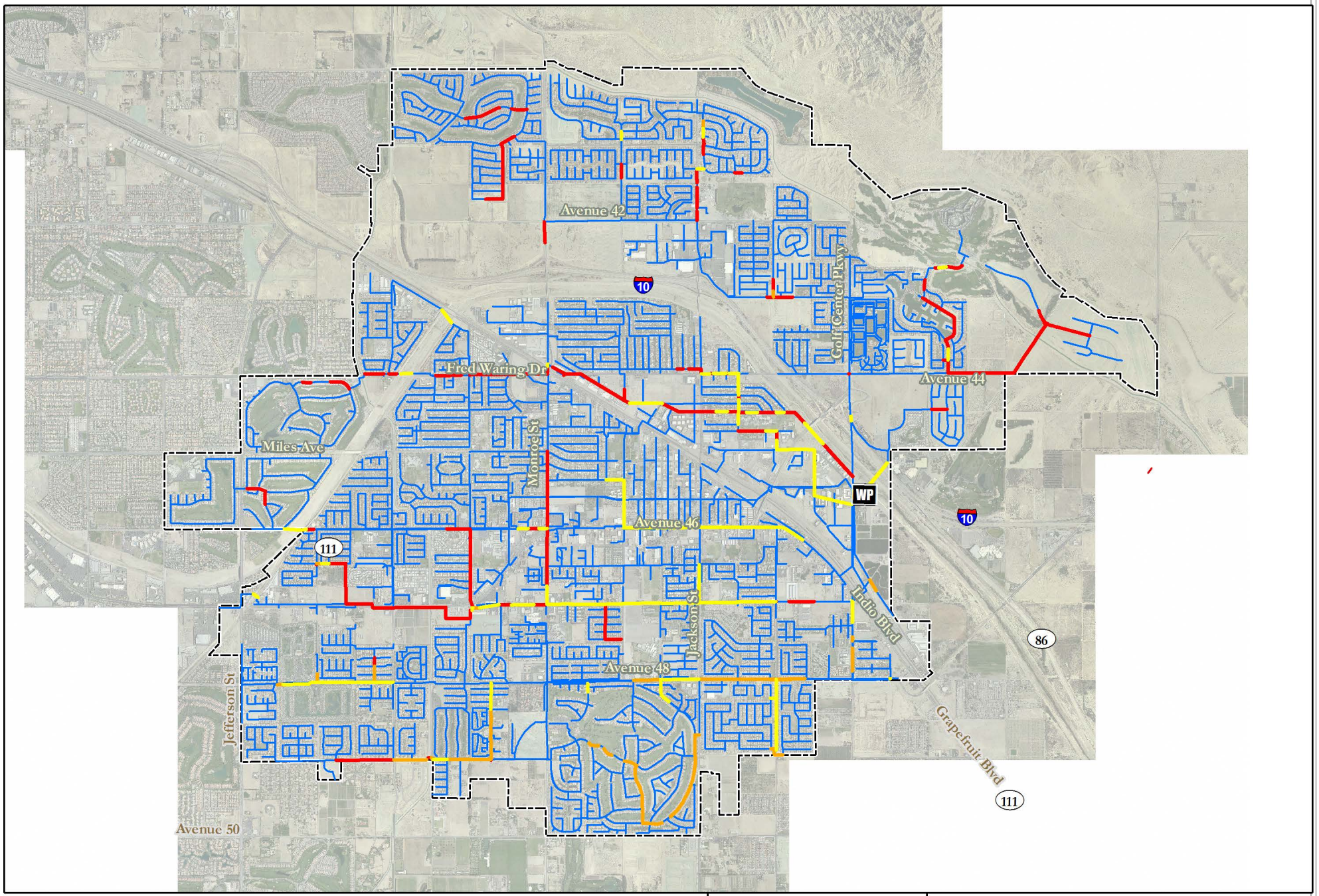
predicts surcharge in a single pipe located at the very upstream reach of the modeled network and is immediately downstream of an upstream catchment's load point, this surcharge can most often be ignored.

3. In conversations with Bentley it was explained that the SewerGEMS software sometimes encounters problems when iterating flow calculation for pipes with no flows assigned to them. This software glitch may cause an instantaneous HGL reading for a pipe even if there is no flow in the pipe. Therefore, a pipe may show a maximum HGL above design capacity in some cases where there is no actual flow modeled in the pipe. Areas such as these were removed from **Figure 5-1** as they did not represent actual capacity issues in the system. Bentley has not indicated when this program glitch may be resolved.

The following sections discuss all areas modeled as impacted for the existing, 5-year, and build-out scenarios. Any area of the system that registered a surcharged or over capacity pipe was verified by reviewing hydraulic profiles. From this process, certain areas of the system were identified as areas of concern (AOCs) for one or more of the scenarios. These areas are discussed in more detail the following sections. **Table 5-2** lists these AOCs and gives the pertinent cross streets for the impacted areas. **Figure 5-1** shows where these areas are found on the VSD district map. In **Figure 5-1**, yellow areas indicate pipes that were identified as AOCs during the existing system analysis; orange areas indicate additional pipes that were identified as AOCs during the 5-Year system analysis; and red areas indicate additional pipes that were identified as AOCs during the build-out system analysis.

Table 5-2
Areas of Concern (AOCs)

AOC Number	Location	Cross Street
Existing System Evaluation		
1	Dr. Carreon Blvd/ Highway 111	Dr. Carreon Blvd. from Monroe St. to Calhoun St.
2	Jackson St. and Dr. Carreon Blvd.	Date St. and Arabia St. to Dr. Carreon Blvd and Jackson St.
3	Highway 111 North	Highway 111 and Arabia St. to Oak St. and Indio Blvd.
4	Avenue 48 West	Avenua 48 between Jefferson St. and Shields Rd. to Avenue 48 and Madison St.
5	Dillon Ave./ Avenue 45	Palo Verde Ave. and Dillon Ave, ending between Avenue 45 and Interstate 10
6	Palo Verde St. / Avenue 44	Avenue 44 and Jackson St. to Palo Verde Ave. and Sonora Ave.
7	Sola St.	Oleander Ave. between Sola St. and Arabia St. to El Paseo Ave. and Sola St.
5-Year Planning Horizon System Evaluation		
8	Desert Grove Dr.	Desert Grove Dr. between Avenue 49 and Avenue 48
9	Avenue 49	Orchard Dr. and Avenue 49 to Desert Grove Dr. and Avenue 9
Build-Out System Evaluation		
10	Avenue 44/ Terra Lago Parkway	Not Applicable, see description below
11	Lago Vista	Lago Brezza Dr. and Armonia Ct. to Avenue 44 and Lago Vista
12	Avenue 46	Avenue 46 from east of Clinton St. to Monroe st.



Key to Features

- WP — Wastewater Treatment Plant
- Valley Sanitary District Boundary
- AOCs identified in existing system analysis
- Additional AOCs identified in 5-year system analysis
- Additional AOCs identified in build-out system analysis
- Non-impacted pipes

N 0 0.5 1 Miles

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Date: September 3, 2013

Valley Sanitary District Areas of Concern (AOC)

MWH.

Figure 5-1

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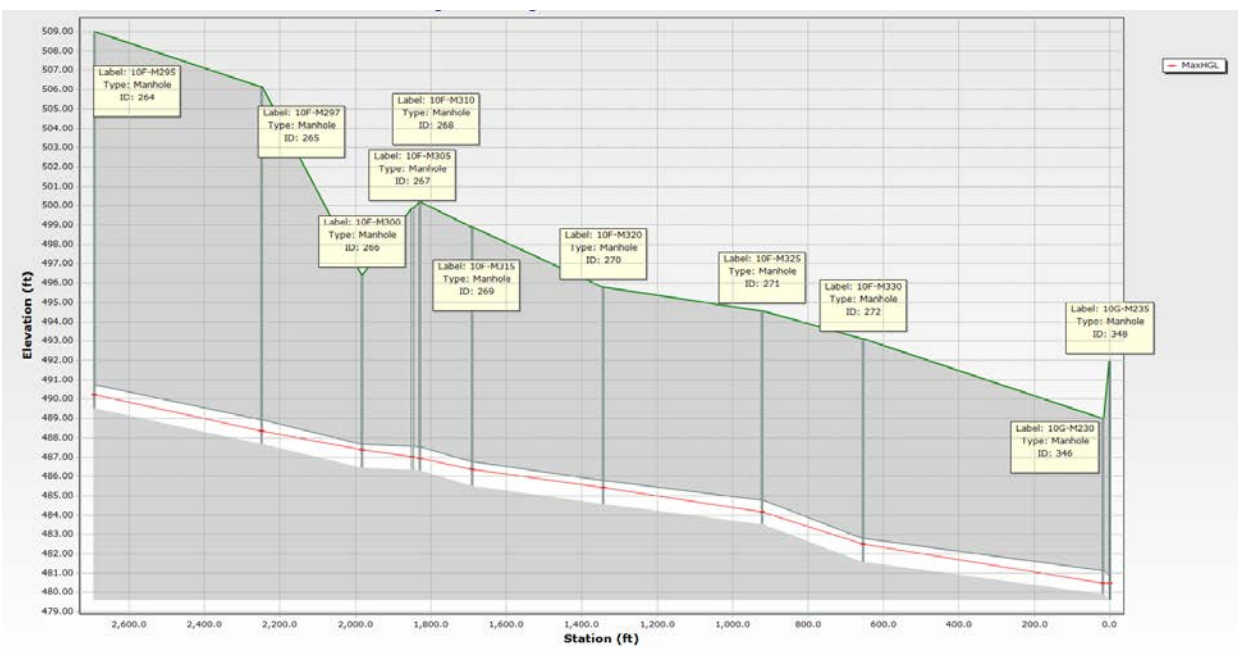
Dr. Carreon Blvd/ Highway 111

The most impacted area in the model for all three scenarios is the Dr. Carreon Blvd. and Highway 111 corridor in the southeast portion of the system. This area of the system sees surcharged and over capacity pipes which then affects tributary pipes along the main pipeline. Due to the severity of the flow problems in this area, several Capital Improvement Program (CIP) recommendations are made to address different sections of this street and to divert flows into nearby trunk lines and interceptors that are sized to handle such flows. **Figure 5-2** through **Figure 5-4** shows profiles for the main line along Dr. Carreon under existing conditions, while **Figure 5-5** through **Figure 5-7** shows the 5-year scenario, and **Figure 5-8** through **Figure 5-10** shows the build-out scenario. In these figures, the red tick marks at each manhole location denote the maximum HGL for each manhole. The profiles are presented in three segments as follows:

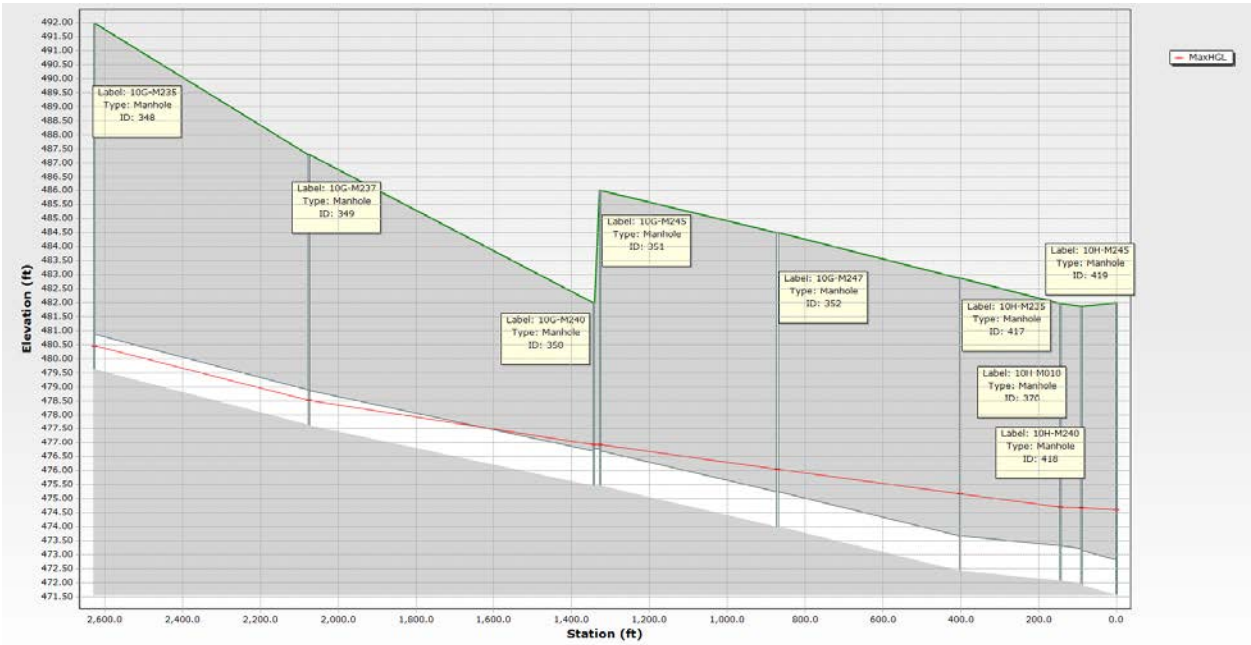
- **Segment 1:** runs from manhole 10F-M295 to 10G-M235. This corresponds to the pipeline running under Dr. Carreon Blvd from Monroe St. to Arabia St.
- **Segment 2:** runs from manhole 10G-M235 to 10H-M245. This corresponds to the pipeline running under Dr. Carreon Blvd from Arabia St. to Jackson St.
- **Segment 3:** runs from manhole 10H-M245 to 10I-M130. This corresponds to the pipeline running under Dr. Carreon Blvd from Jackson St. to Calhoun St.

Figure 5-2
Dr. Carreon Blvd/ Highway 111 under Existing Conditions (Segment 1)



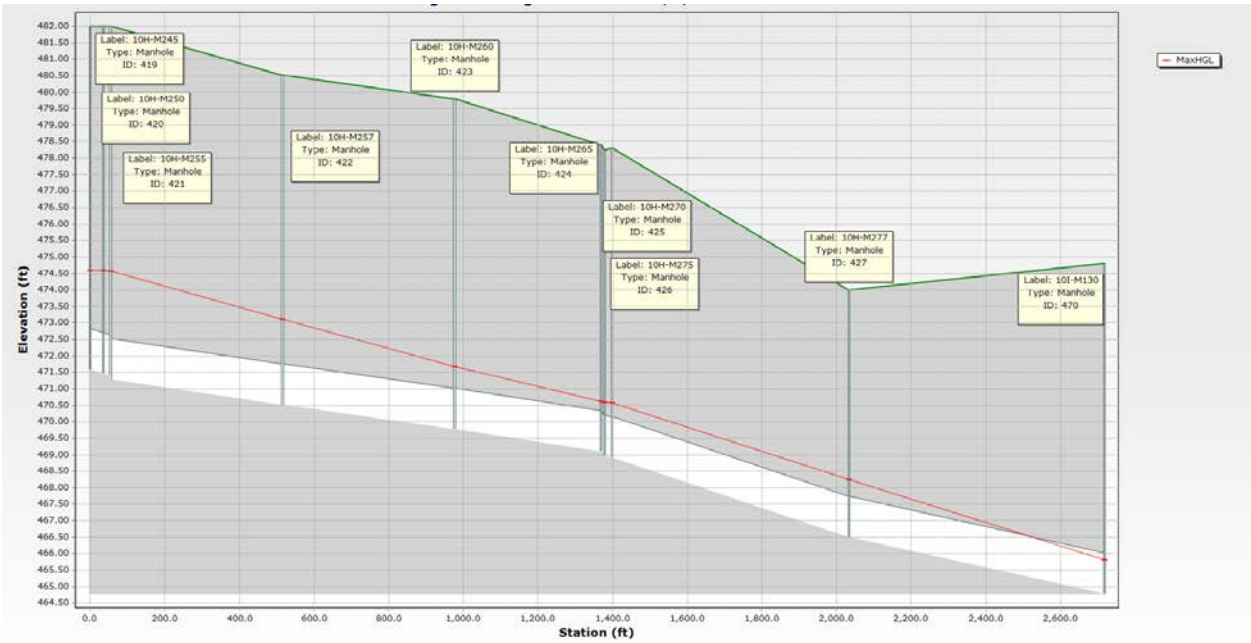
Start: Dr. Carreon Blvd and Monroe St. End: Dr. Carreon Blvd. and Arabia St.

Figure 5-3
Dr. Carreon Blvd/ Highway 111 under Existing Conditions (Segment 2)



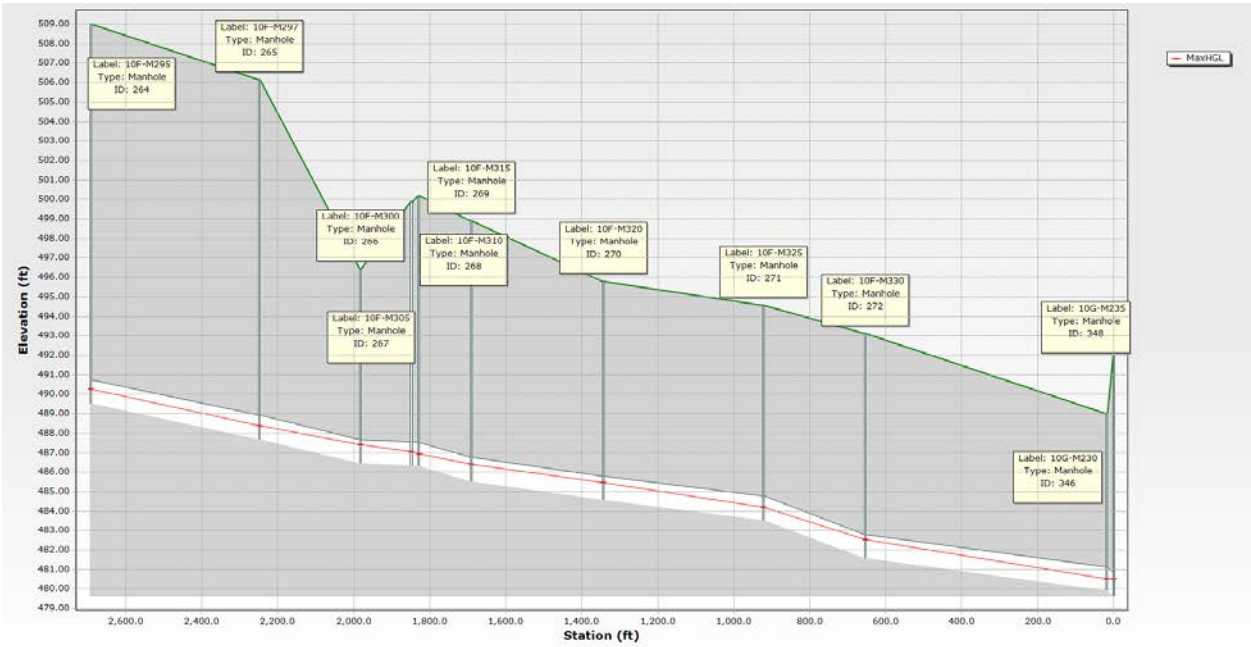
Start: Dr. Carreon Blvd. and Arabia St. End: Dr. Carreon Blvd. and Jackson St.

Figure 5-4
Dr. Carreon Blvd/ Highway 111 under Existing Conditions (Segment 3)



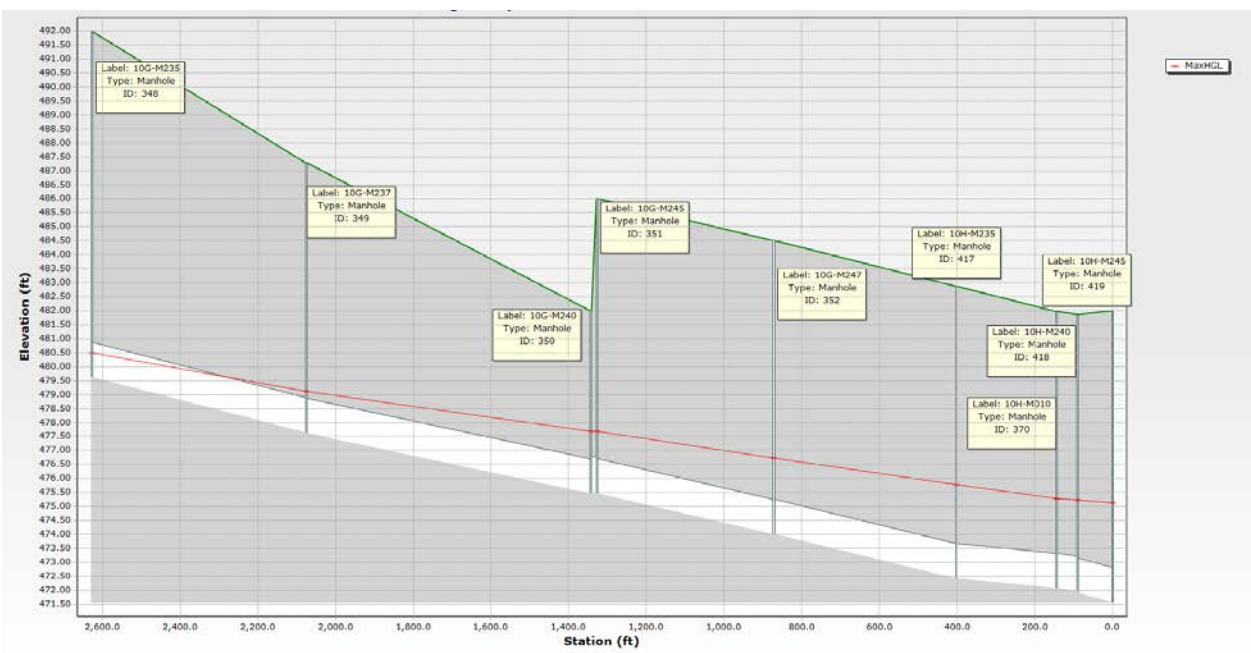
Start: Dr. Carreon Blvd. and Jackson St. End: Dr. Carreon Blvd. and Calhoun St.

Figure 5-5
Dr. Carreon Blvd/ Highway 111 under 5-Year Planning Conditions (Segment 1)



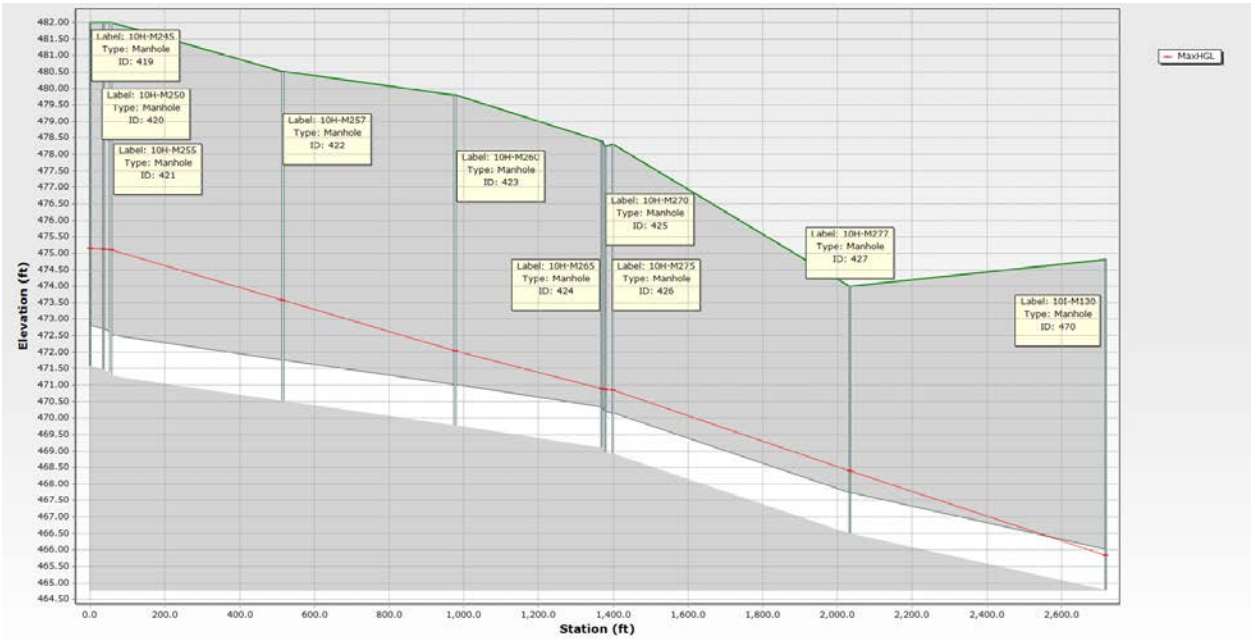
Start: Dr. Carreon Blvd and Monroe St. End: Dr. Carreon Blvd. and Arabia St.

Figure 5-6
Dr. Carreon Blvd/ Highway 111 under 5-Year Planning Conditions (Segment 2)



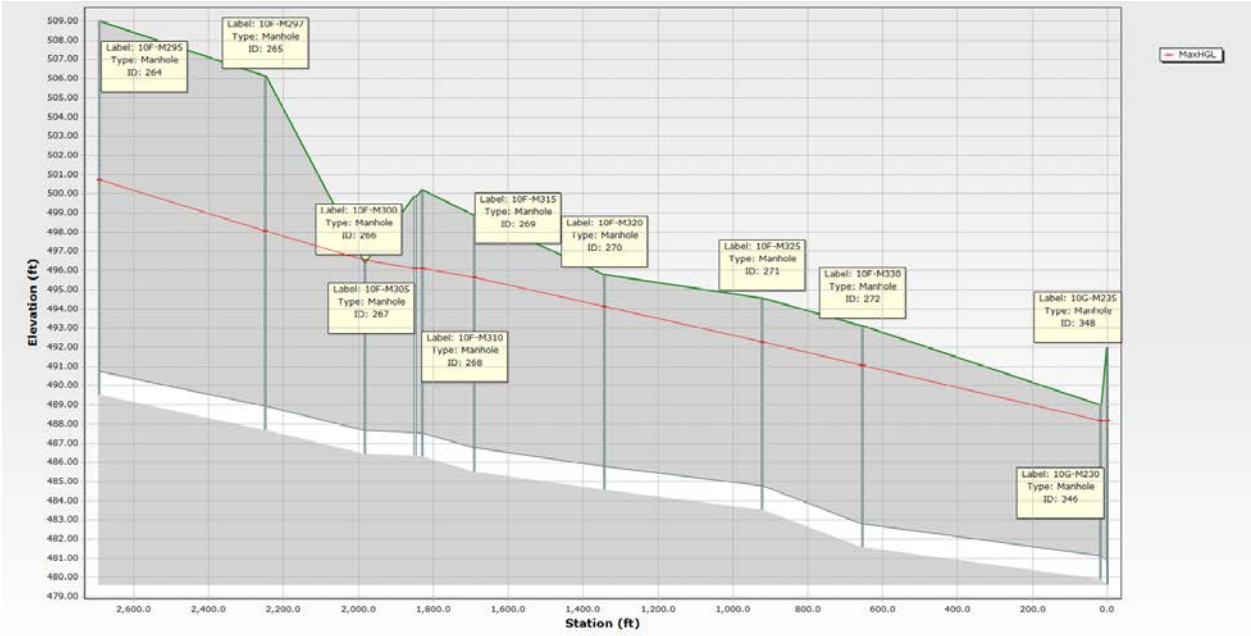
Start: Dr. Carreon Blvd. and Arabia St. End: Dr. Carreon Blvd. and Jackson St.

Figure 5-7
Dr. Carreon Blvd/ Highway 111 under 5-Year Planning Conditions (Segment 3)



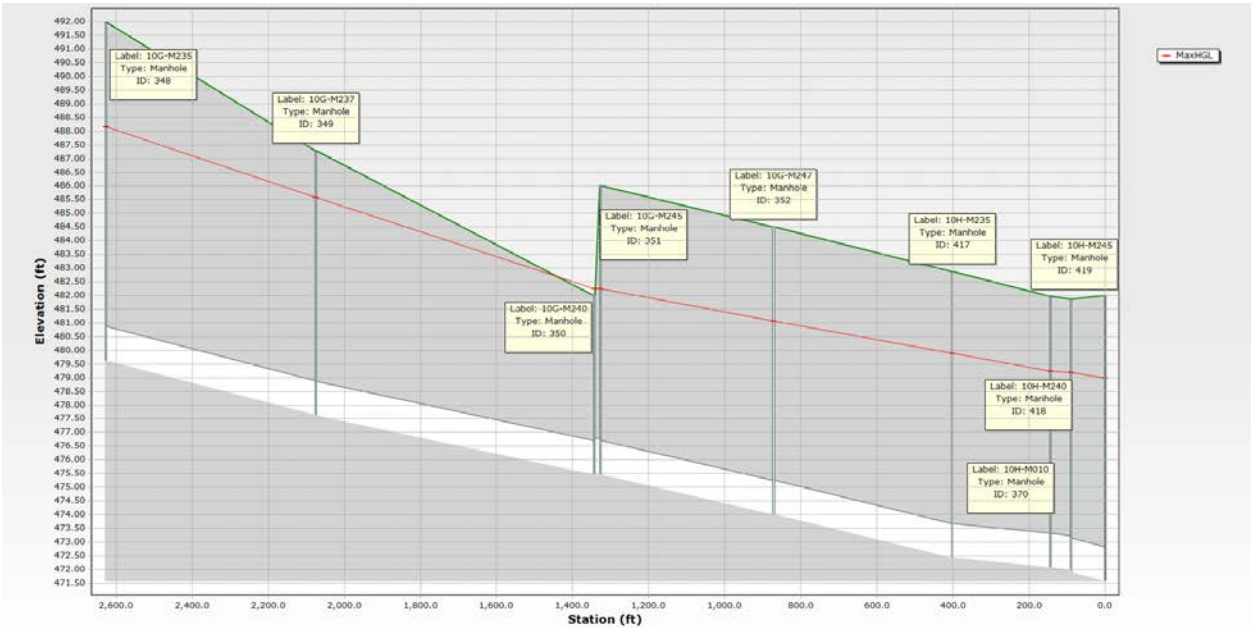
Start: Dr. Carreon Blvd. and Jackson St. End: Dr. Carreon Blvd. and Calhoun St.

Figure 5-8
Dr. Carreon Blvd/ Highway 111 under Build-Out Conditions (Segment 1)



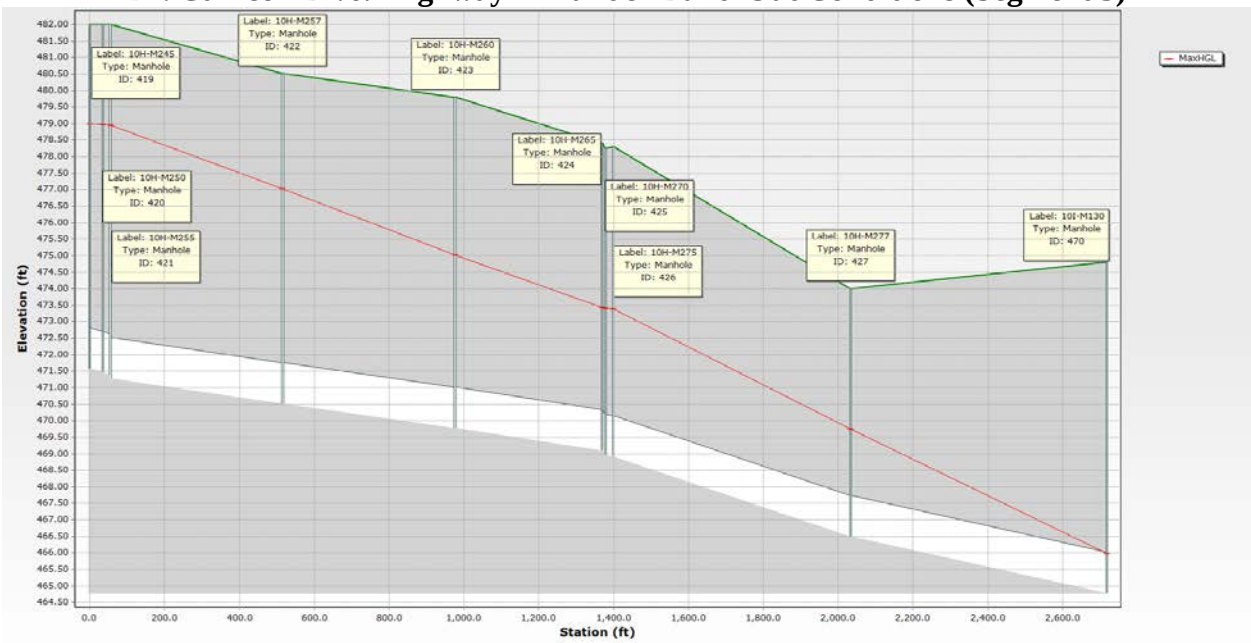
Start: Dr. Carreon Blvd and Monroe St. End: Dr. Carreon Blvd. and Arabia St.

Figure 5-9
Dr. Carreon Blvd/ Highway 111 under Build-Out Conditions (Segment 2)



Start: Dr. Carreon Blvd. and Arabia St. End: Dr. Carreon Blvd. and Jackson St.

Figure 5-10
Dr. Carreon Blvd/ Highway 111 under Build-Out Conditions (Segment 3)



Start: Dr. Carreon Blvd. and Jackson St. End: Dr. Carreon Blvd. and Calhoun St.

The previous profiles show that, even under existing conditions, the 15-inch pipeline running under Dr. Carreon Blvd. is showing surcharging at many manholes, and over-capacity pipes. As the planning scenario progresses, these issues are exacerbated and more pipes become surcharged. The severity of these capacity issues also cause full and over-capacity pipes in the lines feeding into the 15-inch pipeline along Dr. Carreon Blvd. These tributary issues can be seen in **Figure 5-1**.

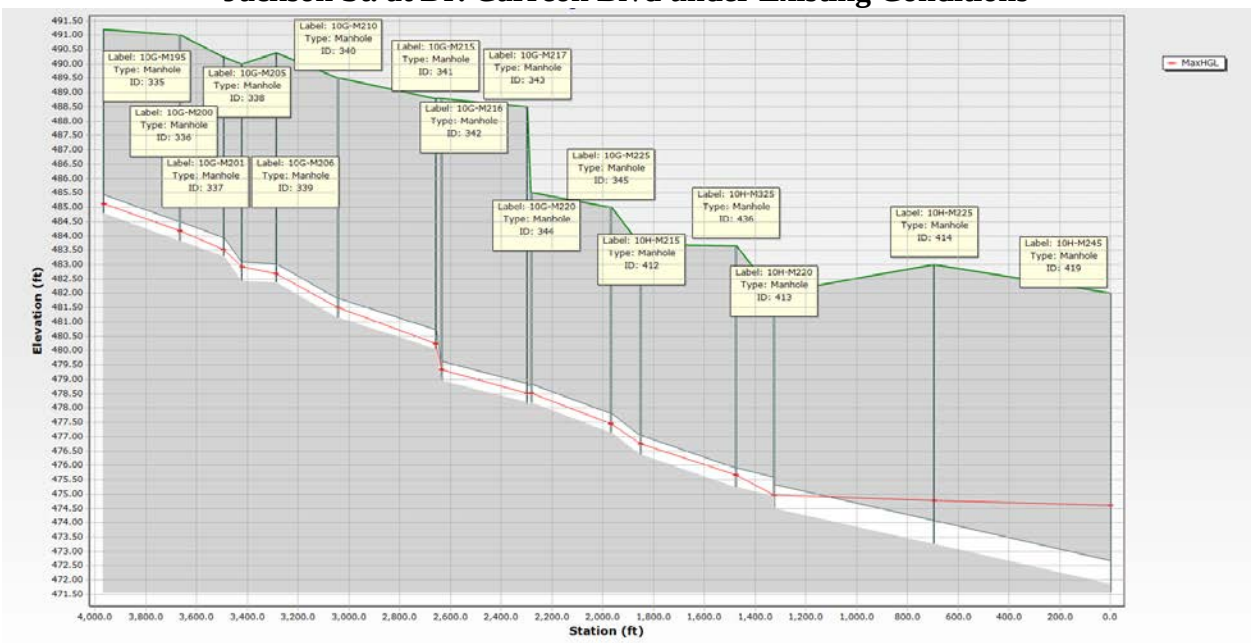
The cause of these hydraulic issues seems to be a pure capacity issue. Currently, there is too much flow being sent to this 15-inch line along Dr. Carreon Blvd. In order to address these hydraulic issues, the CIP will address ways to divert flow from Dr. Carreon Blvd. to trunk lines in the system that are capable of handling the amount of flow.

In the existing system, issues on Dr. Carreon extend from Calhoun St. in the east, to Clinton St. in the west. In the 5-year planning scenario, the same stretch of pipeline is affected as in the existing scenario; however, there are a higher percentage of surcharged pipes along that stretch. Finally, for the build-out scenario, impacts are seen from Calhoun St. to the east to Shield Rd. in the west, with an even higher amount of surcharged pipes and manholes, and a much more pronounce effect on tributary lines along that stretch.

Jackson St. and Dr. Carreon Blvd.

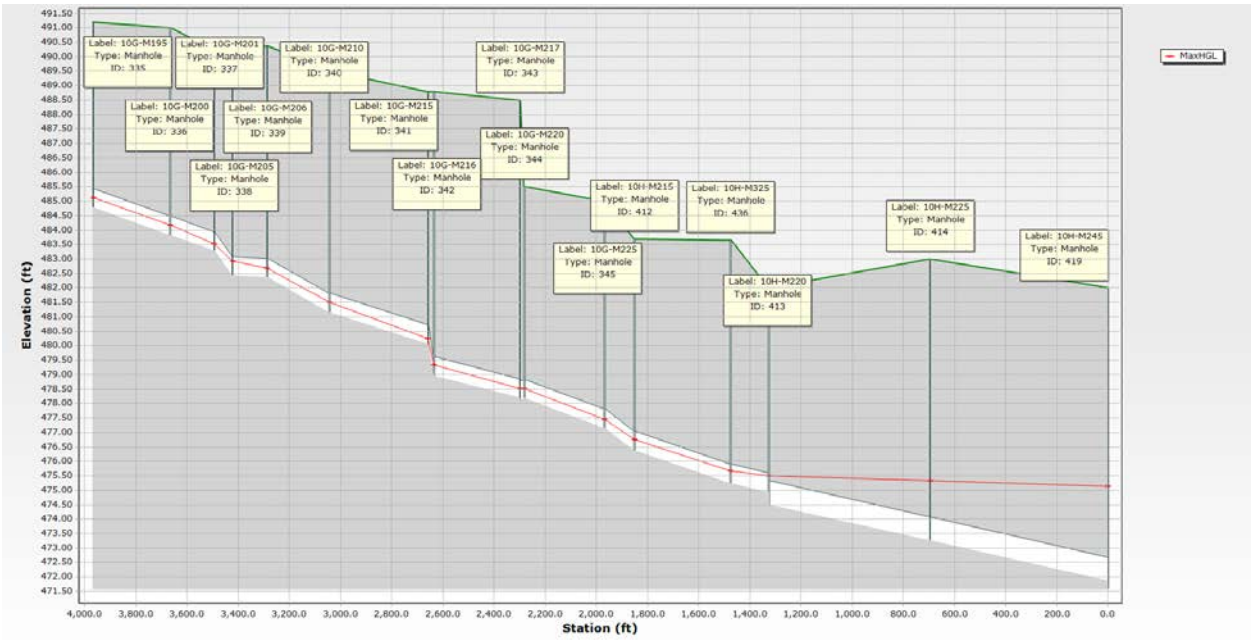
While most of the hydraulic issues tributary to Dr. Carreon Blvd. are due to backups in the lines as those pipes reach Dr. Carreon Blvd., the hydraulic capacity issue on Jackson St. north of Dr. Carreon Blvd is due both to backup along Dr. Carreon Blvd., as well as to the physical layout on of the pipes on Jackson. As shown on **Figure 5-11** through **Figure 5-13**, issues occur from manhole 10H-M245 to manhole 10G-M195. In the 5-year planning and build-out scenarios, issues occur along the same stretch; however the d/D for each pipe gets higher for each pipe section in the 5-year planning and build-out scenarios. This pipe section is the pipe that runs along Jackson St. from Date Ave. to Dr. Carreon Blvd., and then west to the intersection of Arabia St. and John Nobles Ave. (also referred to as Date Ave.).

Figure 5-11
Jackson St. at Dr. Carreon Blvd under Existing Conditions



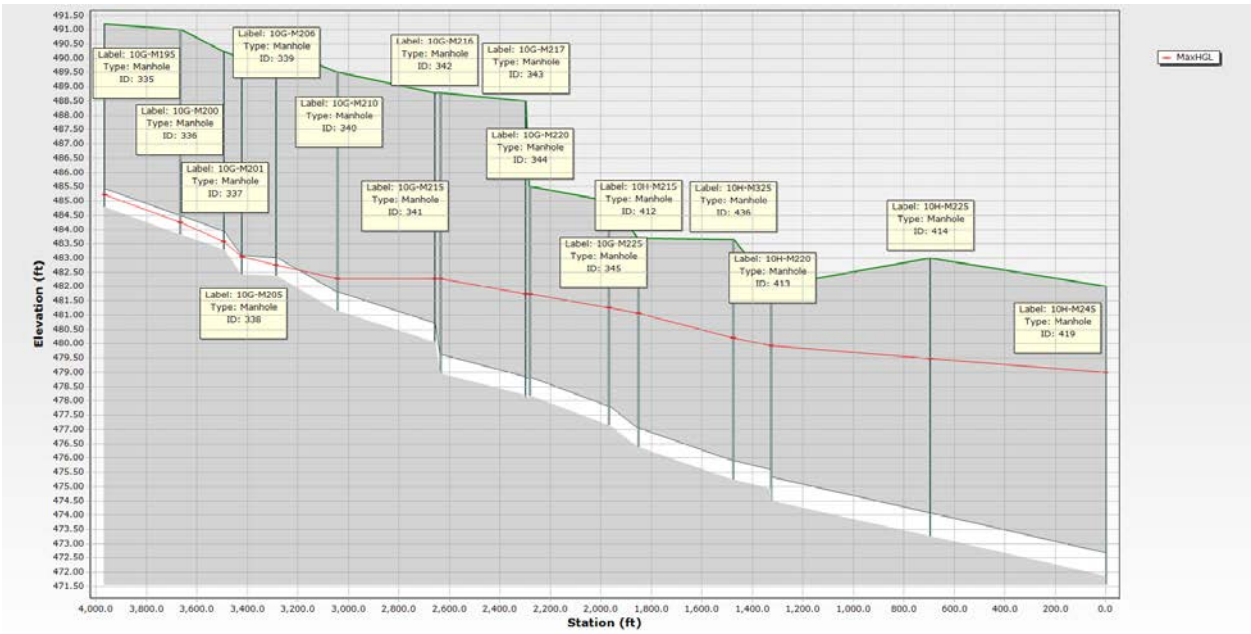
Start: Date St. and Arabia St. End: Dr. Carreon Blvd and Jackson St.

Figure 5-12
Jackson St. at Dr. Carreon Blvd under 5-Year Conditions



Start: Date St. and Arabia St. End: Dr. Carreon Blvd and Jackson St.

Figure 5-13
Jackson St. at Dr. Carreon Blvd under Build-Out Conditions



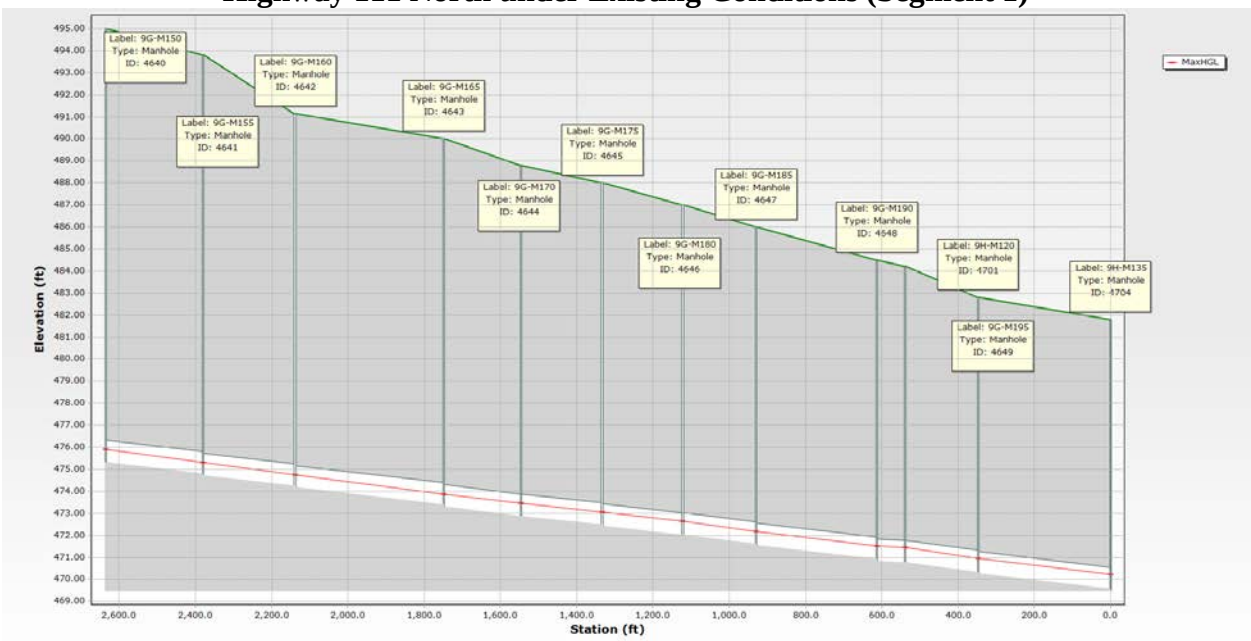
Start: Date St. and Arabia St. End: Dr. Carreon Blvd and Jackson St.

Highway 111 North

This area of the system shows capacity issues beginning at Oak St. and Indio Blvd. At this point, the line running under Indio Blvd (Highway 111) changes from a 15-inch pipeline to an 18-inch pipeline. It is at this change in pipe diameter size that the capacity issues begin. These capacity issues, which in the existing scenario consist only of over-capacity pipes and no surcharged pipes, extend from Oak St. and Indio Blvd. to the intersection of Highway 111 and Arabia St. In the 5-year and build-out scenarios, the impacted section is the same, but there are more surcharged pipes for each progressive scenario. **Figure 5-14** and **Figure 5-15** show profiles for this section for the existing conditions, while **Figure 5-16** and **Figure 5-17** show the 5-year planning scenario, and **Figure 5-18** and **Figure 5-19** the build-out scenario. The profiles are split into two segments where:

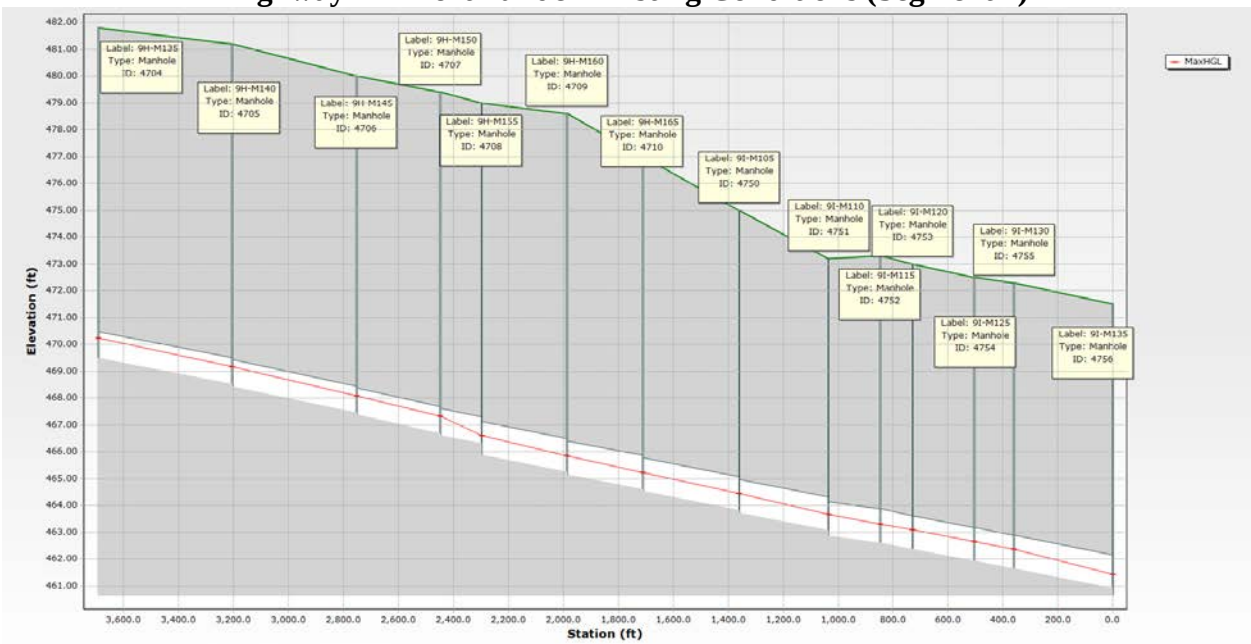
- **Segment 1:** Extends along Highway 111 from manhole 9G-M150 at Arabia St. to manhole 9H-M135 at Jackson St.
- **Segment 2:** Extends from manhole 9H-M135 at the intersection of Jackson St. and Highway 111, to manhole 9I-M135 at Oak St. and Indio Blvd.

Figure 5-14
Highway 111 North under Existing Conditions (Segment 1)



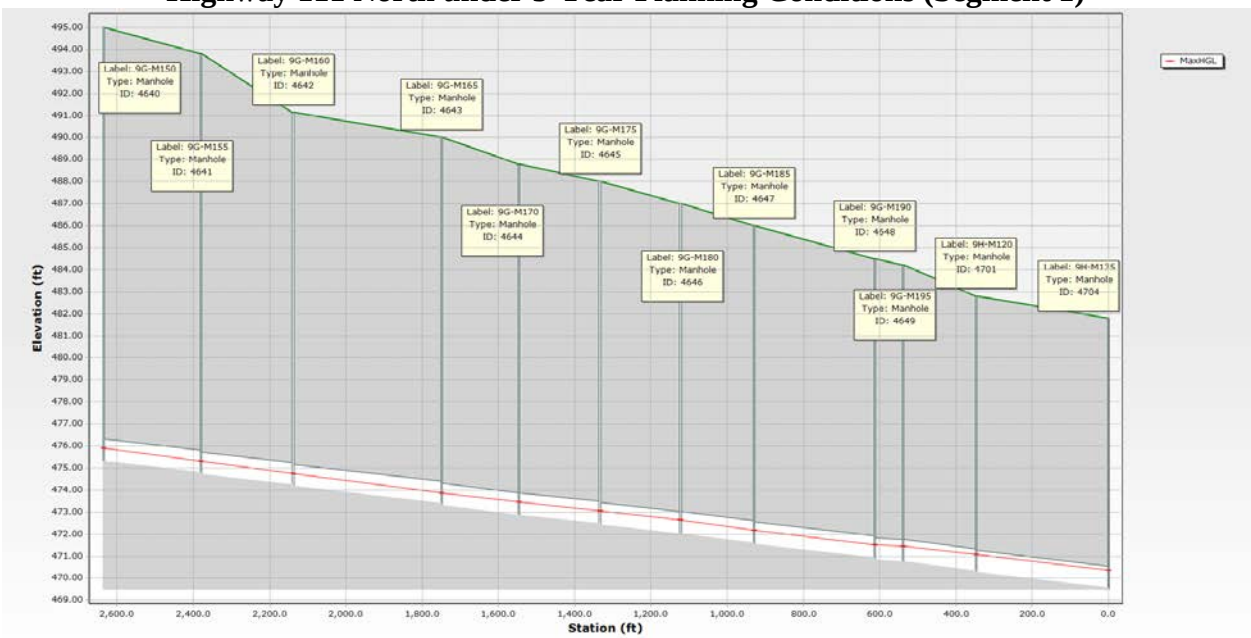
Start: Highway 111 and Arabia St. End: Highway 111 and Jackson St.

Figure 5-15
Highway 111 North under Existing Conditions (Segment 2)



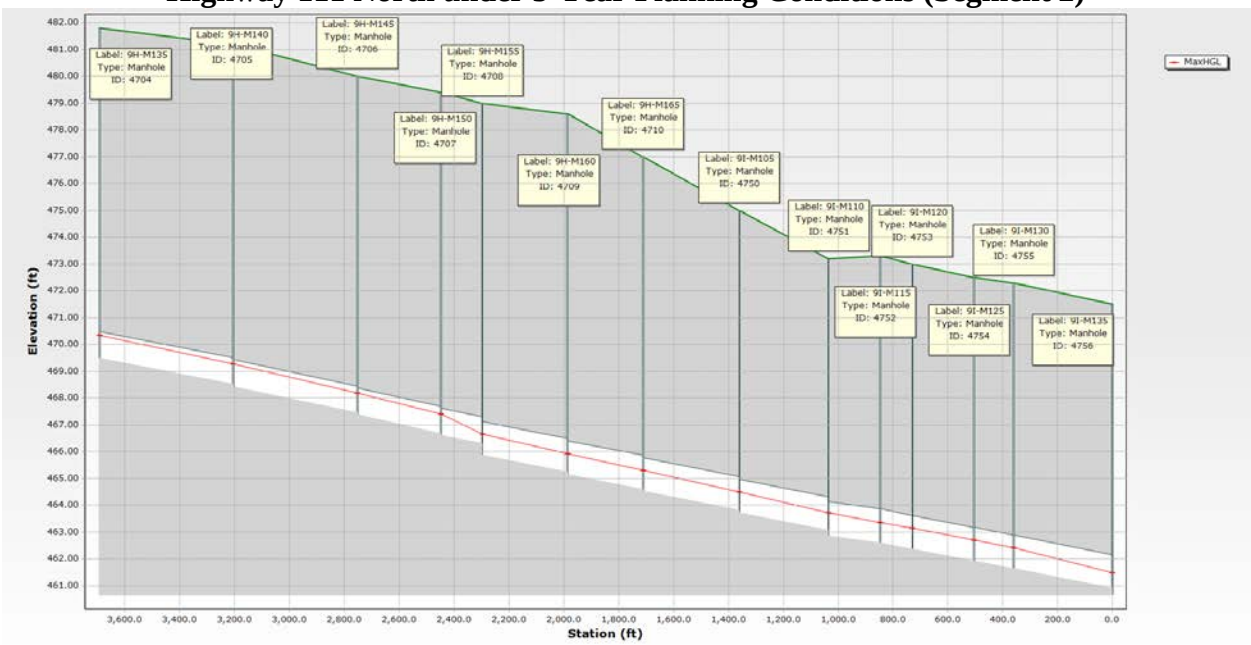
Start: Highway 111 and Jackson St. End: Oak St. and Indio Blvd.

Figure 5-16
Highway 111 North under 5-Year Planning Conditions (Segment 1)



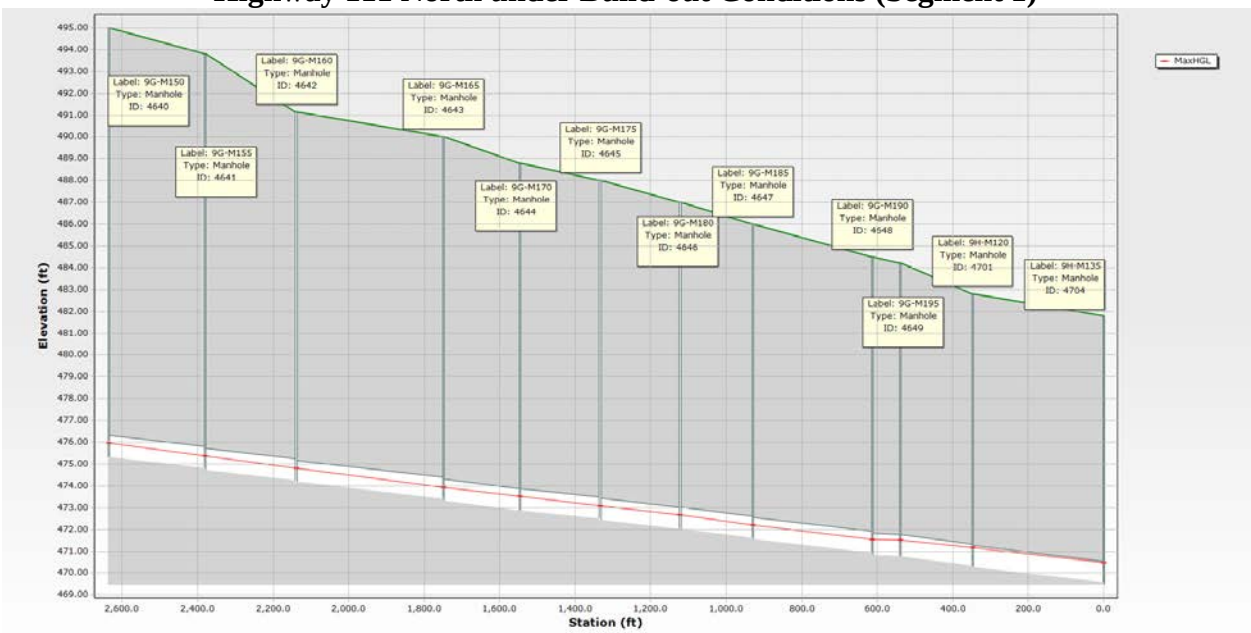
Start: Highway 111 and Arabia St. End: Highway 111 and Jackson St.

Figure 5-17
Highway 111 North under 5-Year Planning Conditions (Segment 2)



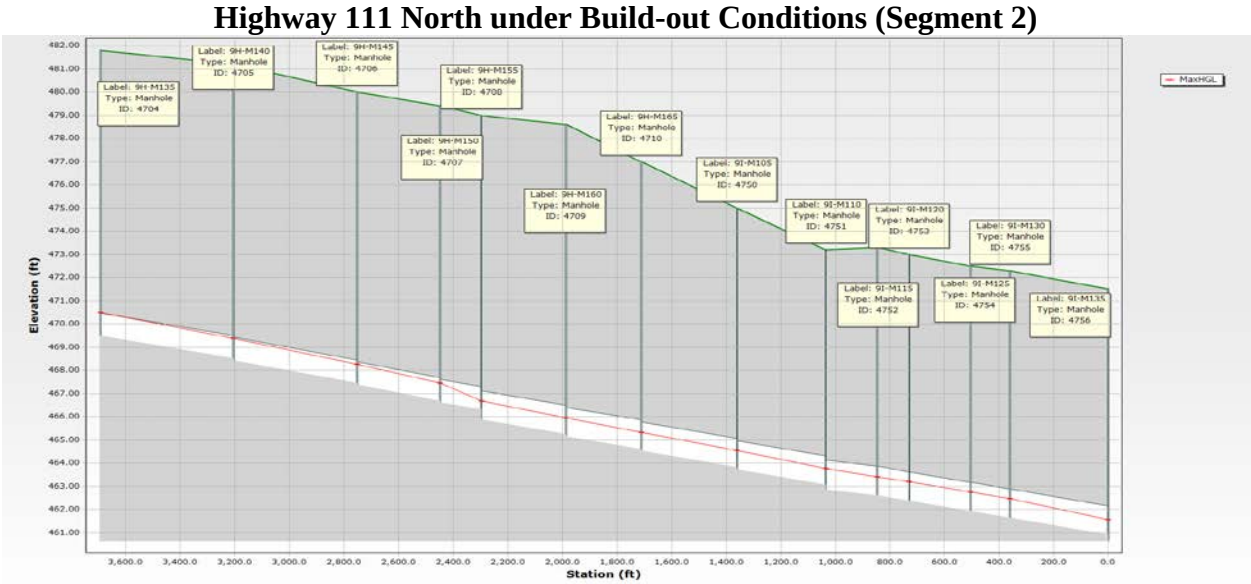
Start: Highway 111 and Jackson St. End: Oak St. and Indio Blvd.

Figure 5-18
Highway 111 North under Build-out Conditions (Segment 1)



Start: Highway 111 and Arabia St. End: Highway 111 and Jackson St.

Figure 5-19
Highway 111 North under Build-out Conditions (Segment 2)

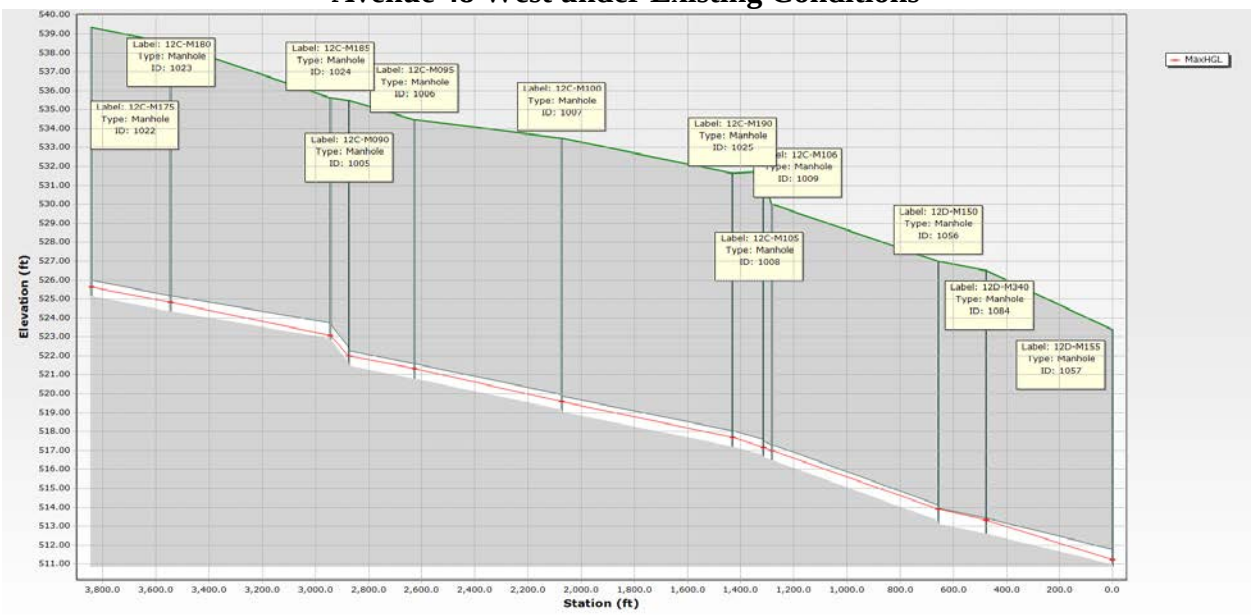


Start: Highway 111 and Jackson St. End: Oak St. and Indio Blvd.

Avenue 48 West

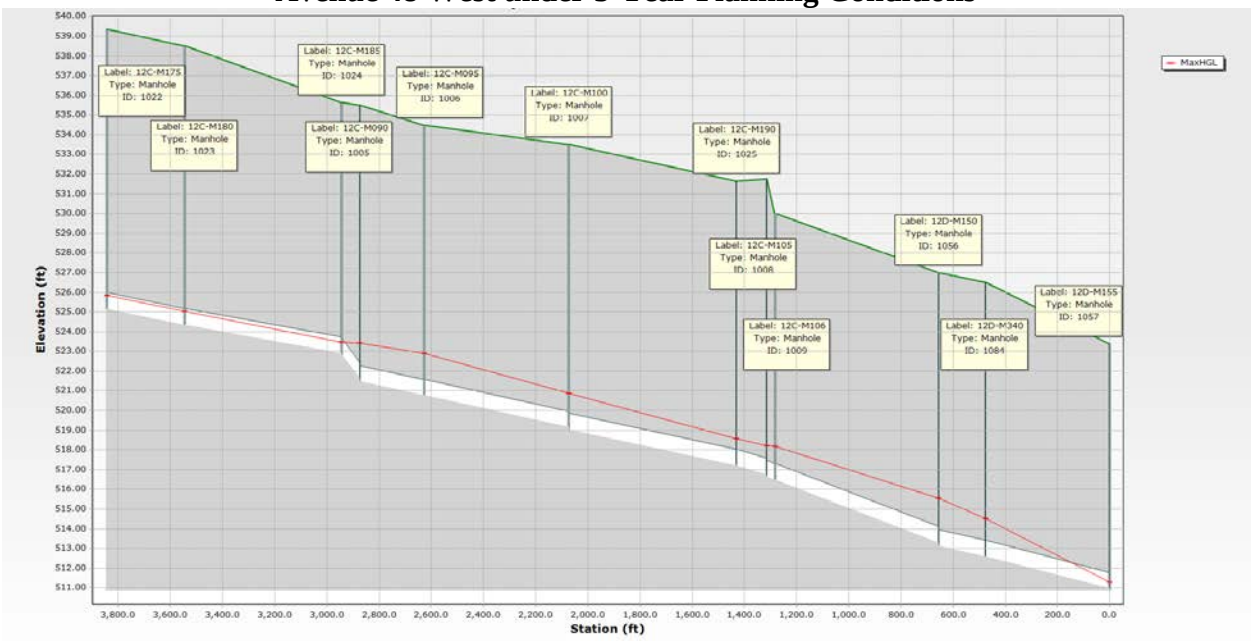
Avenue 48 shows capacity issues from Avenue 48 halfway between Jefferson St. and Shields Rd. to the intersection of Madison St. and Avenue 48. The hydraulic issues begin when the line running under Avenue 48 turns from an 18-inch diameter pipe to a 10-inch diameter pipe at Madison St. These hydraulic issues get progressively worse in the 5-year and build-out scenarios. **Figure 5-20** through **Figure 5-22** show profiles for this section of pipeline for all three planning scenarios.

Figure 5-20
Avenue 48 West under Existing Conditions



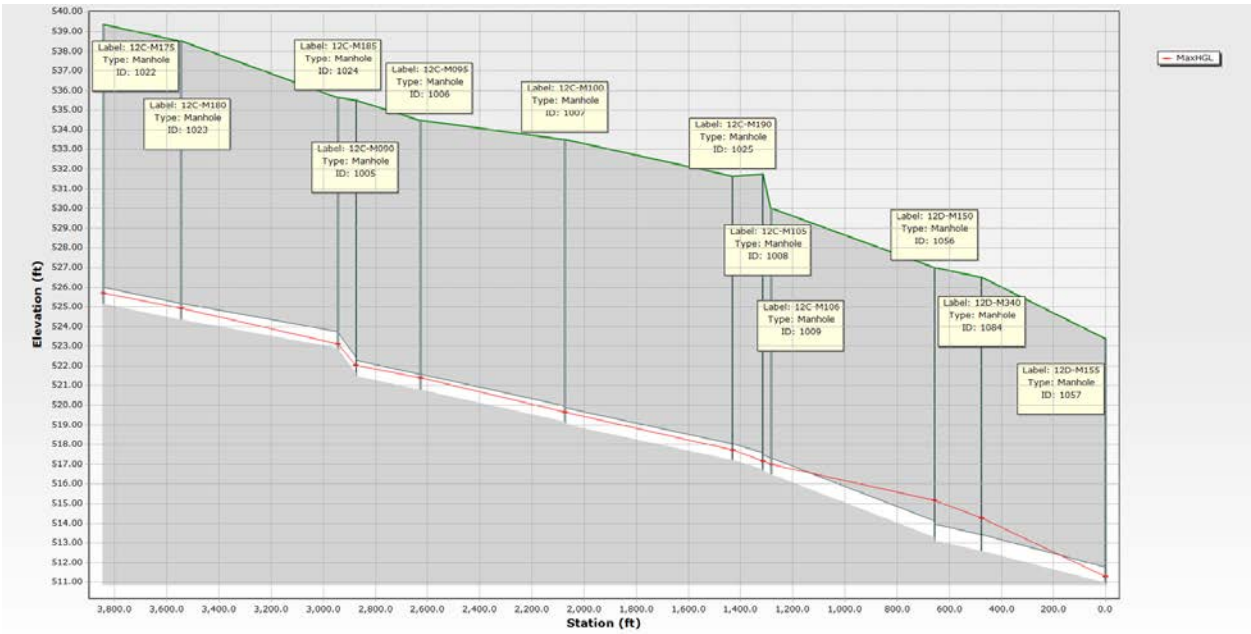
Start: Avenue 48 between Jefferson St. and Shields Rd. End: Avenue 48 and Madison St.

Figure 5-21
Avenue 48 West under 5-Year Planning Conditions



Start: Avenue 48 between Jefferson St. and Shields Rd. End: Avenue 48 and Madison St.

Figure 5-22
Avenue 48 West under Build-out Conditions

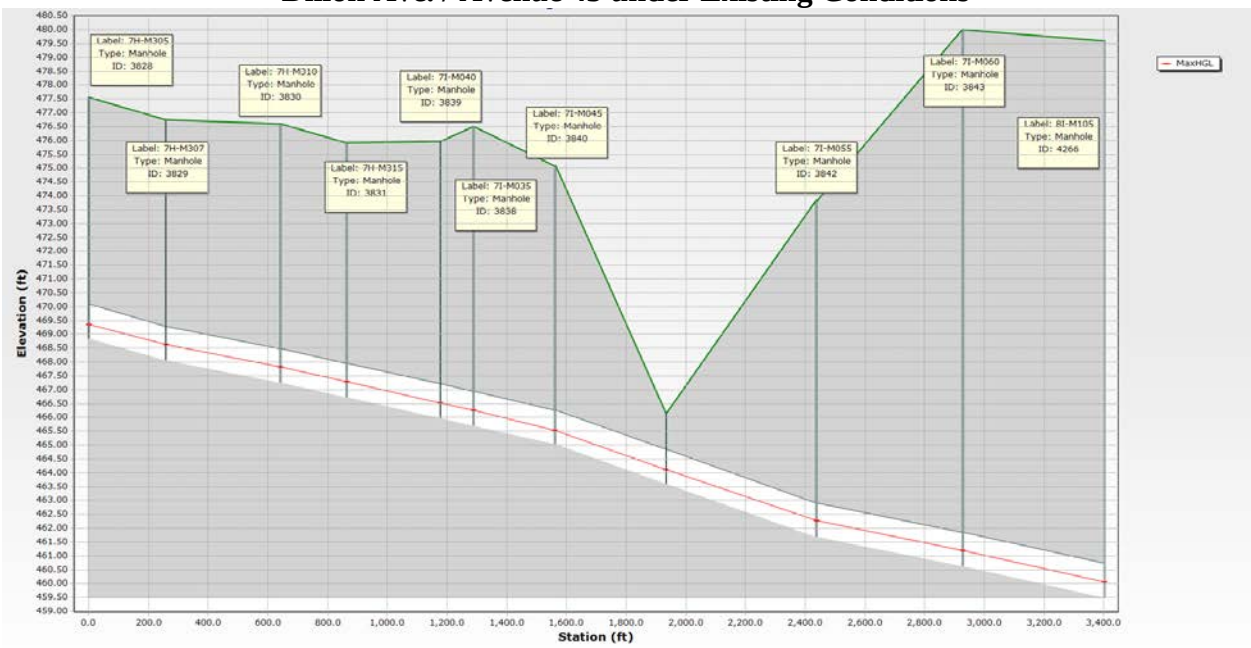


Start: Avenue 48 between Jefferson St. and Shields Rd. End: Avenue 48 and Madison St.

Dillon Ave. / Avenue 45

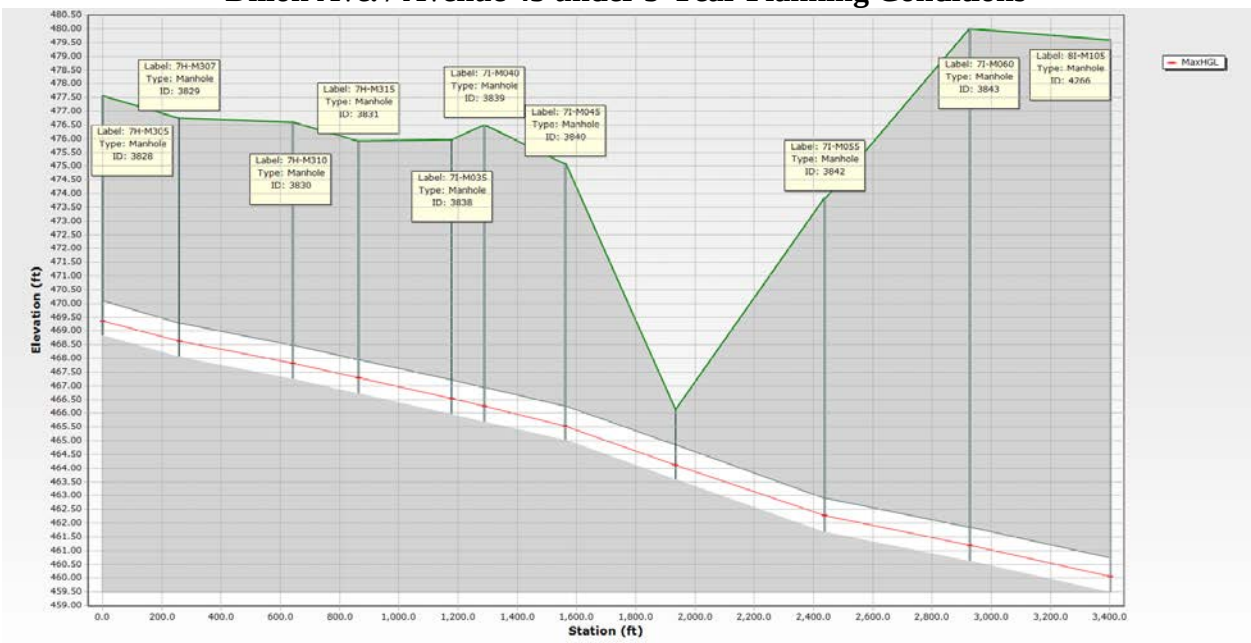
The existing system scenario shows over-capacity pipes from manhole 7H-M305 to manhole 8I-M105. While not all the pipes along this stretch are over-capacity in the existing system, the amount of hydraulic deficiency increases with the 5-year and build-out scenarios. This area of the system corresponds to the 15-inch pipes running from the intersection of Palo Verde St. and Dillon Ave., east on Dillon Ave., and then south east in an easement behind businesses adjacent to Avenue 45 just passed Golf Center Parkway. **Figure 5-23** through **Figure 5-25** shows the profiles for this segment of pipeline for all three scenarios.

