CITY OF HERCULES

Sewer System Management Plan

JANUARY 2019

WEST YOST ASSOCIATES

Sewer System Management Plan

Prepared for

City of Hercules

Project No. 682-21-16-01

01/15/2019

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I.1 INTRODUCTION

This Sewer System Management Plan (SSMP) is a compendium of the policies, procedures, and activities that are included in the planning, management, operation, and maintenance of the City of Hercules' (City's) sanitary sewer system.

The State Water Resources Control Board (SWRCB) has issued statewide waste discharge requirements for sanitary sewer systems, which include requirements for development of an SSMP. The SWRCB requirements are outlined in Order No. 2006-0003-DWQ, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, dated May 2, 2006 (GWDR), and Order No. WQ-2008-0002-EXEC, dated February 20, 2008, which was amended by Order No. 2013-0058-EXEC, effective September 9, 2013, which changed the Monitoring and Reporting Program (MRP). This SSMP is intended to update the City's existing SSMP, in continued compliance with the GWDR.

The structure (section numbering and nomenclature) of this SSMP follows the above referenced GWDR and MRP. This SSMP is organized by the SWRCB outline of elements; and contains language taken from the GWDR as at that beginning of each element. The GWDR uses the term "Enrollee" to mean each individual municipal wastewater agency that has completed and submitted the required application for coverage under the WDR (in this case, the Enrollee is the City). The City's waste discharger identification number in the California Integrated Water Quality System (CIWQS) is 2SSO10141.

I.2 DEFINITIONS, ACRONYMS, AND ABBREVIATIONS

BMP	**Best Management Practices** Refers to the procedures employed in commercial kitchens to minimize the quantity of grease that is discharged to the sanitary sewer system. Examples include scraping food scraps into a garbage can and dry wiping dishes and utensils prior to washing.
Building Lateral	**See Private Sewer Lateral**
CCTV	**Closed Circuit Television** Refers to the process and equipment that is used to internally inspect the condition of gravity sewers.
CIP	**Capital Improvement Program** Refers to the document that identifies future capital improvements to the City's sanitary sewer system.
City	Refers to the City of Hercules
CIWQS	**California Integrated Water Quality System** Refers to the State Water Resources Control Board online electronic reporting system that is used to report SSOs, certify completion of the SSMP, and provide information on the sanitary sewer system.

CMMS	**Computerized Maintenance Management System** Refers to the computerized maintenance management system that is used to plan, dispatch, and record the work on its sanitary sewer system.
CWEA	**California Water Environment Association**
CY	**Calendar Year**
DIP	**Ductile Iron Pipe**
DS	**Data Submitters**
FOG	**Fats, Oils, and Grease** Refers to fats, oils, and grease typically associated with food preparation and cooking activities that can cause blockages in the sanitary sewer system.
FY	**Fiscal Year** Refers to the 12-month periods beginning July 1st and ending June 30th.
FSE	**Food Service Establishment** Refers to commercial or industrial facilities where food is handled/prepared/served that discharge to the sanitary sewer system.
GWDR or WDR	**General Waste Discharge Requirements** Refers to the State Water Resources Control Board Order No. 2006-0003, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, dated May 2, 2006.
GIS	**Geographical Information System** Refers to the City's system that is used to capture, store, analyze, and manage geospatial data associated with the City's sanitary sewer system assets.
GRD	**Grease Removal Device** Refers to grease traps and grease interceptors that are installed to remove FOG from the wastewater flow at food service establishments.
I/I	**Infiltration/Inflow** Refers to water that enters the sanitary sewer system from storm water and groundwater. Infiltration enters through defects in the sanitary sewer system after flowing through the soil. Inflow enters the sanitary sewer without flowing through the soil. Typical points of inflow are holes in manhole lids and direct connections to the sanitary sewer (e.g. storm drains, area drains, and roof leaders).
Lateral	**See Private Sewer Lateral**
LRO	**Legally Responsible Official** Refers to person(s) formally designated by an agency to be responsible for formal reporting and certifying of all reports submitted to the CIWQS.

MH	**Manhole** Refers to an engineered structure that is intended to provide access to a sanitary sewer for maintenance and inspection.
Mainline Sewer	Refers to City wastewater collection system piping that is not a private lateral connection to a user.
Maintenance Hole	**See Manhole**
MMPM	***Monitoring, Measurement, and Plan Modifications***
MRP	**Monitoring and Reporting Program** State Water Resources Control Board Executive Order WQ 2013-0058-EXEC effective September 9, 2013.
NPDES	**National Pollution Discharge Elimination System Permit**
Notification of an SSO	Refers to the time at which the City becomes aware of an SSO event through observation or notification by the public or other source.
OES	**Office of Emergency Services** Refers to the California State Office of Emergency Services.
O&M	**Operations and Maintenance**
OERP	**Overflow Emergency Response Plan**
PM	**Preventive Maintenance** Refers to maintenance activities intended to prevent failures of the sanitary sewer system facilities (e.g. cleaning, CCTV, repair, etc.).
Private Sewer Lateral	Refers to the portion of a private property's building sewer as defined by the plumbing code, and is further defined as the piping of a drainage system that extends from the end of the building drain to the public sewer which includes the connection to the public sewer.
PS	**Pump Station** A facility that transmits and lifts sewage into the City gravity sanitary sewer collection system
PVC	**Polyvinylchloride Pipe**
RWQCB	**Regional Water Quality Control Board** Refers to the San Francisco Bay Regional Water Quality Control Board.
SSO	**Sanitary Sewer Overflows** Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. SSOs include: (a) Overflows or releases of untreated or partially treated wastewater that reach waters of the United States; (b) Overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States; and

(c) Wastewater backups into buildings and on private property that are caused by blockages or flow conditions within the publicly owned portion of a sanitary sewer system.

SSOs that include multiple appearance points resulting from a single cause will be considered one SSO for documentation and reporting purposes in CIWQS.

Note: Wastewater backups into buildings caused by a blockage or other malfunction of a building lateral that is privately owned are not SSOs.

SSO Categories:

Category 1: Discharge of untreated or partially treated wastewater of any volume resulting from a sanitary sewer system failure or flow condition that either:

- Reaches surface water and/or drainage channel tributary to a surface water; or
- Reached a Municipal Separate Storm Sewer System (MS4) and was not fully captured and returned to the sanitary sewer system or otherwise captured and disposed of properly.

Category 2: Discharge of untreated or partially treated wastewater greater than or equal to 1,000 gallons resulting from a sanitary sewer system failure or flow condition that either:

- Does not reach surface water, a drainage channel, or an MS4, or
- The entire SSO discharged to the storm drain system was fully recovered and disposed of properly.

Category 3: All other discharges of untreated or partially treated wastewater resulting from a sanitary sewer system failure or flow condition.

Sanitary Sewer System or Sewer System	Refers to the sanitary sewer facilities that are owned and operated by the City.
SSMP	**Sewer System Management Plan**
SOP	**Standard Operating Procedures** Refers to written procedures that pertain to specific activities employed in the operation and maintenance of the Sanitary Sewer System.
SWRCB	**State Water Resources Control Board** Refers to the California Environmental Protection Agency, State Water Resources Control Board. Note: The State Board is a separate entity from the San Francisco Bay Regional Water Quality Control Board, although the two agencies are closely connected.
SCADA	**Supervisory Control and Data Acquisition** Refers to the system that is employed by the City to monitor the performance of its lift stations and to notify the operating staff when there is an alarm condition that requires attention.
SECAP	**System Evaluation and Capacity Assurance Plan**

VCP	**Vitrified Clay Pipe**
Water of the State	Refers to "any surface water or groundwater, including saline waters, within the boundaries of the state." (California Water Code § 13050(e)).
WWTP	**Wastewater Treatment Plant**

I.3 SANITARY SEWER SYSTEM FACILITIES

The City's wastewater collection system (see Figure 1) serves the area within the City limits and conveys an average dry weather flow of approximately 1.7 million gallons per day (mgd) of wastewater. This service area encompasses an existing population of approximately 25,000, with an additional 5,000 residents expected at full buildout of the service area. The wastewater generated by the City is conveyed to and treated by the Pinole-Hercules Water Pollution Control Plant (WPCP), located southwest of the City limits in the City of Pinole.

The City's collection system consists of gravity sewer mains, force mains, and pump stations. The collection system includes approximately 62 miles of gravity sewer mains and 1,660 manholes, most of which were constructed after 1970. Gravity sewers located in the older areas of the City are believed to be constructed of asbestos cement (AC) pipe, also known as "Transite" pipe. New gravity sewer construction is typically polyvinylchloride (PVC) pipe. The City also owns six pump stations within the collection system, and their associated 4.5 miles of force mains. Table 1 provides the composition of the sewer piping by size.

Table 1. Approximate Gravity Sewer Size Distribution

Diameter	Portion of Sewer System, % (by length)
Less than 10-inch	90%
10-inch or greater	10%

I.4 REFERENCES

State Water Resources Control Board Order No. 2006-0003, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, California State Water Resources Control Board, May 2, 2006.

State Water Resources Control Board Order No. Order No. 2013-0058-EXEC, Amending Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, September 9, 2013.

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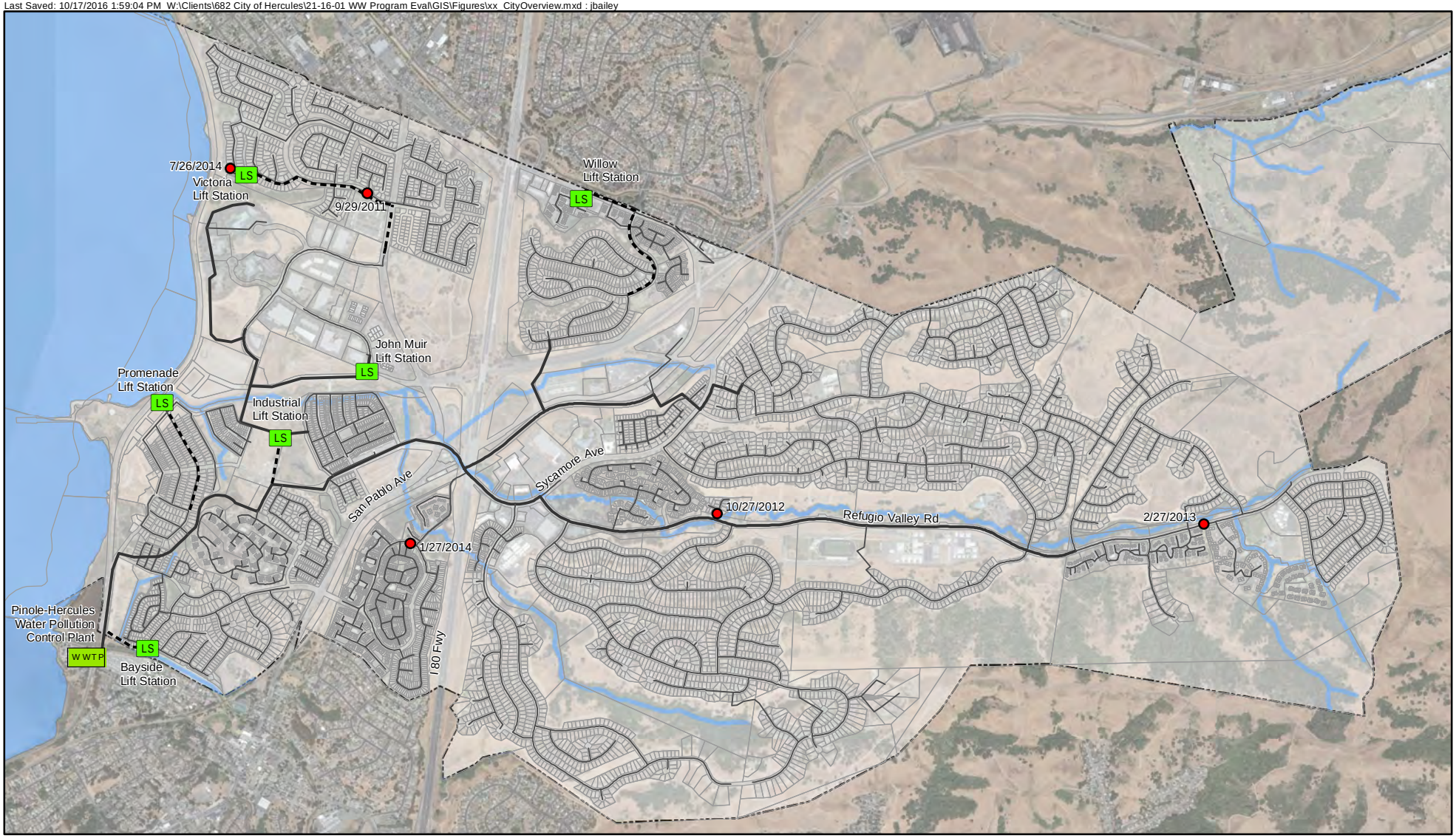


Symbology

- City Limits
- Water Pollution Control Plant (WWTP)
- Lift Station (LS)
- Force Main
- Gravity Main < 10"
- Gravity Main >= 10"
- Creek or Channel
- Reported Sanitary Sewer Overflows

0 1,250 2,500

Scale in Feet

Figure 1

Wastewater Collection System

City of Hercules

State Resources Water Control Board (SWRCB) Waste Discharge Requirement:

The purpose of the Sewer System Management Plan (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 do occur.

1.1 SSMP GOALS

The goals of the City of Hercules (City) SSMP are:

- To properly manage, operate, and maintain the City's sanitary collection system through proper planning and implementation;
- To provide adequate capacity to convey flows by analyzing, identifying, monitoring, and correcting, areas of the collection system that are or could to be considered insufficiently sized;
- To minimize the number and frequency of SSOs through a proactive inspection and maintenance program of the City's sanitary collection system; and
- To mitigate the impact of SSOs through quick response times, thorough cleanup, and public notifications.

SWRCB Waste Discharge Requirement:

The SSMP must identify:

a. The name of the responsible or authorized representative as described in Section J of this Order.

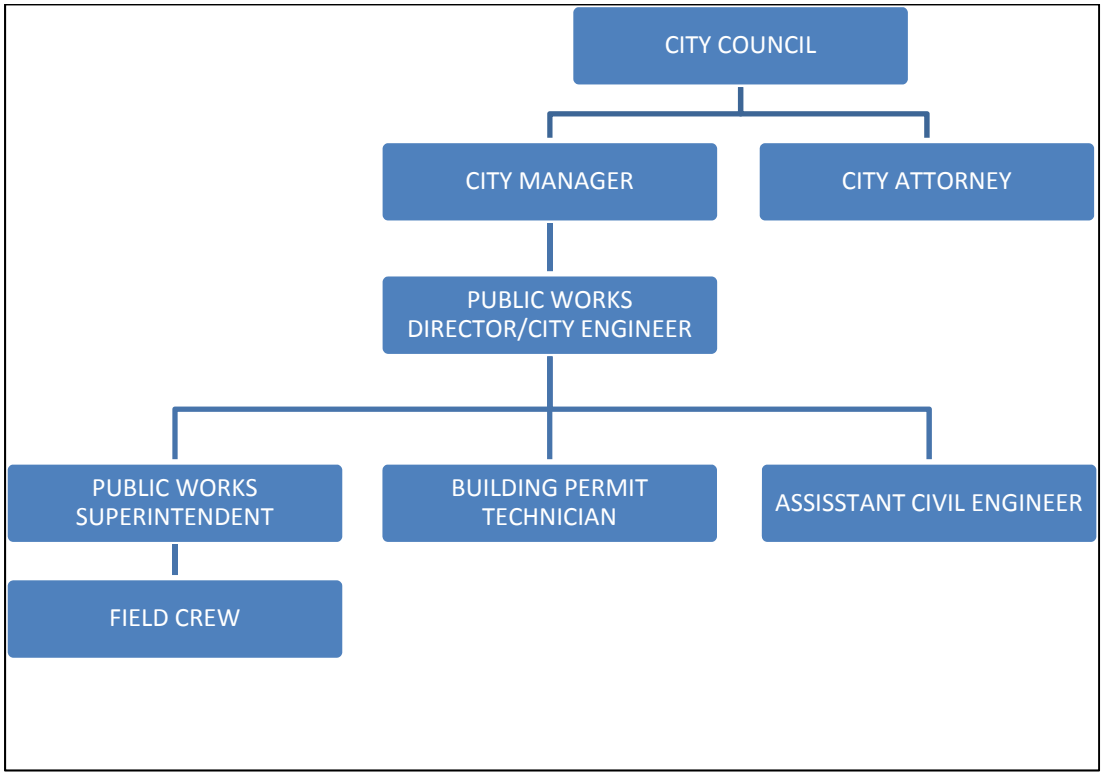
b. The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and

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 as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services (OES)).

2.1 ORGANIZATIONAL STRUCTURE

The organization chart for the management, operation, and maintenance of the City's wastewater collection system is shown on Figure 2.

Figure 2. City of Hercules Public Works Division Organization Chart



2.2 AUTHORIZED REPRESENTATIVES

The Public Works (PW) Director/City Engineer is the sole legally responsible officer responsible for signing and certifying all applicable SSMP documents. Table 2 identifies roles and responsibilities for the collection system operations.

Table 2. Roles and Responsibilities Defined

Position	Roles and Responsibilities
City Council	Establishes policy; adopts the SSMP.
City Manager David Biggs Desk: (510) 799-8216	Plans, organizes and directs the overall administrative activities and operations of the City. Advises and assists the City Council, represents the City's interest with other governmental agencies, business interests, and the community.
Public Works Director/City Engineer (LRO) Mike Roberts Desk: (510) 799-8241	Plans, directs, organizes, coordinates, supervises and reviews the activities of the divisions comprising the Public Works Department; and provides highly responsible professional and technical staff assistance to the City Manager.
Assistant Civil Engineer Jose Pacheco Desk: (510) 799-8247	Plans, coordinates, supervises, and participates in the performance of professional engineering activities of a complex nature involving engineering planning and design, construction project management.
Public Works Superintendent (LRO) Jeff Brown Desk: (510) 799-8252 Cell: (510) 812-4630	Plans, coordinates, lays out the work assignments and supervises the work of a number of crews involved in the operation and maintenance of wastewater system, and provides technical staff assistance.
Maintenance Worker II Glenn Moniz	Participates in maintenance and repair duties and performs a wide variety of skilled and semi-skilled maintenance, construction, and repair work, and operates light and moderately heavy power-driven equipment.
Maintenance Workers Eric Wright, Andy Hernandez, Joey Castaneda, David Romero, Angel Ramos, Efron Telmo, Mark Botin	Participates in maintenance and repair duties and performs a wide variety of skilled and semi-skilled maintenance, construction, and repair work, and operates light and moderately heavy power-driven equipment.
Electrician	Under direction, performs skilled work in the installation, maintenance and repair of electrical wiring and related apparatus, components of the WWTP, water utility, traffic signals, sanitary and storm collections systems and street light installations, and to conduct electrical inspections of City buildings.

2.3 RESPONSIBILITY FOR SSMP IMPLEMENTATION AND MAINTENANCE

The Public Works Director/City Engineer shall have the overall responsibility for implementing, periodically auditing, and maintaining the City's SSMP. Certain tasks may be delegated to staff.

Other City staff responsible for developing, implementing, and maintaining specific elements of the City's SSMP are identified by job title in Table 3. Names and contact information are included in Appendix A.

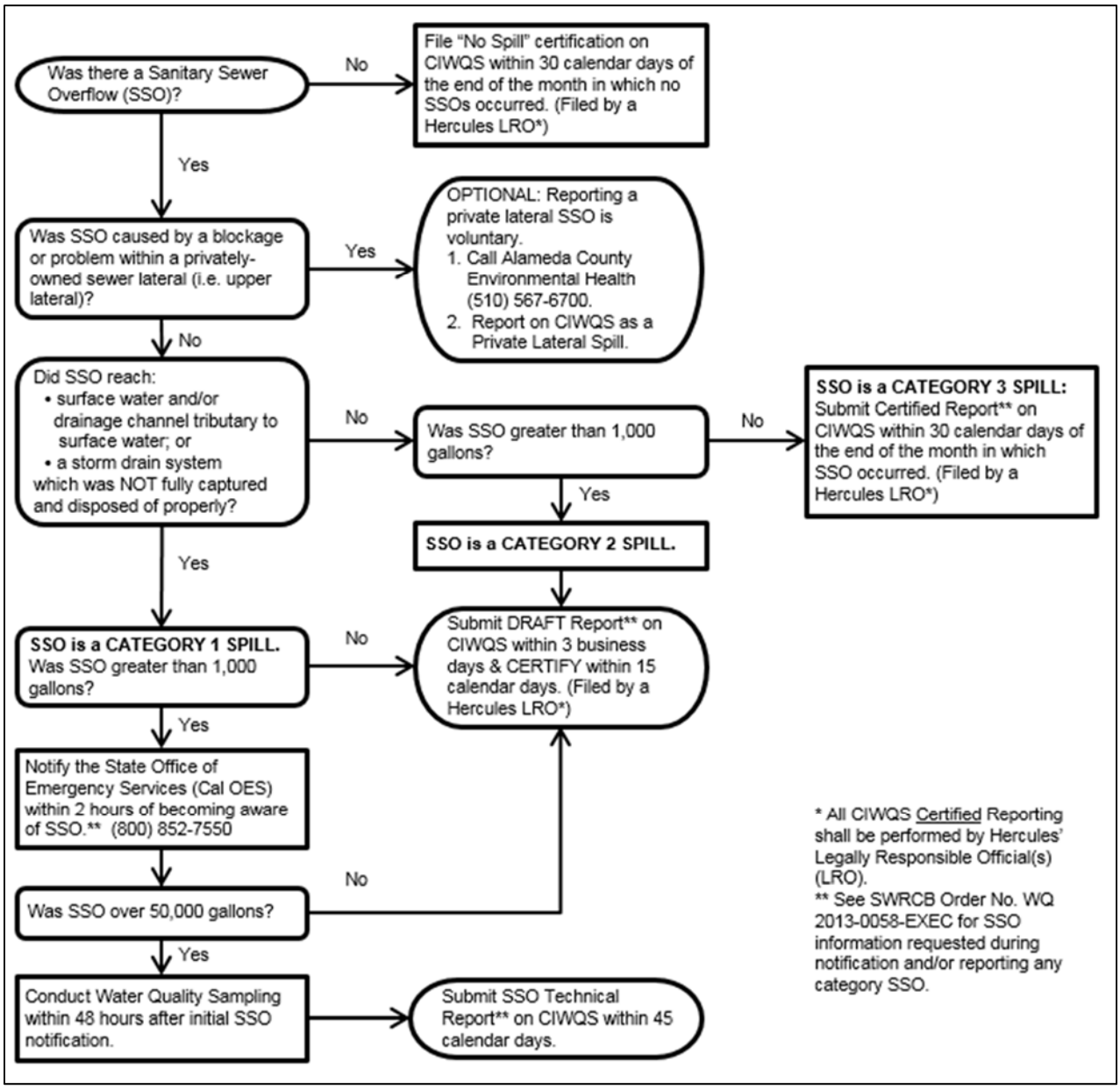
Table 3. Responsible Officials in SSMP Development

Element	Element Name	Responsible City Official
-	Introduction	PW Director/City Engineer
I	Goals	PW Director/City Engineer
II	Organization	PW Director/City Engineer
III	Legal Authority	PW Director/City Engineer
IV	Operations and Maintenance Program	PW Superintendent
V	Design and Performance Provisions	PW Director/City Engineer
VI	Overflow Emergency Response Plan	PW Superintendent
VII	FOG Control Program	PW Superintendent
VIII	System Evaluation and Capacity Assurance Plan	PW Director/City Engineer
IX	Monitoring, Measurement and Program Modifications	PW Director/City Engineer
X	Program Audits	PW Director/City Engineer
XI	Communications Program	Assistant Civil Engineer
Appendix A	Responsible Officials in SSMP Development – Contact Info	PW Superintendent
Appendix B	Sewer System Major Equipment and Critical Parts Inventory	PW Superintendent
Appendix C	Overflow Emergency Response Plan (OERP)	PW Superintendent
Appendix D	Contra Costa Clean Water Program FOG Outreach Materials	PW Superintendent
Appendix E	Wastewater Collection System Master Plan	PW Director/City Engineer
Appendix F	SSMP Audit Reports	PW Director/City Engineer
Appendix G	Log of SSMP Changes	PW Superintendent
Appendix H	SSMP Council Adoption Documents	PW Director/City Engineer

2.4 SSO REPORTING CHAIN OF COMMUNICATION

Incoming calls related to SSOs are received by City Hall and then forwarded onto the Public Works Superintendent. The SSO Reporting Chain of Communication then follows the flow chart shown in Figure 3. The SSO Reporting process and responsibilities are also described in detail in the Overflow Emergency Response Plan in Element VI.

Figure 3. SSO Reporting Flow Chart



SWRCB Waste Discharge Requirement:

Each Enrollee must demonstrate, through 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 sanitary sewer system (examples may include infiltration and inflow (I/I), stormwater, chemical dumping, unauthorized debris and cut roots, etc.);

b. Require that sewers and connections be properly designed and constructed;

c. Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;

d. Limit the discharge of FOG and other debris that may cause blockages; and

e. Enforce any violation of its sewer ordinances.

3.1 MUNICIPAL CODE

The City's Municipal Code is available online (http://www.codepublishing.com/CA/Hercules/) and describes the City's current legal authority required for compliance with the General Waste Discharge Requirements (GWDR). That authority is specifically contained within Title 5 (Sanitation and Health), Chapter 4 (Sanitary Sewers) of the Municipal Code and specifically within Municipal Code Sections that are summarized below in Table 4.

Table 4. GWDR Legal Authority

Requirement	Legal Authority Reference
Prevent illicit discharges into the sanitary sewer system	Municipal Code 5-4.06
Require that sewers and connections be properly designed and constructed	Municipal Code 5-10
Ensure access for maintenance, inspection, or repairs for portions of the service lateral owned or maintained by the City	Municipal Code 5-4-.12; 5-10.16
Clearly define City responsibility and policies for sewer laterals	City Ordinance 457, Testing, Inspection, Repair and Replacement of Building Sewer Laterals, Municipal Code 5-10
Limit the discharge of fats, oils, and grease and other debris that may cause blockages	Municipal Code 5-4.06-.07
Enforce any violation of its sewer ordinances	California Government Code Sections 54740 and 54740.5

SWRCB Waste Discharge Requirement:

The Sewer System Management Plan must include those elements listed below that are appropriate and applicable to the Enrollee's system:

a. Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities;

b. Describe routine preventive operation and maintenance activities by staff and contractors, including 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 Preventive Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;

c. Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on 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 for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;

d. Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained; and provide equipment and replacement part inventories, including identification of critical replacement parts.

4.1 COLLECTION SYSTEM MAPPING

Each Collections field crew has an atlas map book of collection system facilities. The map book includes information on main lines, maintenance holes, and pump stations. The map is organized by map grids or quadrants and shows maintenance hole numbers, pipe diameters, and flow arrows.

4.1.1 Map Updates

The City has identified development of a formalized map update process as an opportunity for improvement within this Element. An updated process would include standardized forms to document submittal, review, and completion of map updates. Comprehensive updates would be scheduled every two years to keep pace with development and expansion, in addition to as-needed updates when discrepancies are discovered in the field. The City has also identified additional information to be added to existing maps, including manhole rim and invert elevations, and stormwater conveyance facilities.

4.2 PREVENTIVE OPERATION AND MAINTENANCE

The elements of the City's sewer system O&M program include:

- Proactive, preventive, and corrective maintenance of gravity sewers, lift stations, and force mains;
- Closed circuit television (CCTV) inspection program to determine the condition of the gravity sewers;
- Rehabilitation and replacement of sewers and lift stations that are in poor condition.

4.2.1 Gravity Sewers

The City's goal is to hydro flush all sewer mainlines on a seven-year cycle. From historical knowledge, records, and inspections, the City has created a list of identified problem areas, referred to as "Hot Spots." Hot spots tend to have frequent blockages that are caused by FOG, root intrusion, and structural defects, such as sags in the line. Hot Spots are inspected annually and cleaned on an as-needed basis. Hot spots are cleaned on a quarterly basis by H&R Plumbing, a local contractor.

4.2.2 CCTV or Video Condition Assessment:

The City utilizes contractors to perform CCTV inspection of the collection system. In 2018, the City completed an inspection of the entire collection system. Results of this CCTV work will lead to main line and lateral repairs. The City will review the need of subsequent CCTV inspections.

4.2.3 Manholes

The City is planning to implement a City-wide program to address manhole I/I next year. Manholes will be sealed to reduce the amount of inflow and infiltration coming into the sewer system.

4.2.4 Lift Stations

The City operates and maintains six lift stations shown on Figure 1 and described in Table 5 below. Pump stations are visited and visually inspected daily for satisfactory operation. More detailed quarterly inspections are performed on each lift station to insure peak efficiency, perform preventive maintenance, and conduct repairs as needed. Lift station wet wells are also cleaned during the quarterly inspections, using Andre's, a local contractor, in combination with City Staff. The Victoria lift station is inspected/cleaned on a bimonthly schedule. Staff will be conducting quarterly training on emergency by-pass pumping and generator power at all lift stations.

Table 5. Lift Station Locations and Descriptions

Lift Station Name	Location	Number of Pumps	Install Year	Firm Capacity, mgd*	Pump Manufacturer	Pump HP
Willow	811 Dover	2	1981	0.80	Paco	30
John Muir	John Muir Parkway and Alfred Nobel Drive	2	2004	1.70	Flygt	10
Industrial	Sanderling Drive and Willet Street	2	1985	2.00	Paco	30
Bayside	Woodfield and Fawcett	2	1984	0.50	Paco	5
Victoria	Near 193 Trestle Cove	3	2001	0.72	Cornell	25
Promenade	Bayfront Boulevard and Promenade Street	2	2002	0.43	Flygt	10

Note: Each lift station is equipped with a portable generator connection
*mgd= million gallons per day

4.2.5 Force Mains

The City does not currently have a force main inspection program. Table 6 lists the force main asset information. Many of the force mains were installed at the time of the original construction of the associated lift stations. There have been two historic force main failures at the Bayside and Willow pump stations – both of which were force main failures at the connection point to the wet wells due to rigid connections. Repairs were made including repair clamps and concrete encasement of the connection points.

Table 6. Force Main Descriptions

Name of Lift Station Associated with Force Main	Force Main Asset Information	
	Size, inches	Length, linear feet
Willow	8	2,716
John Muir	8	12
Industrial	10	770
Bayside	8	675
Victoria	6	2,400
Promenade	6	370
	Total	**6,943**

4.2.6 Private Sewer Laterals

The City has no responsibility for the installation, maintenance, operation, repair or replacement of private sewer laterals connected to the City sewer mains. However, in accordance with Chapter 5-10 of the City Municipal Code, private sewer laterals shall be cleaned and inspected when any of the following events occur:

- The installation of additional plumbing facilities that produce a major increase, in the judgment of the City, in sewage flow from the house, building, property or other structure served.
- A change of use of the house, building, property or other structure served from residential to business, commercial, or other non-residential use; or from non-residential, non-restaurant, non-commercial, non-industrial to restaurant, commercial or industrial uses.
- Upon repair or replacement of any portion of the Building Sewer Lateral.
- Upon the determination by the City that the cleaning, testing, repair or replacement is required for the protection of the public health, safety and welfare.
- Prior to the close of escrow upon a sale or other transfer of the house, building, property or other structure served or, if there is no escrow, prior to recording a deed or other document transferring title to the house, building, property or other structure served. A transfer of ownership between family members does not require testing if reassessment of property value is not required by the Contra Costa County Tax Assessor.
- In a probate or other testamentary proceeding or in the event of a transfer pursuant to the terms of a revocable living trust, joint tenancy termination or other similar instrument, within 180 days after the sale, transfer or conveyance of the house, building, property or other structure served.
- Upon request by the City at any time commencing upon the expiration of the fifth year after the effective date of this ordinance.

4.3 REHABILITATION AND REPLACEMENT PROGRAM

In 2017/18 the City completed cleaning and CCTV inspection of the entire gravity sewer system, and is currently in the process of developing a rehabilitation and replacement program.

4.4 TRAINING

The City uses a combination of tailgate meetings and on-the-job training. Training topics typically include the following:

- SSO Emergency Response
- Pump Station O&M
- Safety
- Traffic Safety
- CPR
- Hazmat

Training events are not currently logged, but the development of a tracking log is planned to be developed in the future, given the required staffing resources become available.

4.5 EQUIPMENT AND REPLACEMENT PARTS

The City owns two (2) trailer-mounted diesel pumps that can be dispatched with pickup trucks and employed by maintenance crews as necessary for bypass pumping applications. The City has developed an inventory of major equipment and critical replacement parts that is included in Appendix B. As part of the overflow emergency response plan, the City uses local vendors to provide emergency equipment to supplement the City's inventory on an as needed basis.

SWRCB Waste Discharge Requirement:

1. Design and construction standards and specifications for the installation of new sanitary sewer systems, lift stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and
2. Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.

5.1 DESIGN CRITERIA FOR INSTALLATION, REHABILITATION AND REPAIR

The City's Sanitary Sewer Design Standards, Standard Plans, and Standard Specifications for sewer mainlines, structures and appurtenances like maintenance holes, lift stations, and service laterals are administered by the Public Works Department.

5.1.1 General

In accordance with the City Design Standards (Section 19 – Sanitary Sewers), the City has adopted the Central Contra Costa Sanitary District (CCCSD) Standard Specifications.

The complete version of the City's Standard Plans Design Standards and Standard Specifications is located on the City's website at https://www.ci.hercules.ca.us/government/engineering-public-works/standard-design-plans-specifications. The complete version of CCCSD's Standard Specifications is located on CCCSD's website at https://www.centralsan.org/standard-specifications. The referenced CCCSD standards provide for both new construction and rehabilitation and repair of all main lines sewers, trunk sewers, manholes and other collection system appurtenances.

5.1.2 Lift Stations

Lift stations standards are not included in the design standards but are handled on a case-by-case basis. The City requires that all new or rehabilitated lift stations be designed by an appropriately experienced engineer and approved by the City before construction and acceptance by the City Council.

