

2013 SEWER SYSTEM MANAGEMENT PLAN

FOR

CITY OF WEED

JUNE 2013

Job No. 161.90





June 3, 2013

161.90

Honorable City Council
City of Weed
P.O. Box 470
Weed, CA 96094

Dear City Council:

We are pleased to present our engineering report entitled:

2013 SEWER SYSTEM MANAGEMENT PLAN
FOR THE CITY OF WEED

This report contains the results of our investigation of the City's sewage collection system. The report includes preliminary plans and cost estimates for the major capital improvements recommended over the next 10 years. Emphasis has been placed on planning and staging of improvements necessary to correct existing deficiencies and to allow growth to continue. A summary of the report follows the Table of Contents.

PACE Engineering is very pleased to have participated in this project. We thank your staff for their assistance in its preparation. We will be happy to meet with you at your convenience to discuss the 2013 Sewer System Management Plan in detail.

Sincerely,

A handwritten signature in blue ink that reads "Paul J. Reuter". The signature is fluid and cursive.

Paul J. Reuter
Managing Engineer



PJR/JB

Enclosures

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- Appendix A Waste Discharge Requirements (Order No. 2006-0003-DWQ)
Monitoring and Reporting Program (No. 2006-0003-DWQ) ‘Amended’ and
WDR ‘Fact Sheet’
- Appendix B SSO Logs, Map, and Trends
- Appendix C Operating Budget
- Appendix D Capital Improvement Plan
- Appendix E City of Redding Construction Standards – Sewer
- Appendix F Sanitary Sewer Overflow Response Instruction Manual
- Appendix G Sewer System Capacity Evaluation
- Appendix H Performance Measure Indicators – Template
- Appendix I Sewer Maintenance Activity Report

ACRONYMS AND ABBREVIATIONS

ADWF	Average Dry Weather Flow
BMP	Best Management Practices
CCTV	Closed-Circuit Television
CDBG	Community Development Block Grant
CIP	Capital Improvement Plan
City	City of Weed
CIWQS	California Integrated Water Quality System
COR	City of Redding
CS	Construction Standards
CWEA	California Water Environment Association
CWSRF	Clean Water State Revolving Fund
FOG	Fats, Oils, and Grease
FSE	Food Service Establishment
GPAD	Gallons per acre per day
GPD	Gallons per day
GPM	Gallons per minute
HE	Household Equivalent
I&I	Infiltration and inflow
LRO	Legally Responsible Officer
MC	Municipal Code
MGD	Million gallons per day
OES	Office of Emergency Services
O&M	Operation and Maintenance
PM	Preventative Maintenance
PWD	Public Works Director
PWWF	Peak Wet Weather Flow
R&R	Rehabilitation and Replacement
RWQCB	North Coast Regional Water Quality Control Board
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflow
SSOBPR	Sanitary Sewer Overflow Backup Response Plan
State WDRs	Statewide General Waste Discharge Requirements
SWRCB	California State Water Resources Control Board
USDA RD	United States Department of Agriculture Rural Development
WWTPs	Wastewater Treatment Plants

I. EXECUTIVE SUMMARY

On May 2, 2006, the California State Water Resources Control Board (SWRCB) adopted Statewide General Waste Discharge Requirements (State WDRs) Order No. 2006-0003 for all publicly owned sanitary sewer collection systems. The purpose of the State WDRs is to prevent sewer system overflows (SSOs). An SSO occurs when sewage backs up onto public right-of-way and/or private property because sewer lines are blocked, clogged, or otherwise obstructed. The State WDRs require publicly owned collection systems to prevent SSOs, comply with reporting requirements, and implement a Sewer System Management Plan (SSMP).

As required by the State WDRs, the City of Weed (City) began electronic reporting of sewer overflows to the California Integrated Water Quality System (CIWQS) database. Within this database reporting program, the City completed its “collection system questionnaire” and will file all future updates and required SSO reports. Chapter 2 contains a contact list of Legally Responsible Officers and data submitters for the City, who are authorized to submit the required regulatory reports, and subsequently certify accuracy of the reports.

This SSMP was prepared in compliance with the State WDRs and provides a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system with the intent of reducing and preventing SSOs. The State WDRs specify dates by which each SSMP component must be completed and require the City Council to approve the Development Plan and Schedule for preparing the SSMP and certify compliance of the final SSMP. This SSMP provides a general description of how the City complies with the various provisions of the State WDRs, and provides references to supporting documents. By implementing the procedures contained in this SSMP, the occurrence of SSOs should decrease or possibly be avoided throughout the City’s wastewater collection system.

II. INTRODUCTION

This document was prepared in compliance with a formal order issued by the SWRCB, which requires every owner and operator of publicly owned sewer systems to develop and implement a system specific SSMP. The plan sets forth goals and actions to be followed, and guidelines for various activities involved in managing, operating, maintaining, repairing, replacing, and expanding the sewer system. Chapter 6 describes actions to follow when responding to an SSO occurrence within the community, including reporting obligations. There are chapters which describe legal authorities for managing the system, and ministerial actions required in monitoring, auditing, reporting, and communicating with the public and regulators. This SSMP evaluates the existing sewer collection system using a hydraulic model to simulate current and projected future loads on the City's system. There are specific requirements for accomplishing public involvement and reporting/modifying changes to the plan. The following requirements are intended to raise public awareness of the hazards associated with SSO events, and to minimize the occurrence of such events:

- The plan is to be monitored and updated no less frequent than every five years.
- The plan must be periodically audited for effectiveness, a report compiled and kept on file, and such audits must occur no less frequent than every two years.
- There are reporting time frames for both emergency and routine reporting events.
- The adoption of, and any revision to the plan must be accomplished utilizing public notification and public hearing procedures as identified in the plan and order.
- Copies of the approved plan must be available for public review, and when requested by state or local regulatory agencies, copies are to be provided, including any audit reports.

III. SEWER SYSTEM MANAGEMENT PLAN

CHAPTER 1 – GOALS AND ACTIONS

This chapter provides the goals and actions for the Sewer System Management Plan (SSMP) the City will complete to maintain an operating collection system. The information presented complies with Section D.13. (i) of the State WDRs, included in Appendix A.

Goals of this SSMP include:

1. City sanitary sewer collection system facilities are properly operated, maintained, and managed to reduce frequency and severity of an SSO and their potential impacts on public health, safety, and on the environment; and,
2. When an SSO occurs, prompt action is taken to identify, contain, and remove the cause, and then to promptly report the event to appropriate regulatory authorities and the public is adequately and timely notified; and,
3. All SSO and system deficiencies and remedial actions taken are well documented; and,
4. City sewer system operators, employees, contractors, responders, or other agents are adequately trained and equipped to address an SSO event; and,
5. The City sewer system is adequately designed, constructed and funded to provide sufficient capacity to convey base flows and peak flows, while meeting or exceeding applicable regulations, laws, and generally acceptable practices relative to sanitary sewer system operations and maintenance.

Actions to be taken under this SSMP are:

1. Conduct planned and scheduled maintenance and training programs to minimize risk and the occurrence of SSOs in support of the SSMP goals.
2. Respond to the reported site when an SSO occurs in a timely manner and under-take feasible remedial actions to contain overflow impacts, including stopping the flow from reaching the storm drain, if possible; and,
3. Stop the overflow as soon as possible and limit public access to the overflow area to prevent public contact with any wastewater contamination; and,

4. Recover the entire overflow if possible, return it to the sewer system, and clean up the contaminated area; and,
5. Gather and compile all pertinent information regarding the overflow event, investigate as necessary to determine probable cause, document findings, report to the appropriate regulatory agencies in a timely manner, and file the completed report; and,
6. Condition all development and capital projects to evaluate, design, and construct sewer facilities to City approved standards and criteria.

CHAPTER 2 – ORGANIZATIONAL STRUCTURE

This chapter describes the City organizational structure for developing and implementing the SSMP, and the chain of communication for reporting and responding to SSOs. The information presented below complies with Section D13 (ii) of the State WDRs.

2.1 Management

The City provides sewer service to a population of approximately 2,947 per the 2011 US Census Bureau. The sewer system and SSMP program is managed by the Public Works Department, Utilities Maintenance Division. The total annual budget for system operation, maintenance, and administration is approximately \$275,000. The collection system consists of approximately 23 miles of 6-inch through 12-inch gravity sewer line.

The Public Works Department, Utilities Maintenance Division has three budgeted, full time positions. There are five additional Public Works employees in other departments available to assist the utilities crew. Distribution of the Public Works Department personnel is depicted in the organization chart presented in Figure 2.1 of this report, and names and telephone numbers for positions responsible for implementing the SSMP program are included in Table 2.1. These personnel maintain facility record plans and administer preventive maintenance and sewer construction programs.

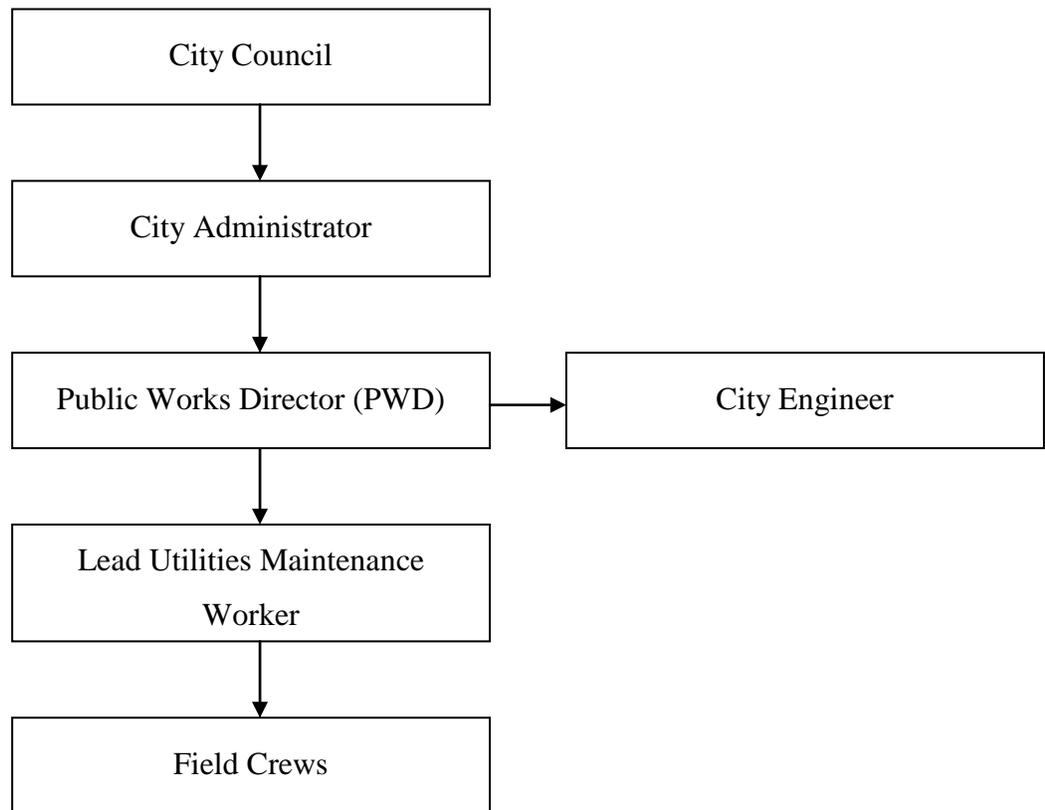
2.2 Authorized Representative

The Public Works Director (PWD) is the Legally Responsible Officer (LRO) and responsible for the execution of compliance actions required under the WDRs. This includes, but is not limited to, signing and certification of all reports and correspondence as required under this order. The City is in the process of designating additional City employees as LROs to allow SSOs to be reported and certified in the absence of the PWD.

2.3 Organization Chart and Responsibilities

The organization chart showing the structure and relationships of all Public Works Department administrative, management, and field positions is presented in Figure 2.1, and a description of responsibilities is presented in Section 2.3.1.

Figure 2.1 - Organization Chart for the Sewer System Management Plan



2.3.1 Description of Responsibilities

A description of the responsibilities or roles of each position, especially as related to SSOs, is below:

- City Council – Responsible for establishing new and amending existing regulation, resolutions, and policies governing the operations of the Public Works Department and approving all Public Works Department contracts and agreements.
- City Administrator – Responsible for assisting with procuring equipment and as-needed contract services for emergency sewer repair projects, printing, and mailing of public outreach program materials, and for procuring material and supplies needed for the day to day operation and maintenance activities.
- PWD – Establishes Public Works Department policy within the scope of the City Council’s policy and legal requirements, directs its execution, and evaluates work accomplished by Public Works Department. Directs the development and enactment of new regulations, and directs the enforcement of plumbing codes involving illegal connections, upkeep of sewer house laterals and the design and construction of new and rehabilitation of existing collection sewer systems.
- City Engineer [Part-Time Contract Services] – Under the auspices of the PWD, directs engineering activities relating to studies, design, investigations, report preparation, budget recommendations, and contractual agreements with firms for technical services projects. Performs special studies, investigations, and reports concerning sewer infrastructure.
- Lead Utilities Maintenance Worker – Responsible for assigning work and has oversight for the activities of a crew of at least two field personnel. Reports to the PWD.
- Field Crews – Responsible for maintenance activities of the sanitary sewer collection system including response to SSOs, sewer cleaning, construction, and other activities as needed. Reports to Lead Utilities Maintenance Worker.

2.3.2 Chain of Communication for SSO Reporting

The chain of communication for SSO response and reporting is shown in Figure 2.2. The City's contact list is presented in Table 2.1. The Lead Utilities Maintenance Worker coordinates with the standby response team to assign crews necessary to investigate, assess, contain, and correct the reported SSO. When the SSO is contained, reports are completed and submitted to the SWRCB or RWQCB by data submitters listed in the contact list (Table 2.1), and reports are certified by the LRO. For more information on reporting SSOs, refer to Chapter 6.

Figure 2.2 - SSO REPORTING PROCEDURES FLOW CHART

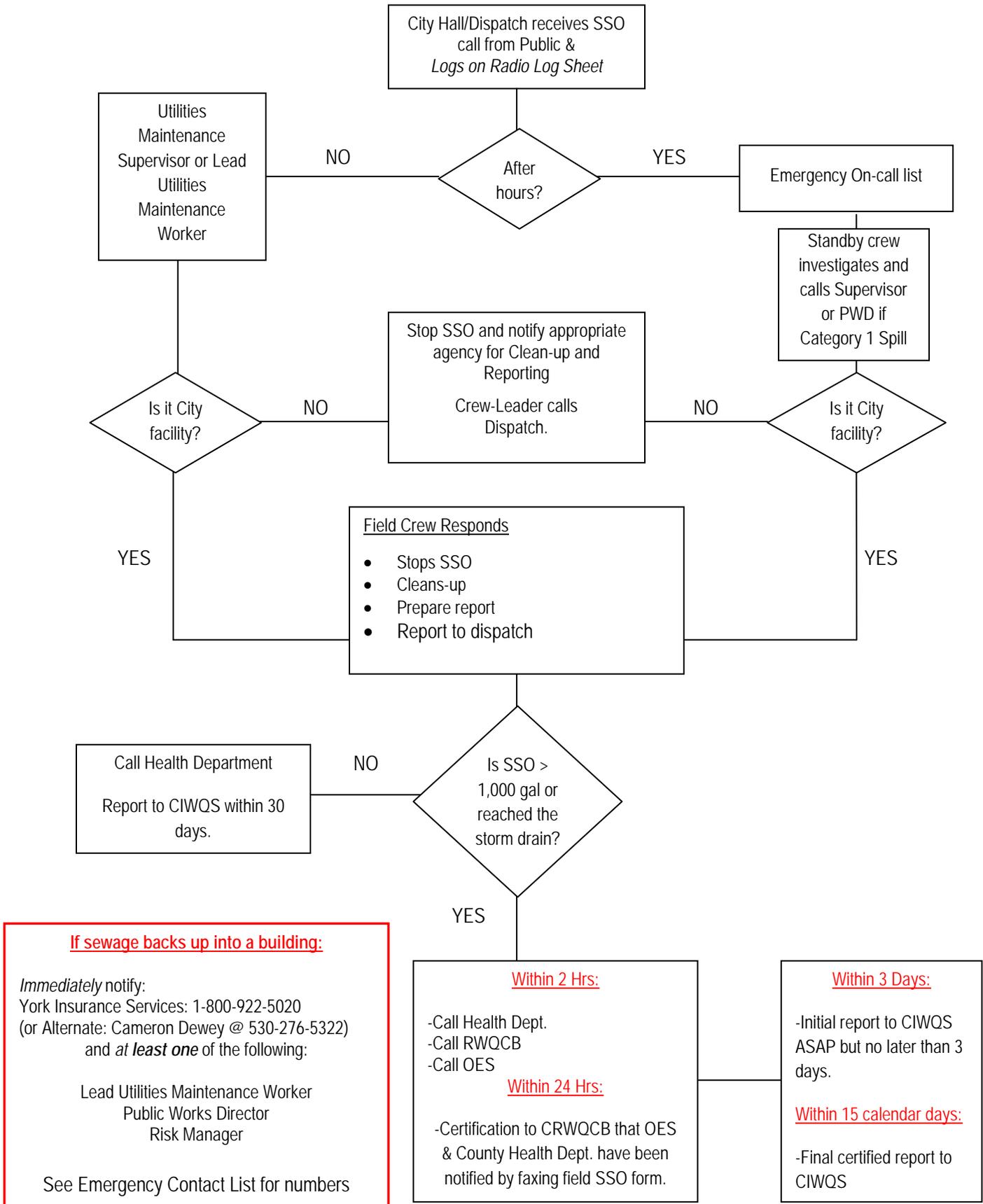


Table 2.1 – City’s Contact Directory for SSO Responding and Reporting

<u>Responsible Party</u>	<u>Name</u>	<u>Telephone</u>	<u>After Hrs. or Cell Phone</u>
City Administrator	Ron Stock	(530) 938-5020	*
Risk Manager	Same as above	(530) 938-5020	
Director of Public Works	Craig Sharp	(530) 938-5020	(530) 938-5028
York Insurance Services		1-800-922-5020 (24 hr/day)	
York Insurance Services	Cameron Dewey	(530) 248-1414	(530) 276-5322
Building Official	Dave Smith	(530) 938-4441	*
Lead Utilities Maintenance Worker	Phil James	(530) 938-5031	(530) 859-5038
On Call Person (After hours)	*		
Police Department	Martin Nicholas	(530) 938-5000	(530) 938-5000
Fire Department	Darin Quigley	(530) 938-5030	*
Siskiyou County Health Department		(530) 841-2100	
Co. Flood Control		(530) 842-8240	
North Coast RWQCB		(707) 576-2220	(707) 576-2220
State O.E.S.		1-800-852-7550	1-800-852-7550

* Can be reached via Weed Police Department, 530-938-5000

CHAPTER 3 – LEGAL AUTHORITY

This chapter of the SSMP discusses the City’s legal authority, including its Municipal Code (MC) and agreements with other agencies. The information presented complies with Section D. 13. (iii) of the State WDRs.