Figure 5-23
Dillon Ave. / Avenue 45 under Existing Conditions



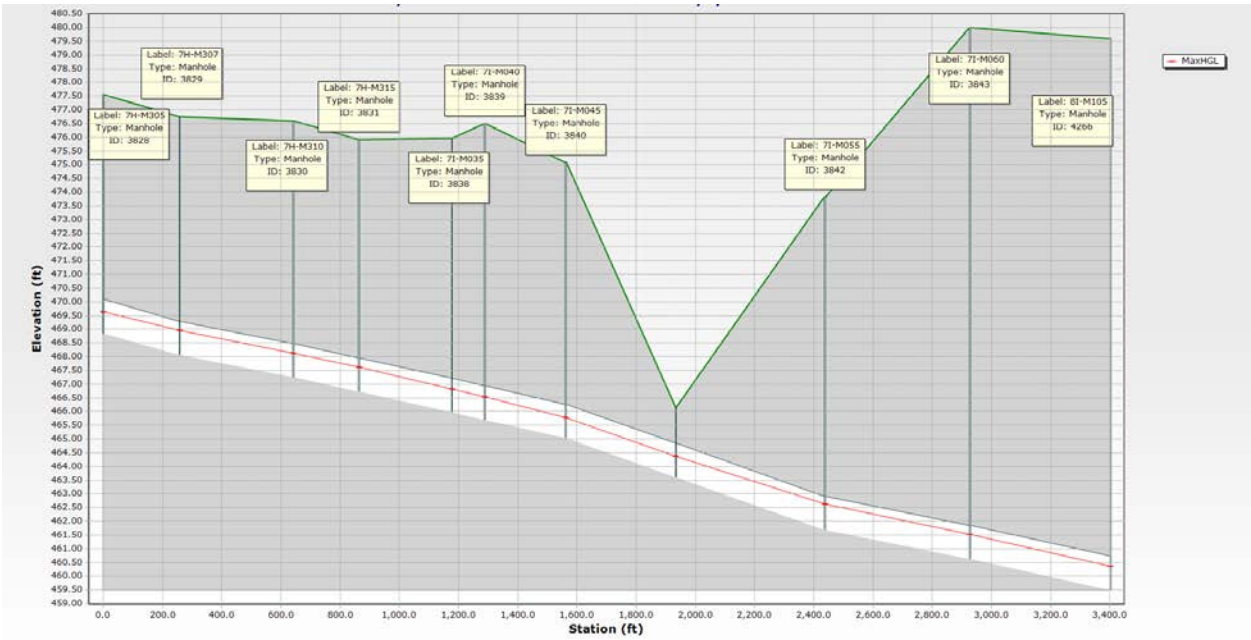
Start: Palo Verde Ave. and Dillon Ave End: Between Avenue 45 and Interstate 10

Figure 5-24
Dillon Ave. / Avenue 45 under 5-Year Planning Conditions



Start: Palo Verde Ave. and Dillon Ave End: Between Avenue 45 and Interstate 10

Figure 5-25
Dillon Ave. / Avenue 45 under Build-Out Conditions

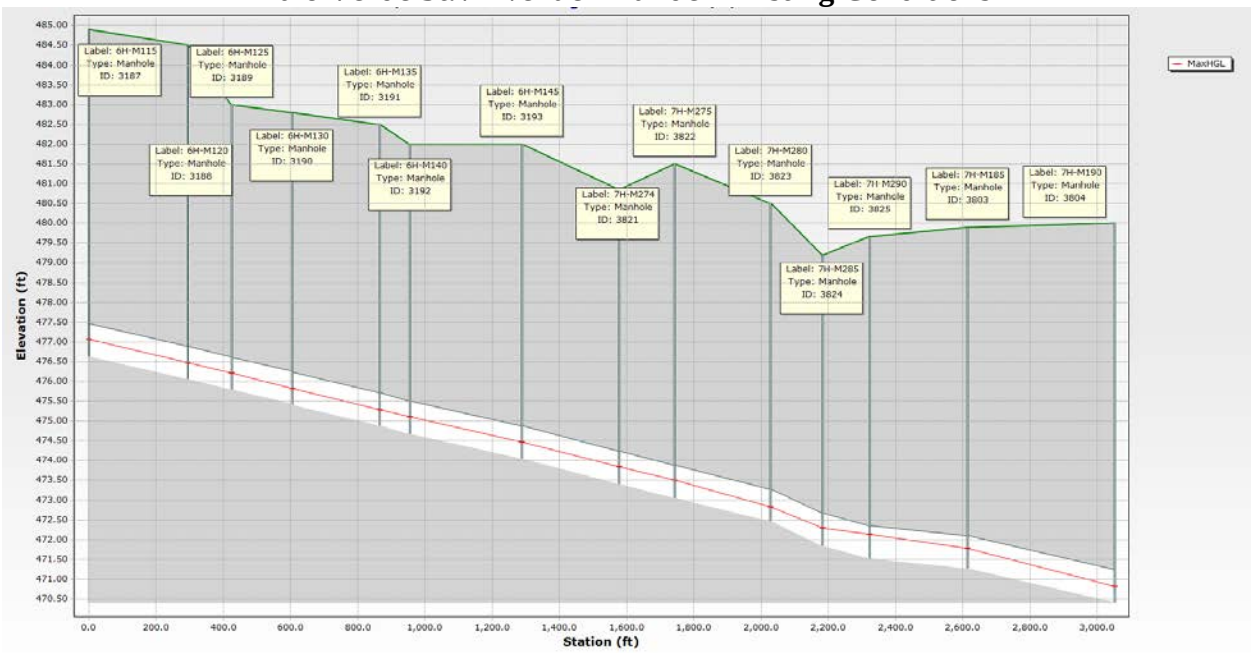


Start: Palo Verde Ave. and Dillon Ave End: Between Avenue 45 and Interstate 10

Palo Verde St. / Avenue 44

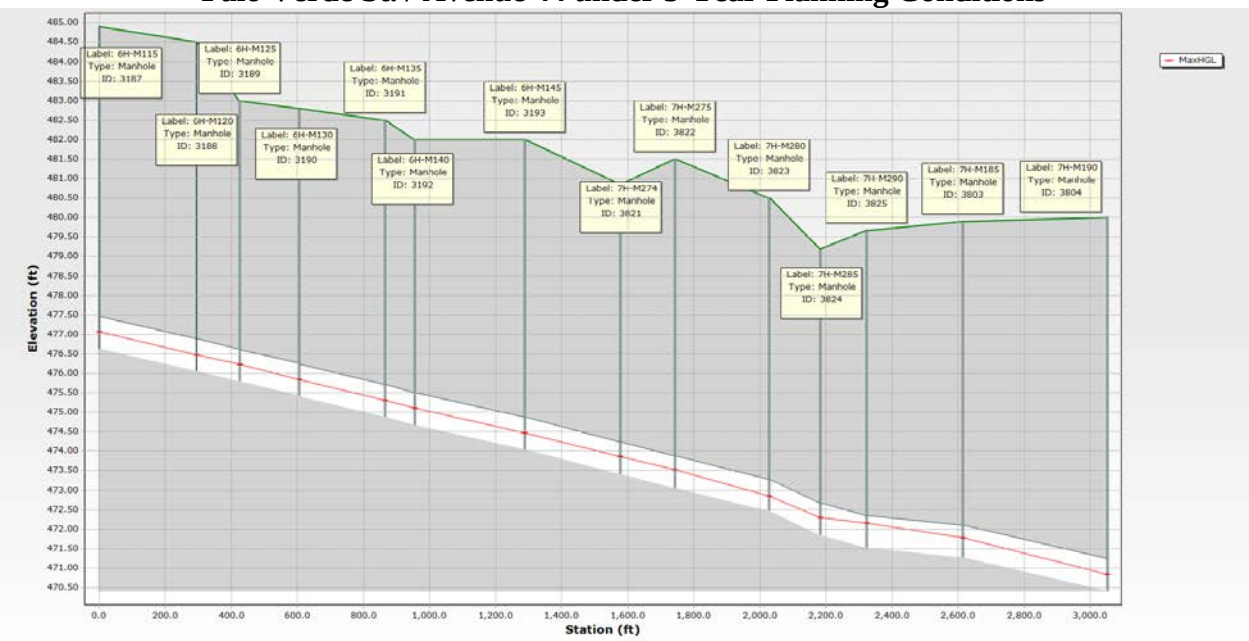
The existing system scenario shows over-capacity pipes from manhole 7H-M190 to manhole 6H-M115. Not all the pipes along this stretch are over-capacity in the existing system; however the amount of hydraulic deficiency increases with the 5-year and build-out scenarios. This area of the system corresponds to the 10-inch pipes running from the intersection of Avenue 44 and Jackson St., east on Avenue 44, and south on Palo Verde St. just past Dillon Ave. **Figure 5-26** through **Figure 5-28** shows the profiles for this segment of pipeline for all three scenarios.

Figure 5-26
Palo Verde St. / Avenue 44 under Existing Conditions



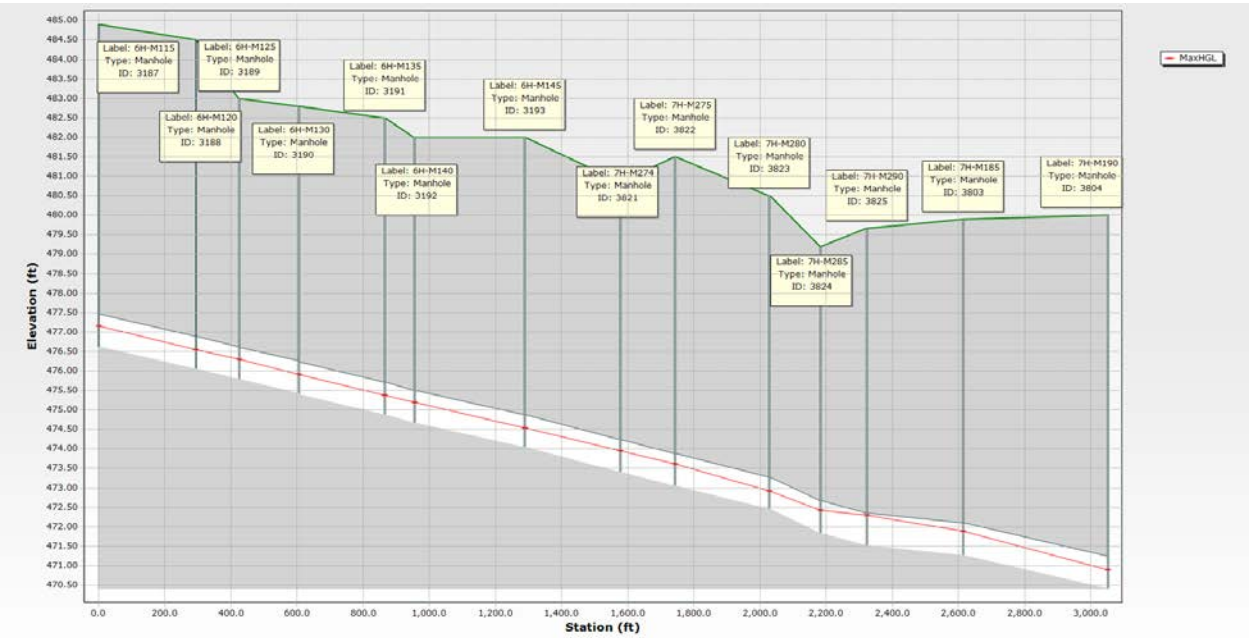
Start: Avenue 44 and Jackson St. End: Palo Verde Ave. and Sonora Ave.

Figure 5-27
Palo Verde St. / Avenue 44 under 5-Year Planning Conditions



Start: Avenue 44 and Jackson St. End: Palo Verde Ave. and Sonora Ave.

Figure 5-28
Palo Verde St. / Avenue 44 under Build-Out Conditions

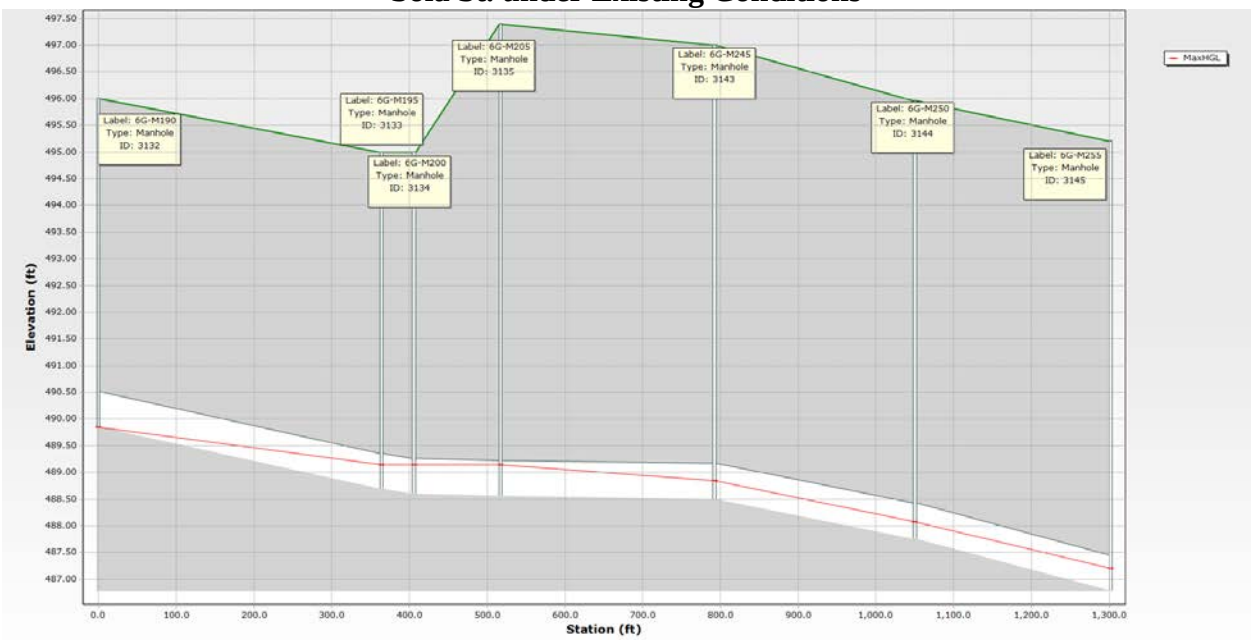


Start: Avenue 44 and Jackson St. End: Palo Verde Ave. and Sonora Ave.

Sola St.

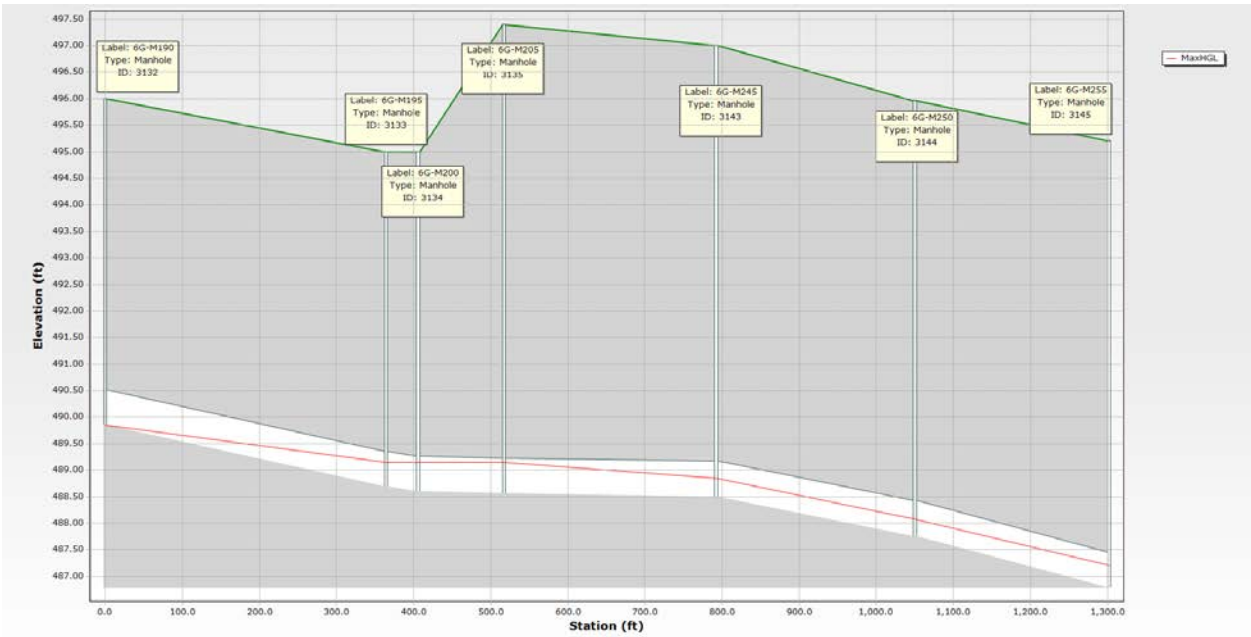
The existing system scenario shows over-capacity and surcharged pipes from manhole 6G-M190 to manhole 6G-M265. The amount of hydraulic deficiency increases with the 5-year and build-out scenarios. This area of the system corresponds to the 8-inch pipes running along Sola St. from Kenner Ave. to Avenue 44. **Figure 5-29** through **Figure 5-31** shows the profiles for this segment of pipeline for all three scenarios.

Figure 5-29
Sola St. under Existing Conditions



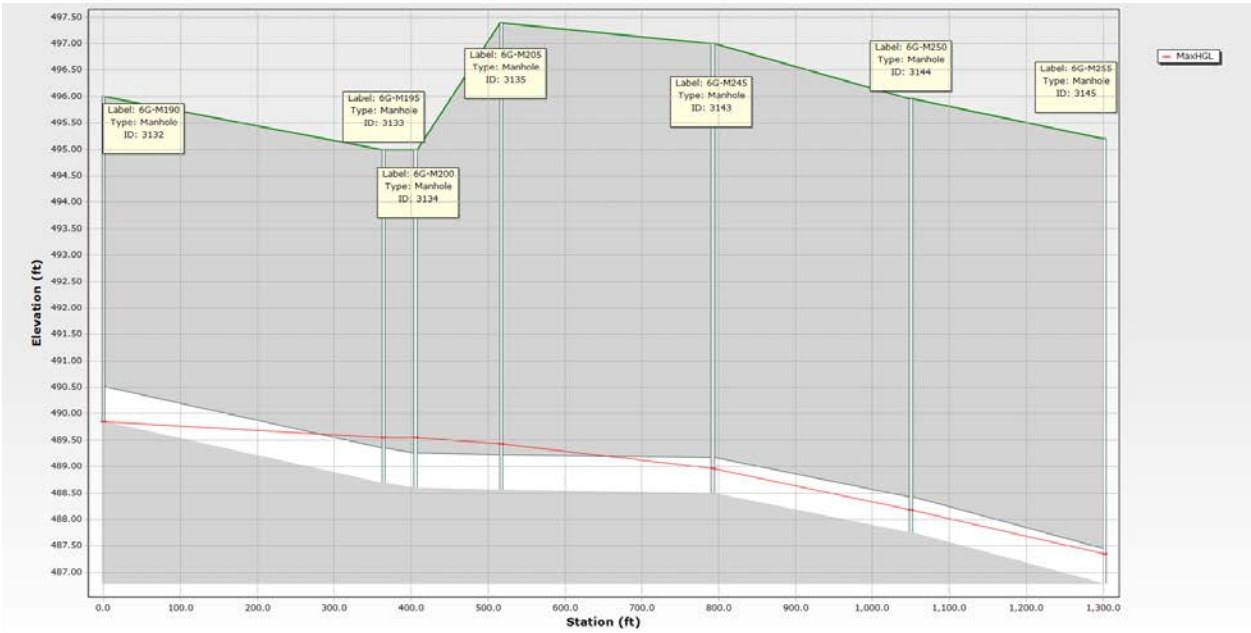
Start: Oleander Ave. between Sola St. and Arabia St. End: El Paseo Ave. and Sola St.

Figure 5-30
Sola St. under 5-Year Conditions



Start: Oleander Ave. between Sola St. and Arabia St. End: El Paseo Ave. and Sola St.

Figure 5-31
Sola St. under Build-Out Conditions



Start: Oleander Ave. between Sola St. and Arabia St. End: El Paseo Ave. and Sola St.

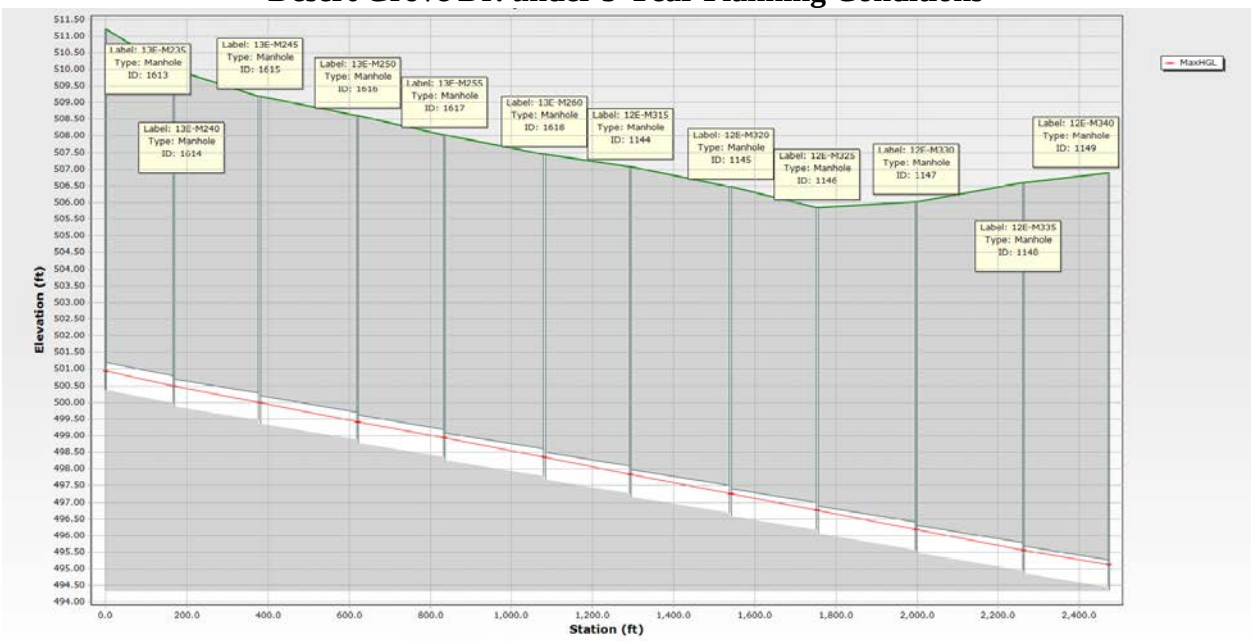
5.1.3 5-Year Planning Horizon System Evaluation

AOCs listed in this section are those that were not contained in the previous section for the existing system. These are areas that have exceeded design capacity or are surcharged due to the added load on the system anticipated in the next 5 years. **Appendix B** shows these loads as provided by VSD. Anticipated point loads due to specific development, as well as land use changes due to build-out conditions in certain areas of the system account for the added flow that is modeled in the 5-year planning scenario. Due to the fact that most areas identified as AOCs in the 5-year planning scenario were also identified in the existing system evaluation, only those that became AOCs in the 5-year analysis are addressed in this section. This includes only two additional AOCs. As with the existing system evaluation, all AOCs were visually checked in the model to ensure results were not due to a modeling error.

Desert Grove Dr.

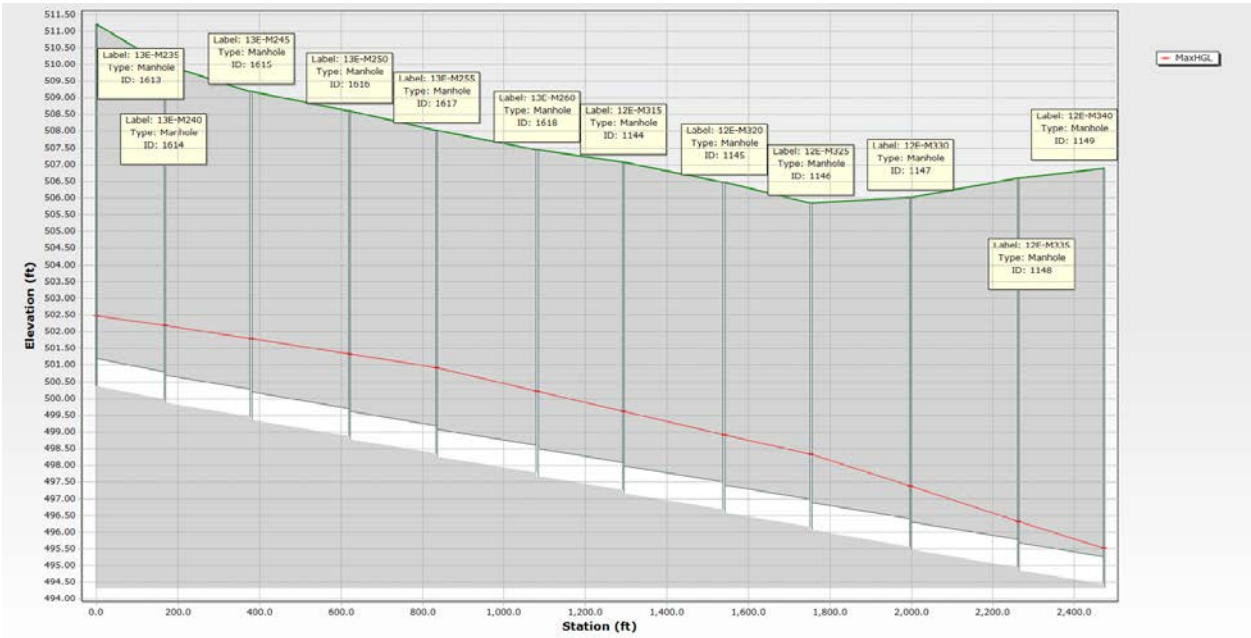
The 10-inch pipe running along Desert Grove Dr. from Avenue 49 to Avenue 48 (manhole 13E-M235 to manhole 12E-M385) shows both surcharging and over-capacity pipes in the 5-year planning scenario. The severity of the hydraulic deficiency increases for the build-out scenario. **Figure 5-32** and **Figure 5-33** show profiles for this area for the 5-year planning and build-out scenarios.

Figure 5-32
Desert Grove Dr. under 5-Year Planning Conditions



Start: Desert Grove Dr. and Avenue 49 End: Desert Grove Dr. and Avenue 48

Figure 5-33
Desert Grove Dr. under Build-Out Conditions

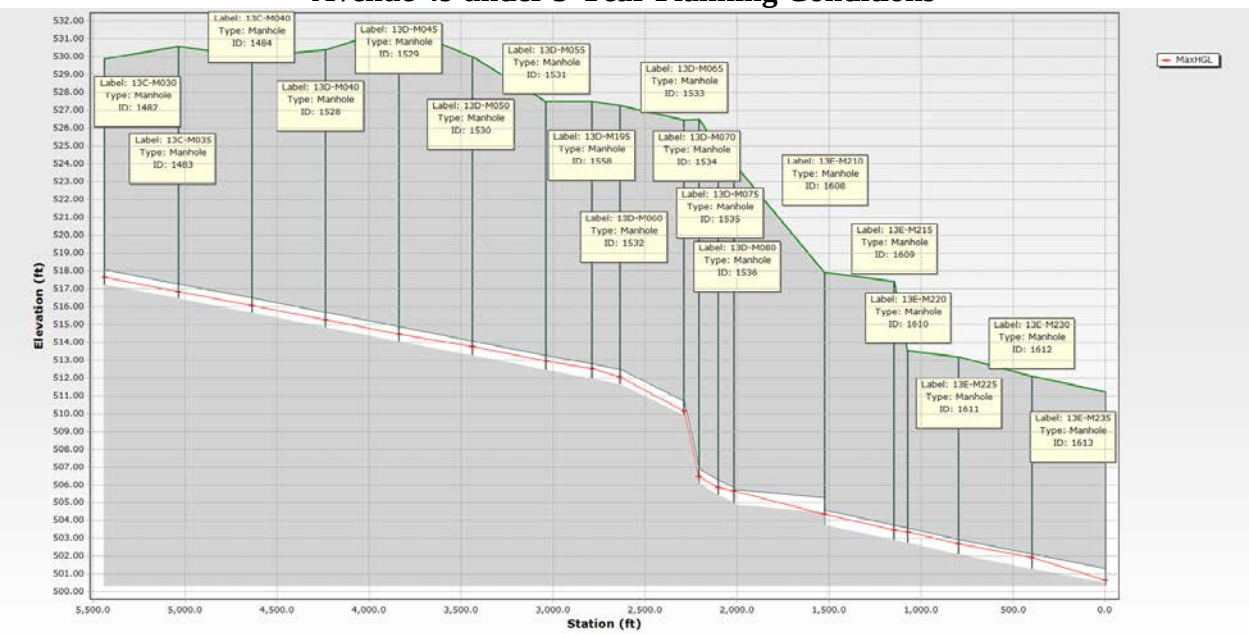


Start: Desert Grove Dr. and Avenue 49 End: Desert Grove Dr. and Avenue 48

Avenue 49

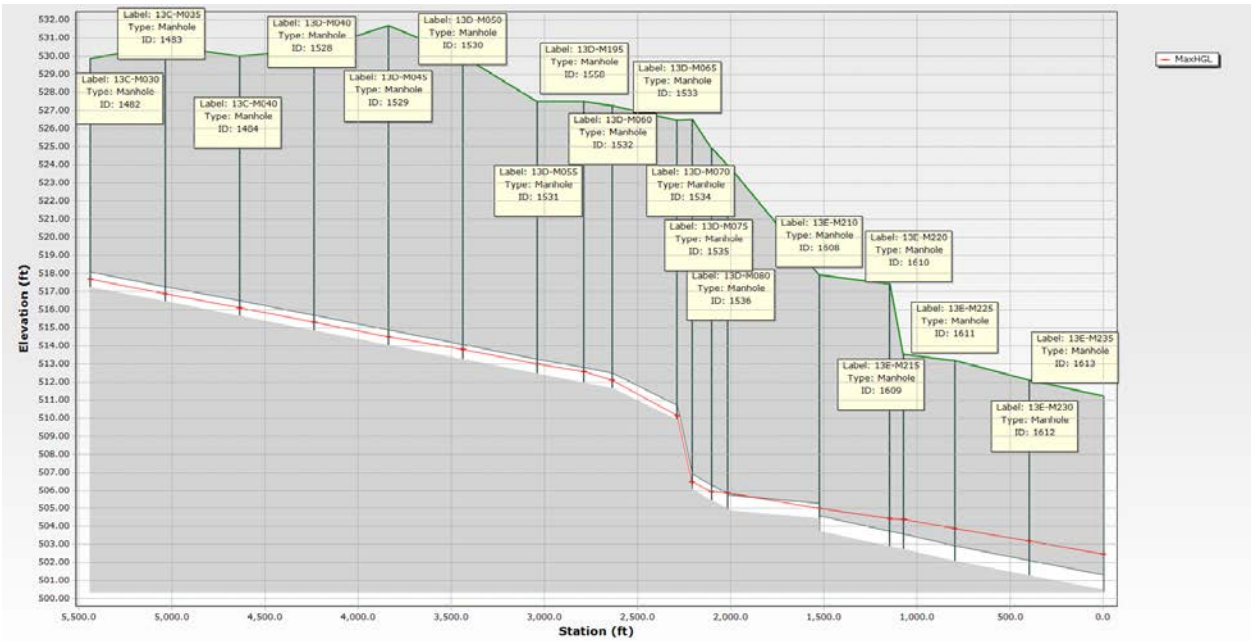
The 5-year planning scenario shows over-capacity and surcharge pipes along Avenue 49, from Madison St. to Desert Grove Dr. (from manhole 13D-M050 to manhole 13E-M235). In the build-out scenario, the severity of the hydraulic deficiencies is greater, and extends beyond Madison St. to Orchard Drive (manhole 13C-M030). **Figure 5-34** and **Figure 5-35** show profiles for this area for the 5-year planning and build-out scenarios.

Figure 5-34
Avenue 49 under 5-Year Planning Conditions



Start: Orchard Dr. and Avenue 49 End: Desert Grove Dr. and Avenue 9

Figure 5-35
Avenue 49 under Build-Out Conditions



Start: Orchard Dr. and Avenue 49 End: Desert Grove Dr. and Avenue 9

5.1.4 Build-Out System Evaluation

The build-out system evaluation seeks to quantify the projected hydraulic deficiencies that might occur given an estimate of the flows in the VSD system if all land within the current system is utilized to its fullest extent. In order to project this scenario, the land use projected in the City of Indio Master Plan was imported into the model, and the highest duty factors and patterns (developed during calibration) that are associated with those land uses were applied. Flows derived from this process total 18.07 MGD on a typical weekend day and 19.25 on a typical weekday.

Because build-out flow represents the ultimate demand on the system, a different threshold is used to determine if an area constitutes an AOC. Instead of using a 0.5 threshold value for d/D for pipes less than 18-inches in diameter and a 0.75 threshold value for d/D for pipes equal to or greater than 18-inches in diameter, a threshold of 0.9 is used for all pipes since no additional flows are anticipated beyond the build out condition. For this reason, many of the pipes shown in **Figure 5-1** as being over design capacity are not listed in this evaluation as they are projected to fall under the 0.9 d/D threshold.

AOCs listed in this section are those that were not contained in the previous sections. These are areas that have exceeded design capacity or surcharged due to the added load on the system due to build-out. Due to the fact that most areas identified as AOCs in the build-out scenario were also identified in the existing system evaluation and the 5-year system evaluation, only those that became AOCs in the build-out analysis are addressed in this section. As with previous sections, all AOCs were visually checked in the model to ensure results were not due to a modeling error.

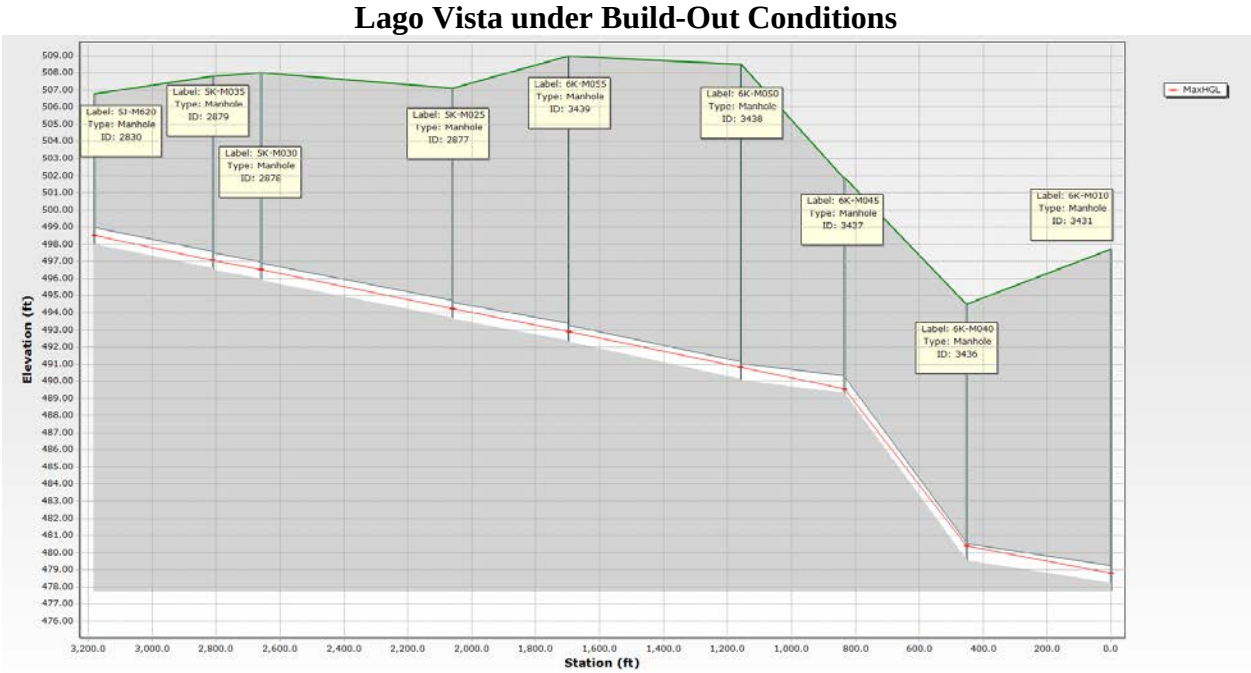
Avenue 44/ Terra Lago Parkway

According to the build-out system analysis, the 12-inch line that extends from manhole 6K-M010 on Avenue 44 to manhole 6L-M025 on Terra Lago Parkway shows over-capacity and surcharged manholes in the model, likely due to planned development along Terra Lago Parkway. VSD provided more accurate residency information for the area than was afforded by the future zoning. Based on this information, these deficiencies are not thought to reflect real world conditions and no CIP is included for this area of the system.

Lago Vista

The build-out system analysis shows hydraulic deficiencies for the 12-inch pipes running from the intersection of Lago Vista and Avenue 44 (manhole 6K-M010), north on Lago Vista and north along Lago Brezza to manhole 5J-M620. **Figure 5-36** shows the profile for this section of pipe during build-out conditions. While some of the deficiency in this pipe may be due to backup in the model caused by the issues on Avenue 44 and Terra Lago Parkway discussed previously, capacity in the pipe is not sufficient to handle the amount of flow projected to pass through the pipe. Therefore, CIP recommendations are made for this AOC.

Figure 5-36
Lago Vista under Build-Out Conditions

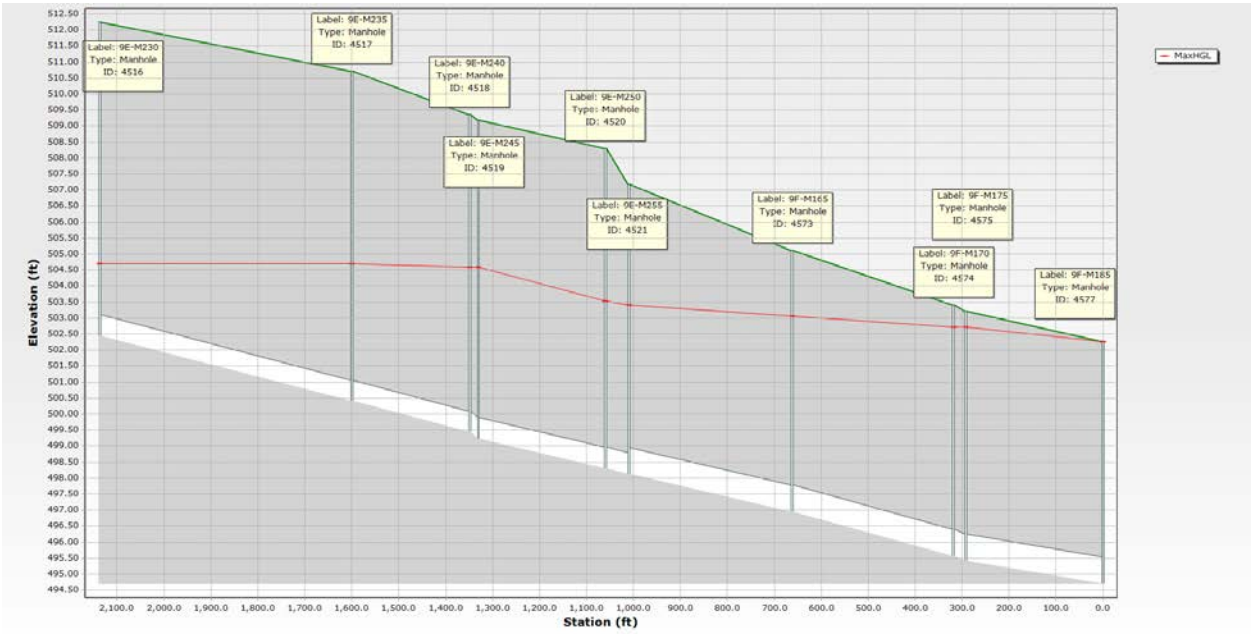


Start: Lago Brezza Dr. and Armonia Ct. End: Avenue 44 and Lago Vista

Avenue 46

This is an area of the system parallel to the Dr. Carreon Blvd. corridor that also shows deficiency. Based on the hydraulics of the system and areas downstream of this AOC, the issues caused are due to the issues on Dr. Carreon Blvd. Therefore, there are no CIP recommendations that are specific to this AOC and it is assumed that recommendations to relieve Dr. Carreon Blvd. will also relieve this area of the system. **Figure 5-37** shows the profile from Clinton St. to Monroe St. along Avenue 46.

Figure 5-37
Avenue 46 under Build-Out Conditions



Start: Avenue 46, east of Clinton St. End: Avenue 46 and Monroe St.

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Section 6
Recommended Improvements

This section presents recommended improvements for the VSD collection system. These improvements are phased according to the scenarios evaluated in the model: existing system, 5-year planning horizon, and build-out conditions. An estimate of costs associated with these improvements is addressed in **Section 7**.

6.1 RECOMMENDED IMPROVEMENTS FOR EXISTING SYSTEM

Improvements for the existing system are ordered according to the severity of the deficiency they address. Based on the hydraulic model and discussion with VSD, improvements to address capacity issues along Dr. Carreon Blvd. were identified to be a priority. Other priority improvements involve recommendations that relieve greater areas of concern (AOC). Locations of recommended improvement projects in the VSD collection system are shown on **Figure 6-1** and listed in **Table 6-1**.

6.1.1 Dr. Carreon Blvd. Relief Projects

According to modeled results, the first and most pressing capacity issue in the existing system lies on Dr. Carreon Blvd. This trunk line stretches along Highway 111 in the west to Dr. Carreon Blvd. in the east. The line ranges from 12-inch diameter at the intersection of Highway 111 and Madison St., to 18-inches at the intersection of Van Buren St. and Dr. Carreon Blvd. For the existing system evaluation, capacity issues are present in pipes between Clinton St. and Jackson St. along Dr. Carreon Blvd. These issues range from pipes over design capacity to pipes flowing at full capacity and beginning to surcharge up manholes. Due to the physical conditions of the pipes below Highway 111/Dr. Carreon Blvd., upsizing of the pipes is not the preferred method to relieve the trunk line. This is due to the depth of the existing sewer and the amount of traffic along the motorways above the trunk line. With this restraint in mind, the purpose of recommended upgrades becomes to relieve enough flow from Highway 111/Dr. Carreon Blvd. to abate existing capacity deficiencies.

Requa Interceptor

The project that will enable VSD to divert the most amount of flow from Highway 111/Dr. Carreon Blvd is the previously submitted Requa Interceptor. MSA Consulting, Inc. submitted an engineer's report November 2, 2009 with an alignment review for the Requa Interceptor. Alignments and elevations stated in that engineers report were used to model the Requa Interceptor in SewerGEMS. The Requa interceptor consists of approximately 20,900 feet of pipe ranging from 24-inch and 30-inch in diameter. **Table 6-2** shows a summary of the Requa Interceptor and the amount of infrastructure required for each stage of the interceptor. **Appendix H** presents the 2009 MSA Consultants Inc. report for the Requa Interceptor. It is of note that the phasing of this project reflected on **Table 6-2** is based off of the previous MSA Consultants study, but based on the model results from this Master Plan, the entire project is necessary to address current capacity issues and phasing of the project is not recommended.

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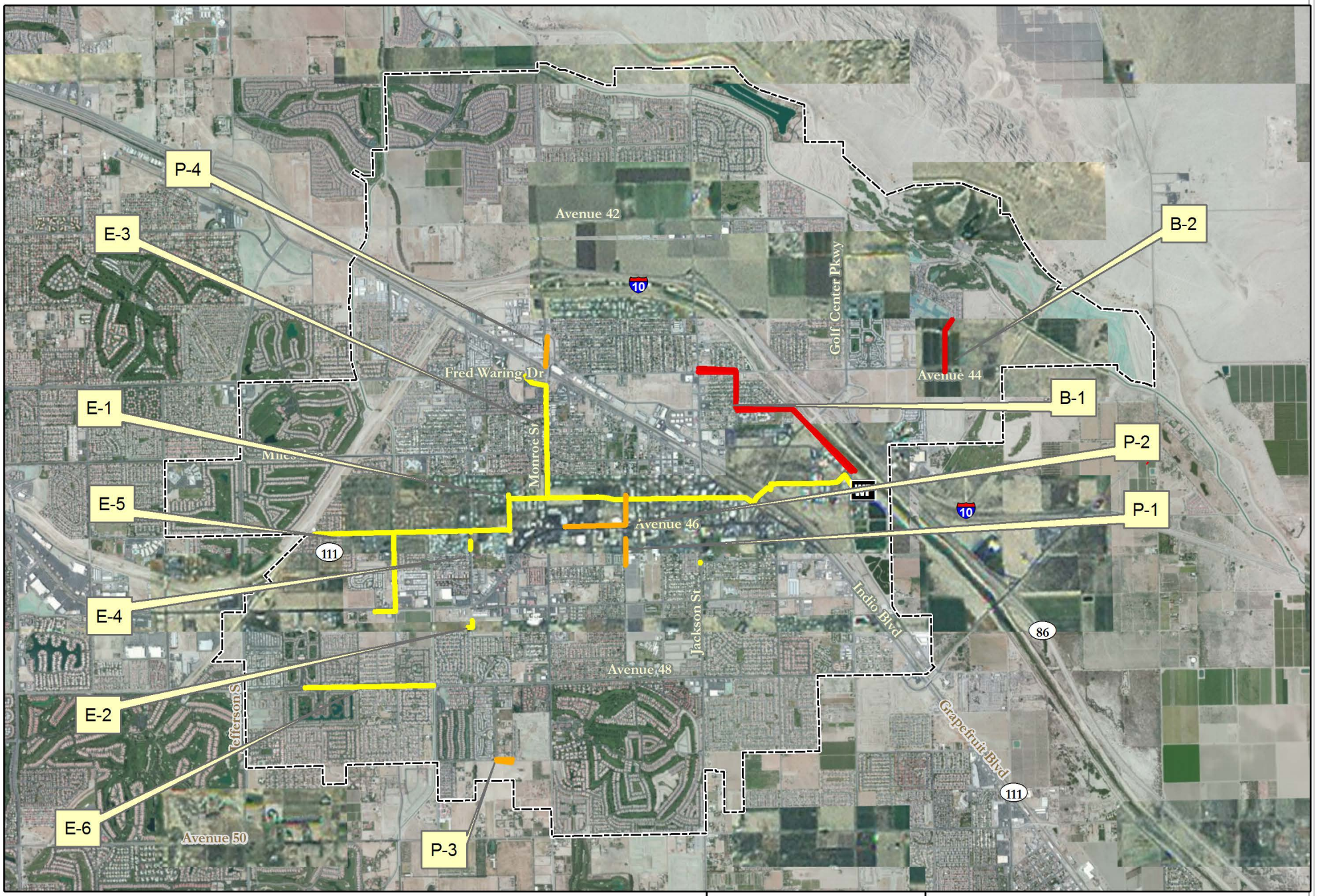

Key to Features

- Wastewater Treatment Plant
- Valley Sanitary District Boundary
- 2030 Build-Out System Improvement
- 2018 Planning Horizon System Improvement
- 2013 Existing System Improvement

N 0 0.5 1 Miles

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Date: September 3, 2013

Valley Sanitary District
Capital Improvement Program

MWH.

Figure 6-1

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Table 6-1
Recommended Improvements Summary

Project Number	Project Name	Description	Purpose	AOC Adressed	Phase	New or Upgrade	Operational Change	Size of Pipe (in)	Length of Pipe (ft.)	Total Length of Pipe (ft.)
E-1	Requa Interceptor	Interceptor from Madison street and Highway 111 to the WWTP	Relieve Dr. Carreon, take Shields PS offline, and service the jail expansion.	1, 2, 3, 12	Existing	New	No	24/ 30	20,906	20,906
E-2	Avenida Esmeralda Interceptor	15-inch line connecting Highway 111 to Avenue 48 via Calle Diamante	Temporary relief of Dr. Carreon Blvd.	1	Existing	New	No	15	368	368
E-3	Monroe Interceptor	Interceptor from Fred Waring Drive and Monroe Street south to the Requa Interceptor	Take Monroe siphon offline and convey flows to the Requa Interceptor	1	Existing	N/A	Yes	N/A	N/A	N/A
E-4	Clinton Street Operational Change	Operational change to send flows north on Clinton Street to the Requa Interceptor	Relieve Dr. Carreon Blvd	1	Existing	N/A	Yes	N/A	N/A	N/A
E-5	Shields Interceptor	Line from Shields PS east to Avenue 46	Take Shield PS offline	N/A	Existing	Both	No	12	2,723	2,723
E-6	Avenue 48 West Upgrades	Upsizing of 10-inch line extending west from along Avenue 48 from Madison St.	Relieve current and projected capacity issues for Avenue 48 West	4	Existing	Upgrade	No	15/18	670/ 2,875	3,545
P-1	Arabia Interceptor/ Jackson Street Operational Change	Bulkheading change and pipe improvements to divert flow from Dr. Carreon Blvd north to Highway 111	Relieve Dr. Carreon Blvd	1,2	5 year	Upgrade	Yes	12/ 15	4,437/ 1,396	5,832
P-2	Highway 111 Interceptor	Pipe connecting N. Hwy 111 to the Requa Interceptor	Relieve Dr. Carreon and increase Hwy 111 capacity in order to accommodate jail expansion	3	5 year	Both	No	12	2,979	2,979
P-3	Avenue 49 Interceptor	Interceptor to convey flows from Avenue 49 to Monroe Street and then north to Avenue 48	Relieve Avenue 49 and Desert Grove Street	8,9	5 year	Both	No	12	565	8,695
P-4	Fred Waring Drive Interceptor	12-inch interceptor along Fred Waring Dr from Industrial Plaza to Monroe Street, sending flows down Market street	Relieve Sola Street, Palo Verde Street, Avenue 44, and Avenue 45	5, 6, 7	5 year	New	No	12	967	967
B-1	Ave 44/Palo Verde Interceptor and Upgrade	Interceptor to divert flows to 15-inch pipe along Avenue 44 from Palo Verde Street, as well as upsizing of surrounding pipes	Relieve Palo Verde and Avenue 45	6	Buildout	Both	No	12/18	2,639/4,942	7,581
B-2	Lago Vista Upgrades	Upsizing of pipes along Lago Vista to relieve capacity issues	Relieve Lago Vista	11	Buildout	Upgrade	No	15/18	1697	1697

Note: Prefixes to project number stand for Existing (E), Planned (P), and Build-out (B).

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Table 6-2
Requa Interceptor Summary

Phase[1]	Down MH	Up MH	Size (in)	Length (ft.)	Slope	Q	V	Max Pipe Depth (ft.)
1A	1	4	30	2,062	0.0046	5.29	4.92	20
	4	5	30	1,342	0.0036	5.29	4.51	11
	5	1b	30	1,626	0.002	3.98	3.37	11
1B	1b	2b	30	1,373	0.002	3.98	3.37	12.5
	2b	3b	30	2,663	0.002	3.81	3.33	17
	3b	4b	30	932	0.0024	3.49	3.48	17
	4b	5b	30	1,747	0.0024	3.41	3.45	22
	5b	6b	24	1,326	0.0096	2.13	5.06	22
	6b	7b	24	1,069	0.002	2.1	2.86	12
	7b	8b	24	1,356	0.0021	1.98	2.88	13
	8b	9b	24	501	0.002	1.4	2.57	14
	9b	10b	24	2,169	0.002	1.34	2.53	19
	10b	15b	24	2,740	-	-	-	19

1: Phasing based on MSA Consultants study; both phases are recommended for the current capacity issues in the system.
Source: MSA Consultants Inc. *Engineer's Report: Requa Avenue Interceptor Alignment Review* November, 2009.

According to modeled results, this interceptor alone in the existing system would transport roughly 1,010 gpm of flow during a typical weekday and about 1,120 gpm during a typical weekend day. The Requa Interceptor will also act as a trunkline for several other interceptors in the system. The Requa interceptor would ultimately convey 1,215 gpm of flow during a typical weekday and 1,245 gpm during a typical weekend day with existing modeled flows.

Avenida Esmeralda Interceptor

The Avenida Esmeralda Interceptor consists of two sections of 15-inch pipe beginning south of the intersection of 47th Avenue and Highway 111, to the pipe at Avenida Esmeralda and Calle Diamante. The diverted flow would then travel south along Calle Diamante through existing pipes to the trunkline that runs along Avenue 48. This pipe would divert flows from the impacted trunkline running under Highway 111/ Dr. Carreon Blvd. This interceptor would serve as a temporary relief to the trunkline until such time that the full Requa Interceptor could be built. Once the Requa Interceptor is built, the Avenida Esmeralda Interceptor would add to the operational flexibility of the system and would help accommodate later improvements or changes to the system. In order to divert flows to this interceptor, bulkheading would need to occur at manhole 11E-M160 to stop flow from travelling to the 15-inch pipe 11E-M160_10E-M150, south of the intersection of 47th Avenue and Highway 111. **Table 6-3** gives a summary of the infrastructure required for this interceptor. **Figure 6-2** shows the location of this recommended improvement.

Table 6-3
Avenida Esmeralda Interceptor Summary

Start Node	Stop Node	Length (ft.)	Size (in)	Pipe Depth (ft.)
11E-M160	New Manhole	220	15	17
New Manhole	New Manhole	149[1]	15	17

[1]: Length is based off of distance to cleanout manhole (11E-C005) currently located north of Avenida Esmeralda which, depending on conditions may be replaced with a new, serviceable manhole..

Figure 6-2
Avenida Esmeralda Interceptor Location

Monroe Interceptor (Operational Change)

The Monroe Interceptor is a line that was built in early 2007 from Fred Waring Dr., between Hoover Ave and Monroe St, south along Monroe to Requa Ave. This pipe is 18-inch in diameter and would divert flow from the north end of the system to the built Requa Interceptor. According to VSD, this interceptor is already built, but has not had flows diverted to it. As part of this CIP, it is recommended that this interceptor be brought online. Once online, this interceptor is expected to divert 273 GPM during a peak weekday and 288 GPM during a peak weekend day, based on modeled existing flows. As part of this interceptor, the following pipes along Monroe St. and along Fred Waring Dr. would be bulkheaded in order to divert flow into the Monroe interceptor:

- 8F-M240_8F-M245
- 8F-M235_8F-M240
- 8F-M230_8F-M235

- 7F-M125_7F-M130
- 6E-M250_6F-M325
- 6F-M260_6F-M265
- 7F-M080_7F-M085

Clinton Street Operational Change

The Clinton Street operational change will allow for flows that are currently sent south along Clinton Street to Highway 111 to be diverted north to Avenue 46, thereby relieving flow in the Dr. Carreon Blvd. line. Currently, there is bulkheading at manhole 9E-M164 that blocks flow from travelling through 9E-M164_9E-M163 and sends this flow south. As part of this operational change, that bulkheading would be removed, and instead bulkheading would occur at 9E-M290 (stopping flows from entering 9E-M290_10E-M155), 9E-M280 (stopping flows from entering 9E-M280_9E-M230) and at 9E-M285 (stopping flow from entering 9E-M280_9E-M285). This would send all flow from Clinton Street, between 46th Avenue and Highway 111, to the Requa Interceptor. This operational change would require no additional infrastructure or upsizing of current infrastructure, and will be able to relieve a portion of flows along Dr. Carreon Blvd. for all three planning scenarios.

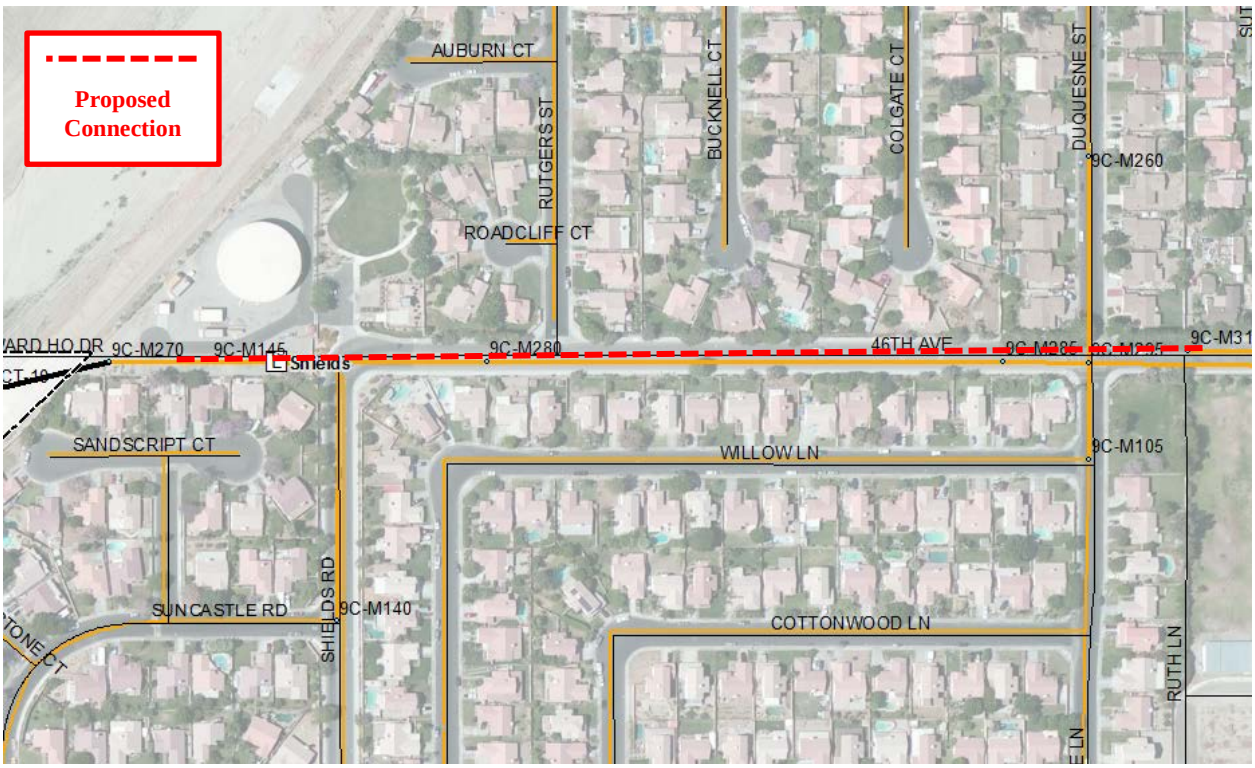
Shields Interceptor

One of the possible benefits of the Requa Interceptor is that the flow taken off of the line running under Avenue 46/Highway 111 creates capacity for an interceptor to be built. The Shields interceptor would take flow that currently goes into the Shields Pump Station and send it east along Avenue 46 by gravity. This will allow VSD to take the Shields pump station offline, which will also relieve Dr. Carreon Blvd. as current flows from the pump station are sent south towards that line. Upsizing of pipes downstream of the new pipes will be necessary to avoid any constrictions in the line as the pipes upstream of the new infrastructure are already 12 inches in diameter. This interceptor was also reviewed in the MSA Consultants, Inc. engineering report (2009) and was modeled according to the elevations and lengths contained in that report. **Table 6-4** gives a summary of the proposed interceptor. **Figure 6-3** shows the location of this recommended improvement.

Table 6-4
Shields Interceptor Summary

New Pipes				
Start Node	**Stop Node**	**Length (ft.)**	**Size (in)**	**Pipe Depth (ft.)**
9C-M145	New Manhole	1277	12	13
New Manhole	9C-M315	150	12	13
Pipes to be Upsized				
Pipe to be upgraded	**Existing Size (in)**	**Recommended Size (in)**	**Length (ft.)**	**Pipe Depth (ft.)**
9D-M195_9D-M200	10	12	242	13
9D-M200_9D-M245	10	12	238	13
9D-M245_9D-M340	10	12	443	13

Figure 6-3
Shields Interceptor Location



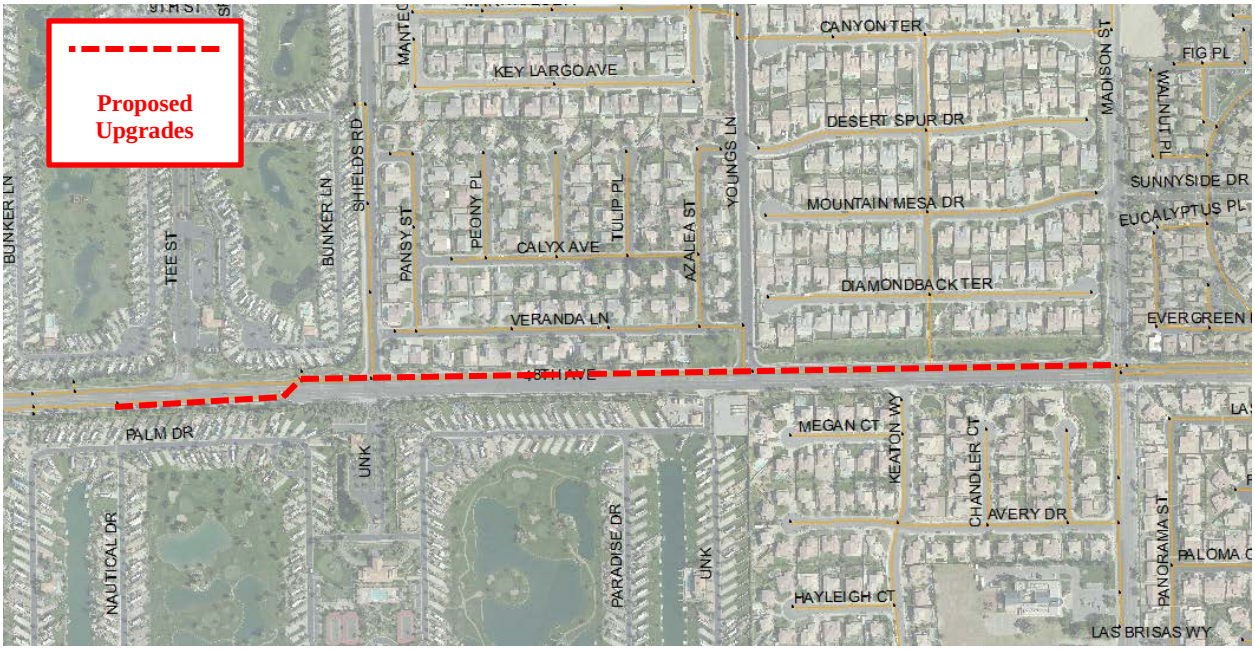
6.1.2 Avenue 48 West Upgrades

In order to address current capacity issues and projected issues along Avenue 48 in the west end of the system, roughly 3,545 feet of existing piping is recommended to be upgraded. The existing pipe is 10 inches in diameter from manhole 12C-M180 to manhole 12D-M155 on Avenue 44 and Madison St. The current capacity issues shown in the model should be confirmed with flow monitoring data before any final sizing is done for this improvement. The recommended sizes based on the current model are summarized in **Table 6-5. Figure 6-4** shows the location of the recommended improvements.

Table 6-5
Avenue 48 West Upgrades Summary

Pipe to be upgraded	Existing Size (in)	Recommended Size (in)	Length (ft.)	Pipe Depth (ft.)
12C-M180_12C-M185	10	15	601	14
12C-M185_12C-M090	10	15	70	14
12C-M090_12C-M095	10	18	248	14
12C-M095_12C-M100	10	18	553	14
12C-M100_12C-M190	10	18	643	14
12C-M190_12C-M105	10	18	116	14
12C-M105_12C-M106	10	18	33	14
12C-M106_12D-M150	10	18	626	14
12D-M150_12D-M340	10	18	180	14
12D-M340_12D-M155	10	18	476	14

Figure 6-4
Avenue 48 West Upgrades Location



6.2 RECOMMENDED IMPROVEMENTS FOR 5-YEAR PLANNING SCENARIO

In addition to the improvements listed above, additional improvements are recommended in order to handle anticipated flows for a build-out scenario and 5-yr planning horizon. These improvements are suggested in addition to those listed above and no project should be considered an alternative to any project above unless specifically described as such.

6.2.1 Arabia Interceptor/Jackson Street Operational Change

Although the Requa Interceptor is anticipated to take a significant amount of flow off of Dr. Carreon Blvd., according to the model, Dr. Carreon Blvd will still be above design capacity with the Requa Interceptor fully built. This is in part due to the fact that the Requa Interceptor is designed to connect to the trunkline at Highway 111 and Madison Street, in the west side of the system. There is a significant amount of flow that is added to the trunkline to the east of this connection and in order to utilize the Requa Interceptor to the fullest, and relieve enough flow from Dr. Carreon Blvd., more flow must be diverted. With this in mind, the Arabia Street Interceptor and Jackson Street Operational Change will allow more flow to be sent north to Highway 111 and away from Dr. Carreon Blvd.

The Arabia Interceptor would consist of aa eight inch line from manhole 10G-M195 on John Nobles Ave. and Arabia St. to manhole 9G-M215 on Arabia St. north of Plaza Ave. The new pipe would extend roughly 850 ft. In addition to the new line, bulkheading would need to occur in manhole 10G-M195 to prevent flow from entering the 8 inchline running along John Nobles Ave. In conjunction with this diversion, an operational change directly to the east will keep additional flow from entering Dr. Carreon Blvd.

Currently, bulkheading exists at manhole 10H-M220, blocking flow from entering 10H-M220_10H-M230 and sending it south to 10H-M220_10H-M225 and eventually to the Dr. Carreon trunkline. For this CIP, it is recommended that the bulkheading at this manhole be reversed in order to send the flow through 10H-M220_10H-M230 and eventually north to Highway 111. In order to accommodate this new flow, the pipes between 10H-M220 and 9H-M155 would need to be upsized in order to handle the additional anticipated flow. In addition, the pipes between 10G-M170 and 10H-M220 would also need to be upsized in order to handle capacity issues that would not be resolved by this change in bulkheading. A summary of the system improvements required for this project are summarized in **Table 6-6** below. **Figure 6-5** shows the location of this recommended improvement.

Table 6-6
Arabia Interceptor/Jackson Street Operational Change Summary

New Pipes				
Start Node	**Stop Node**	**Length (ft.)**	**Size (in)**	**Pipe Depth (ft.)**
10G-M195	9G-M215	850	8	8

Figure 6-5
Arabia Interceptor/Jackson Street Operational Change Location

6.2.2 Highway 111 Interceptor

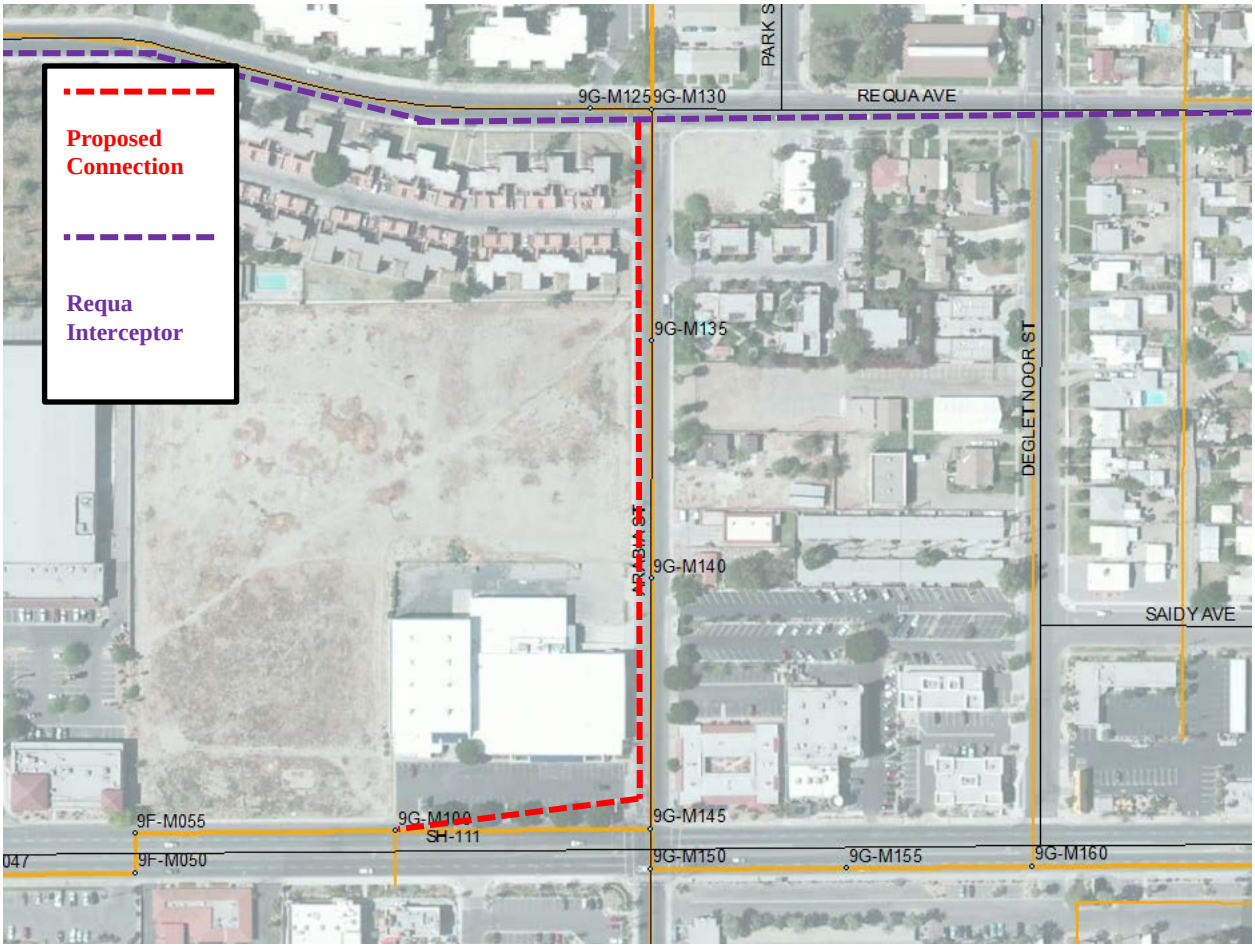
An interceptor at Highway 111 would allow for reduced flows on Highway 111 in the east part of the system, which will help that line accept flow from the south that will further alleviate the Dr. Carreon trunkline (see Jackson Interceptor description above). This interceptor would also allow capacity for the jail expansion that is anticipated to occur at the intersection of Highway 111 and Oasis St.

The location of the new interceptor will be at manhole 9G-M100 and will connect directly to the Requa Interceptor. This manhole was selected because downstream of 9G-M100, there is a significant drop in elevation in the pipes. The invert elevations to the west are lower than the invert elevations for neighboring manholes in the Requa Interceptor. Therefore, this is the most downstream location that a connection between the Highway 111 pipes and the Requa Interceptor can be made that would not require a pump station to raise the hydraulic grade line. In addition to the interceptor that would be built, upsizing of some of the immediately upstream pipes would be necessary in order to relieve capacity deficiencies already present in the pipes. **Table 6-7** below summarizes the recommended improvements. **Figure 6-6** shows the location of this recommended improvement.

Table 6-7
Highway 111 Interceptor Summary

New Pipes				
Start Node	**Stop Node**	**Length (ft.)**	**Size (in)**	**Pipe Depth (ft.)**
9G-M100	REQUA MH	1,229	12	17
Pipes to be upsized				
Pipe to be upgraded	**Existing Size (in)**	**Recommended Size (in)**	**Length (ft.)**	**Pipe Depth (ft.)**
9F-M035_9F-M305	8	12	296	12
9F-M305_9F-M040	8	12	160	12
9F-M040_9F-M045	8	12	454	12
9F-M045_9F-M047	8	12	218	12
9F-M047_9F-M050	8	12	231	12
9F-M050_9F-M055	8	12	52	12
9F-M055_9G-M100	8	12	340	12

Figure 6-6
Highway 111 Interceptor Location



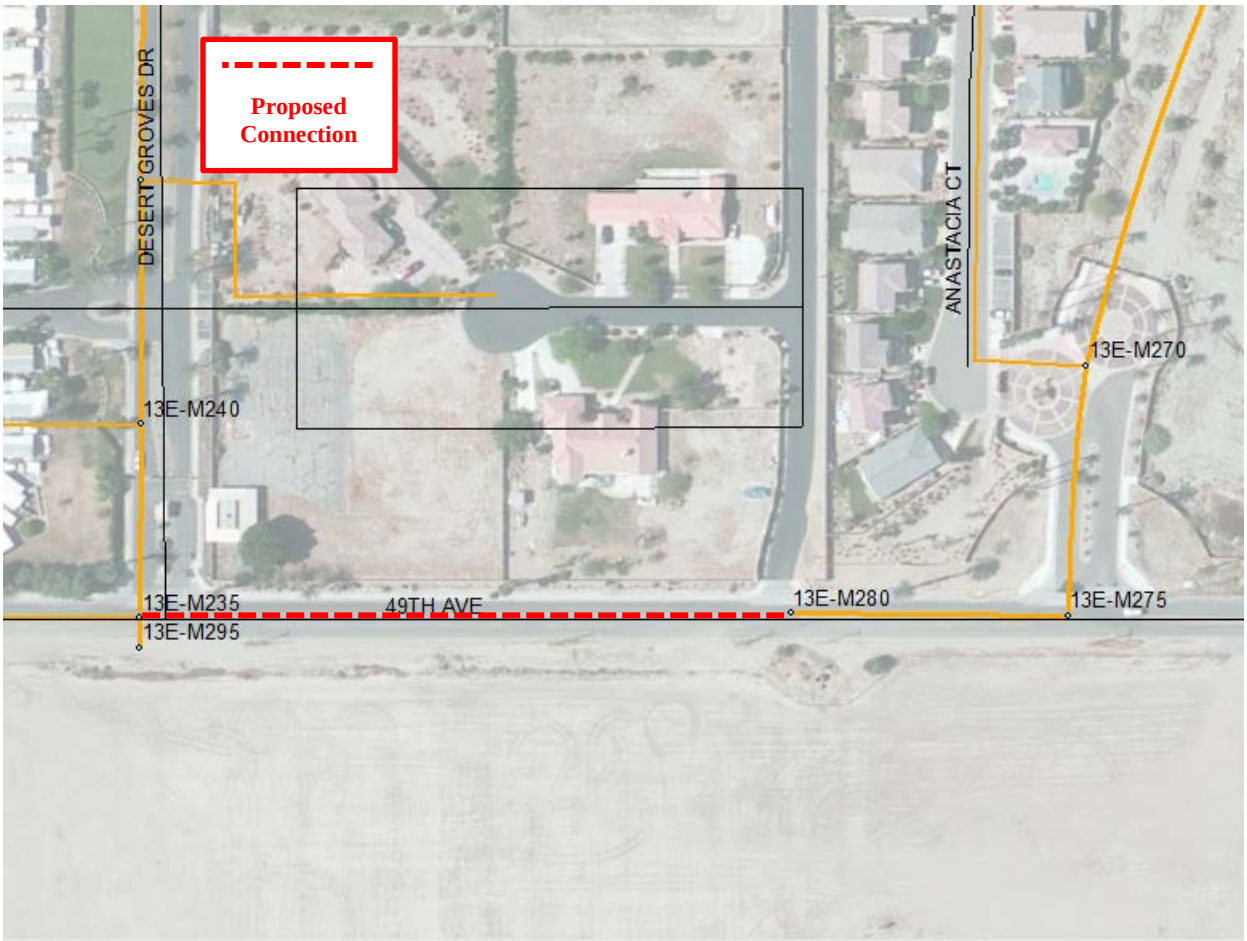
6.2.3 Avenue 49 Interceptor

Capacity deficiencies in the pipes along Avenue 49 and Desert Grove Drive require construction of an interceptor to convey flows to Avenue 48. The previous VSD Master Plan (Dudek and Assoc., 2003) called for a 15-inch pipe along Avenue 49 to Monroe St., then north to Avenue 48. As an alternative to this alignment, a line from Avenue 48 to Avenue 49 along Madison St. was also proposed. For this CIP, the interceptor from manhole 13E-M235 to manhole 13E-M280 is the preferred alternative as it requires the least amount of new infrastructure and should be sufficient to relieve capacity issues along Desert Grove Drive. In addition, no bulkheading will occur at manhole 13E-M235 so flow can travel east or north along Desert Grove Dr., thereby allowing for greater relief upstream. **Table 6-8** summarizes this interceptor. **Figure 6-7** shows the location of this recommended improvement.

Table 6-8
Avenue 49 Interceptor Summary

Start Node	Stop Node	Length (ft.)	Size (in)	Pipe Depth (ft.)
13E-M235	13E-M280	565	12	12

Figure 6-7
Avenue 49 Interceptor Location



6.2.4 Fred Waring Drive Interceptor

In order to relieve capacity deficiency in the north central area of the VSD service area, specifically on Sola St. and Palo Verde St., a downstream interceptor is recommended. Assuming that the operational change of bringing the Monroe Interceptor online, as previously described in this section, is implemented, excess capacity on the pipe along Market St. can be utilized in order to relieve other areas of the system. In order to utilize this capacity, a 12-inch pipe from manhole 6F-M215 to manhole 6F-M340 is recommended to divert flows to Market St. Improvement for the Fred Warning Drive Interceptor is summarized in **Table 6-9**. **Figure 6-8** shows the location of this recommended improvement.

Table 6-9
Fred Waring Drive Interceptor Summary

Start Node	Stop Node	Length (ft.)	Size (in)	Pipe Depth (ft.)
6F-M215	6F-M340[1]	967	12	9

1: 6F-M340 was used to make the downstream connection for the new pipe as the invert elevation of 6F-M290 was too high to maintain proper slope

Figure 6-8
Fred Waring Drive Interceptor Location

6.3 RECOMMENDED IMPROVEMENTS FOR BUILD-OUT SCENARIO

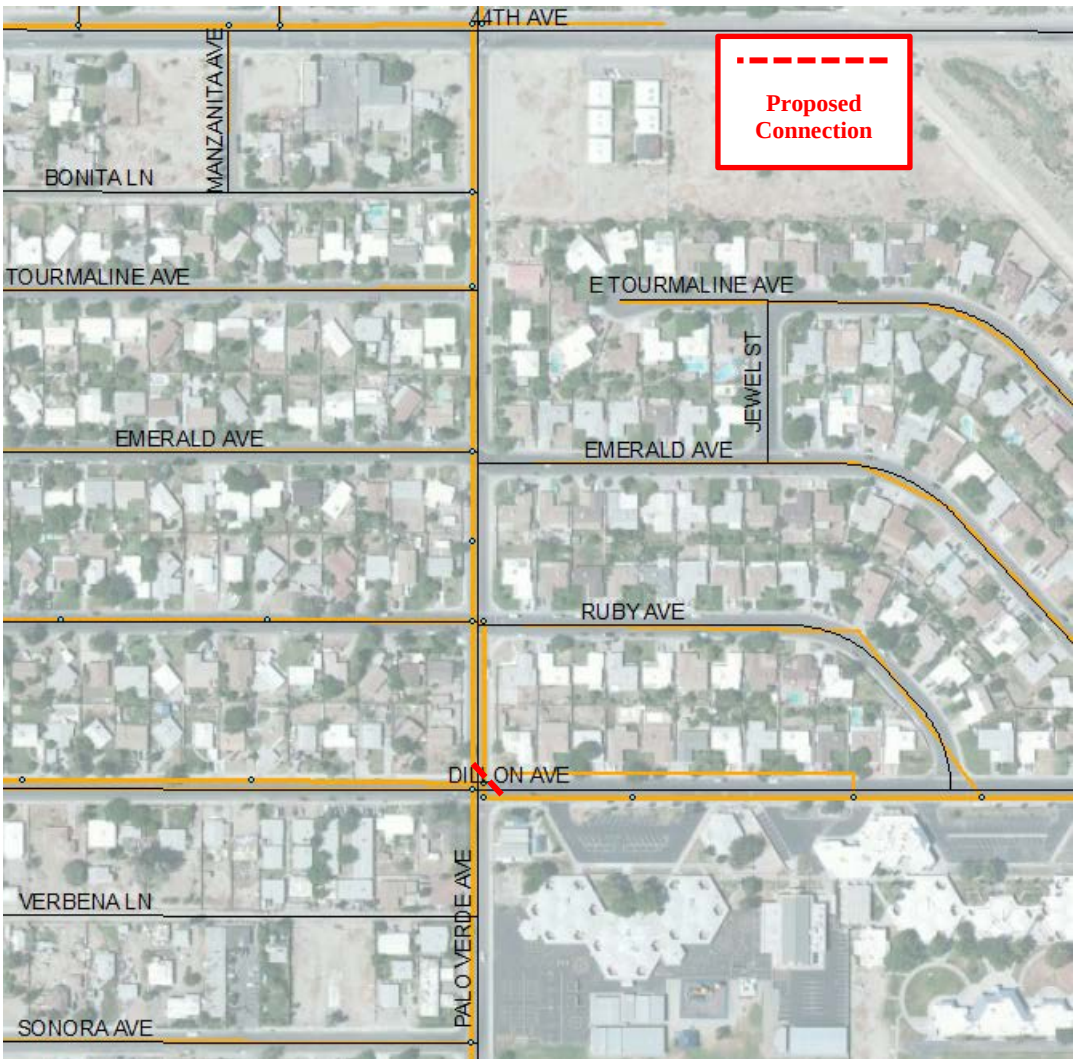
6.3.1 Avenue 44/Palo Verde Interceptor and Upgrade

Due to capacity issues along Avenue 44 and Palo Verde St., upsizing of existing pipes will be required in order to accommodate build-out system flows. Based on flows for the build-out system, a diversion is recommended in order to take advantage of surplus capacity along Dillon Avenue. **Table 6-10** summarizes additions and improvements sized to the ultimate build-out system. **Figure 6-9** shows the location of this recommended improvement.