5.1.3 City Sewer System – Authorized Pipe Materials

The materials authorized and accepted by the City to be used in the sewer system are shown in Table 7.

Table 7. Acceptable Pipe Materials for New Gravity Sewers

Material	Designation	Standard
House Sewers (4" and 6")		
PVC Solid Wall – SDR 26	Use for house sewers 4" or 6"	CCCSD Approved Materials List Standard Specifications – 2014 Edition
ABS Solid Wall Schedule 40	Use for house sewers 4" or 6"	CCCSD Approved Materials List Standard Specifications – 2014 Edition
Vitrified Clay Pipe (VCP)	Use for house sewers 4" or 6" repairs only	CCCSD Approved Materials List Standard Specifications – 2014 Edition
DIP Class 52	Use for house sewers 4" or 6"	CCCSD Approved Materials List Standard Specifications – 2014 Edition
Cast Iron Soil Pipe (CIP) Class SV	Use for house sewers 4" or 6" repairs only	CCCSD Approved Materials List Standard Specifications – 2014 Edition
HDPE SDR 17 Gray (Ductile Iron Pipe O.D.)	Pipe Bursting or Directional Drilling only or at Inspector's discretion	CCCSD Approved Materials List Standard Specifications – 2014 Edition
PVC Solid Wall C900 (DR-14, DR-18, DR-25)	Use for house sewers 4" or 6"	CCCSD Approved Materials List Standard Specifications – 2014 Edition
Main Sewers (Less than 18")		
PVC Solid Wall – SDR 26	Use for main sewers less than 18"	CCCSD Approved Materials List Standard Specifications – 2014 Edition
Ductile Iron CL52 – Epoxy Lined and Bituminous Coated	Use for main sewers less than 18"	CCCSD Approved Materials List Standard Specifications – 2014 Edition
PVC Solid Wall C900 or C905	Use for main sewers less than 18"	CCCSD Approved Materials List Standard Specifications – 2014 Edition
HDPE SR 17 Gray (Ductile Iron Pipe Size O.D.)	Use for main sewers less than 18"	CCCSD Approved Materials List Standard Specifications – 2014 Edition
Vitrified Clay	Use for main sewers less than 18"	CCCSD Approved Materials List Standard Specifications – 2014 Edition

5.1.4 Private Sewer Systems and Private Laterals

The CCCSD Code provides the authority of the City Engineer; states that only Contractors licensed in the state of California (and Property Owners in particular cases) may perform work on private or public sewers; requires Contractor registration; and provides for Plan review, inspection, connection and other service charges.

5.2 INSPECTION AND TESTING CRITERIA

The City's Wastewater Collection System inspection and testing Criteria are based on the CCCSD Standard Specifications. Inspections are performed by the City Assistant Civil Engineer, City Public Works Superintendent, or a contracted inspector. The City's inspection and testing criteria are:

5.2.1 New and Rehabilitated Gravity Sewers

- Design

  Sewer system designs must be prepared by a licensed civil engineer for the review and approval by the City.

- Inspection during Construction

  All new gravity sewers will be inspected during construction to ensure that the sewer is constructed in accordance with the approved design. Specific approvals will be required by the inspector prior to backfilling all trenches, prior to paving, and prior to acceptance by the City. The contractor will be required to provide survey controls so that the inspector can verify line and grade (slope). Unusual conditions and special features will be recorded for future reference.

- Leakage

  All new gravity sewers will be tested in accordance with City Design Standards (Section 19 – Sanitary Sewers) to verify that they have been properly constructed. Gravity sewers that fail the test shall be repaired and retested until they pass.

- CCTV Inspection

  All new gravity sewers will be inspected using CCTV to verify that the pipe is free from defects/damage, that the joints have been correctly constructed, and that the sewer is free from sags that will cause future operational problems. Gravity sewers shall be cleaned prior to inspection and shall be flushed with water so that sags can be readily identified. Defects shall be recorded following the City standards. Sags that exceed one inch in depth shall be repaired.

5.2.2 New and Rehabilitated Manholes

- Leakage

  All new manholes will be vacuum tested to verify that the joints, connections, and frame/cover are tight in accordance with City Design Standards (Section 19 – Sanitary Sewers). Manholes that fail the vacuum test shall be repaired using materials and methods approved by the City and retested until they pass.

5.2.3 New and Rehabilitated Lift Stations

- Inspection during Construction

  All new and rehabilitated lift stations will be inspected during construction to ensure that they are constructed in accordance with City Design Standards (Section 19 – Sanitary Sewers). Unusual conditions and special features will be recorded for future reference.

- Functional Test
- All systems in new and rehabilitated lift stations will be tested to ensure they function as intended. Performance Test

  All new and rehabilitated lift stations will be required to pass an extended performance test to ensure that they are capable of reliably meeting the design performance for a period of continuous operation without failure or alarms. The results of these performance tests will be recorded for use as a basis for evaluating future lift station performance.

SWRCB Waste Discharge Requirement:

Each Enrollee shall develop and implement an Overflow Emergency Response Plan (OERP) that identifies measures to protect public health and the environment. At a minimum, this plan must include the following:

a. Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;
b. A program to ensure an appropriate response to all overflows;
c. Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the Monitoring and Reporting Program (MRP). All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Regional Water Board WDRs or NPDES permit requirements. The SSMP should identify the officials who will receive immediate notification;
d. Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;
e. Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and
f. A program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States and to minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.

The OERP is included in full in Appendix C. This section includes the purpose, policy, and goals of the OERP.

6.1 PURPOSE

The purpose of the City's OERP is to support an orderly and effective response to SSOs. The OERP provides guidelines for City personnel to follow in responding to, cleaning up, and reporting SSOs that may occur within the City's service area. This OERP satisfies the SWRCB Statewide GWDR, which require wastewater collection agencies to have an OERP.

6.2 POLICY AND GOALS

The City's employees are required to report all wastewater overflows resulting from the City-owned/maintained sanitary sewer system and to take the appropriate action to secure the wastewater overflow area, properly report to the appropriate regulatory agencies, relieve the cause of the overflow, and ensure that the affected area is cleaned as soon as possible to minimize health hazards to the public and protect the environment. The City's goal is to respond to sewer system overflows as soon as possible following notification. The City will follow reporting procedures regarding sewer spills as set forth by the San Francisco Bay Regional Water Quality Control Board (RWQCB) and the SWRCB.

The City has acknowledged that the current OERP and procedures are working for smaller and infrequent overflows, but due to staffing issues, the City is vulnerable to negative impacts resulting

from a large overflow or an overflow which impacts critical infrastructure. The City plans to develop and implement a formal on-call system to provide a more robust and reliable response to potential major overflows. The system would include a dedicated call-out system, 24-7 on-call Staff, and documented procedures. Expanding this system would offer a cross-training opportunity with other City Staff who are currently not involved in responding to SSOs.

SWRCB Waste Discharge Requirement:

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 for 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;
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 system service area;
c. The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;
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;
e. Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;
f. An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section; and
g. Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (f) above.

7.1 NATURE AND EXTENT OF FOG PROBLEM

From 2011 through April 2018, the City had only one recorded SSO in the California Integrated Water Quality System (CIWQS) database that was caused by FOG.

7.2 FOG SOURCE CONTROL PROGRAM - REVIEWS & INSPECTIONS

There are 20 areas in the sewer system referred to as “hot spots”. The hot spots require frequent preventative maintenance, mostly to prevent FOG-related problems. The City requires FOG pretreatment in the form of grease interceptors for Food Service Establishments (FSEs). The current Code is posted on the City's website at: http://www.codepublishing.com/CA/Hercules/. The City participates in the Contra Costa Clean Water Program, which currently conducts FOG inspections at FSEs within the City.

7.3 RESPONSE TO GWDR REQUIREMENTS

Requirement (a): An implementation plan and schedule for a public education outreach program should promote proper disposal of FOG.

Response: The Contra Costa Clean Water Program develops and distributes the outreach materials provided in Appendix D to Food Service Establishments (FSE) through their website at https://www.cccleanwater.org/userfiles/documents/files/278/SKMBTC45109060910200.pdf
The City has also identified a potential outreach opportunity in the residential areas of the City and plans to develop a public education/outreach program in the future, given the availability of resources.

Requirement (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 system service area.

Response: The City is currently managing its FOG by requiring grease, oil, and sand interceptors where the Director of Public Works deems they are necessary. The City Municipal Code requires the discharger to maintain the interceptor in a continually efficient operation.

Requirement (c): The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG.

Response: The City's Municipal Code provides the legal basis and authority to prohibit discharges to the system and identifies measures to prevent SSOs and blockages caused by FOG, see Section 5-4.07. The City's current Code is posted on the City's website at: http://www.codepublishing.com/CA/Hercules/.

Requirement (d): Requirements to install grease removal devices (such as traps or interceptors), design standards for the grease removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements.

Response: Section 5-4.07 of the City's Municipal Code requires the installation of grease removal devices where the Director of Public Works deems it is necessary. The City also participates in the Contra Costa Clean Water Program, which works with FSEs to convey standards, BMPs, maintenance and recordkeeping requirements.

Requirement (e): Authority to inspect grease producing facilities, enforcement authorities, and determination of whether the collection system agency has sufficient staff to inspect and enforce the FOG ordinance.

Response: The authority to inspect or review facilities is granted by the Municipal Code in Section 5-4.07. The FOG ordinance is inspected and enforced through the Contra Costa Clean Water Program.

Requirement (f) and (g): Requirement (f) is an identification of sewer system sections subject to FOG blockages and the establishment of a cleaning maintenance schedule for each section, and

Requirement (g) is the development and implementation of source control measures, for all sources of FOG discharged to the sewer system.

Response: The City's Hot Spot program is focused on problematic areas many of which are FOG related. Hot spots are cleaned on a quarterly schedule. Source control measures for FSEs are provided through the City's participation in the Contra Costa Clean Water Program. An opportunity remains for FOG outreach in residential areas.

SWRCB Waste Discharge Requirement:

The Enrollee shall prepare and implement a CIP that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the CIP must include:

a. **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 from 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 limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;
b. **Design Criteria**: Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and
c. **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 programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.

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.

8.1 SYSTEM CAPACITY EVALUATION

The City contracted with Dudek to complete the Sewer Collection System Master Plan dated August 2008 (2008 Master Plan). As part of the 2008 Master Plan, a Capacity Assurance Plan was developed. A Pizer, Inc. Hydra Model was developed to evaluate the capacity of the system and a EPA SWMM model was developed to evaluate the potential for overflow. The study found that the City had adequate capacity to handle dry weather flows, but there were predicted capacity restrictions during a wet weather event. The City is currently in the process of updating the Collection System Master Plan.

8.2 DESIGN CRITERIA.

The capacity-related design criteria, including base wastewater flow and peaking factors, can be found in the CCCSD Standard Specifications Section 4.

8.3 CAPACITY ENHANCEMENT MEASURES - CAPITAL IMPROVEMENT PROGRAM (CIP)

The 2008 Master Plan identified four capacity enhancement projects, three of them being for the trunk line and one for the sewer line upstream of the Willow Pump Station. The City's current Wastewater Collection System Master Plan, which includes the CIP budget and schedule is included as Appendix E.

SWRCB Waste Discharge Requirement:

The Enrollee shall:

a. Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;
b. Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;
c. Assess the success of the PM program;
d. Update program elements, as appropriate, based on monitoring or performance evaluations; and
e. Identify and illustrate SSO trends, including: frequency, location, and volume.

9.1 PERFORMANCE MEASURES

The indicators that the City will use to measure the performance of its wastewater collection system and the effectiveness of its SSMP are:

- SSOs: Total number
- SSOs: Number for each cause (roots, grease debris, pipe failure, capacity, lift station failures, and other)
- SSO Rate (#/100 miles/year)

In addition, the City will consider other performance measures with metrics in the future for issues such as CCTV assessment work, and rehabilitation and replacement of sewers.

9.2 BASELINE PERFORMANCE

The City has performance measures in place and it will evaluate its performance annually following the end of the calendar year. The historical, or baseline, performance is shown below for gravity mains, lift stations, and force mains.

9.2.1 Mains, Lift Stations, and Force Mains

The baseline performance and SSO trends for gravity mains, lift stations, and force mains is shown in Table 8 and Figure 4.

Table 8. Gravity Main Sewer, Lift Station, and Force Main SSOs by Year

Calendar Year	Gravity Main Sewer SSOs	Lift Station SSOs	Force Main SSOs
2011	0	1	0
2012	1	0	0
2013	1	0	0
2014	2	0	0
2015	0	0	0
2016	0	0	0
2017	1	0	0

Figure 4. Trend in Number of Gravity Sewer, Lift Station, and Force Main SSOs

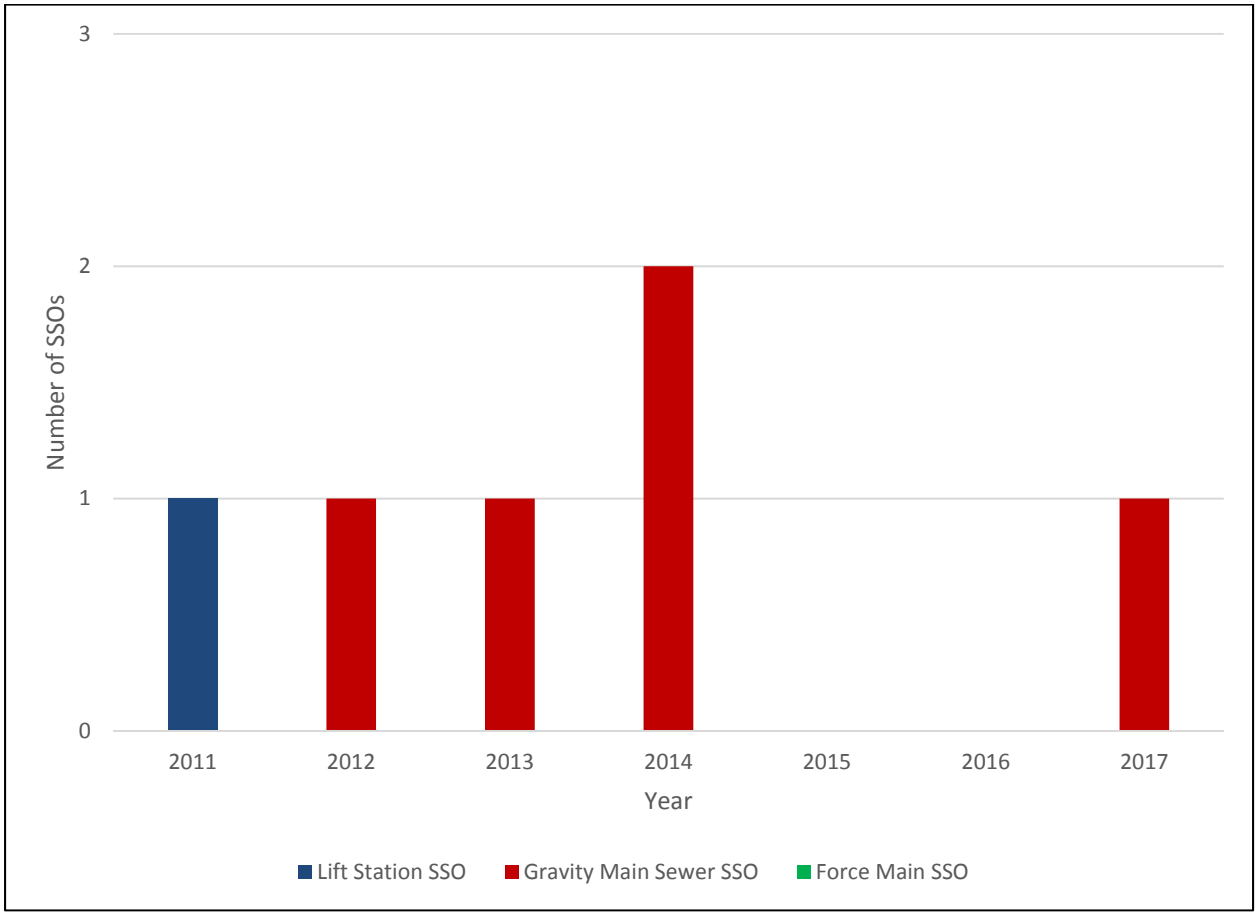


Table 9 and Figure 5 show the data and trends in causes of Mainline, Lift Station and Force Main SSOs for the last seven years (2011-2017).

Table 9. SSOs by Cause

Year	Roots	Debris	Grease	Infiltration	Vandal-ism/Other	Pipe Failure	PS Failure	Total
2011	-	-	-	-	-	-	1	**1**
2012	1	-	-	-	-	-	-	**1**
2013	1	-	-	-	-	-	-	**1**
2014	1	1	-	-	-	-	-	**2**
2015	-	-	-	-	-	-	-	**0**
2016	-	-	-	-	-	-	-	**0**
2017	-	-	1	-	-	-	-	**1**
Total	**3**	**1**	**1**	**0**	**0**	**0**	**1**	**6**

Figure 5. Trend in SSO Cause

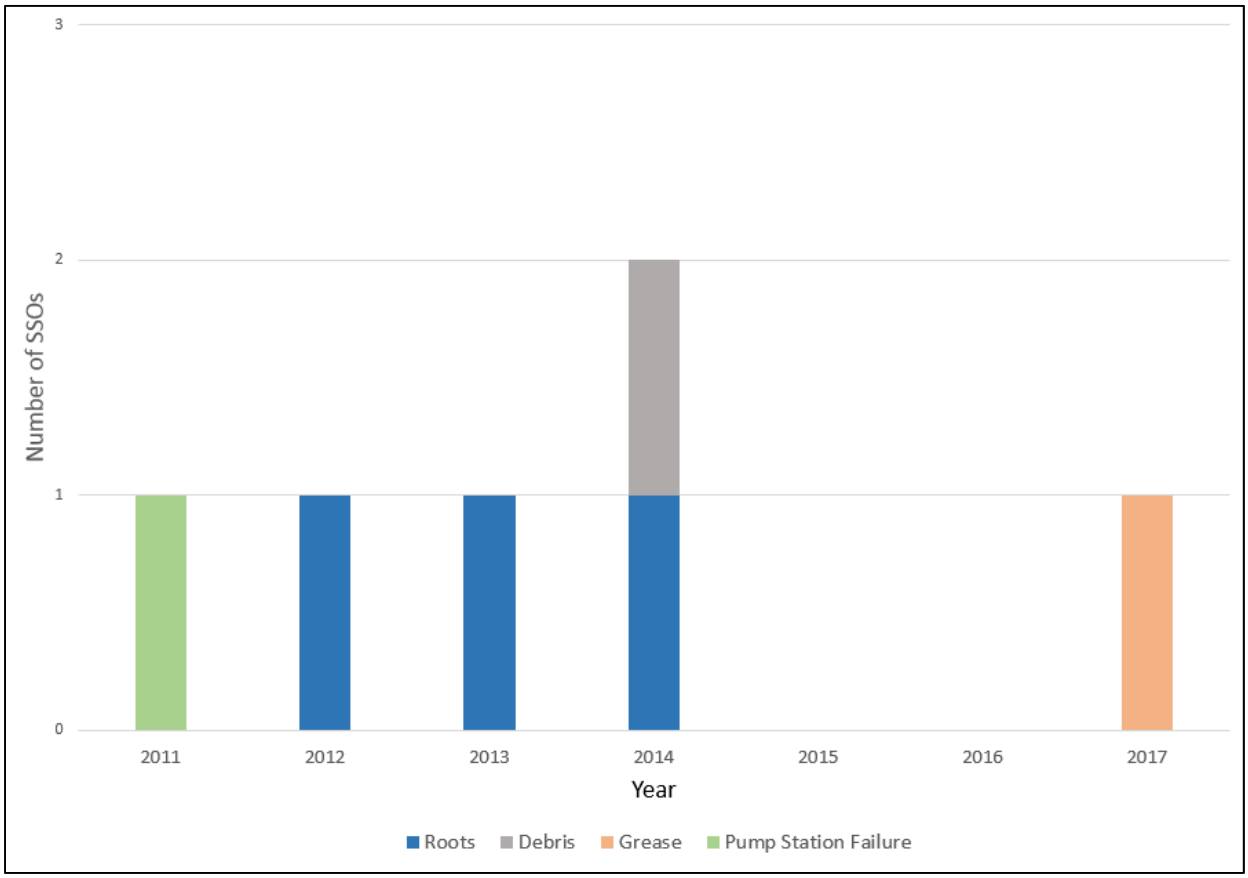
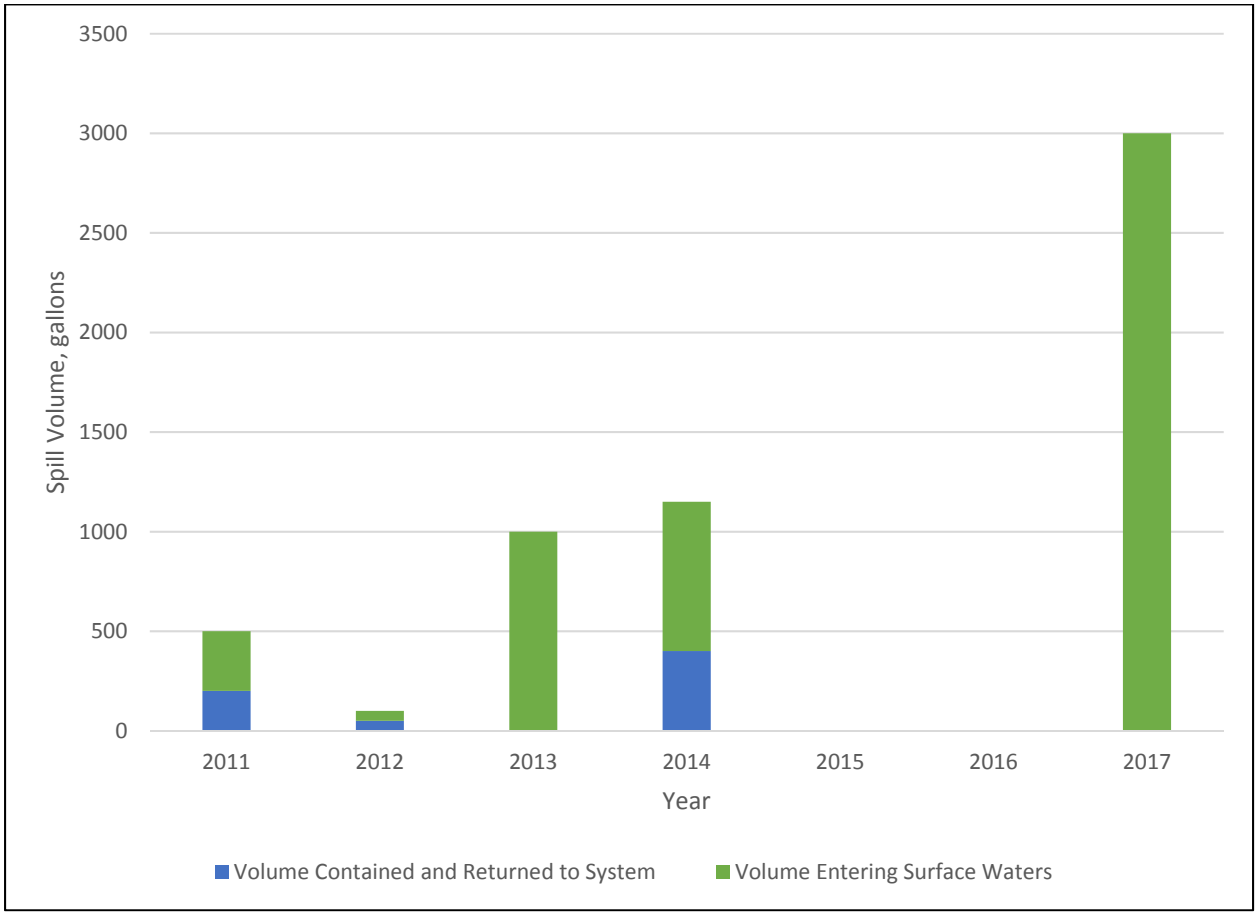


Table 10 and Figure 6 indicate the SSO volumes and trends for the seven-year period. The number of SSOs has not changed much over the seven-year period, but the spill volume of the SSOs has increased over time. Note that there were no SSOs in 2015 and 2016 and thus no volume data was reported.

Table 10. SSO Volumes and Percent Contained

Year	Total Volume, gallons	Portion Contained and Returned to Sewers, percent	Total Volume Entering Surface Waters, gallons
2011	500	40%	300
2012	100	50%	50
2013	1000	0%	1000
2014	1150	35%	750
2015	-	-	-
2016	-	-	-
2017	3000	0%	3000

Figure 6. Trend in Volume of SSOs



9.3 PERFORMANCE MONITORING AND PROGRAM CHANGES

The City will evaluate the performance of its wastewater collection system as required using the performance measures identified in Section 9.1 of this Element.

SWRCB Waste Discharge Requirement:

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), including identification of any deficiencies in the SSMP and steps to correct them.

10.1 AUDITS

The City implemented a regular audit program in 2017. The City will audit its implementation and compliance with the provisions of this SSMP every two years as required by the WDR. The audit will be conducted by a team consisting of City Staff selected from the Public Works Department. The audit team may include members from other departments of the City, outside agencies, or contractors.

The SSMP Audit Template, included in Appendix F, is used to guide the audit process and includes the GWDR requirements for each SSMP element. The audit may contain information about successes in implementing the most recent version of the SSMP, and identify revisions that are needed for a more effective program. The results of the audit should include the identification of any opportunities for improvement, deficiencies, and the steps taken or planned to correct deficiencies. Audit information will be included in an Audit Report.

Audit tasks completed in 2017 included a gap analysis and effectiveness evaluation on the 2012 SSMP. These documents were assembled into an Audit Report, included in Appendix F. Modifications and changes to the SSMP will be identified and tracked in a Change Log, Appendix G.

10.2 SSMP UPDATES

The City will recertify its SSMP on a schedule of once every five years from the original date of City Council adoption and approval (2012) or when substantial changes are made in the SSMP. The City will determine the need to update its SSMP more frequently based on the results of the audits and the performance of its wastewater collection system using information from the Monitoring and Measuring Program in Element IX. In the event that the City decides that an update is warranted, the process to complete the update will be identified, assigned to certain staff and include a schedule for completion. The City will complete the update and take the revisions to the City Council no later one year of identifying the need for an update. Council adoption documents are included in Appendix H.

SWRCB Waste Discharge Requirement:

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.

11.1 COMMUNICATION DURING SSMP DEVELOPMENT AND IMPLEMENTATION

The City maintains a website (http://www.ci.hercules.ca.us/) to inform the public about City activities. The City's website is an effective communication channel for providing alerts and news to the public. The website provides important announcements, public hearing notices, links to agendas and minutes for City Council meetings, and other key information for City residents. The City will publish the most up-to-date SSMP on the Public Works Department page of the City website. The current SSMP was first certified by the City Council during a public City Council meeting on August 21, 2012.

The City communicates with the City Council at public meetings that allow for input from the public with regard to the implementation and performance results of the collection system operations.

APPENDIX A

Responsible Officials in SSMP Development

Appendix A - Responsible Officials in SSMP Development – Contact Info					
Element	Element Name	Position Title	Responsible City Official	Phone	Email
-	Introduction	Public Works Director/City Engineer	Mike Roberts	(786) 250-1457	mikeroberts@ci.hercules.ca.us
I	Goals				
II	Organization				
III	Legal Authority				
V	Design and Performance Provisions				
VIII	System Evaluation and Capacity Assurance Plan				
IX	Monitoring, Measurement and Program Modifications				
X	Program Audits				
Appendix E	Wastewater Collection System Master Plan				
Appendix F	SSMP Audit Reports				
Appendix H	SSMP Council Adoption Documents				
IV	Operations and Maintenance Program	Public Works Superintendent	Jeff Brown	(510) 812-4630	jbrown@ci.hercules.ca.us
VI	Overflow Emergency Response Plan				
VII	Fats, Oils and Grease (FOG) Control Program				
Appendix A	Responsible Officials Contact Info				
Appendix B	Sewer System Major Equipment and Critical Parts Inventory				
Appendix C	Overflow Emergency Response Plan (OERP)				
Appendix D	Contra Costa Clean Water Program FOG Outreach Materials				
Appendix G	SSMP Change Log				
XI	Communications Program	Assistant Civil Engineer	Jose Pacheco	(510) 799-8247	jpacheco@ci.hercules.ca.us

APPENDIX B

Sewer System Major Equipment and Critical Parts Inventory

Sewer System Major Equipment Inventory	
Equipment item	Number Available
Utility Truck	10
Portable Trash Pump (6")	2
Portable Trash Pump (4")	1
Portable Trash Pump (2")	2
Backhoe	1
5 Yard Dump Truck	1
Portable Generator	8

Critical Sewer System Replacement Parts Inventory		
Part Description	Number in Inventory	Location
Willow LS – Backup Pump	1	Willow Lift Station
John Muir LS – Backup Pump	1	John Muir Lift Station
Industrial LS – Backup Pump	1	City Corp Yard
Bayside LS – Backup Pump	1	Bayside Lift Station
Victoria LS – Backup Pump	1	Victoria Lift Station
Last Inventory Date: 12/1/2018		

APPENDIX C

Overflow Emergency Response Plan

CITY OF HERCULES

SANITARY SEWER OVERFLOW (SSO)
EMERGENCY RESPONSE PLAN

Revised: December 2018

SANITARY SEWER OVERFLOW EMERGENCY RESPONSE PLAN

Introduction

The following sanitary sewer overflow scenarios were developed to address public health and regulatory concerns as the City of Hercules desires to keep the city clean, healthy, and in compliance with sanitary sewer overflow laws.

This document is dynamic in nature and will be updated annually, or as necessary, to reflect new changes in the law, personnel, new public health information, unforeseen sanitary sewer overflow scenarios and changes in clean-up containment technologies. It is intended to primarily address emergency sanitary sewer overflows that have public health significance. It is designed to protect public health and the environment by applying a process that will address a broad range of sanitary sewer overflow scenarios.

The objectives are to prevent the discharge of raw or partially treated sewage to any waters and to protect public health by preventing backup of sewage and subsequent discharge to basements, streets, and other public and private property.