3.1 Authority to Prevent Illicit Discharges into the Sewer System

Title 14 of the City’s MC, Sections 14.08.500 and 14.08.510, prohibit the illegal dumping of offensive or damaging wastes, such as harmful chemicals, debris, etc, into the City sewer system. Section 14.08.130 of the City MC prohibits uncontaminated water or rainwater to be discharged directly or indirectly to facilities owned by the City. Section 14.08.140 prohibits illicit discharging directly or indirectly of any industrial wastewater without first obtaining an industrial wastewater discharge permit and/or required pretreatment.

3.2 Authority to Require Sewers and Connections be Properly Designed and Constructed

Title 14 of the City’s MC, Sections 14.08.070 and 14.08.080 require that any new or modified sewer connection must first obtain approval of sewerage construction plans from the PWD. The applicant shall submit construction plans and specifications to the PWD for approval. The construction plans shall be prepared under the supervision of and signed by an engineer of suitable training registered in the state. All sewerage construction shall conform to the requirements of the Standard Specifications for the City, and any industrial users must obtain a discharge permit prior to approval.

Section 14.08.100 requires the inspection of all sewerage construction or alterations shall be made by the City or its contractor. The City shall be notified at least 48 hours prior to cutting into a City sewer. An inspector shall be present prior to any alteration to the City’s facility or backfilling of any work. No wastewater shall be discharged into any sewerage facility tributary without obtaining inspection and approval of sewerage construction by the City.

3.3 Authority to Ensure Access for Maintenance, Inspection, or Repairs

Title 14 of the City's MC Section 14.08.110 requires access to all facilities directly or indirectly connected to the City's sewerage system shall be given to authorized personnel of the City at all reasonable times including emergency conditions. Any permanent or temporary obstruction preventing easy access to the sewerage facility to be inspected shall promptly be removed by the facility user or owner at the written or verbal request of the PWD, and shall not be replaced. No person shall interfere with, delay, resist, or refuse entrance to an authorized City inspector attempting to inspect any connection to the City's sewerage system.

Section 14.08.150 gives the City authority to direct the correction of any improperly maintained lateral or collecting sewer and order its disconnection from the City sewer system if there is continued noncompliance.

3.4 Authority limiting discharge of Fats, Oils, and Greases (FOG) and Other Debris that may Cause Blockages

Title 14 of the City's MC Section 14.08.510 indicates that no person shall discharge or cause to be discharged to any public sewer which directly or indirectly connects to the City's sewerage system, any wastes which, in the opinion of the PWD, may have an adverse or harmful effect on sewers, maintenance personnel, wastewater treatment plant personnel or equipment, treatment plant effluent quality, public or private property, or may otherwise endanger the public, the local environment, or create a public nuisance. Section 14.08.510 of the MC "prohibits any dispersed biodegradable oils and fats, such as lard, tallow, or vegetable oil in excessive concentrations that would tend to cause adverse effects on the sewerage system." The PWD, in determining the acceptability of specific wastes, shall consider the nature of the waste and the adequacy and nature of the collection, treatment, and disposal system available to accept the waste.

3.5 Authority to Enforce any Violation of Sewer Ordinances

Title 14 of the City's MC Section 14.08.710 and 14.08.720 provides the penalties for any violation under the Sewer Service Chapter Ordinances. Under MC Section 14.08.710, violations described as misdemeanors shall be punished as provided by Section 1.20.030 and all other violations of this chapter are denominated infractions and shall be punished as described in Section 1.20.040.

CHAPTER 4 – OPERATION AND MAINTENANCE PROGRAM

This chapter of the SSMP discusses the City’s operations and maintenance (O&M) procedures, including its rehabilitation and replacement asset management program. The information presented complies with section D.13. (iv) of the State WDRs.

4.1 Collection System Maps and Information

The City maintains “as-built” plans of sewer facilities following their construction. These plans are stored at City Hall and contain information regarding location, alignment, pipe material, size, etc. The City is in the process of transferring this data into one GIS Map, which will be kept in all utility vehicles. This map will be used for quick reference by field crew personnel responding to emergencies and routine maintenance. Currently, the City uses an older map, which has been periodically updated to reflect changes in the system; however, growth within the City has been minimal and the map is believed to be an accurate representation of the current system.

According to the City’s Master Sewer plans, the wastewater collection system consists of approximately 23 miles of 6-inch through 12-inch gravity sewer mains. The Shastina Sewage Collection System consists of approximately 43,000 linear feet of 6, 8, and 10-inch sewer mains, in addition to approximately 7,600 linear feet of 12-inch sewer. The Weed Collection System has approximately 69,000 linear feet of 6, 8, and 10-inch sewer mains.

4.2 Preventative O&M

The City’s sewer O&M program includes:

- Reactive, preventive, and routine maintenance of gravity sewers.
- Rehabilitation and replacement of sewers that are in poor condition.
- Inspections of manholes for I&I, odors, and surcharging.

Reactive Maintenance

Reactive maintenance activities in the sewer system include investigation and response to any complaints regarding a City manhole or segment of the collection system. Sewer complaints

received by the Public Works Department are investigated and appropriate action is taken to resolve the source of the problem.

Preventative Maintenance

The City prioritizes its preventative maintenance activities in the sewer system based on service requests (customer complaints) and areas prone to clogging. The Preventive Maintenance (PM) program includes hot spot cleaning, routine system-wide cleaning, root control, and FOG maintenance.

Hot Spot Cleaning - The City's Utility Division performs hot spot cleaning for areas in the sewer system that have been identified to have recurring problems. When an area has been identified by the Public Works Department as a critical area, it is placed on a scheduled maintenance list.

Routine Maintenance

A system-wide sewer cleaning program is performed annually and includes the following:

Sewer Line and Manhole Inspection

Currently there are no pump station facilities in the collection system. Sewer lines, on a needed basis, can be inspected using closed-circuit television (CCTV). The inspection of manhole interiors and lids is performed as overall work scheduling allows. This activity is to identify any structural defects, sewage flow condition, and presence of vermin or rodents, deleterious industrial waste, odors, and any signs of unusual settlement around the manholes and along sewer alignments. Drop manholes are inspected and cleared of stoppages and flow restrictions based on prior inspection records.

Sewer Line Cleaning

Sewer lines are typically cleaned by hydro jet or by mechanical root cutting (rodding). The frequency of cleaning and inspection is based on inspection records and/or call-outs on reported complaints. Sewer lines known to accumulate FOG, garbage grinds, or other grit, or have root intrusions are labeled as hot spots and are put on an annual cleaning schedule. Hot spots in the

collection system are cleaned, cleared, and inspected to ensure blockages are removed. Refer to Appendix B for a list and map of SSOs that have occurred at hot spots in the last two years. As part of this SSMP, the City is starting a FOG program, which is further discussed in Chapter 7.

Root intrusion is a common problem in the City, particularly in older residential areas with mature trees. Mains with a history of root problems are typically cleaned on a regular schedule. Root intrusion is controlled by use of chemical or mechanical treatment. Staff intends to use feedback from the crew in the future to evaluate the effectiveness of mechanical and chemical root cleaning, and look for ways to optimize and integrate these efforts. If root problems cause structural failure, these locations are submitted to the Public Works Department Division to be incorporated in the annual rehabilitation and replacement project. The remainder of the City mainline sewer system is cleaned by hydro jetting once every three years.

CCTV

Sewer lines can be inspected using CCTV equipment. The equipment consists of a camera placed on a transporter or skid-type mounting system configured for varying pipe diameters. The transporter has a drive system that allows the unit to travel at various speeds and directions to move the camera up and down the pipe over long distances. The skid system allows the camera to simply be manually “pushed” into a pipe (typically smaller in diameter) commonly referred to as the “pushcam”. This setup is typically used for shorter distances, in laterals, or where access by the longer transporter unit is restricted. Video images are transmitted from the camera to the control panel and DVD burner. All of the equipment is mounted in a mobile van unit.

The City would like to eventually inspect all line segments in the collection system. However, the City does not own CCTV equipment and would have to contract out these services. Being a small disadvantaged community, this preventative maintenance measure is cost prohibitive.

Work Scheduling and Documentation

All maintenance work is scheduled and tracked manually. Field crew activities are recorded in various paper forms such as service requests, cleaning reports, sewer maintenance daily

reports, manhole adjustments, overflow report forms, etc., and are stored in file cabinets. The City anticipates converting to an electronic database for storing and retrieval of reports within the next five years.

Operating Revenues

An important aspect of the PM program is the receipt of funds sufficient to support scheduled maintenance activities as described above. Shown in Appendix C are recent and projected revenues generated by the City sewer service. The City is currently operating at a deficit, and therefore does not have the funds or personnel to adequately complete PM activities or improvement projects. The City implemented a seven year gradual rate increase in 2011, which should eliminate the deficit by year 2018.

4.3 Rehabilitation and Replacement Plan

Sewer facilities assessment and rehabilitation are an integral part of the City's O&M program. A summary of recent years capital improvement activities, a plan to identify and prioritize system deficiencies (condition assessment), and the programming of short-term and long-term rehabilitation projects and related funding development for those capital improvement projects (CIPs) are discussed below.

Recent Years CIP Activities

In prior years, sewer improvements were completed using benefit assessment methods or infrastructure funding programs. In 1998, the City completed a sewer improvement project, which significantly reduced I&I flows in the Weed and Shastina collection systems. This project, along with previous projects, qualified for federal funding.

Given the City's current wastewater rates, it is unlikely grant funding will be obtained unless rates are increased to at least 1.5% of the median household income (MHI). To receive grant funding the City would need to raise their sewer rates from \$22.15 per month, to approximately \$32.07 per month to reach the 1.5% threshold, given a current City MHI of \$25,659 per the 2011 US

Census Bureau. Therefore, the City will need to adjust their current rate structure in order to qualify for grant funding from USDA Rural Development (RD) or Clean Water State Revolving Fund (CWSRF). If additional sewer rate increases are not a feasible, the City will likely be forced to obtain loans through USDA RD, CWSRF, or the infrastructure bank (I-bank). However, the Community Development Block Grant (CDBG) Program does offer 100% grants for income-qualifying entities. Currently, the City of Weed and Siskiyou County have low-moderate income levels of 56 percent and 47 percent, respectively, per the 2011 CDBG HUD census data. CDBG grants are highly competitive, as this program contains limited funding and is dependent on the need of the project to benefit low income families.

Identification and Prioritization of System Deficiencies

The City utilizes the 2006 Master Sewer Plan Update, customer complaints, and regular maintenance activities to identify and prioritize system deficiencies. It has been determined the City's existing collection system has capacity to meet ADWF flows; however, the City still experiences SSOs in the summer time. A review of SSO reports from the last two years indicates root intrusion is the primary culprit. In addition to root intrusion, the City also has relatively high peaking factors with 2.7 and 6.7 at the Shastina and Weed WWTPs, respectively. These peaking factors indicate the City has a large I&I component. Therefore, root intrusion and I&I treatment should be addressed in the CIP.

Short- and Long-Term Rehabilitation Action Plans

As previously described, CCTV inspection can be used as a basis in the scheduling of any rehabilitation project. Segments of the sewers that are inspected, evaluated, and determined to be deficient will be scheduled for corrective action as funding is made available to perform the work. A list of current and future capital projects is maintained and updated as shown in Appendix D.

The City has identified two segments of the collection system to be replaced in the next two years. Grove Street Alley has chronic root and blockage problems. This segment is planned to be replaced this fiscal year 2013/2014 for approximately \$80,000. In addition, the City plans

to replace a segment of Walnut Street in fiscal year 2014/2015 at a cost of approximately \$90,000. For additional improvement projects, refer to Chapter 8.

As deteriorated lines are discovered during preventive maintenance inspections, pipe segments are either immediately repaired by force account; use of emergency service contractors, or added to the CIP, if timing is not deemed critical. Since 2012, the City has included funding for capital rehabilitation projects as shown in Appendix C and will continue to do so as part of the City's annual budget planning process.

4.4 Equipment Maintenance and Replacement Policy/Inventories

The City has an equipment maintenance program to ensure protection of infrastructure assets. Equipment is regularly checked, adjusted, repaired, or replaced as necessary. Currently, the City owns two Serco trailer-mounted sewer rodders and one FMC flusher. This critical equipment allows the City to remove and clean blockages when needed.

Major assets are replaced when they meet or exceed the City's established fixed assets replacement criteria. Criteria are based on the equipment age, mileage, hours of use, repair history, safety, etc. Replacement of, or additions to, major assets are discussed during the annual budget planning process for the City.

4.5 Training for Field Operations Personnel and Contractors

Public Work's staff are encouraged to attend structured collection system training classes or seminars given by other agencies, including California Occupational, Safety and Health Administration (CALOSHA), California Water Environment Association (CWEA), California Rural Water Association (CRWA), County Sanitation Districts' (CSD), etc. These opportunities help the City and their employees stay informed on the latest information in the industry to safely and efficiently carry out their tasks. The City also utilizes informal training approaches, such as tailgate meetings and monthly safety meetings. Additionally, only those companies with well trained and experienced staff are considered for emergency SSO mitigation or sewer construction and rehabilitation work.

CHAPTER 5 – DESIGN AND PERFORMANCE PROVISIONS

This chapter of the SSMP identifies the design and performance provisions used by the sanitary sewer system and complies with section D.13. (v) of the State WDRs.

5.1 Design and Construction Standards and Specifications

The Public Works Department shall only approve sewerage construction plans that meet requirements of the City’s sewerage construction standards (CS). The City has adopted the City of Redding (COR) 2007 CS. The CS includes standard plans and specifications for the construction of sanitary sewers and appurtenances to ensure that sewer lines and connections are properly designed and constructed. The latest version of this published document is included in the City’s SSMP for reference (Appendix E). The CS are periodically updated as changes develop, which can be found on the COR website.

To further assure sewer facilities are properly designed and constructed, the City requires, under Title 14 of the MC, plans to be designed and signed by a licensed engineer. Plans are then submitted to the DPW for thorough review to ensure the sewer will function properly over time. Permits for construction of any public sewer infrastructure are issued once the functional design and adequate capacity of the public sewer system has been analyzed.

5.2 Procedures and Standards for Inspection and Testing

The City provides inspection for installation of new, and rehabilitation of deteriorated, public sewer facilities. City inspectors (staff or contract) are required to be well trained in pipeline construction, and to attend training classes and educational seminars to maintain familiarity with advancements in the industry. Inspectors are also provided with adequate materials to perform their jobs, including the Standard Specifications and Plans for Public Works Construction, Public Works Inspector’s Manual, etc.

CHAPTER 6 – OVERFLOW EMERGENCY RESPONSE PLAN

This chapter of the SSMP provides an overview of the City’s emergency response procedures for sewer overflows. The City’s overflow response plan is further described in the Sanitary Sewer Overflow and Backup Response Plan (SSOBRP) for the City of Weed dated April 2009, created by David Patzer of Risk Management Solutions (See Appendix F). This document includes information required by section D.13. (vi) of the State WDRs.

6.1 Summary of Sewer Overflow Response

City personnel are available 24 hours a day to receive and respond to emergency situations. The person who receives the emergency call investigates the reported notification and takes appropriate action including, but not limited to, immediate dispatch of a standby crew with necessary equipment to manage the problem, or refers the call to other agencies if the problem is determined to be outside the jurisdiction of the City.

6.2 Notification

The SSOBRP includes notification procedures so primary responders and regulatory agencies are informed of all SSOs in a timely manner. This includes procedures needed to comply with the February 2008 amendment to the State WDRs, which requires 2-hour notifications of Category 1 spills, and 24-hour certifications of the 2-hour notifications. Figure 2.2 outlines the City’s SSO response and reporting procedures. Refer to the SSOBRP in Appendix F for additional details.

The County Health Department must be notified of all overflows, and if the overflow exceeds 1,000 gallons or reaches the storm drain system. The RWQCB and State OES must also be notified. The agencies to be notified, method, and time frame for notification are shown in Table 6.2, as taken from the State WDRs Monitoring and Reporting Program in Appendix A. Relevant data for each overflow such as location, volume, agencies notified, etc., is recorded in the field report forms (see SSOBRP).

Table 6.2 – Regulatory Agencies Notification and Time Frame¹

SSO Category	Type or Description	Agencies to be Notified	Type of notification and time frame	
			Telephone/Fax <i>ASAP, but no later than 2 hours after spill awareness</i>	Written Report/Online Database
1	<i>A discharge that equals or exceeds 1,000 gallons, or discharges into a drain, channel, surface water and was not captured.</i>	County Health Department	(530)841-2100-Bus. Hrs	N/A
		Flood Maintenance Division	(530)842-8250-Bus. Hrs	N/A
		State Office of Emergency Services	800-852-7550 [24/7]	Notification is made within 2 hrs.
		Regional Water Quality Control Board	(530)224-4845-Bus. Hrs	Certification is made no later than 24 hrs.
		State Water Resources Control Board	N/A	Online Database-ASAP, but no later than 3 business days after spill awareness. Final report within 15 days.
2	<i>A discharge that is less than 1,000 gallons, did not discharge into a drain, channel, surface water and was captured.</i>	County Health Department	(530)841-2100-Bus. Hrs	N/A
		State Water Resources Control Board	N/A	Online Database-ASAP, but no later than 30 days after spill awareness
Private Lateral Spill	<i>A discharge from a privately owned lateral.</i>	County Health Department State Water Resources Control Board	(530)841-2100-Bus. Hrs N/A	Online Database at enrollee's discretion.
N/A	<i>No SSO in a calendar month</i>	State Water Resources Control Board	N/A	Within 30 days after the end of a calendar month, file an online database certified statement that no SSO occurred.

1. In the event that the SSO Online Database is not available, the enrollee must fax all required information to the appropriate RWQCB office in accordance with the time schedules identified above.

6.3 Field Response, Report Protocol, and Forms

The SSOBRP describes procedures and reporting activity to be completed during an overflow event. Cleanup and reporting procedures are described, along with the appropriate forms to be completed for each SSO event.