Table 6-10
Avenue 44/Palo Verde Interceptor and Upgrade Summary

New Pipes				
Start Node	**Stop Node**	**Length (ft.)**	**Size (in)**	**Pipe Depth (ft.)**
7H-M185	7H-M305	25	12	9
Pipes to be upsized				
Pipe to be upgraded	**Existing Size (in)**	**Recommended Size (in)**	**Length (ft.)**	**Pipe Depth (ft.)**
7H-M305_7H-M307	15	18	258	9
7H-M307_7H-M310	15	18	383	10
7H-M310_7H-M315	15	18	222	10
7H-M315_7I-M035	15	18	315	10
7I-M035_7I-M040	15	18	111	11
7I-M040_7I-M045	15	18	273	11
7I-M045_7I-M050	15	18	372	9
7I-M050_7I-M055	15	18	504	13
7I-M055_7I-M060	15	18	489	20
7I-M060_8I-M105	15	18	475	20
8I-M105_8I-M110	15	18	239	20
8I-M110_8I-M115	15	18	598	14
8I-M115_8J-M055	15	18	703	14
6H-M115_6H-M120	10	12	294	9
6H-M120_6H-M125	10	12	130	9
6H-M125_6H-M130	10	12	181	8
6H-M130_6H-M135	10	12	260	8
6H-M135_6H-M140	10	12	91	8
6H-M140_6H-M145	10	12	332	8
6H-M145_7H-M274	10	12	290	8
7H-M274_7H-M275	10	12	165	9
7H-M275_7H-M280	10	12	285	9
7H-M280_7H-M285	10	12	155	8
7H-M285_7H-M290	10	12	140	8
7H-M290_7H-M185	10	12	291	9

Figure 6-9
Avenue 44/Palo Verde Interceptor Location



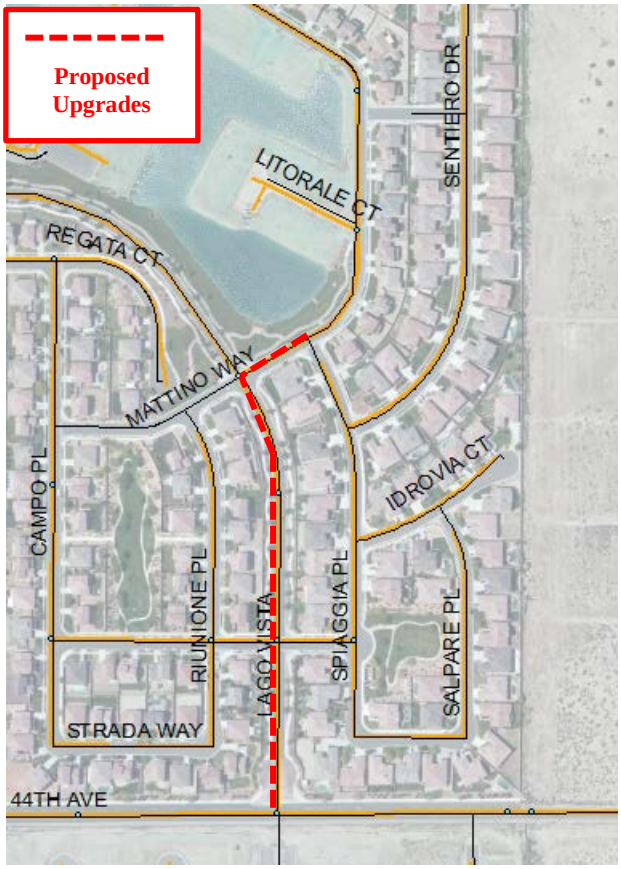
6.3.2 Lago Vista Upgrade

Due to capacity deficiencies on Lago Vista, it will be necessary to upgrade the 12-inch pipe that connects to the 18-inch pipe running along Avenue 44. The upgrades to this line are sized according to buildout conditions, though deficiencies are present according to modeled existing conditions. Further upgrades to neighboring areas, including the line connecting to Terra Lago Parkway will also be described in the following section. The upgrades specific to Lago Vista are described in **Table 6-11**. **Figure 6-10** shows the location of this recommended improvement.

Table 6-11
Lago Vista Upgrade Summary

Pipe to be upgraded	Existing Size (in)	Recommended Size (in)	Length (ft.)	Pipe Depth (ft.)
6K-M055_6K-M050	12	15	539	19
6K-M050_6K-M045	12	18	325	19
6K-M045_6K-M040	12	18	382	15
6K-M040_6K-M010	12	18	452	20

Figure 6-10
Lago Vista Upgrade Location



Section 7
Capital Improvement Program

This section presents a summary of Valley Sanitary District's (VSD's) capital improvement program (CIP) and planning level cost estimates for the recommended projects.

7.1 COST ESTIMATING BASIS

The CIP project cost estimates in this section are planning level cost estimates. The appropriate use of this estimate is for planning and may not be an actual representation of design to construction activities and costs. This estimate has an expected accuracy range of -20 percent to +100 percent. This range depends on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Accuracy could exceed this range in unusual circumstances. The estimate was prepared using a combination of parametric estimating factors and local experience in delivering projects similar to those that constitute VSD's CIP.

Costs were based on MWH's experience with costs of similar projects in the Coachella Valley. The original costs were developed in March 2010. In order to estimate change in costs from March 2010 to June 2013, price indices from Engineering News Record (ENR) were used to create and adjustment factor that was applied to all costs. The ENR Construction Cost Index for March 2010 was 8671, while the same index has a value of 9542 for June 2013. Therefore, an adjustment factor of 1.1 (9542 divided by 8671) will be used to adjust historical price estimates, and all values are then rounded up to the nearest $5 as a conservative estimate. **Table 7-1** shows a summary of the prices used for this cost estimate. All improvements are assumed to take place under asphalt road, and operations and maintenance costs are not included in this estimate. A summary of costs for all estimates for this project can be found at the end of this section.

Due to fluctuations in the market, uncertainty associated with the previous estimates and other factors, this estimate should only be used for planning purposes and a more rigorous estimate is recommended for any further activity. Additionally, manhole costs were not included in this planning level estimate, with the exception of the Requa Interceptor improvement. Because a previous Engineers Report existed for the Requa Interceptor (MSA Consultants), in which manhole costs were covered, they were included for that project. For the remaining projects, manhole costs will need to be addressed at a later stage of development.

Table 7-1
Price Estimating Basis

Pipeline Description	Diameter (in)	Pipe Depth (ft.)	Road Condition	March 2010 Cost ($/lf)	ENR Adjustment Factor	June 2013 Cost ($/lf)
8-inch Gravity	8	6	Asphalt	104	1.10	115
8-inch Gravity	8	8	Asphalt	105	1.10	115
8-inch Gravity	8	12	Asphalt	120	1.10	135
8-inch Gravity	8	16	Asphalt	136	1.10	150
8-inch Gravity	8	20	Asphalt	158	1.10	175
8-inch Gravity	8	23	Asphalt	181	1.10	200
10-inch Gravity	10	6	Asphalt	111	1.10	125
10-inch Gravity	10	8	Asphalt	113	1.10	125
10-inch Gravity	10	12	Asphalt	126	1.10	140
10-inch Gravity	10	16	Asphalt	142	1.10	160
10-inch Gravity	10	20	Asphalt	165	1.10	185
10-inch Gravity	10	27	Asphalt	260	1.10	290
12-inch Gravity	12	6	Asphalt	140	1.10	155
12-inch Gravity	12	8	Asphalt	143	1.10	160
12-inch Gravity	12	12	Asphalt	157	1.10	175
12-inch Gravity	12	16	Asphalt	175	1.10	195
12-inch Gravity	12	20	Asphalt	199	1.10	220
15-inch Gravity	15	8	Asphalt	163	1.10	180
15-inch Gravity	15	12	Asphalt	178	1.10	200
15-inch Gravity	15	16	Asphalt	196	1.10	220
15-inch Gravity	15	20	Asphalt	221	1.10	245
18-inch Gravity	18	8	Asphalt	178	1.10	200
18-inch Gravity	18	12	Asphalt	194	1.10	215
18-inch Gravity	18	16	Asphalt	212	1.10	235
18-inch Gravity	18	20	Asphalt	236	1.10	260
24-inch Gravity	24	8	Asphalt	226	1.10	250
24-inch Gravity	24	12	Asphalt	242	1.10	270
24-inch Gravity	24	16	Asphalt	261	1.10	290
24-inch Gravity	24	20	Asphalt	286	1.10	315
30-inch Gravity	30	6	Asphalt	309	1.10	340
30-inch Gravity	30	8	Asphalt	319	1.10	355
30-inch Gravity	30	12	Asphalt	341	1.10	375
30-inch Gravity	30	16	Asphalt	368	1.10	405
36-inch Gravity	36	8	Asphalt	391	1.10	435
36-inch Gravity	36	12	Asphalt	414	1.10	460

7.2 CAPITAL IMPROVEMENT PROJECTS

7.2.1 Recommended Improvements for Existing System

Requa Interceptor

Costs for the Requa Interceptor were based off of the lengths provided in the 2009 MSA Consultants, Inc. report for the Requa Interceptor (**Appendix H**). This information, in conjunction with the costs in **Table 7-1,** forms the basis for this cost estimate. **Table 7-2** summarizes the anticipated costs for the Requa Interceptor.

Table 7-2
Requa Interceptor Costs

Phase	Down MH	Up MH	Size (in)	Length (ft.)	Max Pipe Depth (ft.)	Unit Cost ($/lf)	Total Construction Cost ($)
1A	1	4	30	2,062	20	405	835,200
	4	5	30	1,342	11	355	476,500
	5	1b	30	1,626	11	355	577,300
1B	1b	2b	30	1,373	13	375	514,900
	2b	3b	30	2,663	17	405	1,078,600
	3b	4b	30	932	17	405	377,500
	4b	5b	30	1,747	22	405	707,600
	5b	6b	24	1,326	22	315	417,700
	6b	7b	24	1,069	12	270	288,700
	7b	8b	24	1,356	13	290	393,300
	8b	9b	24	501	14	290	145,300
	9b	10b	24	2,169	19	290	629,100
	10b	15b	24	2,740	19	290	794,600
Total Pipe Cost (Rounded)							**7,236,300**
Total Manhole Cost (65 x $15,000)							**975,000**
Total Cost							**8,211,300**

In addition to the pipe costs for the project, the Interceptor will require 65 manholes as stated in the 2009 MSA Consultants, Inc. report. Using a conservative estimate of $15,000 per manhole, an additional $975,000 will need to be budgeted for this project. The total construction cost, without contingency, construction management, or engineering and administration, is estimated to be $8,211,300.

In MSA Consultants' 2009 study, an estimation of project cost was completed. According to their findings, a total project cost of $11,367,235 was quoted. Using an ENR price index of 8592 for November 2009, when the report was submitted, this gives a price adjustment factor of 1.11. Applying this to the 2009 cost quoted by MSA Consultants, a present day cost of $12,624,087 is

calculated. This calculation falls within the threshold for the planning level estimate quoted above. It is also of note that the MSA Consultants estimate includes the cost of the Shields Interceptor.

Avenida Esmeralda Interceptor

The Avenida Esmeralda Interceptor will serve as a temporary relief to the Dr. Carreon Blvd. corridor, and will be able to add operational flexibility to the system. As this improvement only includes one new pipe, costs are relatively low compared to other improvements in the system**.** **Table 7-3** presents estimated costs associated with the Avenida Esmeralda Interceptor.

Table 7-3
Avenida Esmeralda Interceptor Costs

Start Node	Stop Node	Length (ft.)	Size (in)	Pipe Depth (ft.)	Unit Cost ($/lf)	Total Construction Cost ($)
11E-M160	New[1] Manhole	220	15	17	245	53,900
New Manhole	New Manhole	149	15	17	245	36,500
Total						**90,400**

Monroe Interceptor (Operational Change)

Because this improvement project is an operational change and all infrastructure is present, there is no cost estimate for this improvement. However, there is anticipated to be personnel and possibly some equipment costs associated with creating the bulkheading necessary to enact this change. It is recommended that VSD conduct an estimate of probable time and cost before embarking on this improvement.

Clinton Street Operational Change

Similar to the Monroe Interceptor, this recommended improvement does not require new or upgraded infrastructure. But, as before, there will likely be personnel and equipment costs associated with the bulkheading required for this operational change. It is recommended that VSD also conduct an estimate of probable time and cost for the Clinton St. operational change before moving forward.

Shields Interceptor

The Shields Interceptor was a project that was included in the 2009 MSA Consultants report on the Requa Interceptor alignment as the interceptor would allow the capacity to take Shields Pump Station offline and send flows to the east. For this Master Plan, the projects are evaluated separately. **Table 7-4** presents the costs associated with the Shields Interceptor.

Table 7-4
Shields Interceptor Costs

New Pipes						
Start Node	**Stop Node**	**Length (ft.)**	**Size (in)**	**Pipe Depth (ft.)**	**Unit Cost ($/lf)**	**Total Construction Cost ($)**
9C-M145	New Manhole	1277	12	13	195	249,000
New Manhole	9D-M195	150	12	13	195	29,300
Pipes to be Upsized						
Pipe to be upgraded	**Existing Size (in)**	**Recommended Size (in)**	**Length (ft.)**	**Pipe Depth (ft.)**	**Unit Cost ($/lf)**	**Total Construction Cost ($)**
9D-M195_9D-M200	10	12	242	13	195	47,200
9D-M200_9D-M245	10	12	238	13	195	46,400
9D-M245_9D-M340	10	12	443	13	195	86,400
Total						**458,300**

Avenue 48 West Upgrades

The Avenue 44 West Upgrades will serve to relieve the operational issues beginning at Avenue 44 and Madison St. No new pipe is required for this improvement, and costs are only for the replacement of pipe along Avenue 44**. Table 7-4** presents estimated costs associated with the Avenue 44 West Upgrades.

Table 7-5
Avenue 48 West Upgrades Costs

Pipe to be upgraded	Existing Size (in)	Recommended Size (in)	Length (ft.)	Pipe Depth (ft.)	Unit Cost ($/lf)	Total Construction Cost ($)
12C-M180_12C-M185	10	15	601	14	220	132,100
12C-M185_12C-M090	10	15	70	14	220	15,300
12C-M090_12C-M095	10	18	248	14	235	58,200
12C-M095_12C-M100	10	18	553	14	235	130,000
12C-M100_12C-M190	10	18	643	14	235	151,000
12C-M190_12C-M105	10	18	116	14	235	27,200
12C-M105_12C-M106	10	18	33	14	235	7,800
12C-M106_12D-M150	10	18	626	14	235	147,200
12D-M150_12D-M340	10	18	180	14	235	42,300
12D-M340_12D-M155	10	18	476	14	235	112,000
Total						**823,100**

7.2.2 Recommended Improvements for 5-Year Planning Scenario

Arabia Interceptor/Jackson Street Operational Change

The Arabia Interceptor/Jackson Street Operational Change consists of the bulkheading of manhole 10H-M220 and A new pipeline along Arabia St. Because of this location's proximity to Dr. Carreon Blvd., traffic may be an issue and lead to higher than anticipated costs. **Table 7-5** presents the estimated costs for the Arabia Interceptor/Jackson Street Operational Change.

Table 7-6
Arabia Interceptor/Jackson Street Operational Change Costs

New Pipes						
Start Node	**Stop Node**	**Length (ft.)**	**Size (in)**	**Pipe Depth (ft.)**	**Unit Cost ($/lf)**	**Total Construction Cost ($)**
10G-M195	9G-M215	850	8	8	115	101,200

Highway 111 Interceptor

The Highway 111 Interceptor is designed to send flows from Highway 111 north to the Requa Interceptor in order to free up capacity so the pipes west along Highway 111 can accept flows from the Jackson St. Interceptor and other improvements such as a possible jail expansion on Highway 111. The alignment of this interceptor would run along Highway 111, north along Arabia St. to Requa Ave. Traffic costs must be considered for this improvement due to impacts to Highway 111 during construction. **Table 7-6** presents estimated costs for the Highway 111 interceptor.

Table 7-7
Highway 111 Interceptor Costs

New Pipes						
Start Node	**Stop Node**	**Length (ft.)**	**Size (in)**	**Pipe Depth (ft.)**	**Unit Cost ($/lf)**	**Total Construction Cost ($)**
9G-M100	MH-28 (Requa Interceptor Manhole)	1,229	12	17	220	270,400
Pipes to be upsized						
Pipe to be upgraded	**Existing Size (in)**	**Recommended Size (in)**	**Length (ft.)**	**Pipe Depth (ft.)**	**Unit Cost ($/lf)**	**Total Construction Cost ($)**
9F-M047_9F-M050	8	12	231	12	135	31,200
9F-M050_9F-M055	8	12	52	12	135	7,100
9F-M055_9G-M100	8	12	340	12	135	45,900
9F-M035_9F-M305	8	12	296	12	135	40,000
9F-M045_9F-M047	8	12	218	12	135	29,500
9F-M040_9F-M045	8	12	454	12	135	61,300
9F-M305_9F-M040	8	12	160	12	135	21,600
Total						**507,000**

Avenue 49 Interceptor

The Avenue 49 Interceptor will transfer flow from the impacted 10-inch line running under Desert Grove Dr. in the south portion of VSD. The recommended pipe would run along Avenue 49, in a lightly developed portion of the system. Due to the length of pipe required and the occupancy in the area, there are not expected to be a large amount of ancillary costs associated with this project. **Table 7-7** presents estimated costs for Avenue 49 interceptor.

Table 7-8
Avenue 49 Interceptor Costs

Start Node	Stop Node	Length	Diameter	Pipe Depth (ft.)	Unit Cost ($/lf)	Total Construction Cost ($)
13E-M235	13E-M280	565	12	12	175	**98,900**

Fred Waring Drive Interceptor

The Fred Waring Drive Interceptor will span along Fred Waring Drive North of the 10 Freeway and south of Industrial Plaza. This area of the system is mostly industrial and is lightly developed. In addition Monroe St., which runs parallel to Fred Waring in this area, serves as the major thoroughfare. Therefore, traffic is not expected to be an issue with this improvement. **Table 7-8** presents estimated costs for the Fred Waring Drive Interceptor.

Table 7-9
Fred Waring Drive Interceptor Summary

Start Node	Stop Node	Length	Diameter	Pipe Depth (ft.)	Unit Cost ($/lf)	Total Construction Cost ($)
6F-M215	6F-M340	967	12	9	175	**169,300**

7.2.3 Recommended Improvements for Build-Out Scenario

Avenue 44/Palo Verde Interceptor and Upgrade

This interceptor and related upgrades will serve the north-central area of the VSD system. This upgrade and addition will directly serve residential and commercial properties along Jackson St. and Avenue 44. **Table 7-9** presents estimated costs for the Avenue 44/Palo Verde Interceptor and Upgrade.

Table 7-10
Avenue 44/Palo Verde Interceptor and Upgrade Costs

New Pipes						
Start Node	**Stop Node**	**Length**	**Diameter**	**Pipe Depth (ft.)**	**Unit Cost ($/lf)**	**Total Construction Cost ($)**
7H-M185	7H-M305	25	12	9	175	4,400
Pipes to be upsized						
Pipe to be upgraded	**Existing Size (in)**	**Recom-mended Size (in)**	**Length (ft.)**	**Pipe Depth (ft.)**	**Unit Cost ($/lf)**	**Total Construction Cost ($)**
7H-M310_7H-M315	15	18	222	10	215	47,800
7H-M305_7H-M307	15	18	258	9	215	55,500
7H-M315_7I-M035	15	18	315	10	215	67,800
7H-M307_7H-M310	15	18	383	10	215	82,400
7I-M050_7I-M055	15	18	504	13	235	118,500
7I-M035_7I-M040	15	18	111	11	215	23,900
7I-M045_7I-M050	15	18	372	9	215	80,000
7I-M055_7I-M060	15	18	489	20	260	127,200
7I-M060_8I-M105	15	18	475	20	260	123,500
7I-M040_7I-M045	15	18	273	11	215	58,700
8I-M105_8I-M110	15	18	239	20	260	62,200
8I-M110_8I-M115	15	18	598	14	235	140,600
8I-M115_8J-M055	15	18	703	14	235	165,300
6H-M115_6H-M120	10	12	294	9	160	47,100
6H-M120_6H-M125	10	12	130	9	160	20,800
6H-M125_6H-M130	10	12	181	8	160	29,000
6H-M130_6H-M135	10	12	260	8	160	41,600
6H-M135_6H-M140	10	12	91	8	160	14,600
6H-M140_6H-M145	10	12	332	8	160	53,200
6H-M145_7H-M274	10	12	290	8	160	46,400
7H-M274_7H-M275	10	12	165	9	160	26,400
7H-M275_7H-M280	10	12	285	9	160	45,600
7H-M280_7H-M285	10	12	155	8	160	24,800
7H-M285_7H-M290	10	12	140	8	160	22,400
7H-M290_7H-M185	10	12	291	9	160	46,600
Total						**1,576,300**

Lago Vista Upgrade

The Lago Vista Upgrade will serve the far northwest portion of the VSD system. Lago Vista serves as the main thoroughfare for a large residential development in this area of the system. **Table 7-10** presents estimated costs for the Lago Vista Upgrade.

Table 7-11
Lago Vista Upgrade Costs

Pipe to be upgraded	Existing Size (in)	Recommended Size (in)	Length (ft.)	Pipe Depth (ft.)	Unit Cost ($/lf)	Total Construction Cost ($)
6K-M050_6K-M045	12	18	325	19	260	84,500
6K-M055_6K-M050	12	15	539	19	245	132,100
6K-M040_6K-M010	12	18	452	20	260	117,600
6K-M045_6K-M040	12	18	382	15	235	89,800
Total						**424,000**

7.3 SUMMARY

Based on the above estimates, **Table 7-11** presents a summary of all recommended projects and the associated total project costs. **Table 7-12** presents these project costs phased out for each planning phase, as well as gives a final cost estimate that includes a 30 percent contingency factor, a 15 percent engineering and administration estimate, and a 10 percent construction management factor. Based on these results, the total cost for all recommended improvements equals roughly $19,500,200.

Table 7-12
Summary of CIP Estimated Costs[1]

Project No.	Project Name	Total Construction (Const.) Cost ($)	30% Cont-igency ($)	15 % Eng. and Admin. ($)	10% Constr. Mgmt. ($)	Rounded Total Cost ($)
E-1	Requa Interceptor	8,211,300	2,463,390	1,231,695	821,130	12,727,600
E-2	Avenida Esmeralda Interceptor	90,400	27,120	13,560	9,040	140,200
E-3	Monroe Interceptor	N/A	-	-	-	-
E-4	Clinton Street Operational Change	N/A	-	-	-	-
E-5	Shields Interceptor	458,300	137,490	68,750	45,830	823,400
E-6	Avenue 48 West Upgrades	823,100	246,930	123,465	82,310	1,275,900
P-1	Jackson Street Interceptor	101,200	30,360	15,180	10,120	156,900
P-2	Highway 111 Interceptor	507,000	152,100	76,050	50,700	785,900
P-3	Avenue 49 Interceptor	98,900	29,670	14,835	9,890	153,300
P-4	Fred Waring Drive Interceptor	169,300	50,790	25,395	16,930	262,500
B-1	Ave 44/Palo Verde Interceptor and Upgrade	1,576,300	472,890	236,445	157,630	2,443,300
B-2	Lago Vista Upgrades	424,000	127,200	63,600	42,400	657,200
Total (Rounded)		**12,459,800**	**3,737,940**	**1,868,975**	**1,245,980**	**19,426,200**

1: June 2013 dollars

Table 7-13
Phased CIP Costs[1]

Scenario	Existing	5-Year	Build-Out
Estimated Construction Cost ($)	9,583,100	876,400	2,000,300
30% Contingency ($)	2,874,930	262,920	600,090
15% Engineering and Administration Costs ($)	1,437,470	131,460	300,040
10% Construction Management ($)	958,310	87,640	200,030
Rounded Total Cost ($)	**14,967,100**	**1,358,600**	**3,100,500**

1: June 2013 dollars

Appendix A
References

The following entities provided information that was cited or used for this Master Plan report for Valley Sanitary District (VSD). Specific documents and websites used in this report are also listed.

Boyer Engineering Company, Inc. *Sewer System Capacity Study: Avenue 42, between Madison Street and Monroe Street*. July, 2008.

Coachella Valley Association of Governments (CVAG). *www.cvag.org.* Accessed: October 2012

Coachella Valley Water District (CVWD). *www.cvwd.org.* Accessed: April 2013

Dudek and Associates, Inc. *Wastewater Collection System Master Plan.* May, 2003

Electronic Files, Valley Sanitary District, Received: May-June 2012

- GIS file of sewer maintenance holes
- GIS file of sewer mains
- GIS file of pump stations
- GIS file of 2- foot elevation contours
- GIS file for the VSD service area boundary
- GIS files for street centerlines and parcels
- GIS information for land use general plan
- Digital aerial photography coverage for VSD
- Topographical data for VSD
- Atlas Maps

Hunsaker & Associates Irvine, Inc. *Sewer System Capacity Study: Avenue 42, between Madison Street and Monroe Street.* May, 2008.

MSA Consultants, Inc. *ENGINEER'S REPORT: Requa Avenue Interceptor Alignment Review*. November, 2009.

National Oceanic and Atmospheric Administration Data Center. *www.ncdc.noaa.gov/data-access.* Accessed: November 2012

United States Census Bureau. *www.census.gov.* Accessed: October 2012

United Sates Historical Climatology Network. *cdiac.ornl.gov/epubs/ndp/ushcn/ushcn.html*. Accessed: November 2012

Utility Systems, Science, and Software, Inc. (US3). *www.uscubed.com*. Accessed: February-March, 2013.

Winzler and Kelly, Consulting Engineers. *Technical Memorandum: Sanitary Sewer Main Analysis.* August, 2008.

Appendix B
Known Developments

The following image was provided by VSD and shows known developments over the 5-year planning horizon. Areas marked as “build-out” were estimated in the model by changing the land use for that area. Developments with known Equivalent Dwelling Units (EDUs) were assigned point loads as described in **Section 4**. This document was provided to MWH by VSD on March 27, 2013.

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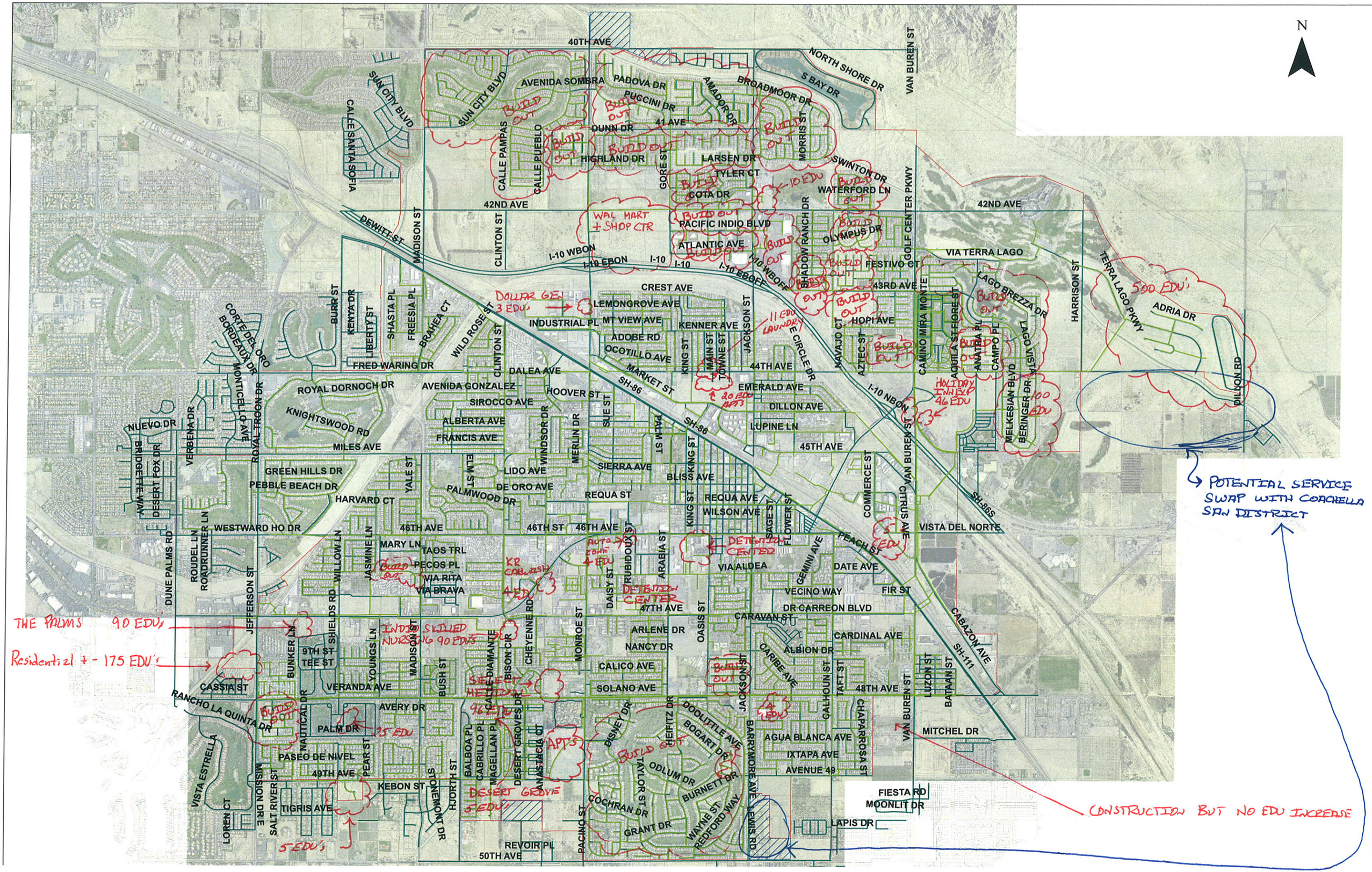
N
40TH AVE
NORTH SHORE DR
VAN BUREN ST
S BAY DR
BROADMOOR DR
AMADOR DR
PUCCINI DR
PADOVA DR
AVENIDA SOMBRA
SUN CITY BLVD
CALLE SANTA SOFIA
CALLE PAMPAS
CALLE PUEBLO
DUNN DR
41 AVE
HIGHLAND DR
LARSEN DR
TYLER CT
GORE ST
MORRIS ST
SWINTON DR
WATERFORD LN
COTA DR
42ND AVE
DEWITT ST
MADISON ST
CLINTON ST
WAL MART + SHOP CTR
PACIFIC INDIO BLVD
ATLANTIC AVE
SHADOW RANCH DR
OLYMPUS DR
GOLF CENTER PKWY
VIA TERRA LAGO
FESTIVO CT
43RD AVE
I-10 WBON
I-10 EBON
I-10
I-10 EBOFF
I-10 WBOFF
CREST AVE
LEMONGROVE AVE
INDUSTRIAL PL
MT VIEW AVE
KENNER AVE
ADOBE RD
OCOTILLO AVE
JACKSON ST
HOPI AVE
NAVAJO CT
AZTEC ST
CIRCLE DR
CAMINO MIRA MONTE
AQUILA STEFORE ST
ANATRA PL
CAMPO PL
LAGO BREZZA DR
LAGO VISTA
HARRISON ST
TERRA LAGO PKWY
ADRIA DR
DILLON RD
BURR ST
KENYA DR
LIBERTY ST
SHASTA PL
FREESIA PL
BRAHEA CT
WILD ROSE ST
CORTE DEL ORO
BORDEAUX DR
MONTICELLO AVE
ROYAL TROON DR
FRED WARING DR
DALEA AVE
MARKET ST
SH-86
KING ST
MAIN ST
TOWNE ST
44TH AVE
EMERALD AVE
DILLON AVE
LUPINE LN
45TH AVE
I-10 NBON
ROYAL DORNOCH DR
AVENIDA GONZALEZ
HOOVER ST
SIROCCO AVE
KNIGHTSWOOD RD
ALBERTA AVE
FRANCIS AVE
MILES AVE
NUEVO DR
VERBENA DR
BRIDGETTE WAY
DESERT FOX DR
SUE ST
PALM ST
MERLIN DR
WINDSOR DR
SIERRA AVE
BLISS AVE
GREEN HILLS DR
PEBBLE BEACH DR
HARVARD CT
YALE ST
LIDO AVE
DE ORO AVE
PALMWOOD DR
ELM ST
REQUA ST
REQUA AVE
WILSON AVE
COMMERCE ST
CITRUS AVE
VISTA DEL NORTE
PEACH ST
WESTWARD HO DR
46TH AVE
46TH ST
MARY LN
TAOS TRL
PECOS PL
VIA RITA
VIA BRAVA
ROUDEL LN
ROADRUNNER LN
DUNE PALMS RD
JEFFERSON ST
WILLOW LN
JASMINE LN
SHIELDS RD
KR CARWASH
DAISY ST
RUBIDOUX ST
ARABIA ST
KING ST
SAGE ST
FLOWER ST
GEMINI AVE
VIA ALDEA
DATE AVE
VECINO WAY
FIR ST
DR CARREON BLVD
CARAVAN ST
CABAZON AVE
SH-86S
SH-111
THE PALMS 90 EDU's
Residential + - 175 EDU's
INDIO SKILLED NURSING 90 EDU's
9TH ST
TEE ST
BUNKER LN
YOUNGS LN
MADISON ST
BUSH ST
CHEYENNE RD
MONROE ST
47TH AVE
OASIS ST
ARLENE DR
NANCY DR
CALICO AVE
SOLANO AVE
CARDINAL AVE
ALBION DR
CARIBE AVE
CALHOUN ST
TAFT ST
48TH AVE
CHAPARROSA ST
LUZON ST
BATAAN ST
CASSIA ST
VERANDA AVE
RANCHO LA QUINTA DR
NAUTICAL DR
AVERY DR
PALM DR
25 EDU
PASEO DE NIVEL
PEAR ST
BALBOA PL
CABRILLO PL
MAGELLAN PL
DESERT GROVES DR
CALLE DIAMANTE
BISON CR
SELECT MEDICAL 96 EDU
APT'S
DISNEY DR
DOOLITTLE AVE
BOGART DR
JACKSON ST
BARRYMORE AVE
AGUA BLANCA AVE
IXTAPA AVE
AVENUE 49
VAN BUREN ST
MITCHEL DR
VISTA ESTRELLA
MISSION DR
SALT RIVER ST
49TH AVE
KEBON ST
TIGRIS AVE
LOREN CT
TONOMONT DR
HJORTH ST
DESERT GROVE 5 EDU's
5 EDU's
REVOIR PL
50TH AVE
PACINO ST
COCHRAN DR
GRANT DR
TAYLOR ST
ODLUM DR
BURNETT DR
WAYNE ST
REDFORD WAY
LEWIS RD
FIESTA RD
MOONLIT DR
LAPIS DR
CONSTRUCTION BUT NO EDU INCREASE
POTENTIAL SERVICE SWAP WITH COACHELLA SAN DISTRICT
BUILD OUT
10 EDU
DOLLAR GEN 3 EDU's
11 EDU LAUNDR
20 EDU APT
HOLIDAY INN BLD 46 EDU
100 EDU
500 EDU's
AUTO ZONE 4 EDU
DETENTION CENTER
4 EDU
5 EDU

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Appendix C
Technical Memorandum - Flow Monitoring

Below is the Flow Monitoring Technical Memorandum (TM) prepared for Valley Sanitary District (VSD). The final version of this TM was delivered to VSD on December 3, 2012.

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TECHNICAL MEMORANDUM

MWH

BUILDING A BETTER WORLD

To:	Joe Glowitz, VSD	**Date:**	December 3, 2012
From:	Jinny Huang, MWH	**Reference:**	10500972/6.2
Subject:	Flow Monitoring Plan		

Introduction

As part of the collection system hydraulic modeling effort, a flow monitoring program will be implemented in order to correlate the actual collection system sewer flows with the estimated flows in the hydraulic model. This flow monitoring plan focuses on the field work and data collection. In addition, the plan shows the proposed locations of the monitoring sites.

The objectives of the flow monitoring program are:

1. To develop flow generation rates for various land use categories;
2. To develop the diurnal curve for various land use categories;
3. To collect representative sewer flows in the collection system to calibrate the hydraulic model to the dry weather flow conditions.

The program has been developed in accordance with Task 4 of the Collection System Master Plan project. MWH will utilize Downstream Services, Inc. (DSI) as subconsultants to perform the flow monitoring in the field. MWH's engineer will supervise the DSI crew on the day of installation of the meters. DSI will be responsible for flow monitoring, data collection, data processing, and transmission of the data to MWH. DSI will also be responsible for preparing any required traffic control plans in accordance with Manual on Uniform Traffic Control Devices (MUTCD) standards.

Implementation of Flow Monitoring Plan

To achieve maximum benefit from the VSD flow monitoring plan, certain guidelines should be considered when selecting manholes for meter installation:

- Avoid manholes with junctions of large pipes or drops: turbulent "mixing" of flows will likely result in inaccurate level and velocity readings. These manholes can also experience high levels of hydrogen sulfide (H_2S) gas, which can damage electrical equipment over time and preclude personnel entry for maintenance, cleaning and periodic accuracy checks;

- Avoid manholes near curves or sharp alignment bends: velocity variations between the inside and outside walls of a pipeline around a curve or sharp alignment bend will likely result in inaccurate velocity readings. Most manufacturers recommend a straight, constantly sloped length of 5 to 10 times the pipe diameter upstream and downstream from the meter location;

Flow Monitoring Plan

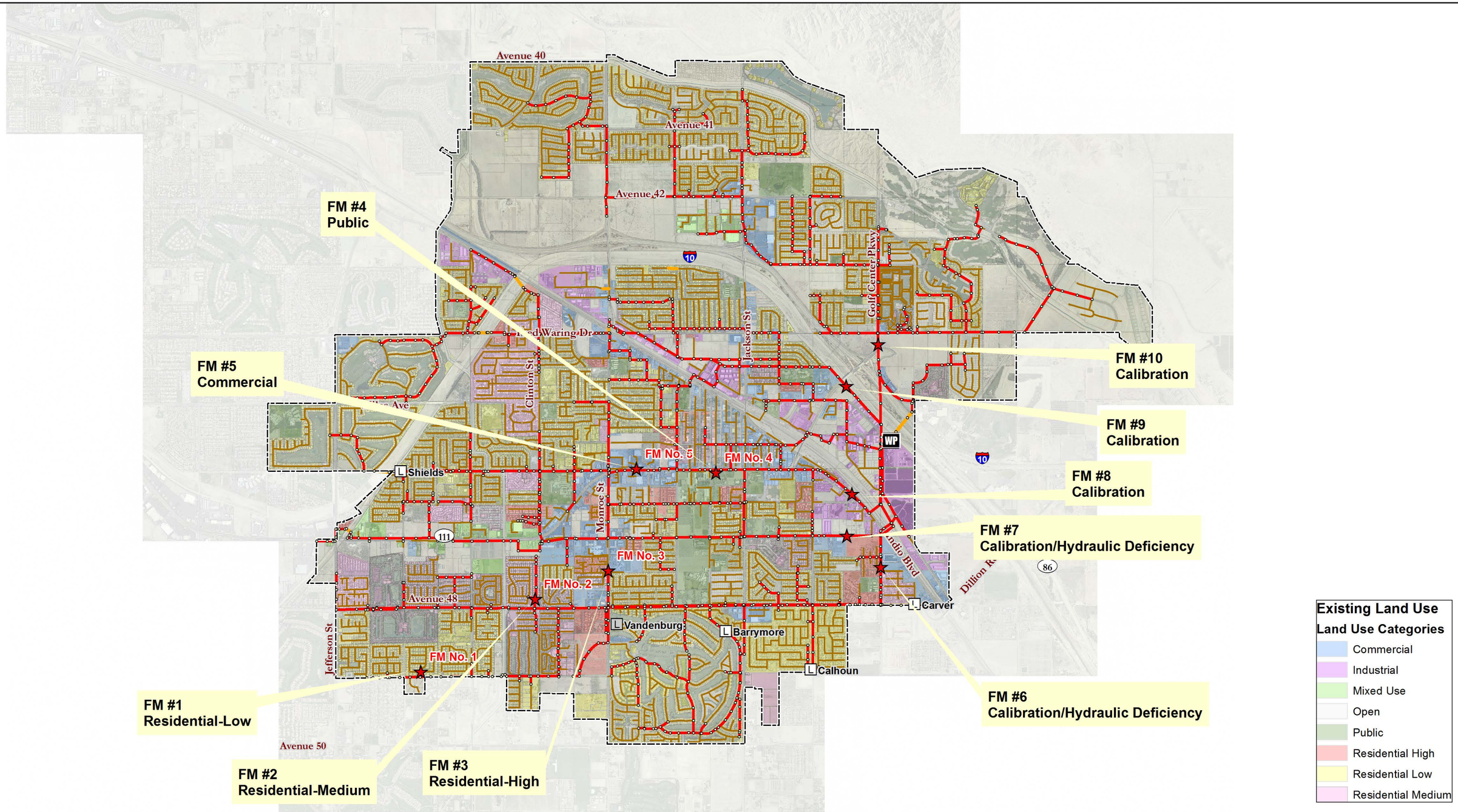
According to the scope of work between MWH and VSD, ten (10) temporary flow monitoring meters are to be installed.

In evaluating the VSD sewer system, MWH is recommending five (5) flow monitoring locations to be selected to obtain flows from a variety of land use types, and five (5) flow monitoring locations to obtain flows from a wide variety of spatial distributions. **Table 1** lists the flow monitoring locations and the reasoning for the location choice. **Figure 1** shows the locations of the proposed flow monitoring meters.

Table 1
Flow Monitoring Locations

Monitor No.	Purpose	Location	Manhole ID	Pipe Diameter
1	Residential – Low Density Land Use	Orchard Drive and 49th Avenue	13C-M085	8
2	Residential – Medium Density Land Use	Avenida Camelia and Calle Diamante	12E-M360	15
3	Residential – High[1] Density Land Use	Monroe Street, 500 ft north of Victoria Street	11F-M070	10
4	Public Land Use	South of Highway 111, 200 ft east of Oasis Avenue	9G-M020	8
5	Commercial Land Use	Highway 111, 500 ft west of Rubidoux Street	9F-M360	8
6	Calibration/ Hydraulic Deficiencies[2]	Van Buren Street, 150 ft north of Manila Avenue	11J-M095	30
7	Calibration/ Hydraulic Deficiencies[2]	Dr. Carreon Blvd, 1,300 ft east of Calhoun Street	10I-M140	18
8	Calibration	Highway 111, 300 ft south of Maple Avenue	10I-M110	18
9	Calibration	Northeast area of Golf Center Parkway and 45th Avenue intersection, and west of Whitewater River	7I-M060	15
10	Calibration	Golf Center Parkway, 400 ft south of 44th Avenue	7J-M055	36

1 Captures some commercial land use.
2 Hydraulically deficient based on 2002 Sewer Master Plan.



Key to Features

- FlowMeterLocations
- Lift Station
- Modeled Lift Station
- Wastewater Treatment Plant
- Manhole
- Valley Sanitary District Boundary
- Siphon
- Modeled Sewer Pipeline
- Sewer Pipeline

N

0 0.5 1 Miles

Document: \\Uspas1s01\muni\Clients\Valley San District\IDIQ As-Needed\Task 1 -Sewer System MP\14 Electronic Files - Modeling_MXDs\FlowMonitoringSitesv2.mxd

Date:November 30, 2012

Valley Sanitary District Proposed Flow Monitoring Sites

MWH.

Figure 1

Flow Monitor No. 1

Flow Monitor No. 1 collects low density residential flow for a rough subcatchment area of 40 acres. The monitor will be installed along an 8-inch pipeline at manhole 13C-M085 at the intersection of Orchard Drive and Apricot Lane, as shown in **Figure 2**.

Figure 2 - Flow Monitor No. 1 Catchment Area

Flow Monitoring No. 2

Flow Monitor No. 2 collects medium density residential flow for a rough subcatchment area of 60 acres. The monitor will be installed along a 15-inch pipeline at manhole 12E-M360 at the intersection of Avenida Camelia and Calle Diamante, as shown in **Figure 3**.

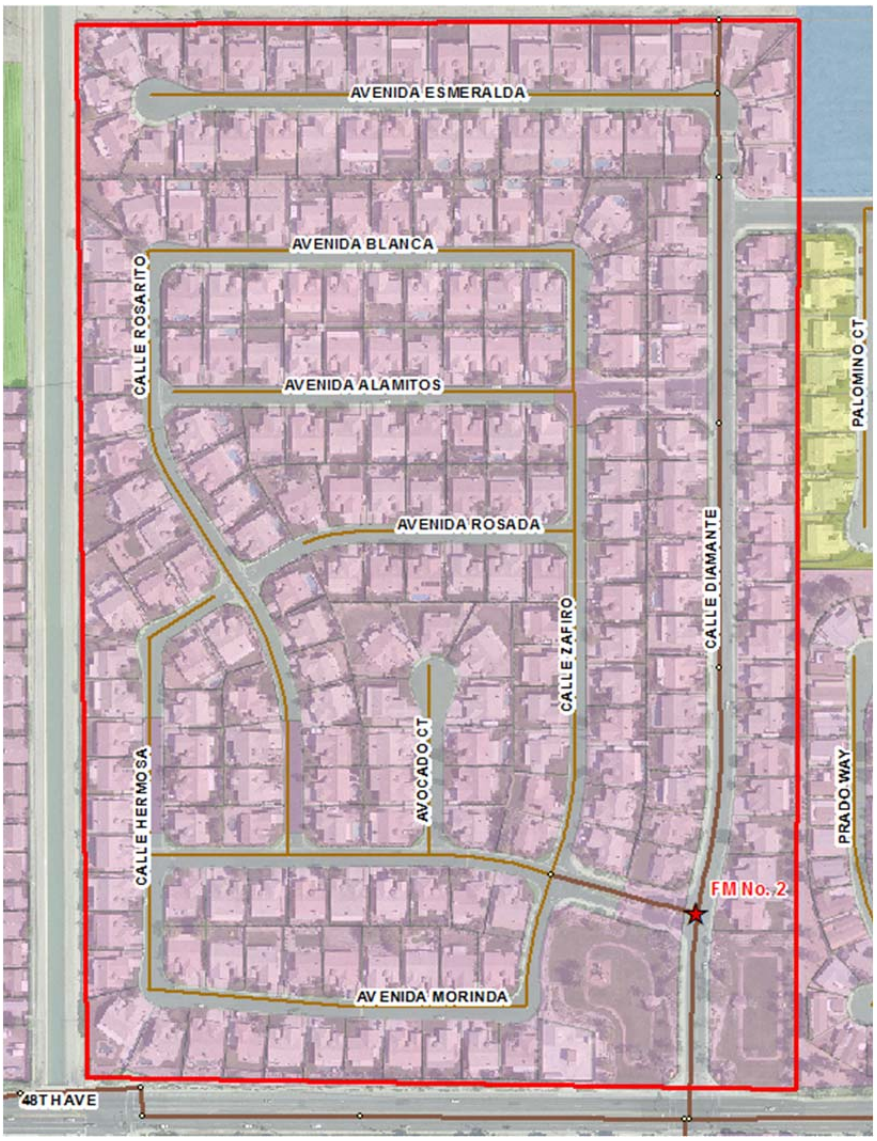


Figure 3 - Flow Monitor No. 2 Catchment Area

Flow Monitor No. 3

Flow Monitor No. 3 collects primarily high density residential flow of about 20 acres and with about 12 acres of commercial flow. The monitor will be installed a 10-inch pipeline at manhole 11F-M070 on Monroe Street (running north to south), about 500 feet north of Victoria Street, as shown in **Figure 4**.

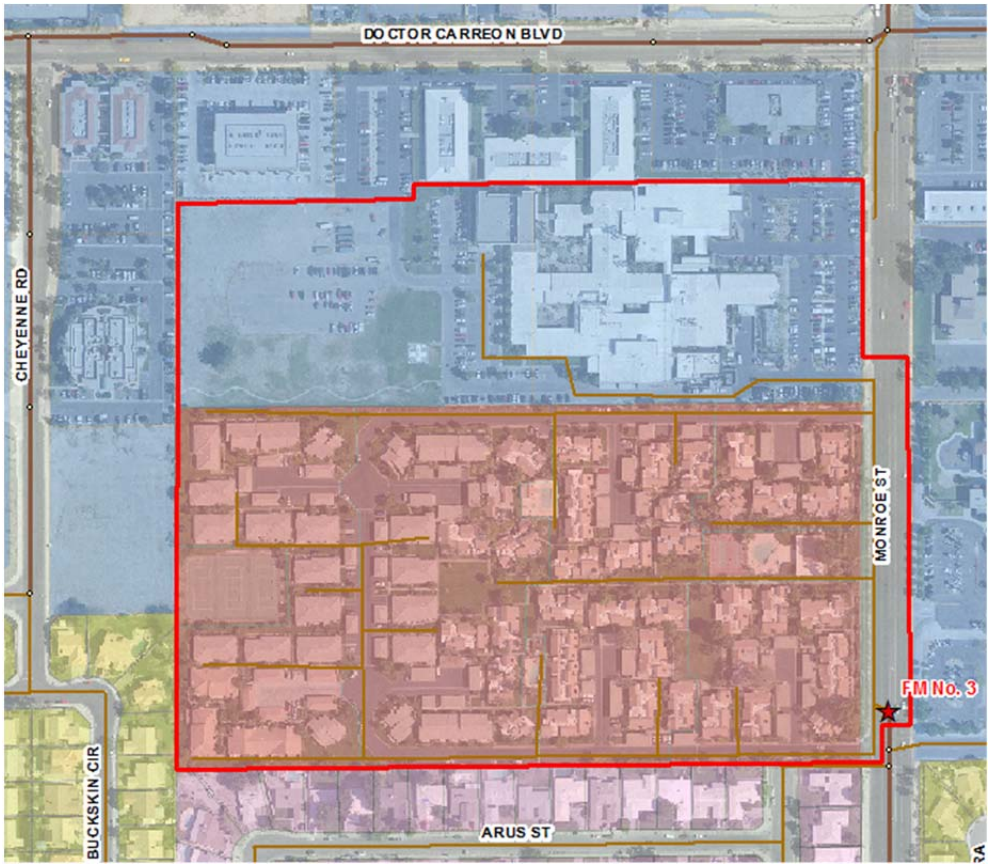


Figure 4 - Flow Monitor No. 3 Catchment Area

Flow Monitor No. 4

Flow Monitor No. 4 collects about 10 acres of public facility flow along an 8-inch pipeline at manhole 9G-M020 at the Larson Justice Center. The manhole is located south of Highway 111 and about 200 feet east of Oasis Avenue, as shown in **Figure 5**.

Figure 5 - Flow Monitors 4 Catchment Areas

Flow Monitor No. 5

Flow Monitor No. 5 collects commercial flow for about 10 acres. The monitor will be installed along an 8-inch pipeline at manholes 9F-M360 along a secondary street about 500 feet west of Rubidoux Street (running north to south), just north of Highway 111, as shown in **Figure 6**.

Figure 6 - Flow Monitor No. 5 Catchment Area

Flow Monitor No. 6

Flow Monitor No. 6 will collect flow from a mix of land use types for a large catchment area of the VSD collection system. This site is also chosen based on its hydraulic deficient designation in the 2002 Sewer Master Plan. The monitor will be located along a 30-inch pipeline at manhole 11J-M095 on Van Buren Street, approximately 150 feet north of Manila Avenue.

Flow Monitor No. 7

Flow Monitor No. 7 will collect flow from a mix of land use types for a large catchment area of the VSD collection system. This site is also chosen based on its hydraulic deficient designation in the 2002 Sewer Master Plan. The monitor will be located along an 18-inch pipeline at manhole 10I-M140 on Dr. Carreon Boulevard, about 1,300 feet east of Calhoun Street.

Flow Monitor No. 8

Flow Monitor No. 8 will collect flow from a mix of land use types for a large catchment area of the VSD collection system. The monitor will be located along an 18-inch pipeline at manhole 10I-M110 along Highway 111, approximately 300 feet south of Maple Avenue.

Flow Monitor No. 9

Flow Monitor No. 9 will collect flow from a mix of land use types for a large catchment area of the VSD collection system. The monitor will be located along a 15-inch pipeline at manhole 7I-M060 at a vacant field west of Whitewater River, and at the northeast area of the Golf Center Parkway and 45th Avenue intersection.

Flow Monitor No. 10

Flow Monitor No. 10 will collect flow from a mix of land use types for a large catchment area of the VSD collection system. The monitor will be located along a 36-inch pipeline at manhole 7J-M055 along Golf Center Parkway, about 400 feet south of 44th Avenue.

Flow Monitoring

Once the flow monitors are installed and confirmed, Downstream Service, Inc. (DSI) will monitor flows for a period of 7 days ("monitoring period"). This period may be extended if necessary. To record data over the longer term, pressure-sensitive taps will be used.

During the course of the project and as part of DSI quality control program, the field crews will visit each location and reconfirm that the monitor is in proper working condition. This includes cleaning depth and velocity sensors, confirmations as needed, and checking an installation to make sure that the ring is secure in the pipe. A DSI data analyst will also review the data on a regular basis throughout the monitoring period.

DSI will provide all necessary services for the flow monitors that involve troubleshooting the common faults that are repairable in the field. Common service problems are sensor scrubs, battery changes, and internal board replacements.

Once activated and confirmed to be working properly, DSI field crews will visit the monitored locations. Depth and velocity data will be collected and reviewed onsite to reduce the potential for data loss.

Once authorized, crews will remove the flow monitors and deliver final data to the data analyst.

Flow Data

During and upon completion of the monitoring period, DSI will analyze the data. The data analyst will directly calculate flow using the continuity equation from recorded depth and average velocity data. Flow quantities as determined by the continuity equation will be plotted. The analyst will also utilize scattergraphs (depth vs. velocity readings) to verify monitor accuracy. Once the data is transmitted to MWH, the data will be used for calibration of the hydraulic model.

Public Notification

VSD is responsible for notifying City of Indio, Riverside County, VSD operations crew, emergency services, and residential water groups that there will be a field crew working in the select areas.

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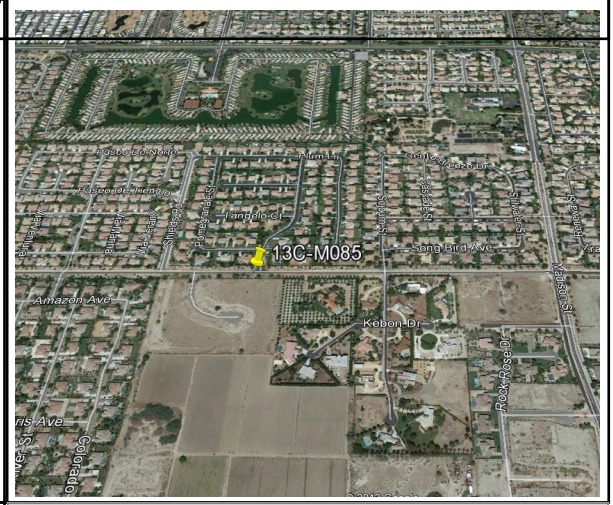
Appendix D
US3 Flow Monitoring Report

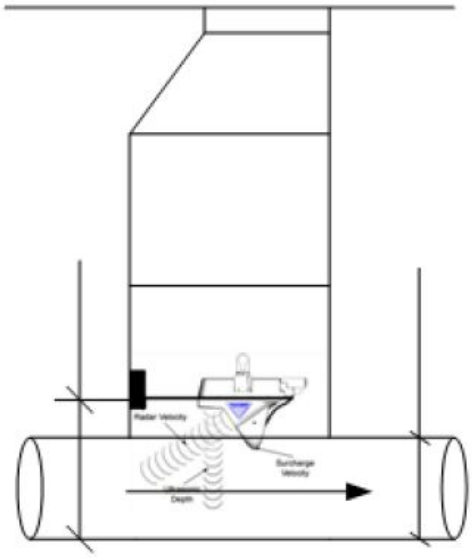
Flow monitoring activities for the VSD system were completed by Utility Systems, Science and Software, Inc. (US3) between January 4th and January 19th, 2013. This Appendix contains the site installation reports and statistics summaries provided by US3 to MWH for the ten flow monitoring locations chosen for the system. This data was used to calibrate the collection system model as described in **Section 4**.

Site Installation Report

Customer:	MWH Americas, Inc.
Site Name:	13C-M085
Site Location	Orchard Drive and 49th Avenue

Access:	System Type:	
Behind Gate in Private Residential Area	Sanitary [X] Storm [ ]	Install Date: 1/5/2013





Manhole Depth (feet)	12.5
Pipe Size (inches)	8 Inch
Pipe Condition	Good
Manhole Material	Concrete
Silt (inches)	0

Hydraulics

Profile used ".2, .4, .8 of Depth Method " Three point profile through

cross section of flow.

Avg Velocity	Avg Measured Level	Multiplier
1.25 FPS	3 Inches	1

Gas

O2	H2S	CO	LEL
20.1	.01	.0	.0

Notes

Traffic Safety

Little – Residential Area

Land Use

Residential	Commercial	Industrial	Trunk
X			

Meter Site Document

City	MWH Americas, Inc.
Site Name	13C-M085
Site Location	Orchard Drive and 49th Avenue
Access	Behind Gate in Private Residential Area

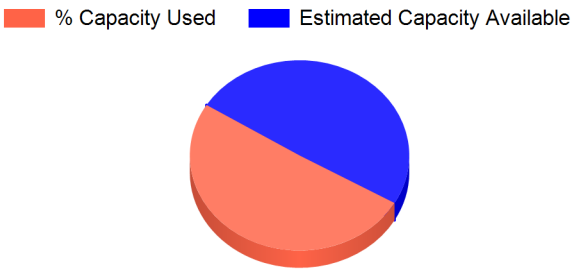
Temporary Flow Study

MWH Americas, Inc.

13C-M085

Meter Start Date		From	1/5/2013 12:00:00 AM
Meter Stop Date		To	1/19/2013 12:00:00 AM
Velocity (fps)		Level (in)	Flow (mgd)
Average	1.065	2.690	0.071
Maximum	2.210	4.358	0.193
Minimum	0.220	1.803	0.016
Pipe Size		8.000	
Estimated Capacity (mgd)		0.382	
Capacity Used		50.56 %	
Sensor Type		Hach - Flodar	

Estimated Capacity Usage



Utility Systems, Science and Software

6190 Fairmount Ave. Suite E
San Diego, CA 92021

601 N. Parkcenter Drive Suite 209
Santa Ana, CA 92705

Utility Systems Science and Software

Report Date: 01/23/2013
Customer: MWH Americas, Inc.
Site: 13C-M085
Pipe size: 8"

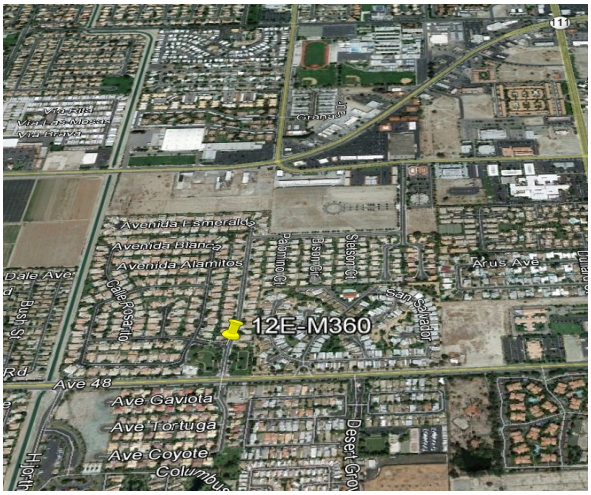
Weekly Flow Statistics for 13C-M085

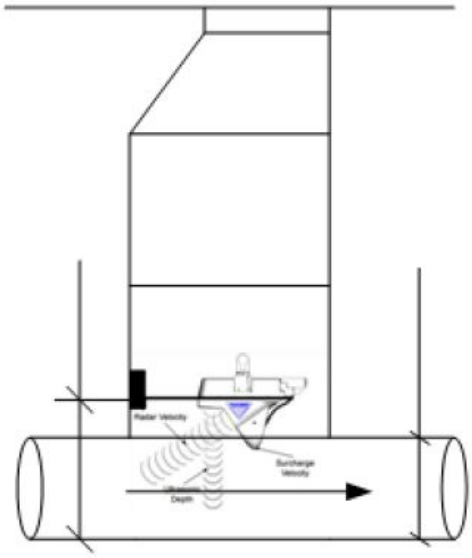
	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)			
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total
1/4/2013	44.48	82.63	24.14	0.06	0.12	0.03	0.89	1.35	0.55	2.82	3.32	2.34	64,050
1/5/2013	40.62	89.32	15.39	0.06	0.13	0.02	0.86	2.21	0.41	2.71	3.91	2.03	58,491
1/6/2013	44.70	118.00	11.40	0.06	0.17	0.02	0.93	1.82	0.35	2.76	4.36	1.93	64,369
Week:	**43.27**	**118.00**	**11.40**	**0.06**	**0.17**	**0.02**	**0.89**	**2.21**	**0.35**	**2.76**	**4.36**	**1.93**	**186,910**
1/7/2013	41.09	100.19	11.24	0.06	0.14	0.02	0.91	1.91	0.22	2.61	3.64	1.82	59,176
1/8/2013	41.90	95.62	15.21	0.06	0.14	0.02	0.91	1.83	0.47	2.68	3.76	1.80	60,339
1/9/2013	49.29	94.81	15.05	0.07	0.14	0.02	1.10	1.88	0.45	2.64	3.61	1.86	70,979
1/10/2013	52.36	102.03	22.19	0.08	0.15	0.03	1.13	1.92	0.68	2.68	3.86	1.93	75,399
1/11/2013	53.35	119.43	21.94	0.08	0.17	0.03	1.17	1.85	0.66	2.65	3.84	1.80	76,823
1/12/2013	54.71	134.07	20.49	0.08	0.19	0.03	1.15	2.00	0.57	2.73	3.68	1.84	78,781
1/13/2013	53.85	108.44	24.16	0.08	0.16	0.03	1.13	1.90	0.67	2.76	3.64	1.94	77,542
Week:	**49.51**	**134.07**	**11.24**	**0.07**	**0.19**	**0.02**	**1.07**	**2.00**	**0.22**	**2.68**	**3.86**	**1.80**	**499,039**
1/14/2013	50.55	101.24	20.91	0.07	0.15	0.03	1.11	2.09	0.66	2.66	3.87	1.89	72,785
1/15/2013	54.18	103.05	23.92	0.08	0.15	0.03	1.14	1.86	0.64	2.76	3.65	1.97	78,026
1/16/2013	53.33	111.84	24.17	0.08	0.16	0.03	1.18	2.02	0.58	2.66	3.65	1.89	76,794
1/17/2013	50.37	98.92	21.12	0.07	0.14	0.03	1.10	1.83	0.70	2.67	3.58	1.90	72,537
1/18/2013	53.19	121.43	28.03	0.08	0.17	0.04	1.12	1.93	0.63	2.72	3.84	2.16	76,587
1/19/2013	47.19	93.13	20.51	0.07	0.13	0.03	1.09	1.72	0.50	2.57	3.54	1.86	67,951
Week:	**51.47**	**121.43**	**20.51**	**0.07**	**0.17**	**0.03**	**1.12**	**2.09**	**0.50**	**2.67**	**3.87**	**1.86**	**444,680**

Site Installation Report

Customer:	MWH Americas, Inc.
Site Name:	12E-M360
Site Location	Avenida Camelia & Calle Diamante

Access:	System Type:	
Street Access	Sanitary [X] Storm [ ]	Install Date: 1/5/2013





Manhole Depth (feet)	10 Feet
Pipe Size (inches)	15 Inches
Pipe Condition	Good
Manhole Material	Concrete
Silt (inches)	0

Hydraulics

Profile used ".2, .4, .8 of Depth Method " Three point profile through

cross section of flow.

Avg Velocity	Avg Measured Level	Multiplier
1.67 FPS	1.5 Inches	1

Gas

O2	H2S	CO	LEL
20.1	.0	.0	.0

Notes

Traffic Safety

Little Traffic

Land Use

Residential	Commercial	Industrial	Trunk
X			

Meter Site Document

City	MWH Americas, Inc.
Site Name	12E-M360
Site Location	Avenida Camelia & Calle Diamante
Access	Street Access

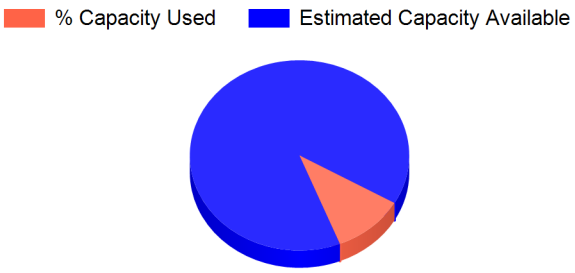
Temporary Flow Study

MWH Americas, Inc.

12E-M360

Meter Start Date		From	1/5/2013 12:00:00 AM
Meter Stop Date		To	1/19/2013 12:00:00 AM
Velocity (fps)		Level (in)	Flow (mgd)
Average	1.443	1.875	0.085
Maximum	2.260	3.580	0.197
Minimum	0.560	1.050	0.020
Pipe Size		15.000	
Estimated Capacity (mgd)		1.847	
Capacity Used		10.66 %	
Sensor Type		Hach - Flodar	

Estimated Capacity Usage



Utility Systems, Science and Software

6190 Fairmount Ave. Suite E
San Diego, CA 92021

601 N. Parkcenter Drive Suite 209
Santa Ana, CA 92705

Utility Systems Science and Software

Report Date: 06/13/2013
Customer: MWH Americas, Inc.
Site: 12E-M360
Pipe size: 15"

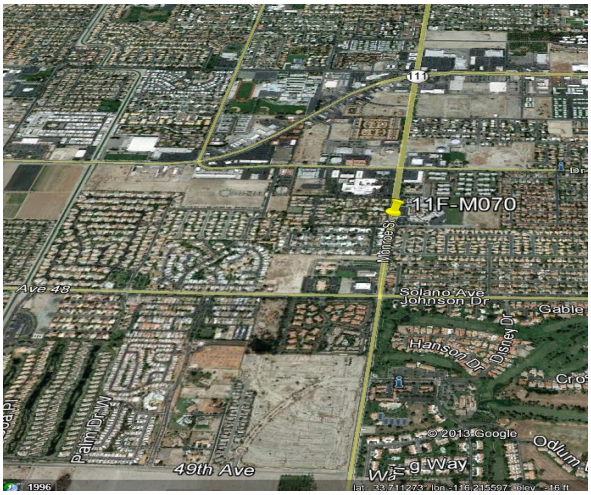
Weekly Flow Statistics for 12E-M360

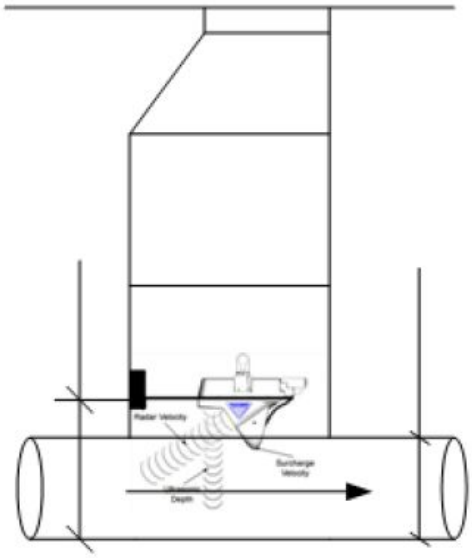
	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)			
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total
1/4/2013	54.21	108.23	0.00	0.08	0.16	0.00	1.08	2.02	0.00	2.79	3.58	1.79	78,059
1/5/2013	75.41	128.30	15.91	0.11	0.18	0.02	1.62	2.26	0.89	1.97	2.48	1.08	108,592
1/6/2013	69.25	121.65	29.63	0.10	0.18	0.04	1.49	2.14	0.68	2.08	2.51	1.46	99,724
Week:	**66.29**	**128.30**	**0.00**	**0.10**	**0.18**	**0.00**	**1.39**	**2.26**	**0.00**	**2.28**	**3.58**	**1.08**	**286,375**
1/7/2013	48.27	72.13	14.51	0.07	0.10	0.02	1.23	1.57	0.76	1.80	2.29	1.11	69,516
1/8/2013	53.20	91.18	15.87	0.08	0.13	0.02	1.38	1.81	0.78	1.78	2.28	1.19	76,609
1/9/2013	59.23	136.70	13.82	0.09	0.20	0.02	1.34	1.83	0.61	1.91	3.22	1.28	85,291
1/10/2013	58.84	92.79	19.11	0.08	0.13	0.03	1.56	1.87	1.11	1.75	2.22	1.05	84,734
1/11/2013	59.93	89.20	26.40	0.09	0.13	0.04	1.35	1.64	0.99	1.99	2.33	1.40	86,304
1/12/2013	62.07	97.20	29.75	0.09	0.14	0.04	1.53	1.88	1.04	1.87	2.25	1.50	89,376
1/13/2013	62.35	103.30	24.24	0.09	0.15	0.03	1.53	2.03	1.07	1.84	2.28	1.28	89,784
Week:	**57.70**	**136.70**	**13.82**	**0.08**	**0.20**	**0.02**	**1.42**	**2.03**	**0.61**	**1.85**	**3.22**	**1.05**	**581,614**
1/14/2013	52.91	79.62	28.39	0.08	0.11	0.04	1.35	1.63	1.07	1.84	2.23	1.39	76,187
1/15/2013	52.41	80.77	22.63	0.08	0.12	0.03	1.27	1.70	0.84	1.90	2.39	1.43	75,465
1/16/2013	59.60	83.96	31.80	0.09	0.12	0.05	1.56	1.81	1.27	1.80	2.18	1.37	85,820
1/17/2013	58.29	82.42	14.70	0.08	0.12	0.02	1.54	1.77	0.79	1.76	2.11	1.12	83,933
1/18/2013	57.73	80.82	22.44	0.08	0.12	0.03	1.58	1.82	1.16	1.73	2.09	1.15	83,128
1/19/2013	21.76	101.14	0.00	0.03	0.15	0.00	0.61	1.75	0.00	0.79	2.43	0.00	31,331
1/20/2013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Week:	**43.24**	**101.14**	**0.00**	**0.06**	**0.15**	**0.00**	**1.13**	**1.82**	**0.00**	**1.40**	**2.43**	**0.00**	**435,864**

Site Installation Report

Customer:	MWH Americas, Inc.
Site Name:	11F-M070
Site Location	Monroe Street

Access:	System Type:	
Street Access	Sanitary [X] Storm [ ]	Install Date: 1/5/2013





Manhole Depth (feet)	13
Pipe Size (inches)	10
Pipe Condition	Good
Manhole Material	Concrete
Silt (inches)	0.25

Hydraulics

Profile used ".2, .4, .8 of Depth Method " Three point profile through

cross section of flow.

Avg Velocity	Avg Measured Level	Multiplier
.90	2.25	1

Gas

O2	H2S	CO	LEL
20.4	.0	.0	.0

Notes

Traffic Safety

Medium Traffic

Land Use

Residential	Commercial	Industrial	Trunk
X			

Meter Site Document

City	MWH Americas, Inc.
Site Name	11F-M070
Site Location	Monroe Street
Access	Street Access

Temporary Flow Study

MWH Americas, Inc.

11F-M070

Meter Start Date		From	1/5/2013 12:00:00 AM
Meter Stop Date		To	1/19/2013 12:00:00 AM
Velocity (fps)		Level (in)	Flow (mgd)
Average	1.405	1.956	0.070
Maximum	2.269	3.164	0.171
Minimum	0.519	1.081	0.012
Pipe Size		10.000	
Estimated Capacity (mgd)		0.667	
Capacity Used		25.59 %	
Sensor Type		Hach - Flodar	

Estimated Capacity Usage

% Capacity Used Estimated Capacity Available

Utility Systems, Science and Software

6190 Fairmount Ave. Suite E
San Diego, CA 92021

601 N. Parkcenter Drive Suite 209
Santa Ana, CA 92705

Utility Systems Science and Software

Report Date: 01/23/2013
Customer: MWH Americas, Inc.
Site: 11F-M070
Pipe size: 10"

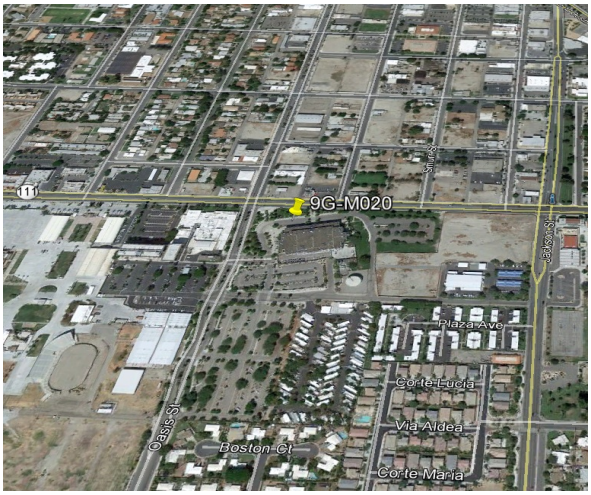
Weekly Flow Statistics for 11F-M070

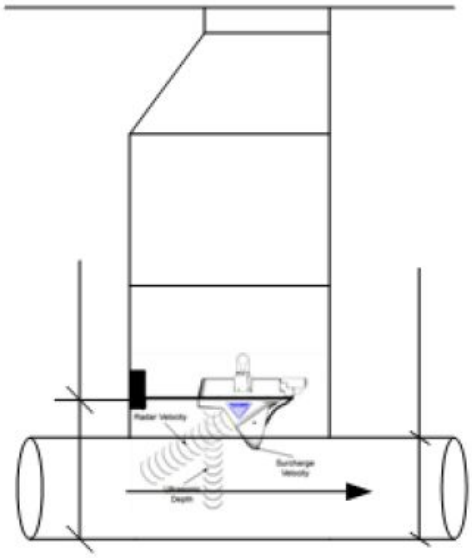
	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)			
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total
1/4/2013	54.16	73.90	32.95	0.08	0.11	0.05	1.51	1.84	0.95	2.04	2.36	1.72	77,990
1/5/2013	46.32	79.79	14.94	0.07	0.11	0.02	1.47	2.05	0.68	1.83	2.41	1.30	66,702
1/6/2013	48.94	89.55	10.17	0.07	0.13	0.01	1.46	1.97	0.52	1.89	2.62	1.18	70,480
Week:	**49.81**	**89.55**	**10.17**	**0.07**	**0.13**	**0.01**	**1.48**	**2.05**	**0.52**	**1.92**	**2.62**	**1.18**	**215,173**
1/7/2013	46.58	83.20	11.78	0.07	0.12	0.02	1.48	1.80	0.56	1.85	2.57	1.08	67,078
1/8/2013	48.20	91.75	10.56	0.07	0.13	0.02	1.43	1.97	0.54	1.91	2.61	1.21	69,413
1/9/2013	47.91	104.45	12.54	0.07	0.15	0.02	1.41	2.06	0.66	1.93	2.65	1.22	68,997
1/10/2013	45.88	105.75	11.77	0.07	0.15	0.02	1.31	1.94	0.67	1.95	2.75	1.16	66,061
1/11/2013	45.85	85.57	14.42	0.07	0.12	0.02	1.39	1.75	0.94	1.91	2.66	1.14	66,019
1/12/2013	52.30	101.55	16.25	0.08	0.15	0.02	1.46	1.95	0.79	1.99	2.73	1.34	75,317
1/13/2013	50.69	93.18	15.52	0.07	0.13	0.02	1.44	1.92	0.69	1.97	2.64	1.30	72,992
Week:	**48.20**	**105.75**	**10.56**	**0.07**	**0.15**	**0.02**	**1.42**	**2.06**	**0.54**	**1.93**	**2.75**	**1.08**	**485,877**
1/14/2013	48.30	106.81	8.12	0.07	0.15	0.01	1.26	1.82	0.53	2.10	3.16	1.14	69,550
1/15/2013	47.85	96.87	13.87	0.07	0.14	0.02	1.28	1.99	0.70	2.05	2.82	1.21	68,905
1/16/2013	50.63	83.32	13.49	0.07	0.12	0.02	1.42	1.96	0.64	1.99	2.57	1.34	72,902
1/17/2013	55.34	118.57	16.40	0.08	0.17	0.02	1.48	2.27	0.67	2.04	2.76	1.37	79,686
1/18/2013	49.41	89.65	14.85	0.07	0.13	0.02	1.40	1.92	0.64	1.98	2.50	1.37	71,157
1/19/2013	46.24	87.51	13.91	0.07	0.13	0.02	1.40	2.06	0.66	1.87	2.58	1.41	66,587
Week:	**49.63**	**118.57**	**8.12**	**0.07**	**0.17**	**0.01**	**1.37**	**2.27**	**0.53**	**2.01**	**3.16**	**1.14**	**428,787**

Site Installation Report

Customer:	MWH Americas, Inc.
Site Name:	9G-M020
Site Location	South of Hwy 111 & Oasis

Access:	System Type:	
Parking Lot Access	Sanitary [X] Storm [ ]	Install Date: 1/5/2013





Manhole Depth (feet)	7 Feet
Pipe Size (inches)	8 Inches
Pipe Condition	Good
Manhole Material	Concrete
Silt (inches)	0

Hydraulics

Profile used ".2, .4, .8 of Depth Method " Three point profile through

cross section of flow.