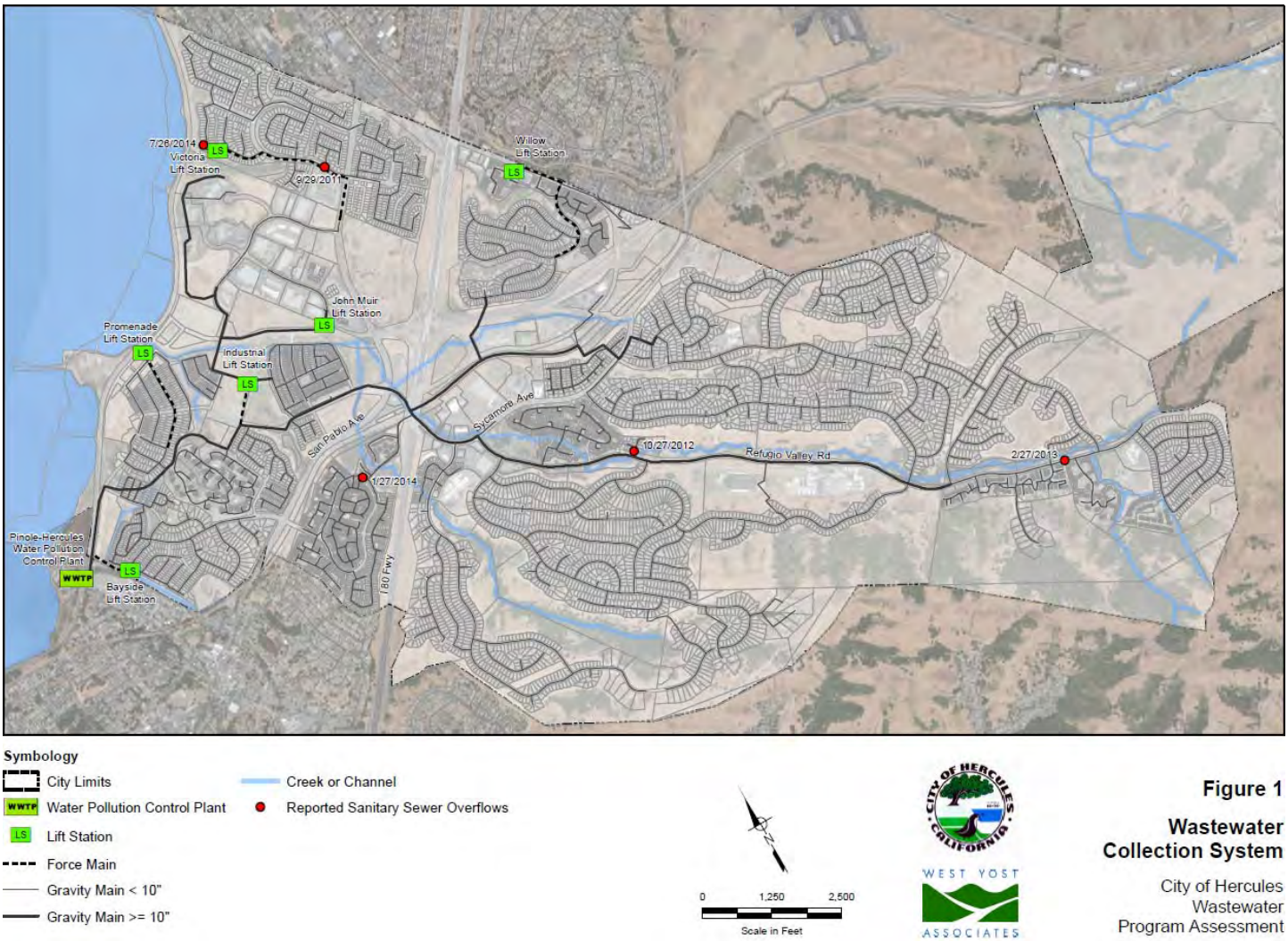


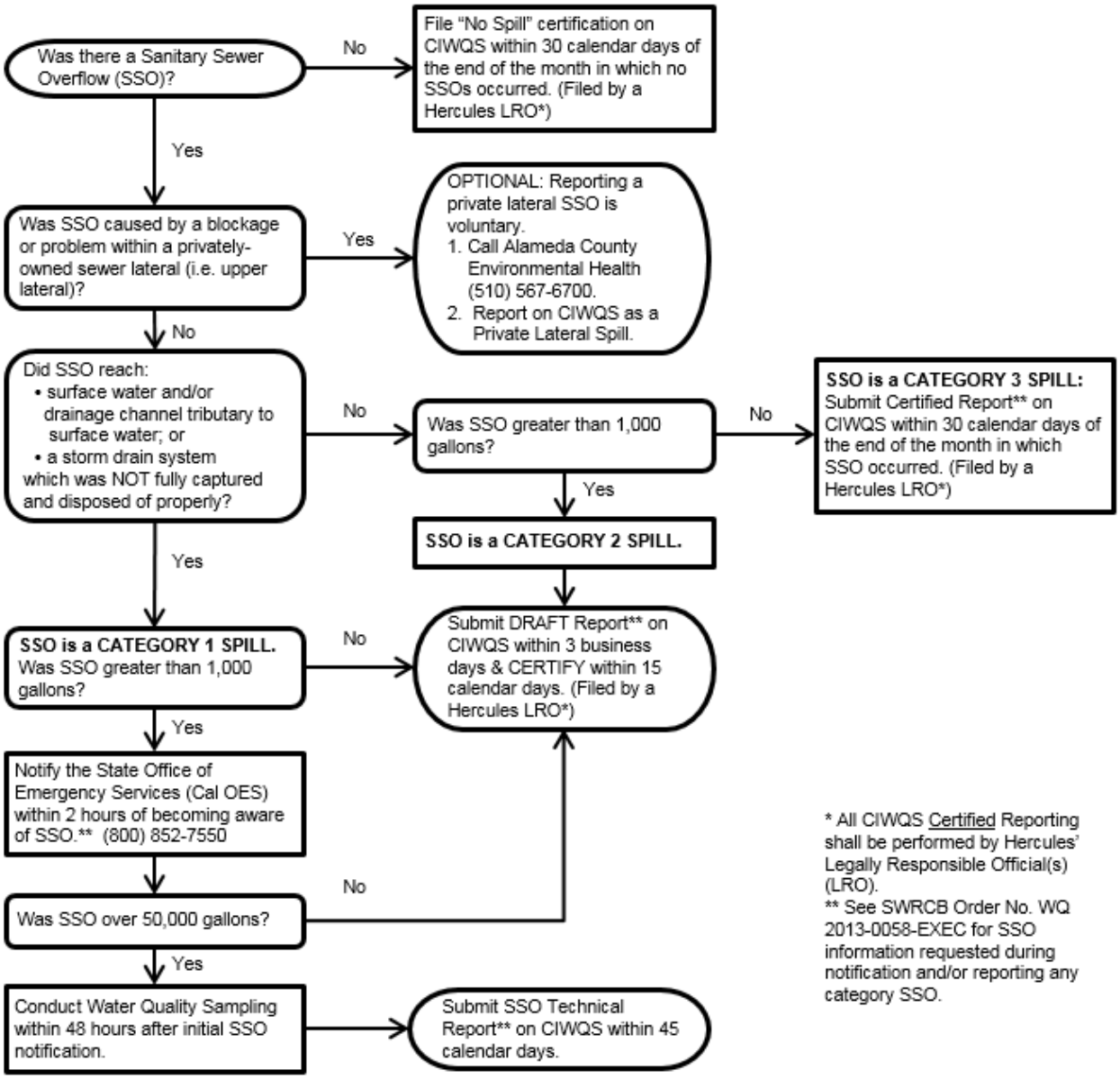
Figure 1

Wastewater Collection System

City of Hercules
Wastewater
Program Assessment

PROCEDURES
Flow Chart for Deciding How to Report an SSO

A. What kind of sanitary sewer overflows need to be reported:



B. Other potential contacts for notification purposes:

1. San Francisco Bay Region Water Quality Control Board (RWQCB) or Local RWQCB
   RWQCB Telephone: (510) 622-2300 (8 a.m. – 5 p.m.)
   (510) 286-1255 (Voicemail)
   Fax: (510) 622-2460

1. Contra Costa County Health Department (925) 692-2500…925-383-4945

2. Urban Creeks Council of California– (510) 540-6669/Fax (510) 848-2219

3. Local Agencies and Individuals:

   a. Contact as situation dictates.
   b. Report as soon as possible.

Fire Department	(510) 799-4575	Protect Public Health
Police Department	(510) 799-1111	Road Block, Traffic Control, etc.
Public Works	(510) 799-8244	Close areas such as beach, parks, fishing pier, etc.
Water District	(510) 835-3000	Impact on drinking water storage or supply.

Contact any local residents who may be impacted.
Contact Supervisor, Manager or Director, as needed.

C. Field Activities:

1. Typical Respondent's role: (Bring Emergency Response Packet on all Calls.)

   a. Protect public health, environment and property from sanitary sewer overflows and restore area to normalcy as soon as possible.
   b. Establish perimeters and control zones with cones, barricades, vehicles or terrain.
   c. Promptly notify agency communication centers of preliminary sanitary sewer overflow information and potential impacts.
   d. Contain sanitary sewer overflow to the maximum extent possible. Every effort must be made to prevent the sanitary sewer overflow into surface waters.
   e. Fill out SSO form.

D. Relieving Cause of the Sanitary Sewer Overflow:

1. Relieve the stoppage as soon as possible by contacting contractor on local vendor list.
2. Refer to and follow all safety regulations.
3. Contain the sewage discharged to the maximum extent possible.
4. If sanitary sewer overflow enters the creek, use screen to collect solids.
5. Any sanitary sewer overflows over 10,000 gallons; the discharger should collect receiving water samples upstream and downstream of the sanitary sewer overflow and have them analyzed for total and fecal coliform. Soil samples may be required in the affected area.

E. Sanitary Sewer Overflow Containment and Recovery:

1. Install air plugs on storm drains whenever appropriate to contain the sanitary sewer overflow.
2. Divert sanitary sewer overflow by building a small berm to change direction of flow to sewer.
3. Divert sanitary sewer overflow by pumping around overflow and return to sewer.
4. Contain sanitary sewer overflow by allowing it to collect in a naturally low area or pump to a storage tank and recover collected sewage as soon as possible.
5. Dike/dam or sand bag sanitary sewer overflow by building a dirt berm to collect the overflow.

F. Clean Up and Disinfection

1. Flush area with tertiary water. The amount of flush water should be at least three times the quantity of the sanitary sewer overflow.
2. If chlorinated water is used for disinfection, the water should be contained and returned to sewer.

G. Sign Posting and Barricading

1. Post **"CONTAMINATED WATER"** signs and block the contaminated area with "yellow caution" tape barricades. Do not remove these until the lab tests are cleared.

H. Sewer Backup Involving Private Property Standard Operating Procedures (SOP)

Refer to Emergency Response Plan (**ERP**) for situational procedures.

Emergency Response Packet Includes:

- Camera
- Cell Phone
- Emergency Response Plan
- Radio

FIRST – Determine if stoppage is in the City main line.

- **IF YES** – Contact contractor on local vendor list to relieve the blockage and backup and call a City staff Supervisor or Manager.

- **IF NO** – Inform customer that the problem is in their private line and that a plumber of their choosing should be contacted to fix the problem.

NEXT - Ask customer if they desire cleanup:

- **IF YES – Call E.V. Link @ 1-800-413-2999 or 707-479-1375** (Bruce Burnett). Request a cleanup crew be dispatched. Ask for ETA and relay information to customer. If for some reason E.V. Link cannot be reached, refer to **ERP** for alternate restoration companies.

  DO NOT ATTEMPT TO CLEAN SEWAGE BACKUP INSIDE THE BUILDING YOURSELF.

- **IF NO** – Request that the customer sign a "Refusal of Service" form. If customer does not wish to sign this form, fill out form and note that they chose not to sign.

  1. Inform customer to:
     - Keep pets and inhabitants from walking through spill.
     - Put towels or some form of diversion to keep the spill from reaching floor vents and spreading.
     - Start making a list of items and areas affected by the spill.
     - Contact their insurance company.

  2. Take pictures of affected areas and items.

  3. If relocation to a motel is requested, call from the list in the ERP to accommodate. Inform the customer that you can only authorize a one-night stay or until the next business day when a City of Hercules representative or a representative from the City's insurance company would contact them.

4. Do not volunteer or disown City liability. If asked about liability, inform them that the City's insurance representative would determine liability.

5. Always maintain a professional and courteous approach to these matters. Put yourself in the customers' position and understand that this can be a very stressful and aggravating situation. The customer, understandably, may not be very pleasant.

   DO NOT WALK AWAY FROM AN UNRESOLVED SANITARY SEWER OVERFLOW (SSO) THAT HAS THE POTENTIAL FOR IMMEDIATE IMPACT ON PUBLIC HEALTH, SAFETY, OR ENVIRONMENTAL DANAGER.

6. If there is a discrepancy as to responsibility, and/or no other timely solution to resolving an SSO, we will make every effort to fix the problem. All financial and legal responsibilities will be left to determine at a future time.

7. For containment and cleanup of outdoor spills, refer to ERP.

8. In the event that the customer is without service and chooses not to relocate, contact vendor from local vendor list for (2) portable chemical toilets as an option for a short-term solution.

COLLECTION SYSTEM DEPARTMENT
SANITARY SEWER OVERFLOW
CALCULATION METHOD

To calculate the number of gallons in a sanitary sewer overflow, you must determine the volume of the sanitary sewer overflow. If it is a rectangular contained area:

V=L x W x D x 7.48 = Gallons

Example: A spill 100' x 100' x 6"
100' x 100' x .5' x 7.48 = 37,400/gallons

If you are dealing with a sanitary sewer overflow that has been running into a storm drain, you must estimate the gallons by the amount of time of the overflow x the number of connections on the receiving line (200 gallons per household per 24 hours).

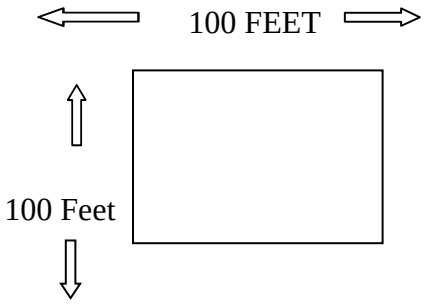
Example: If you have a line with 6 houses on it and it has been overflowing for 24 hours:

6 x 200/gallons = 1,200/gallons

Example: If you have 60 houses on a line that has been overflowing for 1 hour:

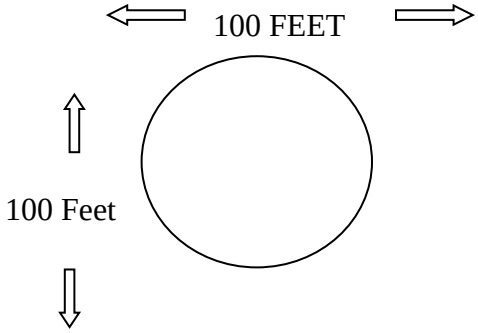
60 x 200/gallons divided by 24 hours = 500/gallons

Example:



V. = 100' x 100' x .5' x 7.48
= 37,400 gallons

Example:



V. = 100' x 100' x .5' x .7
= 26,180 gallons

City of San Diego
Metropolitan Wastewater Department

Reference Sheet for Estimating Sewer Spills from Overflowing Sewer Manholes

All estimates are calculated in gallons per minute (gpm)

Wastewater Collection Division
(619) 654-4160

5 gpm

25 gpm

50 gpm

100 gpm

150 gpm

200 gpm

225 gpm

250 gpm

275 gpm

All photos were taken during a demonstration using metered water from a hydrant in cooperation with the City of San Diego's Water Department.

rev. 4/99

Homeowners Associations
Contact List

HOMEOWNER ASSOCIATION	MANAGEMENT COMPANY
500 Alfred Nobel Drive	Collins Management Company Contact: Erica Greyer 500 Alfred Nobel Drive Hercules, CA 94547 (510) 262-1795
Bayside HOA N Front Lewis Drake Ferello Cabrillo Tsushima (N) DeAnza S Front Serra Clark	Patty Gish, Property Manager 925-603-6560 Cathy McCormack, Asst 925-681-4001 email: infocon@vierramoore.com Vierra Moore Co 2151 Salvio St., Suite 333 Concord, CA 94520 1-800-966-1506 925-681-4000 Fax 925-681-2490
Baypointe HOA Boatswain Oarsman So. Wind Compass Pt., Porthole Sunset Crows Nest, Scupper Tidewater Lagoon Seagull Whaler Lighthouse Seaway Malibu Sextant	Collins Management Company Contact: Erica Greyer 500 Alfred Nobel Drive Hercules, CA 94547 (510) 262-1795
Belleterre HOA - Schuler Homes Crestridge Riverview Rimrock Titan Overlook Ridgepoint Rocky Pointe Lookout Ridgeview Shipwatch	Willis Management Group Chris Willis-Property Manager 7033 Village Pkwy #212 Dublin, CA 94568 (925) 828-7150 Fax: 1-925-828-7195
Bravo HOA Dorado Tuscany Florence Sorrento Marsala Napoli Palermo	HBM, Inc. Attn: Rosie Rivera, CCAM – Association Manager 1855 Gateway Blvd., #340 Concord, CA 94520 Office:925-687-1855 x27 Fax: 925-687-0332 Email: rrivera@hbmcorp.com

HOMEOWNER ASSOCIATION	MANAGEMENT COMPANY
Caprice HOA Caprice Haviture Wy Vierra	Colleen Montoya Community Association Manager M&C Association Management, Inc. An Associa Company 4305 Hacienda Drive Pleasanton, CA 94588 925-460-8890 x105 408-396-5919 (cell) 925-460-8897 (fax) cmontoya@mccommunities.com
Chelsea-By-The-Bay HOA Brenner Cardoza O'Neil Variz Weiss	Willis Management Group Chris Willis-Property Manager 7033 Village Pkwy #212 Dublin, CA 94568 (925) 828-7150 Fax: 1-925-828-7195
Citation –Coventry HOA Camden Hampton Kensington	Jean Bates & Associates Inc Attn. Sally Hanson, Property Manager 1120 Second Street #110 Brentwood, CA 94513 925-516-9710
Christison Company	Christison Company 3090 Independence Drive, Suite 100 Livermore, CA 94551 925-371-5700 Fax 925-371-59
Cottage Lane HOA	Jean Bates & Associates Inc Attn. Sally Hanson, Property Manager 1120 Second Street #110 Brentwood, CA 94513 925-516-9710
Country Run HOA Arete Peak Basin Pinnacle Bluff Playa Crag Range Hill Terrace Knoll Valley Run Mesa Wadi Run Moraine	 Miramonte Lin Yates-Property Manager 1225 Alpine Drive #206 Walnut Creek, CA 925-932-7100

HOMEOWNER ASSOCIATION	MANAGEMENT COMPANY
Devonwood HOA	Lorraine Walsh, President 214 Devonwood, Hercules, CA 94547 724-1737 Massingham & Associates Management Inc. Melissa Hajostek, Property Manager 4085 Nelson Avenue #A Concord, CA 94520 925-405- 4703
Forest Park HOA (Village coalition)	Peter Kodzis, President 2621 Lucas Avenue, Pinole, CA 94564 243-0699 Massingham & Associates Management Inc Attn. Linda Schoeffner, Property Manager Concord, CA 94520 925-405- 4900 fax 925-677-7398 9/06
Foxboro Downs HOA Bristol Chelsea Dover Weymouth Windsor CONDO'S	Allean Banks, President 604 Windsor, Hercules, CA 799-9486 John Stewart Company Attn. Cindy Yonning, Property Manager 1388 Sutter, 11th Floor, San Francisco, CA 94109 (415) 345-4400; Fax: (415) 614-9178 On Site # 510-799-0373
Foxboro Heights HOA Bedford Newbury Brighton Oxford Canterbury Cardiff Dartford Edinburgh SINGLE FAMILY	Helen Wong 139 Oxford, Hercules, CA 799-4188 Matrix Property Management 4861 Sunrise Dr, #104 Martinez, CA 94553 Beth Marquez 925-228-4710 x 14
Foxboro Village HOA Coventry Manchester Davenport Sheffield Glasgow Worthing Lancaster Liverpool London TOWNHOUSES	Don Kuehne, President 133 Lapis Court, Hercules, CA 94547 799-8799 REAL MANAGE Attn. Joanne Johnsted, Manager 68 Mitchell Boulevard, #100, San Rafael, CA 94903 (415) 491-8930; Fax: (415) 491-0328

HOMEOWNER ASSOCIATION	MANAGEMENT COMPANY
Glenwood HOA	Lynn L. Waslohn LLW Properties E.G. "Doc" Waslohn-Manager 1652 W. Texas Street, #106 Fairfield, CA 94533 1-707-428-0490 Fax 1-707-429-8279 Emergency 1-707 420-3840
Hercules-By-The-Bay HOA Buckley Dunham Skelly Fawcett Stout Pavon Williams Pearce Woodfield Rosti Santa Fe Historic Homes District	Euclid Viegas 724-2195 (Direct mail to management company.) Willis Management Group Chris Willis, Property Manager 7033 Village Parkway, #212 Dublin, CA 94568 925-828-7150 Fax 1-925-828-7195
KB – Sycamore Villas HOA Fountain Grass Court, Lavender Place	Community Associations Services Greg Toler, Maint. Dir. Association Maintenance Services Kimberly Carter, Adm. Coordinator 5675 Sunol Blvd, #100 Pleasanton, CA 94566 925-461-9900 x116 Greg, x125 Kim. Fax 925-461-1040
KB – Sycamore Villas HOA Black Walnut, Blue Cypress Dutch Elm, Mahogany, Rosewood, Silver Maple	Christison Company 05/05 Attn. Pamala Christian 5675 Sunol Boulevard, Suite 100 Pleasanton, CA 94566 Old: 707-748-2140 New: 925-461-9900 x211 Fax: 925-461-1040 email: PamalaChristian@ChristisonCompany.com
ORB Partnership c/o Donald Rosenberg One Southeast Third Ave #3050 Miami, Fl 33131 tel 305-358-2600 fax 305-375-0328	Attn. Mrs. Yoncie D. Griswold 283 Randall Drive Folsom, CA 95630 Cell # 916-580-5658 Email: Yoncia@comcast.net
Olympian Hills HOA Apollo Olympus Athena Orion Atlas Zephyr Bacchus Zeus Hera Hermes Nike	 Willis Management Group Chris Willis, Property Manager 7033 Village Parkway #212 Dublin, CA 94568 925-828-7150 Fax 1-925-828-7195

HOMEOWNER ASSOCIATION	MANAGEMENT COMPANY
Promenade HOA (WPH) Earnest Railroad Ave Main Talley Park Taraya Promenade	Willis Management Group Chris Willis, Property Manager 7033 Village Parkway #212 Dublin, CA 94568 925-828-7150 Fax 1-925-828-7195
Refugio Valley Maint. Assn. Armstrong Balboa Fremont Carson Halsey Coronado Raleigh Cortes Stanley Decatur Grissom Farragut Shepard	Call Info Line 868-2253
Refugio Villas HOA Fountain Grass Court, Lavender Place	Christison Company Tena Hamann, Property Manager 3090 Independence Drive, Suite 100 Livermore, CA 94551 Christina 925-371-5700
Refugio Valley Ranch Master Association HOA Aruba Cayman Bermuda Grenadine Bonaire Mandalay Catalina Montego Also: Southwind & Some RVR	Pat Patton - No. Unknown. REAL MANAGE Attn. Vickie 68 Mitchell Blvd #100 San Rafael, CA 94903 415 -491-8930 X 113
Sycamore Place	Attn. Marshall Gross Tel. 415-789-9106 Fax 415-789-9182
Sycamore Villas HOA Black Walnut, Blue Cypress Dutch Elm, Mahogany, Rosewood, Silver Maple	Christison Company Tena Hamann, Property Manager 3090 Independence Drive, Suite 100 Livermore, CA 94551
Schuler Homes - Belleterre HOA Crestridge Riverview Rimrock Titan Overlook Ridgepoint Rocky Pointe Lookout Ridgeview Shipwatch	Willis Management Company Attn. Chris Willis, Manager 7033 Village Parkway #212 Dublin, CA 94568 1-925-828-7150 x 103 Fax 1-925-828-7195

HOMEOWNER ASSOCIATION	MANAGEMENT COMPANY
Valley Oak Villas HOA Amber Aquamarine Crystal Moonstone Sapphire	Paul Nicholas, President 19 Crystal Circle, Hercules, CA 94547 510-799-7013 Massingham & Associates Management, Inc David Boone, Property Manager 4085 Nelson Avenue, Suite A Concord, CA 94520 1-925-405-4733 Fax 925-677-7398
Victoria By The Bay Association	Vierra Moore Co. email: infocon@vierramoore.com Attn. Patty Gish 2151 Salvio Street, #333 Concord, CA 94520 925-681-4000 1-800-966-1506 fax 925-681-2940
Westwood Duets HOA Felton Lampico Scotts Valley Ben Lomond Mission Springs, Bonne Dunne.	Drew Weeks, President 137 Scotts Valley, Hercules, CA 94547 724-2984 Peachtree Commercial Services Tony Khani, Manager P.O. Box 587, Union City, CA 94587 (510) 487-3383; x34Fax: (510) 487-6936 Kristine@peachtree.cas.com
Wildwood HOA Wildwood	Laurel Thurgood 338 No. Wildwood, Hercules, CA 94547 510-724-6175 Massingham & Associates Mgmt Inc. (acquired Lodestar Management) Attn: Melissa Hajostek, Property Manager 2000 Crow Canyon Pl. #120 San Ramon, CA 94583 925-553-1500 fax 925-553-1545
Willow Glen Apartments 844 Willow Avenue Hercules, CA 94547	Carol Andrews, Property Manager 707-746-7700 cell 925-998-3388

Other Contacts

Animals

Animal Control	(510) 374-3966		(510) 646-2995 (Weekends)
Bee Removal	(925) 685-9301		(CCC Mosquito & Vector Control)
A & B Swarm Removal	(510) 458-3900		
Dan Davidson	(510) 429-1717		
Pat Homen	(510) 357-3835		
Rodent Control	(925) 685-9301		(CCC Health Dept)

Governmental

Cal Dept of Transportation	(510) 286-6359		
California Highway Patrol	(925) 646-4980		(707) 551-4200 Option 3 – Communications Center)
Cal OSHA	(925) 602-6517		
Cal Trans/Delta Region/Maint.	(925) 926-6112		
City of Hercules	(510) 799-8200		
City of Hercules/Glen/PW	(510) 812-5366		
City of Hercules/Jeff/PW (Cell)	(510) 812-4630		
City of Richmond	(510) 620-6538		
CCC Flood Control	(925) 313-2270		Mon. – Thurs 6:30 a.m. to 5:00 p.m.
CCC Flood Control/Maint. Div.	(925) 313-7000		
CCC Health Dept	(925) 646-5225		
CCC Public Works/Maint. Div.	(925) 313-7000		
CCC Sheriff	(925) 646-2441		
CCC Signal Maintenance	(925) 313-7052		(925) 313-7054 (Pager Traffic Signals)
Dept Motor Vehicles	(800) 777-0133		
East Bay Regional Parks	(510) 544-3010	or	(510) 237-6896 (John Hitchen)
EPA/Dept. of Toxic Substance (8-5)	(510) 540-2122		(800) 260-3972 (ER Response)
Rodeo/Hercules Fire	(510) 799-4575		
Hercules Police	(510) 724-1111		Dispatch

Media (Newspaper)

San Francisco Chronicle	(415) 777-1111
West County Times	(510) 262-2787

Television

KGO - 7	(415) 954-7777
KPIX - 5	(415) 362-5550
KRON - 4	(415) 561-8000
KTVU - 2	(415) 834-1212

Medical

Concentra Medical Center	(510) 222-8000	(Monday - Friday only)
Doctors Hospital (San Pablo)	(510) 970-5000	
Kaiser Hospital (Martinez)	(925) 372-1999	
Kaiser Hospital (Richmond)	(510) 307-1500	
Kaiser Hospital (Vallejo)	(707) 651-1000	

Pipeline Companies

Chevron Pipelines	(800) 762-3404	
Kinder Morgan Pipelines	(510) 233-2027	
Tosco/Conoco/Phillips Pipelines	(800) 448-7676	

Transportation

AC Transit	(510) 817-1717	
BART	(510) 464-6725	
West Cat	(510) 724-7993	
Burlington Northern Santa Fe	(800) 832-5452	***(909) 386-4217 (Emergency Service Interrupt)**
Union Pacific Railroad	(510) 891-7510	(800) 892-1283

Utilities

EBMUD (Maintenance Yard)	(510) 222-7976	(510) 835-3000 – Main # After Hours)
Pacific Bell	611	
Pacific Gas & Electric	(800) 743-5000	
Underground Service Alert	(800) 227-2600	
West County Waste Water District	(510) 222-6700	(510) 222-6799 (After Hours)

Vendor Listings

Asphalt / Concrete

Syar Industries	(510) 215-1555
Berkley Asphalt / Concrete	(510) 526-1611
Sugar City	(510) 724-3412

Building Supply / Hardware / Keys

Armor Locksmith	(510) 799-1000
Dolan's Lumber	(510) 724-8753
El Cerrito Lumber	(510) 234-2213
Ferguson Enterprises	(925) 432-7375
Harbor Freight Tools	(707) 645-0185
Humus	(510) 233-7745
Lanier Electric	(510) 215-5100
McMullen Glass	(510) 724-7117
San Pablo Plumbing Supply	(510) 234-5400
Zac Kit	(707) 644-6676
Home Depot	(510) 245-9572

Contractors

Andre's Mechanical & General Eng	(925) 323-1871	(Hercules Lift Stations)
Aquatic Commercial Pool Service	(408) 741-5871	
Bill's Underground	(510) 719-1739	Cell# (510) 932-1736
Calcon System	(925) 277-0665	(925) 570-8479
Carone & Sons (Joel) (Crockett)	(510) 787-7283	(Roll Off Bins, Excavations, Haz Mat Lic.)
Carone, Bruce (Concord)	(925) 691-2030	Bruce & Lloyd Carone (Excavations)
(Bruce's—Res:	(925) 313-5980	Cell (925) 383-0095
Contra Costa Pool	(510) 724-7665	(510) 799-4404
Ernies Plumbing	(510) 758-1900	Cell# (510) 207-0825
Kel Aire	(510) 758-4232	

Morgan Fence	(707) 428-3302	
H&R Plumbing	(510) 222-5556	
Pacific Pipelines	(707) 689-3357	
Roto Rooter	(925) 939-3100	
Universal Building Supply	(510) 527-1078	Janitorial Service
Pacific Site Maintenance	(510) 223-6597	

Equipment Rental

Allied Propane	(510) 237-7077	
Bay Area Barricade	(925) 686-1089	
Cresco	(925) 228-9811	
Hertz Equipment	(510) 307-4444	
Rain for Rent (24 Hr)	(510) 458-0200	(21,000 gals delivered in 24 hrs)
United Rentals	(510) 562-3000	
D.P. Nicoli	(800) 695-5007	Shoring
The Construction Zone	(925) 387-8013	

Motels

Days Inn (Appian Way)	(510) 222-9400
Motel #6 (Fitzgerald Drive)	(510) 222-8174

Sewer & Storm Drain Supplies

Central Precast Concrete Inc.	(925) 462-6802
D & L Supply	(800) 422-0848
Phoenix Iron Works	(510) 465-9900
Weco	(707) 644-6661

Sewer Clean-up & Drying

E.V. Link (Bruce Barnett)	(800) 413-2999 or (707) 479-1375	
Cure – Water Damage Restoration	(925) 299-8706	Er: (800) 470-2873/Msg: (925) 299-9672 Cell: (925) 437-3113
Ideal Restoration	(800) 379-6881	**24 hr. Sewage Clean Up**

Towing

AAA Towing	(800) 222-4357
Freeman Towing	(510) 233-0878
J & O Tire	(510) 237-6344
Oliver's Tow	(510) 758 3790
S & S Towing	(510) 232-8000

Traffic Safety Supplies

Bay Area Barricade	(925) 686-1089
California Bag Company	(415) 824-6427
The Construction Zone	(925) 387-8013
Zumar	(800) 654-5164

City of Hercules

Warning

Raw Sanitary Sewer Overflow--Area Closed—Entry Prohibited

CONTAMINATED WATER
DO NOT DIGEST, WADE, SWIM, FISH
OR
COME IN CONTACT

PLEASE KEEP CHILDREN
AND
PETS OUT OF THE AREA

Questions concerning exposure, posting, and clean-up should be directed to the City of Hercules Public Works Department during business hours at (510) 799-8244

City of Hercules
111 Civic Drive
Hercules, CA 94547
(510) 799-8244

Refusal/Acceptance of Overflow Clean-up Services

Resident/Owner Information
Overflow Address: _____
Owner's Address if different than above: _____
Phone Number: _____

Subject: Refusal/Acceptance of Property Clean-up Service Due To Sewage Overflow

Provide details of overflow:
_____
_____
_____
_____
____
Date: _____ Time: _____

By signing below, homeowner or resident acknowledges acceptance of clean-up services:

Signature: _____

Printed Name: _____

Date: _____

By signing below, homeowner or resident acknowledges that clean-up services were offered, but were refused.

Signature: _____

Printed Name: _____

Date: _____

Public Works Employee:

Date: _____

Signature: _____

APPENDIX D

Contra Costa Clean Water Program FOG Outreach Materials

Water Pollution Prevention

TIPS

Tips to protect water quality and keep your food service facility clean

Contra Costa Clean Water Program

Concord

Central Contra Costa Sanitary District

Your Business Affects Water Quality

Your business affects water quality in creeks, the Delta and Bay through two different systems — the storm drain system and the sanitary sewer system. The storm drain system, comprised of gutters, pipes, creeks and ditches, carries water directly to creeks, the Bay and Delta.

Only rainwater belongs in the storm drain system, but pollutants enter it in many ways. For example, you're polluting if you wash greasy equipment in your parking lot, or leave grease, food waste or other pollutants on outdoor surfaces where they can be washed into storm drains with the rain. Outdoor pollutants that don't wash into the storm drain system can soak into the ground and reach the groundwater.

The sanitary sewer system carries wastewater (mostly from indoor plumbing) to a sewage treatment plant before the treated water discharges to the Bay or Delta. Although the water is treated, not all pollutants can be removed, and some pollutants disrupt the treatment system or clog sanitary sewer pipes. Grease, toxic chemicals, pesticides and acids are examples of problem pollutants for the sanitary sewer, or the water body into which the treated wastewater is discharged.

Pollution from many small sources adds up to big pollution problems. That's why the Contra Costa Clean Water Program (The Program) has developed this brochure along with the Central Contra Costa Sanitary District (Central San) and the City of Concord to provide clean water solutions for your food service facility.

The Program serves Contra Costa cities and the county in their effort to radically reduce or eliminate pollutants from entering storm drain systems. Central San and other sewerage agencies treat wastewater for county residents. These agencies, along with other valuable contacts, are listed at the back of this brochure as resources for further information.

CONTRA COSTA CLEAN WATER PROGRAM

Concord

Central Contra Costa Sanitary District

You Benefit from Preventing Water Pollution

The practices in this brochure benefit your business and water quality. These practices help you avoid clogged sewer lines and sewer back-ups, help prevent pest problems and make your business more attractive for customers. They also reduce your liability. If you pollute the storm drain or sanitary sewer systems, you can be fined as much as $10,000 per day and $10 per gallon of discharge.

Your Role in Keeping Our Water Clean

As the owner, manager or team leader, you're responsible for setting a good example for your employees. It's important you understand the pollution prevention practices in this brochure and make sure your employees do too.

We ask you to:

- Read this brochure and make any needed changes to your equipment and practices.
- Assign someone on each shift to make sure the practices are being followed.
- Make sure any cleaning services or other contractors you hire also follow these guidelines; your business can be held liable if your contractor pollutes.
- Know where your drains go. Generally inside drains go to the sanitary sewer, and outside drains go to a storm drain system. Hire a plumbing contractor to check your drains to make sure. Always use the sanitary sewer drains for wash water. Be sure to label the drains for your employees.
- Contact the agencies listed at the back of this brochure if you have questions.
- Call 1-800 NO DUMPING (1-800-663-8674) to report any illegal dumping to storm and sanitary sewer drains.

Tip 1 Provide Training

On-going employee training is essential since preventing pollution depends on everyday actions such as sweeping up litter.

- Train new employees about pollution prevention and why it matters. Review pollution prevention practices with current employees at least four times a year. Document training events and who attended.
- Display the "Tips" poster to remind you and your employees what to do daily. Also, post reminder signs where specific actions are needed. For example, post a sign on your grease recycling container that says, "Keep lid closed".
- Post your spill control plan. (See Tip 5.)
- Stencil storm drains on or near your property with a "Drains to Bay" message. Call your local municipality to get stenciling materials.

Tip 2 Keep Dumpster Area Clean

Leaky or overflowing dumpsters, garbage cans, and tallow bins are common pollution sources from food service facilities. Follow these steps to keep litter, grease, leftover food and other pollutants under control, so they don't wind up in our storm drain system. These steps also help control pests and keep your business attractive.

- Sweep the dumpster area daily. Don't use soap or bleach for clean-up (unless you have a covered dumpster area that drains to the sanitary sewer and is bermed or otherwise separated from storm water); see Tip 3 regarding outdoor cleaning.
- Always keep dumpster and other container lids closed. If possible, lock the dumpster to prevent illegal dumping.
- Provide plenty of trash and recycling containers for customer use, and empty them into appropriate containers frequently. If your container overflows, get a bigger one or arrange for more frequent collection. Ask your waste hauler how to arrange for separate containers for recyclable materials such as glass and cardboard.
- Bag and seal food waste before putting it in your dumpster. Don't dump liquid waste (grease, fluids) into dumpsters or garbage cans, and don't hose them out to a storm drain.
- Check your dumpster for leaks. If it leaks, tell your waste hauler, and ask for a leak-free dumpster.
- Consider building a roof over your dumpster area, placing a berm around it, providing hot and cold water nearby, and draining the area to the sanitary sewer. Call your city, wastewater district, and County Health Department to learn about construction requirements.