6.4 Procedures to Ensure Staff is Properly Trained for an Emergency Response

The SSOBRP is given to all personnel who are responsible for managing or responding to SSOs. City staff and field personnel are trained throughout the year on sewer overflow response procedures. Contractors used in cleanup efforts following an emergency response SSO are properly trained and aware of the City's protocol.

6.5 Procedures to Address Emergency Response Activities

City staff and emergency contractors retained for SSO responses are required to be well trained in traffic and crowd control. City vehicles are equipped with traffic and crowd control tools, including barricades, orange traffic control cones, yellow tape, flashing lights, reflective uniforms, appropriate signs, etc.

6.6 Program to Ensure Spill Containment, Prevention, and Abatement

City staff receives on-the-job training regarding reasonable steps that should be taken to contain and prevent discharge of untreated or partially treated wastewater to waters of the United States, and to minimize or correct any adverse impacts on the environment resulting from SSOs. Some effective methods include the use of sand bag barriers to contain SSOs, placement of absorbent socks to intercept SSO discharge before entering storm drain inlets, and the use of vacuum equipment to suck up contained spills and dump effluent back into the collection system at safe locations.

One of the City's goals listed in Chapter 1 herein is to reduce response time for SSOs. Reducing response time could significantly limit the severity and the amount of untreated water that reaches surface water. Training includes accelerated or additional monitoring as necessary to determine the nature and impact of the discharge.

6.7 Field Guide Procedures

To assist City staff in assessing the impact of an SSO, a field guide is included in the SSOBRP. This field guide includes instruction for use of line clearing equipment, containment, flow volume estimation, bypass pump selection, and determination of overflow rates from manholes. This field guide provides a quick reference for performing all of the above procedures.

CHAPTER 7 – Fats, Oils, and Grease (FOG) CONTROL PROGRAM

This chapter of the SSMP provides a description of the City’s FOG program. The City is required by Section D.13. (vii) of the State WDRs to evaluate its service area to determine whether a FOG control program is needed. If FOG is found to be a problem, the City must prepare and implement a FOG source control program to reduce the amount of SSOs resulting from grease blockages.

Residual FOG are by-products that food preparation, food service establishments (FSEs), automotive service facilities, and machine shops must constantly manage. Typically, FOG enters a facility’s plumbing from wash sinks and floor drains during daily operations. Sanitary sewer systems are not designed or equipped to handle accumulating FOG on the interior of sewer collection system pipes due to unmanaged or unmaintained discharges. In a recent study by the US EPA, over 65% of SSOs nationwide were caused by FOG (EPA, 2009). However, past experience has shown that root intrusion is the primary cause of SSOs in the City. Nevertheless, as part of this SSMP, the City has developed this preliminary FOG Control Program. If FOG does become a problem within the City, the FOG Control Program and the following six elements will be implemented:

- Public education and outreach implementation plan and schedule.
- Legal authority to prohibit illegal discharges, FOG blockages, and prevent SSOs.
- Requirement to install grease removal devices.
- Authority to inspect grease-producing facilities and enforce noncompliant facilities.
- Identification of system locations subject to FOG blockages and establishment of maintenance schedules.
- Development and implementation of source control measures for all FOG discharged to the sanitary sewer system.

7.1 Public Education and Outreach Program

The City will notify sewer customers of their new FOG source control program in a variety of ways. Information on proper disposal of FOG and other SSO prevention measures, including

installation of grease traps, backwater valves, sewer lateral maintenance, etc., will be distributed through publication of brochures, articles in newsletters, individual notices to property owners, and with business license renewal notices. These notifications provide descriptions of grease control efforts that can be undertaken by homeowners and businesses alike. These methods are usually effective in relaying information to a community on proper disposal of FOG and other SSO prevention methods.

Other effective ways to communicate with the public are being considered, such as use of the City's home web page, and both radio and local cable television announcements. Another helpful tool being considered is the exchange of outreach information between sewerage agencies, and use of bilingual posters, developed by the California Restaurant Association (CRA), for direct distribution to FSEs as a best management practice (BMP) tool for training and reminding those who work with FOG producing products. For information on available FOG training to local cities, and information, example documents and guidelines for public outreach the City will refer to Cal FOG website <http://calfog.org>.

FOG in the local sewer system can be a prime contributor to an SSO. Related health and safety issues can also result from the discharge of pharmaceuticals and pesticides into the wastewater collection system. Although not usually a causative factor in sewer overflows, these chemicals have the potential to be toxic and have disruptive environmental and biological effects. Discharges of such chemical compounds into the sewers should be part of the community education and outreach program as well.

7.2 Disposal Methods for FOG

The FOG Control program will inform sewer customers of proper disposal options and their respective schedules through various public outreach efforts. However, if FOG is found in the public sewer system during scheduled cleaning operations or clearing of a blockage, the FOG will be collected and removed from the system to a permitted FOG disposal facility, such as a landfill. FOG in liquid form is flushed down by hydro jetting to designated treatment facilities for disposal.

7.3 Legal Authority

The City's sewer use ordinance, discussed in Chapter 3 herein, provides legal authority to prohibit illegal discharges, FOG blockages, and prevent SSOs. Sewer ordinance Section 14.08.510 of the Municipal Code "prohibits any dispersed biodegradable oils and fats, such as lard, tallow, or vegetable oil in excessive concentrations that would tend to cause adverse effects on the sewerage system."

The City intends to supplement existing legal authority with additional regulations. This includes requiring standardized grease removal devices (traps or interceptors) for FSEs, preventing the discharge of grease to the public sewer system, and educating the public on proper disposal methods for FOG. Location of grease removal device installation will be standardized per California Plumbing Code Section 1009.0 and 1009.1. Discharges from industrial classification facilities are usually controlled under the terms of an industrial wastewater discharge permit, which is issued and monitored by the City.

7.4 Requirements for Grease Removal Devices

The City will require all FSEs to install grease removal devices, and has developed a means to standardize their installation. The City Building Official is authorized to monitor and enforce the terms of the Plumbing Code and the Public Health Code. This includes domestic waste disposal from residential and commercial facilities. The MC prohibits the discharge of "any water, sewage, or liquid waste containing oil, grease, tar, or other ingredients in solution which may clog, obstruct, or fill the and/or prevent the unobstructed use of the facility."

The City is standardizing its procedure of requiring grease removal devices, based on COR construction standards, which follow the Uniform Plumbing Code (UPC). The UPC standard applies to all new construction, tenant improvements, remodels, and existing systems which are in need of upgrading. Refer to Section III of the COR CS in Appendix E.

The DPW is charged with reviewing, permitting, and inspecting industrial waste facilities that discharge into the City's wastewater collection system. Pretreatment devices are required for industrial waste generating facilities, including FSEs. Grease removal devices are required to

be designed per the UPC, and approved, installed, and operated in a manner to control discharges of FOG into the wastewater collection system. This is to ensure facilities do not create nuisances, menaces to the public peace, health or safety hazards, or adverse impacts to the public sewerage system, soil, underground, and/or surface waters. If there is a FOG-related problem associated with an industrial waste permit, the City will take enforcement action against the permittee as described in Section 3.5 herein.

The following are general suggestions for proper BMPs and FOG management:

Bulk or Dry Clean-Up

- Practice bulk and dry materials clean-up before using wet methods that use water.
- Remove bulk or other solid food and grease laden substances into a suitable container before rinsing or washing the initial containers or surfaces that will drain into the plumbing system.
- Keep drain screens in place and fully serviceable to avoid clogging drains or accumulating FOG or grit on the interiors of pipes.
- Do not pour grease, fats, or oils down the drain, nor place food scraps in the drain.
- Use food grade paper to soak up oils and grease and dispose of appropriately.
- Use paper towels to wipe down surfaces and work areas. Cloth towels require washing and thereby introducing FOG back into drains.
- Success of bulk or dry clean-up is dependent upon the behavior of individuals and their access to tools and materials for use in removing bulk and dry materials before washing.

Spill Prevention

- Preventing spills reduces the amount of waste that will require clean-up.
- A dry surface work place is safer for everyone in avoiding slips, trips and falls.
- Capture bulk or dryer materials and place them into an appropriate container.
- Empty containers before they are full to avoid spills.
- Cover any FOG container before transporting to the rendering storage container.
- Provide employees with proper tools to transport materials without spilling.

Maintenance

- Whatever method(s) are being used to collect, filter, and store FOG, ensure that equipment is regularly maintained.
- Employees should be aware of and trained to perform correct and scheduled cleaning procedures.
- A daily and weekly maintenance schedule is highly recommended.
- Contract with a responsible service company to regularly and thoroughly clean larger components and spaces requiring specialized equipment and skills (e.g. large hood filters, hot tanks, floor drain pipes, specialty tools).
- Smaller and less complex elements can be cleaned by hand by the user (e.g. small hood filters, counter/bench tops, sinks, storage areas, daily tools).
- Skim/filter fryer grease daily and test the oil to determine when change is necessary. Build-up of carbon deposits on the bottom of the fryer acts as an insulator that forces the fryer to heat longer, thus causing the oil to break down sooner. This extends the life of both the fryer and the oil.
- Avoid discharging fryer oil into a drain or grease trap, but dispose into a rendering container for transport to a rendering company.
- Cleaning intervals depend upon the type of product being prepared and the typical deposition of materials experienced. The larger the volume produced and deposits incurred, the more frequent the cleaning. This may warrant setting up a system of high use, high deposition work to be done in certain equipment that is cleaned more frequently than others to confine maintenance efforts.

Grease Traps and Interceptors

For grease traps and interceptors to be effective, the units must be properly sized, constructed, and installed in a location to provide an adequate retention time for settling and accumulation of the FOG.

- For information on properly locating, constructing, and sizing grease traps and interceptors, review COR Section III CS in Appendix E.
- Ensure all grease-bearing drains discharge to the grease trap/interceptor.
- No toilet or shower waste should be plumbed to the trap/interceptor.

Oil and Grease Collection/Recycling and Food Donations

- FOG consists of commodities that if handled properly can be treated as a valuable resource.
- Some rendering companies will offer services free-of-charge and others will give a rebate on the materials collected. Contact local rendering representative for specific information and details.
- Use only covered rendering barrels and make sure all drain screens are installed.
- Use a 3-compartment sink for dishware washing. Begin with a hot pre-wash, then a scouring detergent wash, then a hot rinse. Each step should be trapped to capture non-emulsified FOG.

Donations can reduce disposal costs. Ensure that edible food is not washed or flushed down the drain. Edible food waste may be donated to a local food bank. Inedible food waste can be collected by a garbage feeder that will use discards for feeding livestock.

The above described BMPs will be included in public outreach materials, and reviewed with major contributors of FOG to the sewer system during routine grease trap inspections on an as-needed basis.

7.5 Inspection Authority

The City has legal authority to inspect and enforce FOG noncompliance. The City's MC Section 14.08.510 contains language that prohibits the discharge of any substance that can create a public nuisance. The effectiveness of any grease removal device is dependent upon routine maintenance and inspection. To complete these inspections and enforce FOG noncompliance the City may need to hire additional staff or partner with the Fire Department to complete grease interceptor and fire code inspections simultaneously.

Inspection and public outreach to FSEs in the identified hot spots areas will be a critical component of the City's source control program. FSEs will be required to maintain a regular cleaning schedule for its grease removing device and must be able to furnish proof upon

request. The MC grants the City legal authority to prohibit illegal discharges, FOG blockages and SSOs. The utilities supervisor will determine the source of FOG blockages and determine the appropriate remedy. Enforcement will be conducted as needed in response to problems identified by the PWD and utilities supervisor.

7.6 Cleaning schedule for identified FOG prone sewer segments

The City will identify segments of the collection system as prone FOG areas and label them as hot spots. These hot spots will be included in the PM program. Portions of the collection system with persistent FOG problems will be inspected and cleaned more frequently, depending on the magnitude of the problem. If these areas are persistent to FOG problems, they will be referred to the DPW for additional evaluation and corrective actions.

7.7 Source Control Measures

As part of the FOG control program, the City will develop and implement source control measures. The source control measures will include identifying effective maintenance for each hot spot location, public outreach, enforcement, and maintenance activities described previously in this chapter. These activities will be reviewed and amended as needed and as conditions change.

CHAPTER 8 – SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

This chapter of the SSMP presents the City’s System Evaluation and Capacity Assurance Plan that determines hydraulic capacity of key sanitary sewer system elements during peak flow conditions.

8.1 System Evaluation

To assess adequacy of the existing sewer system, a hydraulic evaluation of key mains in the wastewater collection system was performed. The hydraulic evaluation investigated the existing sewer system at the current ADWF and PWWF conditions, along with ten year projected flows. The resulting report and recommended improvements are contained in Appendix G.

8.2 Design Criteria

MC Section 14.08.070 empowers the City with legal responsibility for ensuring sound, logical, and functional design of the City’s public sewer infrastructure. The MC defines terms, establishes fees, sets out provisions for enforcement and maintenance, and provides the basis of design standards for sewers. For specifics on design and performance provisions, refer to Chapter 5.

8.3 Adequate Capacity

The City is responsible to ensure the public sewer infrastructure is adequately sized, correctly designed, and easily accessed for maintenance. The DPW legal authority to perform these important tasks is set forth as summarized in Chapter 3.

Additionally, the City requires completion of a sewer capacity study, by a registered engineer, prior to giving approval for projects that may affect the capacity of the public sewer system. A completed study analyzes the existing system capacity and sets mitigation requirements for the proposed project to ensure adequate capacity is available. The study also justifies the sizing of proposed lines to accommodate the peak flows for all tributaries to the mainline sewer under consideration or pumping station, now and in the future. The approved capacity study is referenced directly by the city plan checker when design plans for the new infrastructure are

submitted to assure adequate capacity. Proposals for new connections to existing sewer must also comply with DPW policies for managing available sewer capacity.

8.4 CIP Schedule

Hydraulic deficiencies and proposed improvements to the sewer system are identified in Appendix G. Hydraulic deficiencies in the sewer system can be corrected by installing larger pipes, re-routing flows within the collection system, reducing excessive I&I, and /or implementing and enforcing water conservation measures. The hydraulic model results were used to determine pipe capacity improvements; however, the City will have to determine which areas in the collection system need replacing based on pipe conditions, as the majority of SSOs within the City are due to root intrusion. Therefore, the City is focusing on replacing these segments in the near term as discussed in Chapter 4.

The hydraulic model results, presented in Appendix G, indicate the Shastina and Weed WWTP interceptors need improvements to meet PWWF capacity. Refer to Chapter 4 for a brief discussion of possible funding sources. An implementation schedule and estimated replacement costs are presented in Appendix D. The hydraulic analysis for the Weed and Shastina Collection Systems is summarized in Appendix G.

CHAPTER 9 – MONITORING, MEASUREMENT AND PROGRAM MODIFICATIONS

This chapter of the SSMP discusses the City's monitoring, measurement, and program modifications. The information presented complies with section D13 (ix) of the State WDRs.

9.1 SSMP Program Effectiveness Evaluation

Effectiveness of the program will be monitored and tracked by recording sewer overflow data in the Performance Measure Indicators Report (Appendix H). The City will use the following measures to evaluate the performance of its wastewater collection system and the effectiveness of its SSMP:

- Number of overflows for each cause (roots, grease, debris, pipe failure, capacity, etc.).
- Number of overflows greater than 100 gallons discharged or reaching Waters of the United States.
- Overflow response time.
- Reduction in repeated incidents of overflow at same location.
- Reduction in number of overflows caused by flows exceeding capacity of the collection system.

9.2 Historical Performance

The City has reported 29 SSOs in the past two years. However, 55% of these SSOs were contained, without discharging untreated or partially treated wastewater on City streets. Approximately 69% of SSOs were caused by root intrusion. The City is aware of these overflow-prone areas and therefore, performs annual inspections and preventative maintenance.

9.3 SSO Location Mapping and Trends

Locations of SSO occurrences are plotted on a citywide map (Appendix B). These maps are used for establishing SSO patterns, identifying probable hot spots, scheduling work assignments, and providing information on SSO activities. The City is currently working on

generating a GIS map to assist in updating these trends. Causes of the respective SSO events are also recorded.

The City has a standard form which they use to report pertinent information regarding the cause and location for each SSO event and determine trends in occurrence. This form can be found in Appendix B, along with a summary of the SSOs that have occurred over the last two years. In addition, a graph is used to illustrate the trend in number and severity of SSOs throughout the year.

9.4 Performance Monitoring and Program Modifications

The City will evaluate the performance of its wastewater collection system at least once a year using the Performance Measure Indicators Report in Appendix H. Relevant data on work performed and changes to the collection system will be documented in the DPW records using the Sewer Maintenance Activity Report in Appendix I. The data will be updated annually and analyzed to determine effectiveness of the SSMP elements in accomplishing goals of the plan. Elements of the SSMP will be modified as needed based on results of this annual performance analysis.

CHAPTER 10 – PROGRAM AUDIT and CERTIFICATION

This chapter describes the schedule and methods the City will utilize in evaluating effectiveness of the SSMP and making revisions to the program. The information contained within this chapter complies with Section D.13. (x) and D.14. of the State WDRs.

10.1 Plan Program Audit

The City will conduct periodic internal audits and prepare a report, at a minimum of every two years. The audit will focus on evaluating operational and cost effectiveness of the SSMP, as well as the City's compliance with all elements of the SSMP. This will include:

- Identification of any deficiencies in the SSMP.
- Steps to correct any identified deficiencies.
- Notes of interviews with key responding personnel and any contractors utilized.
- Notes of operational observations, especially for each SSO event.
- Notes of related equipment inspections.
- Findings of all reviews of related records.

The most recent audit will be kept on file at City Hall, the DPW Office, and the police department.

10.2 Plan Certification

The SSMP shall be certified by the DPW to be in compliance with all requirements set forth in the WDRs, and be presented to the City Council for review and input at a public hearing. Following any necessary revisions, the Final SSMP report will be adopted by the City Council. The City's authorized representative will then complete the certification portion in the Online SSO Database Questionnaire by checking the appropriate milestone box, printing, and signing the automated form, and sending the signed form to:

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

10.3 Plan Modification and Re-certification

The SSMP will be reviewed and updated every five years to keep it current. When significant amendments are made to any portion(s) of the SSMP, it will be resubmitted to the City Council for a re-hearing, adoption, and re-certification. The re-certification will be in accordance with the certification process described in Section 10.2 above.

CHAPTER 11 – COMMUNICATION and SSMP AVAILABILITY

This chapter describes the City’s SSMP Communication Program. The information presented complies with Section D.13. (xi) of the State WDRs.