Avg Velocity	Avg Measured Level	Multiplier
1.03 FPS	.6 Inches	1

Gas

O2	H2S	CO	LEL
20.9	.0	.0	.0

Notes

Traffic Safety

Parking Lot Little traffic

Land Use

Residential	Commercial	Industrial	Trunk
	X		

Meter Site Document

City	MWH Americas, Inc.
Site Name	9G-M020
Site Location	South of Hwy 111 & Oasis
Access	Parking Lot Access

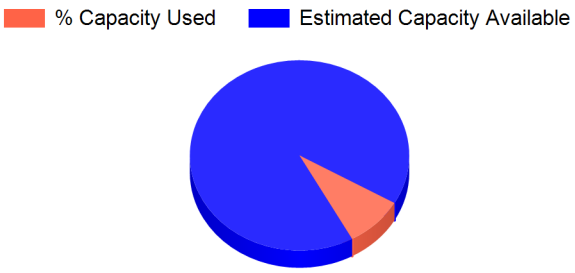
Temporary Flow Study

MWH Americas, Inc.

9G-M020

Meter Start Date		From	1/5/2013 12:00:00 AM
Meter Stop Date		To	1/19/2013 12:00:00 AM
Velocity (fps)		Level (in)	Flow (mgd)
Average	1.092	0.675	0.011
Maximum	2.170	1.170	0.033
Minimum	0.680	0.480	0.006
Pipe Size		8.000	
Estimated Capacity (mgd)		0.382	
Capacity Used		8.70 %	
Sensor Type		Hach - Flodar	

Estimated Capacity Usage



Utility Systems, Science and Software

6190 Fairmount Ave. Suite E
San Diego, CA 92021

601 N. Parkcenter Drive Suite 209
Santa Ana, CA 92705

Utility Systems Science and Software

Report Date: 01/23/2013
Customer: MWH Americas, Inc.
Site: 9G-M020
Pipe size: 8"

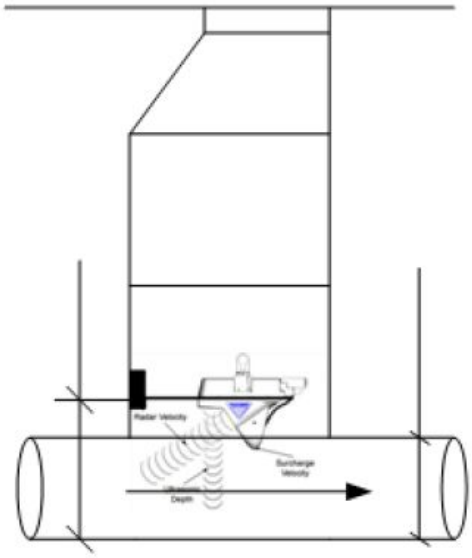
Weekly Flow Statistics for 9G-M020

	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)			
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total
1/4/2013	6.64	12.69	4.48	0.01	0.02	0.01	1.33	1.82	1.10	0.56	0.72	0.50	9,556
1/5/2013	4.81	5.34	4.19	0.01	0.01	0.01	1.08	1.19	0.96	0.53	0.58	0.48	6,922
1/6/2013	4.88	6.35	3.90	0.01	0.01	0.01	0.88	1.01	0.77	0.61	0.71	0.58	7,026
Week:	**5.44**	**12.69**	**3.90**	**0.01**	**0.02**	**0.01**	**1.10**	**1.82**	**0.77**	**0.57**	**0.72**	**0.48**	**23,504**
1/7/2013	8.64	19.82	4.31	0.01	0.03	0.01	1.20	1.81	0.79	0.70	0.98	0.51	12,444
1/8/2013	7.31	14.81	4.23	0.01	0.02	0.01	1.30	1.82	1.03	0.60	0.80	0.50	10,529
1/9/2013	9.04	23.06	4.36	0.01	0.03	0.01	1.35	2.17	1.04	0.66	0.96	0.51	13,016
1/10/2013	7.44	13.99	4.07	0.01	0.02	0.01	1.21	1.60	0.99	0.64	0.84	0.50	10,719
1/11/2013	7.97	20.76	4.10	0.01	0.03	0.01	1.17	1.84	0.90	0.67	1.00	0.54	11,479
1/12/2013	4.80	5.24	4.15	0.01	0.01	0.01	0.91	1.01	0.82	0.60	0.67	0.54	6,911
1/13/2013	5.47	6.99	4.26	0.01	0.01	0.01	0.77	0.84	0.68	0.73	0.84	0.67	7,873
Week:	**7.24**	**23.06**	**4.07**	**0.01**	**0.03**	**0.01**	**1.13**	**2.17**	**0.68**	**0.65**	**1.00**	**0.50**	**72,971**
1/14/2013	9.25	21.02	4.35	0.01	0.03	0.01	1.03	1.54	0.70	0.82	1.14	0.57	13,322
1/15/2013	7.71	15.73	4.14	0.01	0.02	0.01	1.10	1.55	0.85	0.69	0.93	0.56	11,096
1/16/2013	8.63	17.67	4.25	0.01	0.03	0.01	1.11	1.59	0.86	0.73	1.02	0.57	12,431
1/17/2013	7.89	14.67	4.20	0.01	0.02	0.01	1.03	1.36	0.83	0.74	0.97	0.57	11,355
1/18/2013	9.27	22.26	4.32	0.01	0.03	0.01	1.03	1.57	0.79	0.80	1.17	0.60	13,344
1/19/2013	5.45	6.01	0.00	0.01	0.01	0.00	0.87	0.95	0.00	0.66	0.71	0.00	7,851
Week:	**8.03**	**22.26**	**0.00**	**0.01**	**0.03**	**0.00**	**1.03**	**1.59**	**0.00**	**0.74**	**1.17**	**0.00**	**69,398**

Site Installation Report

Customer:	MWH Americas, Inc.
Site Name:	9F-M360
Site Location	Hwy 111 & Rubidoux / CVS

Access:	System Type:	
Street Acess	Sanitary [X] Storm [ ]	Install Date: 1/5/2013



Manhole Depth (feet)	9.5 Feet
Pipe Size (inches)	8 Inch
Pipe Condition	Old but Good
Manhole Material	Concrete
Silt (inches)	0.5

Hydraulics

Profile used ".2, .4, .8 of Depth Method " Three point profile through

cross section of flow.

Avg Velocity	Avg Measured Level	Multiplier
.66 FPS	3 Inches	1

Gas

O2	H2S	CO	LEL
20.1	.01	.0	.0

Notes

Low Velocity Site

Traffic Safety

Commercial Medium

Land Use

Residential	Commercial	Industrial	Trunk
	X		

Meter Site Document

City	MWH Americas, Inc.
Site Name	9F-M360
Site Location	Hwy 111 & Rubidoux / CVS
Access	Street Acess

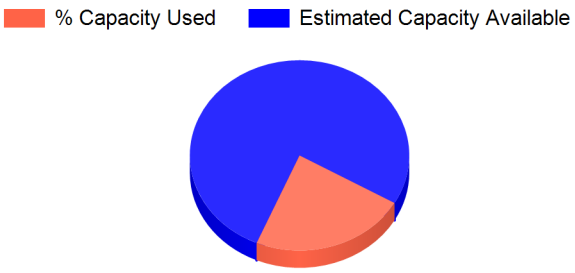
Temporary Flow Study

MWH Americas, Inc.

9F-M360

Meter Start Date		From	1/5/2013 12:00:00 AM
Meter Stop Date		To	1/19/2013 12:00:00 AM
Velocity (fps)		Level (in)	Flow (mgd)
Average	0.643	3.270	0.055
Maximum	1.190	3.860	0.088
Minimum	0.410	2.640	0.033
Pipe Size		8.000	
Estimated Capacity (mgd)		0.382	
Capacity Used		23.07 %	
Sensor Type		Hach - Flodar	

Estimated Capacity Usage



Utility Systems, Science and Software

6190 Fairmount Ave. Suite E
San Diego, CA 92021

601 N. Parkcenter Drive Suite 209
Santa Ana, CA 92705

Utility Systems Science and Software

Report Date: 06/13/2013
Customer: MWH Americas, Inc.
Site: 9F-M360
Pipe size: 8"

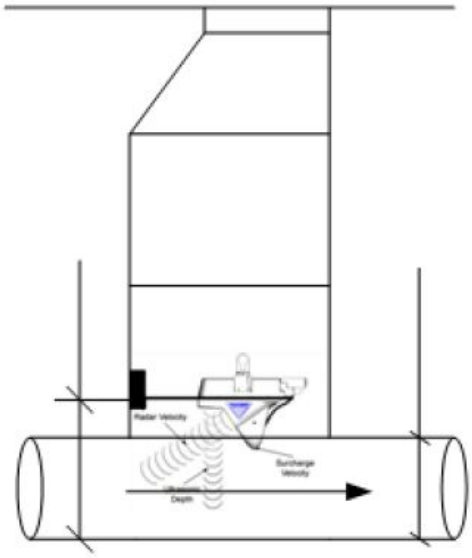
Weekly Flow Statistics for 9F-M360

	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)			
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total
1/4/2013	44.71	59.40	0.00	0.06	0.09	0.00	0.71	0.88	0.00	3.38	3.58	3.15	64,377
1/5/2013	45.70	58.28	30.43	0.07	0.08	0.04	0.76	1.19	0.54	3.30	3.82	2.72	65,814
1/6/2013	43.76	61.16	32.28	0.06	0.09	0.05	0.74	0.93	0.51	3.23	3.62	2.82	63,009
Week:	**44.72**	**61.16**	**0.00**	**0.06**	**0.09**	**0.00**	**0.74**	**1.19**	**0.00**	**3.30**	**3.82**	**2.72**	**193,199**
1/7/2013	39.17	52.80	29.55	0.06	0.08	0.04	0.66	0.78	0.50	3.26	3.77	2.79	56,398
1/8/2013	40.18	53.47	29.29	0.06	0.08	0.04	0.64	0.82	0.49	3.38	3.76	3.07	57,865
1/9/2013	39.73	57.46	30.32	0.06	0.08	0.04	0.65	0.83	0.54	3.33	3.82	2.82	57,213
1/10/2013	36.68	50.17	26.85	0.05	0.07	0.04	0.61	0.76	0.47	3.29	3.86	2.79	52,822
1/11/2013	36.03	51.59	24.43	0.05	0.07	0.04	0.60	0.77	0.42	3.24	3.75	2.69	51,883
1/12/2013	35.36	51.27	24.09	0.05	0.07	0.03	0.61	0.76	0.44	3.19	3.72	2.69	50,911
1/13/2013	34.63	55.41	24.27	0.05	0.08	0.03	0.59	0.83	0.42	3.21	3.54	2.73	49,873
Week:	**37.40**	**57.46**	**24.09**	**0.05**	**0.08**	**0.03**	**0.62**	**0.83**	**0.42**	**3.27**	**3.86**	**2.69**	**376,965**
1/14/2013	40.84	52.80	29.83	0.06	0.08	0.04	0.65	0.94	0.50	3.38	3.77	3.01	58,805
1/15/2013	37.56	55.55	28.11	0.05	0.08	0.04	0.64	0.82	0.48	3.24	3.69	2.77	54,088
1/16/2013	36.57	49.09	24.62	0.05	0.07	0.04	0.62	0.73	0.51	3.24	3.75	2.73	52,656
1/17/2013	33.39	48.40	22.75	0.05	0.07	0.03	0.57	0.75	0.41	3.20	3.79	2.64	48,079
1/18/2013	35.80	49.79	23.03	0.05	0.07	0.03	0.62	0.76	0.43	3.18	3.69	2.64	51,549
1/19/2013	40.24	53.71	32.66	0.06	0.08	0.05	0.69	0.83	0.52	3.20	3.75	2.72	57,947
1/20/2013	44.20	46.37	40.47	0.06	0.07	0.06	0.73	0.75	0.69	3.30	3.34	3.21	63,643
Week:	**38.37**	**55.55**	**22.75**	**0.06**	**0.08**	**0.03**	**0.65**	**0.94**	**0.41**	**3.25**	**3.79**	**2.64**	**386,766**

Site Installation Report

Customer:	MWH Americas, Inc.
Site Name:	11J-M095
Site Location	Van Buren & Manila

Access:	System Type:	
Street Access	Sanitary [X] Storm [ ]	Install Date: 1/5/2013



Manhole Depth (feet)	13
Pipe Size (inches)	30
Pipe Condition	Good
Manhole Material	000
Silt (inches)	0

Hydraulics

Avg Velocity	Avg Measured Level	Multiplier
1.06 FPS	16 Inches	1

Gas

O2	H2S	CO	LEL
20.1	.0	.0	.0

Notes

Traffic Safety

Medium to Heavy

Land Use

Residential	Commercial	Industrial	Trunk
X	X	X	X

Meter Site Document

City	MWH Americas, Inc.
Site Name	11J-M095
Site Location	Van Buren & Manila
Access	Street Access

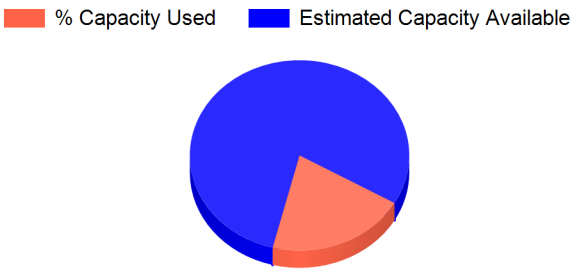
Temporary Flow Study

MWH Americas, Inc.

11J-M095

Meter Start Date		From	1/5/2013 12:00:00 AM
Meter Stop Date		To	1/19/2013 12:00:00 AM
Velocity (fps)		Level (in)	Flow (mgd)
Average	1.066	15.504	1.811
Maximum	1.548	19.869	3.036
Minimum	0.540	10.607	0.550
Pipe Size		30.000	
Estimated Capacity (mgd)		14.731	
Capacity Used		20.61 %	
Sensor Type		Hach - Flodar	

Estimated Capacity Usage



Utility Systems, Science and Software

6190 Fairmount Ave. Suite E
San Diego, CA 92021

601 N. Parkcenter Drive Suite 209
Santa Ana, CA 92705

Utility Systems Science and Software

Report Date: 01/23/2013
Customer: MWH Americas, Inc.
Site: 11J-M095
Pipe size: 30"

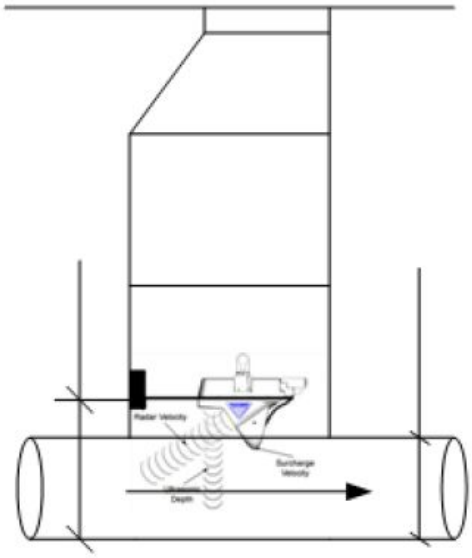
Weekly Flow Statistics for 11J-M095

	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)			
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total
1/4/2013	1453.72	1617.44	1240.72	2.09	2.33	1.79	1.14	1.21	1.06	16.88	17.51	15.65	2,093,361
1/5/2013	1277.76	1891.92	408.68	1.84	2.72	0.59	1.07	1.30	0.58	15.59	19.17	10.77	1,839,977
1/6/2013	1290.03	1865.97	451.96	1.86	2.69	0.65	1.07	1.29	0.64	15.70	19.15	10.68	1,857,643
Week:	**1340.50**	**1891.92**	**408.68**	**1.93**	**2.72**	**0.59**	**1.09**	**1.30**	**0.58**	**16.06**	**19.17**	**10.68**	**5,790,981**
1/7/2013	1263.24	1887.59	445.50	1.82	2.72	0.64	1.08	1.47	0.62	15.43	18.22	10.86	1,819,060
1/8/2013	1211.96	1693.11	428.19	1.75	2.44	0.62	1.03	1.24	0.60	15.38	18.33	10.61	1,745,222
1/9/2013	1218.33	1669.73	408.01	1.75	2.40	0.59	1.04	1.22	0.58	15.37	18.31	10.65	1,754,402
1/10/2013	1228.62	1759.66	421.45	1.77	2.53	0.61	1.04	1.31	0.60	15.45	18.51	10.65	1,769,210
1/11/2013	1236.05	1685.28	454.58	1.78	2.43	0.65	1.06	1.30	0.65	15.37	17.67	10.69	1,779,908
1/12/2013	1247.69	2108.41	448.60	1.80	3.04	0.65	1.04	1.53	0.62	15.68	19.38	10.91	1,796,669
1/13/2013	1261.40	2049.04	396.68	1.82	2.95	0.57	1.02	1.36	0.55	15.88	19.87	10.83	1,816,416
Week:	**1238.18**	**2108.41**	**396.68**	**1.78**	**3.04**	**0.57**	**1.05**	**1.53**	**0.55**	**15.51**	**19.87**	**10.61**	**12,480,888**
1/14/2013	1247.01	1893.58	434.67	1.80	2.73	0.63	1.06	1.44	0.59	15.59	18.84	10.79	1,795,689
1/15/2013	1271.61	2013.63	447.50	1.83	2.90	0.64	1.10	1.49	0.63	15.45	18.92	10.70	1,831,112
1/16/2013	1267.12	2088.71	381.69	1.82	3.01	0.55	1.08	1.51	0.54	15.43	18.63	10.62	1,824,647
1/17/2013	1300.11	2099.56	459.45	1.87	3.02	0.66	1.12	1.55	0.62	15.40	18.49	10.70	1,872,163
1/18/2013	1300.55	2025.64	419.96	1.87	2.92	0.60	1.14	1.54	0.60	15.25	17.56	10.62	1,872,786
1/19/2013	1293.52	2256.04	502.47	1.86	3.25	0.72	1.15	1.64	0.67	15.04	19.59	10.97	1,862,675
Week:	**1279.99**	**2256.04**	**381.69**	**1.84**	**3.25**	**0.55**	**1.11**	**1.64**	**0.54**	**15.36**	**19.59**	**10.62**	**11,059,072**

Site Installation Report

Customer:	MWH Americas, Inc.
Site Name:	10I-M140
Site Location	Hwy 111-Maple

Access:	System Type:	
Sidewalk Access – CAT Rentals	Sanitary [X] Storm [ ]	Install Date: 1/5/2013



Manhole Depth (feet)	8.5 Feet
Pipe Size (inches)	18
Pipe Condition	Good
Manhole Material	Concrete
Silt (inches)	0

Hydraulics

Profile used ".2, .4, .8 of Depth Method " Three point profile through

cross section of flow.
Depth at time of Measure - Fast Velocity

Avg Velocity	Avg Measured Level	Multiplier
3.14	12.5	.90

Gas

O2	H2S	CO	LEL
20.1	0	0	0

Notes

Traffic Safety

Fast Traffic

Land Use

Residential	Commercial	Industrial	Trunk
X	X	X	

Meter Site Document

City	MWH Americas, Inc.
Site Name	10I-M140
Site Location	Hwy 111-Maple
Access	Sidewalk Access – CAT Rentals

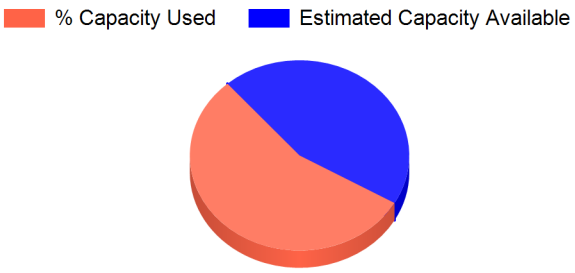
Temporary Flow Study

MWH Americas, Inc.

10I-M140

Meter Start Date		From	1/5/2013 12:00:00 AM
Meter Stop Date		To	1/19/2013 12:00:00 AM
Velocity (fps)		Level (in)	Flow (mgd)
Average	3.052	10.969	2.243
Maximum	3.720	12.880	3.220
Minimum	1.990	7.950	0.980
Pipe Size		18.000	
Estimated Capacity (mgd)		5.829	
Capacity Used		55.25 %	
Sensor Type		Hach - Flodar	

Estimated Capacity Usage



Utility Systems, Science and Software

6190 Fairmount Ave. Suite E
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Santa Ana, CA 92705

Utility Systems Science and Software

Report Date: 06/13/2013
Customer: MWH Americas, Inc.
Site: 10I-M140
Pipe size: 18"

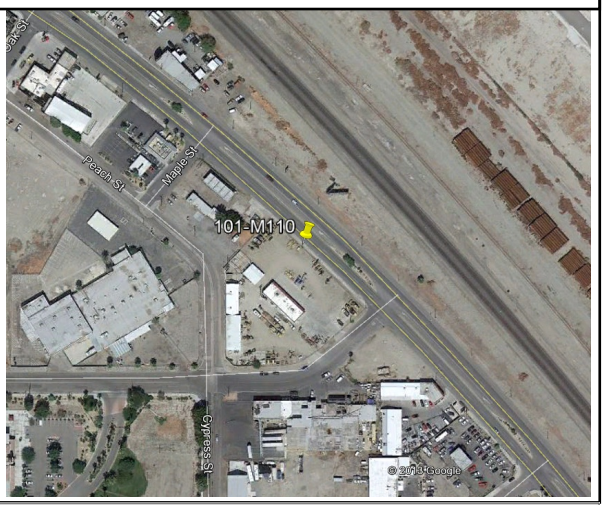
Weekly Flow Statistics for 10I-M140

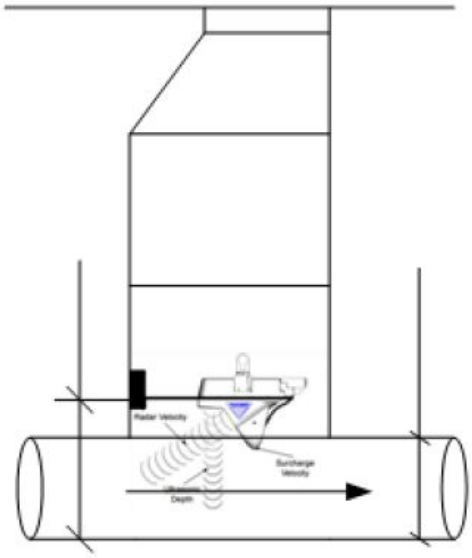
	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)			
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total
1/4/2013	1899.56	1933.09	1849.32	2.74	2.78	2.66	3.39	3.42	3.34	11.99	12.12	11.87	2,735,373
1/5/2013	1647.53	2188.51	752.47	2.37	3.15	1.08	3.18	3.66	2.12	11.08	12.72	8.02	2,372,437
1/6/2013	1690.21	2224.08	940.77	2.43	3.20	1.35	3.22	3.72	2.43	11.22	12.76	8.07	2,433,904
Week:	**1745.77**	**2224.08**	**752.47**	**2.51**	**3.20**	**1.08**	**3.26**	**3.72**	**2.12**	**11.43**	**12.76**	**8.02**	**7,541,714**
1/7/2013	1598.28	2167.81	730.03	2.30	3.12	1.05	3.08	3.61	2.06	11.11	12.77	8.02	2,301,521
1/8/2013	1587.85	2236.42	694.50	2.29	3.22	1.00	3.08	3.69	2.05	11.02	12.88	7.95	2,286,497
1/9/2013	1457.45	2123.76	680.82	2.10	3.06	0.98	2.87	3.57	1.99	10.88	12.66	8.00	2,098,724
1/10/2013	1521.47	2059.22	896.39	2.19	2.97	1.29	2.99	3.51	2.39	10.97	12.56	8.12	2,190,922
1/11/2013	1511.00	2017.37	724.30	2.18	2.91	1.04	2.98	3.46	2.10	10.92	12.43	8.09	2,175,847
1/12/2013	1593.50	2154.93	710.48	2.29	3.10	1.02	3.10	3.61	2.05	11.01	12.72	8.11	2,294,637
1/13/2013	1581.15	2214.54	934.38	2.28	3.19	1.35	3.09	3.66	2.42	10.98	12.88	8.15	2,276,858
Week:	**1550.10**	**2236.42**	**680.82**	**2.23**	**3.22**	**0.98**	**3.03**	**3.69**	**1.99**	**10.98**	**12.88**	**7.95**	**15,625,005**
1/14/2013	1512.01	2092.73	998.86	2.18	3.01	1.44	2.99	3.53	2.51	10.92	12.62	8.19	2,177,297
1/15/2013	1519.27	2086.81	935.11	2.19	3.01	1.35	3.02	3.52	2.56	10.89	12.65	8.00	2,187,743
1/16/2013	1528.93	2137.78	943.17	2.20	3.08	1.36	3.02	3.56	2.56	10.92	12.77	8.12	2,201,655
1/17/2013	1568.20	2127.41	979.23	2.26	3.06	1.41	3.09	3.57	2.64	10.95	12.72	8.11	2,258,208
1/18/2013	1538.90	2072.77	954.61	2.22	2.98	1.37	3.05	3.53	2.58	10.88	12.51	8.13	2,216,013
1/19/2013	1406.58	2117.81	922.16	2.03	3.05	1.33	2.99	3.56	2.51	10.24	12.66	7.94	2,025,473
Week:	**1512.31**	**2137.78**	**922.16**	**2.18**	**3.08**	**1.33**	**3.03**	**3.57**	**2.51**	**10.80**	**12.77**	**7.94**	**13,066,388**

Site Installation Report

Customer:	MWH Americas, Inc.
Site Name:	10I-M110
Site Location	Hwy 111-Maple

Access:	System Type:	
Sidewalk Access – CAT Rentals	Sanitary [X] Storm [ ]	Install Date: 1/5/2013





Manhole Depth (feet)	10.5
Pipe Size (inches)	18
Pipe Condition	Good
Manhole Material	Concrete
Silt (inches)	0

Hydraulics

Profile used ".2, .4, .8 of Depth Method " Three point profile through

cross section of flow.
Depth at time of Measure - Fast Velocity

Avg Velocity	Avg Measured Level	Multiplier
1.88 FPS	8 Inches	.99

Gas

O2	H2S	CO	LEL
20.9	0	0	0

Notes

Traffic Safety

Low Traffic

Land Use

Residential	Commercial	Industrial	Trunk
X			

Meter Site Document

City	MWH Americas, Inc.
Site Name	10I-M110
Site Location	Hwy 111-Maple
Access	Sidewalk Access – CAT Rentals

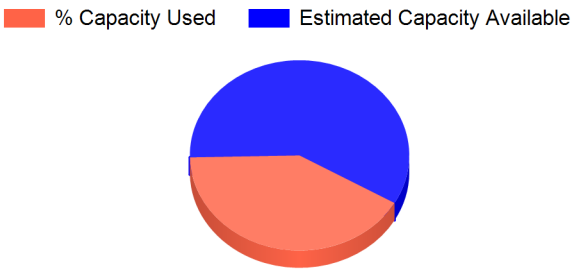
Temporary Flow Study

MWH Americas, Inc.

10I-M110

Meter Start Date		From	1/5/2013 12:00:00 AM
Meter Stop Date		To	1/19/2013 12:00:00 AM
Velocity (fps)		Level (in)	Flow (mgd)
Average	1.771	6.761	0.722
Maximum	2.216	8.954	1.204
Minimum	1.138	4.136	0.235
Pipe Size		18.000	
Estimated Capacity (mgd)		2.914	
Capacity Used		41.34 %	
Sensor Type		Hach - Flodar	

Estimated Capacity Usage



Utility Systems, Science and Software

6190 Fairmount Ave. Suite E
San Diego, CA 92021

601 N. Parkcenter Drive Suite 209
Santa Ana, CA 92705

Utility Systems Science and Software

Report Date: 01/23/2013
Customer: MWH Americas, Inc.
Site: 10I-M110
Pipe size: 18"

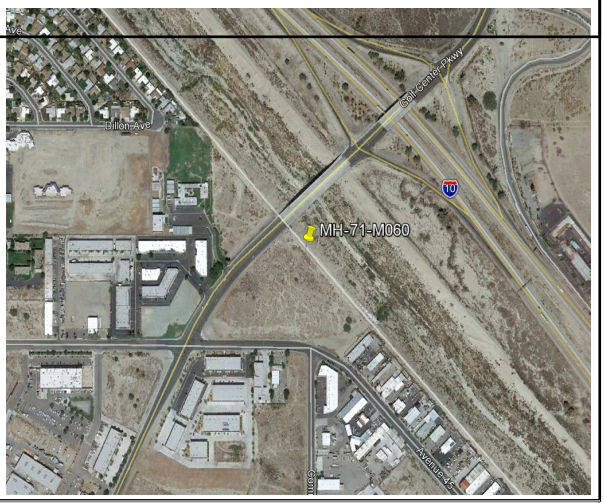
Weekly Flow Statistics for 10I-M110

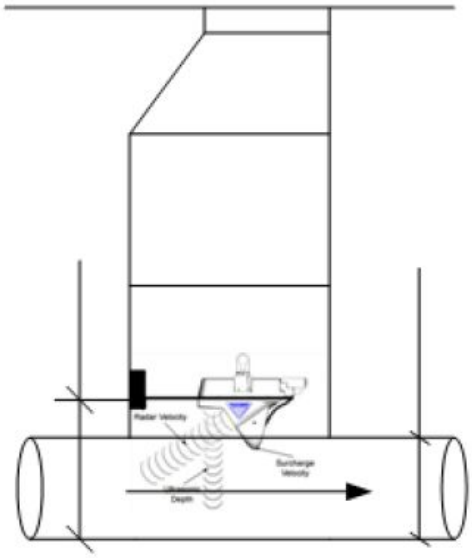
	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)			
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total
1/4/2013	606.37	728.66	449.41	0.87	1.05	0.65	1.89	2.07	1.68	7.64	8.54	6.48	873,176
1/5/2013	500.54	771.27	191.29	0.72	1.11	0.28	1.75	2.11	1.23	6.81	8.63	4.52	720,782
1/6/2013	519.10	774.60	191.27	0.75	1.12	0.28	1.79	2.11	1.24	6.88	8.63	4.50	747,508
Week:	**542.01**	**774.60**	**191.27**	**0.78**	**1.12**	**0.28**	**1.81**	**2.11**	**1.23**	**7.11**	**8.63**	**4.50**	**2,341,467**
1/7/2013	510.66	748.18	171.28	0.74	1.08	0.25	1.78	2.19	1.14	6.81	8.45	4.37	735,353
1/8/2013	514.63	759.18	186.60	0.74	1.09	0.27	1.80	2.19	1.22	6.82	8.37	4.46	741,073
1/9/2013	505.14	745.65	176.42	0.73	1.07	0.25	1.81	2.21	1.24	6.69	8.40	4.25	727,407
1/10/2013	491.82	745.64	179.08	0.71	1.07	0.26	1.80	2.14	1.27	6.61	8.22	4.18	708,218
1/11/2013	491.09	773.35	165.77	0.71	1.11	0.24	1.77	2.22	1.21	6.65	8.50	4.14	707,176
1/12/2013	492.37	816.05	176.91	0.71	1.18	0.25	1.74	2.16	1.21	6.74	8.91	4.33	709,006
1/13/2013	517.08	836.36	183.87	0.74	1.20	0.26	1.78	2.17	1.27	6.83	8.95	4.30	744,592
Week:	**503.26**	**836.36**	**165.77**	**0.72**	**1.20**	**0.24**	**1.78**	**2.22**	**1.14**	**6.74**	**8.95**	**4.14**	**5,072,825**
1/14/2013	496.39	762.44	163.44	0.71	1.10	0.24	1.77	2.09	1.17	6.71	8.48	4.19	714,803
1/15/2013	498.22	776.02	176.40	0.72	1.12	0.25	1.76	2.07	1.19	6.79	8.66	4.37	717,441
1/16/2013	487.88	720.46	163.48	0.70	1.04	0.24	1.74	2.09	1.16	6.72	8.23	4.22	702,552
1/17/2013	509.44	729.69	187.42	0.73	1.05	0.27	1.77	2.07	1.22	6.86	8.23	4.48	733,596
1/18/2013	482.63	732.13	164.46	0.69	1.05	0.24	1.73	2.11	1.14	6.69	8.19	4.27	694,985
1/19/2013	452.84	809.98	176.84	0.65	1.17	0.25	1.68	2.11	1.22	6.40	8.93	4.30	652,088
Week:	**487.90**	**809.98**	**163.44**	**0.70**	**1.17**	**0.24**	**1.74**	**2.11**	**1.14**	**6.69**	**8.93**	**4.19**	**4,215,466**

Site Installation Report

Customer:	MWH Americas, Inc.
Site Name:	MH-71-M060
Site Location	Golf Cntr Pkwy & 45th Ave

Access:	System Type:	
Dirt Road-next to concrete canal and overpass	Sanitary [X] Storm [ ]	Install Date: 1/5/2013





Manhole Depth (feet)	19 Feet
Pipe Size (inches)	15 Inches
Pipe Condition	Good
Manhole Material	Concrete
Silt (inches)	0

Hydraulics

Profile used ".2, .4, .8 of Depth Method " Three point profile through

cross section of flow.

Avg Velocity	Avg Measured Level	Multiplier
4.05	4 Inches	.9

Gas

O2	H2S	CO	LEL
20.9	.0	.0	.0

Notes

Traffic Safety

No Traffic. On dirt road. Key access

Land Use

Residential	Commercial	Industrial	Trunk
	X	X	

Meter Site Document

City	MWH Americas, Inc.
Site Name	MH-71-M060
Site Location	Golf Cntr Pkwy & 45th Ave
Access	Dirt Road-next to concrete canal and overpass

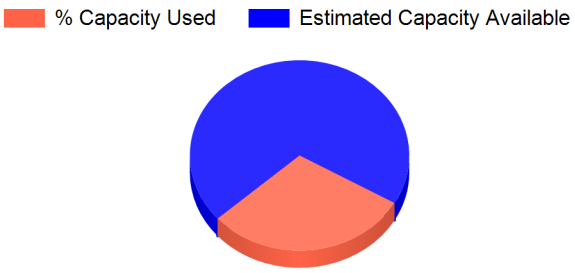
Temporary Flow Study

MWH Americas, Inc.

MH-71-M060

Meter Start Date		From	1/5/2013 12:00:00 AM
Meter Stop Date		To	1/19/2013 12:00:00 AM
Velocity (fps)		Level (in)	Flow (mgd)
Average	3.063	4.293	0.587
Maximum	5.077	5.872	1.069
Minimum	1.082	2.011	0.108
Pipe Size		15.000	
Estimated Capacity (mgd)		3.550	
Capacity Used		30.10 %	
Sensor Type		Hach - Flodar	

Estimated Capacity Usage



Utility Systems, Science and Software

6190 Fairmount Ave. Suite E
San Diego, CA 92021

601 N. Parkcenter Drive Suite 209
Santa Ana, CA 92705

Utility Systems Science and Software

Report Date: 01/23/2013
Customer: MWH Americas, Inc.
Site: MH-71-M060
Pipe size: 15"

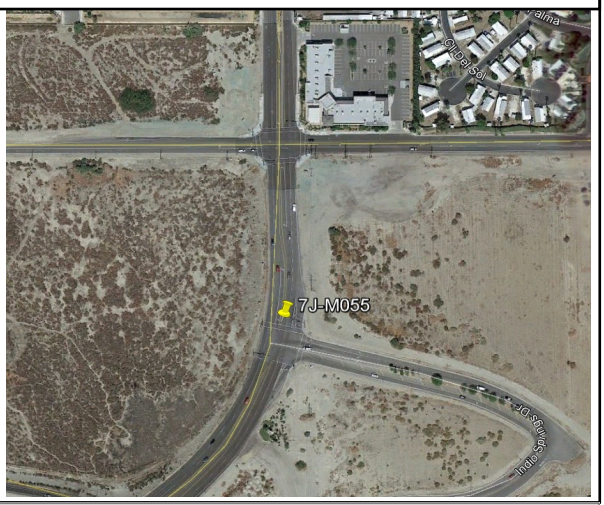
Weekly Flow Statistics for MH-71-M060

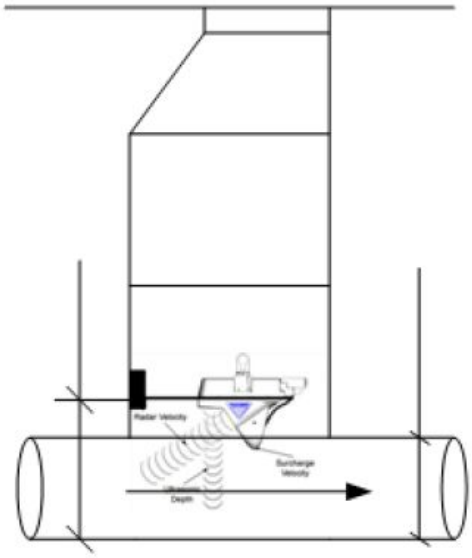
	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)			
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total
1/4/2013	501.21	640.82	338.25	0.72	0.92	0.49	4.35	4.89	3.80	3.93	4.40	3.15	721,746
1/5/2013	445.47	700.38	127.25	0.64	1.01	0.18	4.31	4.99	2.78	3.54	4.77	2.01	641,483
1/6/2013	459.60	678.63	148.66	0.66	0.98	0.21	4.40	5.08	3.38	3.58	4.69	2.01	661,827
Week:	**468.76**	**700.38**	**127.25**	**0.68**	**1.01**	**0.18**	**4.35**	**5.08**	**2.78**	**3.69**	**4.77**	**2.01**	**2,025,056**
1/7/2013	422.97	649.56	144.55	0.61	0.94	0.21	3.57	4.95	2.74	4.11	5.65	2.01	609,080
1/8/2013	367.77	522.29	118.31	0.53	0.75	0.17	2.40	3.04	1.44	4.66	5.73	2.98	529,582
1/9/2013	345.22	491.37	77.52	0.50	0.71	0.11	2.28	2.71	1.10	4.61	5.68	2.79	497,123
1/10/2013	367.98	674.65	81.20	0.53	0.97	0.12	2.41	3.48	1.08	4.60	5.79	2.89	529,884
1/11/2013	404.63	636.43	101.60	0.58	0.92	0.15	2.85	3.71	1.40	4.40	5.43	2.84	582,660
1/12/2013	435.26	706.07	132.05	0.63	1.02	0.19	3.11	3.83	2.00	4.34	5.54	2.62	626,768
1/13/2013	452.19	742.09	117.23	0.65	1.07	0.17	3.18	3.94	2.06	4.36	5.70	2.36	651,156
Week:	**399.43**	**742.09**	**77.52**	**0.58**	**1.07**	**0.11**	**2.83**	**4.95**	**1.08**	**4.44**	**5.79**	**2.01**	**4,026,253**
1/14/2013	426.24	619.85	127.03	0.61	0.89	0.18	3.02	3.77	2.16	4.41	5.58	2.46	613,788
1/15/2013	361.56	666.12	104.37	0.52	0.96	0.15	2.39	3.43	1.49	4.60	5.87	2.75	520,648
1/16/2013	435.12	652.35	107.92	0.63	0.94	0.16	2.94	3.63	1.51	4.50	5.47	2.69	626,570
1/17/2013	402.61	599.10	129.23	0.58	0.86	0.19	3.00	3.77	2.22	4.29	5.51	2.44	579,752
1/18/2013	384.16	594.36	75.31	0.55	0.86	0.11	2.68	3.49	1.10	4.39	5.55	2.72	553,184
1/19/2013	365.12	644.62	139.46	0.53	0.93	0.20	2.69	3.15	2.28	4.31	6.19	2.53	525,773
Week:	**395.80**	**666.12**	**75.31**	**0.57**	**0.96**	**0.11**	**2.79**	**3.77**	**1.10**	**4.42**	**6.19**	**2.44**	**3,419,716**

Site Installation Report

Customer:	MWH Americas, Inc.
Site Name:	7J-M055
Site Location	Golf Center Pky & 44th Avenue

Access:	System Type:	
Street Access – near casino	Sanitary [X] Storm [ ]	Install Date: 1/5/2013





Manhole Depth (feet)	21
Pipe Size (inches)	36 Inches
Pipe Condition	Good
Manhole Material	Concrete
Silt (inches)	0.5

Hydraulics

Profile used ".2, .4, .8 of Depth Method " Three point profile through cr

cross section of flow. Good even Flow

Avg Velocity	Avg Measured Level	Multiplier
2.16 FPS	7 inches	.9

Gas

O2	H2S	CO	LEL
21.9	19	.0	.0

Notes

High H2s

Traffic Safety

Very High Traffic Site

Land Use

Residential	Commercial	Industrial	Trunk
X	X		X

Meter Site Document

City	MWH Americas, Inc.
Site Name	7J-M055
Site Location	Golf Center Pky & 44th Avenue
Access	Street Access – near casino

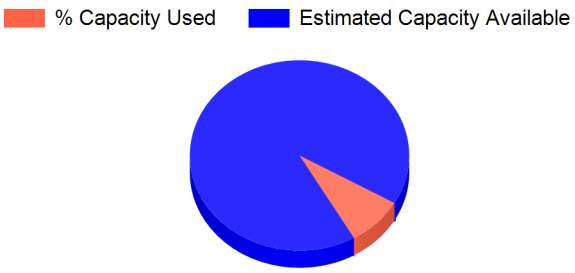
Temporary Flow Study

MWH Americas, Inc.

7J-M055

Meter Start Date		From	1/5/2013 12:00:00 AM
Meter Stop Date		To	1/19/2013 12:00:00 AM
Velocity (fps)		Level (in)	Flow (mgd)
Average	1.868	6.996	1.212
Maximum	2.370	8.760	2.033
Minimum	1.160	4.660	0.402
Pipe Size		36.000	
Estimated Capacity (mgd)		24.231	
Capacity Used		8.39 %	
Sensor Type		Hach - Flodar	

Estimated Capacity Usage



Utility Systems, Science and Software

6190 Fairmount Ave. Suite E
San Diego, CA 92021

601 N. Parkcenter Drive Suite 209
Santa Ana, CA 92705

Utility Systems Science and Software

Report Date: 06/13/2013
Customer: MWH Americas, Inc.
Site: 7J-M055
Pipe size: 36"

Weekly Flow Statistics for 7J-M055

	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)			
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total
1/4/2013	1046.07	1151.01	884.98	1.51	1.66	1.27	2.08	2.17	1.94	7.76	8.07	7.26	1,506,338
1/5/2013	902.42	1384.37	385.49	1.30	1.99	0.56	1.92	2.35	1.33	7.19	8.69	5.30	1,299,478
1/6/2013	952.82	1412.08	371.65	1.37	2.03	0.54	1.96	2.37	1.30	7.35	8.76	5.25	1,372,056
Week:	**967.10**	**1412.08**	**371.65**	**1.39**	**2.03**	**0.54**	**1.99**	**2.37**	**1.30**	**7.43**	**8.76**	**5.25**	**4,177,873**
1/7/2013	949.02	1271.82	378.41	1.37	1.83	0.54	1.97	2.25	1.32	7.37	8.44	5.26	1,366,590
1/8/2013	875.41	1225.95	375.76	1.26	1.77	0.54	1.90	2.24	1.30	7.14	8.25	5.29	1,260,584
1/9/2013	855.66	1172.23	375.54	1.23	1.69	0.54	1.89	2.21	1.31	7.07	8.07	5.26	1,232,153
1/10/2013	858.85	1181.68	394.78	1.24	1.70	0.57	1.89	2.22	1.34	7.08	8.09	5.36	1,236,740
1/11/2013	844.89	1152.25	382.81	1.22	1.66	0.55	1.88	2.18	1.31	7.03	8.05	5.33	1,216,636
1/12/2013	897.66	1399.32	378.65	1.29	2.02	0.55	1.92	2.36	1.31	7.18	8.73	5.29	1,292,634
1/13/2013	930.59	1387.46	397.99	1.34	2.00	0.57	1.94	2.34	1.34	7.27	8.73	5.39	1,340,050
Week:	**887.44**	**1399.32**	**375.54**	**1.28**	**2.02**	**0.54**	**1.91**	**2.36**	**1.30**	**7.16**	**8.73**	**5.26**	**8,945,387**
1/14/2013	803.75	1140.89	373.70	1.16	1.64	0.54	1.85	2.17	1.30	6.89	8.04	5.27	1,157,395
1/15/2013	747.22	1114.38	278.83	1.08	1.60	0.40	1.77	2.15	1.16	6.64	7.94	4.66	1,075,998
1/16/2013	747.74	997.88	295.93	1.08	1.44	0.43	1.78	2.03	1.19	6.68	7.65	4.77	1,076,741
1/17/2013	689.59	961.63	295.23	0.99	1.38	0.43	1.73	2.03	1.18	6.47	7.48	4.79	993,003
1/18/2013	673.79	925.95	293.44	0.97	1.33	0.42	1.71	2.01	1.18	6.41	7.31	4.77	970,251
1/19/2013	612.98	983.35	309.20	0.88	1.42	0.45	1.64	2.23	1.21	6.13	7.26	4.86	882,690
Week:	**712.51**	**1140.89**	**278.83**	**1.03**	**1.64**	**0.40**	**1.75**	**2.23**	**1.16**	**6.54**	**8.04**	**4.66**	**6,156,078**

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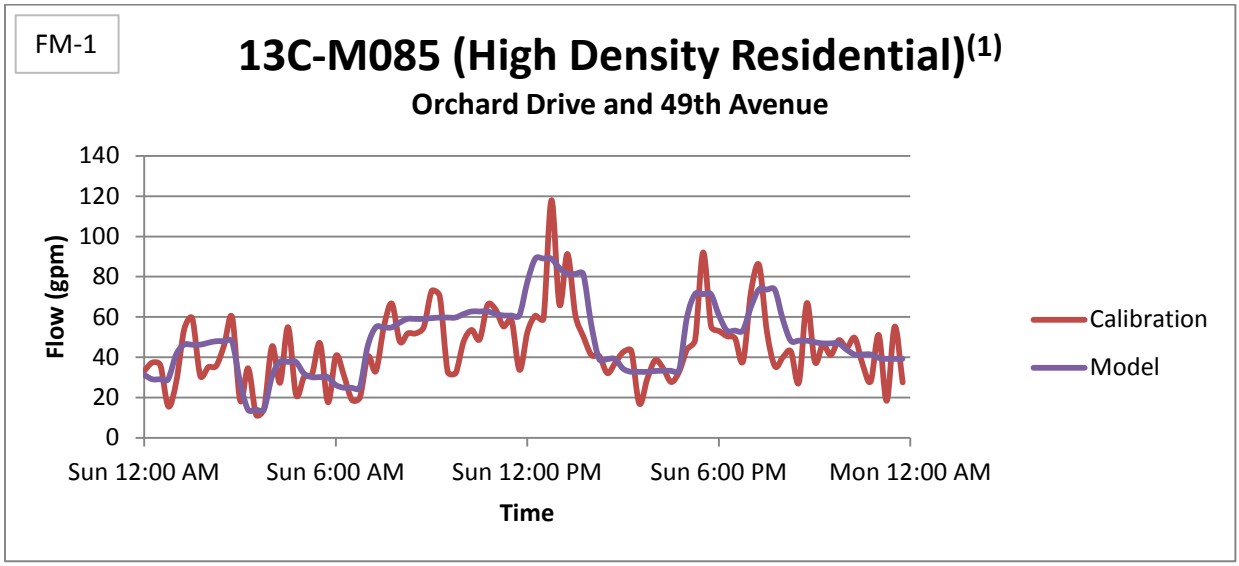
Appendix E
Final Land Uses and Calibration Results

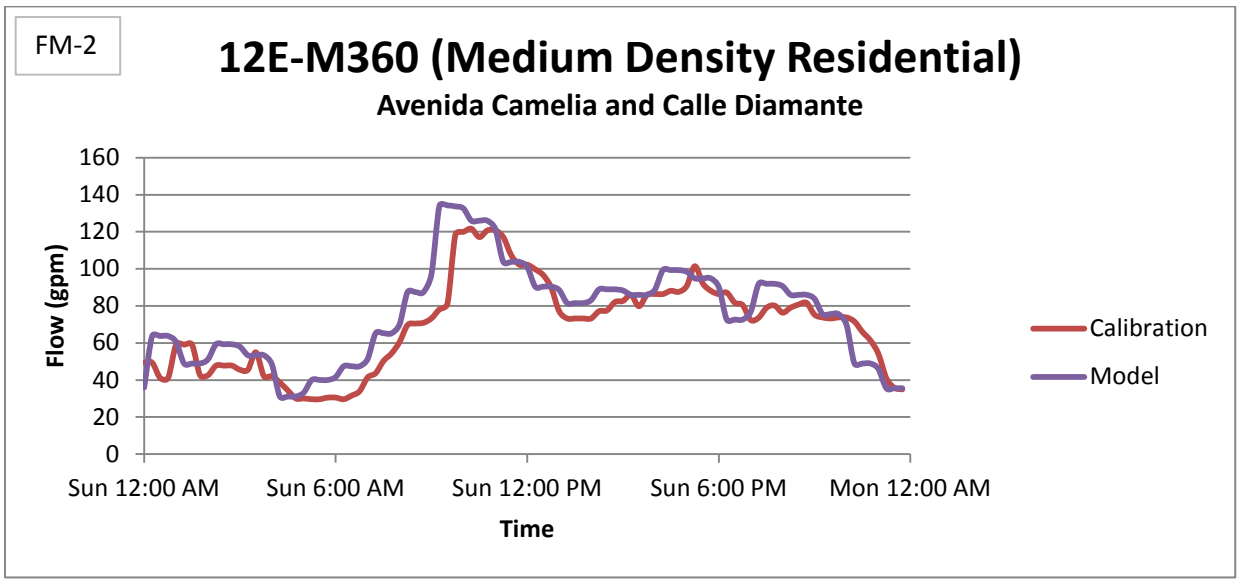
FINAL LAND USES AND DIURNAL MULTIPLES FOR EXISTING SYSTEM

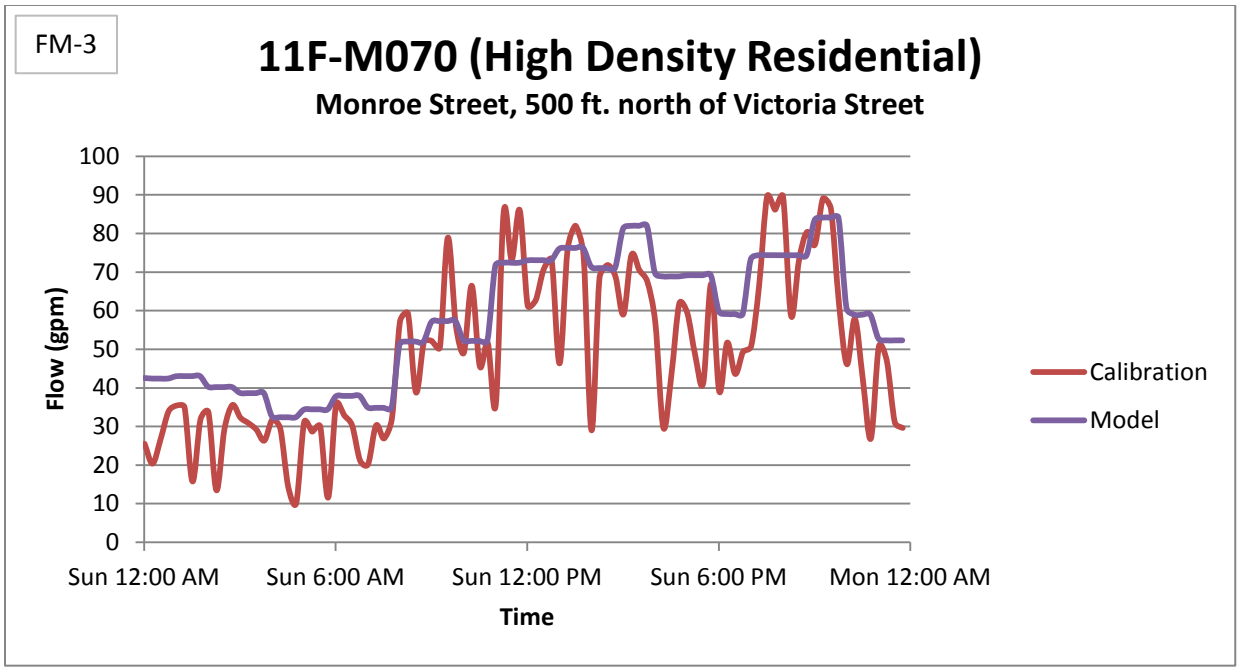
Pattern	Description	Diurnal Multiple (Weekend/ Weekday)
Commercial Central	Commercial flow in the central portion of the system	1.06/1.01
Commercial High_FM	Used only for area tributary to manhole 9F-M360 (Flow Monitor No. 5) which showed unusually high flows for flow monitoring period and was assigned its own duty factor separate from other commercial property in the system	1.10/1.00
Commercial North	Commercial flow in the northern portion of the system	1.10/1.00
Commercial North Central	Commercial flow in the north-central portion of the system	1.48/0.91
Commercial North Central High	Higher commercial flow in the north-central portion of the system	1.48/0.91
Commercial South	Commercial flow in the southern portion of the system	1.26/1.19
Commercial South Central	Commercial flow in the south-central portion of the system	1.52/1.36
Existing Jail	Flows from the existing detention center on Highway 111	1.00/1.00
Industrial North Central	Industrial flows in the north-central portion of the system	1.48/0.91
Industrial South Central	Industrial flows in the south-central portion of the system	1.52/1.36
Mixed Use	Mixed-use flows throughout the system	0.69/0.69
Open	Open areas throughout the system	1.00/1.00
Public	Public flows throughout the system	0.64/1.00
Residential Central	Residential flow in the central portion of the system	1.11/1.08
Residential High	High residential flow throughout the system	1.00/1.00
Residential North	Residential flow in the northern portion of the system	0.96/0.87
Residential North Central	Residential flow in the north-central portion of the system	1.49/0.91
Residential South	Residential flow in the southern portion of the system	1.00/0.75
Residential South Central	Residential flow in the south-central portion of the system	1.50/1.32
Residential South Low	Lower residential flow in the southern portion of the system	1.06/1.06
Septic	Septic areas in the system (no flow, given same duty factor and diurnal pattern as open areas)	1.00/1.00
Vacant	Vacant areas in the system (no flow, given same duty factor and diurnal pattern as open areas)	1.00/1.00

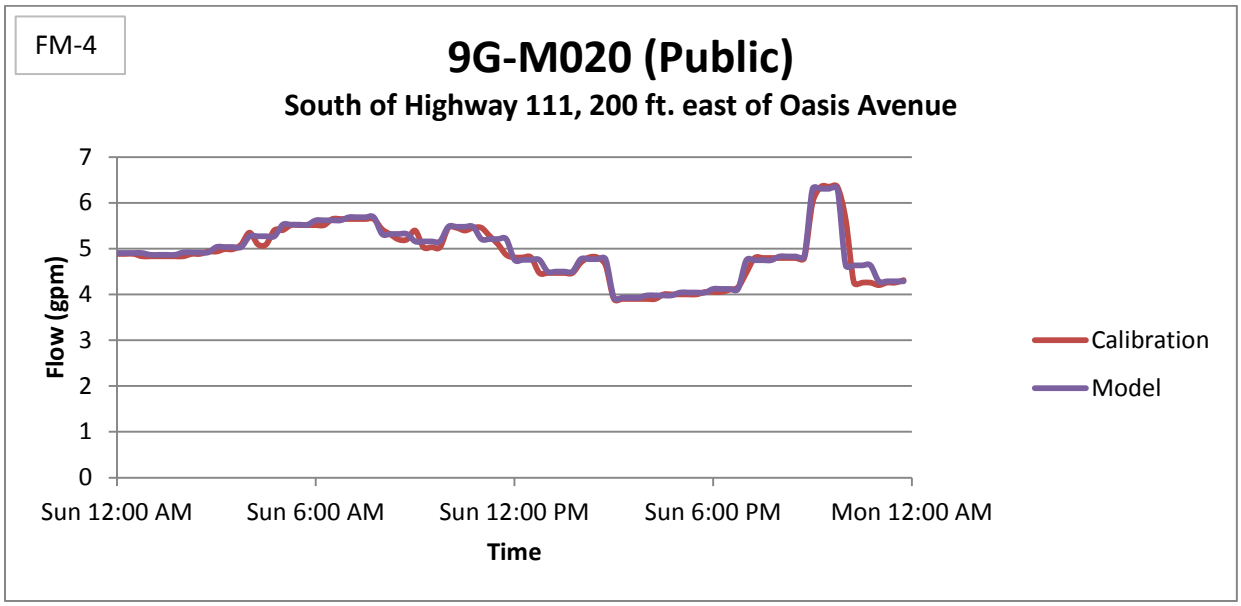
CALIBRATION RESULTS

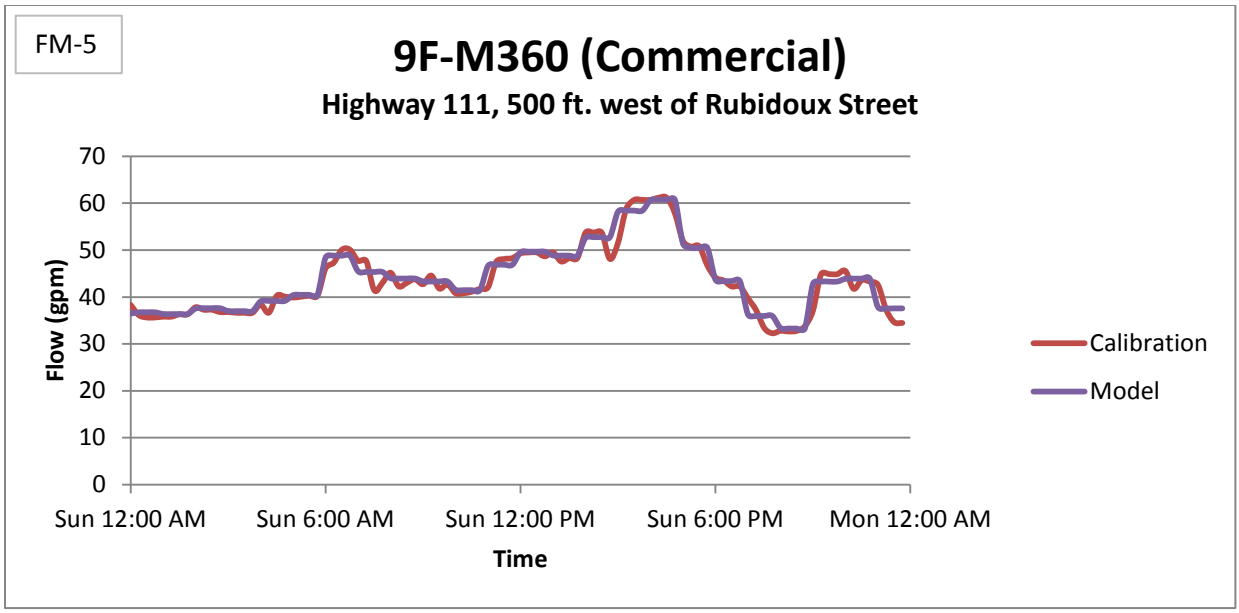
Weekend Calibration Day – Sunday, January 6th, 2013

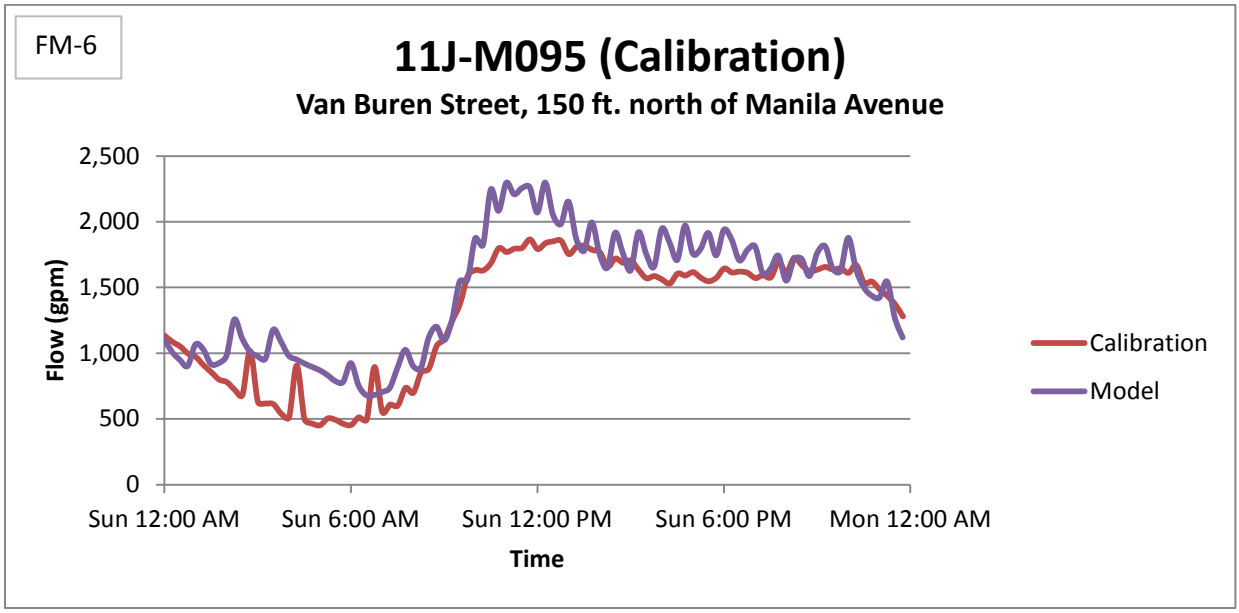


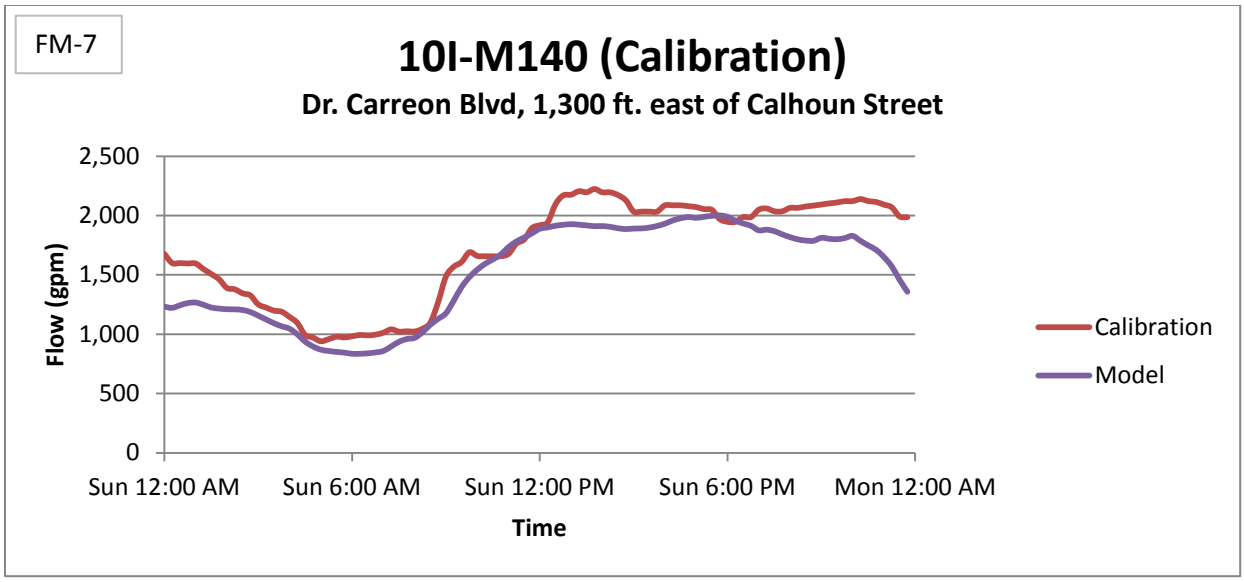


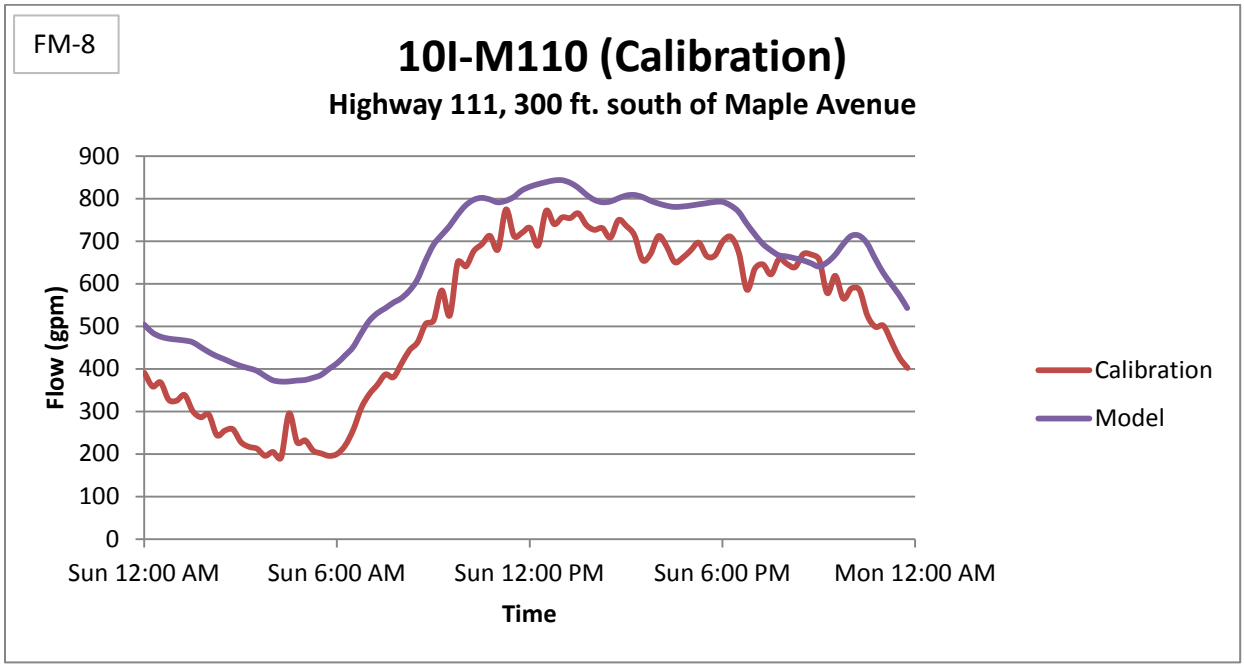

FM-3
11F-M070 (High Density Residential)
Monroe Street, 500 ft. north of Victoria Street
Flow (gpm)
100
90
80
70
60
50
40
30
20
10
0
Sun 12:00 AM
Sun 6:00 AM
Sun 12:00 PM
Sun 6:00 PM
Mon 12:00 AM
Time
Calibration
Model

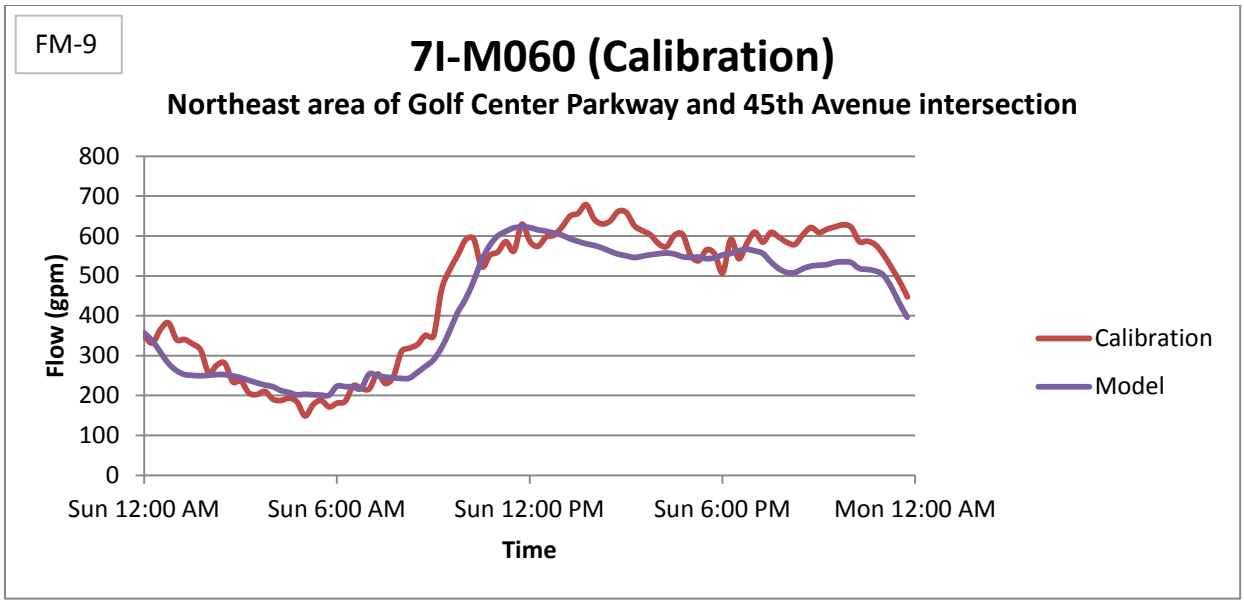

FM-4
9G-M020 (Public)
South of Highway 111, 200 ft. east of Oasis Avenue
Flow (gpm)
7
6
5
4
3
2
1
0
Sun 12:00 AM
Sun 6:00 AM
Sun 12:00 PM
Sun 6:00 PM
Mon 12:00 AM
Time
Calibration
Model

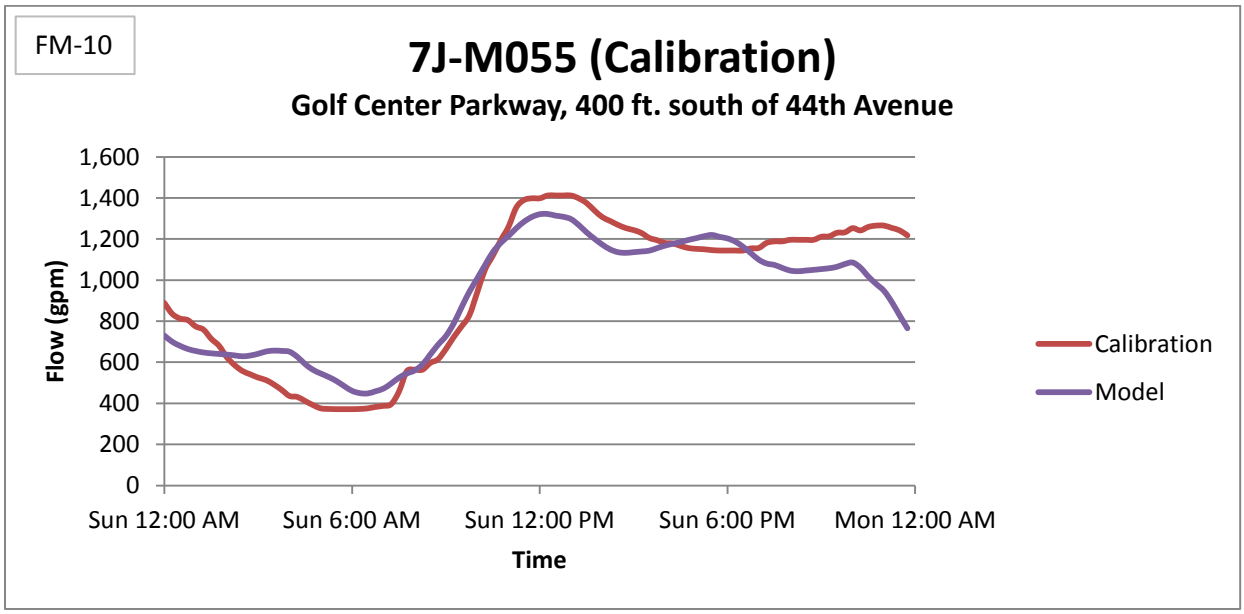

FM-5
9F-M360 (Commercial)
Highway 111, 500 ft. west of Rubidoux Street
Flow (gpm)
70
60
50
40
30
20
10
0
Sun 12:00 AM
Sun 6:00 AM
Sun 12:00 PM
Sun 6:00 PM
Mon 12:00 AM
Time
Calibration
Model

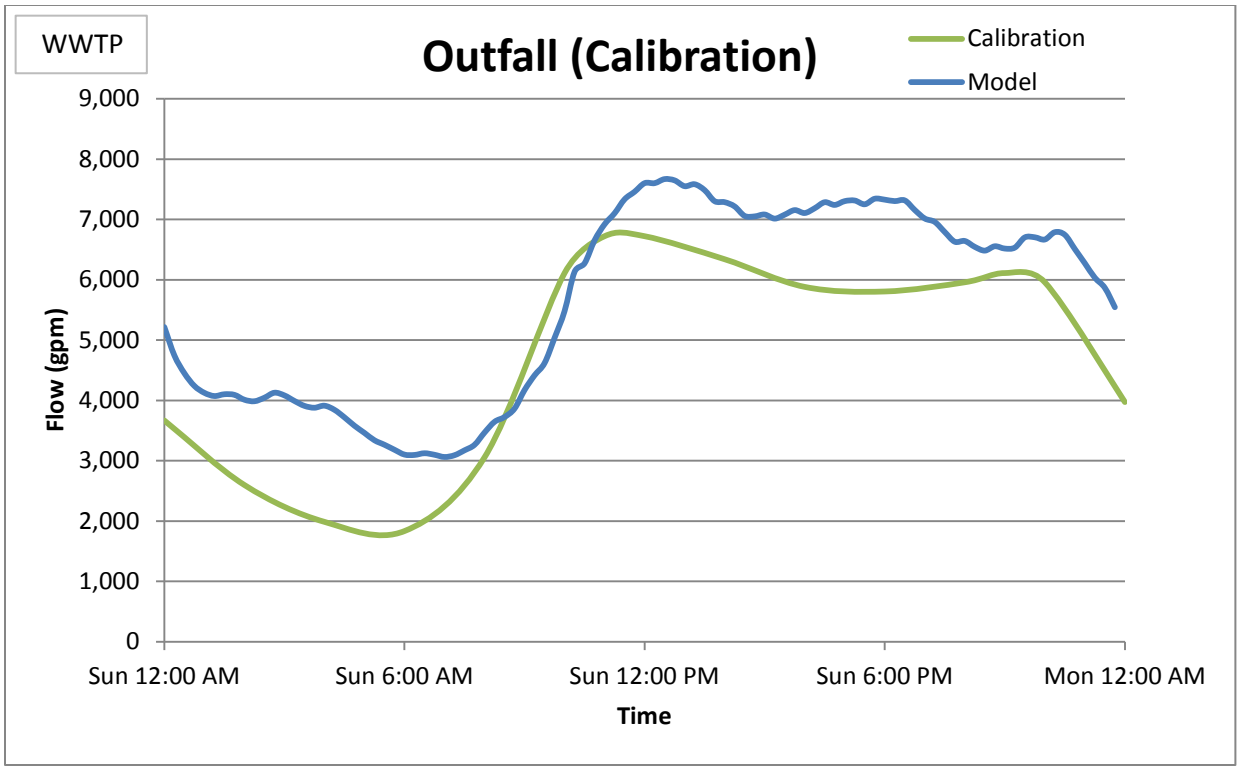

FM-6
11J-M095 (Calibration)
Van Buren Street, 150 ft. north of Manila Avenue
Flow (gpm)
2,500
2,000
1,500
1,000
500
0
Sun 12:00 AM
Sun 6:00 AM
Sun 12:00 PM
Sun 6:00 PM
Mon 12:00 AM
Time
Calibration
Model


FM-7
10I-M140 (Calibration)
Dr. Carreon Blvd, 1,300 ft. east of Calhoun Street
2,500
2,000
1,500
1,000
500
0
Flow (gpm)
Sun 12:00 AM
Sun 6:00 AM
Sun 12:00 PM
Sun 6:00 PM
Mon 12:00 AM
Time
Calibration
Model

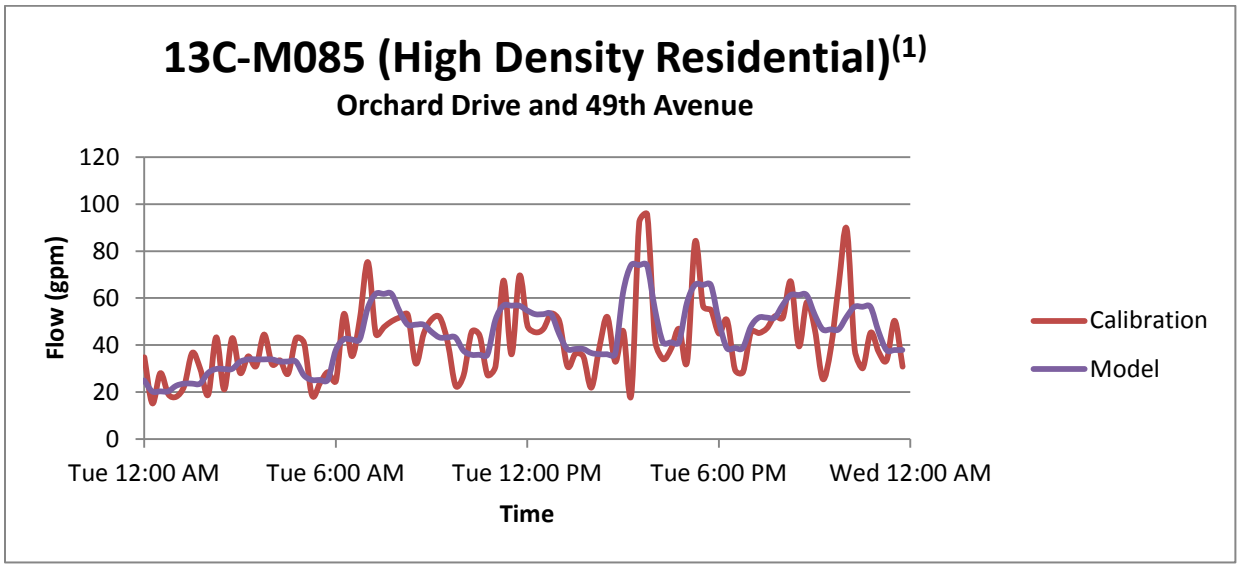

FM-8
10I-M110 (Calibration)
Highway 111, 300 ft. south of Maple Avenue
900
800
700
600
500
400
300
200
100
0
Flow (gpm)
Sun 12:00 AM
Sun 6:00 AM
Sun 12:00 PM
Sun 6:00 PM
Mon 12:00 AM
Time
Calibration
Model