Tip 3 Clean Outdoor Areas Without Polluting

You're polluting if you clean outdoor areas in ways that wash soapy water, oil, grease, and other pollutants to the ground or storm drain system. Any chemicals left on outdoor surfaces can be carried into the storm drain system by the rain. Follow these cleaning practices to prevent water pollution.

- Sweep paved outdoor areas regularly. Place litter in a trash container.
- Never use bleaches, degreasers or detergents for outdoor cleaning (except in an area that you know drains to the sanitary sewer). Do not apply liquid or powder deodorizers to outside surfaces. Even products labeled "biodegradable" or "environmentally safe" can be harmful to fish and wildlife.
- Use absorbent materials to clean spilled grease, oil and any other harmful fluids. Place used absorbent materials in sealed bags before proper, final disposal.
- If you must use water for outdoor cleaning, use a mop and bucket and empty the bucket at a drain connected to the sanitary sewer. If the water is greasy, be sure the drain is connected to a grease removal device.
- If you must hose off an area, sweep it first and avoid or block off any storm drains (such as by placing a specially designed heavy rubber mat over the inlet). Contain the wash water (such as with a portable berm), collect it with a wet vacuum or sump pump, and discharge it to the sanitary sewer connected to a grease removal device.
- Require any outdoor cleaning company you hire to follow these guidelines. Review their practices before and after you hire them, since you can be held liable for any pollution they cause. You can get a list of environmentally certified surface cleaners from the Program.
- For a complete set of outdoor cleaning guidelines, call the Program 1-800-NO DUMPING (925-313-2360).

Tip 4 Clean It Right

Clean equipment in ways that prevent pollutants from reaching the storm drain system.

- When cleaning indoor floors, don't sweep or use a hose or squeegee to send food waste and/or floor cleaning wastewater to the outdoors. Do not dump mop water in parking lots, storm drains or other outdoor areas.
- Do not clean floor mats in the dishwasher. (The health code doesn't allow it.)
- Clean equipment such as floor mats, exhaust filters, and garbage cans in a mop sink outfitted with a grease removal device. Or, clean equipment in an outdoor area that is covered, bermed, and connected to the sanitary sewer and a grease removal device. If you need to construct an outdoor wash area, call the Health Department and your city and local wastewater agency for construction requirements.
- If you hire a surface cleaning service, make sure they follow the guidelines in this booklet.

Tip 5 Clean Up Spills

Contain and clean spills quickly to prevent potentially serious problems.

- Prevent spills. For example, store supplies where they will not get knocked over, keep containers tightly closed, and organize your delivery area.
- Develop a spill control plan that covers spill prevention and include clean-up and disposal instructions for the different types of spills you might have.
- Assign trained employees to manage spill clean-up.
- Buy or assemble a spill clean-up kit or kits with materials and instructions for the different types of potential spills. Assign someone to keep the kit well stocked, and keep clean-up materials clearly marked and readily accessible.
- Stop any spill at the source. Keep it from spreading by placing absorbent material around it.
- Use dry methods first for spill cleanup, such as sweeping or using absorbents or rags.
- If necessary (and appropriate considering the spill), use water to clean the spill. It's best to use a mop and bucket. If the spill isn't hazardous, oily, or otherwise a problem, dispose of the mop water down one of your sanitary sewer drains. When in doubt, call your wastewater agency. If you want to wash an outdoor spill, see Tip 3 for advice on collecting and properly disposing the wash water.

Tip 6 Keep Grease Out of Drains

These practices can drastically reduce the chance of clogging your drains with food and grease.

- Scrape plates thoroughly into a separate container before rinsing them to reduce grease and food buildup and blockage in your drain line and in grease traps, interceptors and sewers. (See Tip 8 for an explanation of grease traps and interceptors.) If possible, collect food waste separately from other garbage for use as compost or animal feed. Call your local garbage or recycling company for information.
- Donate leftover edible food to the Contra Costa Food Bank. Call (925) 676-7543 for more information.
- Install screens and solid traps in sink and floor drains to catch larger solids. Clean these screens and traps frequently.
- Don't try to "dissolve" grease by adding hot water or chemicals (emulsifiers). This will not solve the problem because it will only temporarily break up the grease and send it further down your sewer lines.

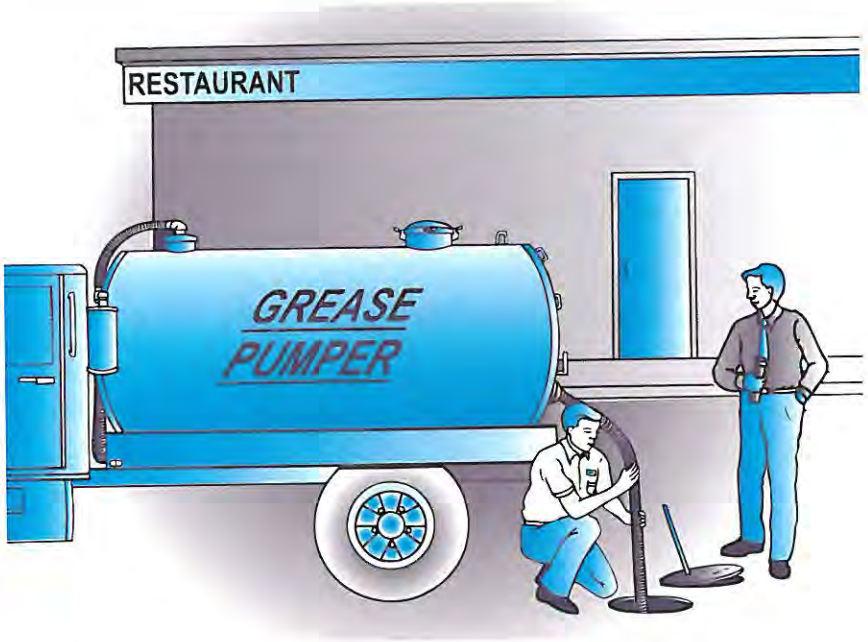
Tip 7 Recycle Grease and Oil

Manage grease recycling to minimize problems.

- Recycle cooking grease and oil. Use tallow bins or sealed containers with tamper-proof lids.
- Keep containers closed except when adding oil or grease.
- Keep the exterior of grease recycling containers clean.
- Avoid spills. Spilled grease is hard to clean up and can wash into the storm drain system.
- Check for leaks. Ask your recycler for a leak-free tallow bin, and replace any leaky grease containers.
- If you store grease containers outside, keep them under a roof, if possible.

Tip 8 Install and Maintain Grease Removal Devices

Many food service facilities have grease removal devices to keep grease out of drain lines and the sanitary sewer system. There are two types: grease traps and grease interceptors. ***Grease traps*** are box-shaped devices which are typically installed on or below the floor under a sink; they retain grease from one to four plumbing fixtures. ***Grease interceptors*** are large, outdoor, underground concrete chambers. Both grease traps and interceptors need to be regularly cleaned to keep them working properly. Regular cleaning reduces the chance of clogged drain lines and sewer back-ups. A backed-up sewer is a health code problem and may lead to business closure until the problem is solved.



- Know which indoor drains are connected to a grease removal device, and label them. Always use these drains to dispose of any greasy water.
- Consider installing a grease trap on any indoor drain receiving greasy water. Call a licensed plumber for installation, and call the Health Department, your city, and your wastewater agency regarding permit and sizing requirements.
- If you have a grease trap, make sure your dishwasher isn't connected to it.
- Garbage grinder use is discouraged. If you have one, it should only be connected to a grease interceptor. Eliminating use of a garbage grinder will reduce interceptor cleaning costs.
- Maintain easy access to your grease removal devices. Don't store things in front of or on top of your grease trap or block access to your grease interceptor with landscaping.
- Regularly inspect your grease removal devices and clean them as needed. Cleaning frequency depends on the device capacity and how much grease is in your wastewater (see Tip #6 on how to reduce grease).
- Make sure your grease trap and interceptor service company has a county hauling license. Know where they dispose of your grease.
- Supervise grease trap and interceptor service companies or inspect their work after it is done. Make sure they completely pump out grease and all liquids. Ask for a written receipt and a copy of the manifest showing where the grease was taken (so you know they disposed of it legally). Don't pay them until you have the manifest and are satisfied with the work.
- Keep written maintenance records on site for at least three years.

Tip 9 Use Water-Friendly Products

Oven cleaners, disinfectants, and other cleaning products often contain toxic chemicals. Reduce your use of hazardous materials and you'll automatically reduce the personal, environmental and health risks associated with them.

- Buy the least toxic products available. Look for labels that say non-toxic, but understand the product may still be harmful to fish or wildlife.
- Avoid chlorinated compounds, petroleum distillates, phenols, formaldehyde, and caustic or acidic products.
- Don't assume "biodegradable" products are safe. Biodegradable means the product will eventually break down, but may harm the environment in the meantime.
- Use water-based cleaning products whenever possible.

Tip 10 Minimize Pesticide Risks

Pesticides are showing up in our creeks, the Bay, and sanitary sewers, at levels toxic to sensitive organisms. Restaurants and other food service facilities contribute to this problem, so it's important you manage pests in ways to minimize environmental risks.

- Prevent pest problems by storing food in pest-proof containers, keeping things clean and dry, fixing any plumbing leaks, and caulking cracks which allow ants and cockroaches to enter.
- Apply pesticides only if necessary, not on a regular schedule.
- If you apply pesticides, follow all label directions. Don't apply pesticides around floor drains, sinks, or food.
- For ants, use ant baits with boric acid, hydramethylnon, or arsenic (ants carry the food to the nest, killing the whole colony). Remove bait when the ants are gone, or else the bait may attract more ants.

- For cockroaches, apply boric acid powder (e.g. Roach Prufe®) where they hide (in cracks, under the refrigerator, but never where food is handled). Apply a fine dusting of dehydrating dust (horticultural grade Diatomaceous earth) to cockroach walkways.
- When hiring a pesticide applicator, look for someone who practices integrated pest management (IPM). An IPM practitioner will try to solve the problem with the least toxic methods.

Getting Answers

Storm Water Questions:

Call the agency responsible for your geographic area to learn more about storm water pollution prevention.

Agency & Phone Number	Area Served
Central Contra Costa Sanitary District (925) 229-7169	Clayton, Concord, Lafayette, Martinez, Moraga, Orinda, Pleasant Hill, San Ramon, Walnut Creek
West County Wastewater District (510) 222-6700	El Cerrito, Pinole
City of Antioch (925) 779-7035	City of Antioch
City of Brentwood (925) 516-5348	City of Brentwood
Town of Danville (925) 820-6337	Town of Danville
City of Hercules (510) 799-8247	City of Hercules
City of Pittsburg (925) 439-4961	City of Pittsburg
City of Richmond (510) 412-2001	City of Richmond
City of San Pablo (510) 215-3030	City of San Pablo
Contra Costa County (925) 313-2238	Unincorporated areas

Construction Requirements:

If you plan to modify your facility, call the County Health Department (925-646-5225), local city building department and local wastewater agency to check applicable requirements.

Sanitary Sewer Questions:

Call your local wastewater agency to learn more about what can and cannot go down the sanitary sewer.

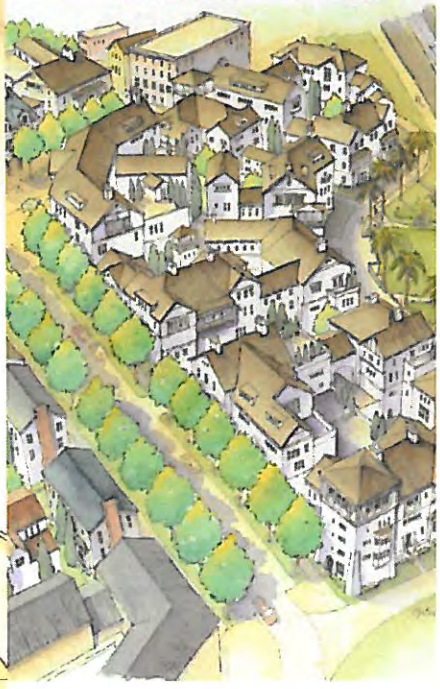
Business Location	Wastewater Contact & Phone Number
Alamo, Clayton, Concord, Danville, Lafayette, parts of Martinez, Moraga, Orinda, Pleasant Hill, northern San Ramon, Walnut Creek	Central Contra Costa Sanitary District (925) 228-9500
Parts of Martinez	Mt. View Sanitary District (925) 228-5635
Southern San Ramon	Dublin San Ramon Services District (925) 846-4565
El Cerrito, Kensington, parts of Richmond	Stege Sanitary District (510) 527-8411
El Sobrante, parts of Pinole and Richmond, San Pablo	West County Wastewater District (510) 222-6700
Parts of Pinole and Hercules	Pinole Hercules Wastewater Plant (510) 724-8963
Parts of Hercules	City of Hercules (510) 724-4637
Rodeo	Rodeo Sanitation District (510) 799-2970
Parts of Richmond	City of Richmond (510) 412-2014
Antioch, Bay Point, Discovery Bay, Pittsburg	Delta Diablo Sanitation District (925) 778-4040
Brentwood	City of Brentwood (925) 634-6905
Oakley	Ironhouse Sanitary District (925) 625-2279

APPENDIX E

Sewer Collection System Master Plan

DUDEK ENGINEERING+ENVIRONMEN

CITY OF HERCULES
SEWER COLLECTION SYSTEM MASTER PLAN



August 2008

PREPARED FOR
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1.0 Executive Summary

1.1 Background

The City of Hercules owns and operates a wastewater collection system and jointly operates a wastewater treatment plant with the City of Pinole. The collection system is a set of underground piping that carries wastewater from homes and businesses to the wastewater treatment plant. The treatment plant removes impurities from wastewater for disposal through a deep water outfall near Rodeo. The collection system and treatment plant are governed by State and Federal regulations. These regulations are administered by the California Regional Water Quality Control Board, San Francisco Bay Region.

The primary regulatory requirements for the operation of the collection system and wastewater treatment plant are referred to as National Pollution Discharge Elimination System (NPDES) permits. The current NPDES permit (March 2007) requires a Collection System Master Plan by June 1, 2008. The Master Plan is to include (1) A ten-year Capital Improvement Program (2) A scheduled Inflow/Infiltration Reduction Program and (3) Consider options for expanding legal authority to reduce I/I from the Hercules collection system.

The second regulatory requirement is from the State Water Resources Control Board. The Regional Water Quality Board has implemented the Waste Discharge Requirements (WDRs). The goal of the WDRs is to eliminate sanitary sewer overflows (SSOs). The WDRs require preparation of a Sewer System Management Plan (SSMP) that describe the current condition of the collection system and the business plan needed to operate without overflow. This Sewer System Master Plan, fulfills the requirements of the NPDES permit and fulfills a major portion of the SSMP (Mapping (GIS), System Evaluations and Capacity Analysis) requirements. Incremental compliance has been certified by the City and the complete SSMP is due August 2008.

During the preparation of the Sewer Master Plan, key components of the collection system were identified. The following elements are directly related to the Inflow and Infiltration Reduction Program and the Capacity Assurance Plan. These form the basis of the Collection System Capital Improvements Projects. The following items are discussed in the Executive Summary.

- **Collection System Capital Improvements Projects**
  - **Inflow and Infiltration Reduction**
    - **Flow Data Analysis**
  - **Condition Assessments**
    - **Above ground visual inspections**
    - **Operations and Maintenance Analysis**
  - **Capacity Assurance**
    - **Mapping/GIS**
    - **Capacity Analysis and Conclusions**

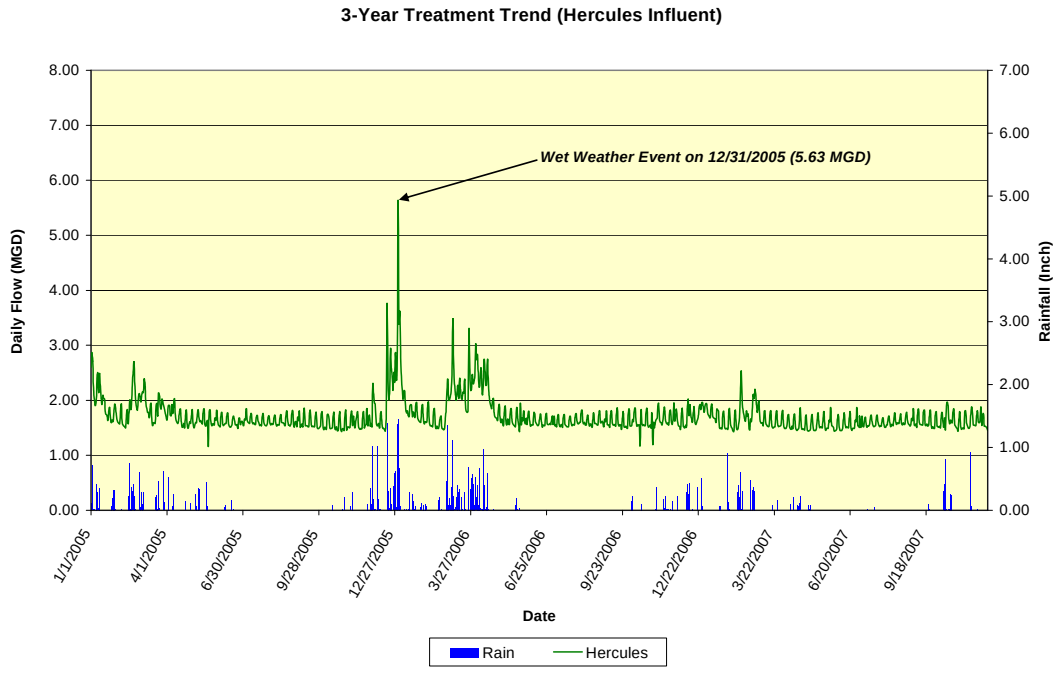
1.2 Inflow and Infiltration Reduction

A key to understanding the integrity of the sewer collection system is the quantification of wet and dry weather flows. This allows analysis of inflow and infiltration (I/I) to be performed. This in turn provides a basis for the targeted condition assessments and an overall I/I Reduction Program to be scheduled.

1.2.1 Flow Analysis

A flow measurement program was performed during February-April 2008. Limited rainfall occurred during the program. The data collected was useful in characterizing dry weather flows and provides the basis for calibration of the hydraulic model. The results of this program are discussed in Chapter 5. A separate analysis was performed to determine the overall impacts of inflow and infiltration on the system. The past three years of wastewater treatment plant influent and rainfall was analyzed for variation in flow related to rainfall. The results of that analysis show that the Hercules collection system has had a significant inflow problem. Figure 1-1 displays the daily rainfall and flow volumes from January 2005 to September 2007. As shown the rainfall event that occurred on 12/31/2005 had significant impacts on the collection system and treatment plant. The average dry weather flow volume is approximately 1.7 million gallons per day (mgd) while the flow volume estimated for this day was 5.7 mgd. Estimates were required since the flow measurement device was overloaded for several hours during the peak event. The estimate indicates that approximately 4.0 million gallons of extraneous flows entered the treatment plant. This is expensive to treat and greatly increases the chances of overflow.

Figure 1-1 WWTP Flow and Rainfall



Additional flow measurements should be periodically performed in the collection system to determine any changes in the wet weather flows. Flow measurements should also be performed at the lift stations continuously to provide operational feedback on these systems.

1.3 Condition Assessments

Condition assessments are used to determine the physical conditions of the collection system. Methods commonly used are operations and maintenance analysis, above ground inspections, smoke testing, televised (CCTV) inspections. O&M analysis was the focus of this study and recommended condition assessment programs are included in the future CIP.

1.3.1 Operations and Maintenance Analysis

Priority maintenance areas are defined as areas of known problem areas based on observation and occurrence of problems. Discussions with the current and previous maintenance personnel yielded a list of areas that need increased maintenance. These areas are located near Canterbury and Newbury Streets. These are in the area of the Willow Avenue Lift Station and the pipes have failed due to high hydrogen sulfide concentrations. These improvements are included in the overall CIP table.

1.4 Capacity Assurance

1.4.1 Mapping/GIS

Mapping and GIS are used to aid in the maintenance of the collection system and to identify hydraulic restrictions through hydraulic modeling. A GIS was prepared for the City based on numerous data sources. Further refinement should be made through incorporation of the field observations during the condition assessment and invert survey programs. This is an ongoing effort to develop a full understanding of the material, age and configuration of the collection system. Figure 1-2 shows the collection system GIS created during the master planning process.

1.4.2 Capacity Analysis and Conclusions

The capacity analysis was performed with the Hydra and EPA SWMM hydraulic models. These models provide for the incorporation of GIS datasets and are used to identify hydraulic restrictions and potential overflows respectively. Based on the data provided by the City, the collection system is in good operating condition with no dry weather restrictions noted. Wet weather flows like those on 12/31/2005 affect the major trunk line and one small area near the Willow lift station. These capacity restrictions could be eliminated by the construction of 3 possibly 4 conceptual capacity enhancement projects. Prior to their pre-design, we are recommending an engineering survey of the pipelines and additional flow measurements. The results of these programs will be used to update the GIS, model to verify their necessity and to aid in the pre-design of the projects.

The Capital Improvement Projects by category are shown in Table 1-1.

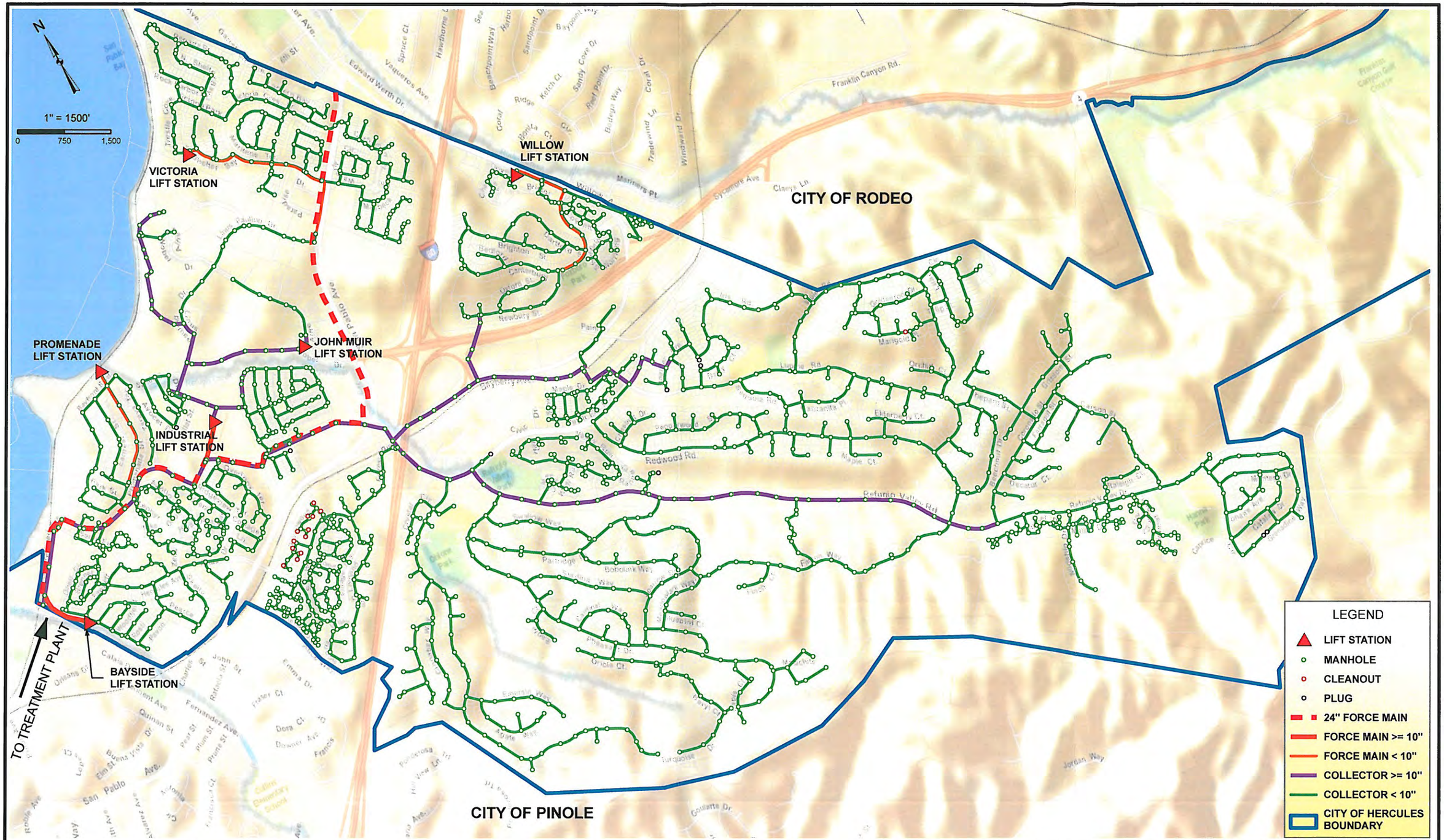


FIGURE 1-2 HERCULES SEWER COLLECTION SYSTEM

Table 1-1 Capital Improvements Projects

City of Hercules Collection System Capital Improvements Projects						Long Term Projects (5-Year Increments)			
	5-Year Collection System Projects (Near Term)								
I/I Reduction Program	**2008-2009**	**2009-2010**	**2010-2011**	**2011-2012**	**2012-2013**	**2013-2018**	**2018-2023**	**2023-2028**	**2028-2033**
Condition Assessment Projects	**Near Term**					**Long Term**			
Lift Station Study and Monitoring	$ 25,000	$ 2,500	$ 2,500	$ 2,500	$ 2,500	$ 12,500	$ 12,500	$ 12,500	$ 12,500
Flow Measurements (Pre/Post Rehab)	$ 30,000		$ 30,000		$ 30,000	$ 60,000	$ 90,000	$ 60,000	$ 90,000
Smoke (5 Year / 10 Year Cycle)	$ 49,314	$ 49,314	$ 49,314	$ 49,314	$ 49,314	$ 123,285	$ 123,285	$ 123,285	$ 123,285
CCTV (5 Year / 10 Year Cycle)	$ 98,628	$ 98,628	$ 98,628	$ 98,628	$ 98,628	$ 246,570	$ 246,570	$ 246,570	$ 246,570
Physical Inspection	$ 38,355	$ 38,355	$ 38,355	$ 38,355	$ 38,355	$ 95,888	$ 95,888	$ 95,888	$ 95,888
Program Management (25% Subtotal)	$ 60,324	$ 47,199	$ 54,699	$ 47,199	$ 54,699	$ 131,436	$ 138,936	$ 131,436	$ 138,936
Condition Assessment Subtotal	$ 301,622	$ 235,997	$ 273,497	$ 235,997	$ 273,497	$ 669,680	$ 707,180	$ 669,680	$ 707,180
Repair/Rehab/Replacements	**Near Term**					**Long Term**			
Pipe and MH Relining	$ 289,659	$ 361,659	$ 72,000	$ 72,000	$ 72,000	$ 360,000	$ 360,000	$ 360,000	$ 360,000
Lift Station Rehabilitation	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 250,000			
Repair/Rehab/Replacements Subtotal	$ 439,659	$ 511,659	$ 222,000	$ 222,000	$ 222,000	$ 610,000	$ 360,000	$ 360,000	$ 360,000
Capacity Assurance Projects	**Near Term**					**Long Term**			
Invert Surveys (Capacity Candidates)	$ 11,924								
Mapping/Model Updates	$ 40,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000		$ 25,000	$ 25,000	$ 25,000
Sycamore Ave to Railroad Ave Trunk*		$ 2,576,220	$ 2,576,220						
Sycamore Ave to Partridge Dr Trunk*				$ 2,105,017					
Partridge Dr to Coronado Blvd Trunk	*Survey Only*								
Bristol St near Willow Lift Station					$ 67,860				
Capacity Assurance Subtotal	$ 51,924	$ 2,581,220	$ 2,581,220	$ 2,110,017	$ 72,860	$ -	$ 25,000	$ 25,000	$ 25,000
Period Total	$ 793,206	$ 3,328,877	$ 3,076,717	$ 2,568,014	$ 568,357	$ 1,279,680	$ 1,092,180	$ 1,054,680	$ 1,092,180
Average Annual	*$ 793,206*	*$ 3,328,877*	*$ 3,076,717*	*$ 2,568,014*	*$ 568,357*	*$ 255,936*	*$ 218,436*	*$ 210,936*	*$ 218,436*

** Potential Redevelopment Funding for Required Capacity*

2.0 Introduction

2.1 History

The City of Hercules was incorporated in 1900 after being formed as the California Powder Works Company Town in 1881. The popularity of the gun powder produced in Hercules helped the city become the largest producer of TNT in the country in 1917. However, 59 workers died within the first 40 years of gun powder and TNT production in Hercules was ended. During the 1960s, the plant began to produce fertilizer and was sold to Valley Fertilizer, Inc. in 1976. The plant was later purchased in 1979 by a group of investors called Hercules Properties, Ltd. As shown in Figure 3-1, migration into Hercules did not start until 1970. Since that time it has been a rapidly expanding population fueled by lower home prices and proximity to the San Francisco Bay area amenities.

2.2 Background

The City of Hercules authorized DUDEK to complete a Sewer Collection System Master Plan to facilitate management goals and to comply with state and federal regulations. The primary objectives of the project were:

- Create a collection system Geographic Information System (GIS)
- Perform flow measurements within the collection system
- Characterize average dry weather and wet weather flows
- Assess Inflow and Infiltration impacts on the collection system
- Prepare a hydraulic model of the collection system
- Perform capacity analysis of the collection system during existing and future, wet and dry conditions
- Identify Capacity Enhancement Projects necessary to eliminate capacity restrictions and minimize Sewer System Overflows (SSOs)
- Prepare a Collection System Master Plan that describes the process and outcome of the planning process
- Provide continued support for preparation of the Sewer System Management Plan

2.3 Study Area

The study area is limited to the collection system within the City Limits of Hercules. The study area consists of 11,712 acres that ranges from San Pablo Bay on the west, Pinole to the southwest, and Rodeo to the north. The Study Area is shown in Figure 2-1. Gravity sewer systems follow the low areas much like streams. Figure 2-2 shows the natural drainage patterns. Note that the Refugio Creek follows a natural alignment towards San Pablo on the west while the sewer collection system turns south away from the creek near I-80 and Sycamore and follows San Pablo Avenue to the southwest to the WWTP. The flatter area near San Pablo and the BNSF Railroad is the first to show capacity limitations during higher flows. The topology of Hercules creates the need for six lift stations in the collection system.