11.1 Communication

The City will provide status updates on the development, revisions, implementation, and performance of the SSMP to the general public and other interested agencies, to encourage public input and comments.

The City will utilize various outreach means to communicate issues surrounding the use and operation of the City’s wastewater collection system such as: letters, quarterly newsletter, water bill inserts, brochures, annual reports, notices in local newspapers, the City’s website, and the Mountain Community Television, Channel 15.

11.2 SSMP Availability

Copies of the SSMP will be maintained at the following locations: DPW, City hall, police department, and linked on the City’s home web page. The document will also be made readily available to the North Coast RWQCB (Region 1) representatives upon request, and to the operators of any collection system or treatment facility downstream of the City wastewater collection system.

APPENDICES

- Appendix A Waste Discharge Requirements (Order No. 2006-0003-DWQ),
Monitoring and Reporting Program (No. 2006-0003-DWQ) ‘Amended’ and
WDR ‘Fact Sheet’
- Appendix B SSO Logs, Map, and Trends
- Appendix C Operating Budget
- Appendix D Capital Improvement Plan
- Appendix E City of Redding Construction Standards – Sewer
- Appendix F Sanitary Sewer Overflow Response Instruction Manual
- Appendix G Sewer System Capacity Evaluation
- Appendix H Performance Measure Indicators – Template
- Appendix I Sewer Maintenance Activity Report

APPENDIX A

**STATE WATER RESOURCES CONTROL BOARD
ORDER NO. 2006-0003-DWQ**

**STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS
FOR
SANITARY SEWER SYSTEMS**

The State Water Resources Control Board, hereinafter referred to as "State Water Board", finds that:

1. All federal and state agencies, municipalities, counties, districts, and other public entities that own or operate sanitary sewer systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility in the State of California are required to comply with the terms of this Order. Such entities are hereinafter referred to as "Enrollees".
2. Sanitary sewer overflows (SSOs) are overflows from sanitary sewer systems of domestic wastewater, as well as industrial and commercial wastewater, depending on the pattern of land uses in the area served by the sanitary sewer system. SSOs often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen-demanding organic compounds, oil and grease and other pollutants. SSOs may cause a public nuisance, particularly when raw untreated wastewater is discharged to areas with high public exposure, such as streets or surface waters used for drinking, fishing, or body contact recreation. SSOs may pollute surface or ground waters, threaten public health, adversely affect aquatic life, and impair the recreational use and aesthetic enjoyment of surface waters.
3. Sanitary sewer systems experience periodic failures resulting in discharges that may affect waters of the state. There are many factors (including factors related to geology, design, construction methods and materials, age of the system, population growth, and system operation and maintenance), which affect the likelihood of an SSO. A proactive approach that requires Enrollees to ensure a system-wide operation, maintenance, and management plan is in place will reduce the number and frequency of SSOs within the state. This approach will in turn decrease the risk to human health and the environment caused by SSOs.
4. Major causes of SSOs include: grease blockages, root blockages, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, excessive storm or ground water inflow/infiltration, debris blockages, sanitary sewer system age and construction material failures, lack of proper operation and maintenance, insufficient capacity and contractor-caused damages. Many SSOs are preventable with adequate and appropriate facilities, source control measures and operation and maintenance of the sanitary sewer system.

SEWER SYSTEM MANAGEMENT PLANS

5. To facilitate proper funding and management of sanitary sewer systems, each Enrollee must develop and implement a system-specific Sewer System Management Plan (SSMP). To be effective, SSMPs must include provisions to provide proper and efficient management, operation, and maintenance of sanitary sewer systems, while taking into consideration risk management and cost benefit analysis. Additionally, an SSMP must contain a spill response plan that establishes standard procedures for immediate response to an SSO in a manner designed to minimize water quality impacts and potential nuisance conditions.
6. Many local public agencies in California have already developed SSMPs and implemented measures to reduce SSOs. These entities can build upon their existing efforts to establish a comprehensive SSMP consistent with this Order. Others, however, still require technical assistance and, in some cases, funding to improve sanitary sewer system operation and maintenance in order to reduce SSOs.
7. SSMP certification by technically qualified and experienced persons can provide a useful and cost-effective means for ensuring that SSMPs are developed and implemented appropriately.
8. It is the State Water Board's intent to gather additional information on the causes and sources of SSOs to augment existing information and to determine the full extent of SSOs and consequent public health and/or environmental impacts occurring in the State.
9. Both uniform SSO reporting and a centralized statewide electronic database are needed to collect information to allow the State Water Board and Regional Water Quality Control Boards (Regional Water Boards) to effectively analyze the extent of SSOs statewide and their potential impacts on beneficial uses and public health. The monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program No. 2006-0003-DWQ, are necessary to assure compliance with these waste discharge requirements (WDRs).
10. Information regarding SSOs must be provided to Regional Water Boards and other regulatory agencies in a timely manner and be made available to the public in a complete, concise, and timely fashion.
11. Some Regional Water Boards have issued WDRs or WDRs that serve as National Pollution Discharge Elimination System (NPDES) permits to sanitary sewer system owners/operators within their jurisdictions. This Order establishes minimum requirements to prevent SSOs. Although it is the State Water Board's intent that this Order be the primary regulatory mechanism for sanitary sewer systems statewide, Regional Water Boards may issue more stringent or more

prescriptive WDRs for sanitary sewer systems. Upon issuance or reissuance of a Regional Water Board's WDRs for a system subject to this Order, the Regional Water Board shall coordinate its requirements with stated requirements within this Order, to identify requirements that are more stringent, to remove requirements that are less stringent than this Order, and to provide consistency in reporting.

REGULATORY CONSIDERATIONS

12. California Water Code section 13263 provides that the State Water Board may prescribe general WDRs for a category of discharges if the State Water Board finds or determines that:

- The discharges are produced by the same or similar operations;
- The discharges involve the same or similar types of waste;
- The discharges require the same or similar treatment standards; and
- The discharges are more appropriately regulated under general discharge requirements than individual discharge requirements.

This Order establishes requirements for a class of operations, facilities, and discharges that are similar throughout the state.

13. The issuance of general WDRs to the Enrollees will:

- a) Reduce the administrative burden of issuing individual WDRs to each Enrollee;
- b) Provide for a unified statewide approach for the reporting and database tracking of SSOs;
- c) Establish consistent and uniform requirements for SSMP development and implementation;
- d) Provide statewide consistency in reporting; and
- e) Facilitate consistent enforcement for violations.

14. The beneficial uses of surface waters that can be impaired by SSOs include, but are not limited to, aquatic life, drinking water supply, body contact and non-contact recreation, and aesthetics. The beneficial uses of ground water that can be impaired include, but are not limited to, drinking water and agricultural supply. Surface and ground waters throughout the state support these uses to varying degrees.

15. The implementation of requirements set forth in this Order will ensure the reasonable protection of past, present, and probable future beneficial uses of water and the prevention of nuisance. The requirements implement the water quality control plans (Basin Plans) for each region and take into account the environmental characteristics of hydrographic units within the state. Additionally, the State Water Board has considered water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect

water quality in the area, costs associated with compliance with these requirements, the need for developing housing within California, and the need to develop and use recycled water.

16. The Federal Clean Water Act largely prohibits any discharge of pollutants from a point source to waters of the United States except as authorized under an NPDES permit. In general, any point source discharge of sewage effluent to waters of the United States must comply with technology-based, secondary treatment standards, at a minimum, and any more stringent requirements necessary to meet applicable water quality standards and other requirements. Hence, the unpermitted discharge of wastewater from a sanitary sewer system to waters of the United States is illegal under the Clean Water Act. In addition, many Basin Plans adopted by the Regional Water Boards contain discharge prohibitions that apply to the discharge of untreated or partially treated wastewater. Finally, the California Water Code generally prohibits the discharge of waste to land prior to the filing of any required report of waste discharge and the subsequent issuance of either WDRs or a waiver of WDRs.
17. California Water Code section 13263 requires a water board to, after any necessary hearing, prescribe requirements as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge. The requirements shall, among other things, take into consideration the need to prevent nuisance.
18. California Water Code section 13050, subdivision (m), defines nuisance as anything which meets all of the following requirements:
 - a. Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
 - b. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
 - c. Occurs during, or as a result of, the treatment or disposal of wastes.
19. This Order is consistent with State Water Board Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California) in that the Order imposes conditions to prevent impacts to water quality, does not allow the degradation of water quality, will not unreasonably affect beneficial uses of water, and will not result in water quality less than prescribed in State Water Board or Regional Water Board plans and policies.
20. The action to adopt this General Order is exempt from the California Environmental Quality Act (Public Resources Code §21000 et seq.) because it is an action taken by a regulatory agency to assure the protection of the environment and the regulatory process involves procedures for protection of the environment. (Cal. Code Regs., tit. 14, §15308). In addition, the action to adopt

this Order is exempt from CEQA pursuant to Cal.Code Regs., title 14, §15301 to the extent that it applies to existing sanitary sewer collection systems that constitute “existing facilities” as that term is used in Section 15301, and §15302, to the extent that it results in the repair or replacement of existing systems involving negligible or no expansion of capacity.

21. The Fact Sheet, which is incorporated by reference in the Order, contains supplemental information that was also considered in establishing these requirements.
22. The State Water Board has notified all affected public agencies and all known interested persons of the intent to prescribe general WDRs that require Enrollees to develop SSMPs and to report all SSOs.
23. The State Water Board conducted a public hearing on February 8, 2006, to receive oral and written comments on the draft order. The State Water Board received and considered, at its May 2, 2006, meeting, additional public comments on substantial changes made to the proposed general WDRs following the February 8, 2006, public hearing. The State Water Board has considered all comments pertaining to the proposed general WDRs.

IT IS HEREBY ORDERED, that pursuant to California Water Code section 13263, the Enrollees, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder, shall comply with the following:

A. DEFINITIONS

1. **Sanitary sewer overflow (SSO)** - Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. SSOs include:
 - (i) Overflows or releases of untreated or partially treated wastewater that reach waters of the United States;
 - (ii) Overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States; and
 - (iii) 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.
2. **Sanitary sewer system** – Any system of pipes, pump stations, sewer lines, or other conveyances, upstream of a wastewater treatment plant headworks used to collect and convey wastewater to the publicly owned treatment facility. Temporary storage and conveyance facilities (such as vaults, temporary piping, construction trenches, wet wells, impoundments, tanks, etc.) are considered to be part of the sanitary sewer system, and discharges into these temporary storage facilities are not considered to be SSOs.

For purposes of this Order, sanitary sewer systems include only those systems owned by public agencies that are comprised of more than one mile of pipes or sewer lines.

3. **Enrollee** - A federal or state agency, municipality, county, district, and other public entity that owns or operates a sanitary sewer system, as defined in the general WDRs, and that has submitted a complete and approved application for coverage under this Order.
4. **SSO Reporting System** – Online spill reporting system that is hosted, controlled, and maintained by the State Water Board. The web address for this site is <http://ciwqs.waterboards.ca.gov>. This online database is maintained on a secure site and is controlled by unique usernames and passwords.
5. **Untreated or partially treated wastewater** – Any volume of waste discharged from the sanitary sewer system upstream of a wastewater treatment plant headworks.
6. **Satellite collection system** – The portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility to which the sanitary sewer system is tributary.
7. **Nuisance** - California Water Code section 13050, subdivision (m), defines nuisance as anything which meets all of the following requirements:
 - a. Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
 - b. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
 - c. Occurs during, or as a result of, the treatment or disposal of wastes.

B. APPLICATION REQUIREMENTS

1. **Deadlines for Application** – All public agencies that currently own or operate sanitary sewer systems within the State of California must apply for coverage under the general WDRs within six (6) months of the date of adoption of the general WDRs. Additionally, public agencies that acquire or assume responsibility for operating sanitary sewer systems after the date of adoption of this Order must apply for coverage under the general WDRs at least three (3) months prior to operation of those facilities.
2. **Applications under the general WDRs** – In order to apply for coverage pursuant to the general WDRs, a legally authorized representative for each agency must submit a complete application package. Within sixty (60) days of adoption of the general WDRs, State Water Board staff will send specific instructions on how to

apply for coverage under the general WDRs to all known public agencies that own sanitary sewer systems. Agencies that do not receive notice may obtain applications and instructions online on the Water Board's website.

3. Coverage under the general WDRs – Permit coverage will be in effect once a complete application package has been submitted and approved by the State Water Board's Division of Water Quality.

C. PROHIBITIONS

1. Any SSO that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited.
2. Any SSO that results in a discharge of untreated or partially treated wastewater that creates a nuisance as defined in California Water Code Section 13050(m) is prohibited.

D. PROVISIONS

1. The Enrollee must comply with all conditions of this Order. Any noncompliance with this Order constitutes a violation of the California Water Code and is grounds for enforcement action.
2. It is the intent of the State Water Board that sanitary sewer systems be regulated in a manner consistent with the general WDRs. Nothing in the general WDRs shall be:
 - (i) Interpreted or applied in a manner inconsistent with the Federal Clean Water Act, or supersede a more specific or more stringent state or federal requirement in an existing permit, regulation, or administrative/judicial order or Consent Decree;
 - (ii) Interpreted or applied to authorize an SSO that is illegal under either the Clean Water Act, an applicable Basin Plan prohibition or water quality standard, or the California Water Code;
 - (iii) Interpreted or applied to prohibit a Regional Water Board from issuing an individual NPDES permit or WDR, superseding this general WDR, for a sanitary sewer system, authorized under the Clean Water Act or California Water Code; or
 - (iv) Interpreted or applied to supersede any more specific or more stringent WDRs or enforcement order issued by a Regional Water Board.
3. The Enrollee shall take all feasible steps to eliminate SSOs. In the event that an SSO does occur, the Enrollee shall take all feasible steps to contain and mitigate the impacts of an SSO.
4. In the event of an SSO, the Enrollee shall take all feasible steps to prevent untreated or partially treated wastewater from discharging from storm drains into

flood control channels or waters of the United States by blocking the storm drainage system and by removing the wastewater from the storm drains.

5. All SSOs must be reported in accordance with Section G of the general WDRs.
6. In any enforcement action, the State and/or Regional Water Boards will consider the appropriate factors under the duly adopted State Water Board Enforcement Policy. And, consistent with the Enforcement Policy, the State and/or Regional Water Boards must consider the Enrollee's efforts to contain, control, and mitigate SSOs when considering the California Water Code Section 13327 factors. In assessing these factors, the State and/or Regional Water Boards will also consider whether:
 - (i) The Enrollee has complied with the requirements of this Order, including requirements for reporting and developing and implementing a SSMP;
 - (ii) The Enrollee can identify the cause or likely cause of the discharge event;
 - (iii) There were no feasible alternatives to the discharge, such as temporary storage or retention of untreated wastewater, reduction of inflow and infiltration, use of adequate backup equipment, collecting and hauling of untreated wastewater to a treatment facility, or an increase in the capacity of the system as necessary to contain the design storm event identified in the SSMP. It is inappropriate to consider the lack of feasible alternatives, if the Enrollee does not implement a periodic or continuing process to identify and correct problems.
 - (iv) The discharge was exceptional, unintentional, temporary, and caused by factors beyond the reasonable control of the Enrollee;
 - (v) The discharge could have been prevented by the exercise of reasonable control described in a certified SSMP for:
 - Proper management, operation and maintenance;
 - Adequate treatment facilities, sanitary sewer system facilities, and/or components with an appropriate design capacity, to reasonably prevent SSOs (e.g., adequately enlarging treatment or collection facilities to accommodate growth, infiltration and inflow (I/I), etc.);
 - Preventive maintenance (including cleaning and fats, oils, and grease (FOG) control);
 - Installation of adequate backup equipment; and
 - Inflow and infiltration prevention and control to the extent practicable.
 - (vi) The sanitary sewer system design capacity is appropriate to reasonably prevent SSOs.

- (vii) The Enrollee took all reasonable steps to stop and mitigate the impact of the discharge as soon as possible.
7. When a sanitary sewer overflow occurs, the Enrollee shall take all feasible steps and necessary remedial actions to 1) control or limit the volume of untreated or partially treated wastewater discharged, 2) terminate the discharge, and 3) recover as much of the wastewater discharged as possible for proper disposal, including any wash down water.

The Enrollee shall implement all remedial actions to the extent they may be applicable to the discharge and not inconsistent with an emergency response plan, including the following:

- (i) Interception and rerouting of untreated or partially treated wastewater flows around the wastewater line failure;
 - (ii) Vacuum truck recovery of sanitary sewer overflows and wash down water;
 - (iii) Cleanup of debris at the overflow site;
 - (iv) System modifications to prevent another SSO at the same location;
 - (v) Adequate sampling to determine the nature and impact of the release; and
 - (vi) Adequate public notification to protect the public from exposure to the SSO.
8. The Enrollee shall properly, manage, operate, and maintain all parts of the sanitary sewer system owned or operated by the Enrollee, and shall ensure that the system operators (including employees, contractors, or other agents) are adequately trained and possess adequate knowledge, skills, and abilities.
9. The Enrollee shall allocate adequate resources for the operation, maintenance, and repair of its sanitary sewer system, by establishing a proper rate structure, accounting mechanisms, and auditing procedures to ensure an adequate measure of revenues and expenditures. These procedures must be in compliance with applicable laws and regulations and comply with generally acceptable accounting practices.
10. The Enrollee shall provide adequate capacity to convey base flows and peak flows, including flows related to wet weather events. Capacity shall meet or exceed the design criteria as defined in the Enrollee's System Evaluation and Capacity Assurance Plan for all parts of the sanitary sewer system owned or operated by the Enrollee.
11. The Enrollee shall develop and implement a written Sewer System Management Plan (SSMP) and make it available to the State and/or Regional Water Board upon request. A copy of this document must be publicly available at the Enrollee's office and/or available on the Internet. This SSMP must be approved by the Enrollee's governing board at a public meeting.

12. In accordance with the California Business and Professions Code sections 6735, 7835, and 7835.1, all engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. Specific elements of the SSMP that require professional evaluation and judgments shall be prepared by or under the direction of appropriately qualified professionals, and shall bear the professional(s)' signature and stamp.
13. The mandatory elements of the SSMP are specified below. However, if the Enrollee believes that any element of this section is not appropriate or applicable to the Enrollee's sanitary sewer system, the SSMP program does not need to address that element. The Enrollee must justify why that element is not applicable. The SSMP must be approved by the deadlines listed in the SSMP Time Schedule below.