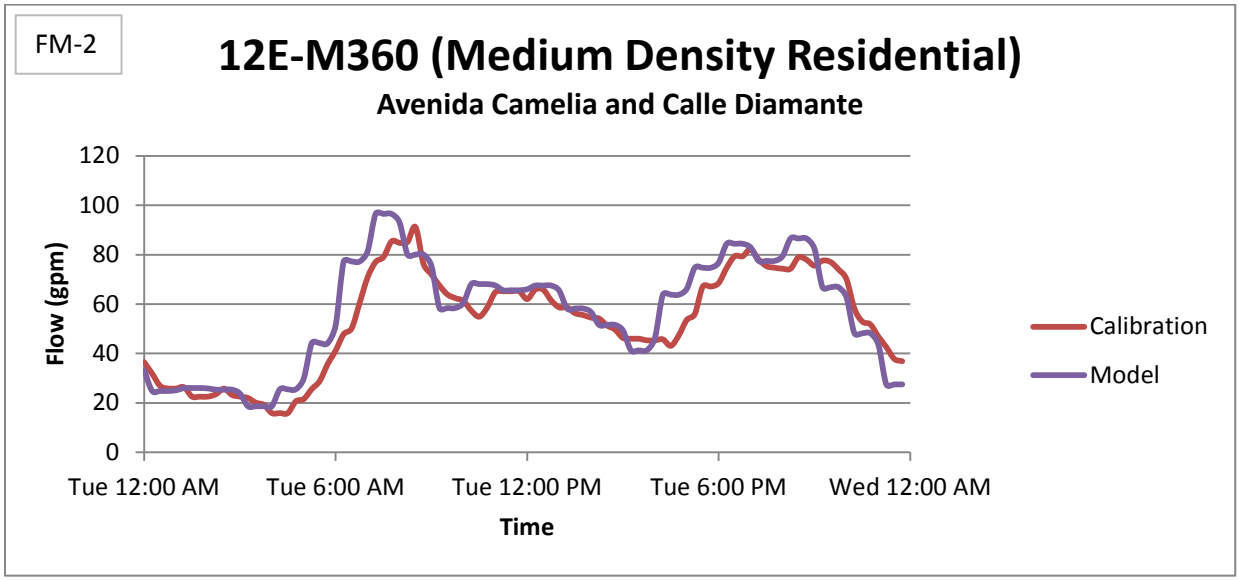

FM-9
7I-M060 (Calibration)
Northeast area of Golf Center Parkway and 45th Avenue intersection
Flow (gpm)
800
700
600
500
400
300
200
100
0
Sun 12:00 AM
Sun 6:00 AM
Sun 12:00 PM
Sun 6:00 PM
Mon 12:00 AM
Time
Calibration
Model

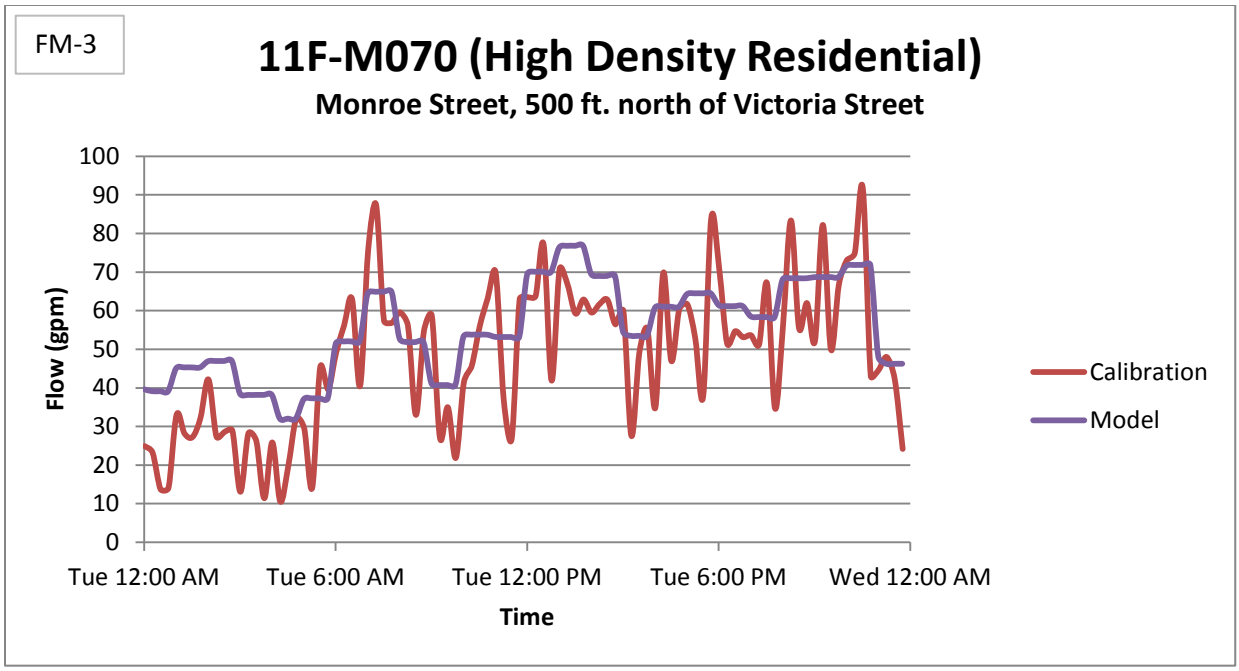

FM-10
7J-M055 (Calibration)
Golf Center Parkway, 400 ft. south of 44th Avenue
Flow (gpm)
1,600
1,400
1,200
1,000
800
600
400
200
0
Sun 12:00 AM
Sun 6:00 AM
Sun 12:00 PM
Sun 6:00 PM
Mon 12:00 AM
Time
Calibration
Model

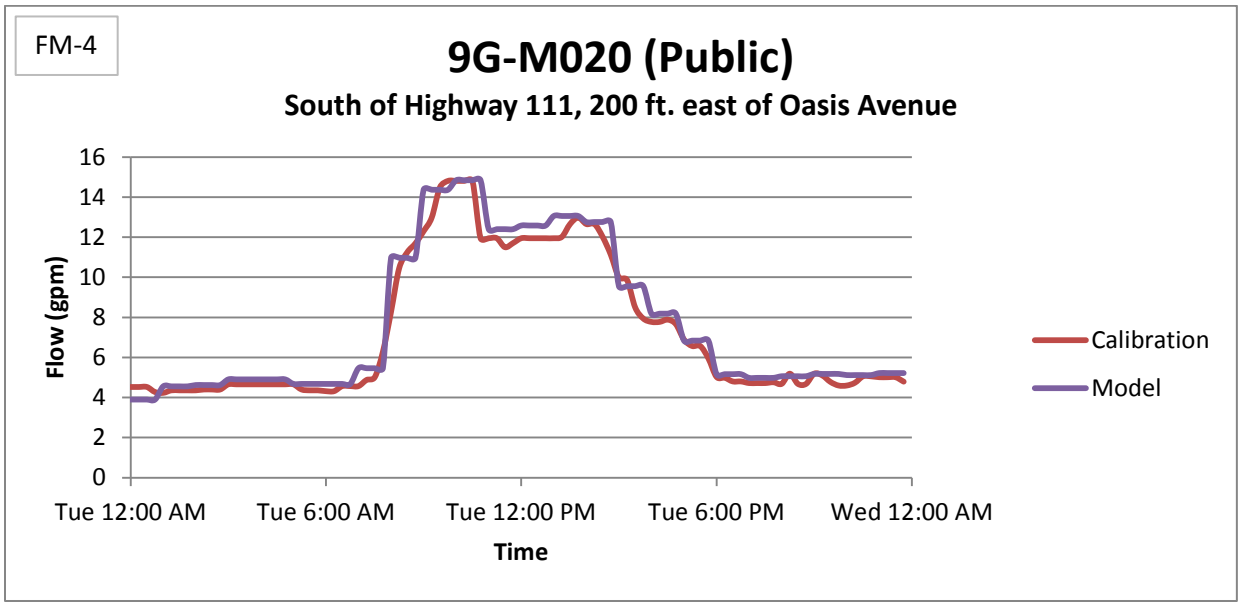

WWTP
Outfall (Calibration)
Calibration
Model
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Flow (gpm)
Sun 12:00 AM
Sun 6:00 AM
Sun 12:00 PM
Sun 6:00 PM
Mon 12:00 AM
Time

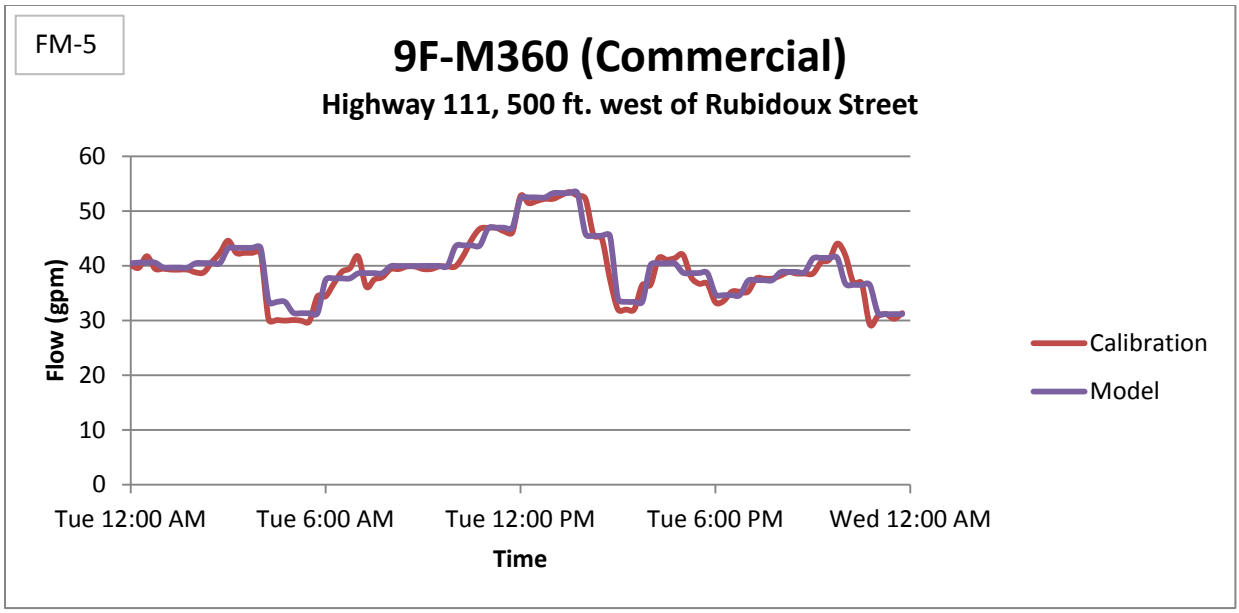
Weekday Calibration Day – Tuesday January 8th, 2013

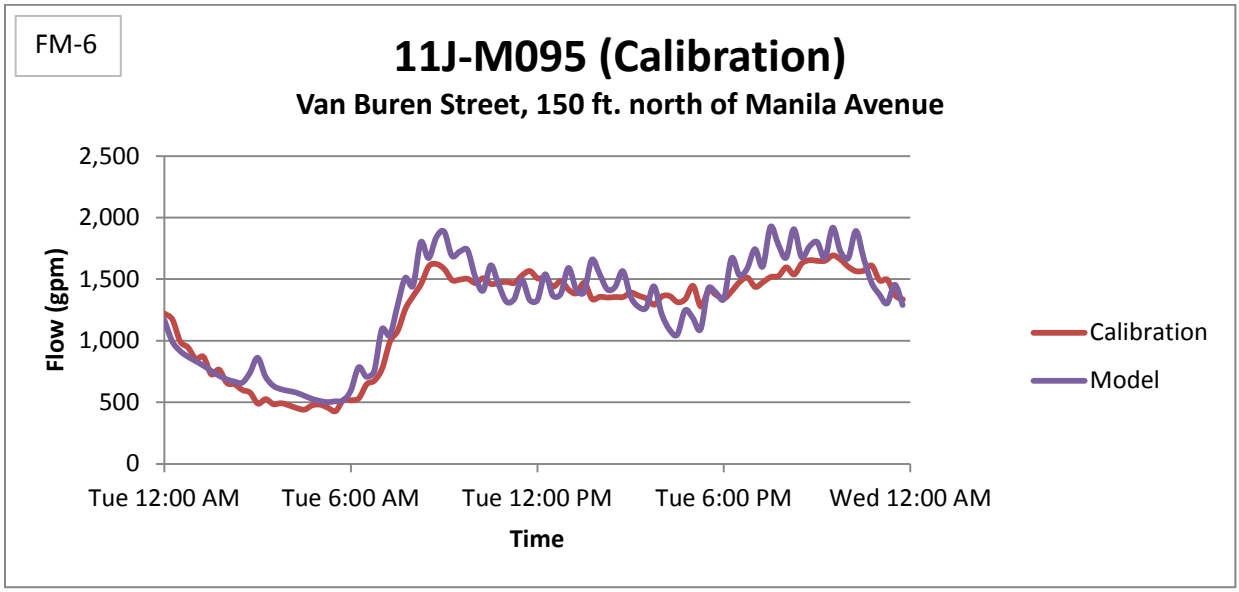


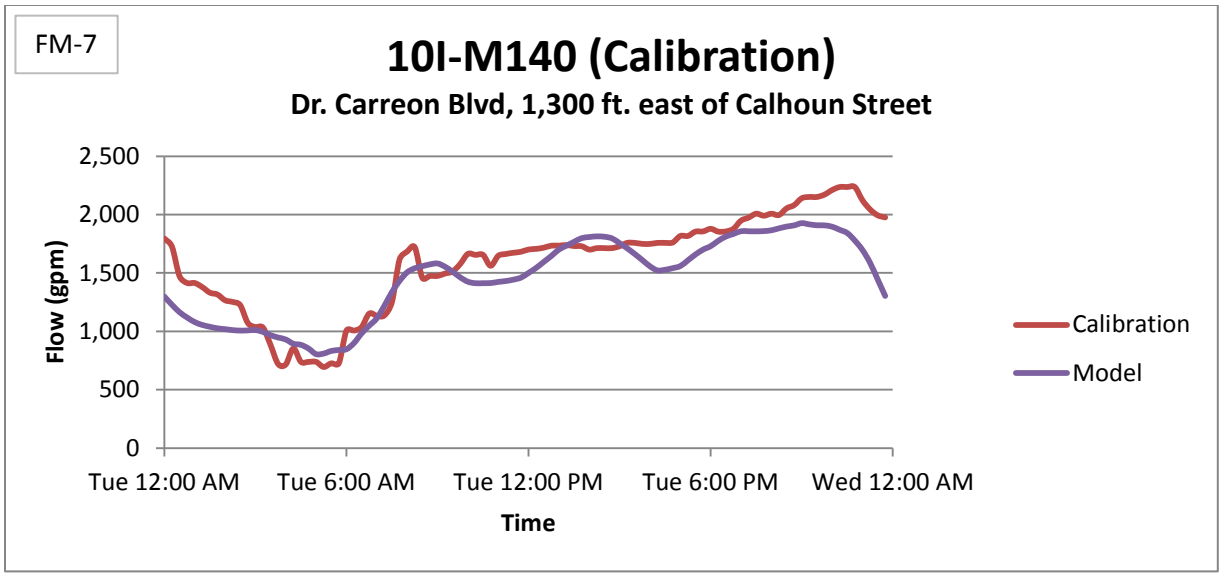



FM-3
11F-M070 (High Density Residential)
Monroe Street, 500 ft. north of Victoria Street
Flow (gpm)
100
90
80
70
60
50
40
30
20
10
0
Tue 12:00 AM
Tue 6:00 AM
Tue 12:00 PM
Tue 6:00 PM
Wed 12:00 AM
Time
Calibration
Model


FM-4
9G-M020 (Public)
South of Highway 111, 200 ft. east of Oasis Avenue
Flow (gpm)
16
14
12
10
8
6
4
2
0
Tue 12:00 AM
Tue 6:00 AM
Tue 12:00 PM
Tue 6:00 PM
Wed 12:00 AM
Time
Calibration
Model


FM-5
9F-M360 (Commercial)
Highway 111, 500 ft. west of Rubidoux Street
Flow (gpm)
60
50
40
30
20
10
0
Tue 12:00 AM
Tue 6:00 AM
Tue 12:00 PM
Tue 6:00 PM
Wed 12:00 AM
Time
Calibration
Model


FM-6
11J-M095 (Calibration)
Van Buren Street, 150 ft. north of Manila Avenue
Flow (gpm)
2,500
2,000
1,500
1,000
500
0
Tue 12:00 AM
Tue 6:00 AM
Tue 12:00 PM
Tue 6:00 PM
Wed 12:00 AM
Time
Calibration
Model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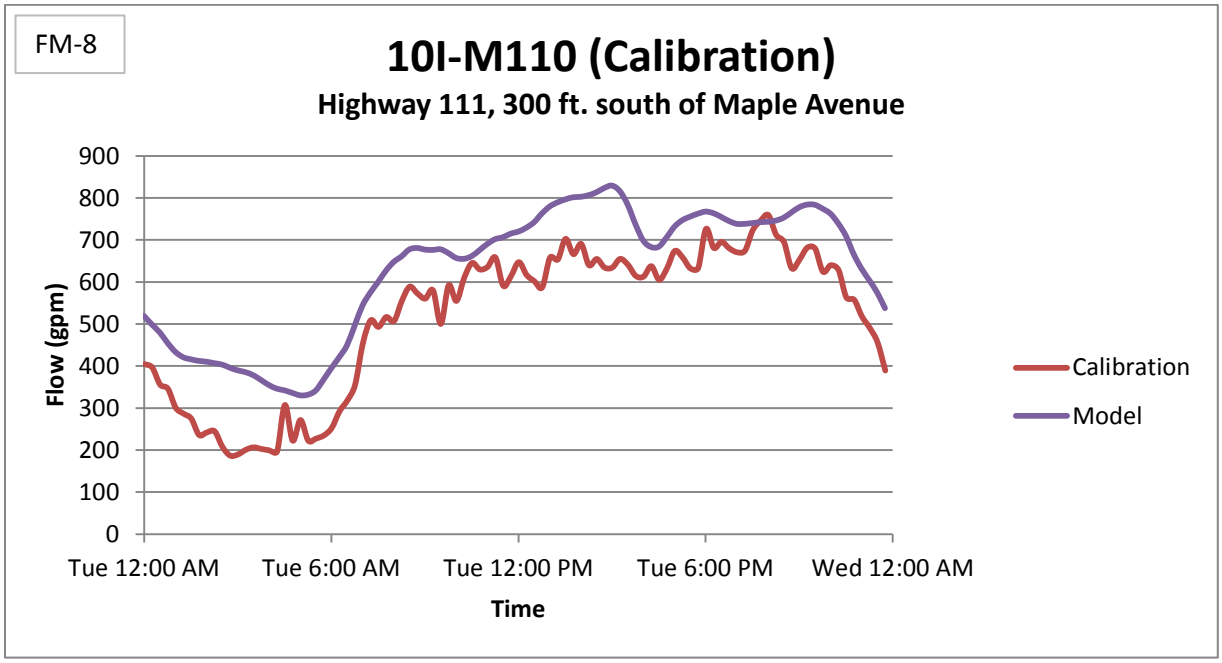
2,500
2,000
1,500
1,000
500
0
Flow (gpm)
Tue 12:00 AM
Tue 6:00 AM
Tue 12:00 PM
Tue 6:00 PM
Wed 12:00 AM
Time
Calibration
Model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600
500
400
300
200
100
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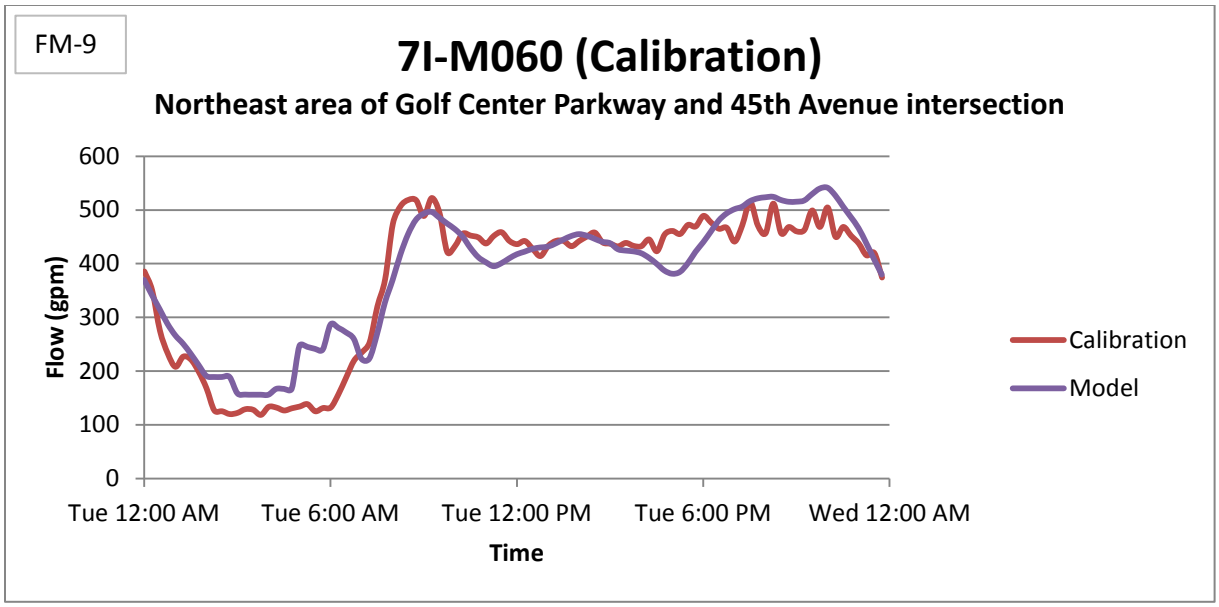
Tue 12:00 AM
Tue 6:00 AM
Tue 12:00 PM
Tue 6:00 PM
Wed 12:00 AM
Time
Calibration
Model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7I-M060 (Calibration)
Northeast area of Golf Center Parkway and 45th Avenue intersection
Flow (gpm)
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500
400
300
200
100
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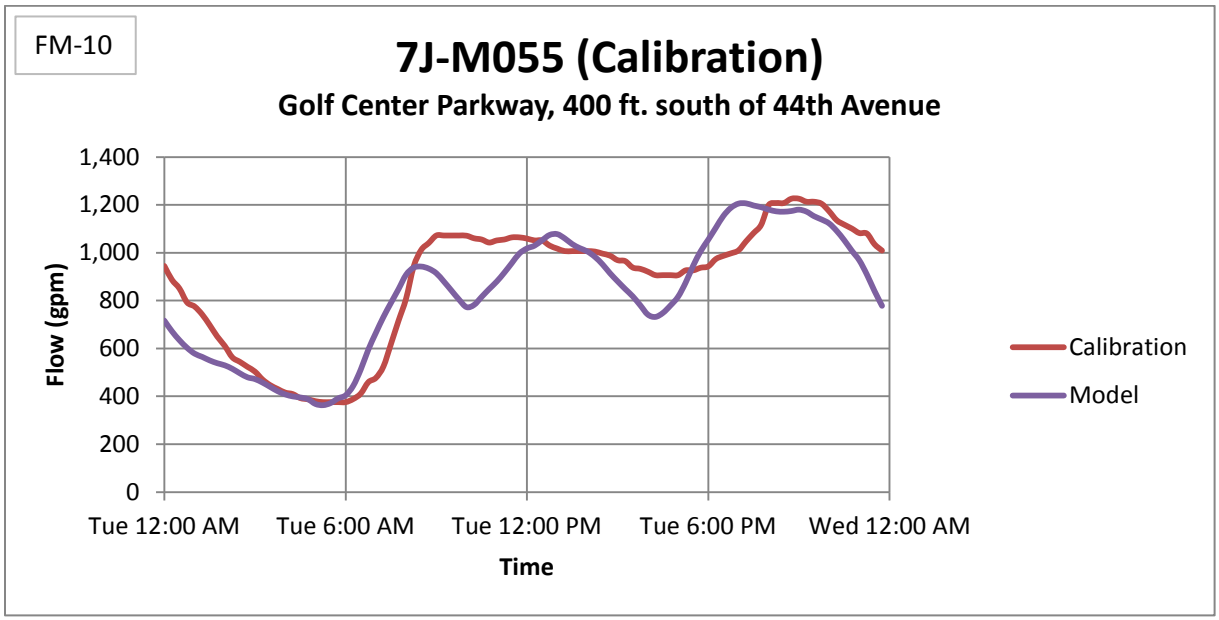
Tue 12:00 AM
Tue 6:00 AM
Tue 12:00 PM
Tue 6:00 PM
Wed 12:00 AM
Time
Calibration
Model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Flow (gpm)
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1,200
1,000
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400
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0
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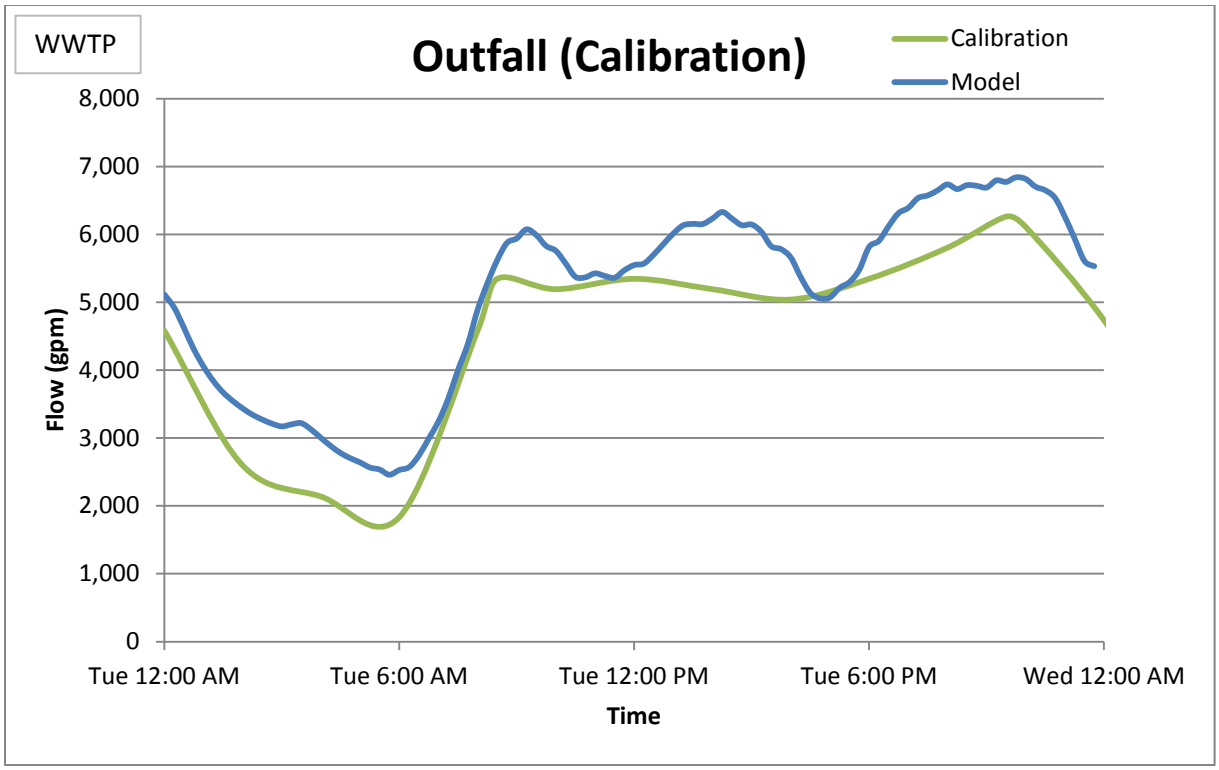
Tue 6:00 AM
Tue 12:00 PM
Tue 6:00 PM
Wed 12:00 AM
Time
Calibration
Model


WWTP
Outfall (Calibration)
Calibration
Model
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Flow (gpm)
Tue 12:00 AM
Tue 6:00 AM
Tue 12:00 PM
Tue 6:00 PM
Wed 12:00 AM
Time

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Appendix F
Technical Memorandum – Sewer System Planning and Design Criteria

Below is the Sewer System Planning and Design Criteria Technical Memorandum (TM) prepared for Valley Sanitary District (VSD). This TM was delivered to VSD on October 1, 2012.

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TECHNICAL MEMORANDUM

MWH

BUILDING A BETTER WORLD

To:	Joe Glowitz, VSD	**Date:**	October 1, 2012
From:	Alok Pandya, MWH Jinny Huang, MWH	**Reference:**	10500972/6.2

Subject: Sewer System Planning and Design Criteria

Introduction

This Technical Memorandum (TM) summarizes Valley Sanitary District's (VSD) planning and sewer system design criteria for the Collection System Master Plan. System characteristics such as per capita flow and peaking factors are discussed, in addition to wastewater flow criteria of flow allocation of the sewer model. These criteria are based on industry guidelines and literature and MWH experience of similar systems. These criteria will serve as the starting point for establishing the size and slope of future sewers, including gravity trunk sewers and force mains, the design and layout of various system features, and as a guide to develop the proposed improvement project costs.

Deviations from the recommended guidelines may be necessary in defining specific improvement projects for an existing sewer collection system due to the restrictions posed by existing upstream and downstream conditions. In these special circumstances, design criteria will need to be determined on a case-by-case basis.

Wastewater Flow Criteria

Flow generation for existing conditions is based on a flow pattern for different land uses and the per capita flow generation by land use. Projected wastewater flows is based on future population information and changes in land use. Flows generated for each land use will be determined by flow monitoring results to be conducted during the month of November to capture typical dry weather flow data. Existing zoning, future land use, and population for the VSD service area is discussed in the following section.

Land Use

The VSD service area is approximately 12,800 acres of land which includes mostly of areas in the City of Indio and unincorporated areas of Riverside County. Existing zoning information for the service area is provided in a GIS shapefile from the 2010 City of Indio General Plan, which contains over 30 land use categories. Existing zoning information for the unincorporated areas is based from the Riverside County General Plan GIS shapefile or determined by visual inspection using aerial images.

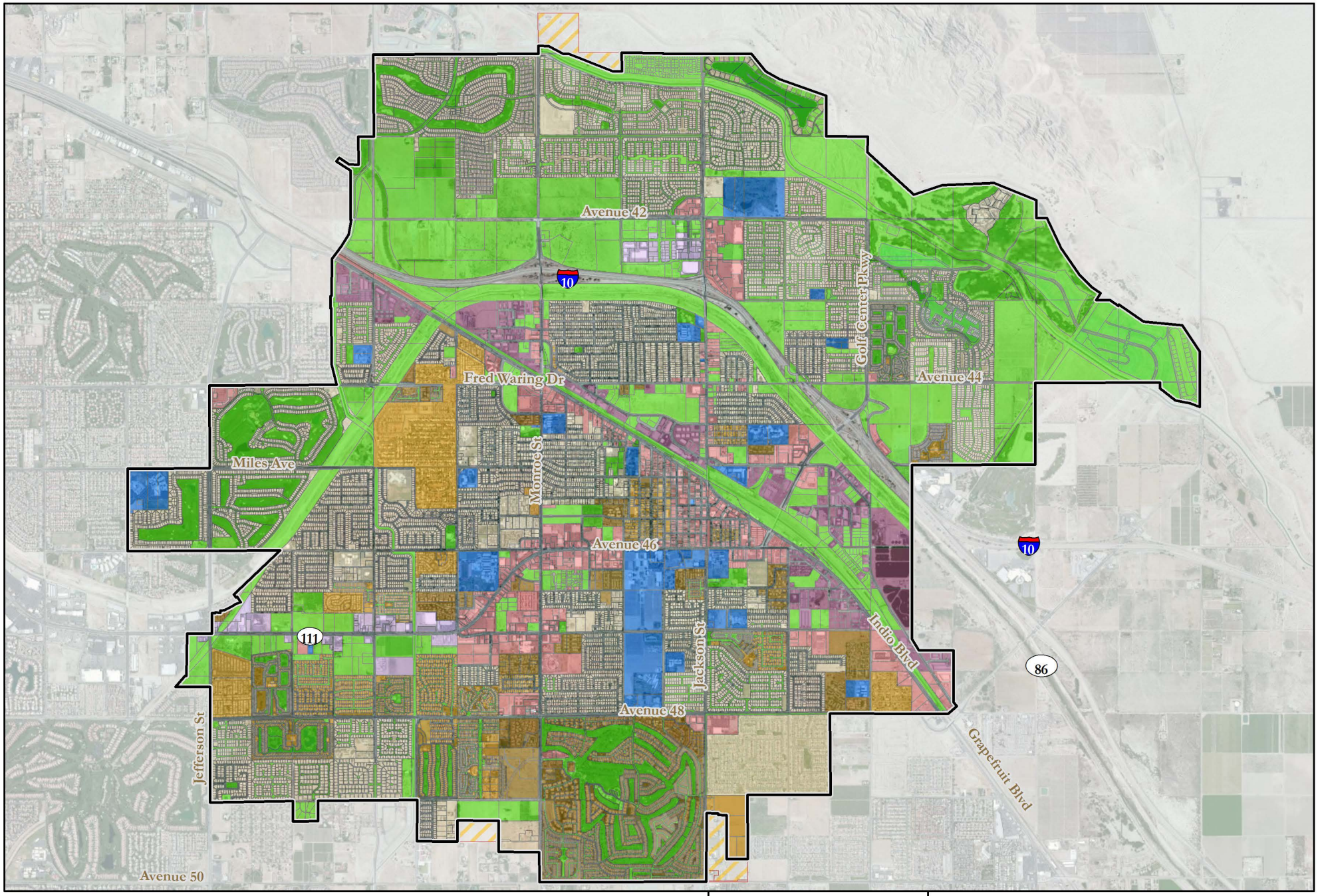
MWH grouped specific land use types into eight general categories. These land use categories used for the VSD sewer model include residential high, residential medium, residential low, commercial, mixed use, open space, industrial, and public. A list of land use categories and percentage of total VSD service area by land use is provided in Table 1.

MWH reviewed existing land use information and observed inconsistencies between the land uses designated in the general plan and aerial images. Existing land use for the VSD area was refined to appropriately match one of the eight general categories and shown in Figure 1.

Future zoning information is also based on the City of Indio and Riverside County general plans, and grouped into the same eight categories. In reviewing the future zones, oddities in select areas of the system were observed, where land use in the general plan was modified from a high density type land use to lower density type land use (e.g., residential to open space or residential to commercial). In this case, MWH would select the land use with the higher density land use type as the modified future zone. Selecting a higher density land use for the future would provide for a more conservative estimation of flow for that area. A major difference between existing land use and future zoning includes the conversion of open land to residential high, which increases residential high from about 6 to 22 percent. There are also areas of existing residential low land use that is zoned for residential high in the future, which decreases residential low from about 26 to 22 percent. The VSD area will also be expanded in the future to include annexed areas as shown in Figure 2.

Table 1
VSD Existing Land Use and Future Zoning Categories by Area

VSD Zone	Existing Land Use		Future Zoning	
	Area (acre)	Percent Total Area (%)	Area (acre)	Percent Total Area (%)
Residential High	723	5.7%	2,860	22.2%
Residential Medium	966	7.6%	739	5.7%
Residential Low	3,328	26.1%	2,852	22.3%
Commercial	735	5.8%	1,063	8.2%
Mixed Use	137	1.1%	777	6.0%
Open Space	5,989	46.9%	3,574	27.7%
Industrial	437	3.4%	542	4.2%
Public	452	3.5%	457	3.5%
Total	**12,768**	**100%**	**12,882**	**100%**



Key to Features

- Valley Sanitary District Boundary
- Commercial
- Industrial
- Mixed Use
- Open Space
- Public
- Residential High
- Residential Medium
- Residential Low
- Future Annexation

N

0 0.25 0.5 Miles

Document: \\Uspas1s01\muni\Clients\Valley San District\IDIQ As-Needed\Task 1 -Sewer System MP\14 Electronic Files - Modeling_MXDs\GenLandUse.mxd

Date: September 27, 2012

Generalized Existing Land Use

Figure 1

MWH

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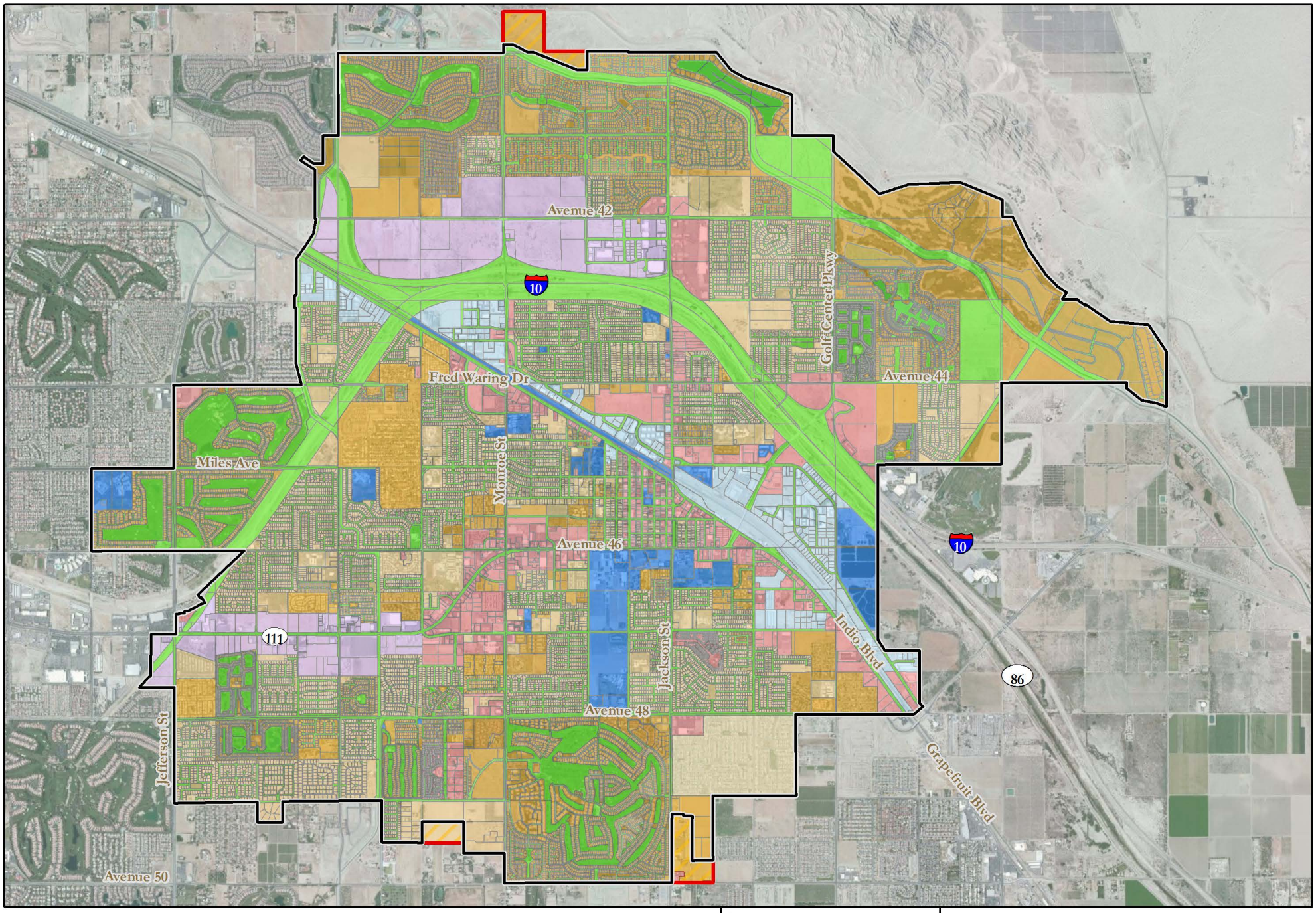

Key to Features

- Valley Sanitary District Boundary
- Future Valley Sanitary District Boundary
- Future Annexation
- Commercial
- Industrial
- Mixed Use
- Open
- Public
- Residential High
- Residential Medium
- Residential Low

N

0 0.25 0.5 Miles

Document: \\Uspas1s01\muni\Clients\Valley San District\IDIQ As-Needed\Task 1 -Sewer System MP\14 Electronic Files - Modeling_MXDs\ZoningGeneral.mxd

Date: September 24, 2012

Generalized Future Zoning

Figure 2

MWH

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Residential

Residential land use consists of about 40 percent of the total service area. Approximately 66 percent is low-density residential homes (single-family homes), 20 percent is medium-density residential homes (multi-family home, condominiums, mobile homes), and the other 14 percent of residential land is high-density residential homes (apartment buildings).

Based on the City of Indio Code of Ordinances, residential densities for low-, medium, and high-density residential typically range 3.5 to 4.0, 6.0 to 8.0, and 12.0 to 15.0 dwelling units per acre (du/acre), respectively. According to the 2010 Census Bureau, there is about 2.89 person per dwelling unit in California. Using the population in 2010 of 76,036 and an average daily wastewater flow generation from the treatment plant of approximately 6.107 million gallons per day as depicted in Figure 3, the wastewater generation for residential land use would be 80.3 gallons per person per day.

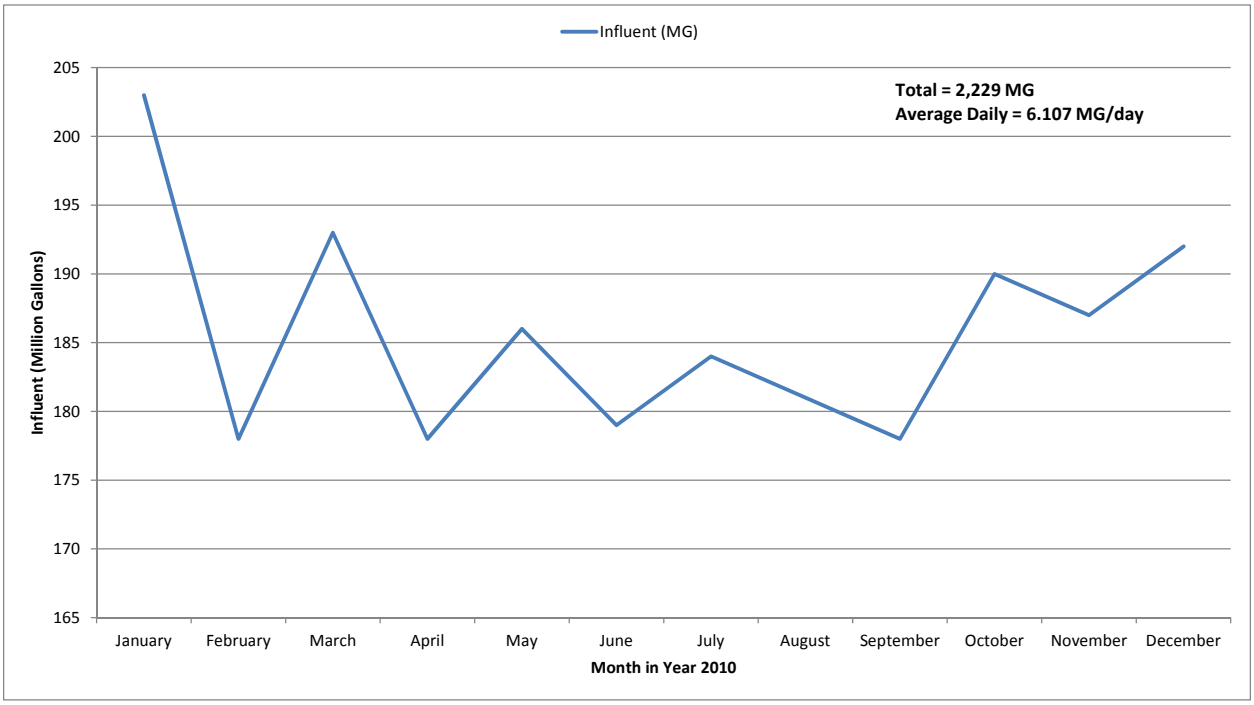

Figure 3
2010 Treatment Plant Average Inflow

A flow pattern for the different type of residential land use will be developed based on flow monitoring data. Typical weekday residential profile characteristics include a low and steady flow between late night to early morning hours (e.g., 12:00 AM to 4:00 AM), and morning (e.g., 6:00 AM to 9:00 AM) and evening peaks (e.g., 5:00 PM to 8:00 PM).

Commercial

Commercial flows are defined as wastewater flows that are generated by commercial businesses such as restaurants, retail offices, hotels, theatres, car washes, laundry facilities, etc. Commercial flows consist of approximately 6 percent of the total service area. These flows are

estimated by an assumed wastewater duty factor for the land use and adjusted after flow monitoring.

Mixed Use

A mixed use area contains a combination of land uses such as residential and commercial within one area, and consists approximately one percent of the total service area. An example of mixed use would be retail stores on the ground floor of a building and office and/or residential area on the upper levels. Mixed land use may also include hotels, lofts, and medium-family residential and commercial facilities with the same area.

Open Space

Open space are open area such as parks, fields, streets, roadways, highways, and undeveloped areas, and consists of approximately 47 percent of the total service area. Open space also consists of existing vacant land. For example, land zoned for residential medium that is currently undeveloped based on aerial images is considered open space under the existing land use. Open spaces may also include central plazas and event courts with sitting areas, water features, gateway elements, festival and special event pedestrian way, neighborhood parks, or landscape parkway. Flow generation for open space is also expected to have no flow contribution to the collection system.

Industrial

Industrial wastewater flows vary significantly based on factors such as the type, size, operational techniques, and presence of on-site treatment facilities for wastewater. Variations in industrial peak flows are significant because of the method of operation and work shifts. Industrial land use consists of about 4 percent of the total land, and there are no large industrial customers are known to contribute significant wastewater flow to the system. Typical industrial diurnal pattern is consistent (i.e., flat) throughout the hours of operation (e.g., 8:00 AM to 8:00 PM).

Public

Public areas include public facilities such as schools, libraries, hospitals, recreational areas, institutions and consist of approximately 4 percent of the total service area. Similar to open space, flow generation to the collection system is expected to be little to none.

Population

Population information is used to verify flow data for the VSD system, and to determine the increase in flow generation within the area based on growth rate of the population. Population information is provided by 2010 U.S. Bureau of Census data and population projections are based 2012 Coachella Valley Association of Governments (CVAG) data for the City of Indio. Since projections are not available for unincorporated areas within the VSD service area, this area is assumed to have a similar growth rate as the City of Indio. Population projection data is provided for each Census tract and evaluated from year 2010 through 2035 in five year increments, as shown in Table 2. Population within the VSD service areas is expected to increase almost 60 percent from year 2010 to 2035.

Table 2
Existing and Projected Population within VSD Service Area

Year	VSD Population	Growth Rate (%)
2010	76,036	
2015	87,486	15.1%
2020	100,387	14.7%
2025	106,923	6.5%
2030	113,681	6.3%
2035	120,676	6.2%

Flow Allocation

Wastewater flows are allocated in the hydraulic model using subcatchment areas. Subcatchments are hydraulic units of land whose drainage system elements direct flow to a single discharge point. These subcatchments are manually delineated to define a sewershed area encapsulating a network of pipelines and are sized roughly 25 to 50 acres to provide sufficient resolution to uniformly apply the wastewater flow components (e.g., flow pattern, land use type). The downstream node of each subcatchment, known as the receiving node, is selected to receive the flows collected within the basin. Within the model, flow is allocated for each subcatchment using the SewerGems LoadBuilder application. Flow loading will be based on land use areas (i.e., polygons), flow rate per land use, and a diurnal pattern associated with land use. The following section describes projections for existing and future wastewater flows.

Existing Flow Projections

Existing flow projections are based on the existing land use information and expected flow generation for each land use. Flow rate per capita of 80.3 gallons per day is based on 2010 U.S. Census Bureau population and flow generation from the treatment plant in 2010 within the VSD service area. Using the calculated water duty factor, dwelling unit threshold for each residential type based on the City of Indio Municipal Code of Ordinances, and the U.S. Census Bureau typical population per dwelling unit discussed previously, the wastewater duty factor can be calculated for low, medium, and high residential land use types as shown in Table 3. Other wastewater duty factors for commercial, mixed used, and industrial land use types are based on information from systems of similar geography and included in Table 3. Wastewater duty factors presented in Table 3 may be adjusted at a later time during model calibration based on updated information gathered from the flow monitoring data.

As discussed previously, flow monitoring will be conducted for one-week during a typical dry weather in year 2012. Flow monitors will be recommended for each land use as well as for select subcatchment area. Flow data is collected to determine typical flow rate from each land use, calibrate the sewer system, and develop flow patterns. A flow pattern will be created for a land use and input into the model to simulate flow generation variations over a 24-hour period.

Table 3
Typical Wastewater Flow Rate per Land Use Category

Land Use Category	Wastewater Duty Factor (gpd/acre)
Residential High	3,500
Residential Medium	1,900
Residential Low	1,000
Commercial	800
Mixed Use	2,700
Open Space	0
Industrial	700
Public	600

Future Flow Projections

Future zoning land use is used to predict future flows and asses the need of system improvements to meet growth-related increases in flows to the year 2035. The same wastewater duty factors used to project existing flows will also be used to project future flows using future zoning information. There are several locations within the VSD service area where future zoning land use from the City of Indio and Riverside County general plan is less dense than the existing land use. During these cases, the land use designation with the most dense or great wastewater duty factor is used to obtain the most conservative estimate for that area. Population projection using SCAG and Census Data used to evaluate future population will be used to verify the flow projections.

Known Developments

Based on discussion with VSD staff, several existing major facilities may be contributing a significant amount of wastewater flow to the collection system. In addition, there are future developments and annexation areas that will also be included in the future VSD system. Wastewater flows for the existing facilities and future developments will be individually assessed and are listed below:

- County of Riverside Indio Jail Facility Expansion
- Fantasy Springs Casino
- John F. Kennedy Memorial Hospital
- Indian Palms Country Club
- Indio County Date Festival
- Annexation: north of 50th Avenue and east of Jackson Street
- Annexation: 40th Avenue and east of Monroe Street
- Annexation: south of 49th Street and west of Monroe Street

Infiltration/Inflow

VSD typically experiences insignificant infiltration and inflows (I/I) through the year due to its dry climate. For systems similar to VSD, I/I is accounted for using conservative per capita flows. Based on discussion with VSD, areas within the system may receive more inflow during winter

storm events. Flow monitoring is planned to capture at least one rainfall event to compare flows to a typical dry weather day. The significance of inflow to the VSD system will be determined from the flow monitoring data. Sources of inflow can include uncapped cleanouts, misconnections to stormwater collection laterals (e.g., rain gutter downspout, outdoor drains, storm drain) and uncovered manholes. Studies have also shown that for newly-constructed sewers, the infiltration component is insignificant. Manholes located in low-lying areas should be watertight in their design to avoid inflow problems caused by flash-floods.

Hydraulic Design Criteria

Peak Design Flow

Taking into account the limited precipitation and the dry weather, the VSD sewer system shall be sized to accommodate the peak dry weather flow (PDWF) observed within the service area. Additional wet weather flow and insignificant inflows can be accommodated by the additional capacity available when the d/D (flow depth/sewer diameter) ratio is greater than 0.5. The recommended peak flow criteria for facility design and sizing is listed below.

- For collector sewers up to 18-inch in diameter, the design peak flow should be equal to 3 times the average day flow.
- For trunk sewers greater than or equal to 18-inch in diameter, the design peak flow should be equal to 2.5 times the average day flow.

Peaking Factors

Typical flow patterns (from field monitoring data for similar agencies in southern California) for different land use classifications are presented on Figure 4. These curves represent the variation in sewer flows for each land use type during a 24-hour period. Flow patterns for general land types used for the VSD sewer system will be generated from the flow monitoring data.

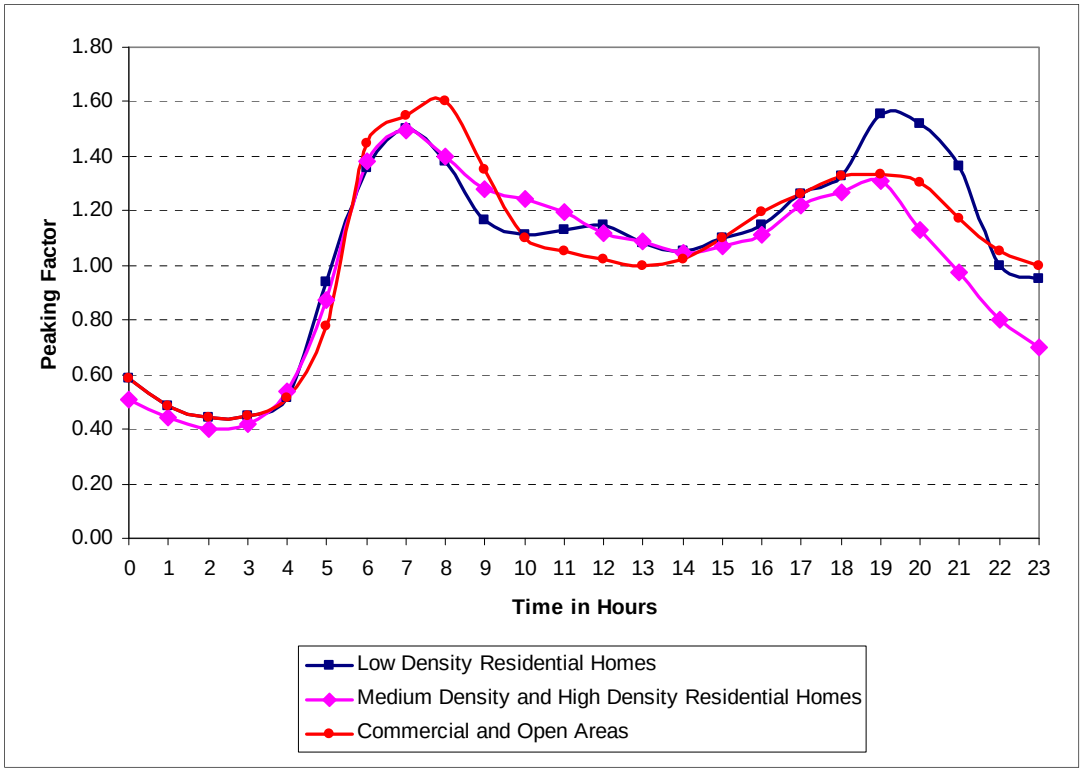

Figure 4
Typical Flow Pattern

Minimum Collection Sewer Size

No sewer shall be less than 8-inches in diameter except at locations authorized by VSD.

d/D Ratio

Typically, sewer systems are designed to account for extraneous flows by designing pipes to have a d/D ratio of 0.5 for PDWFs. The additional wet weather flow can be conveyed by the additional sewer capacity available (in excess of d/D equal to 0.5). Recommended d/D for the VSD sewer system is:

- Maximum d/D ratio for all sewers that are less than 18-inch in diameter shall be 0.50; and
- Maximum d/D ratio for all sewers that are greater than or equal to 18-inch in diameter shall be 0.75.

Slopes and Velocity

All trunk and collector sewers shall be designed with hydraulic slopes sufficient to result in mean velocities at the average day rate of flow of not less than 2 feet per second (fps). The mains shall be designed to meet the minimum slope criteria of 0.4 percent. The maximum allowable velocity in the sewer shall not be greater than 10 fps.

Manholes

Manholes shall be installed on sewers at all changes in slope, size of pipe, or alignment and at all intersections of main line sewers. The maximum spacing allowable between manholes is

500 feet unless otherwise approved. The recommended design criteria for gravity sewer improvement projects discussed above and summarized in the table below. The system planning criteria are summarized in Table 4.

Table 4
System Planning Criteria

Design Criteria	Value
Per Capita Flow	
Flow Generation Rate	Based on Population and Land Use
Velocity	
Minimum Velocity	2 fps
Maximum Velocity	10 fps
d/D Ratio	
For all sewers that are less than 18-inch in diameter	0.5
For all sewers that are greater than or equal to 18-inch in diameter	0.75
Manning's n (gravity mains)	0.013
Hazen-Williams C-factor (force mains)	120
Average Manhole Losses	0.1 feet
Peak Manhole Losses	0.5 feet

Recommended Master Planning Design Criteria for Special Projects

In addition to the recommended design criteria for gravity sewers, the recommended design criteria for non-gravity sewer improvement projects are summarized in Table 5.

Table 5
Design Criteria for Special Projects

Item		Recommended Values
Special Projects	Pump Stations and Force Mains	▪ Pump Stations and force mains will be avoided whenever possible. ▪ Maximum velocity at firm pumping capacity: 8 fps during PDWF at buildout. ▪ Average Dry Weather Flow (ADWF) (existing conditions) velocity = 3.0 fps minimum. ▪ Uses Manning's 'n' to calculate headloss in force mains in the model. For this Master Plan Update, a Manning's 'n' of 0.013 will be assigned to all force mains
	Diversion Structures	▪ New diversion structures will be avoided whenever possible ▪ Maintain existing diversion structures open with no control setting whenever possible ▪ If a gate/stop-log setting is required for a diversion structure, maintain a fixed setting for all flow conditions whenever possible

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Appendix G
MSA Consultants, Inc. Engineer's Report – Requa Avenue Interceptor

This Appendix contains the MSA Consultants, Inc. Requa Avenue Interceptor Alignment Review. This document was submitted in November, 2009, and serves as the basis for Requa Avenue Interceptor discussed in **Section 5**.

ENGINEER'S REPORT
Requa Avenue Interceptor Alignment Review

Located within City of Indio,
County of Riverside, California

Requa Avenue Interceptor

November 2, 2009

Prepared for:

Valley Sanitary District

JN: 1868

MSA CONSULTING, INC.
PLANNING ■ CIVIL ENGINEERING ■ LAND SURVEYING
34200 BOB HOPE DRIVE ■ RANCHO MIRAGE ■ CA 92270
TELEPHONE (760) 320-9811 ■ FAX (760) 323-7893

ENGINEER'S REPORT
Requa Avenue Interceptor Alignment Review

Located within City of Indio,
County of Riverside, California

Requa Avenue Interceptor

November 2, 2009

REGISTERED PROFESSIONAL ENGINEER
JULIAN A. DE LA TORRE
C43880
Exp. 6-30-11
CIVIL
STATE OF CALIFORNIA

Prepared for:

Valley Sanitary District

JN: 1868

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Engineer's Report
Requa Avenue Interceptor Alignment Review

Prepared for: Valley Sanitary District

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LIST OF TABLES

1.0 GENERAL

1.1 Purpose and Intent of the Report

This Engineer's Report provides a basis for the design of a new gravity sewer pipeline to convey flows from the Shields Road Lift Station to the Valley Sanitary District (VSD) Treatment Plant. The report calculates tributary flows and defines the sewer size of the proposed sewer based on VSD requirements. The proposed sewer alignment has been divided into two (2) separate phases. Phase 1A depicts sewer alignments and alternatives from the intersection of Requa Avenue and Flower Street to the VSD Treatment Plant, while Phase 1B represents the proposed sewer alignment from the Shields Lift Station to the intersection of Requa Avenue and Flower Street.

The purposed of the report is to define the Phase 1A Alignment by conducting a detailed review of the Phase 1A portion and to only confirm pipe size and tie-in elevations for the Phase 1B remainder.

1.2 Background & Objectives

VSD completed the Sewer Collection System Master Plan in 2003 (2003 SCSMP). As part of the master plan preparation process, the collection system was evaluated using a computerized hydraulic modeling program (HYDRA). Based on existing flows, there were a number of pipeline segments experiencing peak flows above design capacity, and some areas surcharging. As part of the planning process, a number of capital improvement projects were identified to both reduce existing capacity issues and provide adequate capacity for expected future flows.

In addition to the 2003 SCSMP, Dudek and Associates prepared two Preliminary Design Reports entitled *Requa Avenue Interceptor PDR* and *Avenue 46 / Shields Road Lift Station Interceptor PDR*. These reports explored alternatives to provide a preliminary basis for the design of a new gravity sewer pipeline to convey flows through central Indio to the VSD Treatment Plant.

VSD requested:

1. Verification of existing and expected flows along the proposed alignment
2. Verification of the feasibility of intercepting flows at the Shields Road Lift Station to the existing 10" sewer main
3. Verification of the feasibility of constructing a new sewer interceptor at the intersection of Highway 111 and Madison Street.
4. Verification of sewer main hydraulics based on District requirements.

This report, independently of the prior reports, completes a detailed study of items 1 through 4 above. A comparison is made to the prior PDR's to confirm the design concepts and parameters. Results of these comparisons are discussed further in the report.

1.3 Organization of the Report

The report is organized into eight (8) sections as follows:

Section 1 – General:

This section describes the purpose and intent of the report and general back-ground information

Section 2 – Key Project Stakeholders

Section 2 defines the interceptor owner, permitting agencies, and those property owners providing sewer access easements.

Section 3 – Land Use and Units of Service

This section classifies the land use per City of Indio Land Use Diagram (revised May, 2007) and the associated units of service (UOS) as described per Table 6-2 of the 2003 SCSMD. Unit flows were assigned a rate of 300 gallons per day per UOS.

Section 4 – Existing Utilities

Section 4 identifies the existing utilities located within the Phase 1A segment of the alignment, and provides a list of the respective agencies contact information.

Section 5 – Survey

Survey crews from MSA Consulting, Inc. set control points and field verified top of manhole and invert elevations at key locations along the Phase 1A and Phase 1B alignments.

Section 6 – Hydraulic Criteria

In this section the hydraulic design parameters utilized in the modeling of the proposed alignments is identified.

Section 7 – Verification of Anticipated Sewer Flows

Section 7 summarized the anticipated sewer flows tributary to the proposed alignments. Sewer flows were assigned a rate of 300 gallons per day per unit of service.

Section 8 – Proposed Interceptor Alignments

This section describes the two phases of the proposed Requa Street Interceptor as well as the proposed Madison Street Interceptor. It also provides a narrative of the nine (9) alternatives for the Phase 1A portion of the alignment. Comparisons of alignment lengths are provided as well as respective sewer easement acquisitions required for each alternative. Depths of installation at key locations are tabulated for both phases of the interceptor.

Section 9 – Estimate of Probable Construction Costs

Section 9 summarizes the estimate of probable construction costs for each of the alternatives for the Phase 1A portion of the interceptor alignments as well as a total cost for the Phase 1B (Fixed Portion). Detailed itemizations of the costs are included in the appendix.

Section 10 – Preferred Alignment

This section presents the preferred alignment alternative for the Phase 1A portion based on ease of construction, estimate of probable construction costs and directness of alignment to the VSD treatment plant.

2.0 KEY PROJECT STAKEHOLDERS

This section identifies key stakeholders for the Requa Avenue Interceptor project and provides contact information for each agency/company and private property owners where sewer access easements will be required.

Valley Sanitary District (VSD)

Contact: Rex Sharp, General Manager
45-500 Van Buren Street
Indio, CA 92201
Phone (760) 347-2356
Fax (760) 347-9979

City of Indio

Contact: Grant Eklund, City Engineer
City of Indio Department of Engineering/Public Works
100 Civic Center Mall
Indio, CA 92201
Phone (760) 391-4018
Fax (760) 342-6590

Union Pacific Railroad

Contact: John Preble, Manager Contracts
Union Pacific Railroad
1400 Douglas Street MS 1690
Omaha, NE 68179-1690
Phone (501) 544-8536
Fax (501) 544-0340

Private Property Owners

Contact: (To Be Determined)

3.0 LAND USE AND UNITS OF SERVICE

All parcel information and geometry shown on the exhibits was obtained from the Riverside County Transportation and Land Use Management Agency (TLMA). Land use was identified utilizing City of Indio Land Use Diagram (revised May, 2007). Units of Service (UOS) were applied utilizing Table 6-2 from the 2003 SCSMD and are summarized below:

Table 1: Land Use and Units of Service

Land Use Type	UOS/Acre	Unit Flow
Country Estates	3.5	300 gpd/UOS
Residential – Low	5	
Residential – Medium	10	
Residential – High	20	
Commercial Office	8	
Neighborhood Commercial	8	
Regional Commercial	8	
Community Commercial	8	
Downtown Commerce	8	
Business Park	3	
Industrial Park	3	
Manufacturing	3	
Mixed Use	8	
Public	8	

4.0 EXISTING UTILITIES

Existing utilities, within the Phase 1A portion, were determined utilizing available as-built drawings, aerial photography and site visits. Preliminary existing sewer alignments were obtained from Valley Sanitary District and refined via survey information. Existing utility vaults, power poles, were identified and used in assessing the viability of the proposed sewer alignment. It was assumed that a parallel sewer installed within an existing sewer easement at a lower elevation is feasible in terms of avoiding existing utilities.

The final design, which is not a part of this scope of work, will further delineate horizontal and vertical locations of existing utilities crossing the approved interceptor alignment. The final design will use information obtained by potholing and utility information provided by the agencies/companies serving the area along the Phase 1A alignment.

The following list contains contact information for the agencies/companies affected:

City of Indio
Engineering Department
Roldan Lopez
100 Civic Center Mall
Indio, CA 92201
(760) 391-4017
rlopez@indio.org

Coachella Valley Water District
Irrigation Department
Mike Schaefer
85-995 Avenue 52
Coachella, CA 92236
(760) 398-2651
mschaefer@cvwd.org

The Gas Company
Engineering Division
Art Escobedo
75-097 Mayfair
Palm Desert, CA 92211
(760) 346-5927

Imperial Irrigation District
Travis Maston
333 East Barion Blvd
Imperial, CA 92251
(760) 398-5871

Level 3 Communications, LLC
Megan Sturdevant
1025 El Dorado Blvd., 33A-516
Bloomfield, CO 80021
(720) 888-3860
Megan.Sturdevant@Level3.com

Kinder Morgan Petroleum Pipelines
Don Quinn
1100 Town & Country Road
Orange, CA 92868
(714) 560-4940

MCI WorldCom
Investigations Group
2400 Glenville
Richardson, TX 75082
(972) 729-6016

Time Warner Cable
Construction Department
Bob Loots
83-473 Avenue 45
Indio, CA 92201
(760) 674-5540
bob.loots@twcable.com

Valley Sanitary District
Mike Butvidas
45-500 Van Buren Street
Indio, CA 92201
(760) 347-2356
mbutvidas@valley-sanitary.org

Verizon
Network Engineering Office
Larry Moore
295 North Sunrise Way
Palm Springs, CA 92262
(760) 778-3603
larry.moore@verizon.com

5.0 Survey

A field survey was conducted to verify existing top of manhole and invert elevations at key locations within the Phase 1A and 1B areas.

The basis of bearings for this survey is the California Coordinate System, Zone 6, NAD 83 (epoch 2007) between continuous global positioning stations (CGPS) and or continuous operating reference stations (CORS) COTD AND PSAP. Identified locally along the south line of Section 24 and taken as N89°38'26"E.

Benchmark vertical datum for all survey work used is referenced to a 2" Brass Disk stamped REPL C-NAIL 1998 (DN. 0.7' IN WELL) located at the intersection of Smurr Street and 46th Avenue, with an elevation equal to 485.90'. All elevations shown on the exhibits are NAVD88 + 500'.

In addition, control points were identified and set along the Phase 1A alignment (see Survey Monument & Control Points Exhibit in the appendix).

6.0 HYDRAULIC CRITERIA

The proposed interceptor alignment was evaluated based on the design criteria established by VSD. This section defines the criteria and methodology used in evaluating the proposed alignment.

6.1 District Criteria

Each proposed section of the alignment was assigned flows as determined based on the assigned land use and corresponding Units of Service and modeled using the Manning's Equation for circular pipes to verify District standards were maintained. District criteria used is listed below:

1. Minimum velocity at design flow will be 2 feet per second (fps).
2. Maximum d/D for pipe sizes 15-inches and smaller is 0.50 or less.
3. Maximum d/D for pipe sizes 18-inches and larger is 0.75 or less.
4. The Manning's coefficient for pipe roughness (n-value) equals 0.013.
5. Intersecting pipes of differing diameters will be matched at the design spring-lines.
6. Minimum slope for pipes 10-inches and larger is 0.0020 ft/ft.
7. A peaking factor of 2.5 was used in the analysis of the proposed sewer size.
8. Conversion factor – MGD to CFS = 1.547129271
9. Conversion factor – CFS to MGD = 0.6463584

7.0 VERIFICATION OF ANTICIPATED SEWER FLOWS

A review was performed on the existing and anticipated flows tributary to the proposed interceptors based on the Land Uses as shown per the Indio Land Use Diagram (revised May, 2007) and the associated Units of Service as shown above.

7.1 Overflow Manholes

VSD currently has a number of overflow manholes which will divert surge flows from the primary trunk sewer towards a different line. Some of the overflow manholes which are tributary to the Requa Street Interceptor are:

1. Highway 111 and Madison Street
2. Clinton and 46th Avenue
3. Monroe Street and Requa Avenue
4. Arabia Street and Requa Avenue
5. Fred Waring Drive and Monroe Street
6. Arabia Street and Leroy Way

For the purposes of this report none of the benefits of the overflow manholes were taken into account and all sewer flows were considered tributary to the proposed interceptor line.

7.2 Tributary Areas and Anticipated Sewer Flows

The tributary area was subdivided into 8 smaller areas: A through H (See Existing Sewer Exhibits Sheets 1-9). It should be noted that for the purposes of this review, all of Area 'H' was considered tributary. Based on District requests the tributary areas were grouped based on the representative section of the proposed improvements:

Madison Street Interceptor – Consists of Area 'A'
Shields Lift Station to Madison Street – Area 'B'
Madison Street to Flower Street – Areas 'A' through 'G'
Flower Street to Treatment Plant – Areas 'A' through 'H' (Note: all of Area 'H' was considered tributary to the proposed sewer). See Worksheet 2.

Table 2 shown below presents the anticipated sewer flow at key locations along the interceptor:

Table 2: Anticipated Sewer Flows

NODE	UOS ADDED	LINE TOTAL UOS	TOTAL UOS	FLOW		PEAK FLOW	
				(MGD)	(CFS)	(MGD)	(CFS)
A1	272	272		0.08	0.13	0.20	0.32
A2	504	776		0.23	0.36	0.58	0.90
A3	280	1,056		0.32	0.49	0.79	1.23
A4	444	1,500		0.45	0.70	1.13	1.74
A5	140	1,640		0.49	0.76	1.23	1.90
A6	299	1,939		0.58	0.90	1.45	2.25
A7	14	1,953		0.59	0.91	1.46	2.27
A8	141	2,094		0.72	1.11	1.80	2.79
A9	122	2,216		0.66	1.03	1.66	2.57
A10	22	2,238		0.67	1.04	1.68	2.60
A11	163	2,401		0.72	1.11	1.80	2.79
A12	262	2,663		0.80	1.24	2.00	3.09
A13	70	2,733		0.82	1.27	2.05	3.17
A14	22	2,755	**2,755**	0.83	1.28	2.07	3.20
B3	753	753		0.23	0.35	0.56	0.87
B4	250	1,003		0.30	0.47	0.75	1.16
B6	530	1,533	**4,288**	0.46	0.71	1.15	1.78
C1	-0-	4,288		1.29	1.99	3.22	4.98
C3	392	4,680		1.40	2.17	3.51	5.43
C7	679	6,927		2.08	3.22	5.20	8.04
C10	174	7,101		2.13	3.30	5.33	8.24
F13	4,147	11,248	**11,248**	3.37	5.22	8.44	13.05
G1	-0-	11,248		3.37	5.22	8.44	13.05
G4	892	12,140		3.64	5.63	9.11	14.09
G14	1,140	13,280	**13,280**	3.98	6.16	9.95	15.41
H	4,366	17,646	**17,646**	5.29	8.19	13.22	20.48

8.0 PROPOSED INTECEPTOR ALIGNMENTS

The proposed alignment was sub-divided into two (2) distinct phases. Phase 1A represents the area east of the Requa Avenue and Flower Street intersection, while Phase 1B, the fixed portion, is that area west of the intersection. Each of the primary phases was then further divided into specific segments or alternatives.

8.1 Phase 1A Alignment

Phase 1A begins at the Valley Sanitary District's Treatment Plant and ends at the intersection of Flower Street and Requa Avenue. As this portion of the improvements relies heavily on the acquisition of sewer easements, several alternative alignments have been explored. All of the alternatives cross the Union Pacific Railroad (UPRR) right-of-way in an identical manner.

In addition to the 5 primary alternatives (Alternative 'A'), an additional alternative (Alternative 'B') was considered for alternatives 2 through 5. Alternative 'A' alignments proceed north along the Golf Center Parkway right-of-way to APN 611-340-041 (City of Indio Redevelopment Agency) where the alignment heads in an easterly direction along Citrus Avenue. Alternative 'B' alignments proceed east within the UPRR right-of-way and cross APN 611-410-054 (privately owned) in a northeasterly direction to the cul-de-sac bulb of Citrus Avenue. When compared to the Alternative 'A' alignments, the Alternative 'B' alignments are approximately 200 linear feet (lf) longer and increase the length of installation under paving by approximately 720 lf; however, Alternative 'B' alignments require approximately 310 lf less in easements than the Alternative 'A' alignments.

As stated above each of the alternatives presented are required to cross the UPRR right-of-way. Engineering requirements were obtained from the Union Pacific Railway and copies of the requirements and exhibits are included in the appendix as part of this report.

Table 3 below summarizes the total length of sewer and the approximate length under paving for each of the alternatives:

Table 3: Phase 1A - Alternatives Comparison (Length)

ALT #	SEWER LENGTH (ft)	LENGTH UNDER PAVING	
		(ft)	Percent
1A	5,029	2,255	45%
2A	4,759	2,508	53%
2B	4,958	3,228	65%
3A	5,608	3,090	55%
3B	5,807	3,810	66%
4A	6,148	3,359	55%
4B	6,347	4,079	64%
5A	6,949	4,710	68%
5B	7,148	5,430	76%

Table 4 below identifies the Assessor's Parcel Numbers (APN) and approximate lengths of easements required for each of the alternatives:

Table 4: Phase 1A - Alternatives Comparison (Easements Required)

ALT #	APN	OWNER (If Known)	Length (ft)
1A	611-340-043	UPRR	851
	611-340-041	COI RDA	795
	611-410-059	HARTSHORN	11
	611-390-045	DELANOY	163
	611-391-014	COI	324
		TOTAL LENGTH	**2,144**
2A	611-340-043	UPRR	851
	611-340-041	COI RDA	795
	611-410-059	HARTSHORN	387
	611-410-081	SEECON XIX PTNRS	230
		TOTAL LENGTH	**2,263**
2B	611-340-043	UPRR	1,130
	611-340-054	HATHAWAY	206
	611-410-059	HARTSHORN	387
	611-410-081	SEECON XIX PTNRS	230
		TOTAL LENGTH	**1,953**
3A	611-340-043	UPRR	851
	611-340-041	COI RDA	795
	611-410-045	SCHULTZ	293
	611-410-051	IRELAND	268
		TOTAL LENGTH	**2,207**
3B	611-340-043	UPRR	1,130
	611-340-054	HATHAWAY	206
	611-410-045	SCHULTZ	293
	611-410-051	IRELAND	268
		TOTAL LENGTH	**1,897**
4A	611-340-043	UPRR	851
	611-340-041	COI RDA	795
	611-410-074	QUIRK	280
	611-410-071	DSAF	262
		TOTAL LENGTH	**2,188**
4B	611-340-043	UPRR	1,130
	611-340-054	HATHAWAY	206
	611-410-074	QUIRK	280
	611-410-071	DSAF	262
		TOTAL LENGTH	**1,878**
5A	611-340-043	UPRR	851
	611-340-041	COI RDA	795
		TOTAL LENGTH	**1,646**
5B	611-340-043	UPRR	1,130
	611-340-054	HATHAWAY	206
		TOTAL LENGTH	**1,336**

Phase 1A – Alternative 1A
This is the preferred alignment as it is the most direct and most cost effective route. It follows Alternative 'A' to the knuckle in Citrus Avenue where it continues to the east to APN 611-391-045. There is an existing VSD easement that will allow for the proposed sewer to continue in a northeasterly direction to the Animal Shelter (APN 611-391-014) and ultimately to Avenue 45. The proposed sewer will then continue along Avenue 45 in a southeasterly direction to the Valley Sanitary District's Treatment Plant. While not the shortest of the alternatives, at approximately 5,029 lf, this alignment has the least number of utility crossings and a significant portion of the alignment can be constructed in vacant or open space areas.

Some advantages and disadvantages of the remaining alternatives are itemized below:

Phase 1A – Alternatives 2A and 2B

- Shortest of all of the alternatives presented: 2A – 4,747 lf and 2B – 4,946 lf.
- The alignment will require boring through parcels 611-410-059 and 611-410-081
- In addition to the jack and bore, the City of Indio has planned to replace an existing 18" irrigation drain line with a 48" storm drain within the same area as the proposed sewer alignment (between the northerly building face and the property line). This corridor is approximately 20' feet wide.

Phase 1A – Alternatives 3A and 3B

- These alternatives are approximately 800 lf longer than Alternative 2 alignments: 3A – 5,608 lf and 3B – 5,807 lf.
- Alignment follows the existing sewer main through parcels 611-410-057 and 611-410-050, and while boring should not be required a significant portion of the easement is under existing concrete and/or asphalt.
- Considerable number of existing utility crossings especially at Van Buren Street where there are two (2) sewer mains located within the street.

Phase 1A – Alternatives 4A and 4B

- Alternative 4 alignments are approximately 1,390 lf longer than Alternative 2: 4A 6,148 lf and 4B – 6,347 lf.
- Easement required along parcels 611-410-073 and 611-410-074 and 611-410-072 and 611-410-071.
- As with Alternative 3 alignments, there will be a considerable amount of existing utility crossings associated with this alternative.
- In order to maintain District hydraulic requirements, Alternative 4B will require approximately 4,413 linear feet of 36-inch diameter sewer.