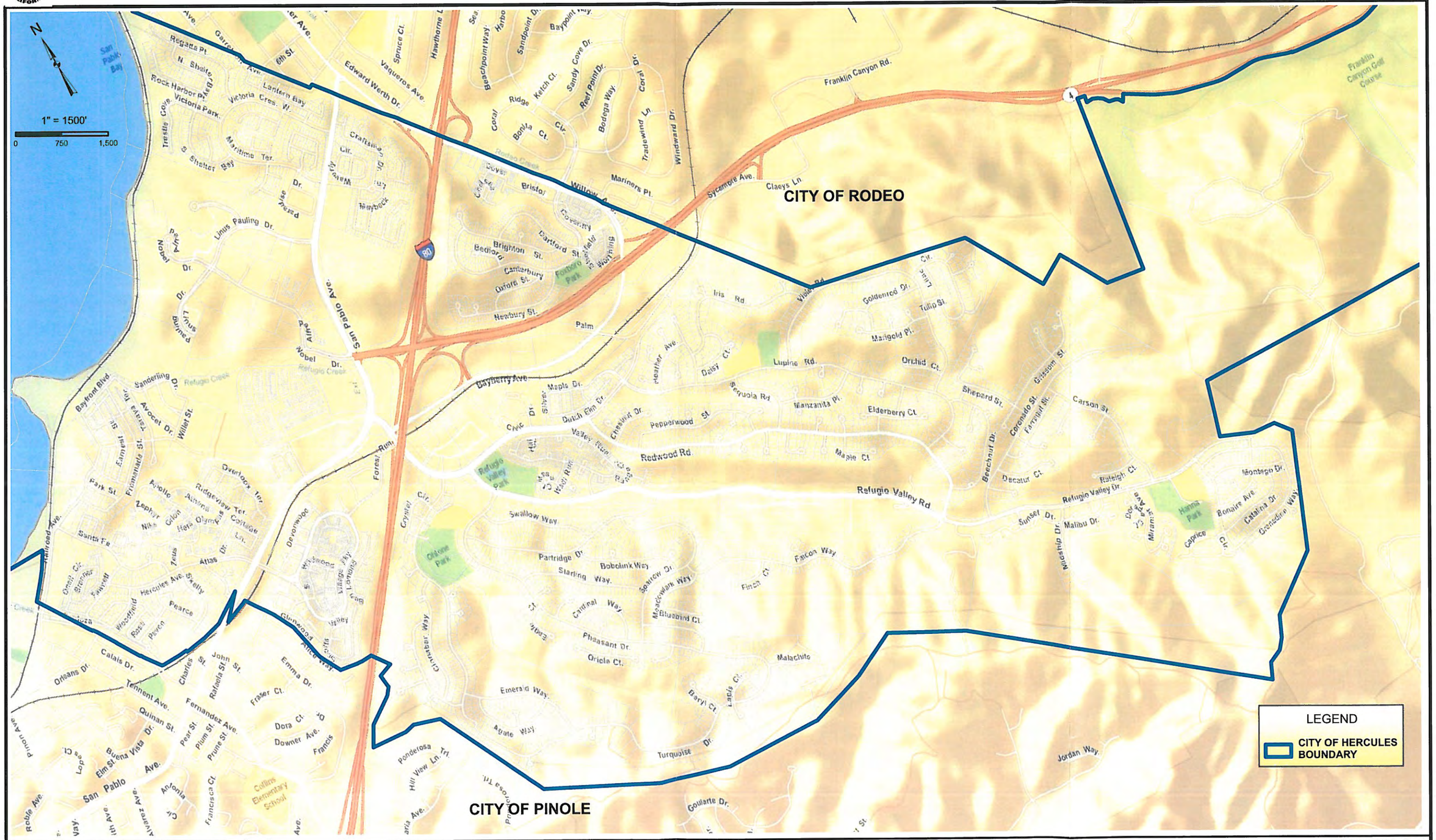


FIGURE 2-1
STUDY AREA LOCATION

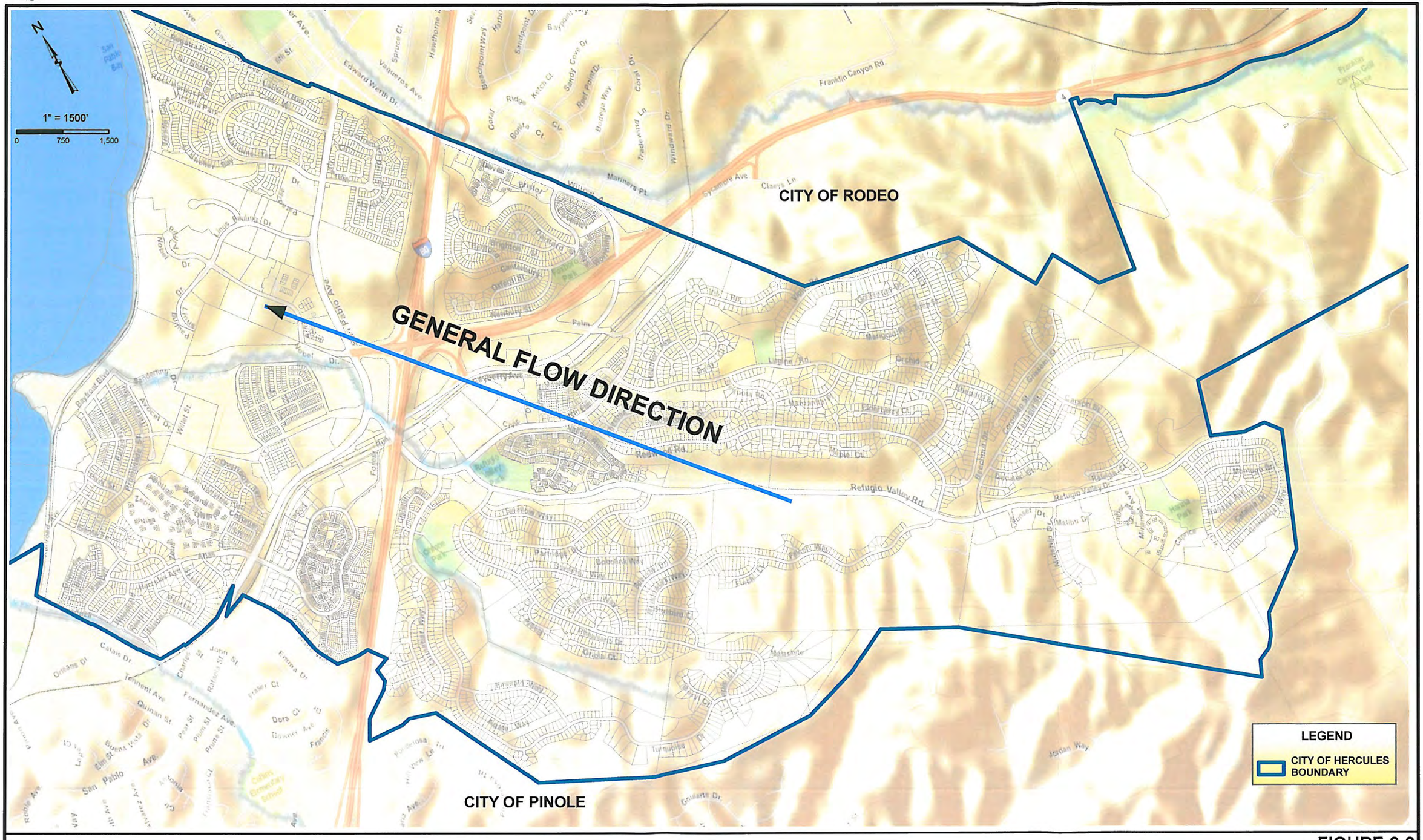


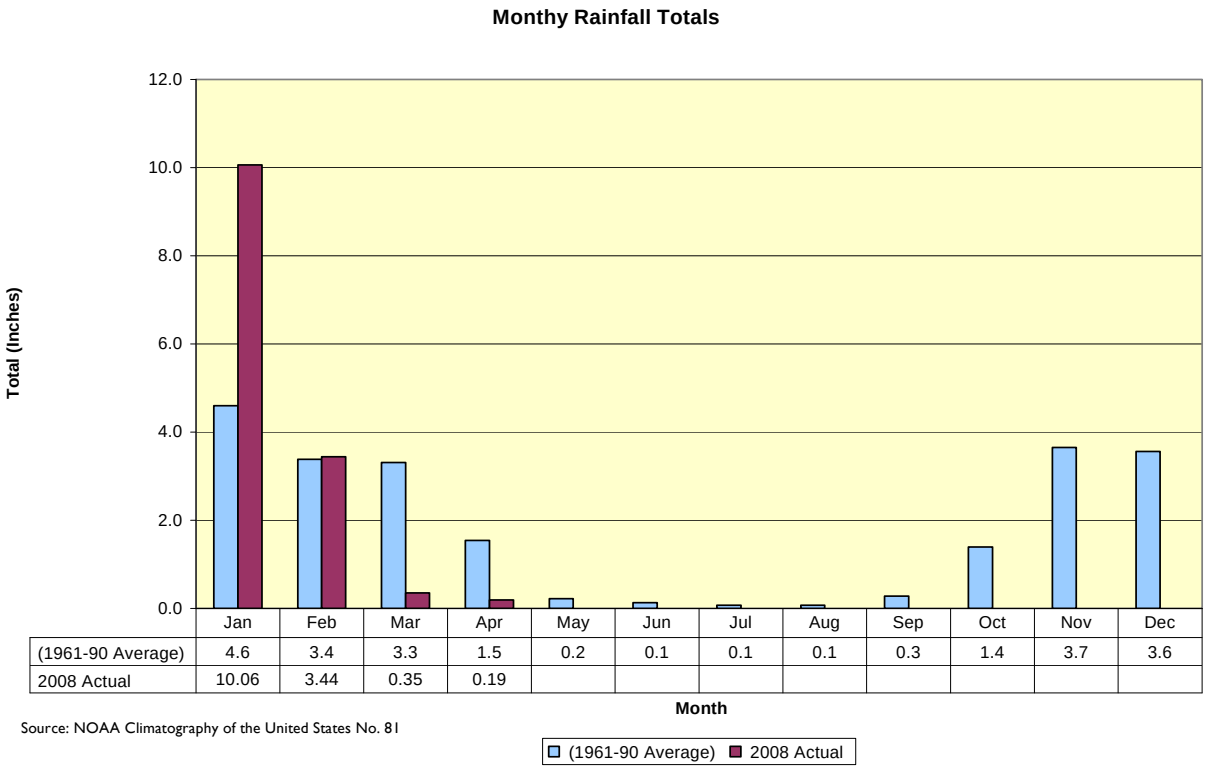
FIGURE 2-2
NATURAL DRAINAGE

2.4 Climate

2.4.1 Average Rainfall

From 1961-1990, Richmond station, approximately 8 miles south of Hercules, had an average annual rainfall of 22.2 inches. Most of the rainfall occurred during November, December, and January. Figure 2-3 shows the long term average and the 2008 actual rainfall amounts.

Figure 2-3 Long Term Monthly Average Rainfall



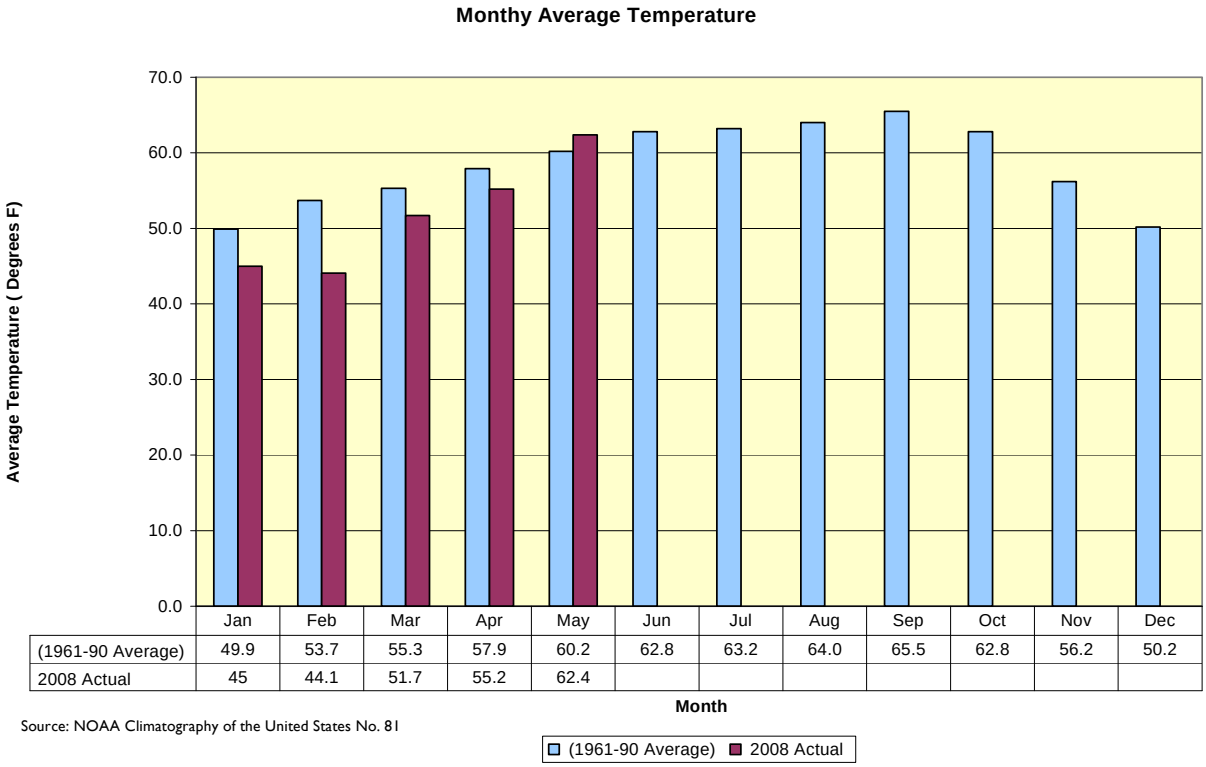
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(1961-90 Average)	4.6	3.4	3.3	1.5	0.2	0.1	0.1	0.1	0.3	1.4	3.7	3.6
2008 Actual	10.06	3.44	0.35	0.19								

Source: NOAA Climatography of the United States No. 81

2.4.2 Average Temperature

From 1961-1990, the National Oceanic and Atmospheric Administration (NOAA) Climatography reported that the Richmond station had an average annual temperature of 58.5 degrees Fahrenheit. Figure 2-4 shows the long term average and the 2008 actual average temperatures.

Figure 2-4 Monthly Average and 2008 Temperatures



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(1961-90 Average)	49.9	53.7	55.3	57.9	60.2	62.8	63.2	64.0	65.5	62.8	56.2	50.2
2008 Actual	45	44.1	51.7	55.2	62.4							

Source: NOAA Climatography of the United States No. 81

http://blogs.reuters.com/environment/files/2008/05/hercules.jpg

2.5 Scope and Purpose

The City of Hercules owns and operates a wastewater collection system to remove water borne wastes from residences and businesses within the City limits. To improve the operations and management of these facilities and to comply with collection systems regulations DUDEK was authorized to prepare a Sewer Master Plan in 2007. The primary objectives of the plan were:

- Review and partial update of the City's Sewer System GIS
- Flow Measurement of sewer flows at key manholes
- Inflow and Infiltration analysis of flow data
- Development and calibration of a hydraulic model of the collection system
- Perform a capacity analysis of the collection system
- Develop projects to address capacity deficiencies
- Prepare Capital Improvement Projects for System Evaluation and Capacity Assurance

The primary purpose of the plan is to provide a basis for compliance with the Regional Water Quality Board NPDES Permit and the Waste Discharge Requirements (WDRs). Specific NPDES Permit Conditions require a Collection System Master Plan providing a 10-year Capital Improvement Project and an implementation schedule for an Inflow and Infiltration Reduction Program by June 1, 2008. These are provided in Table 1-1 and Table 7-1.

This document also covers aspects of the Sanitary Sewer Management Plan required for compliance with the WDRs. This document specifically addresses the System Evaluation and Capacity Assurance portions of the requirements. The Plan establishes the level of funding required to perform complete Condition Assessments and Capital Improvement Projects that serve as the basis of a Capacity Assurance Plan. This complete Collection System Capital Improvements Project, when implemented, will reduce the occurrence of capacity and condition related overflows through rehabilitation, repair, replacement and capacity enhancement.

The following section discusses the overall approach to meeting these objectives. Details regarding the specific techniques and results are in the following chapters.

2.6 General Approach

To manage, measure.

System Evaluation and Capacity Assurance Planning begins with accurate and up-to-date maps of the collection system. The WDR and the Sewer System Management Plan (SSMP) discuss the importance of Performance Measures, Mapping (GIS) and Flow Measurements.

2.6.1 System Evaluation (Condition Assessment)

In addition to Capacity Assurance Planning, the WDRs require a complete and clear understanding of the physical condition of the system. This is accomplished through a structured plan that includes both data analysis and physical inspection. Inflow and Infiltration analysis is performed through analysis of the flow measurement data from dry and wet periods. This allows the sub-areas (basins) to be prioritized so that basins with the highest I&I are investigated first. While the overall system is younger and consists of more modern materials than the adjacent Pinole system, there is still flow based evidence of system defects. This could indicate either material failures or potential cross connections to the system.

To evaluate the condition and develop a baseline for understanding the collection system various forms of physical surveys will be required. This will include smoke testing and physical inspections in inflow areas and television inspections in all areas. A complete video inspection of the system is recommended to perform continuous evaluation of the physical integrity of the system. Recommended schedules and planning-level cost estimates for the condition assessment tasks have been prepared. In addition to these on going tasks, adequate funding should be provided for special studies that may be required to address redevelopment or other physical changes in the system.

2.6.2 Capacity Assurance Planning

A Geographic Information System (GIS) of the collection system was created from paper and digital maps provided by the City. These included Sewer Atlas sheets and subdivision plans. Where available, data for pipe diameter, length, inverts, and slope were taken from these sources and entered into the GIS. The GIS was then used to locate flow measurement devices (meters) at key locations within the collection system and at lift stations. The GIS of the collection system will become a valuable asset to the City becoming the basis for presentation graphics of sewer system issues.

Next, GIS data was imported into the hydraulic model of the collection system along with the analyzed flow data to create a hydraulic model. The entire publicly owned collection system was evaluated with the exception of the Rodeo Force Main which conveys treated wastewater from the treatment plant to the Rodeo collection system. The hydraulic model was calibrated to average dry weather and observed storm events to perform a capacity analysis. A discussion of the demographic and flow metering results is found in the following chapters. Using the physical system represented in the GIS with the flow data captured from the flow measurement

program, a capacity analysis was performed. The capacity analysis identifies areas that are hydraulically deficient based on a capacity criterion. The hydraulically deficient segments are then grouped into logical "conceptual projects."

Planning level cost estimates were then prepared for the conceptual projects. Planning level cost estimates for other capacity assurance projects were also prepared. These include such tasks as additional flow measurements, engineering surveys of critical reaches, GIS and hydraulic model updates, recalibration and re-analysis. The results of these studies and activities will be used to refine the capacity enhancement projects that have been identified and to form the basis of conceptual preliminary design reports.

3.0 Demographics and Land Use

3.1 Demographics

As of the 2000 census, the average family size in Hercules was 3.46 people with an average household size of 3.03 people. There were 6,423 households within the city limits. 26.6% of the residents are under the age of 18, 30.2% are between the ages of 18 to 24, 27.3% are between the ages of 45 to 64, and 7.4% of the residents are over the age of 65, giving a median age of 37 years. The breakdown is 42.73% Asian, 27.98% White, 18.78% African American, 10.81% Hispanic or Latino, 4.47% other, 0.46% Pacific Islander, and 0.25% Native American.
In 2005, the average household income was $82,100 approximately $30,000 higher than the California average. The average house value in 2005 was $532,200 compared to a state average of $447,700. There are only 4.7% residents who live and work within the city limits.

3.2 Land Use Categories

Contra Costa County provided the parcel database and land use categories for each parcel in the Hercules Study Area. These land use categories reflect the current and future uses for the parcels. Undeveloped parcels may also be planned for by Specific Plans. These negotiated highly planned areas are not included in the County land use designations. The land uses are used in conjunction with flow metered areas to provide additional information related to the flow generation per household. Table 3-1 describes land use for developed and undeveloped parcels by basin and major land use category.

Figure 3-2 shows the 2008 Land Use Categories provided by Contra Costa County.

3.3 Population and Land Use Trends

The City of Hercules was incorporated in the early 1900s. Large population increases did not occur until after 1970. See Figure 3-1, Population Growth. This is good news for the sewer system. Since the 70s, materials, construction and inspection techniques have greatly improved.

The City is continuing to grow in population but is limited by available acreage. As newer, high density, multi-use projects are implemented, the collection system will require upgrading to safely convey flow to the treatment plant. The areas in which continued growth can occur are constrained by Pinole, San Pablo Bay, Rodeo and Nature Reserves. Most increases in population would occur from the conversion of commercial and industrial properties to multi-use, high density, residential developments. Hercules will become even more popular as a community once the San Francisco Ferry and the Amtrak Rail Station are completed.

The City is currently considering the addition of over 3,436 residential units in these mixed use developments. The proposed developments are shown in Figure 3-3. The majority of these developments are characterized by high-rise density with over 40 residential units per acre. By contrast, most traditional subdivisions were developed at 6-8 units per acre with the average for the metered areas in Hercules being just over 4.0 units per acre. See Table 3-2.

Table 3-1 Land Use Developed/Undeveloped by Basin and Major Land Use

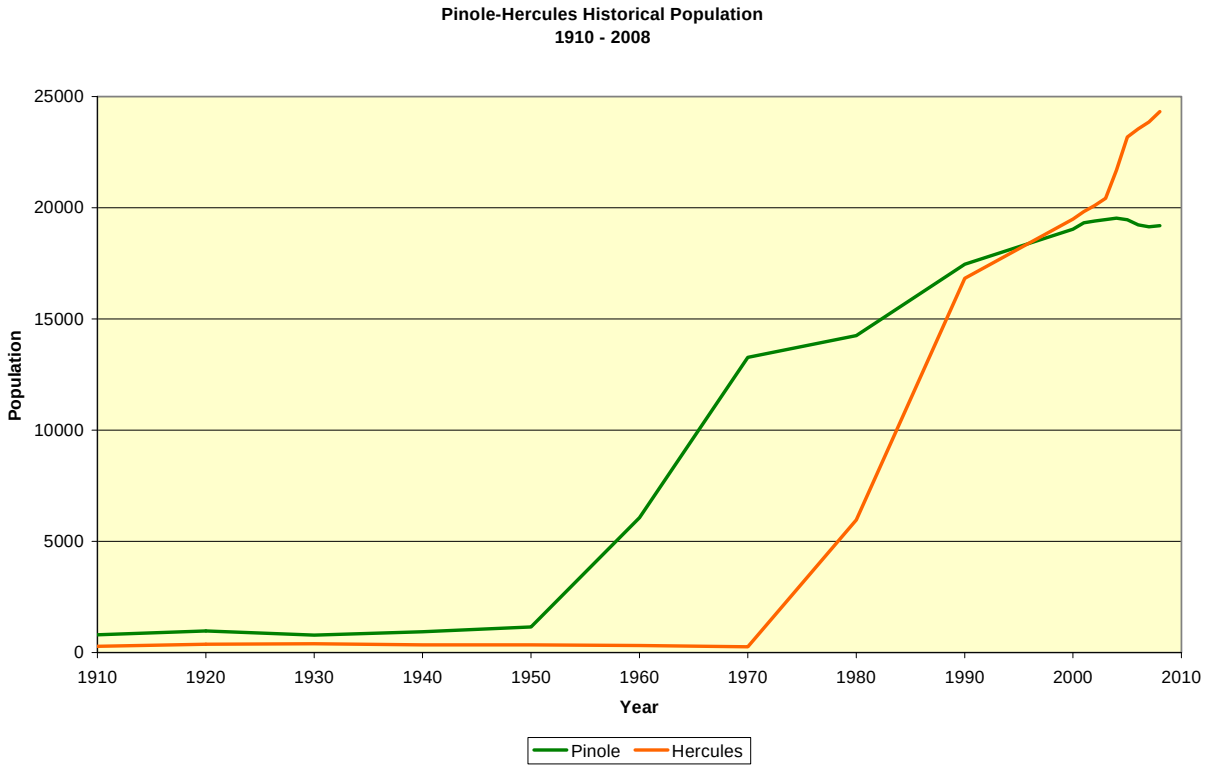
Acreage Utilized (Contra Costa County Parcel Data)						
Major Land Use Category	**Basin 1**	**Basin 2**	**Basin 3**	**Basin 4**	**Basin 5**	**Basin 6**
Residential	244.36	81.38	431.92	93.41	288.18	490.48
Multiple	17.57	9.91	72.27	6.81	48.46	56.79
Commercial	2.43	2.62	10.88	4.07	4.02	28.83
Industrial	0.27	0.18	5.13	10.55	1.89	25.97
Land	0.63	0.05	1.66	0.19	0.34	0.35
Institutional	7.38	1.53	19.20	1.83	9.74	7.62
Miscellaneous	3.78	8.77	2.27	1.68	6.66	3.55
TOTAL	276.43	104.44	543.33	118.54	359.29	613.59
Vacant Acreage (Contra Costa County Parcel Data)						
Major Land Use Category	**Basin 1**	**Basin 2**	**Basin 3**	**Basin 4**	**Basin 5**	**Basin 6**
Residential	3.11	14.52	3.98	11.94	3.55	65.46
Multiple	0.00	0.08	0.00	0.32	0.29	10.64
Commercial	0.17	0.03	0.39	1.80	0.30	7.69
Industrial	0.00	0.06	2.19	0.22	0.72	0.64
Grand Total	3.28	14.69	6.56	14.28	4.85	84.43
Total Basin Acreage	279.71	119.13	549.89	132.82	364.14	698.02
% Vacant	1%	12%	1%	11%	1%	12%

Table 3-2 Parcel Density by Basin

Basin ID	Parcel Count	Acres*	Parcels/Acre
1	734	252.2	2.91
2	465	71.6	6.49
3	1,565	491.1	3.19
4	410	68.3	6.00
5	1,100	316.5	3.48
6	1,430	433.7	3.30
Total	5,704	5,704	4.23

Excludes ROW

Figure 3-1 Population Growth



Source: State of California, Department of Finance, Demographic Studies Unit

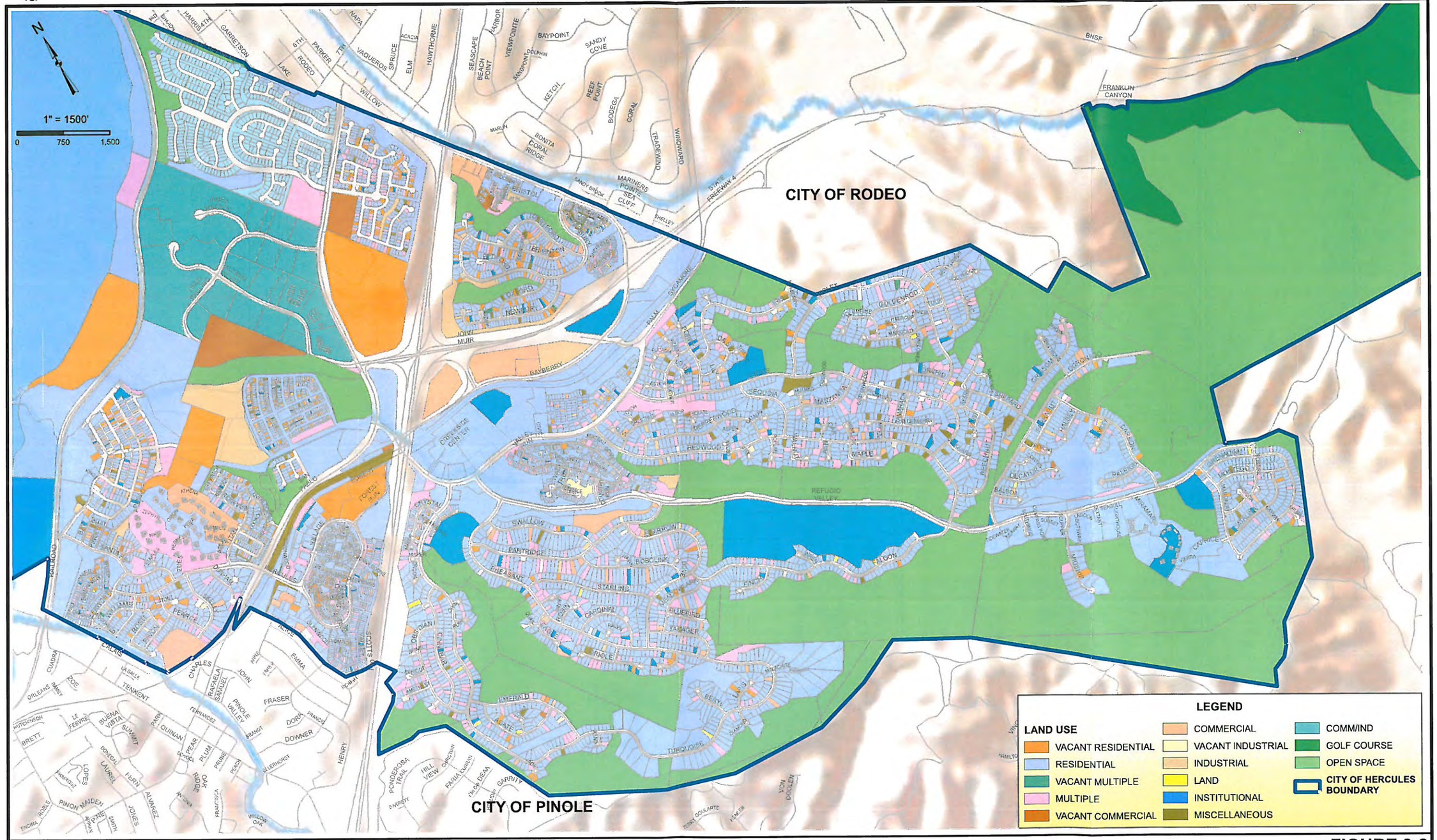


FIGURE 3-2
CURRENT LAND USE

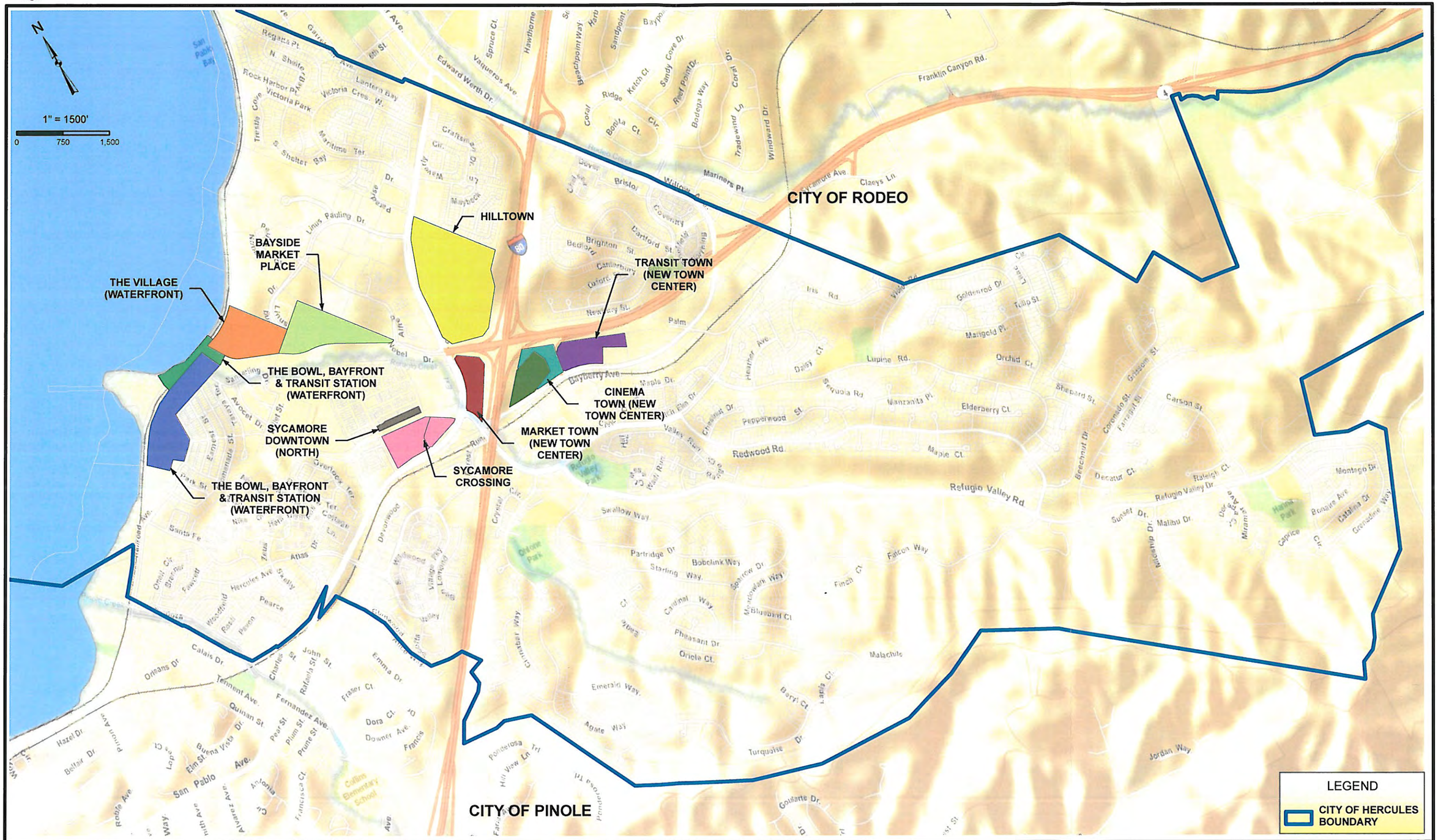


FIGURE 3-3
PLANNED DEVELOPMENTS

4.0 Collection System

4.1 System Overview

There are approximately 352,000 linear feet or about 67 Miles of pipeline, of which 328,000 feet is gravity main and the remaining 24,000 feet is force main. The system contains approximately 1,729 individual pipes, 1,661 manholes, 13 cleanouts, 9 plugs and 13 diversions.

4.2 Collection System

4.2.1 Gravity System

A gravity collection system transports or conveys wastewater from homes and businesses using the power of gravity. This is based on the old rule that "it" flows downhill. Gravity collection systems have been in use for thousands of years and provide reliable and inexpensive systems for drainage when properly maintained. Gravity systems are composed of pipes that vary by diameter depending on the available slope and wastewater loading and of manholes, diversions, cleanouts and plugs. Manholes are located and changes in horizontal or vertical alignment and provide maintenance access to the pipes below. Manholes also provide fresh air through ventilation to keep the sewage fresh. Diversions are manholes that have more than two connections for flow leaving the manhole. This allows the shifting of flow from areas of limited capacity to areas that have capacity.

Keeping the gravity collection system flowing freely is the job of the operations and maintenance staff. They regularly respond to blockages or stoppages on pipes. These situation are most frequently caused by roots or fats, oil and grease (FOG). Proper preventative maintenance (PM) addresses this by routinely cleaning on a schedule based on experience and observations. Blockages and stoppages are the leading cause of sanitary sewer overflows (SSOs). Overflows may also be caused by capacity restrictions but these are generally less prevalent. Following chapters discuss the schedule and costs associated proper Condition based maintenance and capacity planning.

Table 4-1describes the general pipe size distribution characteristics of the gravity collection system. Homes and businesses are generally drained by a four inch private service lateral that is owned and operated by the property owner. These pipes connect to 8-inch lines which in turn connect to increasing larger pipes as additional wastewater is accumulated. The primary trunk in Railroad Avenue is 24 inches in diameter. Note that well over 90% of the collection system is less than 10 inches in diameter. These smaller lines require more attention to assure a free flow condition. Smaller pipes are more prone to blockages due to their smaller size.

Table 4-1 Collection System Characteristics

	Basin ID								
Pipe Size	1	2	3	4	5	6	Out	Total	Portion
(Inches)	Length (feet)								(%)
6"	2,808	644	0	1,893	3,019	1,632	0	9,996	3%
8"	43,866	22,260	65,460	17,729	47,763	71,172	17,467	285,717	87%
10"	2,670	0	2,916	570	424	1,354	0	7,933	2%
12"	0	0	2,646	0	650	5,631	0	8,927	3%
14"	0	0	2,132	0	3,223	0	0	5,354	2%
16"	0	0	0	0	0	842	0	842	0%
20"	0	0	0	0	0	3,945	0	3,945	1%
24"	0	0	0	0	0	1,355	2,815	4,169	1%
							Total	326,884	100%

Table 4-1 lists only those pipes that are greater than 4 inches so the total is slightly less than the described total.

Figure 4-1 shows the general configuration of the entire collection system.