Sewer System Management Plan (SSMP)

- (i) **Goal:** The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur.
- (ii) **Organization:** 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)).
- (iii) **Legal Authority:** 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 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 fats, oils, and grease and other debris that may cause blockages, and
 - (e) Enforce any violation of its sewer ordinances.
- (iv) **Operation and Maintenance Program.** The SSMP 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 Preventative 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

- (e) Provide equipment and replacement part inventories, including identification of critical replacement parts.

(v) **Design and Performance Provisions:**

- (a) Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and
- (b) Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.

(vi) **Overflow Emergency Response Plan** - Each Enrollee shall develop and implement an overflow emergency response plan 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 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.

(vii) **FOG Control Program:** Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an Enrollee determines that a FOG program is not needed, the Enrollee must provide justification 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.

(viii) **System Evaluation and Capacity Assurance Plan:** The Enrollee shall prepare and implement a capital improvement plan (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 plan 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.
 - (d) **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.
- (ix) **Monitoring, Measurement, and Program Modifications:** 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 preventative maintenance 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.
- (x) **SSMP Program Audits** - As part of the SSMP, the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the

Enrollee's compliance with the SSMP requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.

- (xi) **Communication Program** – The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented.

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

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

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

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

The SSMP must be updated every five (5) years, and must include any significant program changes. Re-certification by the governing board of the Enrollee is required in accordance with D.14 when significant updates to the SSMP are made. To complete the re-certification process, the Enrollee shall enter the data in the Online SSO Database and mail the form to the State Water Board, as described above.

15. The Enrollee shall comply with these requirements according to the following schedule. This time schedule does not supersede existing requirements or time schedules associated with other permits or regulatory requirements.

Sewer System Management Plan Time Schedule

<u>Task and Associated Section</u>	Completion Date			
	Population > 100,000	Population between 100,000 and 10,000	Population between 10,000 and 2,500	Population < 2,500
Application for Permit Coverage Section C	6 months after WDRs Adoption			
Reporting Program Section G	6 months after WDRs Adoption ¹			
SSMP Development Plan and Schedule No specific Section	9 months after WDRs Adoption ²	12 months after WDRs Adoption ²	15 months after WDRs Adoption ²	18 months after WDRs Adoption ²
Goals and Organization Structure Section D 13 (i) & (ii)	12 months after WDRs Adoption ²		18 months after WDRs Adoption ²	
Overflow Emergency Response Program Section D 13 (vi)	24 months after WDRs Adoption ²	30 months after WDRs Adoption ²	36 months after WDRs Adoption ²	39 months after WDRs Adoption ²
Legal Authority Section D 13 (iii)				
Operation and Maintenance Program Section D 13 (iv)				
Grease Control Program Section D 13 (vii)	36 months after WDRs Adoption	39 months after WDRs Adoption	48 months after WDRs Adoption	51 months after WDRs Adoption
Design and Performance Section D 13 (v)				
System Evaluation and Capacity Assurance Plan Section D 13 (viii)				
Final SSMP, incorporating all of the SSMP requirements Section D 13				

1. In the event that by July 1, 2006 the Executive Director is able to execute a memorandum of agreement (MOA) with the California Water Environment Association (CWEA) or discharger representatives outlining a strategy and time schedule for CWEA or another entity to provide statewide training on the adopted monitoring program, SSO database electronic reporting, and SSMP development, consistent with this Order, then the schedule of Reporting Program Section G shall be replaced with the following schedule:

Reporting Program Section G	
Regional Boards 4, 8, and 9	8 months after WDRs Adoption
Regional Boards 1, 2, and 3	12 months after WDRs Adoption
Regional Boards 5, 6, and 7	16 months after WDRs Adoption

If this MOU is not executed by July 1, 2006, the reporting program time schedule will remain six (6) months for all regions and agency size categories.

2. In the event that the Executive Director executes the MOA identified in note 1 by July 1, 2006, then the deadline for this task shall be extended by six (6) months. The time schedule identified in the MOA must be consistent with the extended time schedule provided by this note. If the MOA is not executed by July 1, 2006, the six (6) month time extension will not be granted.

E. WDRs and SSMP AVAILABILITY

1. A copy of the general WDRs and the certified SSMP shall be maintained at appropriate locations (such as the Enrollee's offices, facilities, and/or Internet homepage) and shall be available to sanitary sewer system operating and maintenance personnel at all times.

F. ENTRY AND INSPECTION

1. The Enrollee shall allow the State or Regional Water Boards or their authorized representative, upon presentation of credentials and other documents as may be required by law, to:
 - a. Enter upon the Enrollee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order;
 - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;

- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
- d. Sample or monitor at reasonable times, for the purposes of assuring compliance with this Order or as otherwise authorized by the California Water Code, any substances or parameters at any location.

G. GENERAL MONITORING AND REPORTING REQUIREMENTS

1. The Enrollee shall furnish to the State or Regional Water Board, within a reasonable time, any information that the State or Regional Water Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order. The Enrollee shall also furnish to the Executive Director of the State Water Board or Executive Officer of the applicable Regional Water Board, upon request, copies of records required to be kept by this Order.
2. The Enrollee shall comply with the attached Monitoring and Reporting Program No. 2006-0003 and future revisions thereto, as specified by the Executive Director. Monitoring results shall be reported at the intervals specified in Monitoring and Reporting Program No. 2006-0003. Unless superseded by a specific enforcement Order for a specific Enrollee, these reporting requirements are intended to replace other mandatory routine written reports associated with SSOs.
3. All Enrollees must obtain SSO Database accounts and receive a "Username" and "Password" by registering through the California Integrated Water Quality System (CIWQS). These accounts will allow controlled and secure entry into the SSO Database. Additionally, within 30days of receiving an account and prior to recording spills into the SSO Database, all Enrollees must complete the "Collection System Questionnaire", which collects pertinent information regarding a Enrollee's collection system. The "Collection System Questionnaire" must be updated at least every 12 months.
4. Pursuant to Health and Safety Code section 5411.5, any person who, without regard to intent or negligence, causes or permits any untreated wastewater or other waste to be discharged in or on any waters of the State, or discharged in or deposited where it is, or probably will be, discharged in or on any surface waters of the State, as soon as that person has knowledge of the discharge, shall immediately notify the local health officer of the discharge. Discharges of untreated or partially treated wastewater to storm drains and drainage channels, whether man-made or natural or concrete-lined, shall be reported as required above.

Any SSO greater than 1,000 gallons discharged in or on any waters of the State, or discharged in or deposited where it is, or probably will be, discharged in or on any surface waters of the State shall also be reported to the Office of Emergency Services pursuant to California Water Code section 13271.

H. CHANGE IN OWNERSHIP

1. This Order is not transferable to any person or party, except after notice to the Executive Director. The Enrollee shall submit this notice in writing at least 30 days in advance of any proposed transfer. The notice must include a written agreement between the existing and new Enrollee containing a specific date for the transfer of this Order's responsibility and coverage between the existing Enrollee and the new Enrollee. This agreement shall include an acknowledgement that the existing Enrollee is liable for violations up to the transfer date and that the new Enrollee is liable from the transfer date forward.

I. INCOMPLETE REPORTS

1. If an Enrollee becomes aware that it failed to submit any relevant facts in any report required under this Order, the Enrollee shall promptly submit such facts or information by formally amending the report in the Online SSO Database.

J. REPORT DECLARATION

1. All applications, reports, or information shall be signed and certified as follows:
 - (i) All reports required by this Order and other information required by the State or Regional Water Board shall be signed and certified by a person designated, for a municipality, state, federal or other public agency, as either a principal executive officer or ranking elected official, or by a duly authorized representative of that person, as described in paragraph (ii) of this provision. (For purposes of electronic reporting, an electronic signature and accompanying certification, which is in compliance with the Online SSO database procedures, meet this certification requirement.)
 - (ii) An individual is a duly authorized representative only if:
 - (a) The authorization is made in writing by a person described in paragraph (i) of this provision; and
 - (b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity.

K. CIVIL MONETARY REMEDIES FOR DISCHARGE VIOLATIONS

1. The California Water Code provides various enforcement options, including civil monetary remedies, for violations of this Order.
2. The California Water Code also provides that any person failing or refusing to furnish technical or monitoring program reports, as required under this Order, or

falsifying any information provided in the technical or monitoring reports is subject to civil monetary penalties.

L. SEVERABILITY

1. The provisions of this Order are severable, and if any provision of this Order, or the application of any provision of this Order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Order, shall not be affected thereby.
2. This order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, nor protect the Enrollee from liability under federal, state or local laws, nor create a vested right for the Enrollee to continue the waste discharge.

CERTIFICATION

The undersigned Clerk to the State Water Board does hereby certify that the foregoing is a full, true, and correct copy of general WDRs duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 2, 2006.

AYE: Tam M. Doduc
Gerald D. Secundy

NO: Arthur G. Baggett

ABSENT: None

ABSTAIN: None



Song Her
Clerk to the Board

STATE WATER RESOURCES CONTROL BOARD

MONITORING AND REPORTING PROGRAM NO. 2006-0003-DWQ STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR SANITARY SEWER SYSTEMS

This Monitoring and Reporting Program (MRP) establishes monitoring, record keeping, reporting and public notification requirements for Order No. 2006-2003-DWQ, "Statewide General Waste Discharge Requirements for Sanitary Sewer Systems." Revisions to this MRP may be made at any time by the Executive Director, and may include a reduction or increase in the monitoring and reporting.

A. SANITARY SEWER OVERFLOW REPORTING

SSO Categories

1. Category 1 - All discharges of sewage resulting from a failure in the Enrollee's sanitary sewer system that:
 - A. Equal or exceed 1000 gallons, or
 - B. Result in a discharge to a drainage channel and/or surface water; or
 - C. Discharge to a storm drainpipe that was not fully captured and returned to the sanitary sewer system.
2. Category 2 – All other discharges of sewage resulting from a failure in the Enrollee's sanitary sewer system.
3. Private Lateral Sewage Discharges – Sewage discharges that are caused by blockages or other problems within a privately owned lateral.

SSO Reporting Timeframes

4. Category 1 SSOs – All SSOs that meet the above criteria for Category 1 SSOs must be reported as soon as: (1) the Enrollee has knowledge of the discharge, (2) reporting is possible, and (3) reporting can be provided without substantially impeding cleanup or other emergency measures. Initial reporting of Category 1 SSOs must be reported to the Online SSO System as soon as possible but no later than 3 business days after the Enrollee is made aware of the SSO. Minimum information that must be contained in the 3-day report must include all information identified in section 9 below, except for item 9.K. A final certified report must be completed through the Online SSO System, within 15 calendar days of the conclusion of SSO response and remediation. Additional information may be added to the certified report, in the form of an attachment, at any time.

The above reporting requirements do not preclude other emergency notification requirements and timeframes mandated by other regulatory agencies (local

County Health Officers, local Director of Environmental Health, Regional Water Boards, or Office of Emergency Services (OES)) or State law.

5. Category 2 SSOs – All SSOs that meet the above criteria for Category 2 SSOs must be reported to the Online SSO Database within 30 days after the end of the calendar month in which the SSO occurs (e.g. all SSOs occurring in the month of January must be entered into the database by March 1st).
6. Private Lateral Sewage Discharges – All sewage discharges that meet the above criteria for Private Lateral sewage discharges may be reported to the Online SSO Database based upon the Enrollee's discretion. If a Private Lateral sewage discharge is recorded in the SSO Database, the Enrollee must identify the sewage discharge as occurring and caused by a private lateral, and a responsible party (other than the Enrollee) should be identified, if known.
7. If there are no SSOs during the calendar month, the Enrollee will provide, within 30 days after the end of each calendar month, a statement through the Online SSO Database certifying that there were no SSOs for the designated month.
8. In the event that the SSO Online Database is not available, the enrollee must fax all required information to the appropriate Regional Water Board office in accordance with the time schedules identified above. In such event, the Enrollee must also enter all required information into the Online SSO Database as soon as practical.

Mandatory Information to be Included in SSO Online Reporting

All Enrollees must obtain SSO Database accounts and receive a "Username" and "Password" by registering through the California Integrated Water Quality System (CIWQS). These accounts will allow controlled and secure entry into the SSO Database. Additionally, within thirty (30) days of receiving an account and prior to recording SSOs into the SSO Database, all Enrollees must complete the "Collection System Questionnaire", which collects pertinent information regarding an Enrollee's collection system. The "Collection System Questionnaire" must be updated at least every 12 months.

At a minimum, the following mandatory information must be included prior to finalizing and certifying an SSO report for each category of SSO:

9. Category 2 SSOs:
 - A. Location of SSO by entering GPS coordinates;
 - B. Applicable Regional Water Board, i.e. identify the region in which the SSO occurred;
 - C. County where SSO occurred;
 - D. Whether or not the SSO entered a drainage channel and/or surface water;
 - E. Whether or not the SSO was discharged to a storm drain pipe that was not fully captured and returned to the sanitary sewer system;

- F. Estimated SSO volume in gallons;
- G. SSO source (manhole, cleanout, etc.);
- H. SSO cause (mainline blockage, roots, etc.);
- I. Time of SSO notification or discovery;
- J. Estimated operator arrival time;
- K. SSO destination;
- L. Estimated SSO end time; and
- M. SSO Certification. Upon SSO Certification, the SSO Database will issue a Final SSO Identification (ID) Number.

10. Private Lateral Sewage Discharges:

- A. All information listed above (if applicable and known), as well as;
- B. Identification of sewage discharge as a private lateral sewage discharge; and
- C. Responsible party contact information (if known).

11. Category 1 SSOs:

- A. All information listed for Category 2 SSOs, as well as;
- B. Estimated SSO volume that reached surface water, drainage channel, or not recovered from a storm drain;
- C. Estimated SSO amount recovered;
- D. Response and corrective action taken;
- E. If samples were taken, identify which regulatory agencies received sample results (if applicable). If no samples were taken, NA must be selected.
- F. Parameters that samples were analyzed for (if applicable);
- G. Identification of whether or not health warnings were posted;
- H. Beaches impacted (if applicable). If no beach was impacted, NA must be selected;
- I. Whether or not there is an ongoing investigation;
- J. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
- K. OES control number (if applicable);
- L. Date OES was called (if applicable);
- M. Time OES was called (if applicable);
- N. Identification of whether or not County Health Officers were called;
- O. Date County Health Officer was called (if applicable); and
- P. Time County Health Officer was called (if applicable).

Reporting to Other Regulatory Agencies

These reporting requirements do not preclude an Enrollee from reporting SSOs to other regulatory agencies pursuant to California state law. These reporting requirements do not replace other Regional Water Board telephone reporting requirements for SSOs.

1. The Enrollee shall report SSOs to OES, in accordance with California Water Code Section 13271.

Office of Emergency Services
Phone (800) 852-7550

2. The Enrollee shall report SSOs to County Health officials in accordance with California Health and Safety Code Section 5410 et seq.
3. The SSO database will automatically generate an e-mail notification with customized information about the SSO upon initial reporting of the SSO and final certification for all Category 1 SSOs. E-mails will be sent to the appropriate County Health Officer and/or Environmental Health Department if the county desires this information, and the appropriate Regional Water Board.

B. Record Keeping

1. Individual SSO records shall be maintained by the Enrollee for a minimum of five years from the date of the SSO. This period may be extended when requested by a Regional Water Board Executive Officer.
3. All records shall be made available for review upon State or Regional Water Board staff's request.
4. All monitoring instruments and devices that are used by the Enrollee to fulfill the prescribed monitoring and reporting program shall be properly maintained and calibrated as necessary to ensure their continued accuracy;
5. The Enrollee shall retain records of all SSOs, such as, but not limited to and when applicable:
 - a. Record of Certified report, as submitted to the online SSO database;
 - b. All original recordings for continuous monitoring instrumentation;
 - c. Service call records and complaint logs of calls received by the Enrollee;
 - d. SSO calls;
 - e. SSO records;
 - f. Steps that have been and will be taken to prevent the SSO from recurring and a schedule to implement those steps.
 - g. Work orders, work completed, and any other maintenance records from the previous 5 years which are associated with responses and investigations of system problems related to SSOs;
 - h. A list and description of complaints from customers or others from the previous 5 years; and
 - i. Documentation of performance and implementation measures for the previous 5 years.
6. If water quality samples are required by an environmental or health regulatory agency or State law, or if voluntary monitoring is conducted by the Enrollee or its agent(s), as a result of any SSO, records of monitoring information shall include:

- a. The date, exact place, and time of sampling or measurements;
- b. The individual(s) who performed the sampling or measurements;
- c. The date(s) analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical technique or method used; and,
- f. The results of such analyses.

C. Certification

1. All final reports must be certified by an authorized person as required by Provision J of the Order.
2. Registration of authorized individuals, who may certify reports, will be in accordance with the CIWQS' protocols for reporting.

Monitoring and Reporting Program No. 2006-0003 will become effective on the date of adoption by the State Water Board.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Board held on May 2, 2006.



Song Her
Clerk to the Board

FACT SHEET

STATE WATER RESOURCES CONTROL BOARD

ORDER NO. 2006-0003

STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR SANITARY SEWER SYSTEMS

The State Water Resources Control Board (State Water Board) adopted Resolution 2004-80 in November 2004, requiring staff to work with a diverse group of stakeholders (known as the SSO Guidance Committee) to develop a regulatory mechanism to provide a consistent statewide approach for reducing Sanitary Sewer Overflows (SSOs). Over the past 14 months, State Water Board staff in collaboration with the SSO Guidance Committee, developed draft statewide general waste discharge requirements (WDRs) and a reporting program. The WDRs and reporting program reflect numerous ideas, opinions, and comments provided by the SSO Guidance Committee.

The SSO Guidance Committee consists of representatives from the State Water Board's Office of Chief Counsel, several Regional Water Quality Control Boards (Regional Water Boards), United States Environmental Protection Agency (USEPA), Region IX, non-governmental environmental organizations, as well as publicly-owned sanitary sewer collection system agencies. The draft WDRs, reporting program, and associated documents result from a collaborative attempt to create a robust and rigorous program, which will serve as the basis for consistent and appropriate management and operation of sanitary sewer systems.

During the collaborative process, several key issues regarding the draft WDRs were identified. These include:

- Is there a need for statewide collection system requirements?
- Should these systems be regulated under a National Pollutant Discharge Elimination System (NPDES) permit issued pursuant to the Federal Clean Water Act or under WDRs issued pursuant to the California Water Code (the Porter-Cologne Water Quality Control Act or Porter-Cologne)?
- Should the regulatory mechanism include a prohibition of discharge and, if so, should the prohibition encompass only SSOs that reach surface waters, ground water, or should all SSOs be prohibited?
- Should a regulatory mechanism include a permitted discharge, an affirmative defense, or explicit enforcement discretion?
- Should the regulated facilities include publicly-owned facilities, privately owned facilities, satellite systems (public and private), and/or private laterals?