Phase 1A – Alternatives 5A and 5B

- The longest of the alternatives presented, being approximately 2,190 lf longer than Alternative 2: 5A – 6,949 lf and 5B – 7,148 lf.
- The majority of the alignment is within public right-of-way with only 1,646 and 1,336, linear feet respectively, of required easements.
- In order to maintain District hydraulic requirements Alternative 5A will require approximately 3,702 lf of 36-inch diameter sewer and Alternative 5B will require approximately 5,213 lf of 36-inch diameter sewer.
- Significant number of existing utility crossings.

Table 5 on the following page summarizes the hydraulic characteristics of the preferred alignment (Alternative 1A). A 0.2-foot drop was assigned to manholes reflecting a change in alignment. Once an alternative has been approved and easements secured by the District, the vertical component will be refined to reflect the final design. Exhibits for each of the alternatives are included in the appendix.

Table 5: Phase 1A – Alternative 1A (Preferred Alignment)

Down MH	Up MH	Pipe Diam. (in)	Length (ft)	Slope (ft/ft)	Q (mgd)	V (fps)	% Full	Peak Q (mgd)	Peak V (fps)	% Full	$Q_{50/75}$ (mgd)	Surplus Peak Q (mgd)	Surplus UOS
1	4	30	2,062	0.0046	5.29	4.92	37.2	13.23	6.19	63.7	16.40	3.16	4,216
4	5	30	1,342	0.0036	5.29	4.51	39.7	13.23	5.61	69.7	14.51	1.27	1,694
5	1 Ph1B	30	1,626	0.0020	3.98	3.37	39.9	9.96	4.19	70.2	10.81	0.85	1,135

Notes:

1. All of Area ‘H’ was considered tributary to the proposed sewer (See Worksheet 2).
2. A 0.2-foot drop was accounted for at manholes with alignment bends.
3. Surplus UOS represents the extra capacity the pipe is anticipated to possess.

8.2 Phase 1B Alignment

Phase 1B, is the fixed portion of the proposed alignment begins at the intersection of Requa Street and Flower Street and ends at the Shields Lift Station. This portion of the proposed improvements has been divided into three (3) distinct areas to identify and assess the requirements of VSD (see exhibits in the appendix).

Area 1: Flower Street to Madison Street

This portion of the alignment is consistent with the original alignment as described in the *Requa Avenue Interceptor PDR*, prepared by Dudek and Associates. However, the pipelines in this portion have been upsized to accommodate an anticipated increase of flows from the Madison Street Interceptor. Also, the existing 18" sewer stubs at the intersection of Monroe Street and Requa Avenue will need to be removed and replaced with larger diameter pipe (24" – West and 30" – East).

Area 2: Madison Street to Shields Lift Station

The District would prefer to continue to use the existing 10-inch sewer main along Avenue 46, between Duquesne Street and Madison Street. A proposed 10-inch sewer main would intercept flows from west of the White Water Channel and Shields Road and convey those flows to the existing 10-inch main, thus eliminating the need for a third sewer in Avenue 46.

Area 3: Madison Street Interceptor

Originally, as stated in the Avenue 46/Shields Road Lift Station Interceptor PDR, prepared by Dudek and Associates, a new pipeline was proposed to intercept flows along Highway 111 at the intersection of Shields Road and conveyed north to Avenue 46. Currently, the District would prefer to intercept the Highway 111 flows at the intersection of Highway 111 and Madison Street. A proposed 18-inch sewer main north along Madison Street to carry sewer flows from the Highway 111 corridor to the Requa Avenue Interceptor. This Madison Street sewer main would replace an older main and address the concerns regarding the potential density increase along the Highway 111 corridor and the existing land use as identified on the City of Indio Zoning Exhibit. Utilizing TLMA GIS information it was determined approximately 170.7 acres, representing 1,323 UOS, along the corridor are currently vacant. The Q_{75} for the proposed 18-inch main, at a slope of 0.0021 ft/ft, is 2.84 MGD. Therefore approximately 82.0 of the 170.7 acres currently vacant could be re-classified as Residential – High (20 UOS/acre) as opposed to the current classification of Mixed Use (8 UOS/acre) with the remaining 88.7 acres classified as Mixed Use (8 UOS/acre). However, the limiting factor is the existing 12" sewer main, along Highway 111, which has the following capacities:

Q_{50} = 0.84 MGD
Q_{75} = 1.53 MGD
Q_{Full} = 1.68 MGD

These capacities were obtained using the minimum slope (per VSD GIS Information) of 0.0053 ft/ft. The existing manholes and inverts along Highway 111 have not been field verified.

Tables 6 through 8 on the following pages summarize the hydraulic calculations for the proposed sewer mains along the Phase 1B (Fixed) portion of the project.

Table 6: Flower Street to Madison Street Hydraulic Summary

Down MH	Up MH	Pipe Diam. (in)	Length (ft)	Slope (ft/ft)	Q (mgd)	V (fps)	% Full	Peak Q (mgd)	Peak V (fps)	% Full	$Q_{50/75}$ (mgd)	Surplus Peak Q (mgd)	Surplus UOS
1	2	30	1,373	0.0020	3.98	3.37	39.9	9.96	4.19	70.2	10.81	0.85	1,135
2	3	30	2,663	0.0020	3.81	3.33	39.0	9.52	4.16	67.9	10.81	1.29	1,715
3	4	30	932	0.0024	3.49	3.48	35.4	8.72	4.39	60.0	11.84	3.12	4,157
4	5	30	1,747	0.0024	3.41	3.45	35.0	8.52	4.36	59.1	11.84	3.32	4,424
5	6	24	1,326	0.0096	2.13	5.06	26.1	5.32	6.53	42.2	13.06	7.74	10,318
6	7	24	1,069	0.0020	2.10	2.86	39.0	5.25	3.58	67.8	5.96	0.71	951
7	8	24	1,356	0.0021	1.98	2.88	37.3	4.95	3.61	63.9	6.11	1.16	1,547
8	9	24	501	0.0020	1.40	2.57	31.5	3.51	3.28	52.2	5.96	2.45	3,271
9	10	24	2,169	0.0020	1.34	2.53	30.7	3.35	3.24	50.8	5.96	2.61	3,484

Notes:

1. Based on the increased flows from the Madison Street Interceptor line, the existing 18” sewer stubs at MH 10 (Monroe Street and Requa Avenue) will need to be removed and replaced with the appropriate diameter pipe.

Table 7: Madison Street to Shields Lift Station

Down MH	Up MH	Pipe Diam. (in)	Length (ft)	Slope (ft/ft)	Q (mgd)	V (fps)	% Full	Peak Q (mgd)	Peak V (fps)	% Full	$Q_{50/75}$ (mgd)	Surplus Peak Q (mgd)	Surplus UOS
10	11	Existing 8-inch and 10-inch sewer mains											
11	12	10	528	0.0030	0.30	2.08	43.2	0.75	2.49	79.4	0.39	See Notes	See Notes
12	13	10	1,274	0.0043	0.22	2.17	33.6	0.56	2.79	56.3	0.46	See Notes	See Notes

Notes:

1. Approximately 374 lf and 1 Manhole will need to be removed and replaced between MH 11 and MH 12 to provide sufficient slope.
2. Tributary flows were assumed to be conveyed entirely by the 10-inch main, the existing 8-inch line will provide additional capacity for overflow.

Table 8: Madison Street Interceptor

Down MH	Up MH	Pipe Diam. (in)	Length (ft)	Slope (ft/ft)	Q (mgd)	V (fps)	% Full	Peak Q (mgd)	Peak V (fps)	% Full	$Q_{50/75}$ (mgd)	Surplus Peak Q (mgd)	Surplus UOS
10	14	18	1,337	0.0021	0.83	2.31	35.2	2.07	2.91	59.6	2.84	0.77	1,028
14	15	18	1,403	0.0021	0.67	2.18	31.6	1.68	2.78	52.4	2.84	1.16	1,545

Notes:

1. Surplus Units of Service shown are representative of existing flows along the Highway 111 Corridor based on City of Indio Land Use Diagram (revised May, 2007).

8.3 Depth of Installation

Depth of installation is a significant factor in assessing installation costs. Rim elevations for existing manholes along each alignment were used to approximate depths from ground surface to pipeline invert along each stretch of the proposed alignment. Installation depths ranged from approximately 8.5 to 22.0 feet below ground surface (bgs). Tables 9 and 10, below are summaries of the approximate depths at the key manhole locations identified for each phase of the project. The summary for Phase 1A represents the preferred alignment (Alternative 1A). Note: inverts shown are representative of centerline of the manhole.

Table 9: Phase 1A - Approximate Depth of Installation Summary

MH	Ground (ft)	Invert (ft)	Depth (ft)
1	470.3	451.12	19.2
2	471.2	453.24	18.0
3	470.3	458.75	11.6
4	470.9	461.62	9.3
5	477.0	466.44	10.6
6	476.9	467.72	9.2
7	480.3	469.50	10.8
MH1-P1B	481.9	470.85	11.1

Table 10: Phase 1B - Approximate Depth of Installation Summary

MH	Ground (ft)	Invert (ft)	Depth (ft)
1	481.9	470.85	11.1
2	486.0	473.60	12.4
3	495.4	478.90	16.5
4	498.3	481.15	17.2
5	507.4	485.66	21.7
6	510.9	498.76	12.1
7	511.6	501.1	10.5
8	517.5	504.07	13.4
9	519.7	505.07	14.6
10	528.3	509.41	18.9
11	531.8	518.55	13.3
12	533.1	520.15	13.0
13	538.9	525.60	13.3
14	529.5	512.64	16.9
15	528.4	515.64	12.8

9.0 ESTIMATE OF PROBABLE CONSTRUCTION COSTS

The primary factors used within the estimates include:

- Manholes – Number and Depth
- Length of Sewer Main
- Number of Utility Crossings
- Asphalt Restoration
- Concrete Restoration
- Handling of Existing Sewer Flows
- Easement Acquisition and Related Costs
- Traffic Control

A more detailed list for each alternative is included in the appendix.

A summary of the estimates of probable construction costs for each alternative is shown below, with detailed itemized breakdowns included in the appendix. Also included in the appendix are worksheets prepared by Overland Pacific itemizing the associated costs of acquisition of the sewer easements.

Table 11: Phase 1A – Comparison Summary of Probable Construction Costs

Alternative	Total Cost
1A	$3,005,094
2A	$3,597,727
2B	$3,713,595
3A	$3,224,698
3B	$3,340,566
4A	$3,450,718
4B	$3,974,169
5A	$4,108,622
5B	$4,363,336

As shown on the above summary Alternative 1A is the least costly while Alternative 5B is the most costly to install.

For the Phase 1B portion of the alignment, it is estimated the probable construction costs should be approximately $9,087,636. A 20% contingency was applied to the estimate and no provisions were accounted for potholing services. A detailed itemization of the estimate is included in the appendix.

10.0 PREFERRED ALIGNMENT

The preferred alignment for the Requa Avenue Interceptor for the Phase 1 portion would be Alternative 1A. This recommendation was founded on overall “ease of construction” and the lowest estimate of probable construction costs. The preferred alignment is the most direct route from the up-stream tie-in point at the intersection of Requa Street and Flower Street to the headworks of the treatment plant. It also fulfills project goals established by relieving flows south of Highway 111 and Doctor Carreon Boulevard.

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Stantec

Memo

To:	Ron Buchwald, PE District Engineer	From:	Oliver Slosser, PE Civil Engineer
Client:	Valley Sanitary District		Stantec Consulting Services
File:	Collection System Master Plan Review	Date:	March 6, 2019

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INTRODUCTION

BACKGROUND AND PURPOSE OF STUDY

The most recent Collection System Master Plan (CSMP) for Valley Sanitary District (VSD) was prepared in 2013 by MWH, now part of Stantec. Since 2013, economic factors have led to less growth than anticipated in the 2013 CSMP, and effective conservation measures have also contributed to lower than anticipated increase in sewerage flow. This Technical Memorandum (TM) presents the Collection System Master Plan Review (CSMP Review) completed by Stantec. This CSMP Review was initiated to refine earlier population projections, update the model with current observed flows from the Water Reclamation Facility (WRF) and recently added infrastructure improvements, and verify project recommendations from the CSMP. The CSMP Review is not intended to serve as a full update to the 2013 CSMP but is intended to help guide VSD in the implementation of the remaining CIP recommendations. Tasks not included in the CSMP Review include flow monitoring or recalibration of the model.

The purpose of this CSMP Review is to review and revise the sewer system capital improvements projections from the 2013 CSMP. The main objectives of the CSMP Review include:

1) Updating the Bentley SewerGEMS model with current infrastructure and sewage generation;
2) Identifying Areas of Concern for the existing, planning and build-out planning horizons
3) Reviewing the recommendations from the 2013 master plan;
4) Revising the capital improvement program based on new model results.

DATA SOURCES

In preparation of this CSMP review, VSD staff provided several reports, maps, electronic files, and other sources of information. Pertinent material included historical flows for the WRF, as built drawings of recently upgraded infrastructure, and updated GIS files for the sewer collection system. In addition, multiple telephone meetings with VSD staff were conducted throughout the project to obtain a thorough understanding of changes that have occurred in the District since 2013.

ACKNOWLEDGEMENTS

Stantec would like to acknowledge and thank all VSD staff for their time and support in completing this project. Special thanks to Joseph Glowitz (General Manager), Ron Buchwald (District Engineer), Steve Shepard, Tito Moreno, and Adrian Contreras.

PROJECT STAFF

The following Stantec staff was principally involved in the preparation of CSMP Review:

Project Manager:	Oliver Slosser
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OVERVIEW OF 2013 COLLECTION SYSTEM MASTER PLAN

VSD primarily serves the city of Indio, California. The city of Indio encompasses 96 percent of VSD's service area, while the remaining 4 percent consists of portions of City of La Quinta, City of Coachella, and unincorporated area in Riverside County.

VSD maintains and operates approximately 254 miles of sanitary sewer line and in 2017 delivered approximately 5.6 million gallons per day (MGD) of wastewater to its water reclamation facility (WRF), located at Van Buren Street and Enterprise Way. The WRF is rated for a capacity of 12.5 MGD, but economic and environmental conditions have led to a decrease in average flow since 2013. Pipes in VSD's collection system range from 4 to 54 inches, with 8-inch pipes or smaller comprising 75% of the gravity sewer system. The collection system contains approximately 649 feet of force main ranging from 4 inches to 8 inches in diameter. The collection system also has eight inverted siphons, most of which are single barrel pipes. There are four lift stations within VSD's collection system that are currently operational.

The model developed as part of the CSMP contained approximately 4,800 manholes and 5,000 pipe segments. The database included all collection system pipelines 10-inches in diameter and greater. Additional pipes with diameters smaller than 10-inches were added to capture flow from a network of small pipes.

After developing and allocating current and future wastewater flows, calibrating the model, and evaluating the sewer system capacity, a list of recommended improvements were developed for the 2013 CSMP. The outstanding recommended improvements were evaluated in this CSMP Review to determine if these improvements are still required.

MODEL UPDATE AND VERIFICATION

The first task in the CSMP Review consisted of data collection. Information obtained from VSD was used to review, update, and verify the model. This subsection discusses these tasks in greater detail.

DATA COLLECTION

Table 1 presents the information requested as part of the data collection process. The information requested was used for specific tasks as listed in the table.

Table 1 – Data Collection

Item	Category	Description	Use
1	SCADA	Daily Pump Performance Data for Barrymore/Calhoun/Carver/Vandenberg PS	Model Calibration
2	Demand Projection	City of Indio General Plan	Flow Projection
3	Information	VSD WRF No Discharge Technical Report	
4	Model	SewerGEMS Model: 20130818VSDModel_Final	Model Update
5	GIS	Manholes/Pipes/Pump Stations/Septic Tanks	Model Update
6	Demand Projection	Flow Data for WRF (January 2014 through July 2018)	Flow Projection
7	Demand Projection	Permit Log	Flow Projection
8	Record Drawings	Requa Interceptor	Model Update
9	Record Drawings	Lift Station Controls	Model Update

MODEL REVIEW

VSD's Bentley SewerGEMS model was reviewed and compared to the GIS provided by VSD on August 20, 2018. Conduit parameters that were reviewed include conduit IDs (labels), upstream inverts, downstream inverts, diameters, and slope. Negatively sloped conduits, manhole rim elevations, and depths were also reviewed and compared to the GIS. Lift stations were compared to the new information provided by VSD. **Table 2** shows a summary of data conflicts found during the model review.

Table 2 – Summary of Data Conflicts

Description	Count
Conduits in the model	5,024
Conduits in the model but not in GIS	227
Conduits with difference in upstream invert between model and GIS is less than 1 inch	14
Conduits with difference in upstream invert between model and GIS is between 1 inch and 6 inches	49
Conduits with difference in upstream invert between model and GIS is greater than 6 inch	122
Conduits with difference in downstream invert between model and GIS is less than 1 inch	79
Conduits with difference in downstream invert between model and GIS is between 1 inch and 6 inches	142
Conduits with difference in downstream invert between model and GIS is greater than 6 inch	151
Conduits with difference in diameter between model and GIS	8

Conduits with difference in lengths between model and GIS is greater than 1 ft	1,008
Manholes containing no depth information	1,032
Manholes containing no rim elevations	760

Figure 1 through **Figure 3** graphically depict the results of the conduit parameter comparison. **Figure 1** shows a comparison of the pipe IDs in VSD's GIS system versus the model, while **Figure 2** and **Figure 3** compare the upstream and downstream invert elevations, respectively. **Figure 4** shows an overview of the conduits identified having negative slopes. Data conflicts were resolved through discussion with VSD staff and review of as-built drawings and is further detailed in the Model Update section.

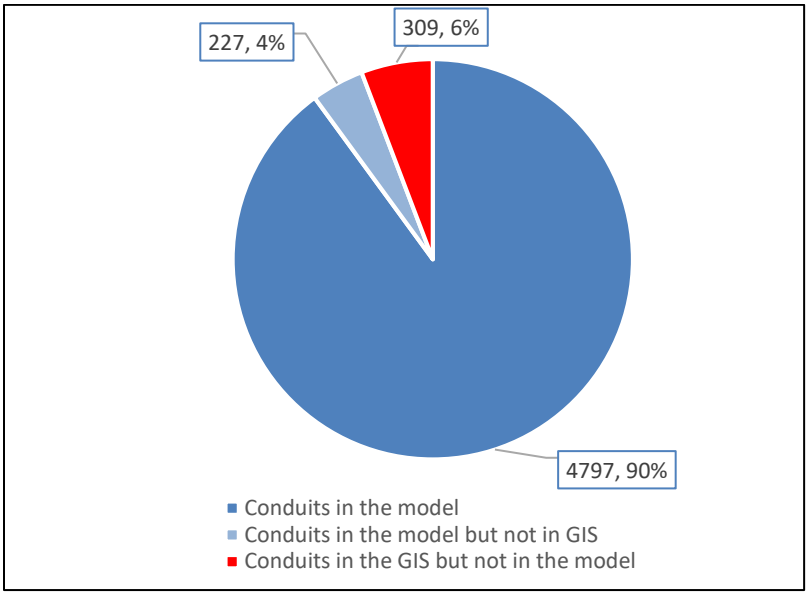

Figure 1 – Conduit Comparison for Diameters 8 inches or Larger

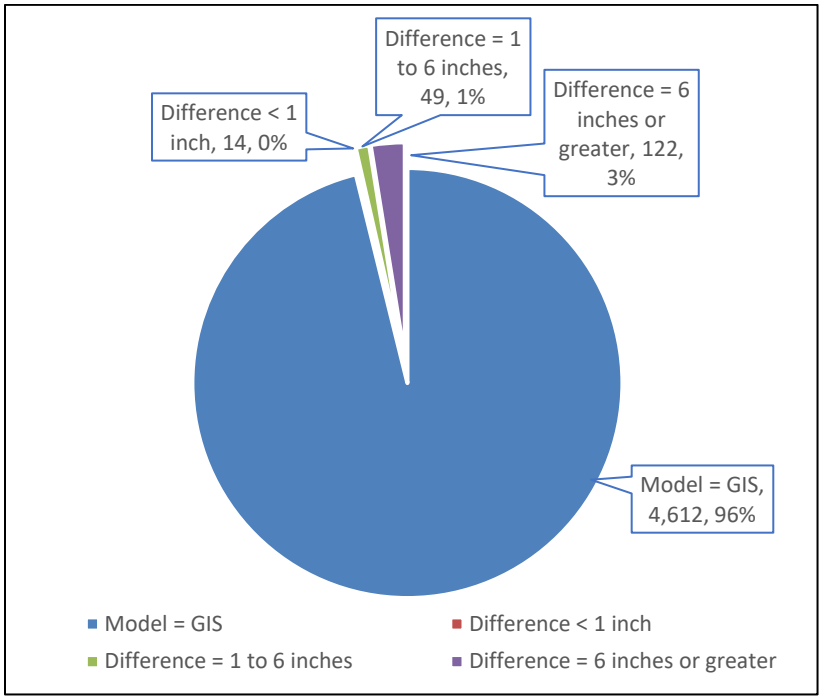

Figure 2 – Upstream Invert Comparison

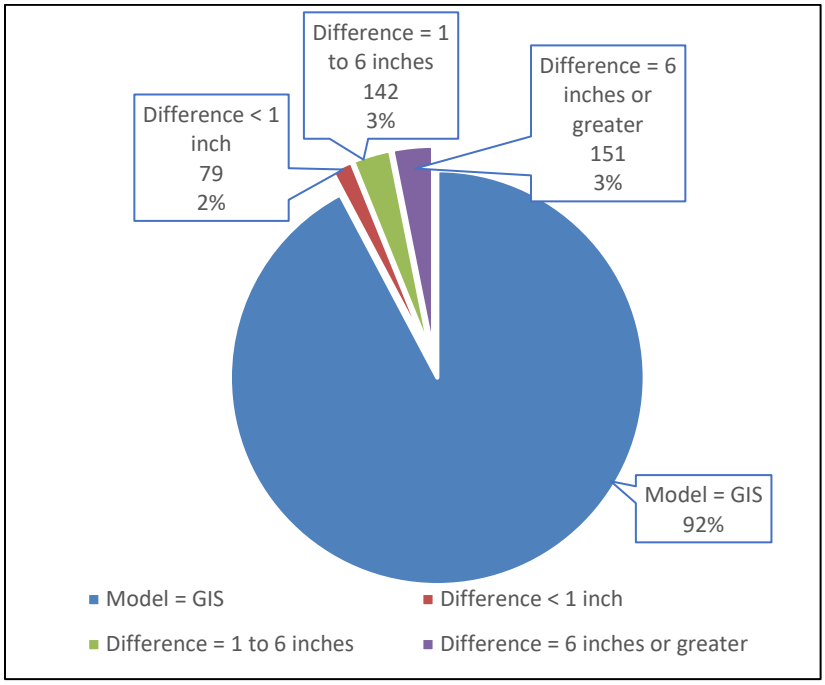

Figure 3 – Downstream Invert Comparison

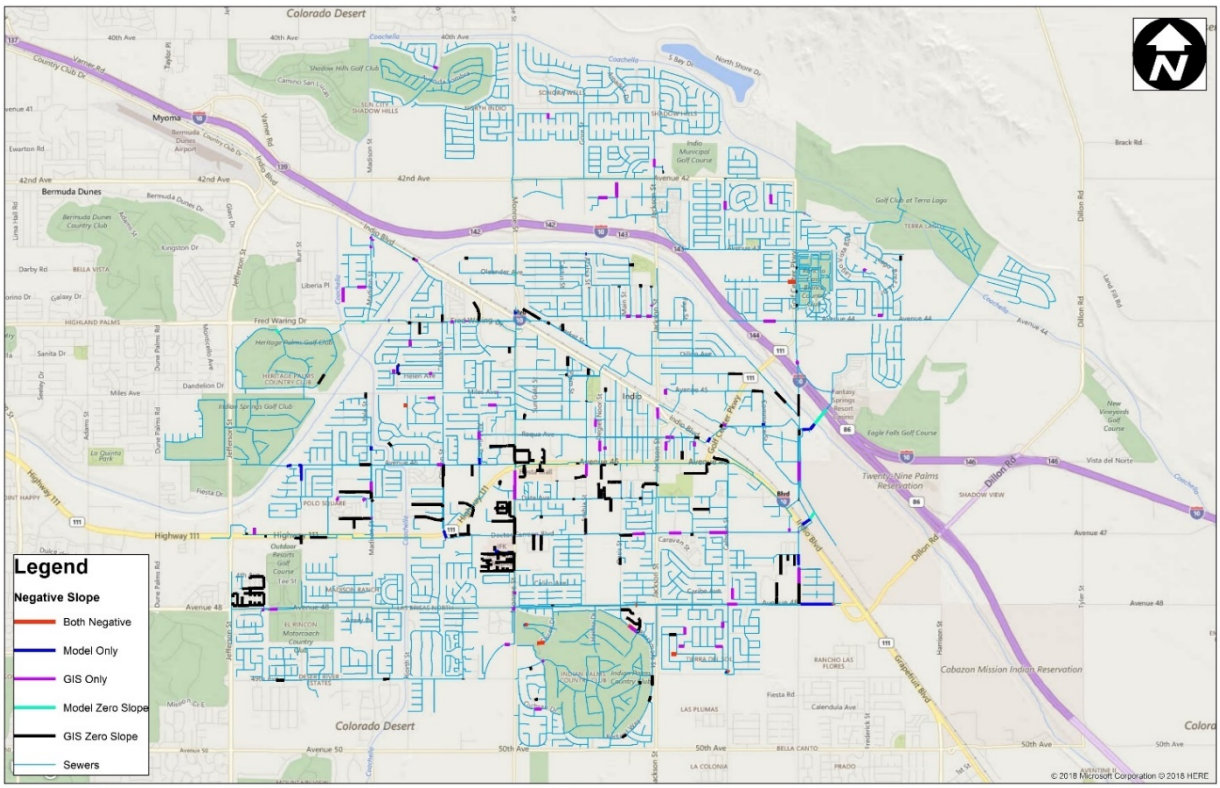

Figure 4 – Negative Slopes

Lift Station Review

VSD lift stations were reviewed with VSD staff to determine if any changes to lift station operation, control, or infrastructure had occurred since the 2013 CSMP. VSD staff informed Stantec that the Shields lift station had been removed from service since the 2013 CSMP, and as such the model was updated with that change. VSD further communicated that no other changes to the lift stations had been made since the previous CSMP. **Table 3** and **Table 4** present the wet well and pump characteristic used for the active lift stations in the VSD system (Barrymore, Calhoun, and Carver lift stations) for this model review.

Table 3 - VSD Wet Well Characteristics

Model ID	Description	Invert Elevation (ft.)	Maximum Depth[1] (ft.)	Wet Well Area (sq. ft.)
BarrymoreWW	VSD Wet Well at Barrymore Lift Station	456.56	16.50	28.3
CalhounWW	VSD Wet Well at Calhoun Lift Station	435.75	34.65	113.1
CarverWW	VSD Wet Well at Carver Lift Station	447.60	7.30	38.5
Vandenberg LS	VSD Wet Well at Vandenberg Lift Station	484.75	15.25	28.3

Table 4 - VSD Pump Station Characteristics

Model ID	Description	Year of Pump Curve	Model Pump ID Curve	Startup Depth (ft.)	Shutoff Depth (ft.)
BarrymorePMP-1	Lead Pump for Barrymore Lift Station	Not provided (Pump Installed 1967)	Barrymore Curve	461.56	459.56
BarrymorePMP-2	Lag Pump for Barrymore Lift Station	Not provided (Pump Installed 1967)	Barrymore Curve	461.56	459.56
CalhounPMP-1	Lead Pump for Calhoun Lift Station	2005	Calhoun Curve	445.75	443.75
CalhounPMP-2	Lag Pump for Calhoun Lift Station	2005	Calhoun Curve	445.75	443.75
CarverPMP-1	Lead Pump for Carver Lift Station	Not provided (Pump Installed 1979)	Carver Curve	451.6	449.1
CarverPMP-2	Lag Pump for Carver Lift Station	Not provided (Pump Installed 1979)	Carver Curve	451.6	449.1
VandPMP-1	Lead Pump for Vandenberg Lift Station	Not provided	Vandenberg curve	488.75	486.75

Model ID	Description	Year of Pump Curve	Model Pump ID Curve	Startup Depth (ft.)	Shutoff Depth (ft.)
VandPMP-2	Lag Pump for Vandenberg Lift Station	Not provided	Vandenberg curve	488.75	486.75

MODEL UPDATE

The model was updated based on recent GIS data and new improvements to VSD's system since the 2013 CSMP. Conduits that were built on or after January 1, 2013 were added to the hydraulic model using GIS. The Requa Interceptor, an improvement identified in the 2013 CSMP, was one of the major improvements that has been implemented by VSD since the previous CSMP. The Requa Interceptor was updated using November 2017 as-built drawings provided by VSD. Lift station controls were updated using operational information provided by VSD. During the model review, negative sloped pipes were identified and were updated using the following methodology:

- If GIS had a positive slope, then model inverts were updated to GIS.
- If GIS had no inverts for a pipe, the model inverts were interpolated using upstream conduits to maintain positive slope.
- If GIS inverts were causing negative slopes upstream or downstream, inverts were interpolated to maintain positive slope.
- As-builts were referenced for any pipe showing a negative slope, where available, and information was confirmed with VSD.

A list of conduits with negative or flat slopes were sent to VSD for verification and are included as Appendix A to this TM. Per VSD's inputs, inverts were interpolated for 42 of the 76 conduits identified to maintain a positive slope. Some of the negative sloped pipes were private laterals and were removed from the model. The remaining negative slope pipes remain unchanged as either there was insufficient data for invert interpolation or the negative slopes were confirmed (often these negative slopes occurred near lift stations).

One of the major improvements included in the model as part of the CSMP Review was construction of the Requa Interceptor. The Requa Interceptor consists of approximately 20,900 feet of pipe ranging from 18-inch to 30-inch in diameter. The plan and profile of the Requa Interceptor between Madison Street and the WRF, as included within the model, are shown in **Figure 5** and **Figure 6** and are based on the as-built drawings provided by VSD on August 27, 2018.

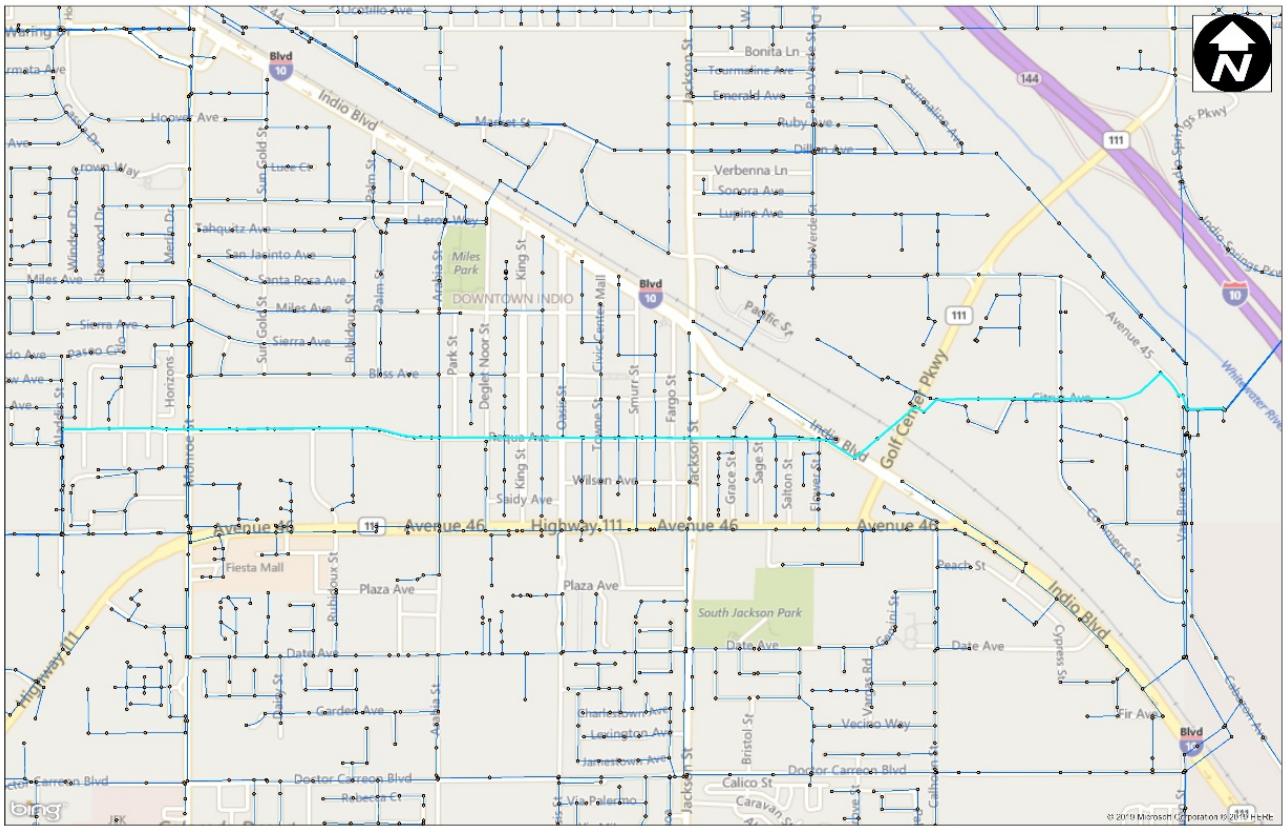

Figure 5 – Plan of Requa Interceptor between Jackson St and WRF per Model Update

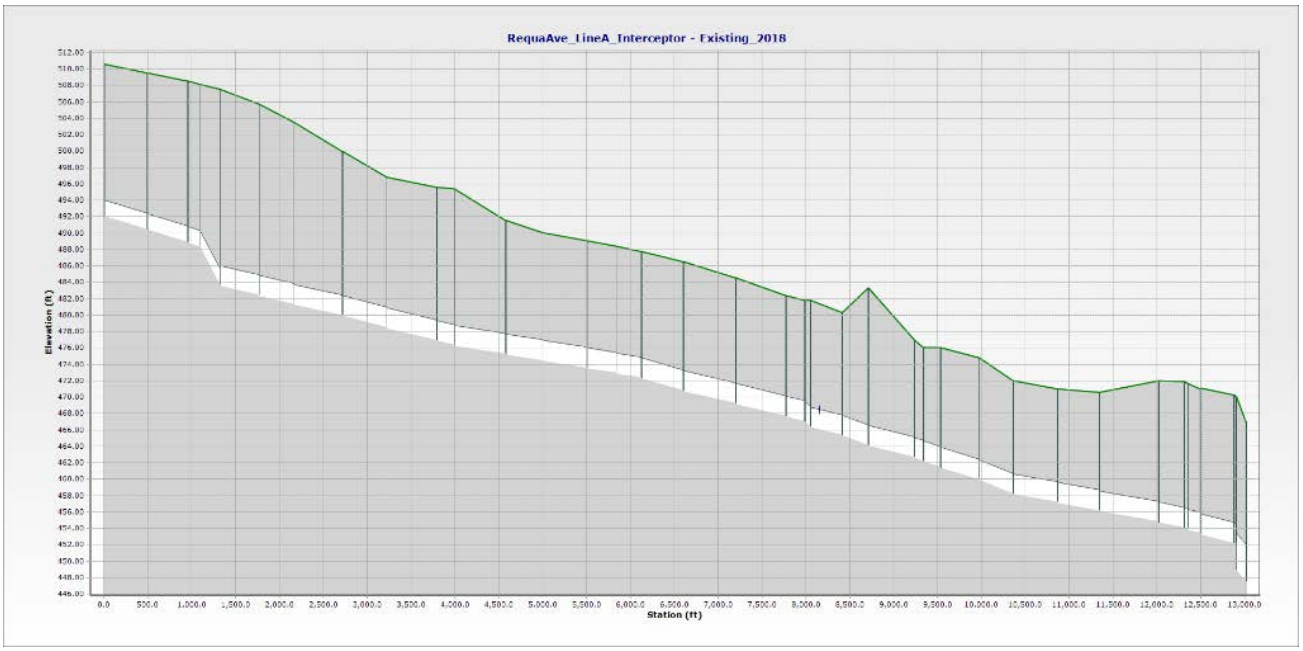

Figure 6 – Profile of Requa Interceptor between Jackson St and WRF per Model Update

The following discrepancies were identified during model update:

- Some model conduits were inactive, but GIS showed them as active.
- Record drawings conduit size did not match with GIS
- Record drawing inter-connections not shown in GIS.
- Record drawing lengths not matching in GIS.
- GIS missing inverts at few key inter-connections.

Discrepancies between GIS and record drawings were discussed with VSD staff to determine the most reliable source of data. These issues were identified and resolved prior to model run. The identified issues were sent to VSD on September 28, 2018. VSD maintains the GIS layer and have since updated any identified data errors. It is recommended that the GIS be regularly updated in conjunction with any changes in the system, or discrepancies with the record drawings that are identified.

SEWER DEMAND UPDATE

The CSMP Review included an update to sewer flow allocation to reflect existing conditions. Sewage flow coefficients in the model were reviewed as were the total baseflows from the 2013 CSMP (8.0 MGD). Plant inflows were analyzed to identify maximum daily flow not influenced by rainfall. The period from November 25th, 2017 to December 1st, 2017 was identified as representative of typical maximum daily flow through analysis of the data and conversations with VSD staff. This period is shown on **Figure 7**. While higher quantities of daily flow occurred in April and May of 2018, that period was not representative of typical daily flows. The average daily flow from November 25th to December 1st, 2017 is 5.7 MGD and was used to

represent existing conditions in the updated model. Baseflows from the previous model were scaled globally in order to achieve a total system flow of 5.7 MGD. It is noted that this scaling assumes homogenous changes in conservation from 2013 and 2017, and is a generalization used to analyze the system. It is recommended that prior to the next model update and master plan that VSD conduct flow monitoring in order to verify where flows have changed in the system and more accurately represent existing conditions.

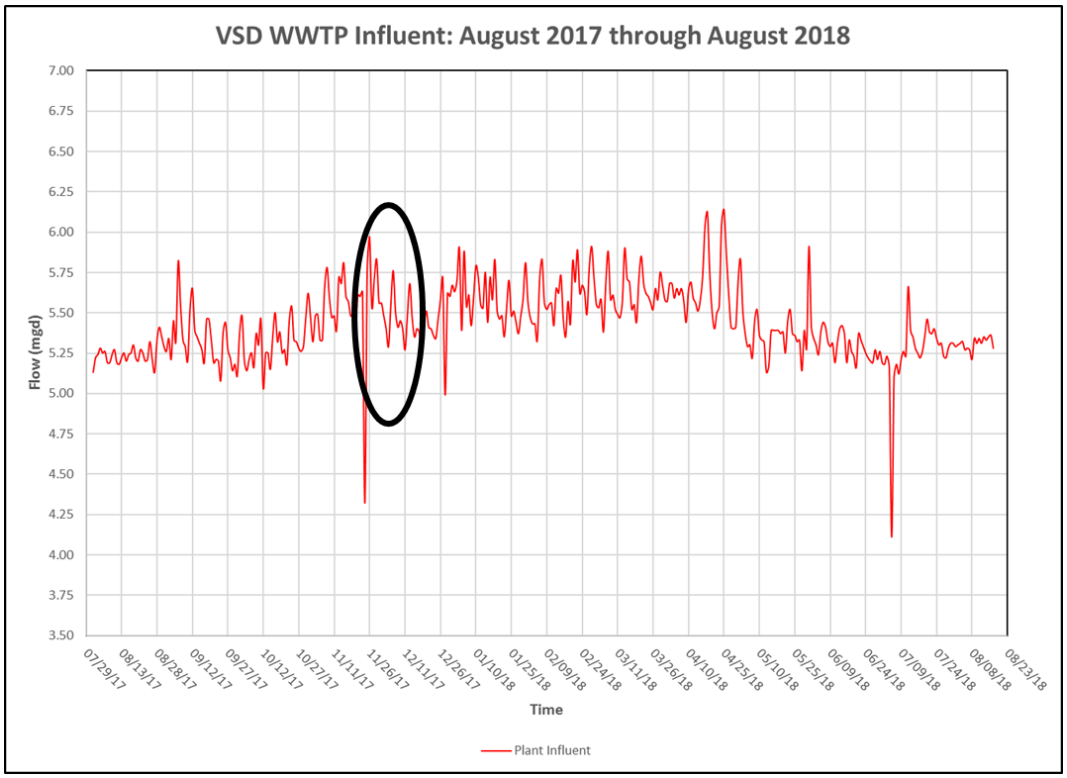

Figure 7 – Typical Maximum Daily Flow Not Influenced by Rainfall

FUTURE SEWER DEMAND PROJECTIONS AND MODEL SCENARIOS

The CSMP Review also included an update to sewer projections for the interim (2035) and build-out scenarios. VSD provided updated zoning for the City of Indio, a shapefile of septic parcels, and a list of known developments among other data sources. These data sources were reviewed for reference against the original loadings built into the 2013 model. The information provided confirmed similar future conditions as were analyzed in the previous master plan. Based on this updated information and analysis, as well as conversations with VSD staff, the build-out scenario was defined to be equal to that calculated in the 2013 CSMP, 19.9 MGD. This level of flow would represent a 355% increase from current conditions. This upper limit is based on the potential for the VSD service area given the available land and planned zoning. As such, recommendations for this planning horizon should be used as a guide for monitoring specific areas in the system. As the service area approaches build-out, the specific areas of growth will determine which of the areas of concern start having capacity deficiencies first.

An interim planning horizon was not defined in the previous CSMP but given the large difference between future and existing flows, it was decided to define an interim scenario in order to plan for near term growth. Given the relatively slow rate of population growth and the effects of conservation, this interim scenario was defined as occurring in 2035. Stantec looked at the population for the service area in 2013 and 2017 in order

to analyze changes in per capita usage since the CSMP. The population for the VSD service area in 2013 was estimated to be 76,063. Updated U.S. Census information estimates the population in 2017 was 89,793. These population projections were applied to the 2013 and 2017 plant flows and used to calculate a per capita usage for 2013 and 2017. The results are shown in **Table 5**.

This analysis shows the per capita usage rate has declined by 41% since the previous CSMP. This high rate of conservation suggests that further conservation and decline in per capita usage will be difficult to achieve, and as such no further conservation was assumed for the interim scenario. The 2017 per capita usage rate was applied to the 2035 population projection established in the 2013 CSMP of 120,767, which yielded a total demand of 5238.7 gpm, or 7.5 MGD. This was applied to the model as the interim planning scenario and represents an increase in the current population of 34% with no change in the current per capita usage. The model scenario was built by taking the build-out demand in the system and scaling it down globally to 7.5 MGD.

It is noted that actual growth in the system will occur in different areas at different rates, and the interim scenario is defined to represent a possible distribution of demand that is based on the future zoning for the service area. It is also noted that the distribution of demand is based on ultimate zoning and not on the calibrated existing demands established in the 2013 CSMP. Therefore, certain areas of the model may show less demand in a pipe in the interim scenario than is represented in the existing scenario. This assumption for the interim scenario allows for analysis of a near term system that is developing in accordance to the future zoning.

Table 6 shows a summary of the dry weather flow allocation for the existing and future scenarios.

Table 5 - Per Capita Usage Comparison for 2013 and 2017

Year	flow (gpm)	Population (from US Census)	Per Capita Usage (gpm/person)	Per Capita Usage (gpd/capita)	Flow based on 2013 per capita (gpm)	Flow Based on 2017 Per Capita (gpm)
2017	3,898	89,793	0.0434	62.5		
2013	5,569	76,036	0.0732	105.4		
2035 Population Projection		120,676			8,838	5,238

Table 6 - Dry Weather Flow Allocation

Scenario	Baseflows (gpm)	Baseflows (MGD)
Existing Conditions (2013 MP)	5,645	8.1
Existing Conditions (2018 CSMP Review)	3,898	5.6
Interim Planning Horizon 2035	5,238	7.5
Ultimate Build Out Conditions (2035)	13,723	19.9

MODEL VERIFICATION

Model calibration was not completed as part of the CSMP Review as flow monitoring data was not available or collected. However, the model simulated flows for the November 25th through December 1st, 2017 period were compared with the available plant influent flow data as a verification. VSD provided seven-minute interval WRF flow data for a diurnal pattern analysis. The model was run with the original CSMP (2013) dry weather flows and compared with the observed WRF flow data within the November 25th to December 1st period. As shown in **Figure 8**, the 2013 CSMP demand projections (shown in blue) were significantly higher than the observed daily flows (shown in red). The CSMP demand projections were adjusted by reducing the flows in the model by 30%. The adjusted demands are show on **Figure 8** in green and more closely match the observed flow at the end of 2017. The model was further verified by ensuring connectivity, checking for negative or flat slopes, and confirming areas where there were issues not originally identified in the CSMP.

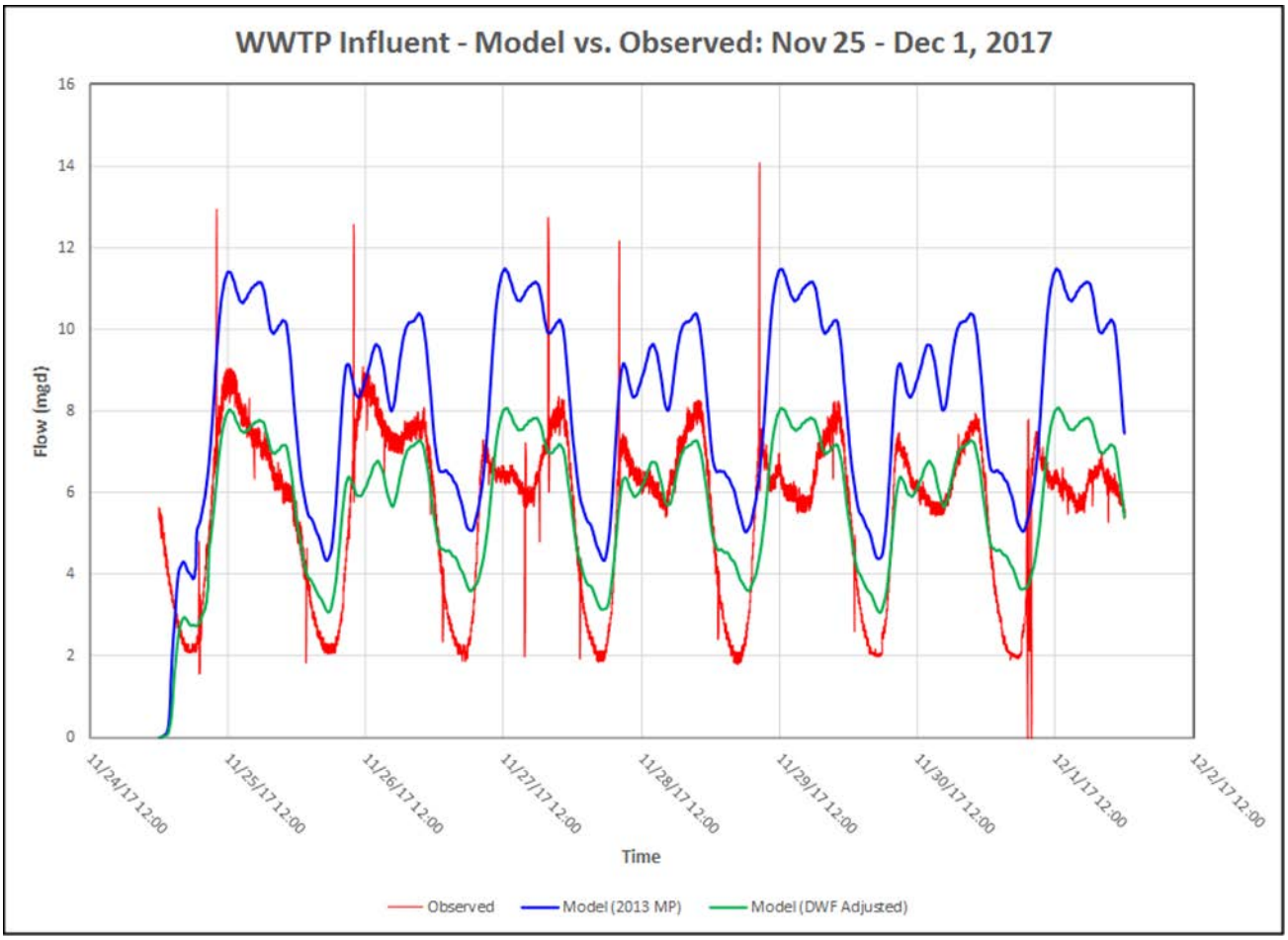

Figure 8 – Demand Projections Comparison

MODEL ANALYSIS

After model verification, the model was used to analyze the following objectives: 1) Identifying Areas of Concern 2) Verifying the requirements of previously identified capital improvement projects (CIPs).

SYSTEM EVALUATION CRITERIA

The system capacity evaluation criteria established during CSMP (2013) was used for the CSMP Review. A more comprehensive discussion of the criteria is shown in the Sewer System Planning and Design Criteria Technical Memorandum (TM) shown in Appendix F of the CSMP. Potential areas of concern were evaluated at existing conditions (2017), interim planning horizon (2035), and build-out conditions.

Per the CSMP, the criteria used to evaluate dry weather flow for all the flow conditions include:

- All modeled pipes in the existing and interim scenario with a d/D ratio (depth of flow in pipe divided by the pipe diameter) greater than the design criteria (d/D ratio of 0.5 or less for pipes smaller than 18 in. in diameter, ratio of 0.75 or less for pipes 18-in. or greater in diameter) are identified as an area of concern.
- All modeled pipes in the build-out scenario with a d/D ratio equal to or greater than 0.9 are identified as an area of concern.

It is important to note that the CSMP Review used a different computational engine compared to CSMP (2013). The original SewerGEMS model from the CSMP (2013) used SewerGEMS Implicit Solver in computations. For the current CSMP Review, the analysis used the SWMM Solver engine, which offers a more conservative estimate of flows in the system. As a result, additional areas of concern were identified in build-out scenario that were not highlighted in the previous CSMP. Using the SWMM Solver engine as a more conservative approach captures any areas where future capacity deficiency may occur and can be monitored as-needed by VSD.

MODEL RESULTS

The model was run for existing (2017), interim (2035), and buildout conditions. Pipes in the model were color coded based on the maximum d/D ratio and categorized according to the evaluation criteria. The results of this analysis are shown on **Figure 9** through **Figure 11**. The results of the capacity analysis are used to identify areas of concern (AOCs) in the subsequent section.

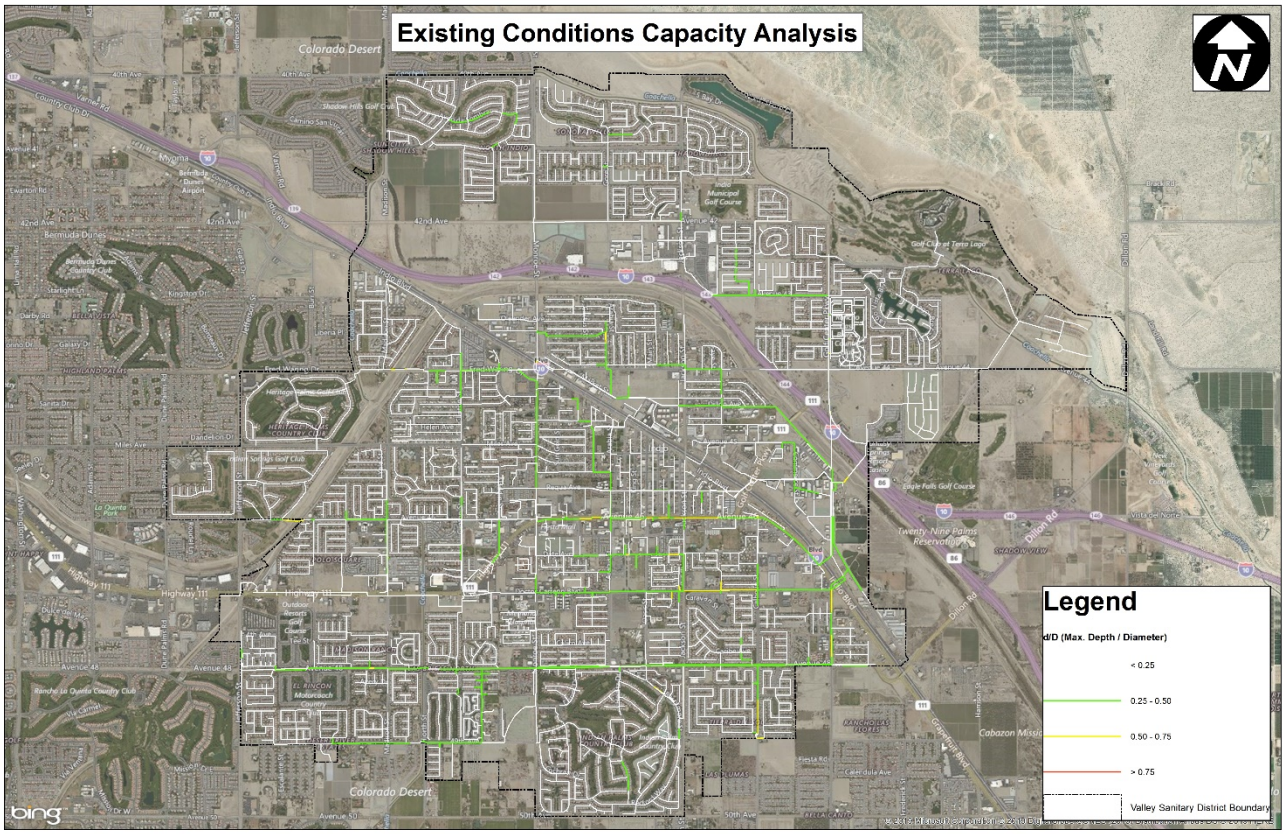

Figure 9: Existing Conditions Capacity Analysis

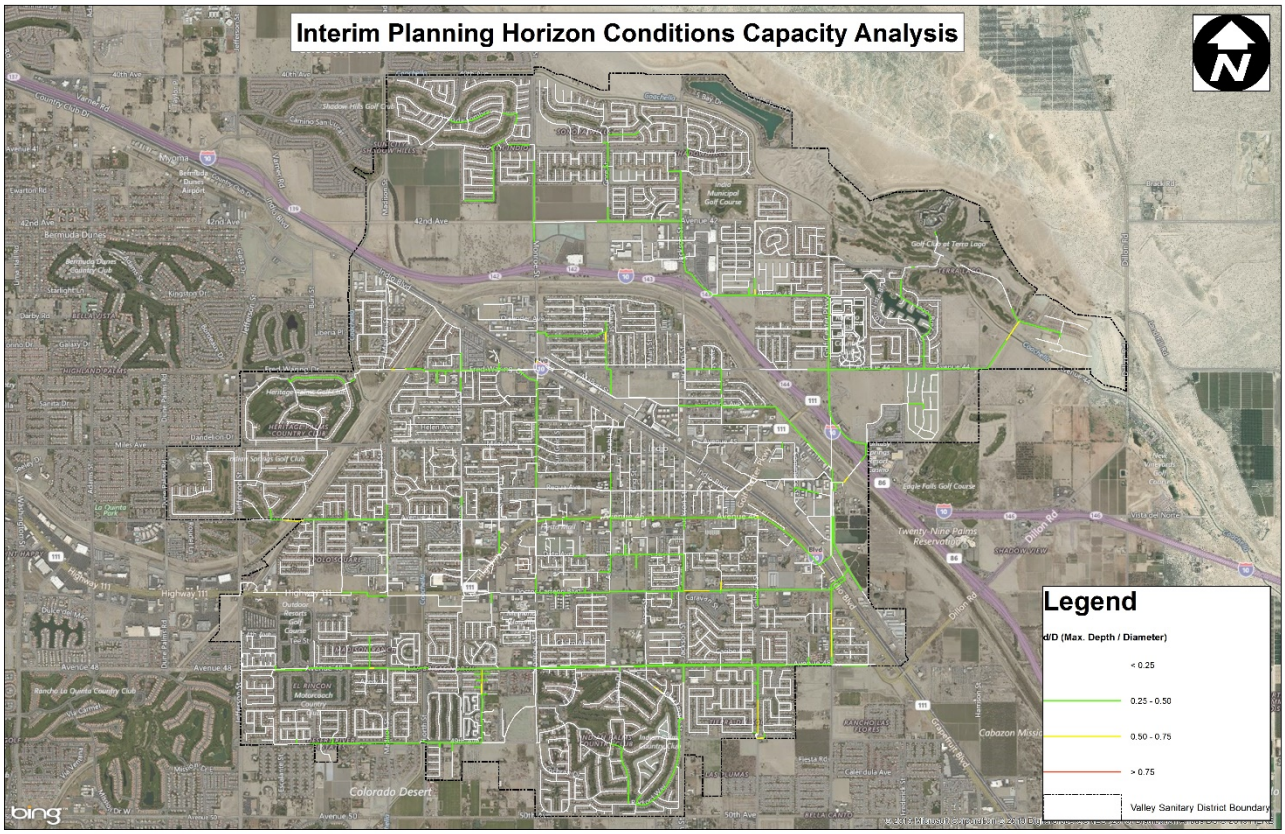

Figure 10: Interim (2035) Conditions Capacity Analysis

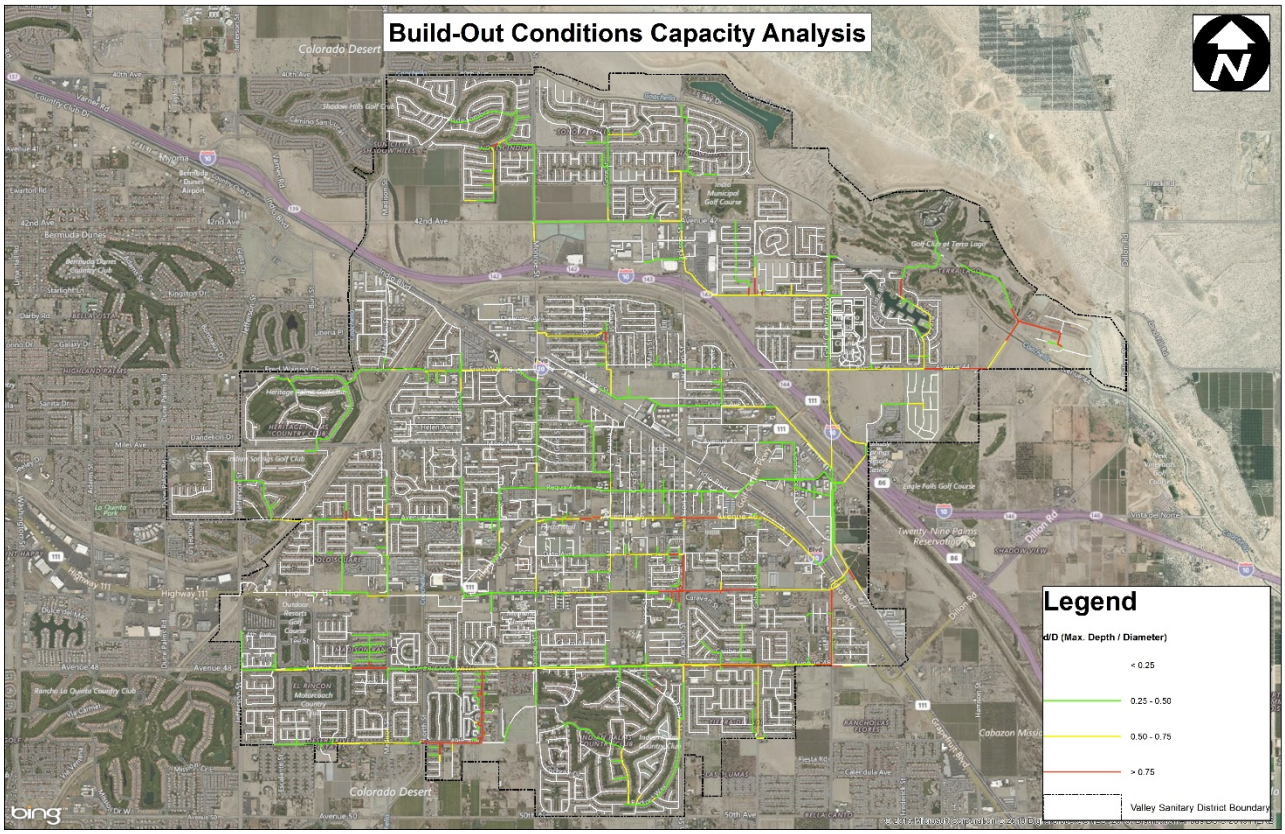

Figure 11: Buildout Conditions Capacity Analysis

AREAS OF CONCERN

AOCs were identified using the model results and sewer system capacity criteria discussed in the previous section. Areas of concern previously identified in the CSMP (2013) are verified by the CSMP Review and have been associated with a capital improvement project. New areas of concern identified in the CSMP Review do not have a capital improvement projects associated and should be monitored by VSD. **Table 7** and **Figure 12** shows a summary of areas of concern by planning horizon i.e. existing conditions (2017), interim planning horizon conditions (2035), build-out conditions.

Table 7 – Areas of Concern (AOCs)

AOC Number	Location	Cross Street
1	Avenue 48	Avenue 48 between Shields Rd and Madison St
2	Dr. Carreon Blvd	Dr. Carreon Blvd between Oasis St and Mangrove St
3	Date Ave	Date Ave between Arabia St and Jackson St
4	Highway 111/Arabia St	Highway 111 between Monroe St and Arabia St
5	Highway 111/Flower St	Highway 111 between Arabia St and Flower St
6	Sola St	Sola St between Oleander Ave and Avenue 44
7	Avenue 49	Avenue 49 between Hjorth St and Desert Grove Dr
8	Desert Grove Dr	Desert Grove Dr between Avenue 49 and Avenue 48
9	Van Buren St	Van Buren St between Avenue 48 and Highway 111
10	Calhoun St	Calhoun St at Avenue 43

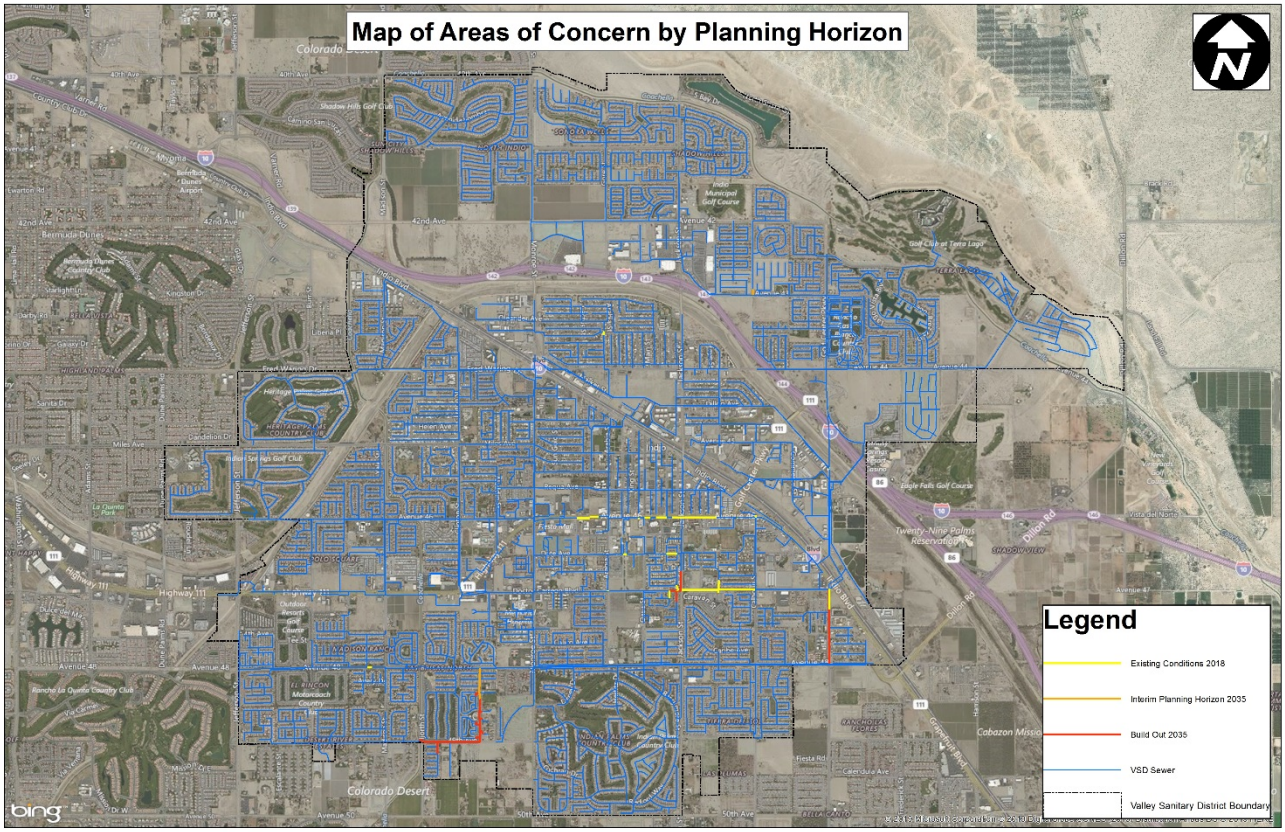

Figure 12 – Areas of Concern by Planning Horizon

The conduits that exceeded the design criteria (d/D) for existing conditions, interim planning horizon and build-out conditions along with CIPs required for each area of concern are discussed below.

1. **Avenue 48 between Shields Rd and Madison St** – The conduit that exceeded the d/D criteria for existing conditions, interim planning horizon and build-out conditions on Avenue 48 is listed below. The hydraulic profile for this area of concern is shown in **Figure 13** through **Figure 15**, and the model results are shown in **Table 8**. Avenue 48 West Upgrade project is recommended for this area of concern which will provide relief for current and projected capacity issues.

Table 8 - Avenue 48 between Shields Rd and Madison St

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
12D-M150_12D-M340	10	0.55	0.55	1.00

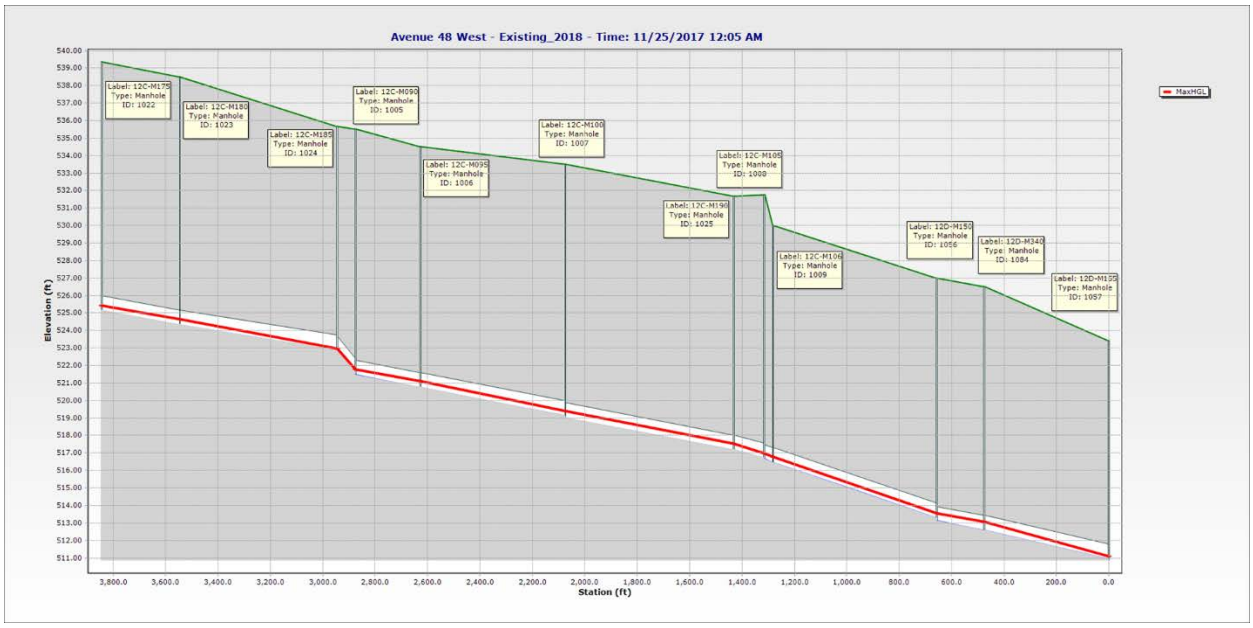

Figure 13 – Avenue 48 under Existing Conditions

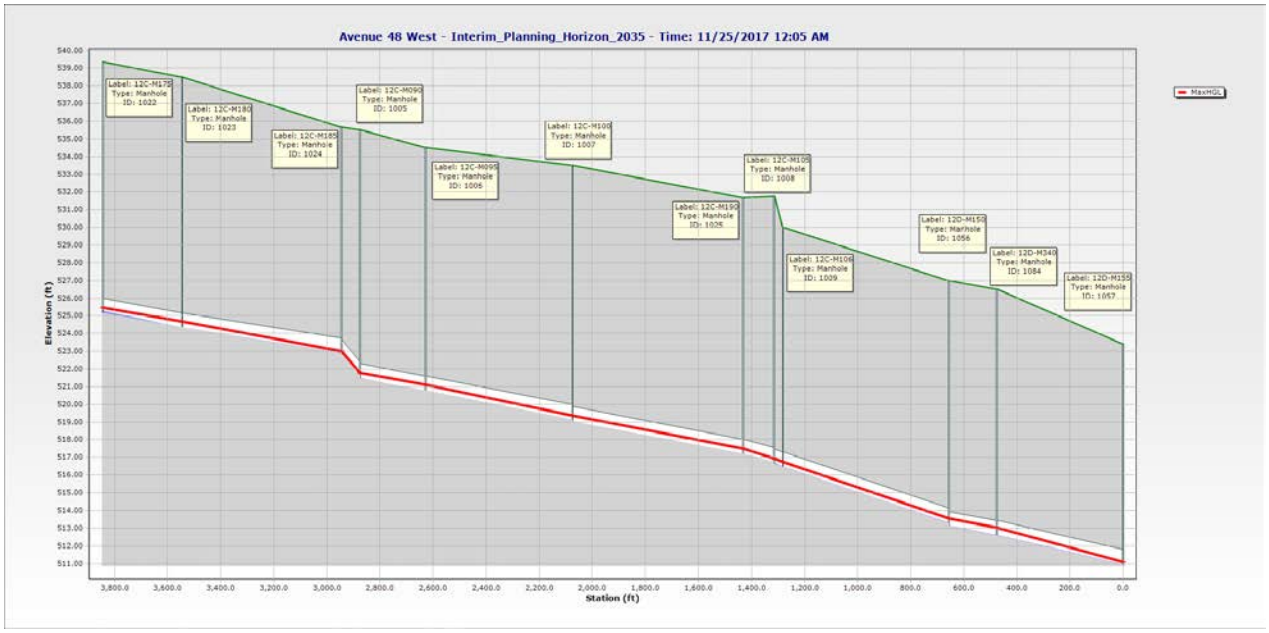

Figure 14 – Avenue 48 under Interim Planning Horizon Conditions

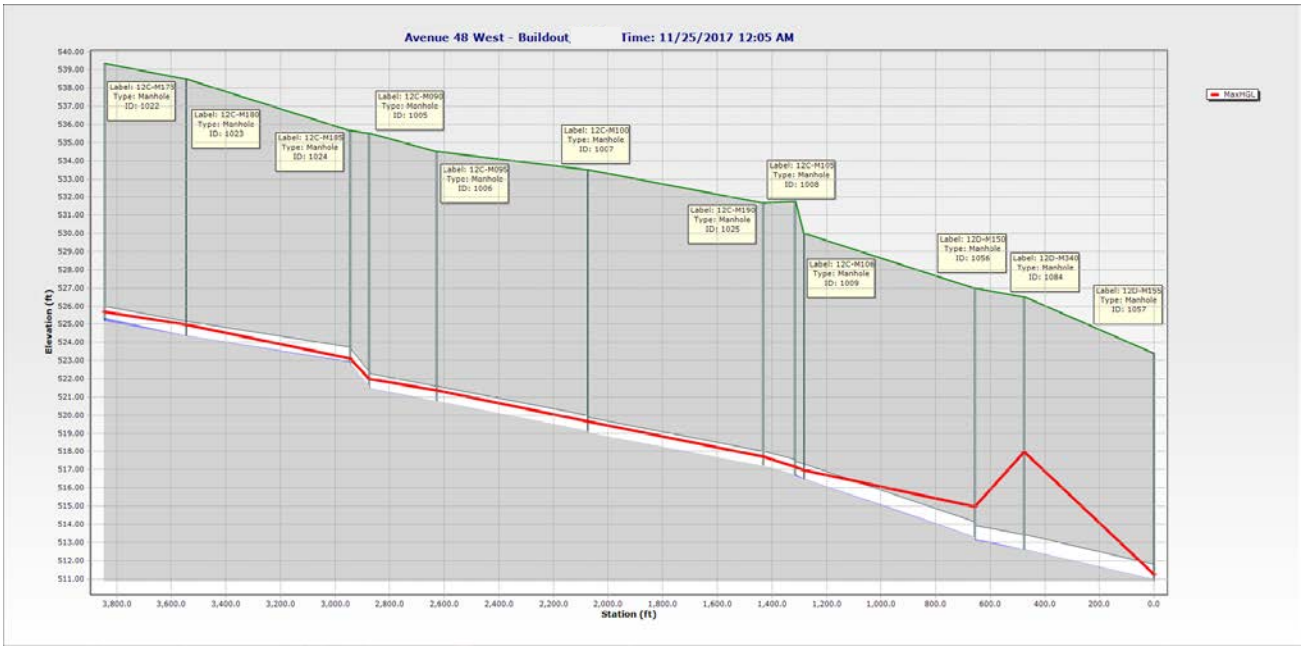

Figure 15 – Avenue 48 under Build-Out Conditions

2. **Dr. Carreon Blvd. between Oasis St. and Mangrove St.** – The conduits that exceeded the d/D criteria for existing conditions, interim planning horizon and build-out conditions on Dr. Carreon Blvd are listed below. Some conduits listed below exceed d/D criteria only for build-out conditions. The hydraulic profile for this area of concern is shown in **Figure 16** through **Figure 18**, and the model results are shown in **Table 9**. Clinton St Operational Change, Arabia Interceptor/ Jackson Street Operational Change and Highway 111 Interceptor projects are recommended for this area of concern which will provide relief for current and projected capacity issues.