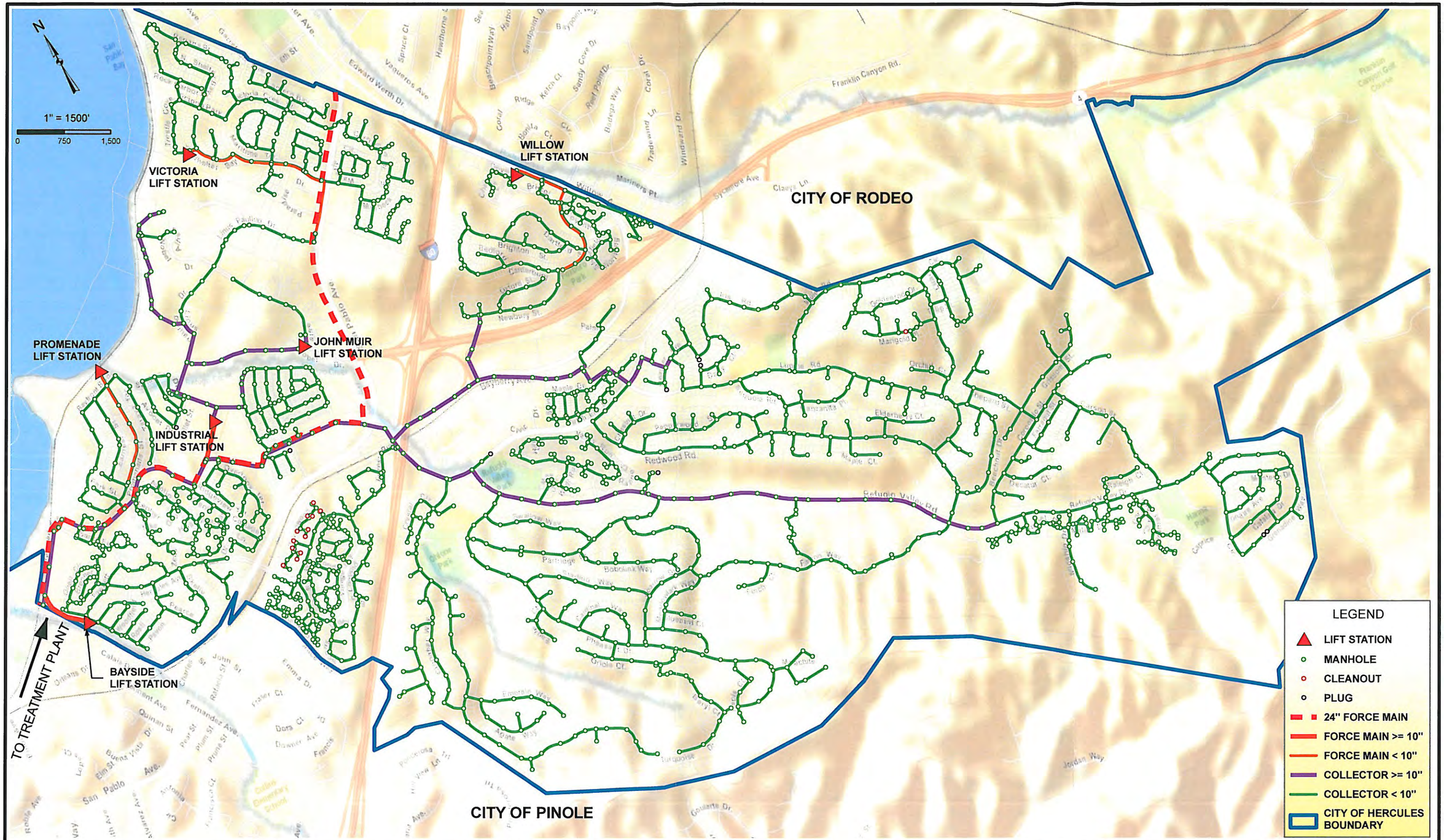
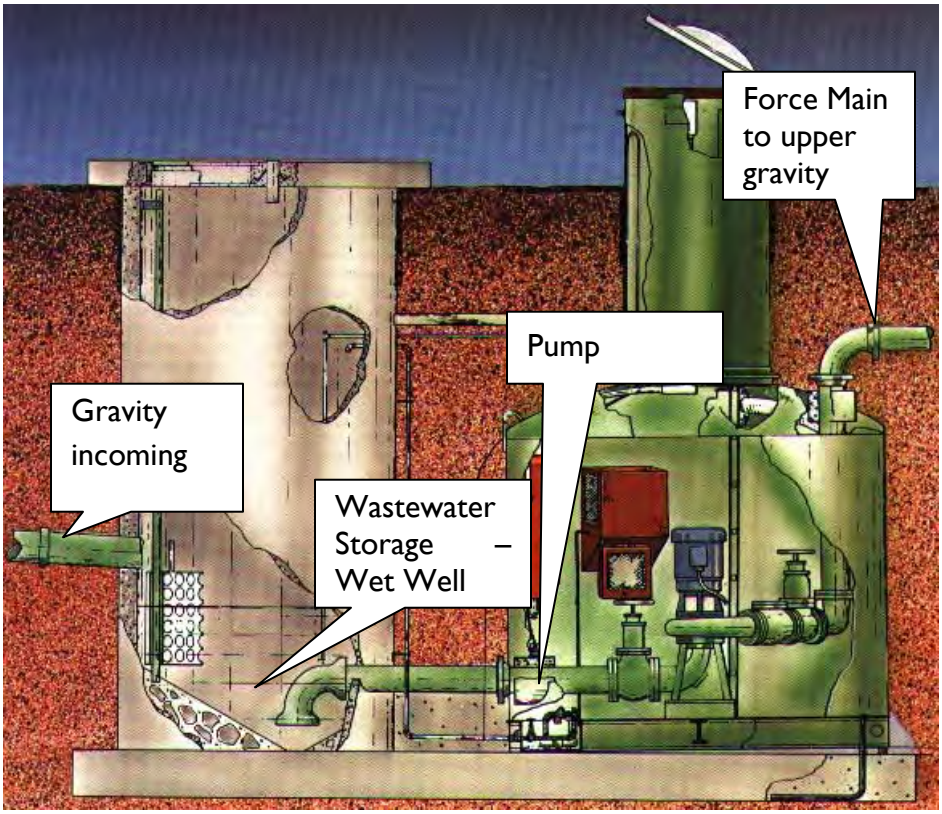


FIGURE 4-1 HERCULES SEWER COLLECTION SYSTEM

4.2.2 Lift Stations

Lift stations are used to pump wastewater flow from an low lying area to a higher area that drains by gravity towards the treatment plant. Lift stations are comprised of a storage area (Wet Well), pumps, and a pressure pipe (Force Main). Figure 4-2 shows a typical layout of a lift station. Due to the timing and location of development combined with the undulating topography, the City has installed 6 lift stations. When compared to a gravity sewer, a lift station is a complex mechanical, electrical and hydraulic system. Wastewater is stored in the wet well until it reaches a certain level. At the preset level the pump is activated and wastewater is pressurized and sent through the pressure pipe (force main) to the receiving manhole. During storage the sewage may become anaerobic (septic). Increased hydrogen sulfide is then released downstream at the receiving manhole. Hydrogen sulfide at higher levels is corrosive to concrete (manholes) and certain pipe materials. Asbestos cement pipe is particularly vulnerable. Any fluid piped under pressure through the soil can create havoc if the pressurized pipe fails. In Hercules, there has been at least one example of force main failures leading to subsurface erosion and sagging pavement in the roadway. Alert operators were able to effect a repair prior to total roadway failure. Due to the increased potential for failure in the complex systems and the increased consequences of failure, the goal of every collection system manager should be the elimination of all unnecessary lift stations.

Figure 4-2 Typical Lift Station



A Tier 1 structural inspection was performed on the larger pump stations in 2004. We recommend that this study be expanded to include all lift stations operated by the City and to identify opportunities for lift station removal. The plan should also provide a detailed emergency response plan for each station. The information developed would include total life cycle cost assessments to provide a clear management basis to establish a schedule of removal. The information developed would also provide risk assessments and provide emergency response procedure drills for each station. These drills would be regularly practiced to minimize the consequences of failure. The following section discusses each of the lift stations characteristics and makes observations related to the flow measurements that were performed as a part of this study. It is also recommended that permanent flow measurements devices be installed at each of the pump stations. Analysis of this data will show long term trends and identify areas of inflow and infiltration.

4.2.2.1 General Description

The City of Hercules collection system configuration currently requires 6 publicly owned lift stations. Approximately 28 percent of the collection system service area requires that pumping en route to the Pinole/Hercules Treatment Plant Three of the lift stations were built in the 1980's and have been in operation with only minor modifications. These include: the Willow Street, Industrial and Bayside stations. The remaining three have been built since 2000. These newer stations include Victoria, the Promenade or Bayfront and the John Muir stations

The location of lift stations and force mains is shown in Figure 4-1 .The City of Hercules owns the lift stations and performs daily station visits. Routine maintenance of the lift stations is performed by the City of Pinole. Major preventative maintenance is performed by private contractors. A description of each lift station is provided in Table 4-2 and in the following sections. Firm capacity is the capacity of the pump station with the largest pump out of service.

Table 4-2 Lift Station Characteristics

Hercules Lift Stations				Force Main	
	Built	Pump Requirements		Diameter	Length
Name	(Year)	Flow Rate (gpm)	Lift (feet)	(Inches)	(feet)
Bayside	1983	350	25	8	675
John Muir	2004	1200	9	8	12
Promenade (Bayfront)	2002	300	39	6	370
Victoria	2001	250	110	6	2,400
Industrial	1984	1400	33	10	800
Willow	1981	550	11	8	2,716

Willow Lift Station

Description

The Willow Avenue Lift Station is located at 800 Willow Avenue between Interstate 80 and Viewpointe Blvd. The station was constructed in 1981 and has two 0.8 MGD submersible pumps. There is a third 'spare pump' on site. However since the third pump is not installed, the firm pumping capacity is 0.8 MGD. The station has a standby diesel generator for emergency power outages onsite. The station currently has high level and power outage alarming to a phone tree. It does not have SCADA monitoring of pump run times wet levels and power consumption

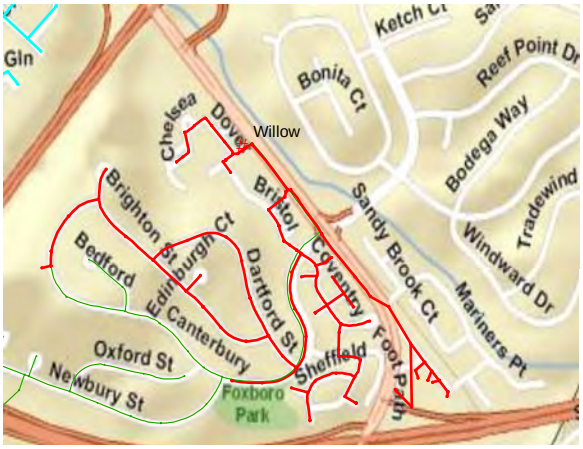
Service Area

The Willow lift station provides service to approximately 14,262 lineal feet of pipe and serves a total service area of approximately 75 acres. The service area of the Willow Lift Station is shown in Figure 4-3. The service area contains 273 residential units and 5.5 acres of industrial and commercial development. There is no undeveloped acreage in this area therefore unless redevelopment occurs or there is an increase in inflow and infiltration there should be no increase in future flows.

Station Capacity

The calculated flows based on land use flowing into the station are estimated at 0.0794 MGD these flows do not include inflow and infiltration. The station was monitored for flow and pump on off cycles. The average dry weather flows for the monitoring period were 0.084 MGD therefore using a peaking factor of 5 for wet weather flows bringing the total wet weather flow to 0.42 MGD. This station has adequate capacity for existing and future flows.

Figure 4-3 Willow Lift Station



John Muir Lift Station

Description

The John Muir Lift Station is located at the corner of Alfred Nobel Drive and John Muir Parkway. The station was constructed in 2004 and has two 1.7 MGD submersible pumps. The station has an emergency overflow by gravity into the 12 inch gravity line downstream of the station. The station currently has high level and power outage alarming to a phone tree but does not have SCADA monitoring of pump run times, wet levels and power consumption. The invert of the manhole upstream of the station is 13.1 feet the invert of the manhole downstream of the lift station is 9.8 feet. It appears possible to provide service to this area by gravity.

Service Area

The John Muir lift station provides service to approximately 1,900 lineal feet of pipe and serves a total service area of approximately 5.9 acres. The service area of the John Muir Lift Station is shown in Figure 4-4. The service area contains 1.9 acres of industrial and commercial development. There appears to be no undeveloped acreage in this service area. Unless redevelopment occurs, or there is an increase in inflow and infiltration, there should be no increase in future flows.

Station Capacity

The calculated flows based on land use flowing into the station are estimated at 0.0267MGD these flows do not include inflow and infiltration. The station was monitored for flow and pump on off cycles. The average dry weather flows for the monitoring period were 0.0269 MGD therefore using a peaking factor of 5 for wet weather flows bringing the total wet weather flow to 0.1345 MGD. The firm pumping capacity at his station is 1.7 MGD. This station has plenty of excess capacity for existing and future flows.

Recommendation

This area could be served by gravity. Therefore to save the cost of operating a lift station and reduce the possibility of overflows it is recommended that this station be decommissioned and relived by gravity line construction of 146 feet of 12 –inch gravity line. The possible routing of gravity line to relive the station by gravity is shown in Figure 4-5.

Figure 4-4 John Muir Lift Station Service Area

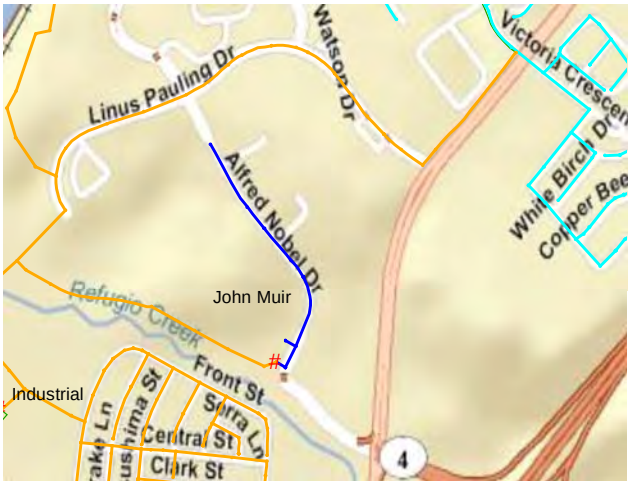


Figure 4-5 Potential Muir Relief Alignments

Industrial Lift Station

Description

The Industrial Lift Station is located north of Sycamore Avenue between Wilet and I Drive. The station was constructed in 1985 and has two submersible variable speed pumps rated at 2.0MGD each. The firm pumping capacity of the station is 2.0 MGD. The station has a standby diesel generator for power outages. The station currently has high level and power outage alarming to a phone tree but does not have SCADA monitoring of pump run times wet levels and power consumption

Service Area

The Industrial lift station provides service to approximately 25,275 lineal feet of pipe and serves a total service area of approximately 85 acres. The service area of the Industrial Lift Station is shown in Figure 4-6. The service area contains 1129 residential units and 38.8 acres of industrial and commercial. There are no undeveloped areas in the Industrial lift station service area. The station also receives flows from the Victoria by the Bay Lift Station.

Figure 4-6 Industrial Lift Station Service Area

Station Capacity

The total estimated flow to the industrial lift station based on the flow measurement of the collection system is approximately 0.676MGD. The dry weather peak flows based on the flow monitoring program of 0.676 MGD, when multiplied by the peaking factor of five (5), results in a total wet weather flow of 3.38MGD. The firm pumping capacity of the Industrial Lift Station is not sufficient to handle existing flows.

Recommendation

The firm pumping capacity of the Industrial Lift station should be reevaluated and upgraded to accommodate existing and future peak wet weather flows if required.

Bayside Lift Station

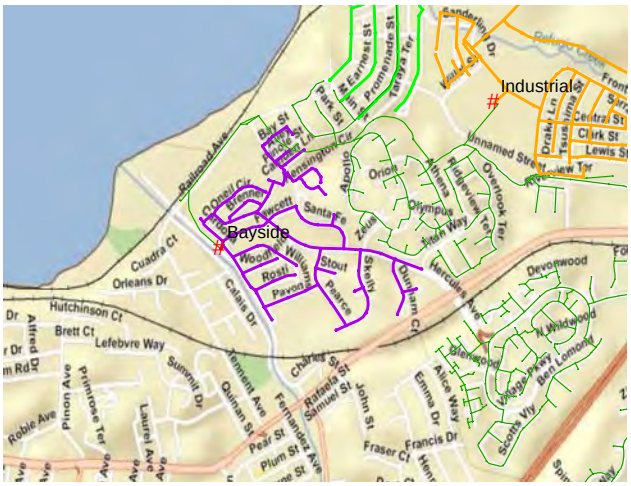
Description

The Bayside Lift Station is located at the corner of Woodfield and Fawcett in the northwestern part of Hercules The station was constructed in 1984 and has two 0.5 MGD submersible pumps. There is a third 'spare pump' on site. However since the third pump is not installed the firm pumping capacity is 0.5 MGD of one pump. The station has a standby diesel generator for emergency power outages onsite. The station currently has high level and power outage alarming to a phone tree but does not have SCADA monitoring of pump run times wet levels and power consumption

Service Area

The Bayside lift station provides service to approximately 17,373 lineal feet of pipe and serves a total service area of approximately 104 acres. The service area of the Bayside Lift Station is shown in Figure 4-7. The service area contains 367 residential units and 11.2 acres of industrial and commercial development. There are approximately 0.66 acres of undeveloped land in the Bayside Lift Station service area.

Figure 4-7 Bayside Lift Station



Station Capacity

The calculated flows based on land use flowing into the station are estimated at 0.110 mgd these flows do not include inflow and infiltration. The estimated land use dry weather flows when multiplied times the wet weather peaking factor of 5 results in 0.55 mgd. This exceeds the firm pumping capacity of 0.50 mgd. The average dry weather flows for the monitoring period were 0.130 MGD therefore using a peaking factor of 5 for wet weather flows bringing the total wet weather flow to 0.650 MGD.

Recommendations

The firm pumping capacity of the Bayside lift station should be reevaluated and upgraded to accommodate existing and future peak wet weather flows if required

Victoria Lift Station

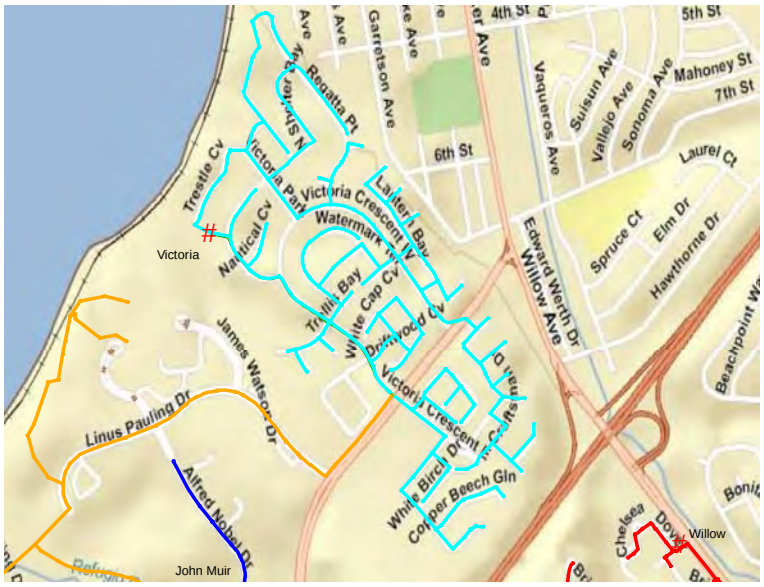
Description

The Victoria Avenue Lift Station is located in an easement east of Trestle Cove and West of South Shelter Bay The station was constructed in 2001 and has three 0.360 MGD submersible pumps. The firm pumping capacity of the Victoria Lift station is 0.720 MGD The station has a standby diesel generator for emergency power outages onsite. The station currently has high level and power outage alarming to a phone tree. The station has full SCADA monitoring including flow metering, pump run, times wet levels and power consumption.

Service Area

The Victoria lift station provides service to approximately 30,693 lineal feet of pipe and serves a total service area of approximately 150 acres. The service area of the Victoria Lift Station is shown in Figure 4-8. The service area contains 880 residential units (748 SF and 132 MF) and 11.8 acres of industrial and commercial development. There are approximately 7.48 acres of undeveloped land in the Victoria Lift Station service area.

Figure 4-8 Victoria Lift Station



Station Capacity

The calculated dry weather flows based on land use flowing into the station are estimated at 0.160 mgd. Estimated land use based wet weather flow are 0.8 mgd. Based on the existing installed firm pumping capacity of 0.72 MGD and using a wet weather peaking factor of five, the lift station does not appear have sufficient capacity for existing flows. There are 7.48 acres of vacant land that may be developed in the future creating potential for additional flows

Recommendation

Further investigation is required to assure that this pump station has adequate capacity for future and wet weather flows.

Bayfront Lift Station (Promenade)

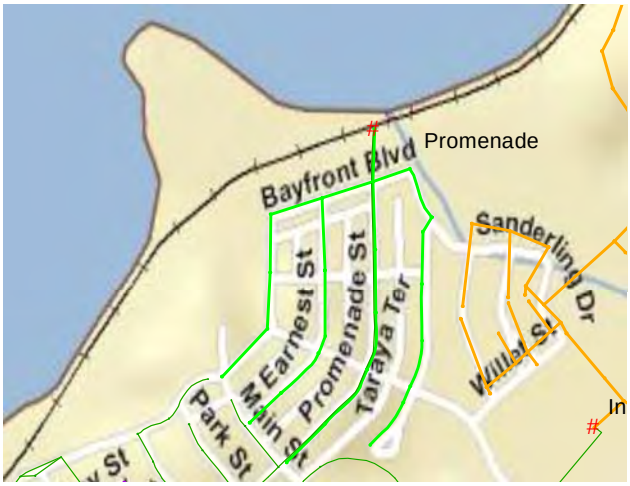
Description

The Bayfront Lift Station is located in an easement near the intersection of Bayfront Boulevard and Promenade The station was constructed in 2002 and has two 0.43 MGD submersible pumps. The firm pumping capacity is 0.43 MGD of one pump. The station has a standby diesel generator for emergency power outages onsite. The station currently has high level and power outage alarming to a phone tree but does not have SCADA monitoring of pump run times wet levels and power consumption

Service Area

The Bayfront lift station provides service to approximately 6,766 lineal feet of pipe and serves a total service area of approximately 35 acres. The service area of the Bayfront Lift Station is shown in Figure 4-9. The service area contains 129 residential units and 2.08 acres of industrial and commercial development. There is approximately 0.24 acres of undeveloped land in the Bayfront Lift Station service area

Figure 4-9 Bayfront Lift Station



Station Capacity

The calculated flows based on land use flowing into the station are estimated at 0.037 MGD these flows do not include inflow and infiltration. The station was monitored for flow and pump on off cycles; the average daily flows during the monitoring period were 0.058MGD. The estimated land use dry weather flows when multiplied times the wet weather peaking factor of 5 result in 0.185 MGD peak wet weather flow The average dry weather flows for the monitoring period were 0.058 MGD therefore using a peaking factor of 5 for wet weather flows bringing the total wet weather flow to 0.290 MGD.

Recommendations

The Bayfront lift station appears to have adequate capacity for existing and future peak wet weather flows.

5.0 System Flows

5.1 2008 Flow Measurement Plan

The Geographic Information System (GIS) that was created from the various data sources was reviewed and commented on by the City engineering and operations staff including Pinole personnel who served as collection system maintenance support. DUDEK made the revisions to the maps to incorporate correct alignments and flow directions. Based on the layout of the system, a Flow Measurement Plan was prepared that identified six (6) key locations in the collection system. These locations allow the collection system to be subdivided into logical units for flow characterization and defect prioritization.

The goal of the Flow Measurement task is to characterize the flows during normal dry weather and within wet weather. Comparison of the average dry weather volume and hourly rates are compared to wet weather volumes and hourly rates to determine the nature and extent of the defects in the system. The flow measurement program was extended to include the operations of the lift stations.

Figure 5-1 shows the location of the flow meters and the areas that drain to each flow measurement site (Sub Basins). The results of the flow metering program are discussed in the following sections.

Table 5-1indicates the flow meter ID (Basin1, Basin 2, etc) and the upstream contributing land use. This table is helpful in defining the individual variations of flow observed at each site.

Table 5-1 Meter Basin Land Use

Acreage Utilized (Contra Costa County Parcel Data)						
Major Land Use Category	**Basin 1**	**Basin 2**	**Basin 3**	**Basin 4**	**Basin 5**	**Basin 6**
Residential	244.36	81.38	431.92	93.41	288.18	490.48
Multiple	17.57	9.91	72.27	6.81	48.46	56.79
Commercial	2.43	2.62	10.88	4.07	4.02	28.83
Industrial	0.27	0.18	5.13	10.55	1.89	25.97
Land	0.63	0.05	1.66	0.19	0.34	0.35
Institutional	7.38	1.53	19.20	1.83	9.74	7.62
Miscellaneous	3.78	8.77	2.27	1.68	6.66	3.55
TOTAL	276.43	104.44	543.33	118.54	359.29	613.59

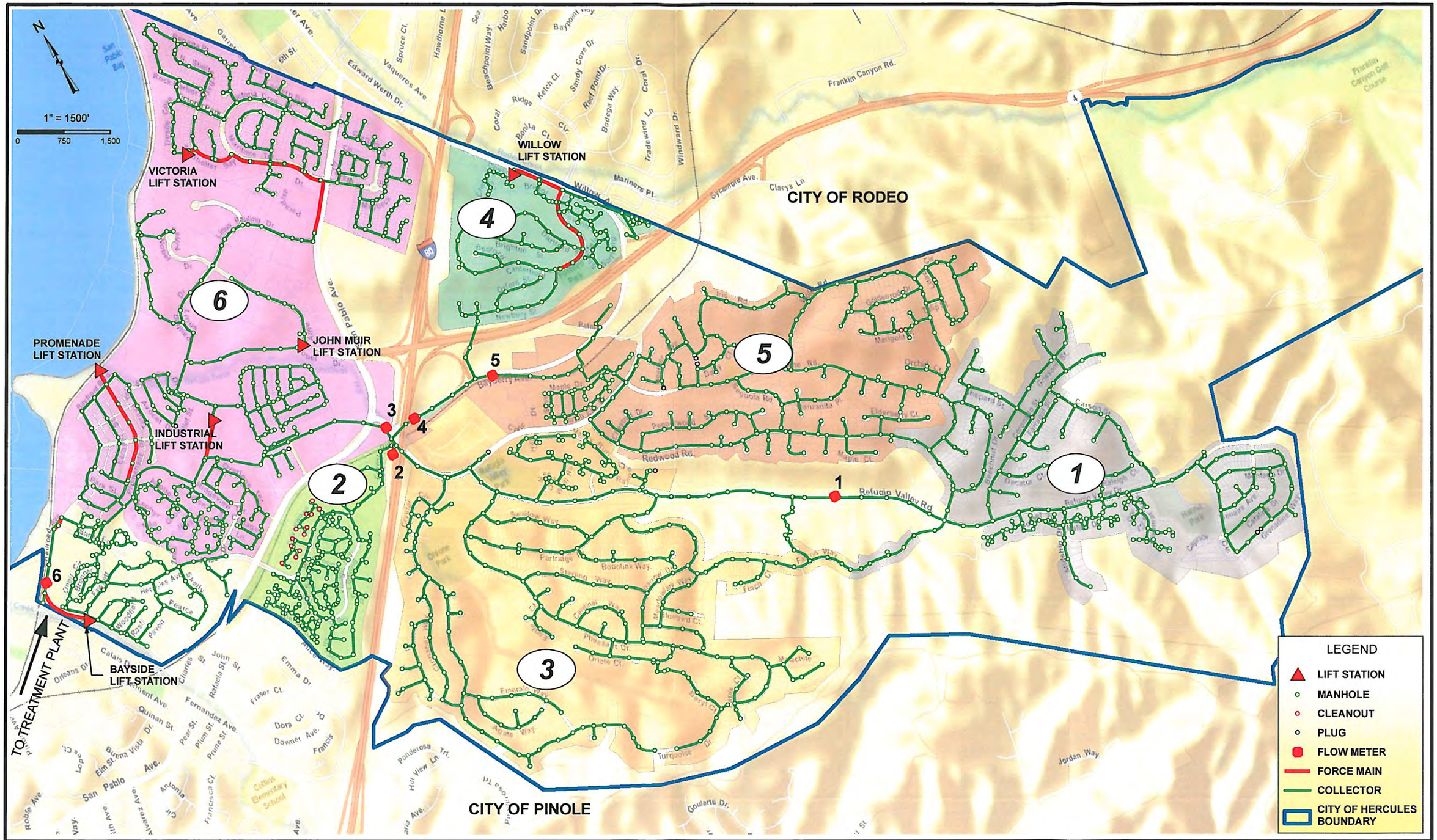


FIGURE 5-1 FLOW MEASUREMENT SITES AND SUB BASINS

5.2 Average Dry Weather

Average dry weather flow is determined by analyzing the flow patterns on days which no rainfall occurred and which were not impacted by a previous rainfall event. Table 5-2 indicates the overall characteristics of the flow observed at each site.

Table 5-2 Dry Weather Flow Characteristics

	Upstream H-01		Upstream H-02		Upstream H-05		Upstream H-04				Upstream H-03				Upstream of H-06			
ADWF	H-01		H-02		H-05		H-04		H-04-H-05		H-03		H03-(H4+H2+H1)		H-06		H06-H-03	
Hour	0.73	MGD	0.24	MGD	0.265	MGD	0.641	MGD	0.376	MGD	1.87	MGD	0.26	MGD	2.10	MGD	0.24	MGD
0:00	1.13	0.82	1.10	0.26	1.09	0.29	1.19	0.76	1.26	0.47	1.18	2.20	1.37	0.35	1.25	2.62	1.79	0.42
1:00	0.92	0.67	0.88	0.21	0.94	0.25	0.91	0.58	0.88	0.33	0.92	1.72	1.00	0.26	1.08	2.26	2.33	0.55
2:00	0.63	0.45	0.67	0.16	0.71	0.19	0.67	0.43	0.65	0.24	0.76	1.43	1.48	0.38	0.87	1.83	1.70	0.40
3:00	0.43	0.31	0.58	0.14	0.57	0.15	0.56	0.36	0.55	0.21	0.62	1.16	1.38	0.36	0.69	1.45	1.22	0.29
4:00	0.38	0.28	0.54	0.13	0.51	0.14	0.49	0.31	0.47	0.18	0.56	1.05	1.29	0.33	0.58	1.22	0.71	0.17
5:00	0.38	0.28	0.55	0.13	0.52	0.14	0.44	0.28	0.39	0.15	0.54	1.01	1.23	0.32	0.53	1.11	0.42	0.10
6:00	0.48	0.35	0.64	0.15	0.58	0.15	0.46	0.29	0.37	0.14	0.60	1.13	1.29	0.33	0.52	1.10	-0.13	-0.03
7:00	1.00	0.73	0.98	0.24	0.81	0.21	0.66	0.42	0.55	0.21	0.85	1.59	0.81	0.21	0.64	1.34	-1.09	-0.26
8:00	1.51	1.10	1.52	0.37	1.17	0.31	1.13	0.72	1.10	0.41	1.35	2.53	1.32	0.34	0.99	2.08	-1.88	-0.44
9:00	1.66	1.20	1.60	0.38	1.62	0.43	1.45	0.93	1.32	0.50	1.58	2.96	1.71	0.44	1.49	3.13	0.75	0.18
10:00	1.21	0.88	1.18	0.28	1.34	0.35	1.41	0.90	1.46	0.55	1.30	2.44	1.44	0.37	1.47	3.09	2.76	0.65
11:00	1.08	0.78	1.02	0.25	1.12	0.30	1.20	0.77	1.26	0.47	1.09	2.03	0.89	0.23	1.15	2.43	1.70	0.40
12:00	0.94	0.69	0.98	0.24	1.07	0.28	1.14	0.73	1.19	0.45	1.08	2.01	1.39	0.36	1.11	2.33	1.35	0.32
13:00	0.90	0.66	0.91	0.22	1.00	0.26	1.13	0.72	1.22	0.46	0.99	1.84	0.96	0.25	1.00	2.09	1.06	0.25
14:00	0.92	0.67	0.88	0.21	0.95	0.25	1.01	0.65	1.06	0.40	0.94	1.76	0.91	0.23	0.96	2.02	1.08	0.25
15:00	0.96	0.70	0.86	0.21	0.97	0.26	0.95	0.61	0.94	0.35	0.93	1.74	0.88	0.23	0.91	1.92	0.78	0.18
16:00	0.97	0.71	0.86	0.21	0.94	0.25	0.91	0.58	0.89	0.33	0.91	1.71	0.81	0.21	0.88	1.86	0.64	0.15
17:00	1.00	0.72	0.88	0.21	0.97	0.26	0.91	0.58	0.87	0.33	0.89	1.66	0.53	0.14	0.89	1.87	0.89	0.21
18:00	1.03	0.75	0.93	0.22	0.99	0.26	1.02	0.65	1.04	0.39	0.93	1.73	0.38	0.10	0.91	1.92	0.82	0.19
19:00	1.16	0.84	1.03	0.25	1.06	0.28	1.13	0.72	1.18	0.44	1.01	1.88	0.26	0.07	0.98	2.07	0.80	0.19
20:00	1.29	0.94	1.23	0.30	1.21	0.32	1.26	0.81	1.30	0.49	1.14	2.12	0.30	0.08	1.10	2.30	0.78	0.18
21:00	1.38	1.01	1.44	0.35	1.34	0.35	1.36	0.87	1.37	0.51	1.27	2.37	0.58	0.15	1.26	2.64	1.15	0.27
22:00	1.39	1.01	1.45	0.35	1.33	0.35	1.36	0.87	1.38	0.52	1.30	2.43	0.80	0.21	1.38	2.91	2.03	0.48
23:00	1.32	0.96	1.32	0.32	1.18	0.31	1.26	0.81	1.31	0.49	1.25	2.34	0.99	0.25	1.37	2.89	2.34	0.55
0:00	1.13	0.82	1.10	0.26	1.09	0.29	1.19	0.76	1.26	0.47	1.18	2.20	1.37	0.35	1.25	2.62	1.79	0.42
	1.00	**0.73**	**1.00**	**0.24**	**1.00**	**0.265**	**1.00**	**0.641**	**1.00**	**0.376**	**1.00**	**1.87**	**1.00**	**0.26**	**1.00**	**2.10**	**1.00**	**0.24**

The average dry weather flow pattern is dominated by the residential land use. Figure 5- 3 shows the flow pattern for 5 of the 6 basins measured. Figure 5-4 shows the net pattern measured at site 3. This site is strongly influenced by the adjacent shopping center and industrial activity. Notice the food preparation and the just afternoon peak.