- Should all SSOs be reported, and if not, what should the reporting thresholds be; and what should the reporting timeframes be?
- How will existing permits and reporting requirements incorporate these new WDRs?
- How much will compliance with these new WDRs cost?

The WDRs and Reporting Program considered the comments of all stakeholders and others who commented on the two drafts circulated to the public. These documents also incorporate legal requirements and other revisions to improve the effectiveness and management of the regulatory program. Following is a discussion of the above issues, comments received on the drafts and an explanation of how issues were resolved.

The Need

As California's wastewater collection system infrastructure begins to age, the need to proactively manage this valuable asset becomes increasingly important. The first step in this process is to have a reliable reporting system for SSOs. Although there are some data systems to record spills and various spill-reporting requirements have been developed, inconsistent requirements and enforcement have led to poor data quality. A few Regional Water Boards have comprehensively tracked SSOs over the last three to five years, and from this information we have been able to determine that the majority of collection systems surveyed have had SSOs within this time period.

Both the San Diego and Santa Ana Regional Water Boards have issued WDRs over the last several years to begin regulating wastewater collection systems in an attempt to quantify and reduce SSOs. In fact, 44 out of 46 collection system agencies regulated by the San Diego Regional Water Board have reported spills over the last four and a half years, resulting in 1467 reported SSOs. Twenty-five out of 27 collection system agencies subject to the Santa Ana Regional Water Board's general WDRs reported SSOs between the years of 1999-2004. During this time period, 1012 SSOs were reported.

The 2004 Annual Ocean and Bay Water Quality Report issued by the Orange County Environmental Health Care Agency shows the number of SSOs increasing from 245 in 1999 to 399 in 2003. While this number indicates a concerning trend, the total annual spill volume from these SSOs has actually decreased dramatically, as has the number of beach closures due to SSOs. It is likely, therefore, that the rise in number of SSOs reflects better reporting, and not an actual increase in the number of SSOs.

This information also suggests that the Santa Ana Regional Water Board's WDRs, which contain sanitary sewer management plan (SSMP) requirements similar to those in the proposed statewide general WDRs, have been effective in

not only increasing the number of spills that are reported but also in mitigating the impacts of SSOs that do occur.

Data supports the conclusion that virtually all collection systems have SSOs and that implementation of a regulatory measure requiring SSO reporting and collection system management, along with required measures to limit SSOs, will greatly benefit California water quality. Implementation of these requirements will also greatly benefit and prolong the useful life of the sanitary sewer system, one of California's most valuable infrastructure items.

NPDES vs. WDRs

Porter-Cologne subjects a broader range of waste discharges to regulation than the Federal Clean Water Act. In general, the Clean Water Act prohibits the discharge of pollutants from point sources to surface waters of the United States unless authorized under an NPDES permit. (33 U.S.C. §§1311, 1342). Since not all SSOs result in a discharge to surface water, however, not all SSOs violate the Clean Water Act's NPDES permitting requirements. Porter-Cologne, on the other hand, covers all existing and proposed waste discharges that could affect the quality of state waters, including both surface waters and groundwater. (Wat. Code §§13050(e), 13260). Hence, under Porter-Cologne, a greater SSO universe is potentially subject to regulation under WDRs. In addition, WDRs under Porter-Cologne can address both protection of water quality as well as the prevention of public nuisance associated with waste disposal. (*Id.* §13263).

Some commenters contend that because all collection systems have the potential to overflow to surface waters the systems should be regulated under an NPDES permit. A recent decision by the United States Court of Appeals for the 2nd Circuit, however, has called into question the states' and USEPA's ability to regulate discharges that are only "potential" under an NPDES permit. In *Waterkeeper Alliance v. United States Environmental Protection Agency* (2005) 399 F.3d 486, 504-506, the appellate court held that USEPA can only require permits for animal feedlots with "an actual addition" of pollutants to surface waters. While this decision may not be widely followed, especially in the area of SSOs, these are clearly within the jurisdiction of the California Water Code.

USEPA defines a publicly owned treatment works (POTW) as both the wastewater treatment facility and its associated sanitary sewer system (40 C.F.R. §403.3(o)¹). Historically, only the portion of the sanitary sewer system that is owned by the same agency that owns the permitted wastewater treatment facility has been subject to NPDES permit requirements. Satellite sewer collection systems (i.e. systems not owned or operated by the POTW) have not been

¹ The regulation provides that a POTW include sewers, pipes, and other conveyances only if they convey wastewater to a POTW.

typically regulated as part of the POTW and, therefore, have not generally been subject to NPDES permit requirements.

Comments were received that argued every collection system leading to a POTW that is subject to an NPDES permit should also be permitted based upon the USEPA definition of POTW. Under this theory, all current POTW NPDES permits could be expanded to include all satellite sewer collection systems, or alternatively, the satellite system owners or operators could be permitted separately. However, this interpretation is not widely accepted and USEPA has no official guidance to this fact.

There are also many wastewater treatment facilities within California that do not have discharges to surface water, but instead use percolation ponds, spray irrigation, wastewater reclamation, or other means to dispose of the treated effluent. These facilities, and their satellite systems, are not subject to the NPDES permitting process and could not be subject to a statewide general NPDES permit. POTWs that fall into this category, though, can be regulated under Porter-Cologne and do have WDRs.

In light of these factors, the State Water Board has determined that the best approach is to propose statewide general WDRs at this time.

Prohibition of Discharge

The Clean Water Act prohibits the discharge of wastewater to surface waters except as authorized under an NPDES permit. POTWs must achieve secondary treatment, at a minimum, and any more stringent limitations that are necessary to achieve water quality standards. (33 U.S.C. §1311(b)(1)(B) and (C)). Thus, an SSO that results in the discharge of raw sewage to surface waters is prohibited under the Clean Water Act.

Additionally, California Water Code section 13263 requires the State Water Board to, after any necessary hearing, prescribe requirements as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge. The requirements shall, among other things, take into consideration the need to prevent nuisance.

California Water Code section 13050 (m), defines nuisance as anything which meets all of the following requirements:

- a. Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
- b. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

- c. Occurs during, or as a result of, the treatment or disposal of wastes.

Some SSOs do create a nuisance as defined in state law. Therefore, based upon these statutory requirements, the WDRs include prohibitions in Section C. of the WDRs. Section C. states:

C. PROHIBITIONS

1. Any SSO that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited.
2. Any SSO that results in a discharge of untreated or partially treated wastewater, which creates a nuisance as defined in California Water Code section 13050(m) is prohibited.

Furthermore, the State Water Board acknowledges the potential for more stringent water quality standards that may exist pursuant to a Regional Water Board requirement. Language included in Section D.2 of the WDRs allows for these more stringent instances.

D. PROVISIONS

2. It is the intent of the State Water Board that sanitary sewer systems be regulated in a manner consistent with the general WDRs. Nothing in the general WDRs shall be:
 - (i) Interpreted or applied in a manner inconsistent with the Federal Clean Water Act, or supersede a more specific or more stringent state or federal requirement in an existing permit, regulation, or administrative/judicial order or Consent Decree;
 - (ii) Interpreted or applied to authorize an SSO that is illegal under either the Clean Water Act, an applicable Basin Plan prohibition or water quality standard, or the California Water Code;
 - (iii) Interpreted or applied to prohibit a Regional Water Board from issuing an individual NPDES permit or WDRs, superseding the general WDRs, for a sanitary sewer system, authorized under the Clean Water Act or California Water Code; or
 - (iv) Interpreted or applied to supersede any more specific or more stringent WDRs or enforcement order issued by a Regional Water Board.

Permitted Discharge, Affirmative Defense, and Enforcement Discretion

Commenters from the discharger community have requested inclusion of an affirmative defense to an SSO on the grounds that certain SSO events are unforeseen and unavoidable, such as SSOs due to extreme wet weather events. An affirmative defense is a mechanism whereby conduct that otherwise violates WDRs or a permit will be excused, and not subject to an enforcement action, under certain circumstances. Since many collection system industry experts believe that not all SSOs may be prevented, given certain circumstances (such as unforeseen vandalism, extreme wet weather, or other acts of God), many

collection system owner representatives believe this should formally be recognized by including an affirmative defense for these unavoidable SSOs.

Previous informal drafts of the general WDRs included affirmative defense language, which was contingent upon appropriate development and implementation of sanitary sewer management plan (SSMP) requirements, as well as a demonstration that the SSO was exceptional and unavoidable. Other stakeholders, including USEPA and the environmental groups opposed the concept of an affirmative defense for SSOs. They argued that its inclusion in the WDRs would undermine the Clean Water Act and inappropriately limit both Regional Water Board and third party enforcement.

After considering input from all stakeholders, and consulting with USEPA, staff is not recommending inclusion of an affirmative defense. Rather, the draft WDRs incorporate the concept of enforcement discretion, and explicitly identify what factors must be considered during any civil enforcement proceeding. The enforcement discretion portion of the WDRs is contained within Sections D. 6 and 7, and is consistent with enforcement discretion provisions within the California Water Code.

Facilities Subject to WDRs

Collection systems consist of pipelines and their appurtenances, which are intended to transport untreated wastewater to both publicly-owned and private wastewater treatment facilities. While wastewater treatment facilities are owned by a wide variety of public and private entities, public agencies (state and federal agencies, cities, counties, and special districts) own the vast majority of this infrastructure.

Collection systems that transport wastewater to POTWs could be grouped into four different categories:

1. Publicly-owned treatment works – pipelines and appurtenances that are owned by a public agency that also owns a wastewater treatment facility;
2. Publicly-owned satellites – pipelines and appurtenances that are owned by a public agency that does not own a wastewater treatment facility; and
3. Private laterals - pipelines and appurtenances that are not owned by a public agency, but rather discharge into one of the above types of facilities.
4. Privately owned treatment works – pipelines and appurtenances that are owned by a private entity, which also owns a wastewater treatment facility (often a septic tank and leach field).

The WDRs require all public agencies, which own wastewater collection systems (category 1 and 2 above) to enroll in the WDRs. Privately owned systems (categories 3 and 4) are not subject to the WDRs; however, a Regional Water

Board may at its discretion issue WDRs to these facilities on a case-by-case or region wide basis.

Collection systems discharging into POTWs (categories 1, 2, and 3) represent, by far, the greatest amount of collection system infrastructure within California. Since regulating private entities (categories 3 and 4) on a statewide basis would be unmanageable and impractical (because of the extremely large number and lack of contact information and other associated records), staff believes focusing on the public sector is the best option for meaningful and consistent outcomes. The legal authority and reporting provisions contained in the WDR do require limited oversight of private laterals (category 3) by public entities. Given this limited responsibility of oversight, public entities are not responsible or liable for private laterals.

State Water Board staff will notify all known public agencies that own wastewater collection systems, regarding their obligation to enroll under these WDRs. However, because of data inaccuracies, State Water Board staff may inadvertently not contact an agency that should enroll in the WDRs or erroneously contact a public agency that does not own a collection system. Staff will make every effort to accurately identify public agencies. In the event that a public agency is overlooked or omitted, however, it is the agency's responsibility to contact the State Water Board for information on the application process. An agency can find the appropriate contact by visiting the State Water Board's SSO homepage at www.waterboards.ca.gov/ss0.

SSO Reporting

SSOs can be distinguished between those that impact water quality and/or create a nuisance, and those that are indicators of collection system performance. Additionally, SSO liability is attributed to either private entities (homeowners, businesses, private communities, etc...) or public entities. Although all types of SSOs are important to track, the reporting time frames and the type of information that need to be conveyed differ.

The Reporting Program and Online SSO Database clearly distinguish the type of spill (major or minor) and the type of entity that owns the portion of the collection system that experienced the SSO (public or private entity). The reason to require SSO reporting for SSOs that do not necessarily impact public health or the environment is because these types of SSOs are indicators of collection system performance and management program effectiveness, and may serve as a sign of larger and more serious problems that should be addressed. Although these types of spills are important and must be regulated by collection system owners, the information that should be tracked and the time required to get them into the online reporting system are not as stringent.

Obviously, SSOs that are large in nature, affect public health, or affect the environment must be reported as soon as practicable and information associated with both the spill and efforts to mitigate the spill must be detailed. Since the Online SSO Database is a web based application requiring computer connection to the internet and is typically not as available as telephone communication would be, the Online Database will not replace emergency notification, which may be required by a Regional Water Board, Office of Emergency Services, or a County Health or Environmental Health Agency.

Incorporating Existing Permits

It is the State Water Board's intent to have one statewide regulatory mechanism that lays out the foundation for consistent collection system management requirements and SSO reporting. While there are a significant number of collection systems that are not actively regulated by the State or Regional Water Boards, some efforts have been made to regulate these agencies on a facility-by-facility or region-by-region basis. General WDRs, individual WDRs, NPDES permits, and enforcement orders that specifically include collections systems are mechanisms that have been used to regulate collection system overflows.

However, because of these varying levels of regulatory oversight, confusion exists among collection system owners as to regulatory expectations on a consistent and uniform basis (especially with reporting spills). Currently, there are a myriad of different SSO reporting thresholds and a number of different spill report repositories. Because of the varying levels of reporting thresholds and the lack of a common database to capture this information, an accurate picture of SSOs throughout California is unobtainable.

In order to provide a consistent and effective SSO prevention program, as well as to develop reasonable expectations for collection system management, these General WDRs should be the primary regulatory mechanism to regulate public collection systems. The draft WDRs detail requirements associated with SSMP development and implementation and SSO reporting.

All NPDES permits for POTWs currently include federally required standard conditions, three of which apply to collection systems. NPDES permits must clarify that the following three conditions apply to that part of the collection system that is owned or operated by the POTW owner or operator. These conditions are:

- Duty to mitigate discharges (40 CFR 122.41(d))
- Requirement to properly operate and maintain facilities (40 CFR 122.41(e))
- Requirement to report non-compliance (40 CFR 122.41(l)(6) and (7))

Understandably, revising existing regulatory measures will not occur immediately. However, as time allows and, at a minimum, upon readopting existing WDRs or WDRs that serve as NPDES permits, the Regional Water Boards should rescind redundant or inconsistent collection system requirements. In addition, the Regional Water Boards must ensure that existing NPDES permits clarify that the three standard permit provisions discussed above apply to the permittee's collection system.

Although it is the State Water Board's intent that this Order be the primary regulatory mechanism for sanitary sewer systems statewide, there will be some instances when Regional Water Boards will need to impose more stringent or prescriptive requirements. In those cases, more specific or more stringent WDRs or an NPDES permit issued by a Regional Water Board will supersede this Order. Finding number 11, in the WDRs states:

11. Some Regional Water Boards have issued WDRs or WDRs that serve as National Pollution Discharge Elimination System (NPDES) permits to sanitary sewer system owners/operators within their jurisdictions. This Order establishes minimum requirements to prevent SSOs. Although it is the State Water Board's intent that this Order be the primary regulatory mechanism for sanitary sewer systems statewide, Regional Water Boards may issue more stringent or more prescriptive WDRs for sanitary sewer systems. Upon issuance or reissuance of a Regional Water Board's WDRs for a system subject to this Order, the Regional Water Board shall coordinate its requirements with stated requirements within this Order, to identify requirements that are more stringent, to remove requirements that are less stringent than this Order, and to provide consistency in reporting.

Cost of Compliance

While the proposed WDRs contain requirements for systems and programs that should be in place to effectively manage collection systems, many communities have not implemented various elements of a good management plan. Some agencies are doing an excellent job managing their collection systems and will incur very little additional costs. Other agencies will need to develop and implement additional programs and will incur greater costs. However, any additional costs that a public agency may incur in order to comply with these General WDRs are costs that an agency would necessarily incur to effectively manage and preserve its infrastructure assets, protect public health and prevent nuisance conditions. These General WDRs prescribe minimum management requirements that should be present in all well managed collection system agencies.

In order to estimate the compliance costs associated with the proposed WDRs, staff analyzed costs associated with implementing the Santa Ana Regional Water Board's general WDRs. Twenty-one agencies, which discharge to Orange County Sanitation District, submitted financial summaries for the last five years, representing both pre- and post-WDRs adoption. Operation and maintenance costs, program development costs, as well as capital improvement costs were

considered and fairly accurately represent what can be expected statewide with the adoption of the General WDRs.

After extrapolating the sample to yield a statewide cost perspective, the projected annual cost of implementing the statewide WDRs is approximately \$870 million. This total represents \$345.6 million in O&M costs and \$524.5 for capital improvement projects.

While this sum is substantial, presenting the costs on a per capita or per household basis puts the figure in perspective. Department of Finance estimated the total population for Californians that may be subject to the WDRs to be 30.3 million persons (1/1/05). Dividing the population by the approximate average household size of 2.5 yields 12 million households. The average household in California is assumed to be 2.5 persons. The increased average annual cost (in order to comply with these WDRs) per person is estimated to be \$28.74 and \$71.86 per household (or \$5.99 per month per household)

Given these average costs there will be some communities that realize higher costs on a per household basis and some that realize less cost. Furthermore, larger communities will probably also realize an economy of scale, which is dependent upon a community's size. While larger communities may see lower costs associated with compliance, smaller communities will probably see a higher cost associated with compliance. Costs for compliance in small communities may be as high as \$40 per month per household.

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER NO. WQ 2008-0002-EXEC

ADOPTING AMENDED MONITORING AND REPORTING REQUIREMENTS FOR
STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR SANITARY SEWER
SYSTEMS

The State of California, Water Resources Control Board (State Water Board) finds:

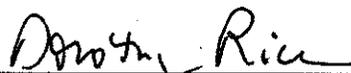
1. The State Water Board is authorized to prescribe statewide general waste discharge requirements for categories of discharges that involve the same or similar operations and the same or similar types of waste pursuant to Water Code 13263, subdivision (i).
2. The State Water Board on May 2, 2006, adopted Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Order No. 2006-0003-DWQ, pursuant to that authority.
3. The State Water Board on May 2, 2006, adopted Monitoring and Reporting Requirements to implement the General Waste Discharge Requirements for Sanitary Sewer Systems.
4. State Water Board Order No. 2006-0003-DWQ, paragraph G.2., and the Monitoring and Reporting Requirements, both provide that the Executive Director may modify the terms of the Monitoring and Reporting Requirements at any time.
5. The time allowed in those Monitoring and Reporting Requirements for the filing of the initial report of an overflow is too long to adequately protect the public health and safety or the beneficial uses of the waters of the state when there is a sewage collection system spill. An additional notification requirement is necessary and appropriate to ensure the Office of Emergency Services, local public health officials, and the applicable regional water quality control board are apprised of a spill that reaches a drainage channel or surface water.
6. Further, the burden of providing a notification as soon as possible is de minimis and will allow response agencies to take action as soon as possible to protect public health and safety and beneficial uses of the waters of the state.