Table 9 - Dr. Carreon Blvd. between Oasis St. and Mangrove St. Model Results

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
10H-M005_10H-M010	8	0.56	0.56	1.00
10H-M046_10H-M275	8	0.54	0.54	0.73
10H-M120_10H-M240	8	0.52	0.52	0.94
10H-M210_10H-M235	8	0.55	0.55	1.00
10H-M305_10H-M265	8	0.50	0.50	0.99
11H-M150_10H-M005	8	0.29	0.23	1.00
10H-M010_10H-M240	15	0.40	0.37	1.00
10H-M235_10H-M010	15	0.47	0.43	1.00
10H-M240_10H-M245	15	0.45	0.39	1.00
10H-M245_10H-M250	15	0.47	0.41	1.00
10H-M250_10H-M255	15	0.48	0.41	1.00
10H-M255_10H-M257	15	0.58	0.58	1.00
10H-M257_10H-M260	15	0.60	0.60	1.00
10H-M260_10H-M265	15	0.51	0.51	0.88
10H-M275_10H-M277	15	0.51	0.51	0.94
10H-M277_10I-M130	15	0.53	0.53	0.91

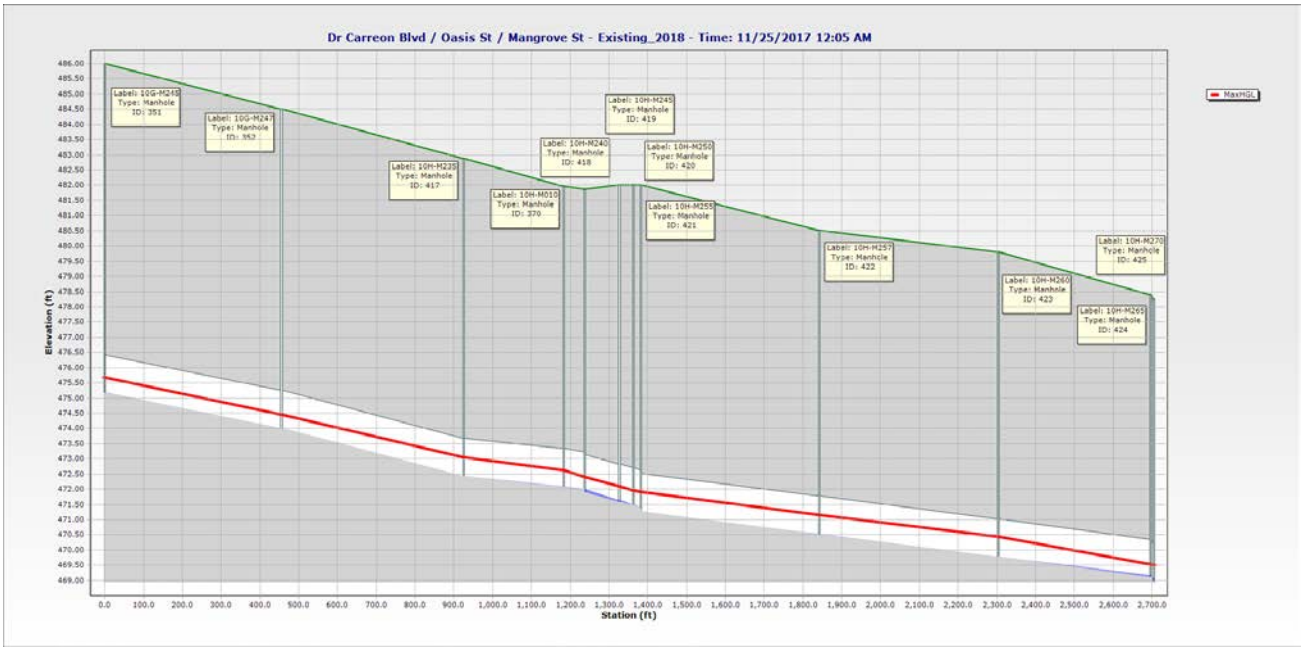

Figure 16 – Dr. Carreon Blvd under Existing Conditions

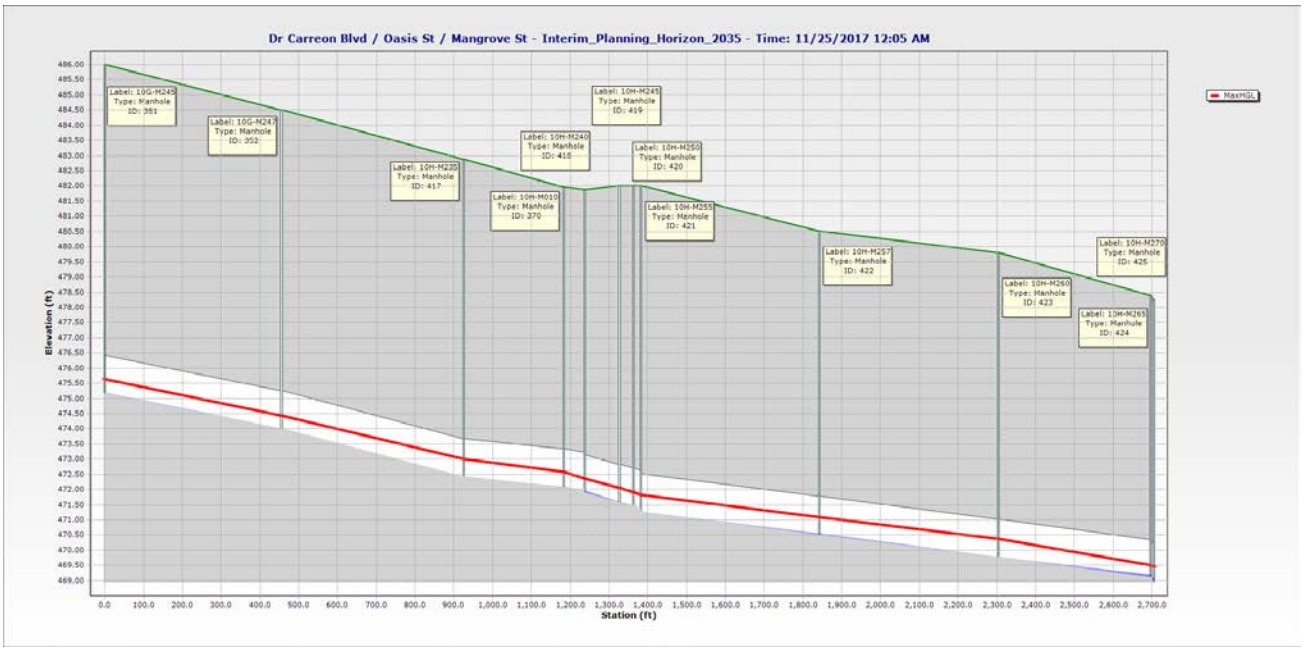

Figure 17 - Dr. Carreon Blvd under Interim Planning Horizon Conditions

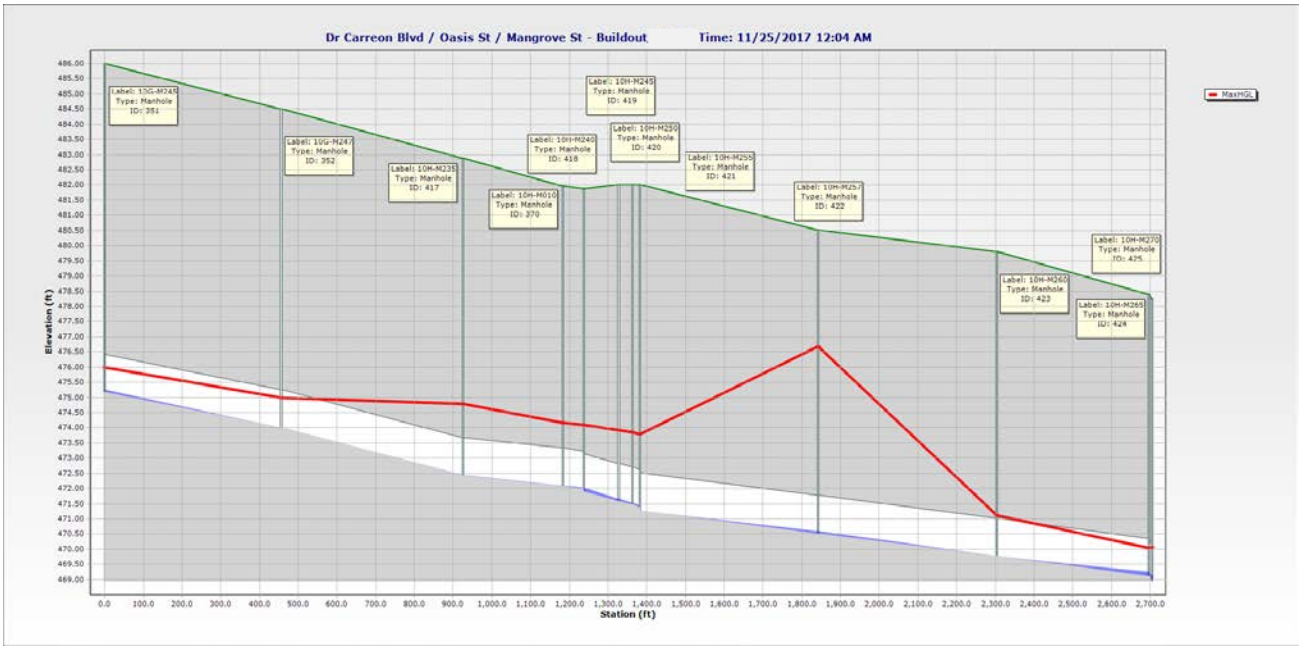

Figure 18 - Dr. Carreon Blvd under Build-Out Conditions

3. **Date Ave between Arabia St and Jackson St** – The conduits that exceeded the d/D criteria for existing conditions and interim planning horizon conditions on Date Ave between Arabia St and Jackson St are listed below. However, these conduits do not exceed the d/D criteria for build-out conditions. The hydraulic profiles for this area of concern is shown in **Figure 19** through **Figure 21**, and the model results are shown in **Table 10**. A CIP is not recommended for this AOC as d/D doesn't exceed the design criteria of 0.90. However, based on conversations with VSD and review of the hydraulic profile and model, there does appear to be capacity concerns in this line that warrant further monitoring and study. The model calculates max d/D based on an average depth over the length of the pipe; review of the hydraulic profile shows that even though the max d/D for 10H-M215_10H-M325 during build-out is 0.81, there may be full pipe conditions at the downstream end of the pipeline. It is recommended that VSD monitor this location and conduct further study if capacity deficiency is observed.

Table 10 - Date Ave between Arabia St and Jackson St. Model Results

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
10G-M205_10G-M206	8	0.52	0.45	0.75
10H-M215_10H-M325	8	0.50	0.44	0.81

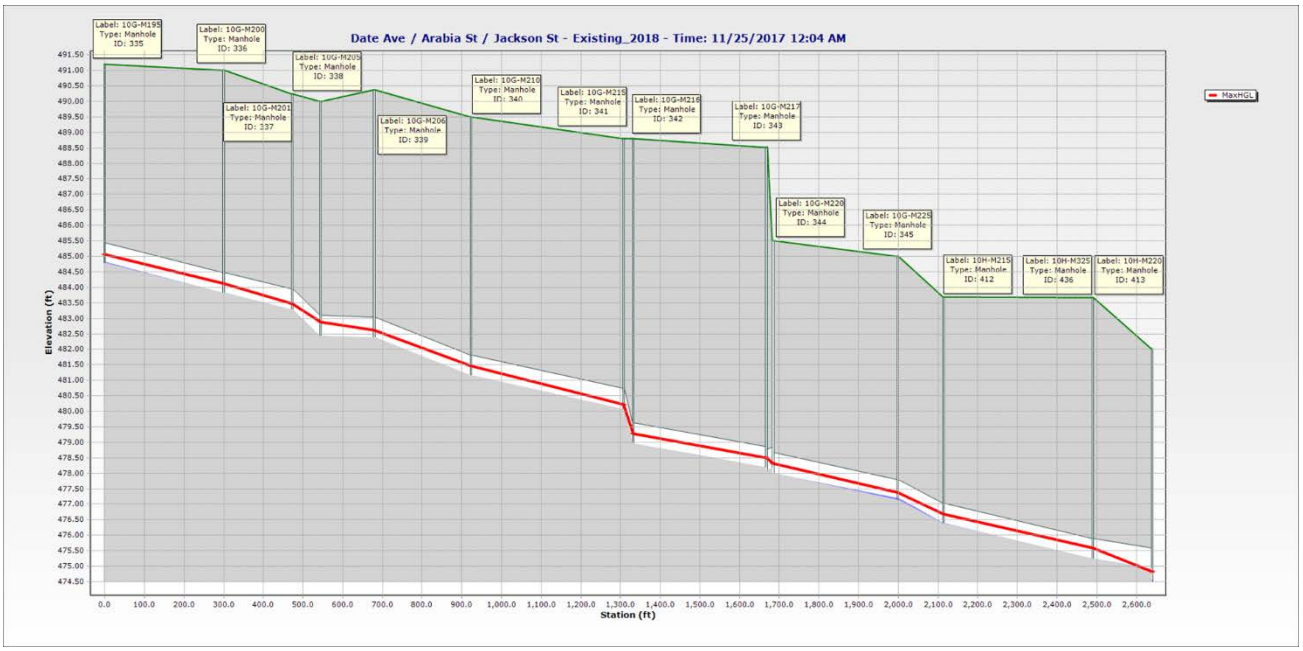

Figure 19 – Date Ave between Arabia St and Jackson St under Existing Conditions

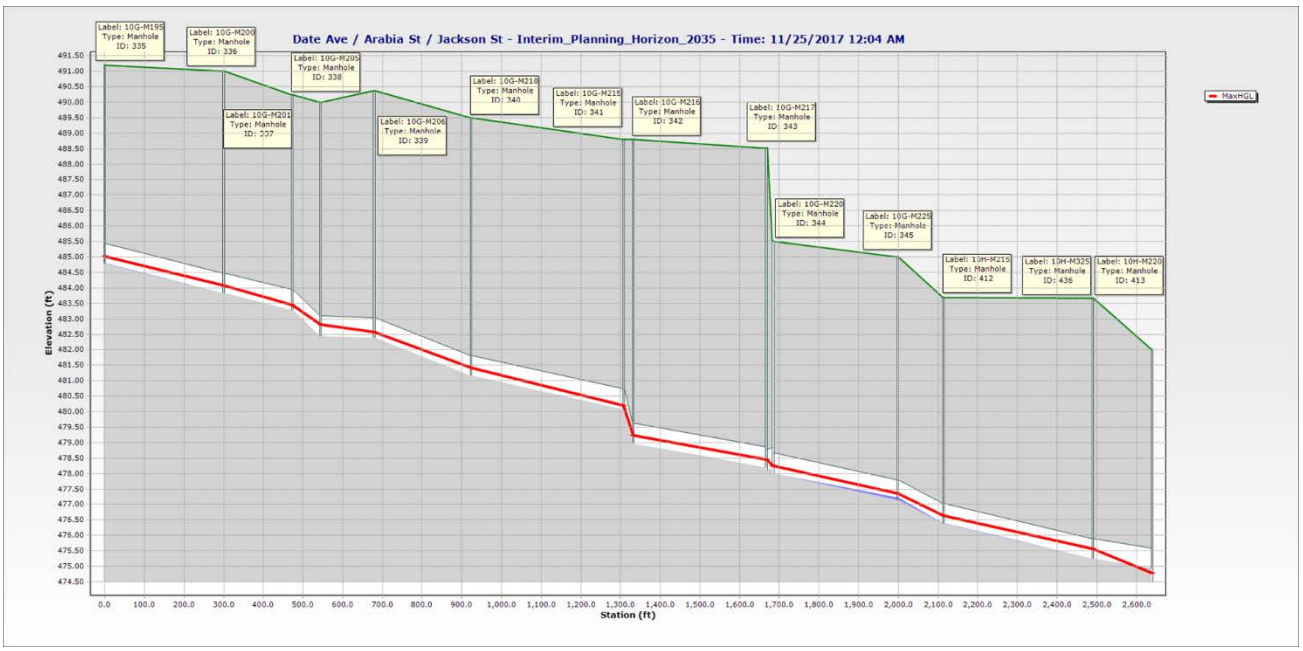

Figure 20 – Date Ave between Arabia St and Jackson St under Interim Planning Horizon Conditions

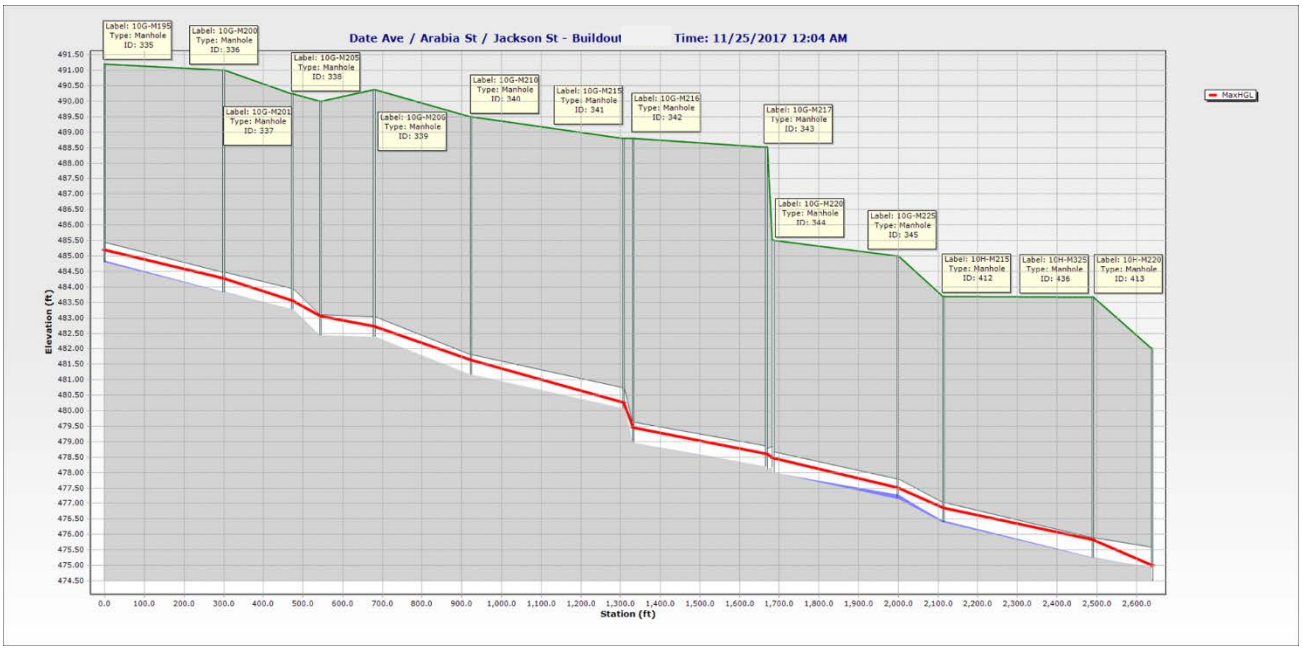

Figure 21 – Date Ave between Arabia St and Jackson St under Build-Out Conditions

4. **Highway 111 between Monroe St and Arabia St** – The conduits that exceeded the d/D criteria for existing conditions on Highway 111 between Monroe St and Arabia St are listed below. However, these conduits do not exceed the d/D criteria for interim planning horizon and build-out conditions. The hydraulic profiles for this area of concern is shown in **Figure 22** through **Figure 24** and the model results are shown in **Table 11**. A CIP is not recommended for this AOC as d/D doesn't exceed the design criteria of 0.90. However, Highway 111 Interceptor project recommended for the Dr. Carreon Blvd AOC will increase the capacity of this line.

Table 11 - Highway 111 between Monroe St and Arabia St Model Results

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
9F-M045_9F-M047	8	0.54	0.45	0.82
9F-M047_9F-M050	8	0.52	0.44	0.77
9F-M055_9G-M100	8	0.50	0.42	0.78

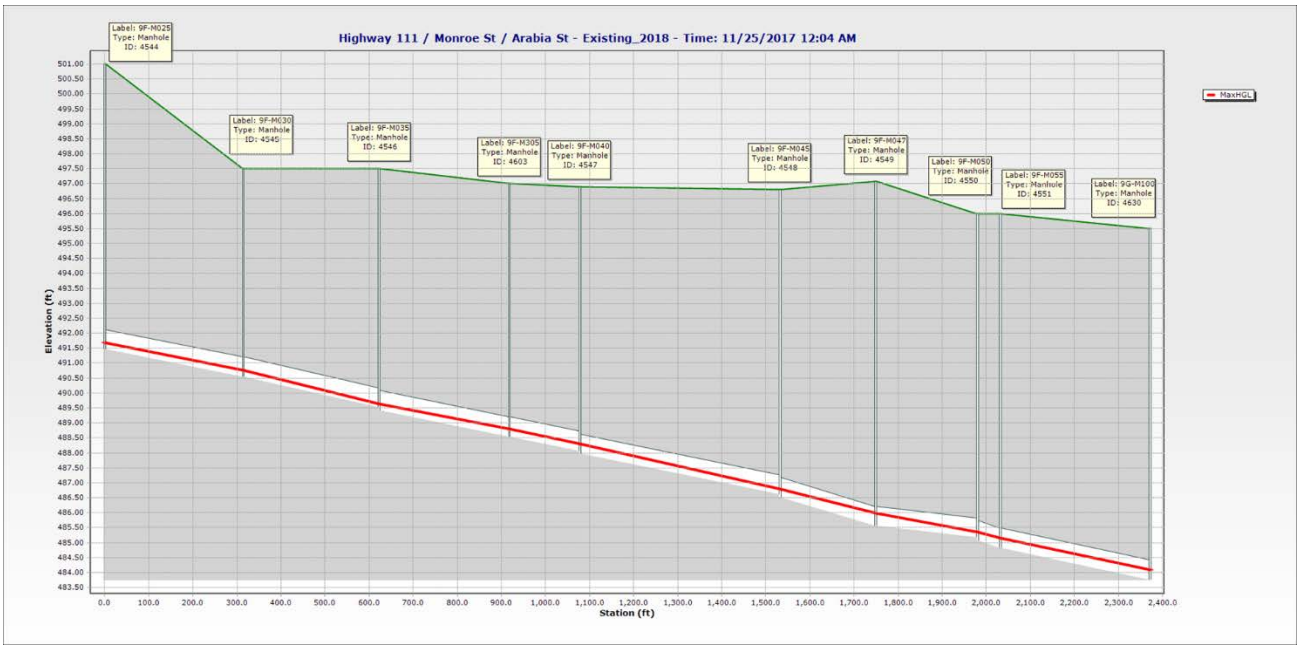

Figure 22 – Highway 111 between Monroe St and Arabia St under Existing Conditions

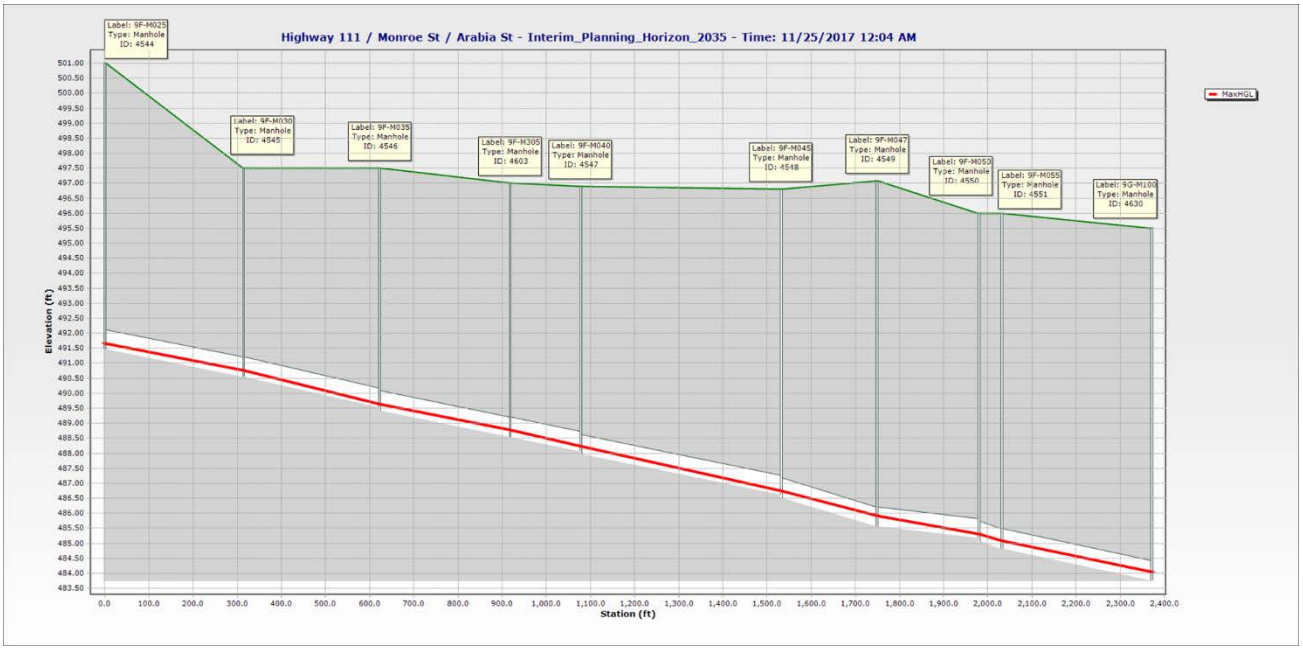

Figure 23 – Highway 111 between Monroe St and Arabia St under Interim Planning Horizon Conditions

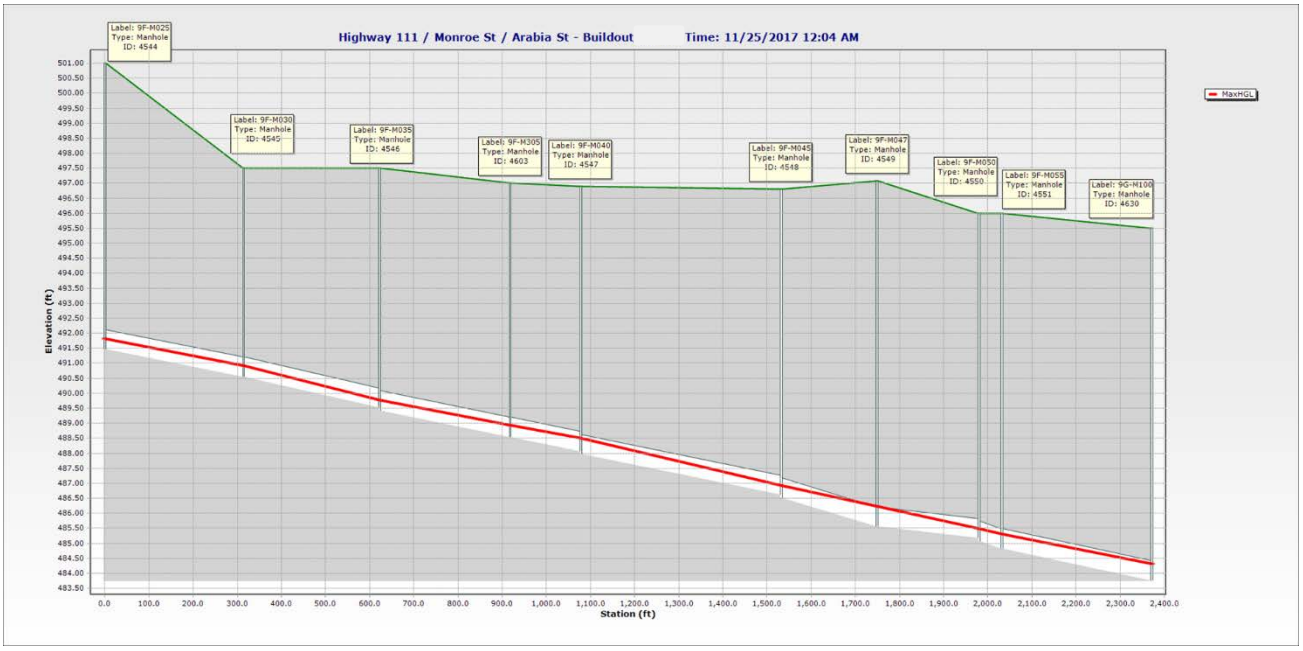

Figure 24 – Highway 111 between Monroe St and Arabia St under Build-Out Conditions

5. **Highway 111 between Arabia St and Flower St** – The conduits that exceeded the d/D criteria for existing conditions on Highway 111 between Arabia St and Flower St are listed below. However, these conduits do not exceed the d/D criteria for interim planning horizon and build-out conditions. The hydraulic profiles for this area of concern is shown in **Figure 25** through **Figure 27**, and the model results are shown in **Table 12**. A CIP is not recommended for this AOC as d/D doesn't exceed the design criteria of 0.90.

Table 12 - Highway 111 between Arabia St and Flower St Model Results

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
9G-M245_9G-M170	8	0.60	0.48	0.89
9G-M175_9G-M180	12	0.53	0.41	0.73
9G-M185_9G-M190	12	0.52	0.40	0.73
9G-M190_9G-M195	12	0.55	0.42	0.75
9H-M120_9H-M135	12	0.51	0.48	0.84
9H-M135_9H-M140	12	0.52	0.49	0.86
9H-M140_9H-M145	12	0.51	0.48	0.84
9H-M145_9H-M150	12	0.51	0.48	0.81

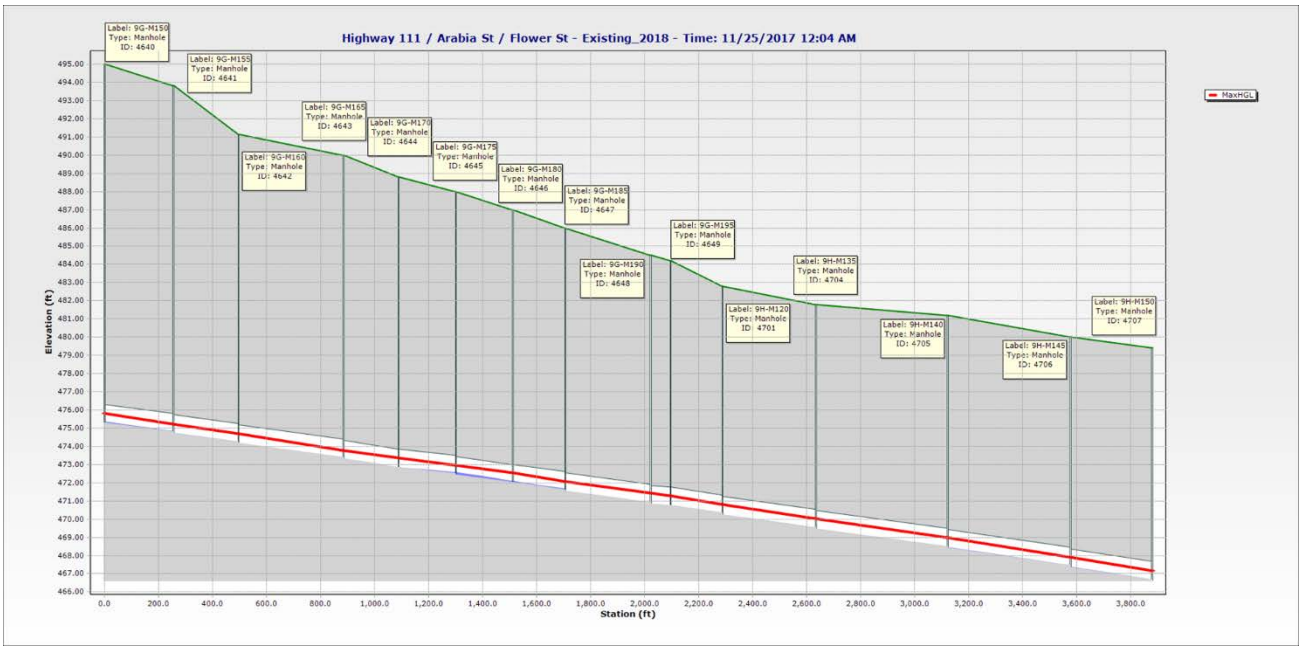

Figure 25 – Highway 111 between Arabia St and Flower St under Existing Conditions

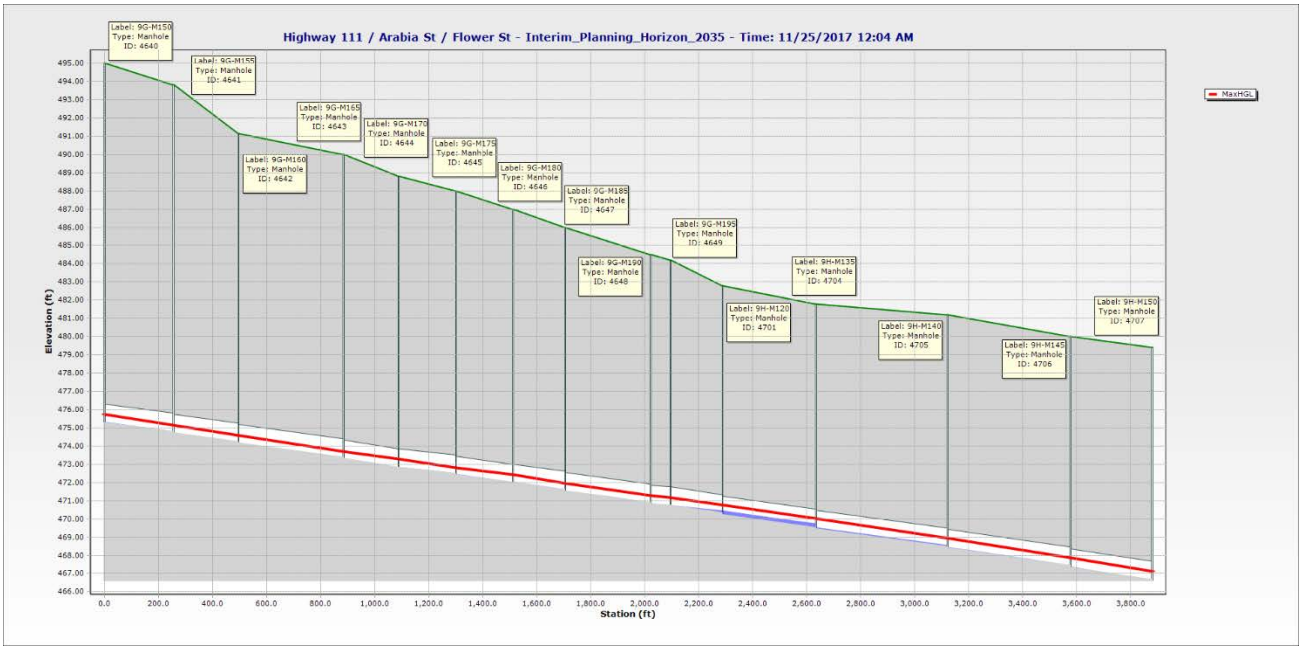

Figure 26 - Highway 111 between Arabia St and Flower St under Interim Planning Horizon Conditions

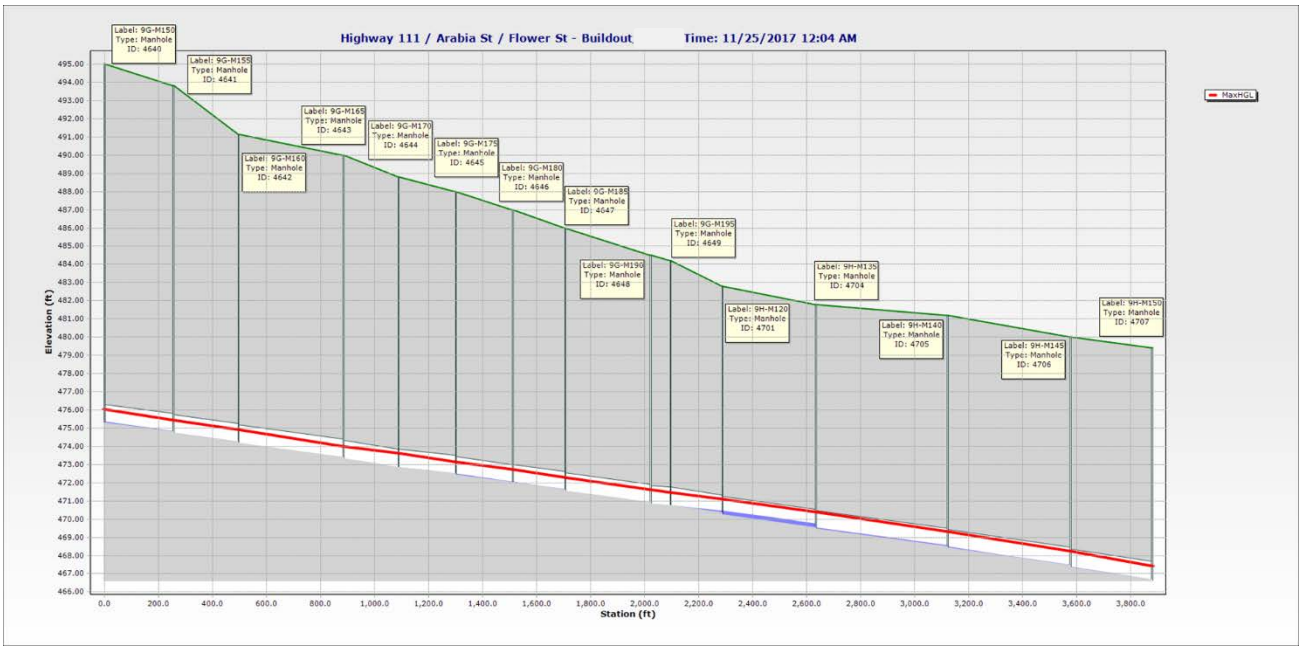

Figure 27 - Highway 111 between Arabia St and Flower St under Build-Out Conditions

6. **Sola St between Oleander Ave and Avenue 44** – The conduits that exceeded the d/D criteria for existing conditions, interim planning horizon and build-out conditions on Sola St are listed below. The hydraulic profile for this area of concern is shown in **Figure 28** through **Figure 30**, and the model results are shown in **Table 13**. Industrial Pl./Market Interceptor project is recommended for this area of concern which will provide relief for current and projected capacity issues.

Table 13 - Sola St between Oleander Ave and Avenue 44 Model Results

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
6G-M195_6G-M200	8	0.65	0.60	1.00
6G-M200_6G-M205	8	0.71	0.66	1.00

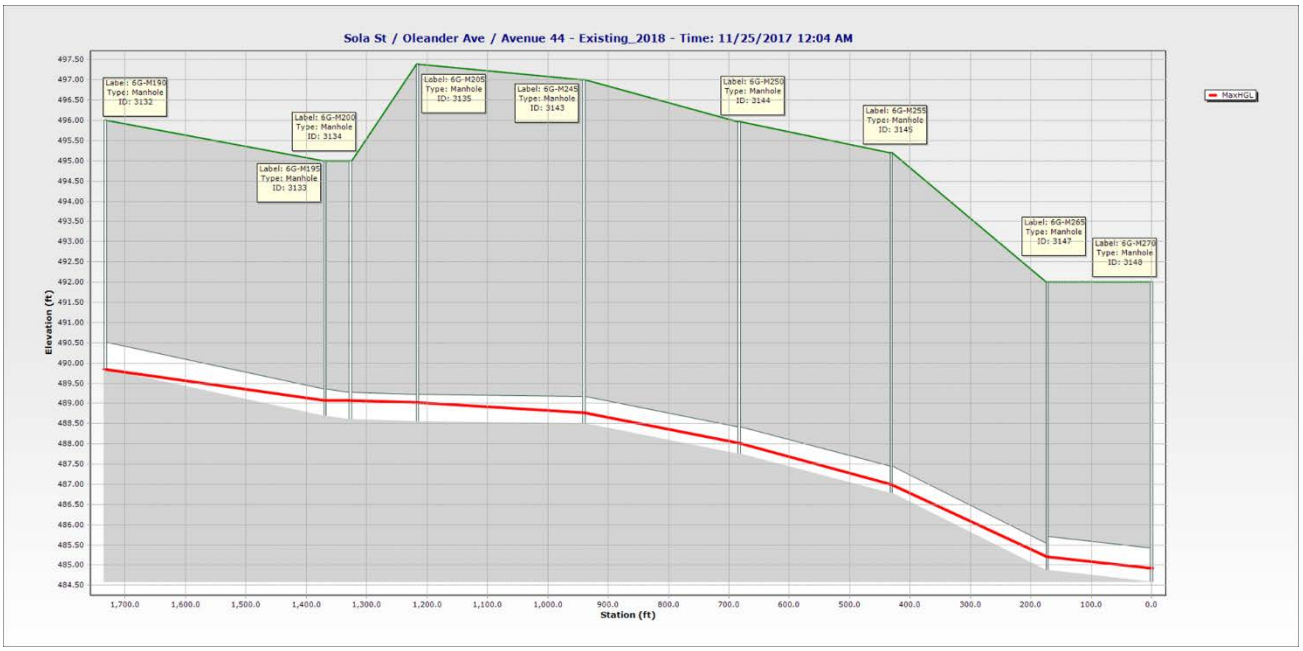

Figure 28 – Sola St between Oleander Ave and Avenue 44 under Existing Conditions

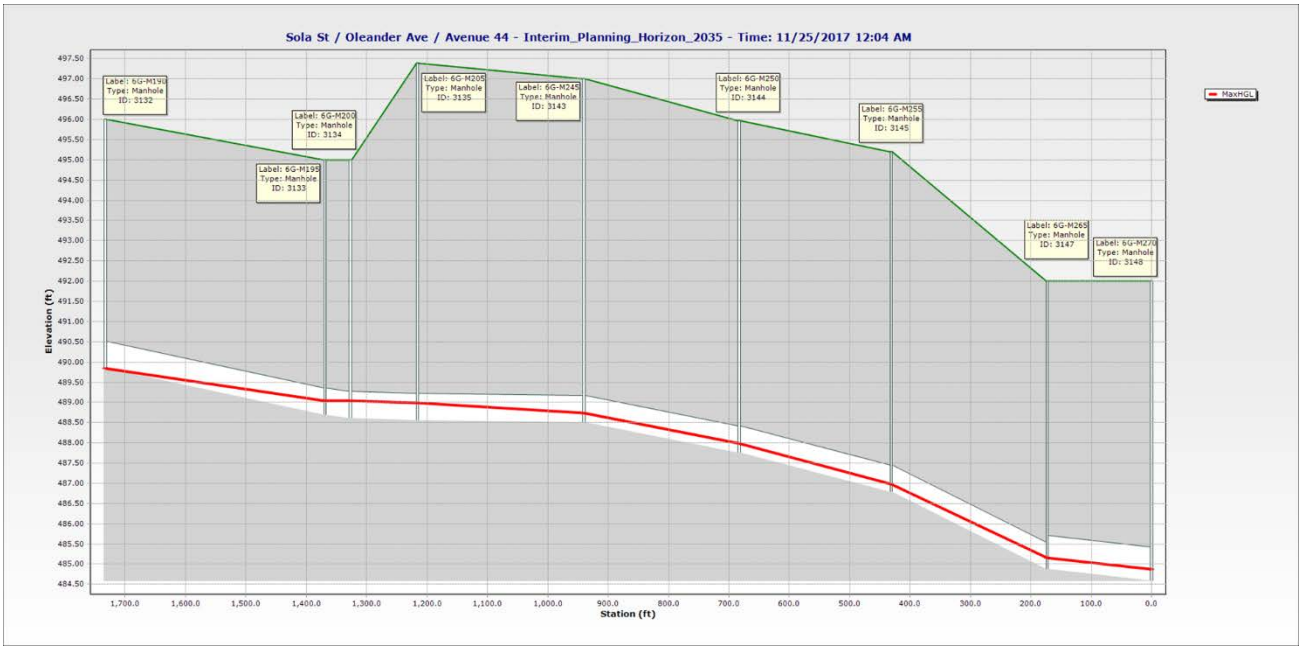

Figure 29 – Sola St between Oleander Ave and Avenue 44 under Interim Planning Horizon Conditions

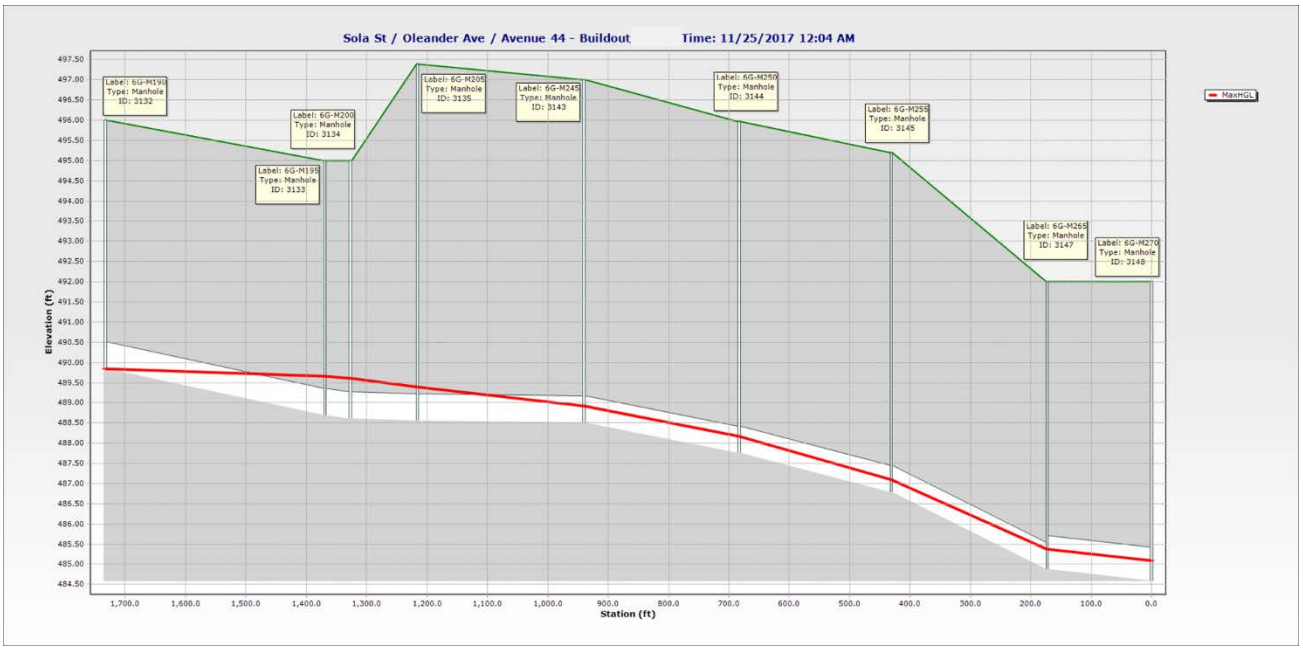

Figure 30 – Sola St between Oleander Ave and Avenue 44 under Build-Out Conditions

7. **Avenue 49 between Hjorth St and Desert Grove Dr** – This area of concern is applicable for build-out conditions only. The conduits that exceeded the d/D criteria for build-out conditions on Avenue 49 are listed below. The hydraulic profile for this area of concern is shown in **Figure 31**, and the model results are shown in **Table 14**. Avenue 49 Interceptor project was previously recommended for this area of concern and provides partial relief for projected capacity issues. It is recommended that VSD continues to monitor this line for future capacity issues and include this area in future flow monitoring efforts.

Table 14 - Avenue 49 between Hjorth St and Desert Grove Dr Model Results

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
13E-M130_13E-M135	8	0.06	0.07	1.00
13E-M135_13E-M210	8	0.28	0.33	1.00
13D-M070_13D-M075	10	0.27	0.31	1.00
13D-M075_13D-M080	10	0.35	0.41	1.00
13D-M080_13E-M210	10	0.40	0.47	1.00
13E-M210_13E-M215	10	0.36	0.43	1.00
13E-M215_13E-M220	10	0.36	0.44	1.00
13E-M220_13E-M225	10	0.36	0.45	1.00
13E-M225_13E-M230	10	0.39	0.49	1.00
13E-M230_13E-M235	10	0.35	0.43	1.00

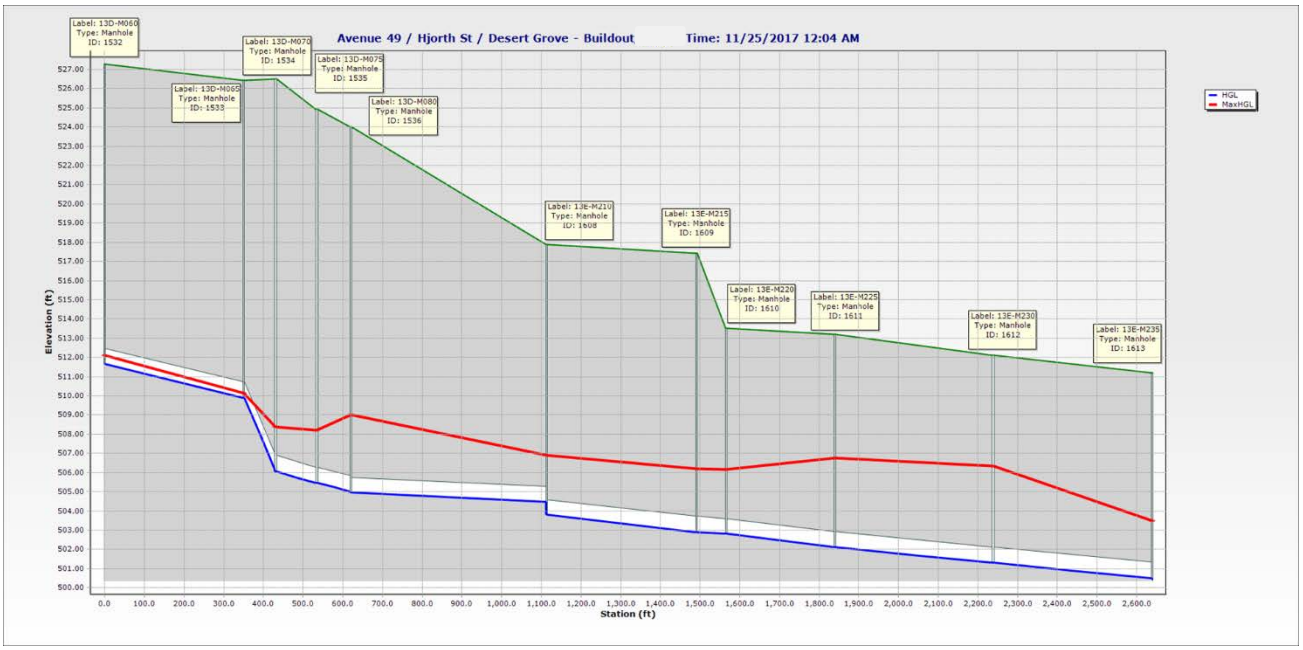

Figure 31 – Avenue 49 between Hjorth St and Desert Grove Dr under Build-Out Conditions

8. **Desert Grove Dr between Avenue 49 and Avenue 48** – This area of concern is applicable for build-out conditions only. Thee conduits that exceeded the d/D criteria for build-out conditions on Desert Grove Dr are listed below. There are few conduits on the trunk line which exceeded the d/D criteria for interim planning horizon conditions. The hydraulic profile for this area of concern is shown in **Figure 32** through **Figure 34**, and the model results are shown in **Table 15**. It is recommended that VSD monitor this area and include it as part of future flow monitoring efforts. It is noted that project P-3 may provide relief to this area as well.

Table 15 - Desert Grove Dr between Avenue 49 and Avenue 48 Model Results

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
12E-M315_12E-M320	10	0.39	0.49	1.00
12E-M320_12E-M325	10	0.40	0.50	1.00
12E-M325_12E-M330	10	0.41	0.53	1.00
12E-M330_12E-M335	10	0.40	0.52	1.00
12E-M335_12E-M340	10	0.43	0.54	1.00
13E-M235_13E-M240	10	0.33	0.44	1.00
13E-M240_13E-M245	10	0.35	0.46	1.00
13E-M245_13E-M250	10	0.34	0.45	1.00

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
13E-M250_13E-M255	10	0.36	0.47	1.00
13E-M255_13E-M260	10	0.39	0.49	1.00
13E-M260_12E-M315	10	0.39	0.49	1.00
13E-M295_13E-M235	10	0.19	0.24	1.00
12E-M340_12E-M385	10	0.45	0.53	0.83

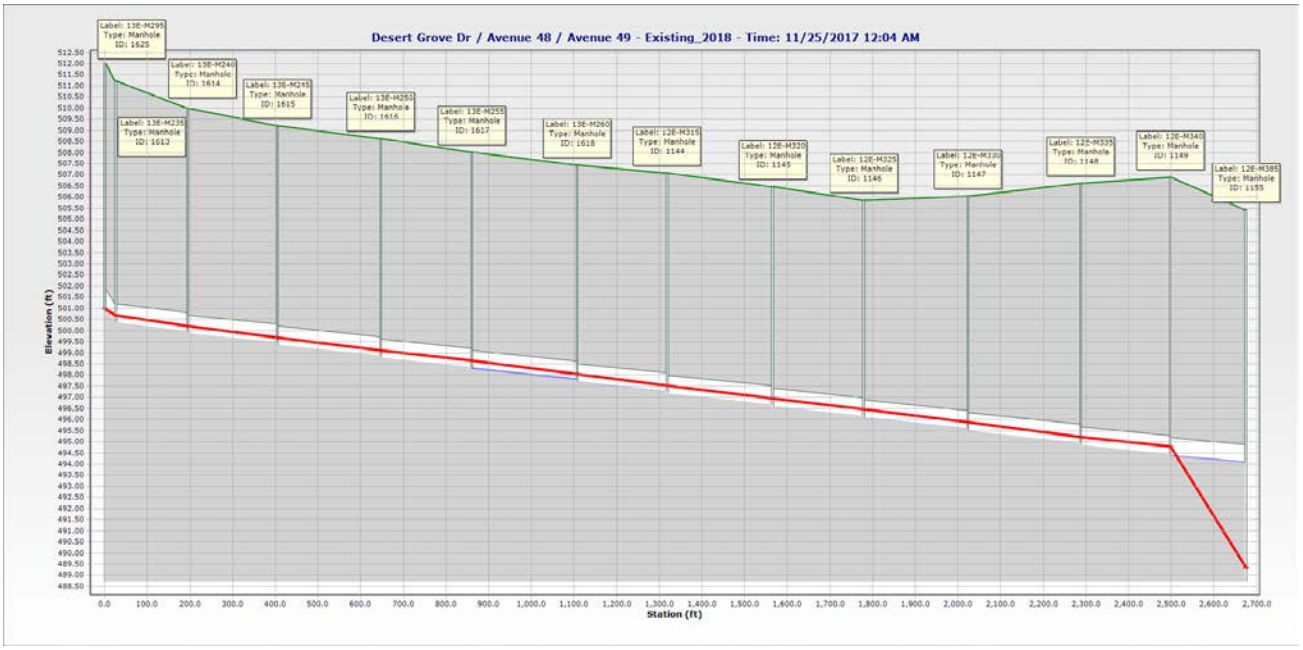

Figure 32 – Desert Grove Dr between Avenue 49 and Avenue 48 under Existing Conditions

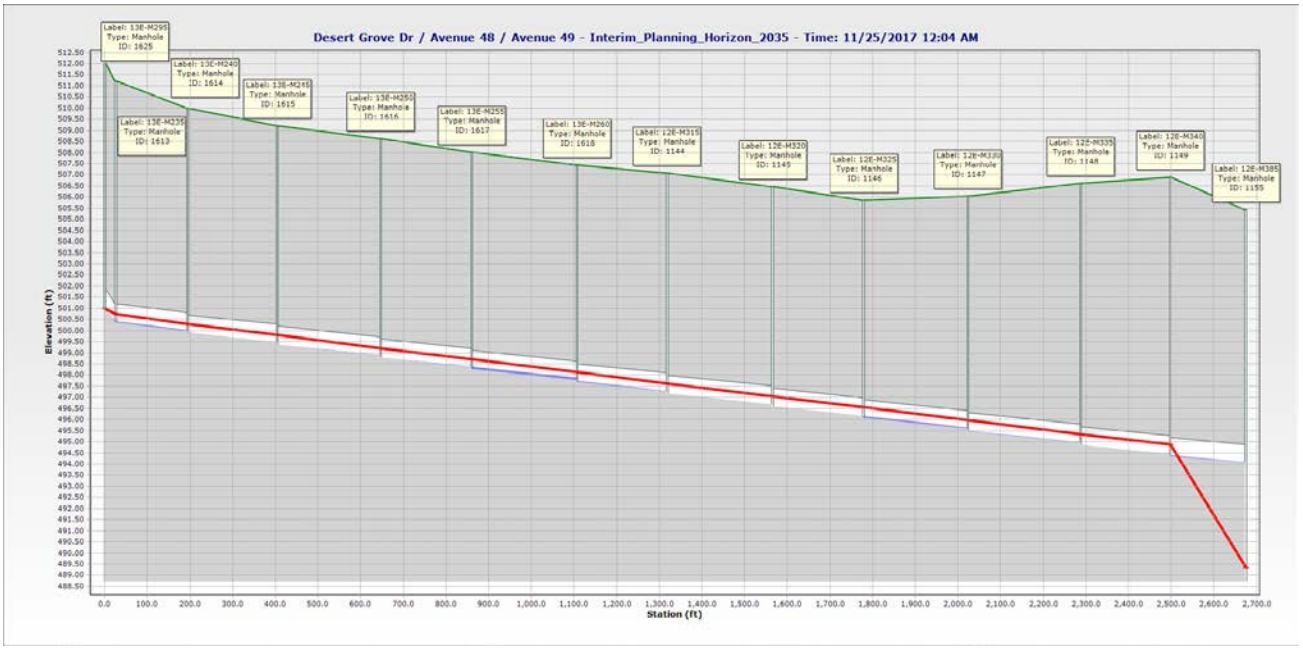

Figure 33 – Desert Grove Dr between Avenue 49 and Avenue 48 under Interim Planning Horizon Conditions

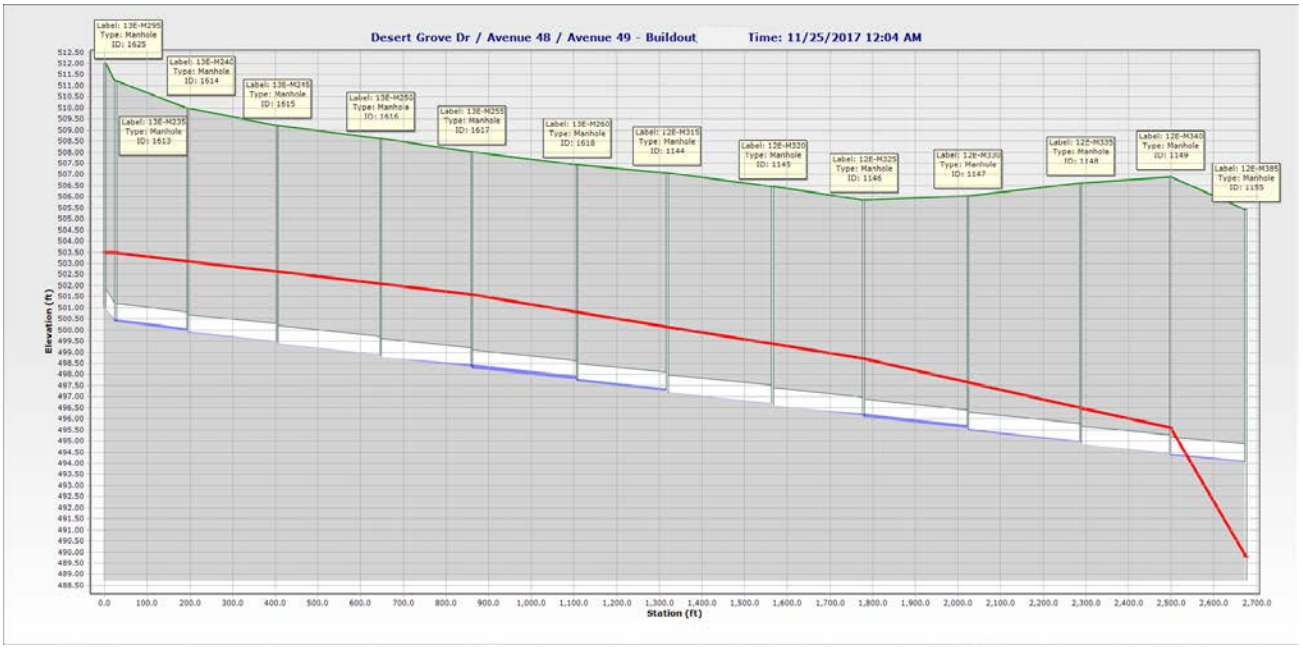

Figure 34 – Desert Grove Dr between Avenue 49 and Avenue 48 under Build-Out Conditions

9. **Van Buren St between Avenue 48 and Highway 111** – This area of concern is applicable for build-out conditions only. The conduits that exceeded the d/D criteria for build-out conditions on Van Buren street are listed below. The model results are shown in **Table 16**. There was no CIP project from the 2013 CSMP that addressed this areas and as such it is recommended that VSD monitor this area and include it as part of future flow monitoring efforts.

Table 16 - Van Buren St between Avenue 48 and Highway 111 Model Results

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
12J-M075_12J-M080	30	0.46	0.50	0.99
12J-M080_11J-M085	30	0.53	0.56	1.00
11J-M085_11J-M090	30	0.52	0.55	0.98
11J-M090_11J-M145	30	0.48	0.51	0.95
11J-M145_11J-M095	30	0.48	0.51	0.94
11J-M095_11J-M100	30	0.49	0.51	0.93
11J-M100_11J-M105	30	0.53	0.55	0.94
11J-M105_10J-M045	30	0.57	0.58	0.93

10. **Calhoun St** – The conduit that exceeded the d/D criteria for interim planning horizon and build-out conditions on Calhoun St at Avenue 43 between South Fork Ct is listed below. The hydraulic profile for this area of concern is shown in **Figure 35**, and the model results are shown in **Table 17**. There was no CIP project from the 2013 CSMP that addressed this areas and as such it is recommended that VSD monitor this area and include it as part of future flow monitoring efforts.

Table 17 - Calhoun St Model Results

Conduit ID	Diameter (inches)	Existing Conditions d/D	Interim Planning Horizon d/D	Build-Out Conditions d/D
5I-M075_5I-M080	15	0.40	0.59	1.00

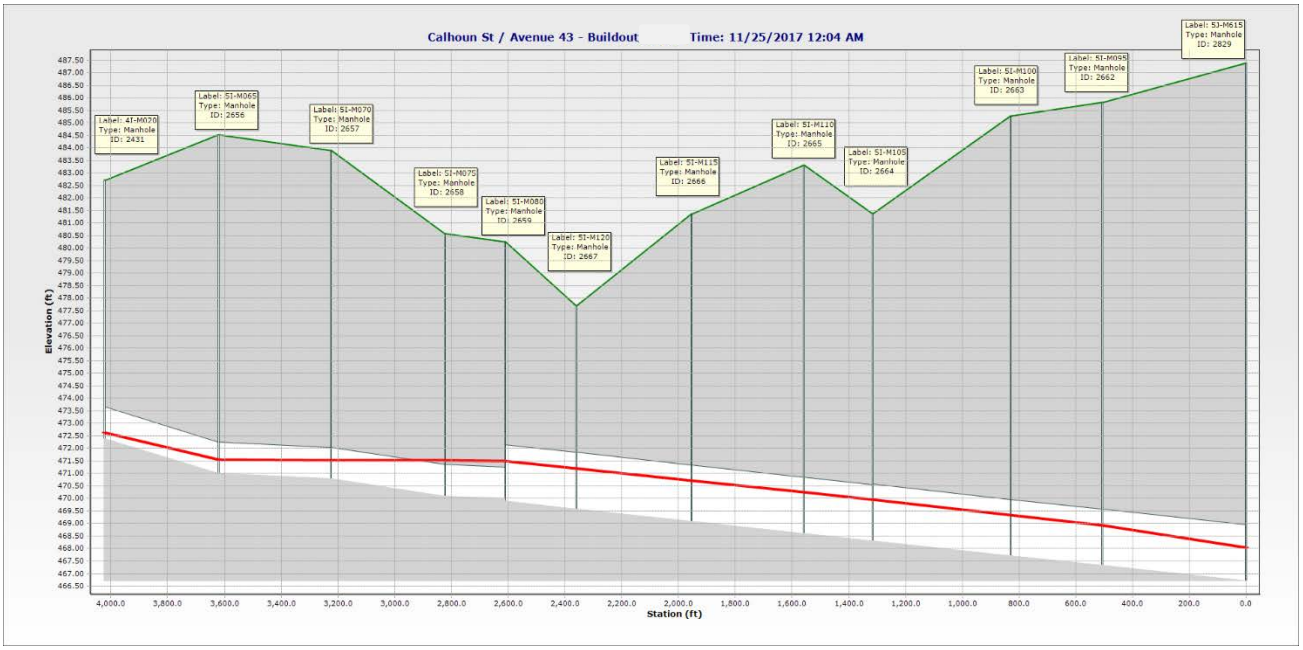

Figure 35 – Calhoun St at Avenue 43 Under Build-Out Conditions

Updated Recommended Improvements

The model results indicate that no improvements are needed for the existing conditions (2017) and interim planning horizon conditions (2035). However, projects E-4, E-6, P-1, P-2 and P-3 from the CSMP (2013) are still required to address the capacity deficiencies predicted by the model for build-out conditions. These projects are recommended no sooner than the planning horizon according to the results of this CSMP Review; however new development, changes in zoning and population, and changes in usage trends could cause areas to exceed design capacity sooner which would necessitate a project earlier than the interim horizon (2035). It is recommended that VSD initiate a new Master Plan Update and flow monitoring effort prior to 2035, ideally in the next four to eight years, in order to confirm these results and update model flows with field data. AOCs identified in this review should be prioritized for flow monitoring and should be monitored by operations staff in the meantime to ensure no capacity issues develop. A summary of updated recommended improvements is shown in **Table 18**.

Table 18 – Updated Recommended Improvements Summary

Project Number	Project Name	Description	Purpose	AOC Addressed	Phase[1]	New or Upgrade	Operational Change	Size of Pipe (in)	Length of Pipe (ft.)	Total Length of Pipe (ft.)
E-4	Clinton Street Operational Change	Operational change to send flows north on Clinton Street to the Requa Interceptor.	Relieve Dr. Carreon Blvd	2	Build-Out	N/A	Yes	N/A	N/A	N/A
E-6	Avenue 48 West Upgrade	Upsizing of 10-inch line extending west from along Avenue 48 from Madison St.	Relieve current and projected capacity issues for Avenue 48 West	1	Build-Out	Upgrade	No	15/18	670/ 2,875	3,545
P-1	Arabia Interceptor/ Jackson Street Operational Change	Bulkheading change and pipe improvements to divert flow from Dr. Carreon Blvd north to Highway 111	Relieve Dr. Carreon Blvd and Date St	2	Build-Out	New	Yes	8	850	850
P-2	Highway 111 Interceptor	Pipe connecting N. Hwy 111 to the Requa Interceptor	Relieve Dr. Carreon and increase Hwy 111 capacity in order to accommodate jail expansion	2, 4, 5	Build-Out	Both	No	12	2,979	2,979
P-3	Avenue 49 Interceptor	Interceptor to convey flows from Avenue 49 to Monroe Street and then north to Avenue 48	Relieve Avenue 49 and Desert Grove Street	7, 8	Build-Out	New	No	12	565	565
P-4	Industrial Pl./Market Interceptor	12-inch interceptor along Fred Waring Dr. from Industrial Pl. to Monroe St., sending flows down Market street	Relieve Sola Street, Palo Verde Street, Avenue 44, and Avenue 45	6	Build-Out	New	No	12	967	967

[1]: These areas should be monitored, reviewed and modeled in the next 4-8 years, but are currently not recommended until after the interim planning scenario.

REMAINING AREAS OF CONCERN

The model is run with the updated CIP recommendations shown in **Table 5**, and the results were analyzed to verify if any projects are further required to address capacity issues. The model results show the following areas of concern with conduits exceeding the design criteria (d/D>0.90) for build-out conditions. **Figure 36** shows the locations of these AOCs. It is recommended that these areas be monitored in the future.

- Calhoun St at Avenue 43
- Highway 111 between Oasis St and Calhoun St
- Van Buren St between Avenue 48 and Dr. Carreon Blvd
- Avenue 49 between Hjorth St and Desert Grove Dr.

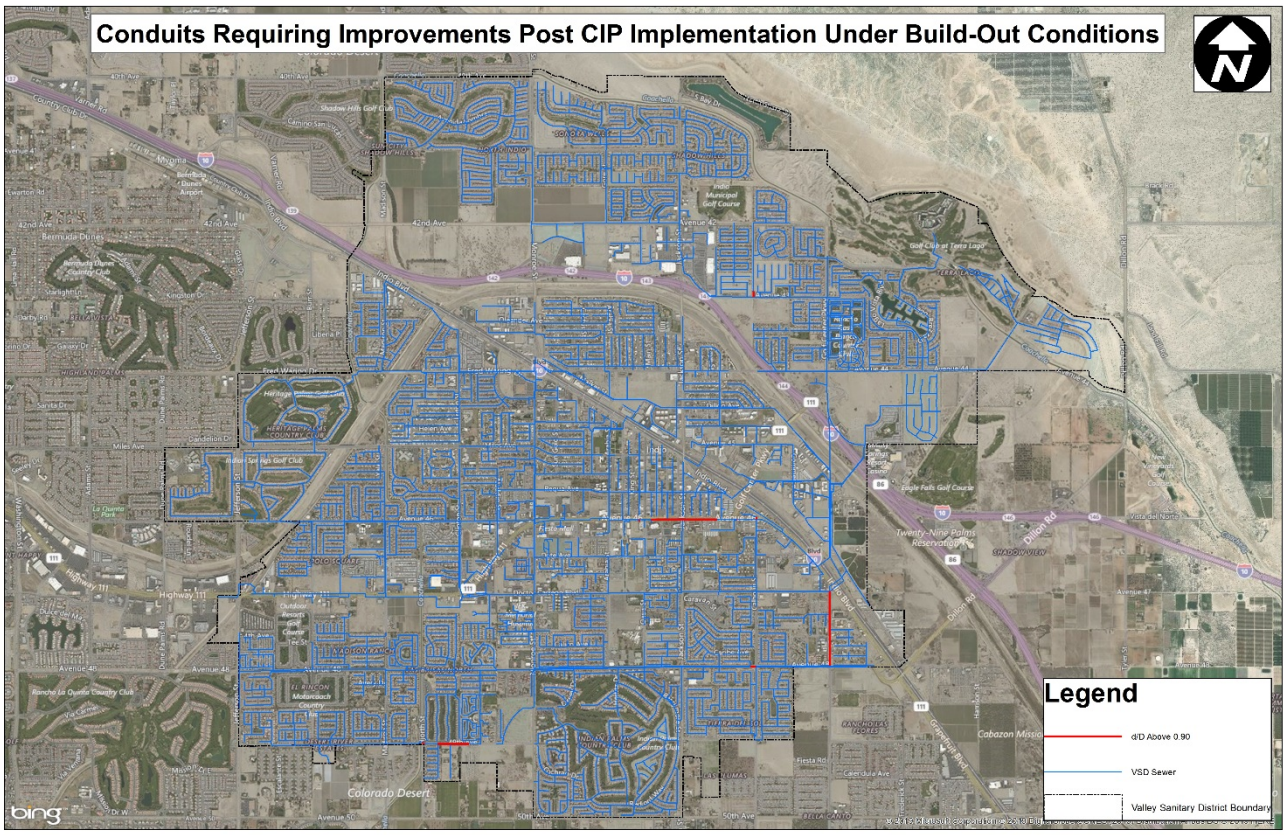

Figure 36 – Conduits Exceeding Design Criteria (d/D>0.90) Post CIP Implementation

APPENDIX A – NEGATIVE AND FLAT SLOPE VERIFICATION

Review of Negative and Flat Slopes in 2018 Model				
Conduit_ID (2013 Model)	Conduit_ID (2018 Model)	Slope (ft/ft)		
		2013	2018	VSD Comment
10E-M153_10E-M180	10E-M153_10E-M180	-0.0213967	-0.0213967	Not Negative See 2-133, 2-193, & 2-105
10E-M170_10E-M180	10E-M170_10E-M180	-0.0007725	-0.0007725	Not Negative See 2-105
10G-M217_10G-M220	10G-M217_10G-M220	-0.0035473	0.0065034	Negative See 10-051
10G-M240_10G-M245	10G-M240_10G-M245	0	0.0338447	Not negative See 2-050
10J-M045_10J-M050	10J-M045_10J-M050	-0.0069798	0.0008725	Negative See 2-325.03
10J-M060_10J-M065	10J-M060_10J-M065	-0.0006064	0.0001155	See 2-325.03
10J-M065_10J-M070	10J-M065_10J-M070	-0.0139472	0.0004102	See 2-325.03
10J-M070_10J-M075	10J-M070_10J-M075	0	0.0001323	See 2-325.03
10J-M100_10J-M025	10J-M100_10J-M025	0	0	Dry Over flow line 2-003
11F-M230_11F-M235	11F-M230_11F-M235	-0.0018301	0.0030719	Private. Remove from model
11F-M245_11F-M250	11F-M245_11F-M250	-0.0029295	0.000651	Private. Remove from model
11J-M095_11J-M100	11J-M095_11J-M100	-0.000172	0.0003194	See 2-325.03
12C-C010_12C-M175	12C-C010_12C-M175	-0.0441951	-0.0168182	Private. Remove from model
12F-M135_12F-M140	12F-M135_12F-M140	-0.0739672	-0.0739672	Force Main
12F-M240_12F-M245	12F-M240_12F-M245	-0.0013621	0.0012995	No as-builts. Interpolate
12F-M315_12F-M316	12F-M315_12F-M316	0	0.0045455	Accept as interpolated.
12G-M215_12G-M340	12G-M215_12G-M340	-0.0037145	-0.0037145	See 2-110
12G-M225_12G-M230	12G-M225_12G-M230	-0.0286786	-0.0286786	Force Main
12H-M355_12H-M360	12H-M355_12H-M360	0	0.0003924	See 15-310.05
12J-M045_12J-M025	12J-M025_12J-M045	0	0	Pump Station Overflow
12J-M050_12J-M055	12J-M050_12J-M055	-0.0036826	-0.0036826	Old Force Main Out of Service
12J-M070_12J-M085	12J-M070_12J-M085	0	0.000343	See 2-325.03
12J-M085_12J-M075	12J-M085_12J-M075	-0.0056288	0.0009381	See 2-325.03
13H-C005_13H-M130	13H-C005_13H-M130	-0.0433492	0.0031628	Accept as interpolated.
4H-M008_4H-C020	4H-M008_4H-C020	-0.0045454	0.4795449	4H-C020 is US Stub for Tie ON
6D-M005_6D-M105	6D-M005_6D-M105	0	0.0020284	See 2-124
6F-M335_6F-M340	6F-M335_6F-M340	-0.0350253	0.0033457	See 2-182 Siphon Dry due to Monroe interceptor
6I-M120_6J-M780	6I-M120_6J-M780	-0.0001319	0.0031658	Accept as interpolated.
7C-M075_7C-M080	7C-M075_7C-M080	0	0.0006312	See 5-095
7D-M024_7D-M077	7D-M024_7D-M077	-0.012569	0.0010079	See 5-002
7G-M325_7G-M200	7G-M325_7G-M200	-0.0470117	0.0315939	Over Flow
8D-M290_8D-M175	8D-M290_8D-M175	-0.0000758	0.0014407	See 5-029
8G-C005_8G-M035	8G-C005_8G-M035	0	0.0123904	No as-builts. Interpolate

Review of Negative and Flat Slopes in 2018 Model				
Conduit_ID (2013 Model)	Conduit_ID (2018 Model)	Slope (ft/ft)		
		2013	2018	VSD Comment
8J-M065_8J-M070	8J-M065_8J-M070	-0.0030403	0.0041897	Accept as interpolated.
9C-M145_9C-M150	9C-M145_9C-M150	-0.0099129	-0.0099129	Force Main Out of Service
9D-M330_9D-M335	9D-M330_9D-M335	-0.0005756	0.001535	Trouble spot may have grade bust
9E-M146_9E-M147	9E-M146_9E-M147	0	0.0033956	Private. Remove from model
9H-M255_9H-M250	9H-M255_9H-M250	-0.0011233	-0.0011233	No longer in GIS. Remove from model
CALHOUN_13I-M010_1	CALHOUN_13I-M010_1	-0.0325781	-0.0325781	Force Main
CALHOUN_13I-M015	CALHOUN_13I-M015	0	0.0094595	13I-M015 upstream See 15-324.04
CDT-11	9C-M265_9C-M270_2	-0.068	0.0019405	Siphon See 2-122
CDT-15	Crest Ave Siphon 1_5G-M085	-0.0175	-0.0175	Siphon See 4-057
CDT-19	6F-M030_6F-M205	0	0.0025794	Siphon See 4-172
CDT-25	6D-M115_6D-M120	-0.4141208	0.0021286	Siphon See 2-123
CDT-29	8J-M125_8J-M130_7	-0.1412805	0.0036897	Siphon See 2-306.05
CDT-31	8J-M125_8J-M130_8	-0.1412805	0.0037009	Siphon See 2-306.05
CDT-33	8J-M125_8J-M130_9	-0.1412805	0.0037009	Siphon See 2-306.05
CDT-35	8J-M125_8J-M130_4	0	0.0037006	Siphon See 2-306.05
CDT-37	8J-M125_8J-M130_5	0	0.0037006	Siphon See 2-306.05
CDT-45	8J-M125_8J-M130_6	0	0.0037006	Siphon See 2-306.05
CO-10	BarrymorePMP-1_12G-M225	-0.5975233	-0.5975233	Force Main
CO-149	9E-M280_9E-M345	-0.0144509	0.0460999	See 2-385.38
CO-15	12G-M290_BarrymorePMP-2	0	0	Force Main
CO-150	9E-M245_9E-M330	-0.0554394	0.0633333	See 2-385.37
CO-16	BarrymorePMP-2_12G-M225	-0.2909552	-0.2909552	Force Main
CO-19	9C-M145_ShieldsWW	0	0	Pump Station
CO-24	ShieldsWW_ShieldsPMP-1	0	0	Pump Station
CO-25	ShieldsPMP-1_MH-5	-7.4686564	-7.4686564	Pump Station
CO-26	ShieldsPMP-2_MH-5	-8.3163369	-8.3163369	Pump Station
CO-27	ShieldsWW_ShieldsPMP-2	0	0	Pump Station
CO-31	VandPMP-1_12F-M135	-0.1747081	-0.1747081	Force Main
CO-32	Vand WW_VandPMP-1	0	0	Pump Station
CO-33	Vand WW_VandPMP-2	0	0	Pump Station
CO-34	VandPMP-2_12F-M135	-0.1579684	-0.1579684	Force Main
CO-37	12J-M050_12J-M030	-0.0057436	-0.0057436	Force Main
CO-44	CalhounWW_CalhounPMP-1	0	0	Pump Station
CO-45	CalhounPMP-1_CALHOUN	-1.0968326	-1.0968326	Pump Station

Review of Negative and Flat Slopes in 2018 Model				
Conduit_ID (2013 Model)	Conduit_ID (2018 Model)	Slope (ft/ft)		
		2013	2018	VSD Comment
CO-46	CarverPMP-1_12J-M050	-0.5333333	-0.5333333	Pump Station
CO-47	12J-M-045_CarverPMP-1	0	0	Pump Station
CO-48	CarverPMP-2_12J-M050	-0.5333333	-0.5333333	Pump Station
CO-49	12J-M-045_CarverPMP-2	0	0	Pump Station
CO-5	CalhounWW_CalhounPMP-2	-0.3728618	-0.3728618	Pump Station
CO-6	CalhounPMP-2_CALHOUN	-0.3622374	-0.3622374	Pump Station
CO-73	8I-M098_8I-M200	-0.0096268	0.174	See 2-385.34
CO-9	12G-M290_BarrymorePMP-1	0	0	Pump Station
CO-91	9G-M130_9G-M330	-0.1534076	0.00625	See 2-385.36

Valley Sanitary District

Technical Memo 1

Memorandum for Program Management Plan and Design for the Collection System Infrastructure Project

FINAL

October 17, 2018

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1. Background

a. Introduction

This memorandum establishes criteria to evaluate the existing condition of Valley Sanitary District (District) Collection System and rehabilitation options to repair defective sewer pipelines.

Trenchless rehabilitation options will be prioritized because of its inherent cost effectiveness and lesser impacts on the community during construction. It is also understood that the District would like to investigate trenchless lining as an early pilot project.

The Memorandum will also address the District's Close Circuit TV (CCTV) program with regards to the completion of the CCTV information and recommended CCTV cycle. CCTV information will help prioritize the most urgent pipeline rehabilitation needs, and collaboratively, this memo will provide the criteria for establishing the District's Capital Improvement Program, identify sequencing of construction projects to address program priorities, and achieve reasonable budgeted costs.