Figure 5-2 Residential Dry Weather Pattern

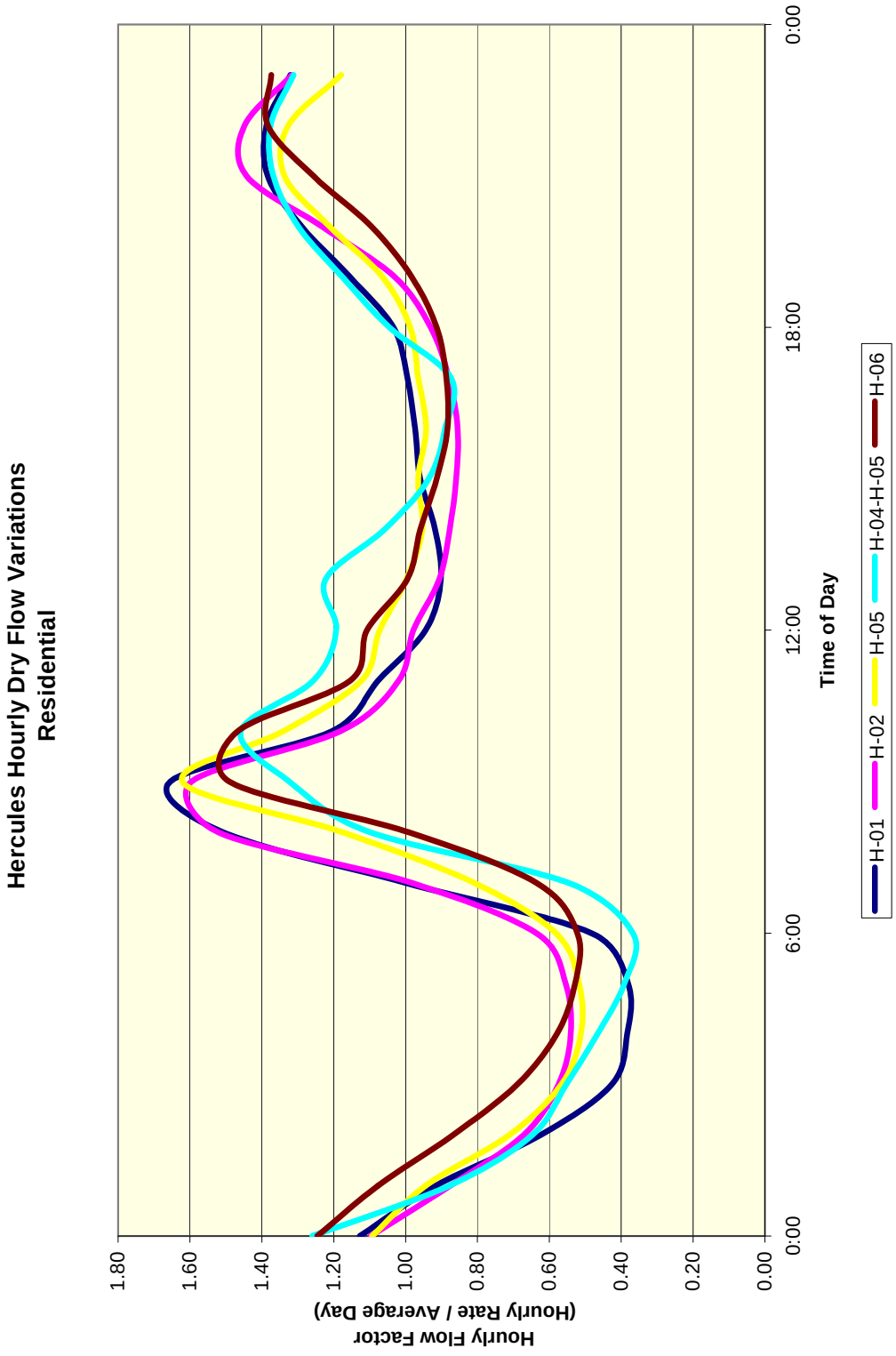
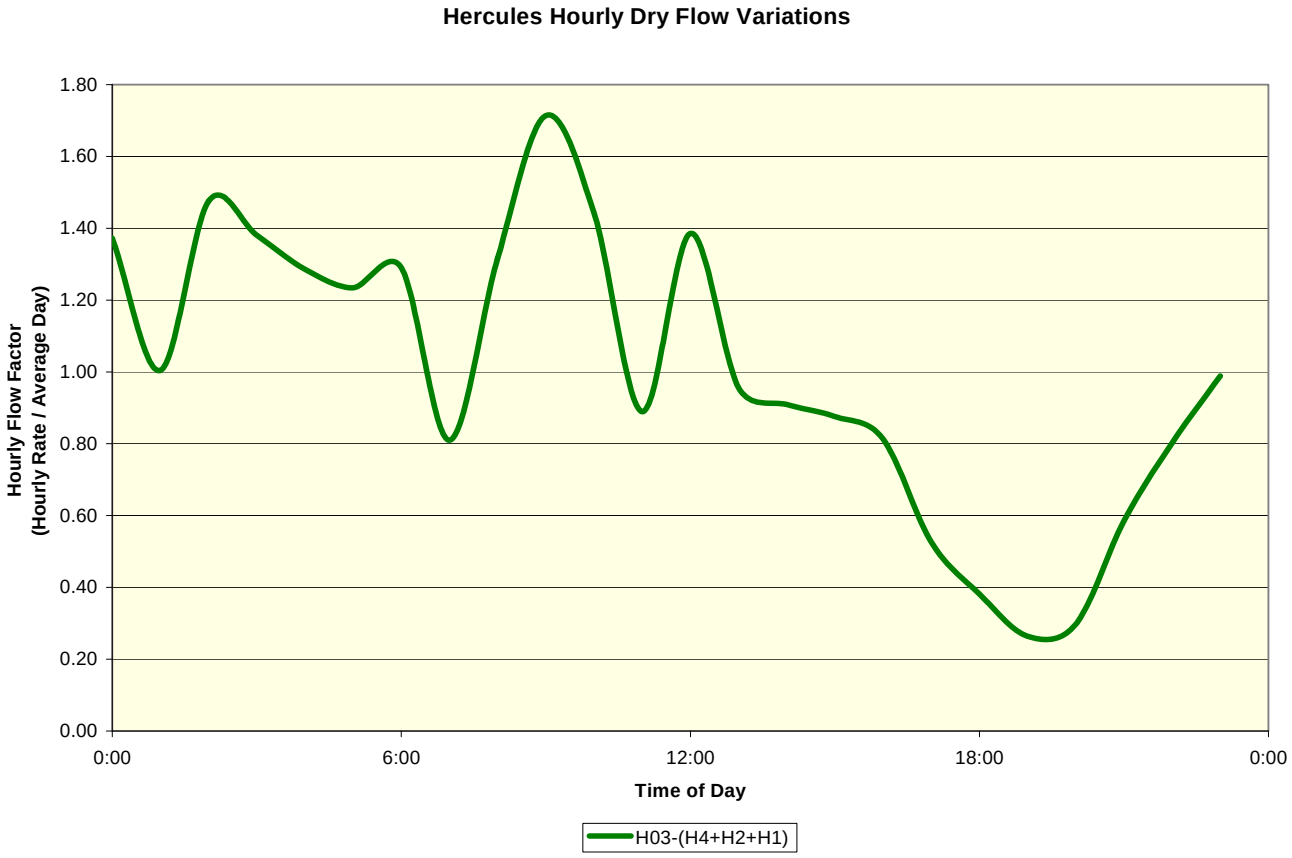


Figure 5-3 Non-Residential Flow Pattern



5.3 Inflow and Infiltration Analysis

Flows originating from defects are generally known as defect flows, or I&I. Defect flows that occur consistently regardless of precipitation are known as Base Inflow and Infiltration (BII). Defect flows that only occur as a result of a rainfall event are known as Rainfall-Derived Inflow and Infiltration (RDII). A wet-weather analysis was used to determine the impacts of defect flow. This section discusses the methodology used to estimate the RDII.

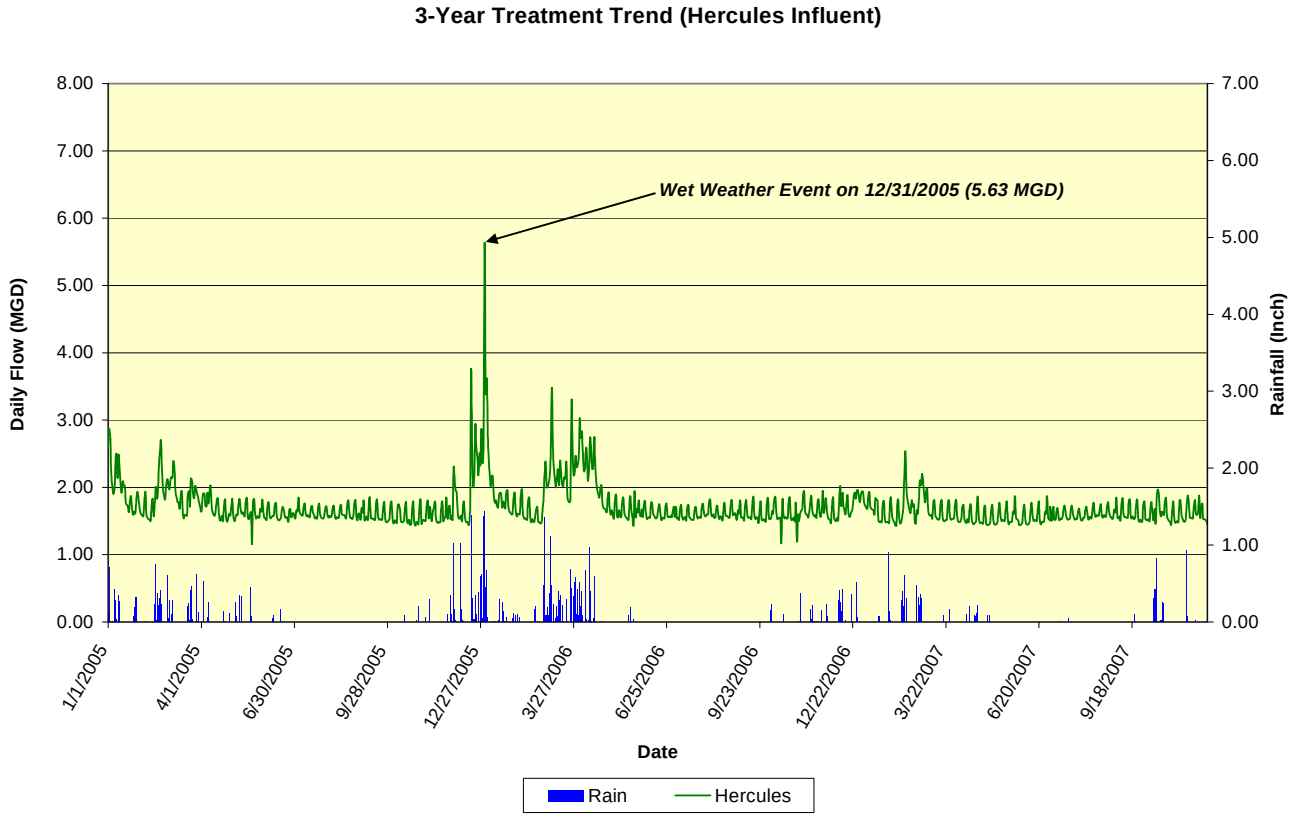
I&I flows originate from defects in the collection system. Each is distinguished by the method by which it enters the collection system. Inflow comes from direct connections to the surface waters. Examples of inflow sources would include: missing clean-out covers; missing manhole covers; damaged manhole rings and cones in watercourses; manholes in street gutters; and roof, patio, refuse bin, storm and other drains that are connected to the sanitary sewer system. Inflow is characterized by a rapid response and diminishment closely following the pattern of the rainfall event. Inflow is most frequently located through the use of smoke testing during dry weather.

Infiltration flows enter the system from indirect connections through the soil/groundwater interface. Examples of infiltration source include cracked pipe, offset joints, manhole/pipe connections, and manhole chimney seals. Infiltration has a slow initial response to rainfall and infiltration defect flows may last for months after a rainfall event. Infiltration defects are best located through the use of CCTV inspections performed during periods of high groundwater.

RDII flows into the sewer and temporarily elevates wastewater flows in the collection system. The nature of the RDII response is indicative of the type, magnitude, and distribution of the defects in the system. Defect flows are calculated by subtracting the ADWF from wet-weather flow on a selected storm event.

On 31st December, 2005, the City's treatment plant observed a major wet weather event. The treatment plant estimated a total flow of 13.27 MGD, of which Hercules' contribution was 5.63 MGD. Figure 5-5 depicts the wet weather event.

Figure 5-4 WWTP Flow and Rainfall



In addition to flows observed during the average dry weather condition 2008(ADWF), a wet weather analysis needs to be performed to determine the impacts of defect flow. In order to determine the locations where defect flows might be occurring in the collection system, a well defined flow monitoring program has been developed.

To further isolate RDII, a second phase of the flow monitoring program is recommended for the winter wet season 2008-2009. A second phase will involve a more detailed flow monitoring of the lift stations in addition to the six key locations. This approach will further facilitate the determination of defect flows per unit inch of rainfall per unit foot of pipeline and allow an assessment of lift station performance.

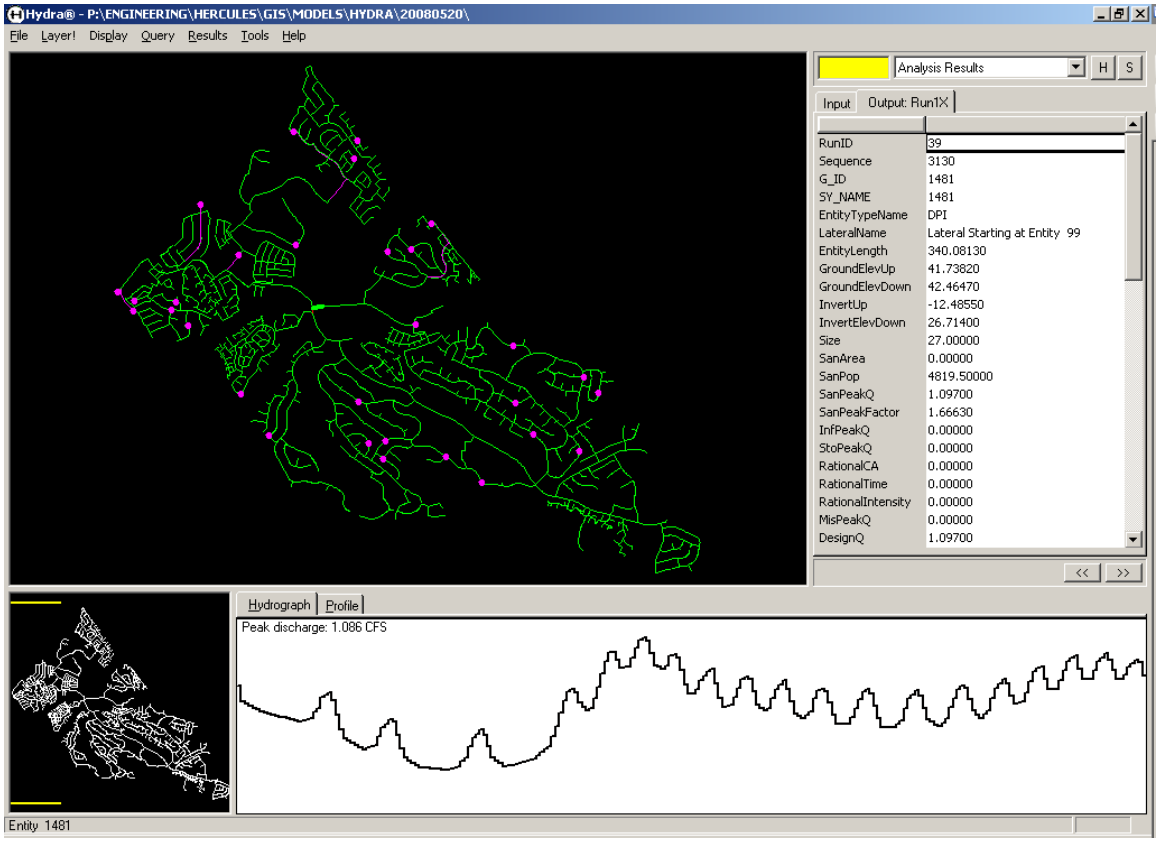
6.0 Capacity Assurance Plan

6.1 Hydraulic Model

To assess the capacity of the collection system to convey flow under normal and stressed conditions, a hydraulic model was created from the GIS data. This model includes all facilities in the collection system except for privately owned lift stations, collectors and laterals. The Pizer, Inc. Hydra Model and EPA SWMM model were used to evaluate the capacity of the system and the potential for overflow, respectively. A complete technical memorandum on the detailed results of the models will be provided in a separate binder.

Figure 6-1 captures a screen shot of the collection system as it is modeled in the Hydra user interface.

Figure 6-1 Hydra Dry Weather Capacity Model



The hydrograph displayed shows the effect of the Willow Pump Station on the downstream flows. For the average dry weather flows, no capacity restrictions are predicted in the Hercules collection system. Any overflows that have occurred in the system are related to blockages or pipe failures and not due to hydraulic capacity.

6.2 Flow Loading

Flow loading is the process where flows created by individual users are quantified and directed to the proper receiving pipe. In the hydraulic model prepared for Hercules, all flows generated from the parcel were assigned to the nearest gravity sewer pipeline. Since the entire collection system is modeled, this represents the most accurate way to assign flows.

6.2.1 Average Dry Weather

Two components are used to describe flow for the model. These are the average daily volume and the hourly flow pattern. The hourly flow pattern is also called the diurnal curve. In the model, each parcel was assigned a flow meter ID number that was then associated with its specific land use driven diurnal curve. All of the residential curves are very similar, varying only due to the location of the flow monitor in its basin. For example, Meter 6 is the last basin in the collection system and shows a diurnal variation that lags the remainder of the system by one hour. In these basins and in unmonitored areas upstream of the Bayside Lift Station, the typical residential curve was used. In the commercial areas located in Basin 3, a typical non-residential pattern was used.

Average dry weather flows were calculated in the model by considering the land use and its associated flow generation factors and diurnal curves.

6.2.2 Wet Weather

As noted in the discussion on the Inflow and Infiltration Analysis, a basin by basin wet weather characterization could not be performed. This is due to the overall low intensity of rainfall events that were observed during the monitoring period. The contribution of wet weather flows from defects could only be characterized by an overall increase in flows. This was done by using a feature in the Hydra program that allows the peak rate to be increased by a specific multiplier. In the inflow and infiltration analysis of the treatment plant data, the highest observed peaking factor for daily volume was 3.3. The peak flow volume was recorded at 13.3 mgd. During the peak rate, the influent flow meters failed. It is estimated that the actual peak flow rate was nearly 20.0 mgd. To account for the potential impacts of rainfall defects on a global basis, a wet to dry weather peaking factor of 5.0 was used.

6.3 Capacity Analysis

The capacity analysis was performed using the dry weather flow meter calibrated model. Wet weather capacity analysis was performed using a global peaking factor of 5.0. This represents the highest flow observed at the treatment plant from Hercules in the last 3.0 years. The Contra Costa County Flood Control District estimates a rainfall return period for the 12/31/2005 storm event as between 5 and 10 years for the Rodeo Fire Station rain gauge. This return frequency is consistent with other collection system planning assumptions in the Bay Area.

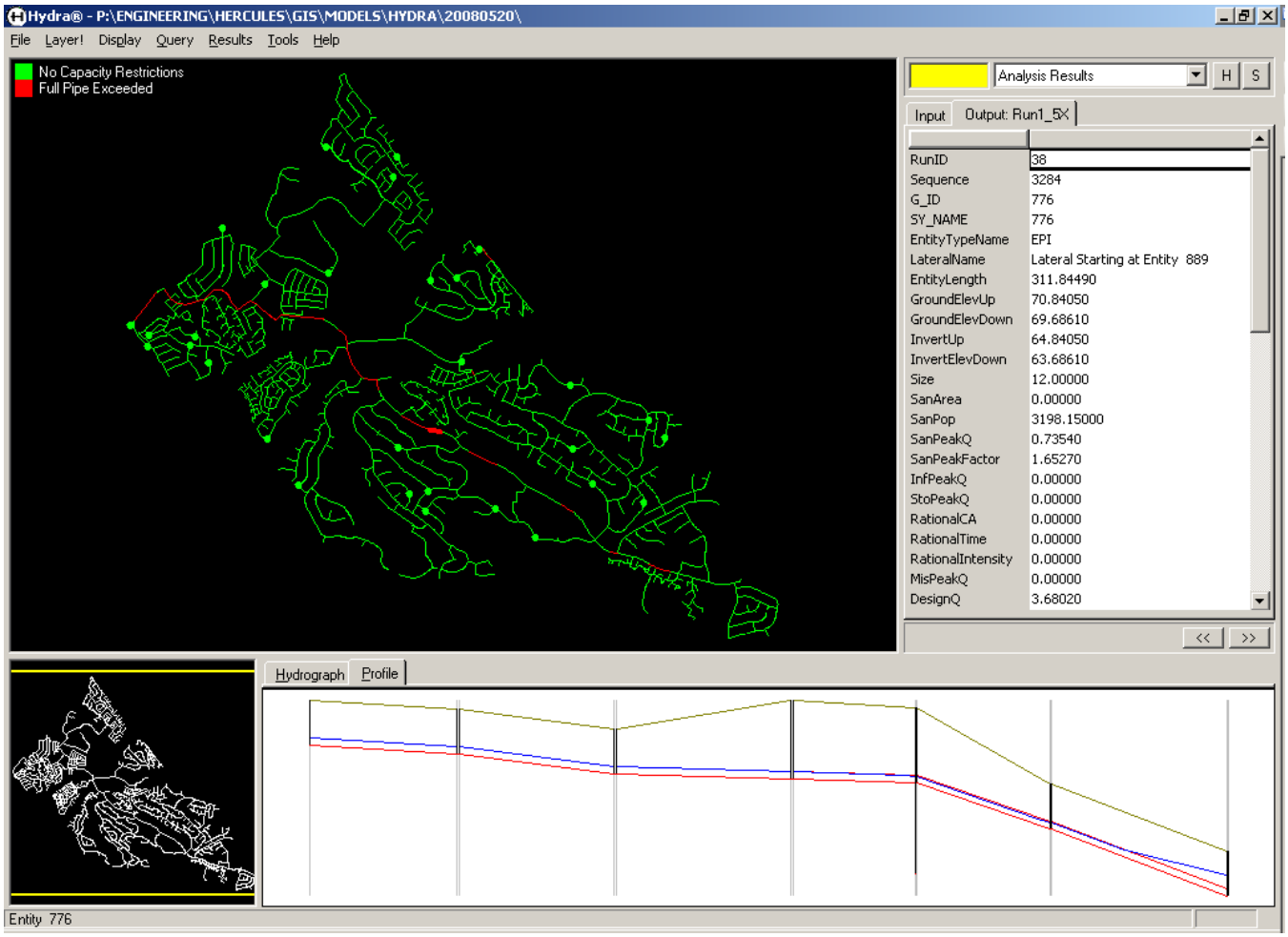
A pipe was considered capacity restricted if the maximum flow at full pipe was exceeded.

6.3.1 Capacity Restrictions

As shown in Figure 6-1 there are no predicted capacity restrictions in the calibrated dry weather model. This would indicate that any overflows that may occur are due to conditions not present in the model. This can include: roots, silt, fats, oils, grease build-up, or collapsed and obstructed pipes.

Figure 6-2 shows the wet weather predicted capacity restrictions in red and unrestricted pipes in green.

Figure 6-2 Wet Weather Capacity Restrictions



Note that the lower panel shows the predicted hydraulic grade line in blue and the top and bottom of pipe in red. Notice that the predicted water surface is well below the ground surface, except at the lower end (on the right of the profile). As the lower trunk (Railroad Avenue to Sycamore) flattens out, the HGL does exceed the ground level and indicates a potential for overflow. For perspective, Figure 6-3 shows the Railroad Avenue Bridge during a rainfall event of this magnitude.

Figure 6-3 Pinole Creek 12/31/2005

6.4 Candidate Capacity Enhancement Projects

Four candidate projects were identified from the hydraulic modeling for the wet weather event. Additional preliminary flow measurements, capacity evaluation surveys, GIS/model updates should be performed. These tasks are required to confirm the impact of wet weather events, establish current existing invert elevations and lengths, update the GIS and reevaluate the capacity analysis with these input data changes. The total costs for these programs are identified in the Capacity Enhancement Projects.

6.4.1 Prioritization

As noted above, the preliminary requirements are for additional field information to be collected. The Capital Improvement Projects are assigned a priority based on the location in the collection system. Three of the four projects are located on the trunk line and would begin at the lower reaches and work upstream. The fourth project is located at Bristol Street, just upstream of the Willow Pump Station. The projects then listed in priority order are:

1. Railroad Avenue to Sycamore Trunk
2. Sycamore Avenue to Partridge Trunk
3. Survey Only Partridge Avenue to Coronado Boulevard and
4. Bristol Street near Willow Lift Station

7.0 Capital Improvement Projects

7.1 Replacement Costs

To estimate the financial resources required for the replacement pipelines identified in this section, project cost estimates were made. The planning level unit cost of $ 18.85 per inch per feet of pipe was used to calculate the total amount of the replacement project. The formula below shows the calculation performed for estimating the replacement project costs.

Replacement Project Cost = ($ 18.85 per inch per length) * Length * Diameter

Table 7-1 below shows the replacement project cost due to capacity restrictions.

Table 7-1 Capacity Related Project Costs

Capacity Related Projects	Diameter (Inch)	Length (ft)	Cost
Sycamore Ave to Railroad Ave Trunk	33	8,283	$ 5,152,440
Sycamore Ave to Partridge Dr Trunk	24	4,653	$ 2,105,017
Partridge Dr to Coronado Blvd Trunk	*Requires Survey Only*		
Bristol St near Willow Lift Station	8	450	$ 67,860
Total		**13,386**	**$ 7,325,317**

Contingencies were not included during the estimation of the replacement project cost. The actual costs for design and construction may vary due to site specific requirements. Technical services, field engineering and other contingencies such as environmental costs should be considered while estimating the costs at design level. The contingencies can be as high as 50% of the construction costs and are described as follows:

Technical Services – 25%

- Preparation of environmental documentation
- Processing of approvals and permits
- Preliminary planning and design documents
- Final Design/Preparation of Plans, Specifications and Project Manuals
- Preparation of As-Builts
- Surveying

Field Engineering – 15%

- Contract Administration
- Coordination with other agencies
- Administration of geotechnical, archaeological, ROW and other outside services
- Construction Inspection

Contingencies – 10%
Easement Contingency [1] – 30%

- Permitting
- Special Construction
- Realignment

Rehabilitation Costs

In addition to the Capacity Related Replacement Projects, the City must address looming age, material, condition related replacements or rehabilitation. The following sections discuss the cost estimates of these improvements and additional Operations and Maintenance related activities that will insure compliance with the WDR through a well managed collection system. The maintenance hotspots identified by the City were grouped based on the pipe diameter and rehabilitation costs for these maintenance areas were calculated using the unit costs shown in Table 7-2 below:

Table 7-2 Lining Unit Costs

Diameter (Inch)	Unit Cost ($/ft)
4	60
8	60
10	70
12	74
14	90

Approximately, 9,000 ft of the entire collection system needs immediate maintenance. The breakdown of the pipes by diameters that needs rehabilitation and the corresponding rehabilitation cost are shown in Table 7-3 below:

Table 7-3 Rehabilitation Project Costs

Diameter (Inch)	Length (ft)	Unit Cost ($/ft)	Total Cost
4	58	60	$ 3,474
8	6,090	60	$ 365,408
10	576	70	$ 40,320
12	314	74	$ 23,236
14	1,883	90	$ 169,478
Total	**8,921**		**$ 601,916**

It is recommended that rehabilitation projects identified by the City shown in the table above should be completed in the fiscal year 2008-2009 and an amount of $ 72,000 per years should be budgeted and spent on maintenance for years 2009-2033.

7.2 Condition Related Projects

These projects comprise an ongoing condition assessment and system evaluation for the physical aspects of the collection system.

7.2.1 Flow Measurements

Flow measurements are performed at key locations in the collection system in all weather conditions. The equipment typically measures both depth and velocity to determine the flow rate. The data is simultaneously recorded so that the overall system response may be characterized. By comparing wet weather flows and dry weather flows, the location and type of defects (Inflow and Infiltration) can be quantified. This screening method allows further physical inspection to be used where appropriate. For the Hercules system, we are recommending a biennial approach to flow measurements. Alternatively, the City should consider long term leasing or purchase of permanent flow meter installations.

7.2.2 Smoke Testing

Smoke testing is performed on systems with a quick response to rainfall events. If the flows rapidly increase and decrease, the defects are most likely associated with openings to the surface or cross connection to the storm drain system. These defects are identified by blowing low pressure smoke into the system. While the Hercules collection system is fairly new, it exhibits a dominant inflow response to rainfall. These defects allowed almost four million gallons of rainwater into the system on the 12/31/2005 event. Smoke testing should be used to identify the locations of these defects, as the additional flow is expensive to treat and pump.

7.2.3 Physical Inspection

Physical inspections are the above-ground observations of lift stations, manholes and pipes. These investigations allow general inferences to be made regarding corrosion, fats, oil, grease, and roots. It is an invaluable practice/process that allows the maps to be updated with observed conditions. All too often, observed conditions go unreported or under-documented.

7.2.4 Televised Inspections

The introduction of closed circuit television (CCTV) into the sewer collection system has greatly increased the understanding of internal conditions and required maintenance practices. The approach that is recommended for the CCTV inspection for Hercules is an initial 5 year cycle or 20% per year to establish the baseline. Subsequently the inspection frequency would be once every 10 years unless warranted other wise by change in flow or pipe conditions.

7.2.5 Lift Station Evaluations

The City of Hercules owns and operates 6 lift stations. These lift stations have special requirements for operations and maintenance. These stations were the subject of a Tier 1 structural inspection in 2004. All of the lift stations should be re-inspected with an emphasis on emergency response planning.

7.2.6 Repair/Rehabilitation/Replacement

The outcome of the inspection techniques listed above is a continuous assessment of conditions in the collection system. This assessment will generate an ongoing repair/rehab/replacement program. These projects may be, but are not generally, related to capacity restrictions in the system. The purpose of these projects is to reduce the probability of blockage-related and stoppage- related overflows. Table 7-4 lists the projects that have been identified and discussed in the cost estimate table. These are current problems that need to be addressed to minimize overflows from condition related problems. Figure 7-1 illustrates the locations of Priority Maintenance Areas.

Table 7-4 Specific 2008-2009 Condition Projects

Hercules Hot List	
Location	**Comments**
Redwood and Sycamore Intersection	Grease
Redwood and Fir Intersection	Grease
Lupine and Sycamore Intersection (continue to next MH on trail)	Grease
Redwood-Falcon at Refugio Valley Road Intersection	Inverts buildup grease
Black Walnut and Silver Maple Intersection	Grease Buildup
Manzanita St (belly between 133 and 175)	Belly
Turquoise and Sycamore Intersection	Roots from outflow pipe down the street
Hannah School (at top)	Grout with root intrusion overflow
Sycamore (first MH up from Refugio)	Roots
Canterbury and Newbury	H2S corrosion line collapse
Bristol and Canterbury Intersection	Belly grease up overflow
Silver Maple and Black Walnut	Check if rut is a belly

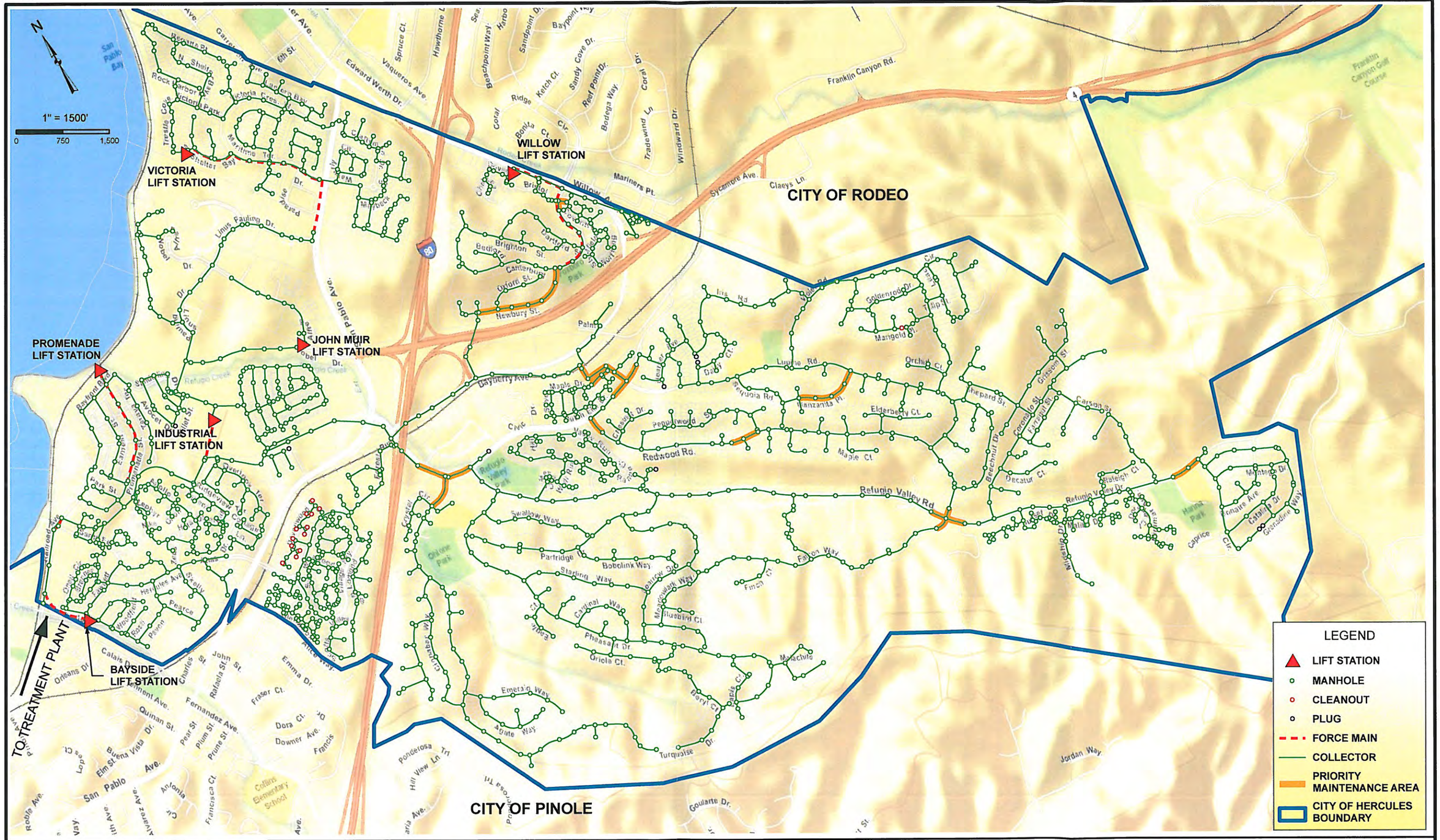


FIGURE 7-1 PRIORITY MAINTENANCE AREAS

Capacity Enhancement Projects

This section discusses briefly capacity enhancement projects. These projects are necessary to reduce the potential for overflows that are caused by inadequate capacity. In addition to traditional engineering solutions such as pipe replacement, two preliminary and ongoing projects are recommended. These are the Capacity Evaluation Survey and the GIS/Model Update. The former is an full invert survey to reestablish the precise positioning of the inverts in the collection system. This is required to reflect changes that may have occurred since the design, construction and settling of the pipes.