IT IS HEREBY ORDERED THAT:

Pursuant to the authority delegated by Resolution No. 2002-0104 and Order No. 2006-0003-DWQ, the Monitoring and Reporting Requirements for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems No. 2006-0003-DWQ is hereby amended as shown in Attachment A, with new text indicated by double-underline.

Dated:

February 20, 2008



Dorothy Rice
Executive Director

ATTACHMENT A

STATE WATER RESOURCES CONTROL BOARD MONITORING AND REPORTING PROGRAM NO. 2006-0003-DWQ (AS REVISED BY ORDER NO. WQ 2008-0002-EXEC)

STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR SANITARY SEWER SYSTEMS

This Monitoring and Reporting Program (MRP) establishes monitoring, record keeping, reporting and public notification requirements for Order No. 2006-2003-DWQ, "Statewide General Waste Discharge Requirements for Sanitary Sewer Systems." Revisions to this MRP may be made at any time by the Executive Director, and may include a reduction or increase in the monitoring and reporting.

NOTIFICATION

Although State and Regional Water Board staff do not have duties as first responders, this Monitoring and Reporting Program is an appropriate mechanism to ensure that the agencies that do have first responder duties are notified in a timely manner in order to protect public health and beneficial uses.

1. For any discharges of sewage that results in a discharge to a drainage channel or a surface water, the Discharger shall, as soon as possible, but not later than two (2) hours after becoming aware of the discharge, notify the State Office of Emergency Services, the local health officer or directors of environmental health with jurisdiction over affected water bodies, and the appropriate Regional Water Quality Control Board.
2. As soon as possible, but no later than twenty-four (24) hours after becoming aware of a discharge to a drainage channel or a surface water, the Discharger shall submit to the appropriate Regional Water Quality Control Board a certification that the State Office of Emergency Services and the local health officer or directors of environmental health with jurisdiction over the affected water bodies have been notified of the discharge.

A. SANITARY SEWER OVERFLOW REPORTING

SSO Categories

1. Category 1 - All discharges of sewage resulting from a failure in the Enrollee's sanitary sewer system that:
 - A. Equal or exceed 1000 gallons, or
 - B. Result in a discharge to a drainage channel and/or surface water; or
 - C. Discharge to a storm drainpipe that was not fully captured and returned to the sanitary sewer system.

2. Category 2 – All other discharges of sewage resulting from a failure in the Enrollee's sanitary sewer system.
3. Private Lateral Sewage Discharges – Sewage discharges that are caused by blockages or other problems within a privately owned lateral.

SSO Reporting Timeframes

4. Category 1 SSOs – Except as provided above, all SSOs that meet the above criteria for Category 1 SSOs must be reported as soon as: (1) the Enrollee has knowledge of the discharge, (2) reporting is possible, and (3) reporting can be provided without substantially impeding cleanup or other emergency measures. Initial reporting of Category 1 SSOs must be reported to the Online SSO System as soon as possible but no later than 3 business days after the Enrollee is made aware of the SSO. Minimum information that must be contained in the 3-day report must include all information identified in section 9 below, except for item 9.K. A final certified report must be completed through the Online SSO System, within 15 calendar days of the conclusion of SSO response and remediation. Additional information may be added to the certified report, in the form of an attachment, at any time.

The above reporting requirements are in addition to do not preclude other emergency notification requirements and timeframes mandated by other regulatory agencies (local County Health Officers, local Director of Environmental Health, Regional Water Boards, or Office of Emergency Services (OES)) or State law.

5. Category 2 SSOs – All SSOs that meet the above criteria for Category 2 SSOs must be reported to the Online SSO Database within 30 days after the end of the calendar month in which the SSO occurs (e.g. all SSOs occurring in the month of January must be entered into the database by March 1st).
6. Private Lateral Sewage Discharges – All sewage discharges that meet the above criteria for Private Lateral sewage discharges may be reported to the Online SSO Database based upon the Enrollee's discretion. If a Private Lateral sewage discharge is recorded in the SSO Database, the Enrollee must identify the sewage discharge as occurring and caused by a private lateral, and a responsible party (other than the Enrollee) should be identified, if known.
7. If there are no SSOs during the calendar month, the Enrollee will provide, within 30 days after the end of each calendar month, a statement through the Online SSO Database certifying that there were no SSOs for the designated month.
8. In the event that the SSO Online Database is not available, the enrollee must fax all required information to the appropriate Regional Water Board office in

accordance with the time schedules identified above. In such event, the Enrollee must also enter all required information into the Online SSO Database as soon as practical.

Mandatory Information to be Included in SSO Online Reporting

All Enrollees must obtain SSO Database accounts and receive a "Username" and "Password" by registering through the California Integrated Water Quality System (CIWQS). These accounts will allow controlled and secure entry into the SSO Database. Additionally, within thirty (30) days of receiving an account and prior to recording SSOs into the SSO Database, all Enrollees must complete the "Collection System Questionnaire", which collects pertinent information regarding an Enrollee's collection system. The "Collection System Questionnaire" must be updated at least every 12 months.

At a minimum, the following mandatory information must be included prior to finalizing and certifying an SSO report for each category of SSO:

9. Category 2 SSOs:

- A. Location of SSO by entering GPS coordinates;
- B. Applicable Regional Water Board, i.e. identify the region in which the SSO occurred;
- C. County where SSO occurred;
- D. Whether or not the SSO entered a drainage channel and/or surface water;
- E. Whether or not the SSO was discharged to a storm drain pipe that was not fully captured and returned to the sanitary sewer system;
- F. Estimated SSO volume in gallons;
- G. SSO source (manhole, cleanout, etc.);
- H. SSO cause (mainline blockage, roots, etc.);
- I. Time of SSO notification or discovery;
- J. Estimated operator arrival time;
- K. SSO destination;
- L. Estimated SSO end time; and
- M. SSO Certification. Upon SSO Certification, the SSO Database will issue a Final SSO Identification (ID) Number.

10. Private Lateral Sewage Discharges:

- A. All information listed above (if applicable and known), as well as;
- B. Identification of sewage discharge as a private lateral sewage discharge; and
- C. Responsible party contact information (if known).

11. Category 1 SSOs:

- A. All information listed for Category 2 SSOs, as well as;
- B. Estimated SSO volume that reached surface water, drainage channel, or not recovered from a storm drain;
- C. Estimated SSO amount recovered;
- D. Response and corrective action taken;
- E. If samples were taken, identify which regulatory agencies received sample results (if applicable). If no samples were taken, NA must be selected.
- F. Parameters that samples were analyzed for (if applicable);
- G. Identification of whether or not health warnings were posted;
- H. Beaches impacted (if applicable). If no beach was impacted, NA must be selected;
- I. Whether or not there is an ongoing investigation;
- J. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
- K. OES control number (if applicable);
- L. Date OES was called (if applicable);
- M. Time OES was called (if applicable);
- N. Identification of whether or not County Health Officers were called;
- O. Date County Health Officer was called (if applicable); and
- P. Time County Health Officer was called (if applicable).

Reporting to Other Regulatory Agencies

These reporting requirements do not preclude an Enrollee from reporting SSOs to other regulatory agencies pursuant California state law. These reporting requirements do not replace other Regional Water Board telephone reporting requirements for SSOs.

1. The Enrollee shall report SSOs to OES, in accordance with California Water Code Section 13271.

Office of Emergency Services
Phone (800) 852-7550

2. The Enrollee shall report SSOs to County Health officials in accordance with California Health and Safety Code Section 5410 et seq.
3. The SSO database will automatically generate an e-mail notification with customized information about the SSO upon initial reporting of the SSO and final certification for all Category 1 SSOs. E-mails will be sent to the appropriate County Health Officer and/or Environmental Health Department if the county desires this information, and the appropriate Regional Water Board.

B. Record Keeping

1. Individual SSO records shall be maintained by the Enrollee for a minimum of five years from the date of the SSO. This period may be extended when requested by a Regional Water Board Executive Officer.

[2. Omitted.]

3. All records shall be made available for review upon State or Regional Water Board staff's request.
4. All monitoring instruments and devices that are used by the Enrollee to fulfill the prescribed monitoring and reporting program shall be properly maintained and calibrated as necessary to ensure their continued accuracy;
5. The Enrollee shall retain records of all SSOs, such as, but not limited to and when applicable:
 - a. Record of Certified report, as submitted to the online SSO database;
 - b. All original recordings for continuous monitoring instrumentation;
 - c. Service call records and complaint logs of calls received by the Enrollee;
 - d. SSO calls;
 - e. SSO records;
 - f. Steps that have been and will be taken to prevent the SSO from recurring and a schedule to implement those steps.
 - g. Work orders, work completed, and any other maintenance records from the previous 5 years which are associated with responses and investigations of system problems related to SSOs;
 - h. A list and description of complaints from customers or others from the previous 5 years; and
 - i. Documentation of performance and implementation measures for the previous 5 years.
6. If water quality samples are required by an environmental or health regulatory agency or State law, or if voluntary monitoring is conducted by the Enrollee or its agent(s), as a result of any SSO, records of monitoring information shall include:
 - a. The date, exact place, and time of sampling or measurements;
 - b. The individual(s) who performed the sampling or measurements;
 - c. The date(s) analyses were performed;
 - d. The individual(s) who performed the analyses;
 - e. The analytical technique or method used; and,
 - f. The results of such analyses.

C. Certification

1. All final reports must be certified by an authorized person as required by Provision J of the Order.
2. Registration of authorized individuals, who may certify reports, will be in accordance with the CIWQS' protocols for reporting.

Monitoring and Reporting Program No. 2006-0003 will become effective on the date of adoption by the State Water Board. The notification requirements added by Order No. WQ 2008-0002-EXEC will become effective upon issuance by the Executive Director.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of an order amended by the Executive Director of the State Water Board.



Jeanne Townsend
Clerk to the Board



CITY OF WEED

Sewer Complaint Reporting

Date: _____

Time: _____

Manhole #: _____ Upstream or Downstream

Address: _____

of feet rodded: _____

Source of problem:

Amount Spilled: _____

Cleanup Performed:

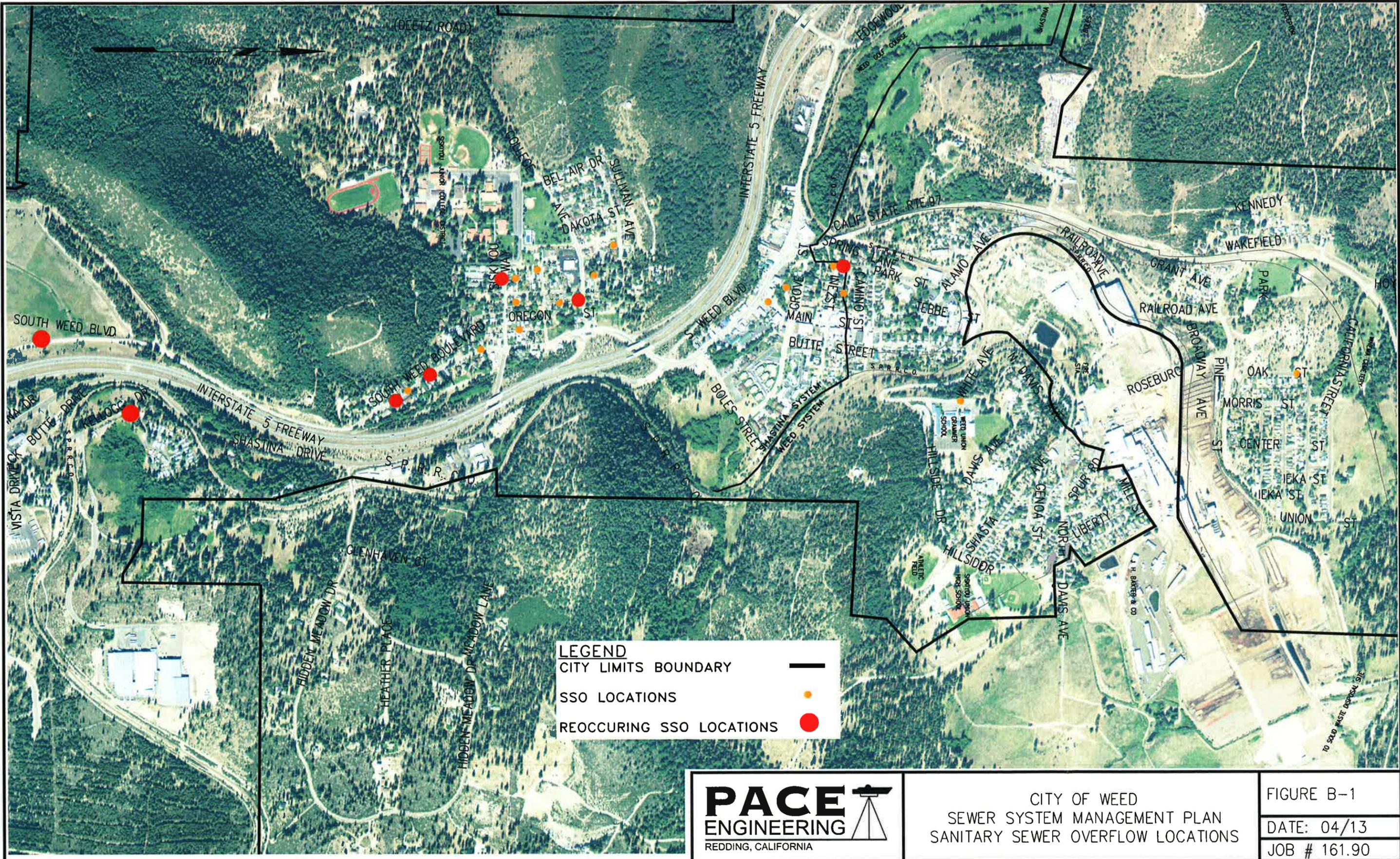
Reported to: _____

Completed by: _____

CITY OF WEED
SANITARY SEWER OVERFLOW LOG
APPENDIX B

Date	Location/Street	Cause	Corrective Action Rodded (ft)	Amount Spilled (gal)	Cleanup Performed
3/14/2011	88 W. Division	Roots	300	20	Shoveled spillage, 2 gal chlorox, and covered with sand
4/2/2011	275 Siskiyou	Roots	160	0	None
4/5/2011	836 South Weed Blvd	(1)	188	10	None
4/14/2011	275 Siskiyou	Roots	285	0	None
4/25/2011	824 South Weed Blvd	(1)	310	0	None
5/3/2011	White Ave	Roots	200	30	(1)
5/6/2011	West Inez/ Park Street	Roots	275	50	Washed down street
6/21/2011	Kellogg	Plug broke	100	0	(1)
7/8/2011	564 Oregon	Roots	290	0	None
9/21/2011	565 South Weed Blvd	Roots	150	0	None
10/7/2011	789 South Weed Blvd	Roots	200	10	Bleach
12/10/2011	805 South Weed Blvd	Roots	300	30	Bleach
12/12/2011	Oregon	Roots	250	0	None
12/22/2011	195 W Inez	Roots	122	50	Street sweeper and bleach
12/26/2011	564 Oregon	Roots	216	0	None
4/19/2012	51 Main	(1)	0.5	3	removed paper and bleached
6/8/2012	355 Walnut	Roots	25	30	Chlorox and covered with sand
9/25/2012	Kellogg	Unknown	220	0	(1)
11/5/2012	195 W Inez	Women's Underwear and wash clothes	110	60	Water truck and bleach
11/8/2012	85 Grove	Preventative Maintenance/ roots	300	0	None
11/10/2012	689 South Weed Blvd	Roots	150	20	(1)
11/14/2012	355 Phelps	Roots	50	0	None
11/15/2012	353 Sullivan	Roots	210	0	None
2/8/2013	1593 Oak Street	Paper	135	200	Rake up and disinfected
2/9/2013	275 Siskiyou	Roots	275	0	None
2/11/2013	580 Walnut	Roots	375	0	(1)
2/11/2013	789 South Weed Blvd	(1)	200	0	None
2/12/2013	925 South Weed Blvd	Roots	465	0	None
2/25/2013	925 South Weed Blvd	Roots	200	50	Bleach