This memorandum does not discuss VSD's sewer pump stations and force mains.

b. Project Progress to Date

To date, the following tasks have been completed in accordance with our scope of services:

- Developed draft Communication Plan and draft Project Charter
- Inventoried entire VSD sewer pipeline & manhole system GIS data of **1,332,487 LF of Sewer Pipeline and 4,910 Sewer Manholes**
- Compiled VSD sewer pipeline CCTV GIS data & videos up to 10/3/18 received on a quarterly basis.
- Compiled VSD sewer manhole condition GIS data up to 8/23/18
- Inventoried VSD private and abandoned sewer pipeline owner GIS data
- Inventoried VSD sewer trouble spots GIS data & description
- Compiled VSD boundary, parcel and street GIS data, and City of Indio boundary GIS data

The following maps were created from the above obtained data and are included in the Appendix:

- VSD Sewer Pipeline Quick Rating Structural (QRS) Grading Inventory Map
- VSD Sewer Pipeline CCTV Needs, Trouble Spots and Descriptions Map
- VSD Sewer System Identified in Easements and Right-of-Way Map as of 8/28/18
- Harris Sample Review of CCTV Data with Recommended Repairs Map

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- VSD Sewer Manhole Inspection Condition Inventory Map
- VSD Future Sewer Manhole Inspection Needs Map

2. CCTV Inspection Program

The VSD system is comprised of 1,332,487 linear feet (LF) of pipe ranging in diameter from 6" to 54", the system also encompasses 4,910 sewer manholes. The majority of system pipeline are smaller than 12" in diameter, approximately 1.15 million LF, and trunk sewer systems (greater than 12") are approximately 185,000 linear feet. District staff self performs all CCTV work based on staff's availability and work load.
Based on available CCTV data, it appears that the District has a consistent CCTV program dating back to 2008. The District has significantly ramped up CCTV efforts over the last 5 years.

The following summarizes LF of CCTV inspection performed by the District over the last 10 years.

Year	Length of VSD Sewer Pipeline CCTV'd (LF)	Average Linear Feet Per Month
2008	26,642	3,806
2009	50,230	4,186
2010	62,414	5,201
2011	41,116	3,426
2012	69,613	5,801
2013	75,001	6,250
2014	108,195	9,016
2015	123,293	10,274
2016	179,905	14,992
2017	97,612	8,134
2018*	83,686	19,925
Total	**917,707**	

*Year 2018 is up to May 11th of 2018

The District is working on establishing a consistent CCTV cycle to inspect the entire system network. Based on our discussion with District Staff, it appears that a 10 year cycle interval is appropriate for VSD sewer systems that are 12" or smaller, and a 5 year cycle interval for sewer systems 15" or larger.

Based on the above criteria, the District should be able to complete CCTV of the entire system within the above intervals by conducting CCTVs at rate of 11,000 LF per month. However, since there is an existing backlog of pipes that have never been CCTV'd, an accelerated CCTV rate is initially required to achieve the 10 year CCTV cycle interval. We developed several scenarios to demonstrate the timeline required to achieve CCTV of the entire system within the above recommended cycles.

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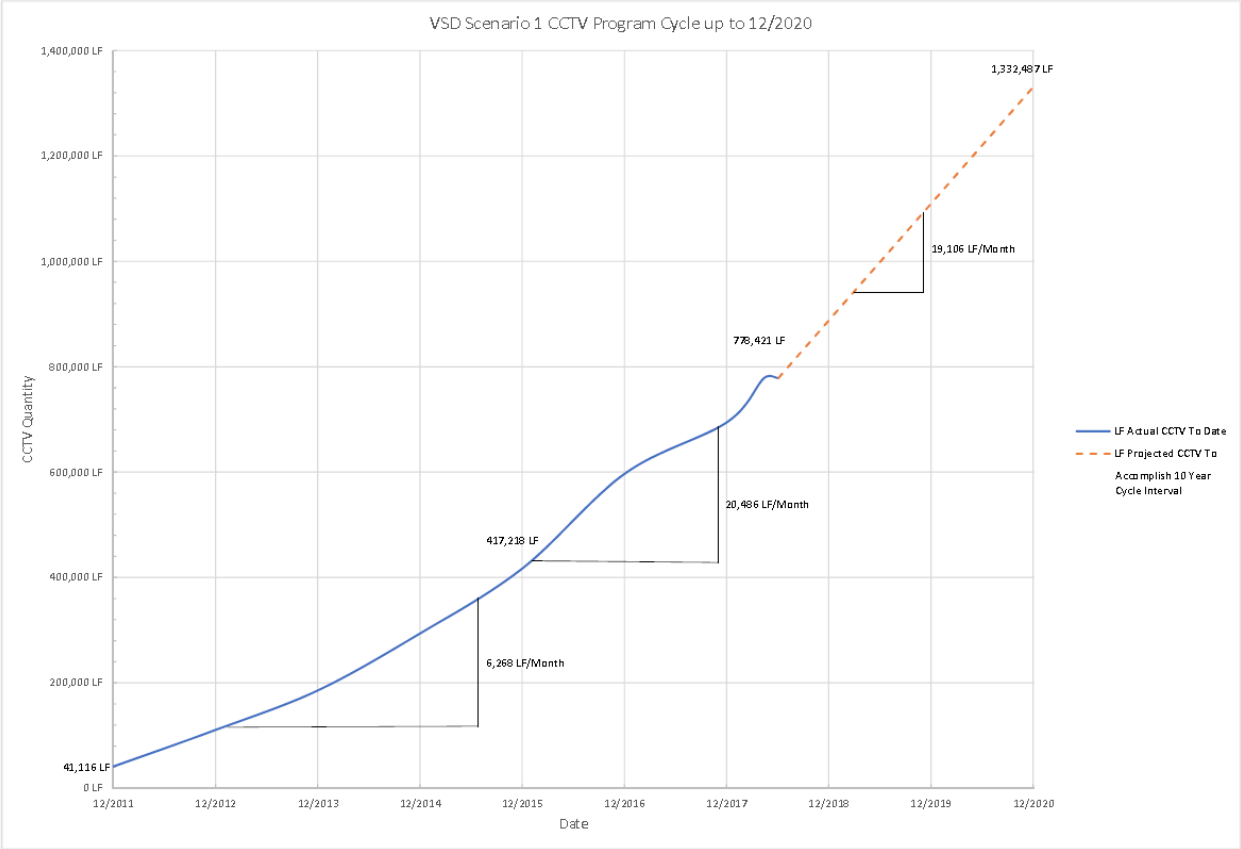
Scenario 1 VSD CCTV Program Cycle up to 12/2020 – This scenario covers the period from 1/2011 to 12/2020. All sewer CCTV footage inspected prior to 2011 will be considered outside the 10 year CCTV cycle. This scenario accounts for a total of 778,421 LF of cumulative CCTV footage completed from 2011 up to 5/11/2018. The remaining sewer system comprised of 414,780 LF has never been CCTV'd. (In addition, 139,286 LF of CCTV footage that is older than 1/2011 will be considered outside of the 10 year CCTV cycle interval and will be required to re-CCTV.) In order to have the entire VSD sewer pipeline system CCTV'd within the 10 year CCTV cycle, a CCTV rate of 19,000 LF/Month will be required system.



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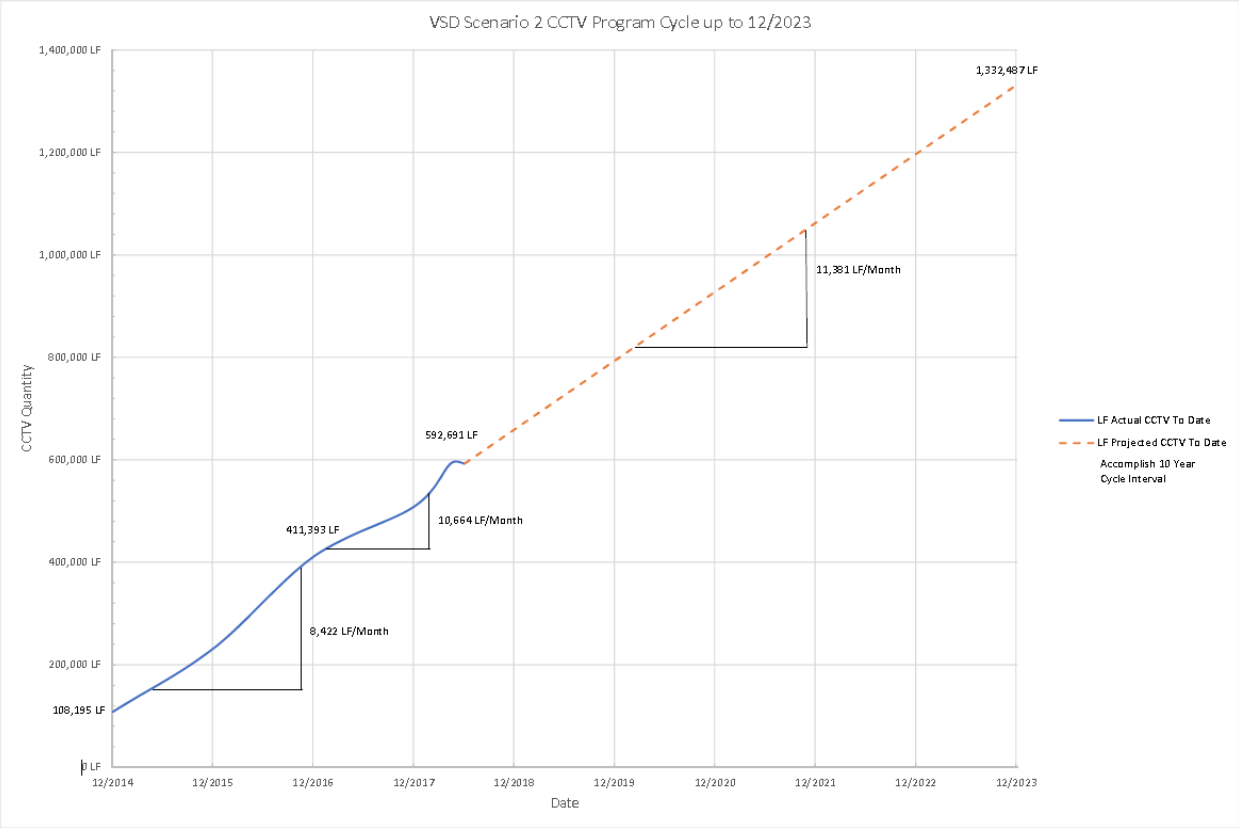
Scenario 2 VSD CCTV Program Cycle up to 12/2023 – This scenario covers the period from 1/2014 to 12/2023. All sewer CCTV footage inspected prior to 2014 will be considered outside the 10 year CCTV cycle. This scenario accounts for a total of 592,691 LF of cumulative CCTV footage completed from Year 2014 up to 5/11/2018. The remaining sewer system comprised of 414,780 LF has never been CCTV'd. In addition, 325,016 LF of CCTV footage from 2008 to 12/2013 will be considered outside of the 10 year CCTV cycle and will have to be re-CCTV'd. In order to have the entire VSD sewer pipeline CCTV video within the 10-Year CCTV cycle, a CCTV rate of 11,500 LF/Month will be required.



As discussed with District staff, priority on sewer pipelines to be CCTV'd shall be placed on pipelines built before 2000 and shall be tracked by the District. District believes scenario 2 is most feasible based on history of CCTV rates per month. Refer to Valley Sanitary District – Future CCTV Needs Map in the Appendix section on pg 28.

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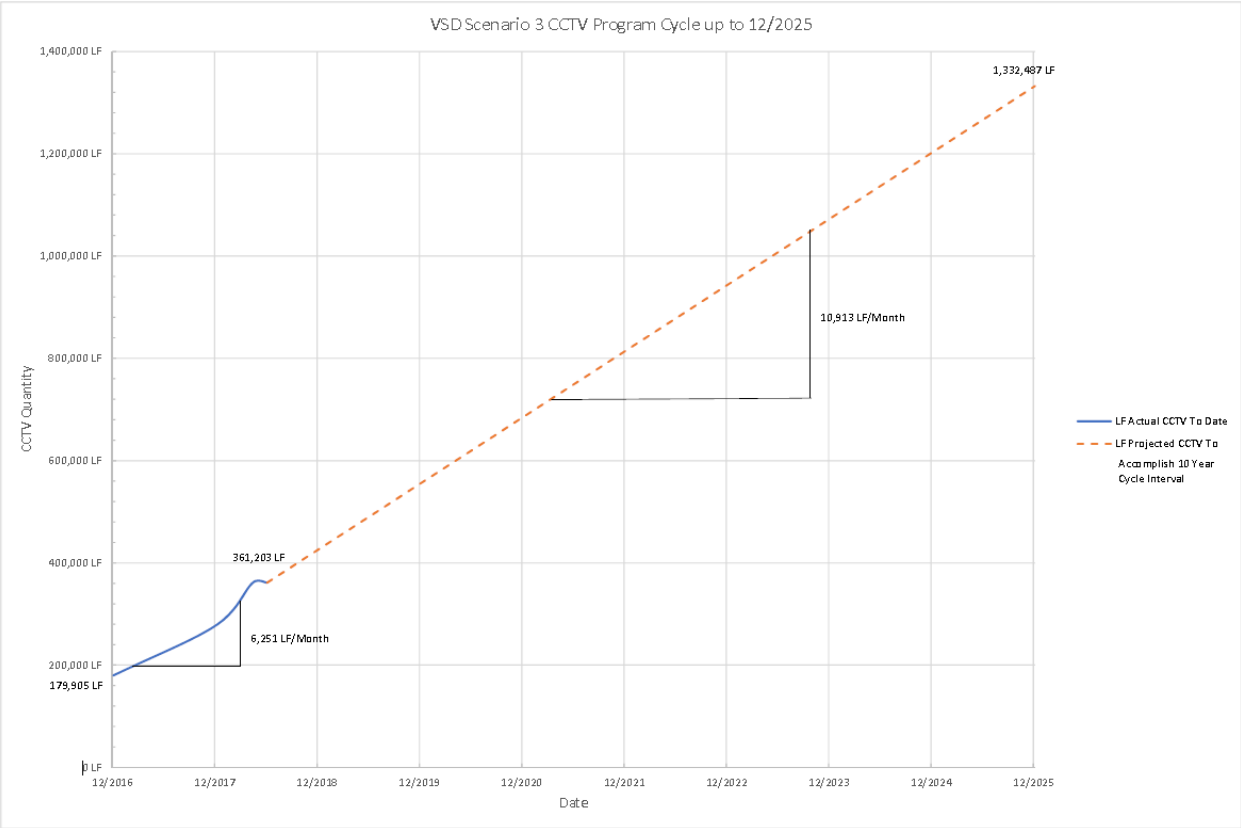
Scenario 3 VSD CCTV Program Cycle till 12/2025 –This scenario covers the period from 1/2016 to 12/2025. All sewer CCTV footage inspected prior to 2016 will be considered outside the 10 year CCTV cycle. This scenario accounts for a total of 361,203 LF of cumulative CCTV footage completed from Year 2016 up to 5/11/2018. The remaining sewer system comprised of 414,780 LF has never been CCTV'd. In addition, 556,504 LF of CCTV footage from 2008 to 12/2015 will be considered outside of the 10 year CCTV cycle and will have to be re-CCTV'd. In order to have the entire VSD sewer pipeline CCTV video within the 10 year CCTV cycle, a CCTV rate of 11,000 LF/Month will be required.



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District's CCTV Capabilities

Based on our discussions with District Staff, the District has limited equipment and resources that limits CCTV capabilities for large diameter trunks with high flows, sewer main with limited access, and mains with sags and siphons. It is our understanding that approximately 31,000 LF of sewer pipeline cannot be CCTV'd with District own forces and will required to be contracted out.

For sewer main with high flows, Harris recommends that conventional CCTV inspection is performed by-passing sewer flows as this method provides the most accurate visual inspection of sewer mains. However, there are different available alternatives of sewer pipe inspection which do not require sewer bypass in large high flow sewer mains.

<u>Multi-Sensor Pipeline Inspection:</u>

- Multi-sensor inspection (MSI) refers to the collection of data from multiple sensors on one robotic platform in one pass through a pipeline.
- A multi-laser pipe profiler is used for measurement of h2s corrosion, ovality, debris quantification, and internal pipe conditions with an accuracy of +/-.001% of pipe diameter.
- In full or partially full pipelines the sonar unit can provide a profile of pipe conditions, including pipe defects, and debris quantifications in 18" and larger pipelines and siphons.
- Battery-operated units do not require power or data cables. All tv, laser, and sonar data is stored on board the float.
- Laser technology includes: 3D Laser, Ring Laser, and Diode Lasers.
- Using this technology, technicians can collect and process data on internal pipeline conditions, including debris level, ovality, H2S corrosion, lateral location, and damage without requiring flow diversion, flow interruption, or manhole ring removal.
- Unit Cost of Multi-Sensor Pipeline Inspection for 36" and larger size: $6.50/LF

Multi-Sensor Pipeline Inspection Configuration & MSI HD Submarine Equipment, Carylon Corporation

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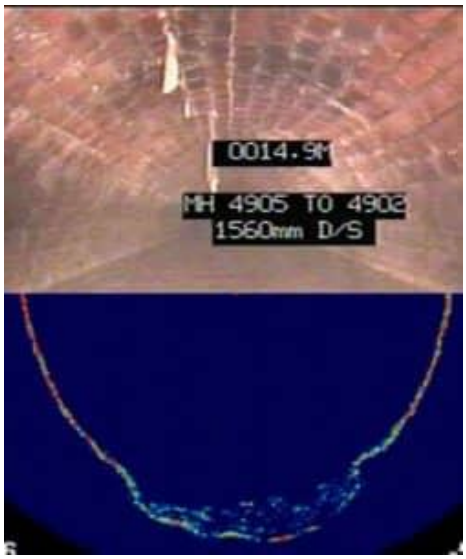
Sonar Pipeline Inspection:

- For use in submerged and semi-submerged pipelines ranging from 8" to 18 feet.
- Used with CCTV to provide simultaneous image of pipe both above and below waterline.
- Provides and quantifies dimensional data on silt level, grease accumulation, pipe deformation, offsets, blockages, etc. below the water line in partially charged lines.
- Provides "real-time" cross-sectional views of the pipe, utilizing high resolution/short range sonar.
- Sonar inspection provides a two-dimensional profile of the interior pipe wall, much like a medical MRI.
- Combination sonar and/or laser profiler provides true 360-degree report of conditions during active flow.
- Surcharged pipelines, siphons, river crossings, and force mains can be inspected without the costly, disruptive and sometimes impossible need for bypass pumping.
- Unit Cost of Sonar Pipeline Inspection for 8" – 30" sizes: $4.00/LF

Sonar CCTV Equipment



Sonar CCTV Inspection

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3. Assessment Methodology

As part of the District's CCTV Program, District staff rates the condition of the sewer network using Pipeline Assessment Certification Program (PACP) Condition Grading System Quick Structural Rating (QRS) for all pipes that have been CCTV'd to date. District Staff has completed visual inspection on approximately 4,187 manholes and provided a rating ranging from 3 (poor) to 1(good) for the sewer manhole trough, bench and walls.
The tables below summarize the Pipelogix Sewer Inspection QRS values of all pipes and manholes condition assessment inspected to date.

Sewer Pipeline (QRS) Grading CCTV Table*

Quick Rating Structural (QRS) Grading	Linear Foot of VSD CCTV'd Sewer Pipeline (LF)*	Percentage of Entire VSD Sewer Pipeline
5	15,189	1.1 %
4	44,974	3.4 %
3	28,146	2.1 %
2	34,525	2.6 %
1	5,562	0.4 %
0	789,311	59.2%
Total=	**917,707**	**68.9%**

*The above table is based on VSD Sewer PACP GIS Data received by VSD in May 2018.

Current State of VSD Sewer Manhole Inspected Condition*

Inspected Condition of VSD Sewer Manholes (Includes Trough, Bench or Wall)	Quantity (Each)	Percentage of Entire VSD Sewer Manhole
3 (Poor)	35	0.7%
2 (Fair)	125	2.5%
1 (Good)	3,807	77.5%
0 (Manholes not accessible due to easement challenges)	220	4.8%
Manholes not Inspected**	723	14.5%
Total=	**4,910**	

*The above table is based on latest VSD Sewer Manhole GIS Data received on 8/23/2018
**Manholes not Inspected also include Private/Abandoned sewer manholes based on GIS data received

Consistent condition rating is one of the primary means of identifying and prioritizing pipeline defects, which sets the stage for identifying project candidates for the different improvements; lining, point repair, minor replacements, etc. To that end, we reviewed a random sample (5,374 LF) of pipe rated 3-5 to draw correlations between QRS ratings and type of repair required for each pipe segment. Based on our review, we

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determined that there is no apparent correlation in the QRS rating lending to a consistent recommendation of the method of pipe segment repairs. We believe that providing pipe rehabilitation selection recommendations depending solely on QRS rating is not feasible, and a review of CCTV for pipe segments with QRS 3 or higher is necessary to establish proposed defect rehabilitation method and ultimately project candidates. Our opinion is consistent with 2018 NASSCO PAPCP Manual recommendation, refer to Appendix A for excerpts from NASSCO PACP Manual.

What if What Scenarios

Harris developed a pipeline rehabilitation selection flow chart to aid in developing suitable recommendation for pipeline repairs based on CCTV inspection of pipe segments on page 12 of this Memo. The flow chart addresses various pipe condition defects, including sags, offsets, abrupt alignment changes, apparent pipe deterioration (due to age or material type), etc. The chart also addresses factors impacting the selected methods for pipe repair including environmental concerns, proximity to high risk utilities, ground surface conditions, traffic, etc.

The following will provide a summary of the different pipe conditions and correlated recommended rehabilitation methods. A detailed description of each rehabilitation method is included in the Appendix.

Pipe Segment Defects Candidate for Open Trench Repair Recommendations: Sewer main candidate for open trench repairs contain continuous large dislocated joints which are not candidates for CIPP, large root intrusions and 30% of the pipe area contains stagnant flow due to a sag in the pipe that covers over at least half of the sewer reach length. Refer to below example photograph of a collapsed sewer pipe candidate for open trench repair.

Collapsed Sewer Pipe

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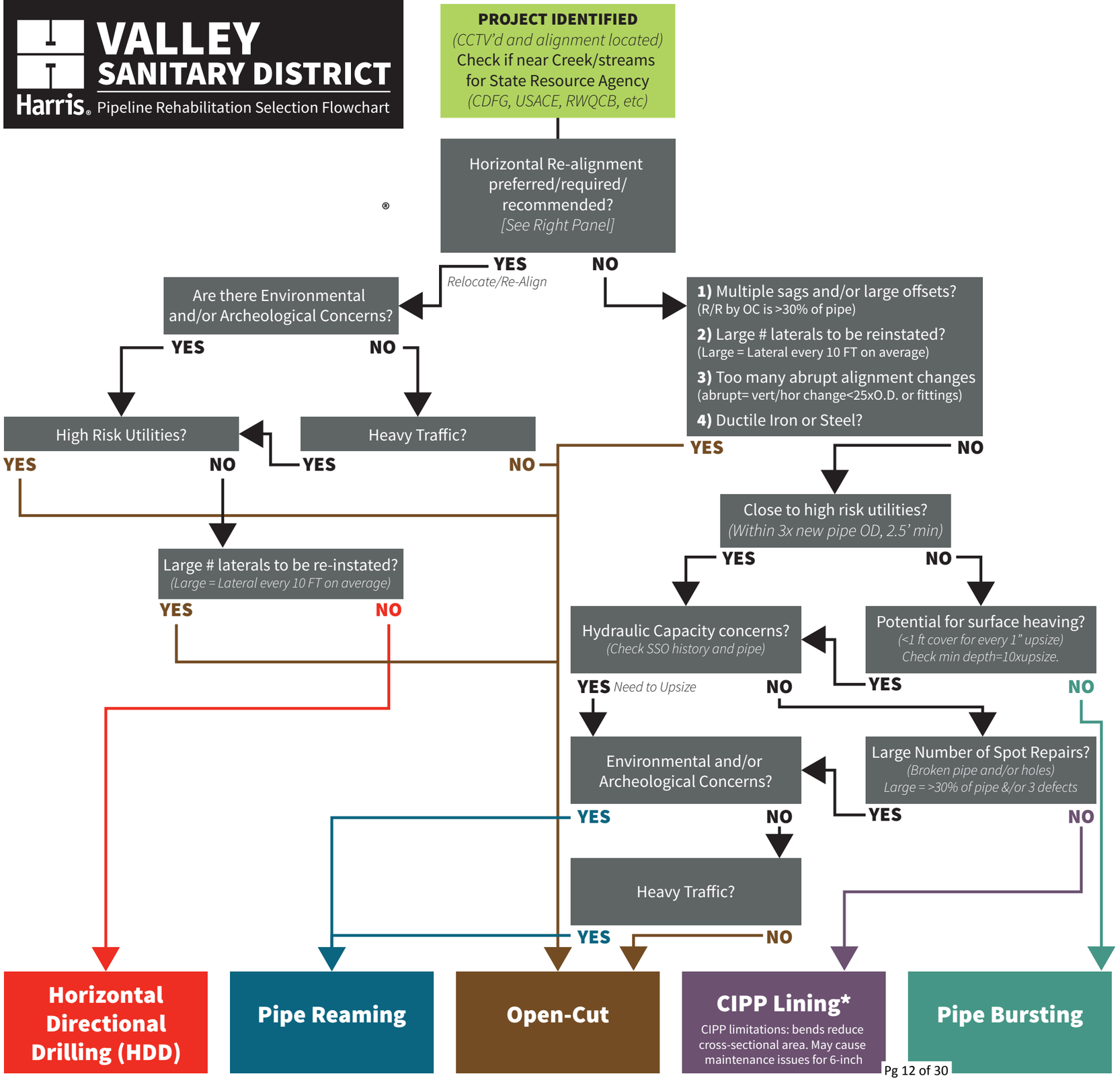
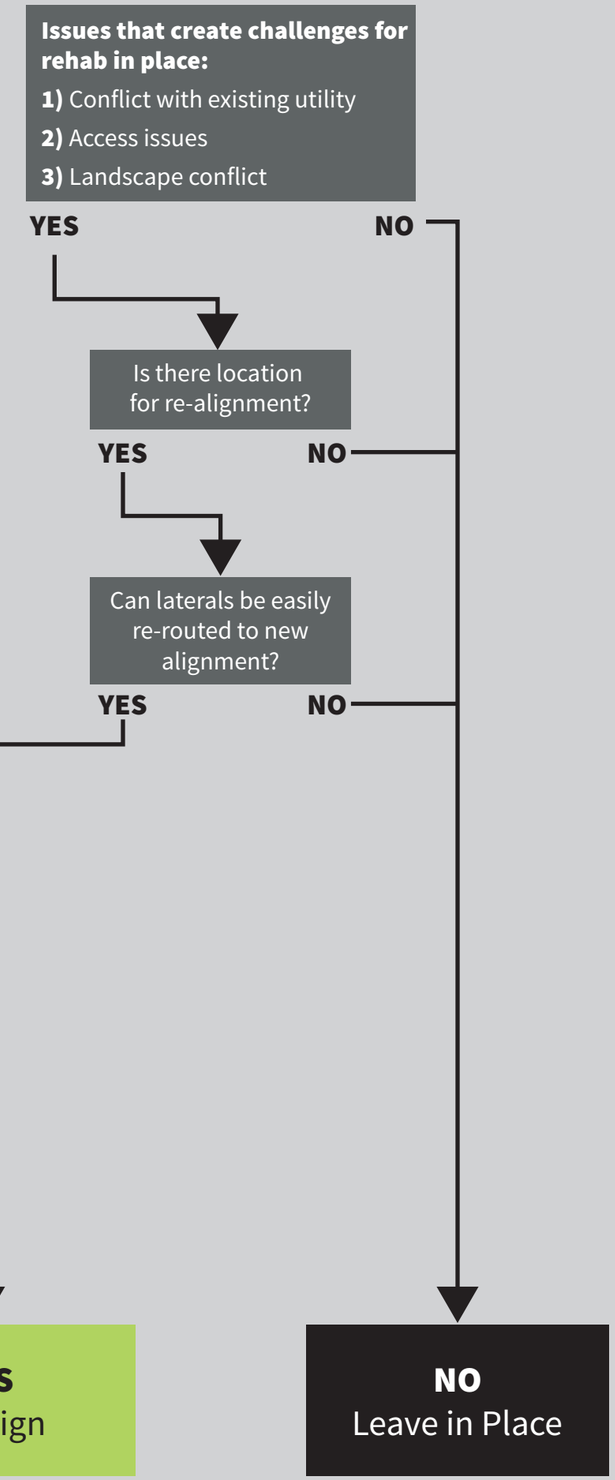
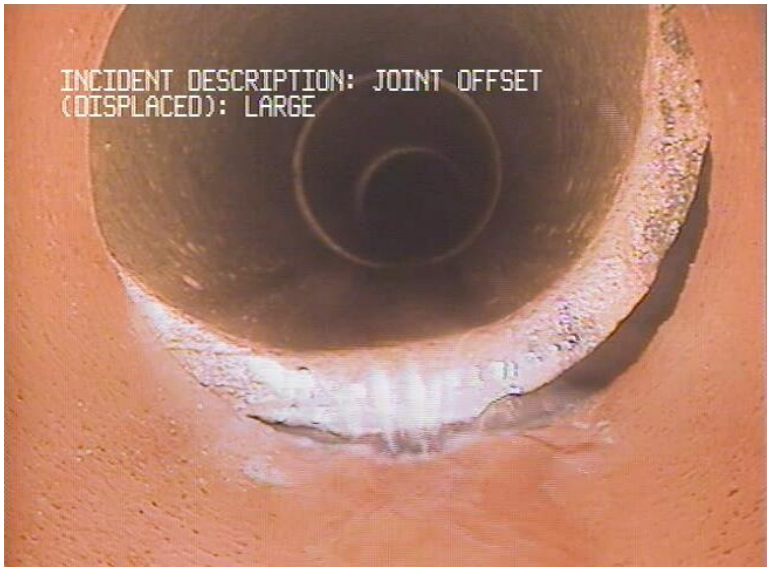
VALLEY SANITARY DISTRICT

Harris® Pipeline Rehabilitation Selection Flowchart



Recommendation for Re-Alignment





Joint Displacement & Sag Example

Planning level costs for open trench repairs average $18 to $20 per inch-diameter/foot of trench length in pavement. For example, for a 10-inch diameter pipeline the construction costs would be approximately $180 to $200/foot.

Pipe Segment Defects Candidate for Spot Repair Recommendations: Sewer mains candidate for spot repair have a small quantity of defective locations in an otherwise acceptable manhole-to-manhole reach of pipeline. These defects would typically be isolated areas with large dislocated joints, missing pieces of pipe or imminent collapse of the pipe due to extensive cracking. Repairs would be made either via trenchless methods with short segments, or sleeves of CIPP lining or a short segment of new pipeline installed by open trench. The length of the spot repair will vary between 4 feet and 10 feet typically, but sometimes longer lengths may be required.

An evaluation would be made to determine if the spot repairs can be made with CIPP lining, or if open trench excavation is required. Further, a cost analysis would be done to determine if it makes more sense to remove and replace the entire manhole-to-manhole reach, as the cost to perform multiple spot repairs becomes higher than complete replacement of the pipeline. Because point repairs require the same amount of set up for mobilization/demobilization, bypass pumping, traffic control, etc., the cost per foot is much higher than a longer trench.

For pipelines that have severe defects in isolated areas but are also defective along the entire length to require a lining, a spot repair by open trench would be required prior to trenchless rehabilitation of CIPP.

Also, for pipelines that could not be CCTV'd because the camera could not pass through defective locations, an open trench spot repair would be required.

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Planning level unit costs for open trench point repair of up to a 10-foot length would range from $4000 to $6000 for 8-inch to 24-inch diameters and $8000 to $12,000 for diameters greater than 24-inches to 54-inches.
For up to 10-foot CIPP point repairs the costs range from $2500 to $5000 for 8-inch to 24-inch diameters and $6000 to $8,000 for diameters greater than 24-inches to 54-inches.

Pipe Segment Defects Candidate for Cured-in-Place Pipe (CIPP) Recommendations:
Sewer main candidates for repair via CIPP would have small dislocated joints, multiple cracks and fractures and small fine sewer root intrusion defects throughout the sewer reach. Excessive pipe ovality or discontinuity defects would prevent the liner from being installed so spot repairs would be required. Also, a pipeline with excessive sags and bellies, CIPP repair would not improve these defects.
Planning level costs for CIPP lining start at $80 per foot for 8-inch ($10 per inch-diameter/foot). As the pipe diameter increases greater than 8-inches the average inch-diameter/foot costs go down since there is a minimum cost for mobilization and staging the work. For 10-inch to 18-inch diameters the costs are $8 to $9 per inch-diameter/foot. For 24-inch to 54-inch diameters the costs are approximately $7 per inch-diameter/foot.

Pipe Segment Defects Candidate for Pipe Bursting Recommendations: In lieu of open trench repair, pipe bursting is an alternative method for deep challenging open trench areas and situations where flow capacity needs to be increased. An increase of up to 2 pipe sizes (8-inch diameter increased to 12-inch diameter), can be routinely accomplished for sewer sizes from 4-inch to 48-inch.

Pipe bursting requires a launching and receiving pit be excavated down to the existing sewer. A bursting head is attached to a string of fusion welded HDPE pipe and inserted into the sewer with a cable attached to the head. As the bursting head and new pipe is pulled into the existing pipe it breaks up the old pipe and a continuous length of new pipe is installed. Service laterals are reinstated in pits dug for each lateral. Existing pipe material that are candidates for bursting include cast iron, VCP, PVC and unreinforced concrete pipe. Orangeburg pipe has been successfully pipe burst with a new HDPE pipeline installed.

Pipe Bursting may be recommended for the following field conditions;
- No multiple sags and/or large offsets
- No adjacent high risk utilities
- No potential for surface heaving

Construction costs for pipe bursting are typically 20 to 30% less costly than open trench pipeline replacement. Planning level costs average $15 to $18 per inch-diameter/foot of trench length in pavement. So, for a 10-inch diameter pipeline increasing to a 12-inch the construction costs would be approximately $150 to $180/foot.

Pipe Segment Defects Candidate for Pipe Reaming: When pipe bursting presents a risk to adjacent utilities, structures, or surface features, then pipe reaming is another trenchless technology to consider. Pipe reaming applies to sewer sizes from 4-inch to 48-inch and it can be used to also upsize pipe similar to pipe bursting.

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Construction costs for pipe reaming are typically 30% more costly than pipe bursting pipeline replacement and similar to costs for open trench pipeline replacement.

Pipe Reaming may be recommended for the following field conditions;

- Shallow cover or near adjacent utilities or structures
- Lined or encased pipe
- Severely distressed pipe sections
- No potential for surface heaving for sensitive surroundings

Pipe Segment Defects Candidate for Horizontal Directional Drilling Recommendations: When long and deep pipeline improvements are required in sensitive areas with difficult soil or below the water table, horizontal directional drilling (HDD) is recommended. For the areas in the District where sewer mains are in backyard easements, HDD is a good technique to reroute house sewer laterals to a newly constructed main in the public right-of-way.

Horizontal directional drilling is recommended for situations such as;

- Impacts to surface improvements must be avoided
- Deep or long installations in sensitive areas
- Difficult soils or below water table
- Curves in alignment

Planning level costs for HDD in the 6-inch to 8-inch diameter pipelines for rerouting house laterals are site specific, but would be approximately $10,000 to $15,000 per lateral.

Sewer Manhole Rehab Recommendations:

Sewer Manhole defects Candidate for Manhole Protective Lining Rehab – Sewer manholes with fair or better condition that do not exhibit any structural defects are a candidate for epoxy protective lining. The lining provides protection for the sewer manhole structure against caustic gasses that arise from the sewer flow that attack concrete and mortar. This method of rehab includes cleaning of the structure and pressure blasting to achieve a clean structure surface which will act as a substrate to the epoxy material. The walls and base are restored to their original state with mortar, epoxy coated and finished with a polyurethane liner.

Sewer Manholes defects Candidate for Manhole Replacement: Sewer manholes candidate for complete replacement exhibit large cracks and voids throughout the manhole structure and are at risk of imminent failure.

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APPENDIX

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Appendix A:

The below are excerpts from the 2018 NASSCO PACP Manual Appendix C – PACP Condition Grading System to further describe Quick Ratings and their use. "The PACP Quick Rating provides a means to summarize the number and severity of the most significant defects found within a pipe segment". "The PACP Condition Grading System alone is inadequate for determining if a pipe segment should be rehabilitated or replaced. Many other factors in addition to the internal condition of the segment should be considered. … PACP does not replace the judgment of professional engineers.

Pipeline Rehabilitation Alternatives

A brief narrative of pipeline rehabilitation alternatives and descriptions are discussed below.

Cured-In-Place Pipe Lining (CIPP): The Cured-in-Place pipe method utilizes a thermosetting resin impregnated felt tube to fully line the interior of a defective pipeline. The resin saturated tube is either pulled or inverted into the host pipe. The inversion process turns the tube as delivered inside out, like turning a sock inside out, otherwise the tube is simply pulled into place. The felt tube is then inflated to conform tightly against the host pipe. The resin is then cured-in-place by hot water, stream or UV-light. When the curing process is complete, a new seamless pipe is created with no joints preventing infiltration/leakage and minimizing root intrusion. The anticipated design life of a CIPP liner is 50 years.

Once a sewer main line has been rehabilitated by CIPP, the lateral connections to each home are restored with robotically controlled cutting devices. These robots cut out a round coupon from the new liner at the lateral connections to allow lateral flow into the sewer main.

Lateral connections that have structural deficiencies due to roots in or around the connection, or where infiltration occurs can be rehabilitated with a Sewer Lateral Connection (SLC) Liner. The rehabilitation method for the sewer main will dictate the type of SLC to be used, either a connection rehabilitation (Top Hat) or a complete lateral rehabilitation (T-Liner).

- Top Hats are short connection liners that are shaped to seal the connection of the lateral with the mainline. They create a brim around the lateral connection in the mainline and extend into the lateral for a short distance. These liners are installed through the mainline.

- T-Liners add a short full-circle mainline seal to the sewer main while the T-Liner extends up to 20' into the lateral. The stem of the top hat forms the section of liner that is placed into the lateral pipe while the hat brim sits against the inner

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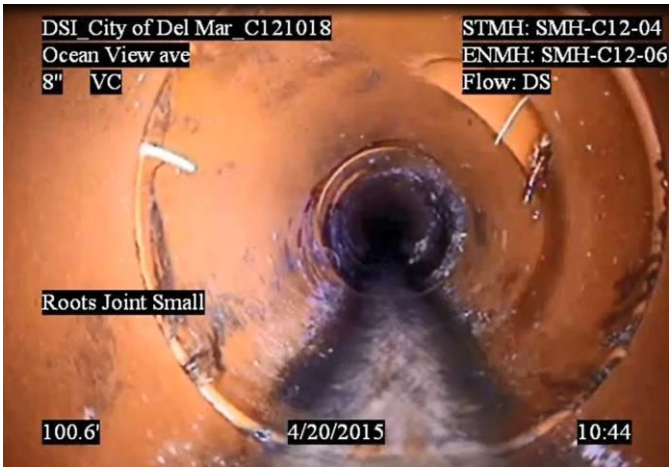
wall of the main. A specially designed remote control robotic installer is used to position and hold the SLC for curing the resin. Once cured, the robot and retention system are removed leaving the T-shaped liner forming a seal across the later/main connection.

Where to Consider CIPP	• Gravity Mains or Culverts (> 6"Dia) • Existing Capacity Sufficient • Few Large Structural Defects or Offsets
Benefits	• Reduced Time & Cost • Lengths up to 700 ft • Minimal Surface Impacts
Disadvantage/Limitations	• Bypass Pumping Required • Reduces Diameter • Spot Repairs Before Often Required • Styrene in Most Resins

Example of CIPP Installation



Pre-CIPP Sewer Main

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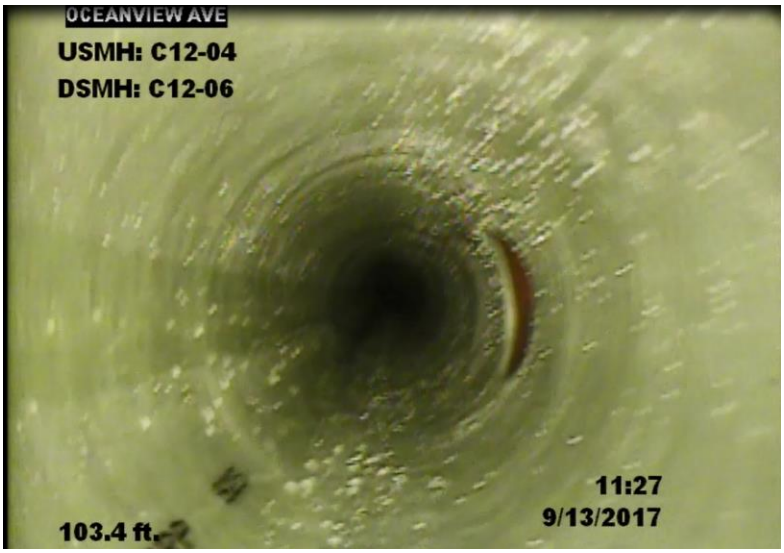

Post-CIPP Sewer Main

Pipe Bursting: In a typical pipe bursting operation, a cone-shaped tool ("bursting head") is inserted into the existing pipe and forced through it, fracturing the pipe and pushing its fragments into the surrounding soil. At the same time, a new high density polyethylene (HDPE) pipe is pulled in the annulus left by the bursting head. The rear of the bursting head is connected to the new pipe, and the front end of the bursting head to either a winching cable or a pulling rod assembly. The bursting head and the new pipe are launched from the insertion pit. The cable or rod assembly is pulled from the pulling or reception pit. The new pipe is typically 20 foot lengths of HDPE pipe that has been welded together by a butt-fusion welding machine to the required "manhole-to-manhole" length. The new, seamless pipeline can be of the same size or larger than the replaced pipe.

Currently pipe bursting is done dynamically using pneumatic air pressure, or statically using the pulling force of the winch. Pneumatic bursting heads use pulsating air pressure to drive the head forward and burst the old pipe. A small pulling device guides the head via a constant tension winch and cable. The head is simply pulled through the pipe by a heavy-duty pulling device via a segmented drill rod assembly or heavy anchor chain.
The following are criteria used to help determine whether pipe bursting is suitable for rehabilitating a pipe segment.

a. Pipe bursting can be used to replace brittle pipes, such as clay, cast iron, and non-reinforced concrete.
b. The depth of sewer is important as shallow depths can crack pavement and hard-scape surfaces
c. The locations of nearby buried utilities is important to know to avoid impacts to them. Common practice is to have at least 2 to 3 pipe diameters radial clearance from other parallel existing utilities.
d. Information on the soil material is important for upsizing pipe diameters

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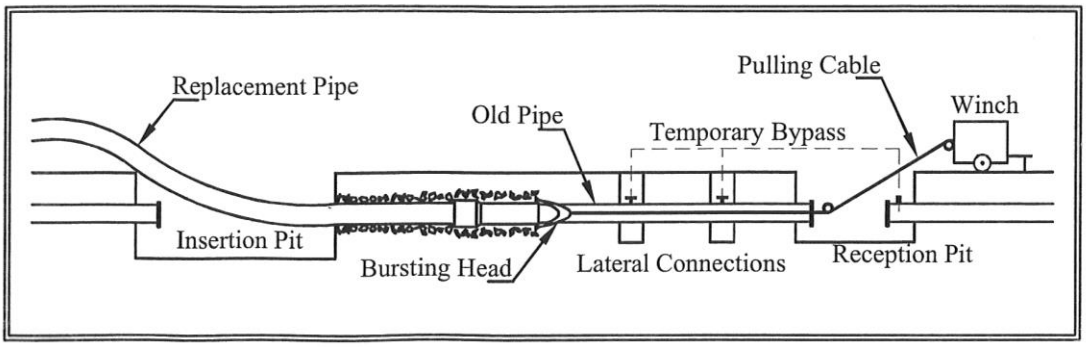
e. Pipe bursting will not repair sags or bellies in the pipeline. However, it can sometime improve the amount of sag and if a sag is not sufficiently improved a spot repair can be made in the sag area.

Where to Consider Pipe Bursting	• Water, sewer, or SD (4" to 54") • Ex. VCP, PVC, CI, or Conc. Pipe • Upsize required • Significant Ex. Structural Defects
Benefits	• Cost Savings • Can Upsize/ Increase Capacity
Disadvantage/Limitations	• Pressure on surface and utilities • Potential to increase sags • Cannot burst DIP or Steel • Max pull approx. 500 ft



Excerpts taken from "Guidelines for Pipe Bursting," Trenchless Technology Center Technical Report # 2001.02, March 2001

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Example of Pipe Busting 10 inch ID VCP with 20 inch OD HDPE

Pipe Reaming: When pipe bursting presents a risk to adjacent utilities, structures, or surface features, then pipe reaming is another trenchless technology to consider. Pipe Reaming is a trenchless pipe replacement method that uses horizontal directional drilling (HDD) equipment to remove existing pipe material and insert a new pipeline in the void created. After pushing the drill rods with a directional drill head through the old pipeline and connecting the rods to a special reamer, the new pipe string is attached to the reamer via a swivel and towing head. As the drill rig rotates and simultaneously pulls back, the old pipe and surrounding soil is removed and replaced by the new pipe. Removal of the old pipe is accomplished by the grinding action of the reamer, pulverizing the pipe into small bits which mix up with surrounding soil and drilling fluid. The slurry material created is flowable and it is pushed forward through the existing pipe by the reaming head to pits or existing manholes where it is vacuumed up and removed.

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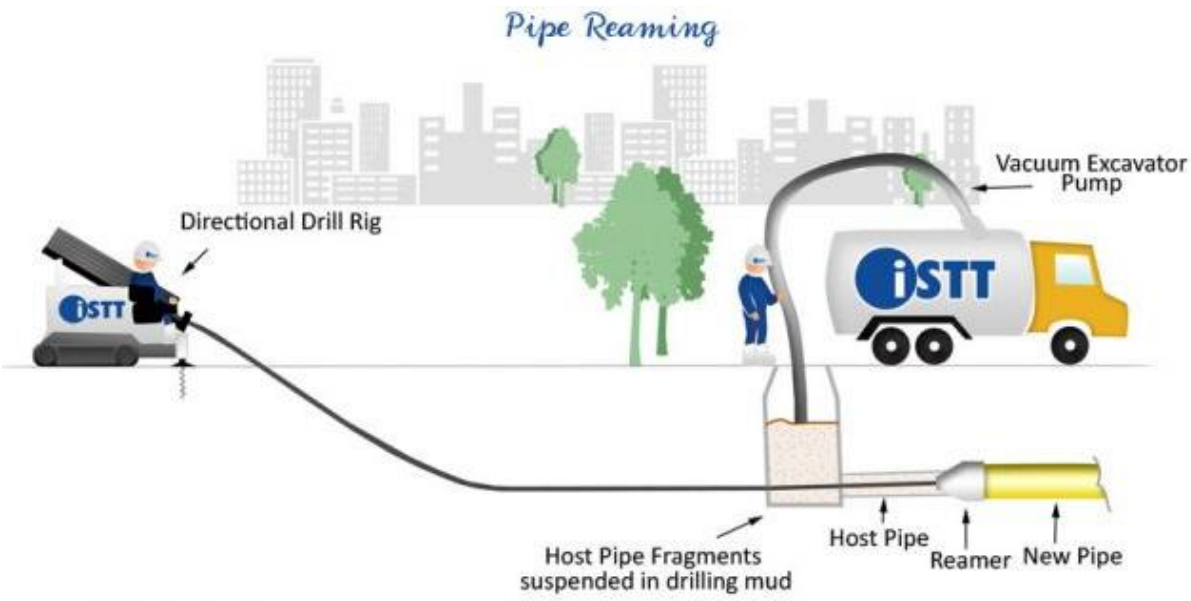

Figure 1: Pipe Reaming (courtesy of ISTT).

Pipe reaming can be used to replace a number of existing non-metallic pipe materials and is particularly well suited for replacing and upsizing pipes in stiff soils and rock, or pipe with collapsed sections where pipe bursting may not be an option.

Equipment

A modified back reaming tool, shown in Figure 2 below, is the only special tool required for the technique. This may be modified by the manufacturer or by the contractor to meet the specific project needs. It is important that the selected reamer be in good condition with sharp bits and/or cutting edges. Reamers are in general multi-purpose as shown below, however very hard vitrified clay pipe (VCP), concrete, concrete encased pipe, or upsizing in rock, will require special reamers. A variety of reamers for various piping and conditions are available from the various HDD tool suppliers.

Figure 2: Pipe Reaming Head

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HDPE pipes in the field are typically connected by means of butt fusion, as shown in Figure 3. Butt fusion is a process by which plain ends of HDPE pipe are squared off and melted to an appropriate temperature and subsequently held together, so that the melted portions fuse together to create a bead at the joint. When done properly, HDPE butt fused joints are as strong, if not stronger than, the pipe itself.

Figure 3: Fusion welding

Potential Benefits

By removing and conveying the existing pipe material and surrounding soil, pipe reaming typically reduces surface heave or pressure to adjacent facilities from displacement from the more commonly used pipe bursting method.

For segments with collapsed areas where it would be difficult to pull a cable through for pipe bursting installation, pipe reaming's method of directional drilling through the existing pipe can avoid the need to excavate in the collapsed areas.

The pull tension for reaming is typically less than that of pipe bursting, and reaming will often allow for a longer pull length than bursting in similar conditions. This could allow for less pits during construction.

Where to Consider Pipe Reaming	• Water, sewer, or SD (4" to 48") • Upsize required • Shallow cover or adjacent utilities • Lined or Encased Pipe • Collapsed Pipe sections
Benefits	• Reduced pressure on surroundings • Can Rehab Collapsed Pipe • Can Upsize/ Increase Capacity
Disadvantage/Limitations	• Higher Cost Than Bursting • Potential to increase sags • Cannot Ream DIP or Steel

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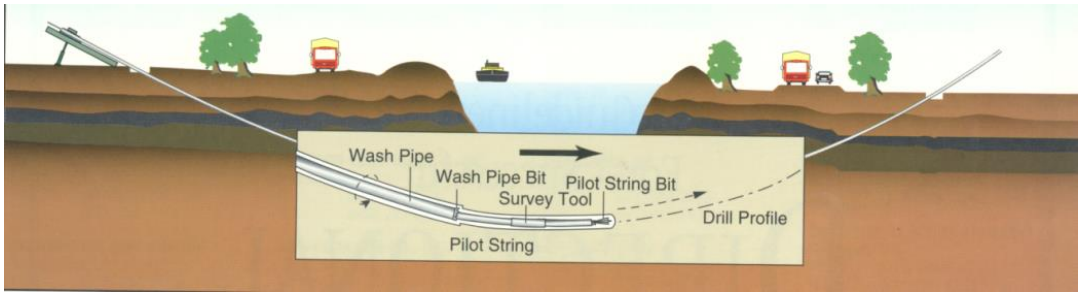
Horizontal Directional Drilling (HDD): Horizontal directional drilling (HDD) is a trenchless construction method used to install new pipelines of various sizes and materials below the ground surface. Horizontal directional drilling allows a wet utility system of a city to be replaced without causing a major traffic jam and incurring the enormous cost of restoring streets and roads. Horizontal directional drilling is often used where open cut installations are not feasible, such as road and river crossings. Using directional drilling techniques to guide a drill string along a bore path under obstacles such as rivers, lakes, railway crossings or highways, enables replacement of existing pipelines, or installation of new ones, at a relatively rapid rate. As the hole is bored, a steel drill string is extended behind a cutting head. Drilling mud is used to cool the cutter and transmitter electronics, to flush excavated soil from the borehole and to lubricate the borehole. The cutting head is then removed and a back-reamer attached. The pipe string is attached to the back-reamer through a swivel device. As the drill string is withdrawn to the drilling rig, the back-reamer enlarges the borehole and the pipe string is pulled into the hole. As with any pipe pulling technique, the movement of the drill string and the pipe string should be monitored. The pulling load on the polyethylene pipe must not exceed the allowable tensile load, or safe pull strength of the pipe.

Where to Consider HDD	• Deep or long Installations • Sensitive Areas • Difficult Soils or Below Water Table • Curves in Alignment
Benefits	• Relatively Low Cost • Drives to 5,000 linear feet • Can Steer and Curve Pipe
Disadvantage/Limitations	• Gravity Pipelines Need Slope >2% • Potential for Fracking • Potential for Damage to Ex Utilities • Max 60" Diameter



Step 1 – Drill Pilot Hole

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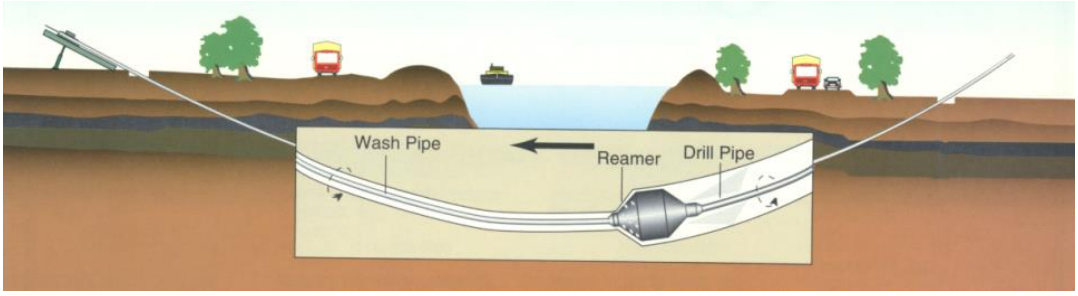
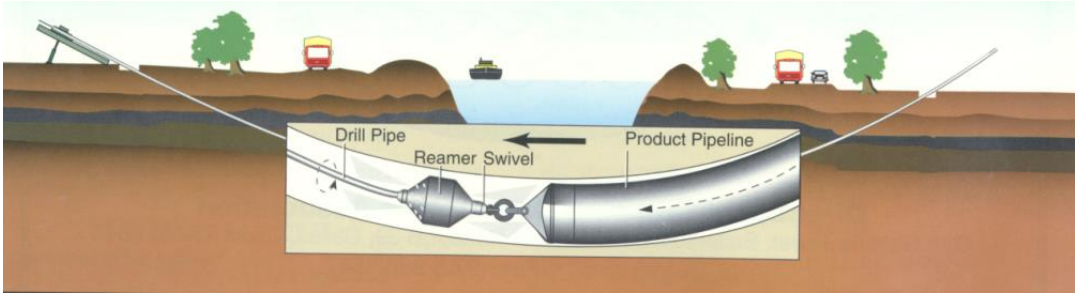
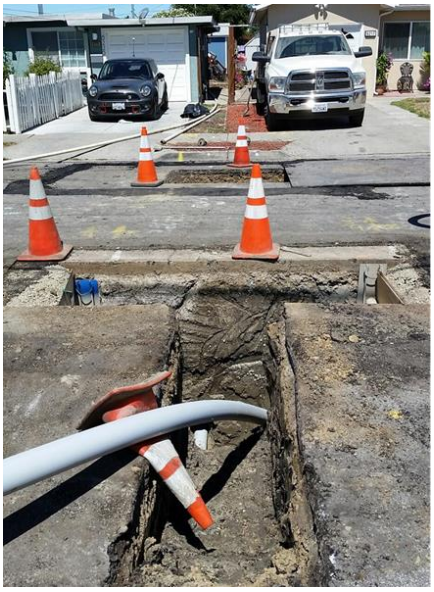


Step 2 – Back Ream to Enlarge Hole



Step 3 – Pull Pipe into Place



Photos of sewer lateral rerouting from backyards to the new sewer main in the street

Open Trench: Open cut trench excavation consists of excavating a trench for the manual installation of each "stick" or piece of pipe. The open cut trench method involves excavating down to and exposing the existing pipe so that it can be repaired or replaced and then backfilled. When the open cut trench excavation is located under pavement the existing pavement must be saw cut and removed, the excavation shall then be filled with granular backfill (compacted stone or sand to prevent

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settlement), and the pavement must be replaced to the end of the pipe repair or replacement. PVC pipe design life is approximately 50 years.

6-Inch Sewer Open Trench Installation

Spot Repairs: Spot repairs are short repairs of defects in a localized area of the pipeline where full rehabilitation of the existing pipe is not necessary. They can be made trenchless with CIPP liner segments, or as short open trench excavation to remove and replace the localized defects.

- CIPP liner spot repairs are made similar to the process described for mainline pipe repair except a short section of liner is prepared to repair the smaller length defect. Segments up to 8 feet long are pulled into the distressed area and an air bladder inflates the liner tightly to the interior pipe wall. The resin cures under ambient conditions in approximately an hour for smaller diameter pipelines. The bladder has an opening allowing sewer flows to pass and thus not requiring bypass pumping normally required for mainline CIPP liners.

- Open cut spot repairs require excavation of short segments of defective pipeline. Traditional open trench construction methods are required so the cost per foot for spot repairs is much more than for longer lengths because all the initial costs for mobilization/demobilization, export/import of backfill, are still required for even short segments of repair. A judicious use of spot repairs is required because the cost of making a few spot repairs can add up to be as expensive as replacing the entire pipeline.

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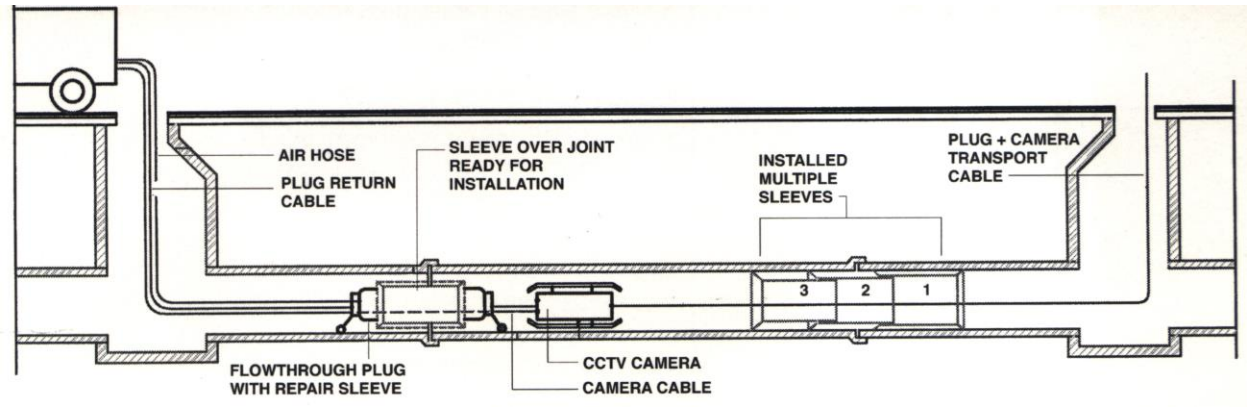

CIPP Spot Repair Illustration

15-inch diameter CIPP spot repair sleeve prepared onsite and ready for installation

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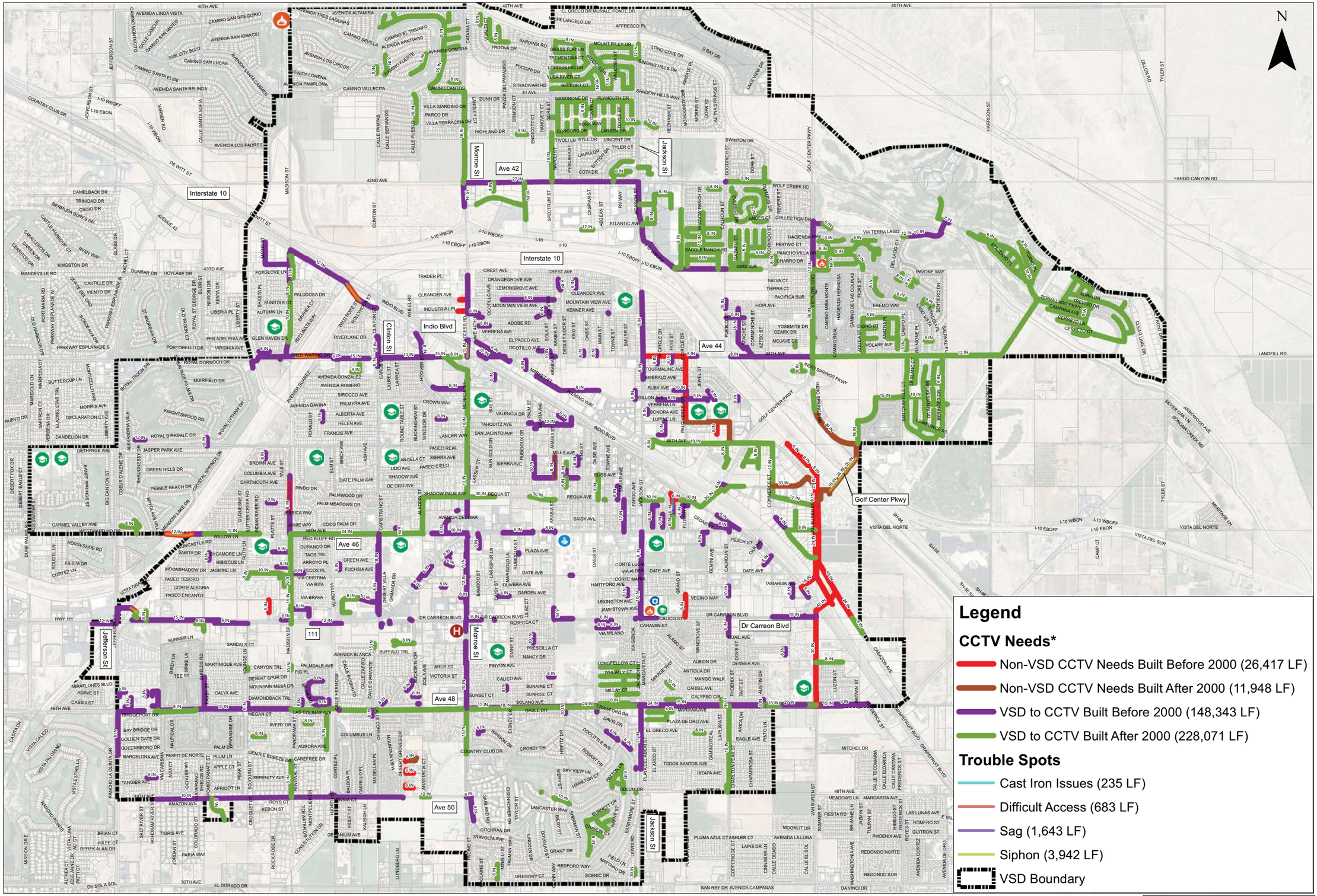

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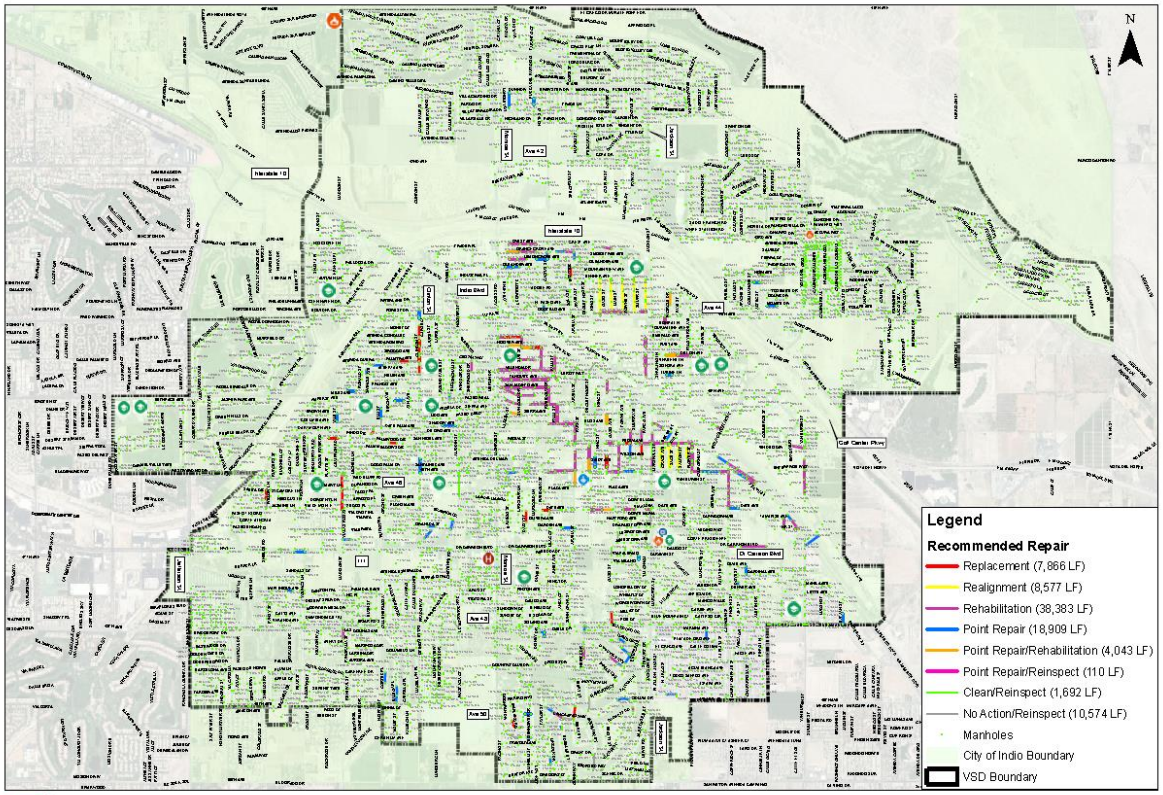
Valley Sanitary District - Future CCTV Needs Map

* CCTV Needs is based on no historical CCTV data provided by VSD on 5/23/2018 & mark up received 9/20/2018.



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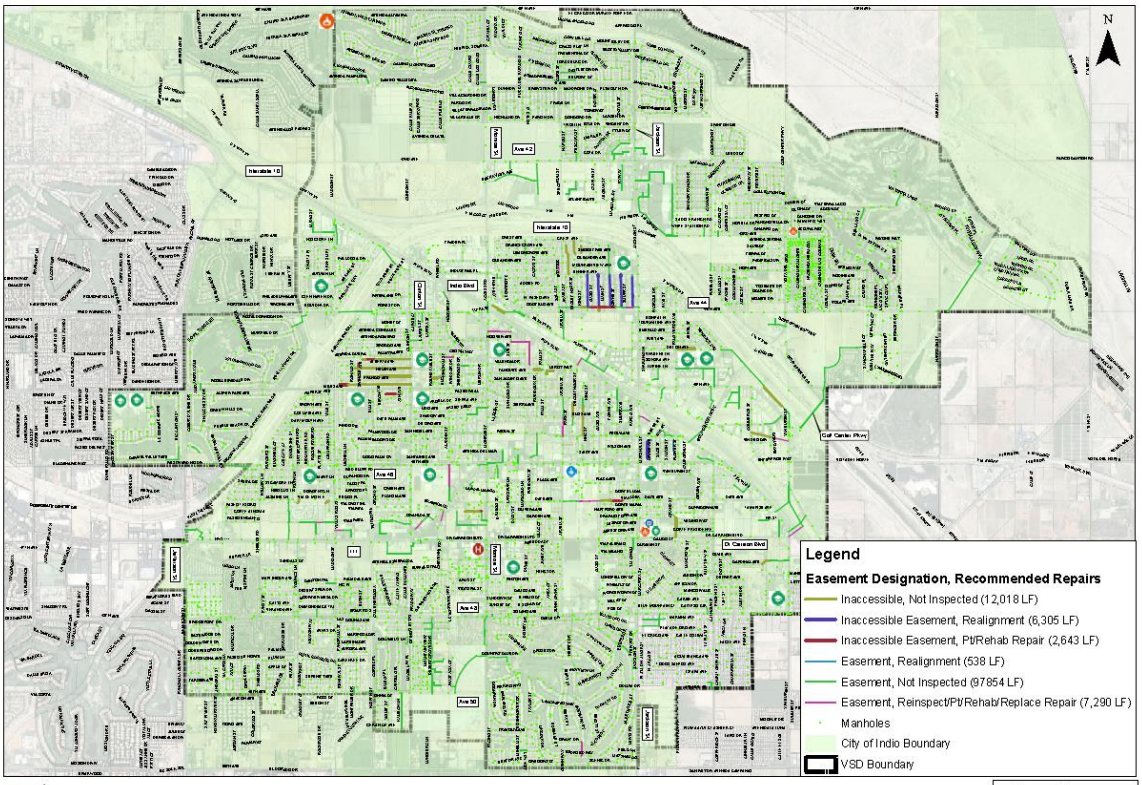
Valley Sanitary District - Sewer Recommended Repairs

0 1,200 Feet
1 inch = 1,200 feet
10/16/2018



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Valley Sanitary District - Easement Sewer Data Map

0 1,100 Feet
1 inch = 1,200 feet

*Easement Sewers are based on CCTV data provided by VSD on 8/29/2018.

10/15/2018

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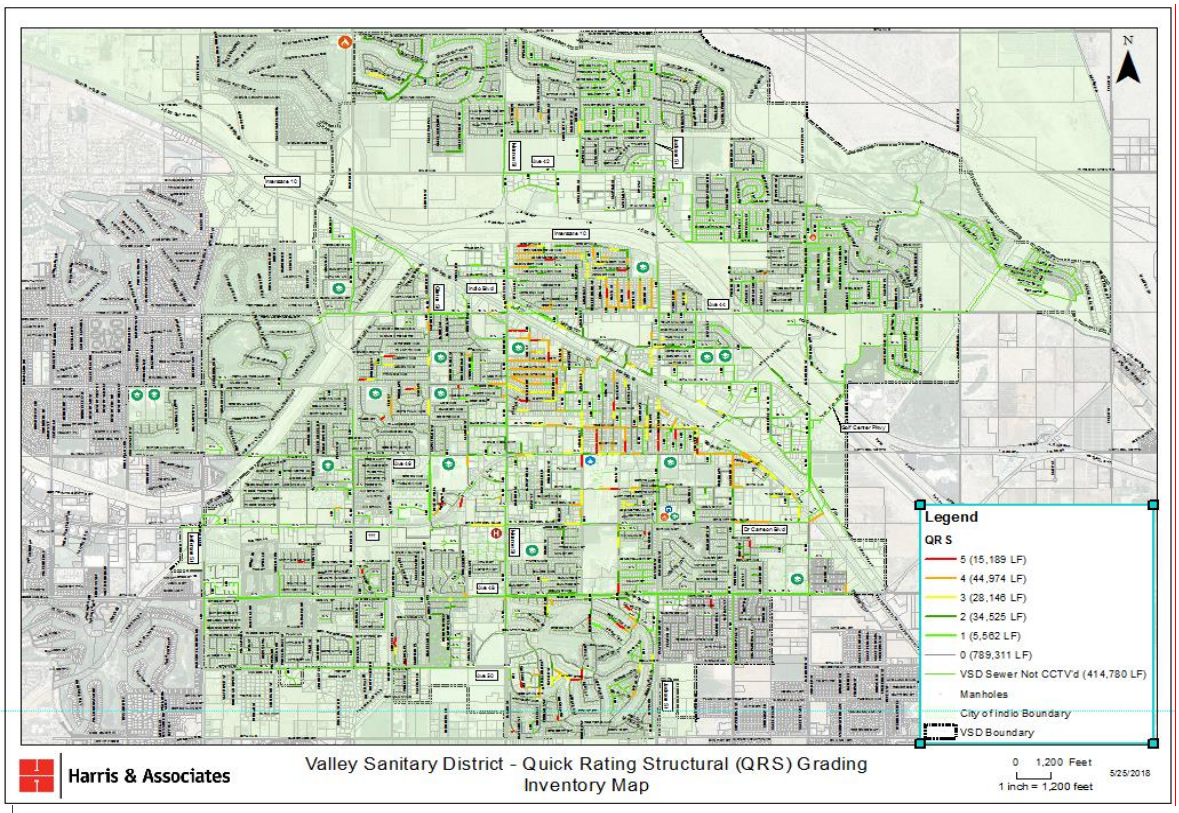

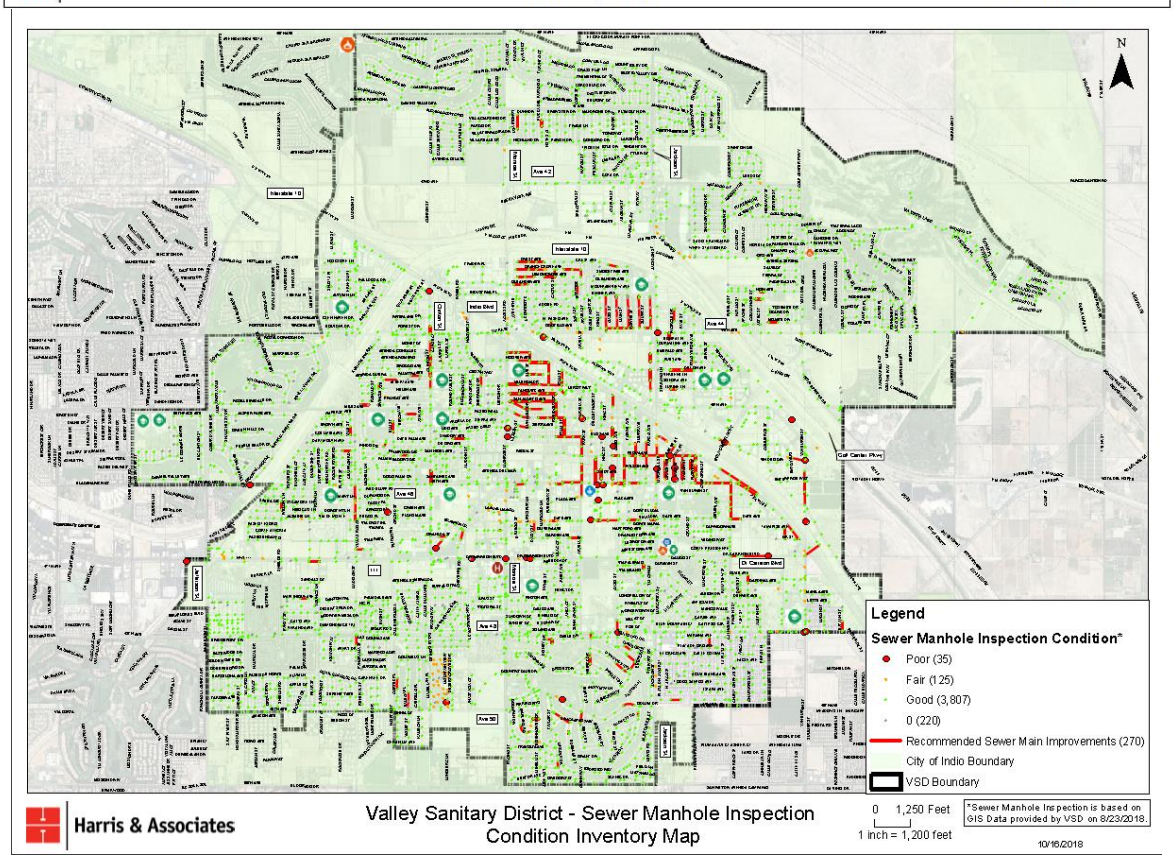

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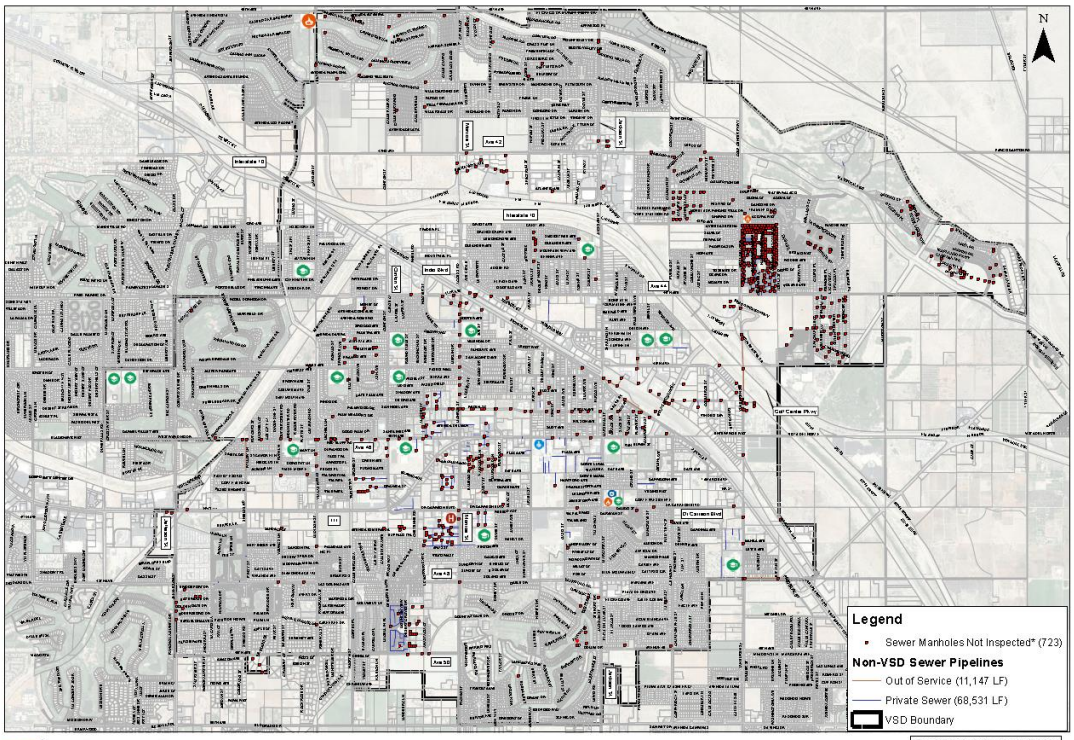

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