7.2.7 Capacity Evaluation Survey

A Capacity Evaluation Survey is strongly recommended for all reaches included in capacity related projects. This provides a structured assessment of not only the pipe inverts and diameters but also provides an opportunity for logging the material and condition of the assets.

7.2.8 GIS/Model Update

The GIS/Model update program adds newly acquired field data to the GIS. Additionally, the ongoing maintenance activities need to be reflected in the data collection. This will evolve into a computer based asset management system for the collection system. Regular hydraulic model updates from the inspections and flow measurements will result in a continuously calibrated model. This mode can be used to assess the impacts of planned changes in land use or discharge characteristics.

7.2.9 Replacement Projects

The traditional approach to capacity restrictions in the collection system is to replace the pipe with a larger pipe. An alternative to this approach is to engage in a progressive Inflow and Infiltration Reduction Program. After evaluating the effects of rehabilitation reasonable economic decisions can restore capacity at the highest cost-benefit ratio. For the purposes of this Master Plan, planning level cost estimates have been prepared to establish the level of funding required to replace pipes at a size that does not account for inflow and infiltration reduction. These cost estimates are listed in Table 7-5.

Table 7-5 Capital Improvement Projects

City of Hercules Collection System Capital Improvements Projects						Long Term Projects (5-Year Increments)			
I/I Reduction Program	5-Year Collection System Projects (Near Term)								
	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2018	2018-2023	2023-2028	2028-2033
Condition Assessment Projects	**Near Term**					**Long Term**			
Lift Station Study and Monitoring	$ 25,000	$ 2,500	$ 2,500	$ 2,500	$ 2,500	$ 12,500	$ 12,500	$ 12,500	$ 12,500
Flow Measurements (Pre/Post Rehab)	$ 30,000		$ 30,000		$ 30,000	$ 60,000	$ 90,000	$ 60,000	$ 90,000
Smoke (5 Year / 10 Year Cycle)	$ 49,314	$ 49,314	$ 49,314	$ 49,314	$ 49,314	$ 123,285	$ 123,285	$ 123,285	$ 123,285
CCTV (5 Year / 10 Year Cycle)	$ 98,628	$ 98,628	$ 98,628	$ 98,628	$ 98,628	$ 246,570	$ 246,570	$ 246,570	$ 246,570
Physical Inspection	$ 38,355	$ 38,355	$ 38,355	$ 38,355	$ 38,355	$ 95,888	$ 95,888	$ 95,888	$ 95,888
Program Management (25% Subtotal)	$ 60,324	$ 47,199	$ 54,699	$ 47,199	$ 54,699	$ 131,436	$ 138,936	$ 131,436	$ 138,936
Condition Assessment Subtotal	$ 301,622	$ 235,997	$ 273,497	$ 235,997	$ 273,497	$ 669,680	$ 707,180	$ 669,680	$ 707,180
Repair/Rehab/Replacements	**Near Term**					**Long Term**			
Pipe and MH Relining	$ 289,659	$ 361,659	$ 72,000	$ 72,000	$ 72,000	$ 360,000	$ 360,000	$ 360,000	$ 360,000
Lift Station Rehabilitation	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 250,000			
Repair/Rehab/Replacements Subtotal	$ 439,659	$ 511,659	$ 222,000	$ 222,000	$ 222,000	$ 610,000	$ 360,000	$ 360,000	$ 360,000
Capacity Assurance Projects	**Near Term**					**Long Term**			
Invert Surveys (Capacity Candidates)	$ 11,924								
Mapping/Model Updates	$ 40,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000		$ 25,000	$ 25,000	$ 25,000
Sycamore Ave to Railroad Ave Trunk*		$ 2,576,220	$ 2,576,220						
Sycamore Ave to Partridge Dr Trunk*				$ 2,105,017					
Partridge Dr to Coronado Blvd Trunk	*Survey Only*								
Bristol St near Willow Lift Station					$ 67,860				
Capacity Assurance Subtotal	$ 51,924	$ 2,581,220	$ 2,581,220	$ 2,110,017	$ 72,860	$ -	$ 25,000	$ 25,000	$ 25,000
Period Total	$ 793,206	$ 3,328,877	$ 3,076,717	$ 2,568,014	$ 568,357	$ 1,279,680	$ 1,092,180	$ 1,054,680	$ 1,092,180
Average Annual	*$ 793,206*	*$ 3,328,877*	*$ 3,076,717*	*$ 2,568,014*	*$ 568,357*	*$ 255,936*	*$ 218,436*	*$ 210,936*	*$ 218,436*

** Potential Redevelopment Funding for Required Capacity*

8.0 Recommendations and Conclusions

To properly manage and operate the collection system, it is recommended that the programs described be funded and executed. Reliable performance measures need to be established in the collection system to determine the rate of work and assess the long-term funding requirements. Fundamental to the planning process is an annual review of the Sewer System Management Plan to determine the effectiveness of the implemented programs. Programs are modified as necessary to move closer to the overriding goal of No Overflows.

In conclusion, the City of Hercules is blessed with a relatively new collection system. This system will require only moderate investments to assure that it is properly managed, operated and maintained. Some detective work will be required through the condition assessment process to identify the existing sources of inflow. Further activities, such as increased lift station investments, are necessary to assure the sustainability of the collection system.

Lift stations are a significant expense and potential liability for the City. The City should perform a complete condition assessment and the addition of telemetry for flow measurements at all locations. The continuous data logging of flows at these locations would provide great insight into the changing conditions in the service area as well as providing benchmarks for lift station performance.

APPENDIX F

Sewer System Management Plan Audit Reports

An audit was performed in November 2017 on the City of Hercules' (City) current 2012 Sewer System Management Plan (SSMP). The SSMP was first created and filed in 2012. Audit methods included a Gap Analysis and an Effectiveness Evaluation using the City's performance indicators. The intent of this SSMP Audit is to evaluate the effectiveness of the SSMP elements and the SSMP's compliance with the State Water Board Order No. 2006-0003-DWQ Statewide General Waste Discharge Requirements (WDR) for Sanitary Sewer Systems and Order No. WQ 2013-0058-EXEC Amending Monitoring and Reporting Program (MRP) for the WDR.

This SSMP Audit evaluates the current SSMP document and does not reflect procedures currently in place or desired improvements to the SSMP outside of what is currently documented. These desired additions will be reviewed and prioritized with City staff as part of the SSMP update tasks planned for 2018.

Gap Analysis

The Gap Analysis portion of the audit uses industry reference materials, benchmarking data, and SWRCB regulatory enforcement procedures to identify areas for improvement in the SSMP itself, or the City's management or maintenance procedures. The Gap Analysis evaluated each WDR/MRP requirement on the following scale:

- **BMP Gap** – An element of collection system operation or management could be improved to Best Management Practices.
- **Management Tool Gap** – An element of the SSMP could be improved to enhance the effectiveness of the SSMP as a collection system management tool.
- **WDR Compliance Gap** – SSMP is not compliant with existing SSMP WDR.

The Gap Analysis results are presented in the table below. It should be noted that a "check mark" indicates that a gap exists as described in the column. An element with no "check marks" has been evaluated to be in compliance. At the end of each element section, an overall evaluation of the effectiveness of the SSMP element is provided along with suggestions on improvement if applicable.

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
ELEMENT 1 – GOALS					
A.	Are the goals stated in the SSMP still appropriate and accurate?		✓		The first goal is not easily quantified and cannot easily be determined if it is met or not. The second goal has not been met. The third goal must be compared to historical data. Need more data to analyze the fourth goal.
Effectiveness of Element 1		Element is effective. Consider adjusting/adding metrics, if applicable, to evaluate achievement of goals.			
ELEMENT 2 – ORGANIZATION					
A.	Is the Public Works Services Key Staff Telephone List current?		✓	✓	The phone list for key staff needs to be updated. The phone list should be updated regularly.
B.	Is the Sanitary Sewer Overflow (SSO) Responder Telephone List current?			✓	Update phone list.
C.	Is an "Organization Chart" provided and is it current?			✓	The Organization Chart has been provided, but needs to be updated since staffing levels have changed.
D.	Are the position descriptions an accurate portrayal of staff responsibilities?			✓	There are no position descriptions.
E.	Does the SSMP identify the Chain of Communication for Responding to SSOs, and is it accurate and up-to-date?		✓		See SSMP Element 6: The Chain of Communication is listed in the SSO ERP starting on page 3. It may be more helpful to show this as part of the flow chart as well.
F.	Does the SSMP identify the Legally Responsible Official (LRO) responsible for reporting SSOs?			✓	The Municipal Services Director is listed as the LRO. When the SSMP was developed, John J. McGuire filled this position.
G.	Does the SSMP identify staff responsible for implementing specific measures in the SSMP?		✓	✓	A table should be included that lists the member's name, phone number, and the element he/she is responsible for. The element each person is responsible for is not part of the table, but it may be assumed that the Municipal Services Director is responsible for all the elements of the SSMP.
Effectiveness of Element 2		Element needs improvement. WDR non-compliances above can be addressed in the next SSMP Update. The City is optimizing the limited staffing and equipment resources available to them. Initiatives have been identified in many of the SSMP Elements which would strengthen the overall SSMP effectiveness, but which cannot be implemented with current resource levels.			

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
ELEMENT 3 – LEGAL AUTHORITY					
Does the SSMP contain excerpts from the City Code documenting the legal authority to:					
A.	Prevent illicit discharges?				No gap. Title 5 Chapter 4 Section 06
B.	Require proper design and construction of sewers and connections?				No gap. Title 5 Chapter 10
C.	Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the City?				No gap. Title 5 Chapter 10 Section 16
D.	Limit discharges of fats, oil and grease?				No gap. Title 5 Chapter 4 Section 07
E.	Enforce any violation of its sewer ordinances?				No gap.
Effectiveness of Element 3		Element is effective. Municipal Code satisfies all requirements; Sewer Lateral Ordinance No. 457 is an advanced policy with long-term benefits of I/I and SSO reduction.			
ELEMENT 4 – OPERATIONS AND MAINTENANCE PROGRAM					
Collection System Maps					
A.	Does the SSMP reference the current process and procedures for maintaining the wastewater collection system maps?			✓	Document procedure - describe a process for field crews to communicate map inaccuracies with GIS or CAD staff, and establish a regular frequency (e.g., twice annually) for map book updates and redistribution to field crews and on-call personnel.
B.	Are the wastewater collection system maps complete, current, and sufficiently detailed (including showing applicable storm water conveyance facilities)?		✓	✓	Maps are included, but storm conveyance facilities are not shown. The map must show all gravity line segments, manholes, pumping facilities, pressure pipes, valves, and applicable stormwater conveyance facilities.
Resources and Budget					
C.	Does the City allocate sufficient funds for the effective operation, maintenance and repair of the wastewater collection system and is the current budget structure documented in the SSMP?		✓	✓	The current budget should be included as an Appendix to the SSMP, and a section describing the budget should be added to the *Operations and Maintenance Program* section.

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
Prioritized Preventive Maintenance					
D.	Does the SSMP describe current preventive maintenance activities and the system for prioritizing regular maintenance and cleaning of the system?			✓	Element should be updated to reflect actual tasks and frequency of maintenance being performed.
E.	Based upon information in the Annual SSO Report, are the preventive maintenance activities sufficient and effective in minimizing SSOs and blockages?				SSO rates are very low per CIWQS, therefore hotspot maintenance activities appear effective.
Scheduled Inspections and Condition Assessments					
F.	Is there an ongoing condition assessment program? Are the current components of this program documented in the SSMP?	✓	✓	✓	There is no formal condition assessment program mentioned in the SSMP.
G.	Is there a system for prioritizing the rehabilitation and replacement program? Does the capital improvement plan (CIP) include a time schedule for implementing the short- and long-term needs, plus a schedule for developing the funds needed for the CIP?	✓	✓	✓	There is no current system for prioritizing the rehabilitation and replacement program. Priorities can be set based on structural integrity (based on CCTV), maintenance frequency, Inflow and Infiltration (I&I) control, capacity improvements, new development.
Training					
H.	Is the training calendar current?		✓	✓	Training is not documented. A schedule should be included that tracks training for all collection system workers. The City should track completed training activities such as work orders, which can be used as a reference for the SSMP Update.
Contingency Equipment and Replacement Inventory					
I.	Does the SSMP list the major equipment currently used in the operation and maintenance of the collection system and document the procedures of inventory management?		✓	✓	No O&M equipment inventories or inventory management procedures are documented in the SSMP.

Requirement		BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
Effectiveness of Element 4		O&M Program needs improvement. Opportunities identified for improvement (given adequate resources) include: • Development of Map Update Process • Expansion of Mapping data (manhole data, stormwater facilities) • Development of a maintenance tracking system (POs, work orders, vendors, SSOs, etc.) • Development of a formal condition assessment program • Development of a training tracking system Other WDR non-compliances identified can be addressed in the next SSMP Update.			
ELEMENT 5 – DESIGN AND PERFORMANCE PROVISIONS					
A.	Does the SSMP contain current design and construction standards for the installation of new sanitary sewer systems, pump stations and other appurtenances and for the rehabilitation and repair of existing sanitary sewer systems?				No gap.
B.	Does the SSMP document current procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and the rehabilitation and repair of existing sewer lines?				No gap.
Effectiveness of Element 5		Provisions are effective. City utilizes CCCSD documents for design and performance provisions. CCCSD standards are comprehensive and are updated regularly.			
ELEMENT 6 – OVERFLOW EMERGENCY RESPONSE PLAN					
A.	Does the Overflow Emergency Response Plan (OERP) establish procedures for the emergency response, notification, and reporting of SSOs?			✓	The response, notification, and reporting procedures need to be revised to meet the requirements of the Revised MRP (Order No. WQ 2013-0058-EXEC).

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
B.	Does the OERP establish procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the Revised MRP? Does the SSMP identify the officials who will receive immediate notification?			✓	The notification procedures are documented, need to be revised to meet the requirements of the Revised MRP (Order No. WQ 2013-0058-EXEC). A flow chart should be developed that includes the notification procedures, timeframes, contact person's name, and phone numbers.
C.	Does the OERP include a program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to surface waters and to minimize or correct any adverse impact on the environment resulting from the SSOs?			✓	Update phone list and reporting requirements per the revised MRP.
D.	Are staff and contractor personnel appropriately trained on the procedures of the OERP?			✓	Include documentation on training procedures and schedules.
E.	Considering performance indicator data in the Annual SSO Report, is the OERP effective in handling SSOs to safeguard public health and the environment?			✓	Include performance indicator data for assessment.
Effectiveness of Element 6		OERP is adequate, but could be improved to ensure a more robust and reliable OERP. The City acknowledges that the current OERP and procedures are working for smaller and infrequent overflows, but due to staffing issues, the City is vulnerable to negative impacts resulting from a large overflow or an overflow which impacts critical infrastructure. The City lacks formal on-call staff provisions to provide a more robust and reliable response to potential major overflows. Such provisions would include: • A dedicated call-out system • Rotating list of 24-7 on-call staff with appropriate levels of compensation • Documented after-hours procedures Expanding this system would also offer cross-training opportunities with other City Staff who are currently not involved in responding to SSOs			

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
ELEMENT 7 – FATS, OILS, AND GREASE (FOG) CONTROL PROGRAM					
A.	Does the Fats, Oils, and Grease (FOG) Control Program include efforts to educate the public on the proper handling and disposal of FOG?			✓	Describe the CCClean Water Program public education/outreach program in the SSMP.
B.	Does the FOG Control Program identify sections of the collection system subject to FOG blockages, establish a cleaning schedule and address source control measures to minimize these blockages?		✓	✓	The SSMP does not identify sections of the collection system subject to FOG blockages. A map of the problem areas should be included to document this institutional knowledge and facilitate bringing new staff up to speed.
C.	Are requirements for grease removal devices (GRD), best management practices (BMP), record keeping and reporting established in the FOG Control Program?	✓		✓	Describe the CCClean Water Program and City Code requirements for grease control devices.
D.	Does the City have sufficient legal authority to implement and enforce the FOG Control Program?				No gap. The Municipal Code provides basis for legal authority.
E.	Is the current FOG program effective in minimizing blockages of sewer lines resulting from discharges of FOG to the system?		✓	✓	Effectiveness of the program is not tracked in the SSMP. Grease accumulation rates and blockages caused by FOG should be tracked by cause and location to better target outreach activities to minimize future FOG-related issues.
Effectiveness of Element 7		FOG program is effective. City has had only one FOG-related SSO since 2011, however FOG accumulation increases maintenance requirements in hotspots and pump station wet wells. WDR non-compliances can be addressed in the next SSMP Update. The City has identified the FOG Program as a potential public outreach initiative in residential areas, and plans to develop this program as staff resources become available.			
ELEMENT 8 – SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN					
A.	Does the Sanitary Sewer Master Plan evaluate hydraulic deficiencies in the system, establish sufficient design criteria and recommend both short and long term capacity enhancement and improvement projects?		✓	✓	Four capacity projects are listed and prioritized, but there are no dates mentioned for when the projects might be required. Design criteria are not listed or referenced in this section of the SSMP.

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
B.	Does the Capital Improvement Plan (CIP) establish a schedule of approximate completion dates for both short and long-term improvements and is the schedule reviewed and updated to reflect current budgetary capabilities and activity accomplishment?		✓	✓	There are four projects detailed in this section of the SSMP, but no schedule is provided.
Effectiveness of Element 8		Capacity Program is effective for current flows as there have been no SSOs identified to be caused from capacity-related issues but needs expansion to accommodate future development flows. The next SSMP Update should review and update CIP project information, budgeting, and scheduling.			
ELEMENT 9 – MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS					
A.	Does the SSMP accurately portray the methods of tracking and reporting selected performance indicators?	✓	✓	✓	Performance indicators that evaluate the overall effectiveness of the SSMP should be developed and tracked annually. Examples of performance indicators include: total number of SSOs per 100 miles of sewer, volume recovered versus total spill volume, and volume discharged to surface waters versus total spill volume. Performance indicators should be reported separately for gravity main, force main, lateral, and lift station SSOs.
B.	Is the City able to sufficiently evaluate the effectiveness of SSMP elements based on relevant information?		✓	✓	SSMP effectiveness is not regularly evaluated.
Effectiveness of Element 9		Element needs improvement. Performance measures should be developed in the next SSMP Update along with a tracking program.			
ELEMENT 10 – SSMP PROGRAM AUDITS					
A.	Has an SSMP Audit been conducted and reported within the last two years?		✓	✓	This is the first SSMP audit to occur since 2012. Audits must occur every two years, at a minimum, and a report must be prepared and kept on file documenting the effort. An audit report should be developed which evaluates the effectiveness of the SSMP, the City's compliance with the WDR, and identifies deficiencies in the SSMP with steps for correction.
Effectiveness of Element 10		SSMP Audit Program needs improvement. The City initiated an audit program this year.			

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
ELEMENT 11 – COMMUNICATION PROGRAM					
A.	Does the City effectively communicate with the public and other agencies about the development and implementation of the SSMP and continue to address any feedback?			✓	Revise SSMP to reflect current communication program. The City intends to improve its communication program by posting the SSMP on its website and using the SSMP as a communication tool with City Council on the required 5-year SSMP update schedule.
Effectiveness of Element 11		Communication Program could be improved. The City intends to improve public communication by posting the SSMP on its website. PW Staff will use the SSMP Updates as a communication tool with Council.			

Evaluation of Effectiveness of SSMP

Performance indicators developed in the Draft 2017 SSMP Update (Section IX: Monitoring, Measurement, and Program Modifications) were used to measure the performance of the wastewater collection system and the effectiveness of the SSMP. Performance indicator metrics were retrieved the California Integrated Water Quality System (CIWQS) online database. Selected performance indicators are listed below. Historical results are presented in the following sections.

- Total number of SSOs per year
- Number of SSOs by cause (roots, grease, debris, structural failure, capacity, pump station failure, and other)
- SSO Rate (number per 100 miles per year)

Total Number of SSOs per Year

Table 1. Total SSOs by Year

Calendar Year	SSOs
2011	1
2012	1
2013	1
2014	2
2015	0
2016	0
2017	1
Average	**0.86**

The City experiences an average of 0.86 SSOs per year, based on data from 2011-2017.

Number of SSOs by Cause

Table 2. SSOs by Cause

Year	Roots	Debris	Grease	Infiltration	Vandal-ism/Other	Pipe Failure	PS Failure	Total
2011	0	0	0	0	0	0	1	1
2012	1	0	0	0	0	0	0	1
2013	1	0	0	0	0	0	0	1
2014	1	1	0	0	0	0	0	2
2015	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0
2017	0	0	1	0	0	0	0	1
Total	**3**	**1**	**1**	**0**	**0**	**0**	**1**	**6**

The City has experienced SSOs from various causes, most often from roots (3 of 6 total SSOs). The City has recently implemented a one-year program to hydro jet clean the entire collection system. This work is planned to be completed by the end of 2018 and should reduce future root-related SSOs.

SSO Rate

Table 3. SSO Rate

Calendar Year	SSOs
2011	1.6
2012	1.6
2013	1.6
2014	3.2
2015	0
2016	0
2017	1.6
Average	**1.3**

The City has 62 miles of gravity sewer main. The average SSO rate per 100 miles of pipe is 1.3 SSOs. This is lower than the Region 2 average of 6.8 SSOs per 100 miles of pipe.

An audit was performed in [DATE] on the City of Hercules' (City) [CURRENT SSMP NAME AND DATE] (SSMP). Audit methods included a Gap Analysis and an Effectiveness Evaluation using the City's performance indicators. The intent of this SSMP Audit is to evaluate the effectiveness of the SSMP elements and the SSMP's compliance with the [CONFIRM REGULATION ORDERS AND DATES] State Water Board Order No. 2006-0003-DWQ Statewide General Waste Discharge Requirements (WDR) for Sanitary Sewer Systems and Order No. WQ 2013-0058-EXEC Amending Monitoring and Reporting Program (MRP) for the WDR.

This SSMP Audit evaluates the current SSMP document and does not reflect procedures currently in place or desired improvements to the SSMP outside of what is currently documented. These desired additions will be reviewed and prioritized with City staff as part of the SSMP update tasks planned for 2018.

Gap Analysis

The Gap Analysis portion of the audit uses industry reference materials, benchmarking data, and SWRCB regulatory enforcement procedures to identify areas for improvement in the SSMP itself, or the City's management or maintenance procedures. The Gap Analysis evaluated each WDR/MRP requirement on the following scale:

- **BMP Gap** – An element of collection system operation or management could be improved to Best Management Practices.
- **Management Tool Gap** – An element of the SSMP could be improved to enhance the effectiveness of the SSMP as a collection system management tool.
- **WDR Compliance Gap** – SSMP is not compliant with existing SSMP WDR.

The Gap Analysis results are presented in the table below. It should be noted that a "check mark" indicates that a gap exists as described in the column. An element with no "check marks" has been evaluated to be in compliance. At the end of each element section, an overall evaluation of the effectiveness of the SSMP element is provided along with suggestions on improvement if applicable.

Requirement		BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
ELEMENT 1 – GOALS					
A.	Are the goals stated in the SSMP still appropriate and accurate?				
Effectiveness of Element 1		[Provide details on effectiveness of element. Identify opportunities for improvement if applicable. Example: Element is effective. Example: Element needs improvement. Consider adjusting/adding metrics, if applicable, to evaluate achievement of goals.]			
ELEMENT 2 – ORGANIZATION					
A.	Is the Public Works Services Key Staff Telephone List current?				
B.	Is the Sanitary Sewer Overflow (SSO) Responder Telephone List current?				
C.	Is an "Organization Chart" provided and is it current?				
D.	Are the position descriptions an accurate portrayal of staff responsibilities?				
E.	Does the SSMP identify the Chain of Communication for Responding to SSOs, and is it accurate and up-to-date?				
F.	Does the SSMP identify the Legally Responsible Official (LRO) responsible for reporting SSOs?				
G.	Does the SSMP identify staff responsible for implementing specific measures in the SSMP?				
Effectiveness of Element 2					

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
ELEMENT 3 – LEGAL AUTHORITY					
Does the SSMP contain excerpts from the City Code documenting the legal authority to:					
A.	Prevent illicit discharges?				
B.	Require proper design and construction of sewers and connections?				
C.	Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the City?				
D.	Limit discharges of fats, oil and grease?				
E.	Enforce any violation of its sewer ordinances?				
Effectiveness of Element 3					
ELEMENT 4 – OPERATIONS AND MAINTENANCE PROGRAM					
Collection System Maps					
A.	Does the SSMP reference the current process and procedures for maintaining the wastewater collection system maps?				
B.	Are the wastewater collection system maps complete, current, and sufficiently detailed (including showing applicable storm water conveyance facilities)?				
Resources and Budget					
C.	Does the City allocate sufficient funds for the effective operation, maintenance and repair of the wastewater collection system and is the current budget structure documented in the SSMP?				
Prioritized Preventive Maintenance					
D.	Does the SSMP describe current preventive maintenance activities and the system for				

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
	prioritizing regular maintenance and cleaning of the system?				
E.	Based upon information in the Annual SSO Report, are the preventive maintenance activities sufficient and effective in minimizing SSOs and blockages?				
Scheduled Inspections and Condition Assessments					
F.	Is there an ongoing condition assessment program? Are the current components of this program documented in the SSMP?				
G.	Is there a system for prioritizing the rehabilitation and replacement program? Does the capital improvement plan (CIP) include a time schedule for implementing the short- and long-term needs, plus a schedule for developing the funds needed for the CIP?				
Training					
H.	Is the training calendar current?				
Contingency Equipment and Replacement Inventory					
I.	Does the SSMP list the major equipment currently used in the operation and maintenance of the collection system and document the procedures of inventory management?				
Effectiveness of Element 4					
ELEMENT 5 – DESIGN AND PERFORMANCE PROVISIONS					
A.	Does the SSMP contain current design and construction standards for the installation of new sanitary sewer systems, pump stations and other appurtenances and for the rehabilitation and repair of existing sanitary sewer systems?				

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
B.	Does the SSMP document current procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and the rehabilitation and repair of existing sewer lines?				
Effectiveness of Element 5					
ELEMENT 6 – OVERFLOW EMERGENCY RESPONSE PLAN					
A.	Does the Overflow Emergency Response Plan (OERP) establish procedures for the emergency response, notification, and reporting of SSOs?				
B.	Does the OERP establish procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the Revised MRP? Does the SSMP identify the officials who will receive immediate notification?				
C.	Does the OERP include a program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to surface waters and to minimize or correct any adverse impact on the environment resulting from the SSOs?				
D.	Are staff and contractor personnel appropriately trained on the procedures of the OERP?				
E.	Considering performance indicator data in the Annual SSO Report, is the OERP effective in handling SSOs to safeguard public health and the environment?				
Effectiveness of Element 6					

Requirement		BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
ELEMENT 7 – FATS, OILS, AND GREASE (FOG) CONTROL PROGRAM					
A.	Does the Fats, Oils, and Grease (FOG) Control Program include efforts to educate the public on the proper handling and disposal of FOG?				
B.	Does the FOG Control Program identify sections of the collection system subject to FOG blockages, establish a cleaning schedule and address source control measures to minimize these blockages?				
C.	Are requirements for grease removal devices (GRD), best management practices (BMP), record keeping and reporting established in the FOG Control Program?				
D.	Does the City have sufficient legal authority to implement and enforce the FOG Control Program?				
E.	Is the current FOG program effective in minimizing blockages of sewer lines resulting from discharges of FOG to the system?				
Effectiveness of Element 7					
ELEMENT 8 – SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN					
A.	Does the Sanitary Sewer Master Plan evaluate hydraulic deficiencies in the system, establish sufficient design criteria and recommend both short and long term capacity enhancement and improvement projects?				

	Requirement	BMP Gap	Management Tool Gap	WDR Compliance Gap	Comments
B.	Does the Capital Improvement Plan (CIP) establish a schedule of approximate completion dates for both short and long-term improvements and is the schedule reviewed and updated to reflect current budgetary capabilities and activity accomplishment?				
Effectiveness of Element 8					
ELEMENT 9 – MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS					
A.	Does the SSMP accurately portray the methods of tracking and reporting selected performance indicators?				
B.	Is the City able to sufficiently evaluate the effectiveness of SSMP elements based on relevant information?				
Effectiveness of Element 9					
ELEMENT 10 – SSMP PROGRAM AUDITS					
A.	Has an SSMP Audit been conducted and reported within the last two years?				
Effectiveness of Element 10					
ELEMENT 11 – COMMUNICATION PROGRAM					
A.	Does the City effectively communicate with the public and other agencies about the development and implementation of the SSMP and continue to address any feedback?				
Effectiveness of Element 11					

Evaluation of Effectiveness of SSMP

Performance indicators developed in the [CURRENT SSMP NAME AND DATE] (Section IX: Monitoring, Measurement, and Program Modifications) were used to measure the performance of the wastewater collection system and the effectiveness of the SSMP. Performance indicator metrics were retrieved the California Integrated Water Quality System (CIWQS) online database. Selected performance indicators are listed below. Historical results are presented in the following sections.

- Total number of SSOs per year
- Number of SSOs by cause (roots, grease, debris, structural failure, capacity, pump station failure, and other)
- SSO Rate (number per 100 miles per year)

Total Number of SSOs per Year

Example:

Table 1. Total SSOs by Year

Calendar Year	SSOs
2011	1
2012	1
2013	1
2014	2
2015	0
2016	0
2017	1
Average	**0.86**

The City experiences an average of 0.86 SSOs per year, based on data from 2011-2017.

Number of SSOs by Cause

SSO Rate

Overall Performance of the System

[City to provide client-specific language on how system performs overall; any information not covered in the SSMP on performance and initiatives.]

APPENDIX G

Log of Sewer System Management Plan Changes

Appendix G - Log of SSMP Changes

Date	SSMP Element	Description of Change/Revision Made	Person Authorizing Change
12/20/18	Introduction	Added description of regulatory requirements and system inventory tables; updated system description and system maps	Public Works Director/City Engineer
12/20/18	Element I: Goals	Added WDR for clarity; updated goals to reflect existing SSMP priorities.	Public Works Director/City Engineer
12/20/18	Element II: Organization	Added WDR for clarity; updated organizational chart and roles and responsibilities to reflect staffing and role changes; assigned SSMP responsibilities; added SSO Reporting flow chart for clarity.	Public Works Director/City Engineer
12/20/18	Element III: Legal Authority	Added WDR for clarity; added table of references to Municipal Code for clarity.	Public Works Director/City Engineer
12/20/18	Element IV: Operations and Maintenance Program	Added WDR for clarity; updated collection system mapping, preventative operation and maintenance, training, and equipment and replacement parts descriptions to reflect current procedures; revised rehabilitation and replacement program.	Public Works Director/City Engineer
12/20/18	Element V: Design and Performance Provisions	Added WDR for clarity; added descriptions of design criteria and inspection and testing criteria for easy reference.	Public Works Director/City Engineer
12/20/18	Element VI: Overflow Emergency Response Plan	Added WDR for clarity; updated OERP to reflect current response and reporting procedures and to meet revised MRP requirements.	Public Works Director/City Engineer
12/20/18	Element VII: FOG Control Program	Added WDR for clarity; updated FOG control program activities to reflect current procedures; added description of compliance with WDR for clarity.	Public Works Director/City Engineer
12/20/18	Element VIII: System Evaluation and Capacity Assurance Plan	Added WDR for clarity; added descriptions of SECAP assessment and capital improvement program for easy reference	Public Works Director/City Engineer
12/20/18	Element IX: Monitoring, Measurement, and Program Modifications	Added WDR for clarity; developed additional performance measures; added spill charts and tables with recent SSO records	Public Works Director/City Engineer
12/20/18	Element X: SSMP Program Audits	Added WDR for clarity; minor text revisions and addition of SSMP Audit form to facilitate audit process; added description of SSMP update requirement	Public Works Director/City Engineer

Appendix G - Log of SSMP Changes

Date	SSMP Element	Description of Change/Revision Made	Person Authorizing Change
12/20/18	Element XI: Communication Program	Added WDR for clarity; updated communication program description to reflect current procedures	Public Works Director/City Engineer

APPENDIX H

City Council SSMP Adoption Documents

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WEST YOST ASSOCIATES