1. Action or cause was left blank on the City's complaint report



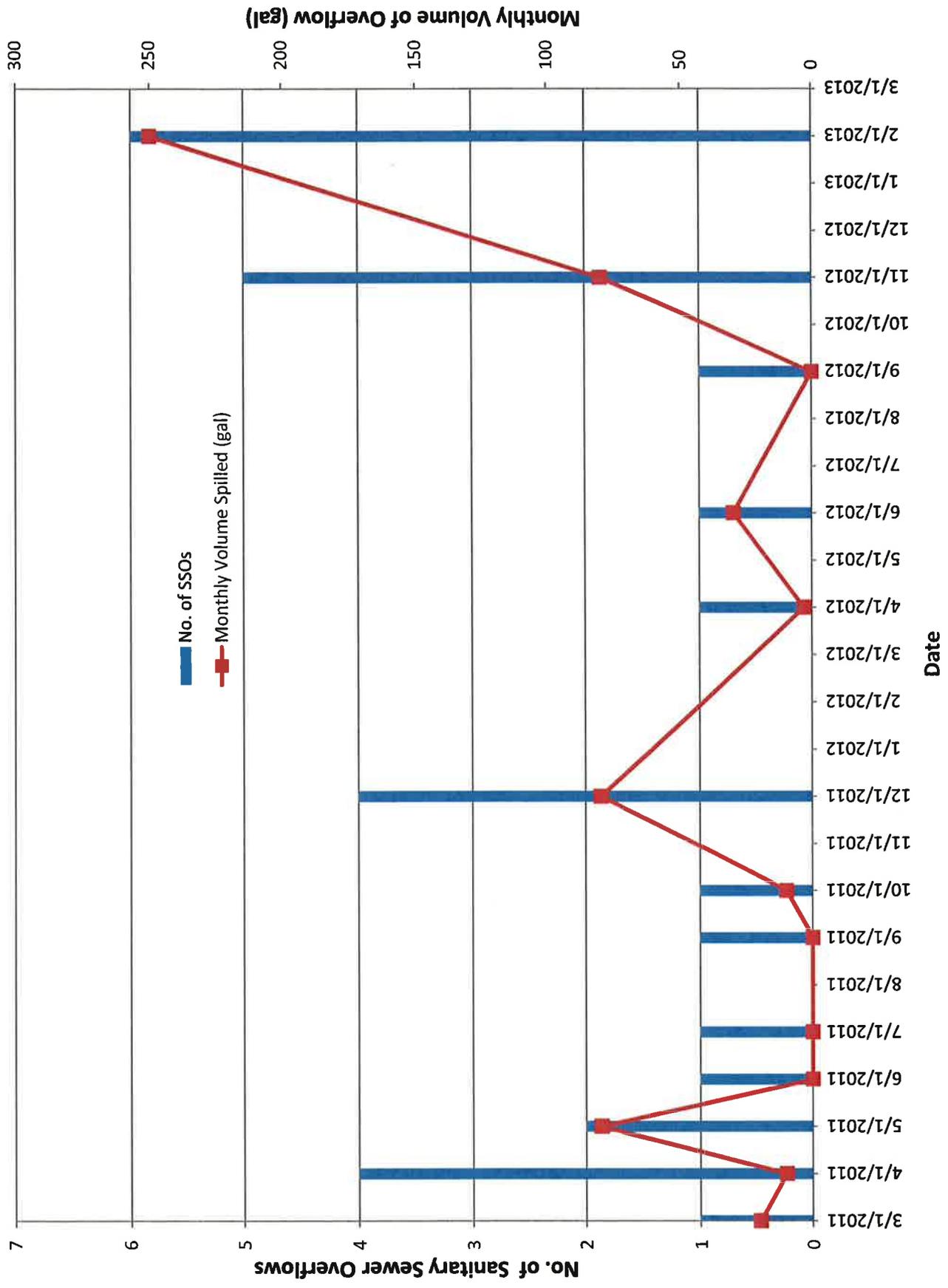
LEGEND
 CITY LIMITS BOUNDARY ———
 SSO LOCATIONS ●
 REOCCURRING SSO LOCATIONS ●



CITY OF WEED
 SEWER SYSTEM MANAGEMENT PLAN
 SANITARY SEWER OVERFLOW LOCATIONS

FIGURE B-1
 DATE: 04/13
 JOB # 161.90

CITY OF WEED
COLLECTION SYSTEM
MONTHLY SSO TRENDS



CITY OF WEED
SANITARY SEWER OPERATIONS AND CAPITAL OUTLAY BUDGETING¹

	FY 2009/10	FY 2010/11	FY 2011/12
<u>Revenues</u>			
Charges for Services and Facilities	\$364,604	\$372,927	\$407,158
Sewer Penalties	\$4,521	\$4,349	\$5,954
Total Revenues	\$369,125	\$377,276	\$413,112
<u>Expenditures</u>			
Salaries and Benefits	\$148,538	\$130,696	\$125,988
Transmission and Treatment	\$127,352	\$208,417	\$138,576
Capital Outlay	\$0	\$0	\$10,018
Operating Budget	\$275,890	\$339,113	\$274,582
Sewer Bond Payment	\$14,200	\$13,700	\$13,200
Generated Government Cost	\$125,923	\$123,873	\$112,748
Total Expenditures	\$416,013	\$476,686	\$400,530
Net Income	(\$46,888)	(\$99,410)	\$12,582

1. Operating revenue and expenditure values per the City of Weed AIMS General Ledger System Future Budget Comparison

**CITY OF WEED
CAPITAL IMPROVEMENT PROGRAM
FISCAL YEARS 2013-2018**

PROJECT NO.	PROJECT NAME	APPROPRIATION BY FISCAL YEAR						TOTAL
		FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/2018	
WW-01	Sewer System Management Plan	\$29,500	\$0	\$0	\$0	\$0	\$0	\$29,500
WW-02	Grove Street Sewer Replacement ¹	\$0	\$78,000	\$0	\$0	\$0	\$0	\$78,000
WW-03	Walnut Street Sewer Replacement ²	\$0	\$0	\$91,000	\$0	\$0	\$0	\$91,000
WW-04	Weed Interceptor Sewer Replacement Project Phase I ³	\$0	\$0	\$0	\$178,400	\$0	\$1,605,600	\$1,784,000
WW-05	Weed and Shastina Interceptor Improvements Phase II ⁴	\$0	\$0	\$0	\$0	\$0	\$75,700	\$75,700
Subtotal		\$29,500	\$78,000	\$91,000	\$178,400	\$0	\$1,681,300	\$2,058,200

1. Fiscal year 2013/14 the City will replace approximately 370 feet of 8-inch gravity sewer along Grove Street Alley.
2. Fiscal year 2014/15 the City plans to replace approximately 445 feet of gravity sewer on Walnut Street between College Avenue and Phelps Avenue.
3. Fiscal year 2015/16 the City will budget for preliminary engineering design (approximately 10%) for Phase I of the Interceptor Improvement Project expected to start in 2018.
4. Fiscal year 2017/18 the City will budget for preliminary engineering design for Phase II of the Interceptor Improvement Project expected to start in 2020.

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City of Redding Construction Standards Index

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Self-contained Meter Requirements (CS5010) 550.00

Meter Requirements When Main Switch Is Located

 in an Equipment Room (CS5075) 551.00

Residential and Commercial Remote Metering

Guide (CS5080)	552.00 - 552.02
Roadway Lighting Guide (DS240)	
General Notes	553.00 - 553.01
Lighting Arrangement Diagrams	553.02
Tables	553.03 - 553.05
Aluminum Street Light Standard (CS5110)	
(Pole and Arm Details)	554.00
(Base and Grounding Details)	554.01
Luminaires / Photocells (CS5111)	555.00 - 555.01
Typical Street Light Standard Base Detail (CS5112)	556.00
Decorative Roadway Lighting Options (CS5129)	557.00 - 557.04
<i>Intentionally Not Used</i>	558.00 - 559.00
Esplanade Luminaire Teardrop Style (CS5130)	560.00
<i>Intentionally Not Used</i>	561.00 - 563.00
300 Cast Aluminum Post	
and XBC-1 Crossarm (CS5141)	564.00
and SBC-2-180 Crossarm	564.01
<i>Intentionally Not Used</i>	565.00 - 567.00
Streetscape Street Light Standard and Details (CS5151)	568.00 - 568.06
Architectural Area Lighting, PR5 (CS5152)	569.00
Architectural Area Lighting, BD6 (CS5153)	570.00
Architectural Area Lighting, SL SR24 & SLA4/SLA4-2 (CS5154)	571.00
Cypress Ave. Lighting (CS5155)	
Base, Pole, Arm & Photocell	572.00
Arm & Photocell	572.01
King Luminaire & Photocell K203 Falconridge / Finial (CS 5156)	573.00
Wiring Diagram for Decorative Roadway Lighting,	
Options 1, 2, 4, 5, 6, & 7 (CS5157)	574.00
Transformer Rated Meters Diagram of Connections (CS5036)	575.00
Primary Service Guidelines (DS160)	576.00 - 576.03
Overhead 12KV Primary Service Metering	
Installation (CS2060)	577.00 - 577.06
New Construction Drawings (DS742)	
(Symbols for Proposed Facilities)	578.00
(Symbols for Existing Facilities)	578.01 - 578.03
Street Banner Specifications (CS5420)	579.00

VI. Miscellaneous

Standard Drafting Symbols	600.00
Density Reference Guidelines	601.00
Trench Backfill	610.00
Trench Resurfacing Details	611.00
Manhole Adjustment Detail	612.00
Joint Utility Trench Details	620.00
Utility Locations	622.00
Utility Service Box Location	623.00
Trench Location for Meandering Sidewalk	624.00
Trench Location for Non-meandering Sidewalk	624.10
Trench Location	624.20
Green Belt Access Details	630.00
Access Control Gate	631.00
Paved Path	635.00
Right-of-Way Fence Detail Pier Foundation	640.00
Postal Pad, NDCBU "Cluster Box," Concrete Pad without J-Bolts	650.00
Pipe Support Across Trenches	660.00
Landscape Construction Criteria	670.00
Concrete Divider	680.10
Sprinkler Detail (Type 1)	681.20
Sprinkler Detail (Type 2)	681.30
Sprinkler Detail (Type 3)	681.40
Quick Coupling Valve Detail	681.50
Remote Control Valve (RCV)	681.60
Irrigation Control Enclosure	681.70
Planting Detail	683.00
Tree Staking Detail	683.10
Ball Valve Detail	683.20
Landscape Irrigation Trenching Detail	683.40
Tree Root Barrier Detail	683.50
Slope Planting Detail	683.60
Irrigation Controller Detail (Type 1)	683.80
Sod Planting Detail	683.90

VII. Grading and Erosion Control

Grading Design Standards	700.00
Density Requirements in Streets	705.00
Declaration Regarding Embankments or Unclassified Fills	705.10

Temporary Straw Bale/Gravel Drop Inlet Sediment Barrier	751.00
Temporary Block and Gravel Drop Inlet Sediment Barrier	751.10
Temporary Silt Fence Drop Inlet Protection	751.20
Curb Inlet Sediment Barrier (Block and Gravel Type)	751.30
Curb Inlet Sediment Barrier (Sandbag Type)	751.40
Curb Inlet Sediment Barrier (Sandbag Type)	751.50
Inlet Gabions, Inlet Sediment Trap	751.60
Straw Bale Sediment Barrier	752.00
Semi-Pervious Straw Bale Sediment Barrier, with Sand and Gravel Spillway	752.10
Silt Fence	753.00
Straw Bale Dike	753.50
Rock Check Dam	754.00
Straw Bale Check Dam	754.20
Temporary Gravel Construction Entrance/Exit	756.00
Rolling Dip and Waterbar	758.00

1. ACCEPTABLE PIPE MATERIALS:

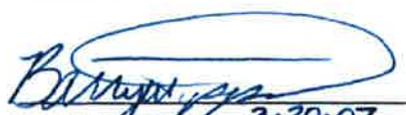
INTERCEPTORS (30"-60"):	HDPE, HIGH DENSITY POLYETHYLENE VCP, VITRIFIED CLAY PIPE (EXTRA STRENGTH) PVC SOLID WALL SDR 26 PER ASTM D-3034
TRUNK SEWER (15"-30"):	HDPE, HIGH DENSITY POLYETHYLENE VCP, VITRIFIED CLAY PIPE (EXTRA STRENGTH) PVC SOLID WALL SDR 26 PER ASTM D-3034
SEWER MAIN (8"-12"):	HDPE, HIGH DENSITY POLYETHYLENE VCP, VITRIFIED CLAY PIPE (EXTRA STRENGTH) PVC SOLID WALL SDR 26 PER ASTM D-3034
SEWER CONNECTIONS/LATERALS:	VCP, VITRIFIED CLAY PIPE (EXTRA STRENGTH)
(4" OR 6"):	ABS SOLID WALL PIPE SDR 23.5 ASTM D-2751 ABS SOLID WALL PIPE SDR 26 ASTM D-2751 ABS SOLID WALL PIPE (DWV SCHEDULE 40) PVC SOLID WALL PIPE SDR 23.5 ASTM D-3034 PVC SOLID WALL PIPE SDR 26 ASTM D-3034
PRESSURE SEWER CONNECTIONS/LATERALS:	HDPE, HIGH DENSITY POLYETHYLENE PVC SOLID WALL PIPE (SCHEDULE 80) PVC SOLID WALL PIPE (C900)

**FOR USE IN SEWER PIPELINES FOR WHICH COMMERCIAL OR INDUSTRIAL AREAS ARE TRIBUTARY,
SPECIFIC APPROVAL IS REQUIRED FOR PLASTIC PIPE.**

2. THE LARGEST PIPELINE THAT CAN BE TAPPED FOR A SEWER CONNECTION LATERAL IS 15 INCH UNLESS APPROVED BY THE CITY ENGINEER.
3. PRIOR TO ACCEPTANCE OF THE SEWER, THE PIPELINES SHALL BE PROPERLY CLEANED OF ALL DEBRIS, AIR TESTED, MANDRELLED WHEN APPLICABLE, AND TELEVIEWED. PROPER CLEANING TECHNIQUES AND DEVICES SHALL BE UTILIZED TO INSURE NO DEBRIS, SAND, GRAVEL OR SILT WILL ENTER THE EXISTING CITY SEWER SYSTEM.
4. THE DOWNSTREAM END OF ALL NEW PIPELINES SHALL BE PLUGGED UNTIL THE SEWER IS ACCEPTED BY THE CITY.
5. MANDREL TESTING SHALL BE REQUIRED FOR PVC PIPE PER STANDARD SPECIFICATIONS SECTION 306-1.2.12.
6. THE CITY OF REDDING MAY PRECLUDE THE USE OF PVC PIPE IN AREAS OF HIGH GROUNDWATER OR UNSTABLE GROUND CONDITIONS OR WHEN A TRENCH SHIELD IS TO BE USED.
7. PRIOR TO ACCEPTANCE ALL MANHOLE SHALL SUCCESSFULLY PASS A VACUUM TEST PER CITY OF REDDING STANDARDS 300.10.
8. MINIMUM DEPTH OF COVER:
 - △ A. 5.0 FEET OVER SEWER MAIN
 - B. 4.5 FEET OVER SEWER CONNECTIONS/LATERALS AT PROPERTY LINE (PER PAGE 301.00 & 622.00)
9. THE MINIMUM RADIUS CURVATURE FOR SEWER MAINS SHALL BE 1.5 TIMES THE MANUFACTURERS RECOMMENDATION. ALL CURVATURE OF FLEXIBLE PIPE SHALL BE MADE BY BENDING THE PIPE. NO DEFLECTION OF THE PIPE JOINTS SHALL BE ALLOWED. SHARPER CURVES MAY BE OBTAINED BY USING 3" COUPLINGS (18" MINIMUM BETWEEN COUPLINGS).
10. SEWER TAPS ON LIVE SEWER MAINS SHALL BE PERFORMED BY CITY OF REDDING CREW ONLY. CONTACT THE CITY SEWER DEPARTMENT TO SCHEDULE THE TAP.

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
△ 1	4-06	EDIT NOTES	APPROVED BY	SANITARY SEWER CONSTRUCTION CRITERIA
	DATE	REVISION	 CITY ENGINEER 3-20-07	

1. EACH MANHOLE SHALL BE TESTED IN THE PRESENCE OF THE CITY INSPECTOR FOR ACCEPTANCE PRIOR TO FINAL PAVING AND AFTER ALL BACKFILLING AND COMPACTION IS COMPLETED. INDUSTRY STANDARDS SUGGEST THAT THE MANHOLES BE PRETESTED IMMEDIATELY AFTER ASSEMBLY AND PRIOR TO BACKFILLING. SUCH PRETESTING IS FOR THE CONTRACTORS CONVENIENCE AND NEED NOT BE IN THE PRESENCE OF THE INSPECTOR.
2. ALL TESTING EQUIPMENT AND LABOR SHALL BE PROVIDED BY THE CONTRACTOR.
3. ALL PIPES ENTERING THE MANHOLE SHALL BE PLUGGED, TAKING CARE TO SECURELY BRACE THE PLUGS FROM BEING DRAWN INTO THE MANHOLE.
4. THE TEST HEAD SHALL BE PLACED AT THE INSIDE OF THE TOP OF THE CONE SECTION AND THE SEAL INFLATED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION.
5. A VACUUM OF 10 INCHES OF MERCURY SHALL BE DRAWN AND THE VACUUM PUMP SHUT OFF. WITH THE VALVES CLOSED, THE TIME SHALL BE MEASURED FOR THE VACUUM TO DROP TO NINE INCHES. THE MANHOLE SHALL PASS IF THE TIME IS GREATER THAN 60 SECONDS FOR 48" DIAMETER MANHOLE, 75 SECONDS FOR 60", AND 90 SECONDS FOR 72".
6. IF THE MANHOLE FAILS THE INITIAL TEST, NECESSARY REPAIRS SHALL BE MADE WITH A NONSHRINK GROUT. RETESTING SHALL PROCEED UNTIL SATISFACTORY TEST IS OBTAINED. NO GROUT SHALL BE PLACED IN THE HORIZONTAL JOINTS BEFORE TESTING.

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
			APPROVED BY	SPECIFICATIONS FOR VACUUM TESTING OF MANHOLES
MARK	DATE	REVISION	 CITY ENGINEER 3-20-07	

1. DESIGN OF SEWER LINES SHALL BE BASED UPON AN AVERAGE DAILY FLOW OF 300 GALLONS PER HOUSEHOLD EQUIVALENT PER DAY PLUS 1,500 GALLONS PER ACRE PER DAY FOR STORM WATER AND GROUNDWATER INFILTRATION. PEAKING FACTORS SHALL BE PER CITY OF REDDING MASTER PLAN.
2. MAINS AND COLLECTOR SEWER LINES SHALL BE DESIGNED WITH A MINIMUM MANNING COEFFICIENT OF $N=0.013$.
3. THE MINIMUM SLOPE ALLOWED FOR SEWER PIPELINES SHALL BE:

8"	$s=0.0040$
10"	$s=0.0030$
12"	$s=0.0025$

THE MAX. LENGTH OF ANY DEAD END PIPELINE SHALL BE 250 FEET, OR LESS, SHALL HAVE A MIN. SLOPE OF $s=.0040$ AND NO MORE THAN FOUR SERVICE CONNECTIONS.

4. MINIMUM GRADES SHALL NOT BE LESS THAN THOSE REQUIRED TO PRODUCE A VELOCITY OF TWO (2.0) FEET PER SECOND WHEN THE SEWER SIZE SELECTED IS FLOWING FULL OR HALF FULL. PIPE SIZES SHALL NOT BE ARBITRARILY INCREASED IN ORDER TO TAKE ADVANTAGE OF A FLATTER GRADE.
5. THE MINIMUM SIZE SEWER MAIN SHALL BE 8-INCH.
6. MINIMUM DEPTH OF COVER:



- A. 5.0 FEET OVER SEWER MAIN
- B. 4.5 FEET OVER SEWER CONNECTIONS/LATERALS AT PROPERTY LINE (STANDARD PAGE 301.00)

7. MANHOLE SPACING:



- | | | |
|---|---|--------------------|
| A. SEWERS 8 TO 12 INCH | : | 500 FEET MAXIMUM |
| B. SEWERS 15 TO 30 INCH | : | 700 FEET MAXIMUM |
| C. SEWERS 36 INCH AND LARGER | : | 1,000 FEET MAXIMUM |
| D. AT ALL ANGLE POINTS IN HORIZONTAL AND VERTICAL ALIGNMENT | | |

8. DROP MANHOLES WILL NOT BE PERMITTED UNLESS APPROVED BY THE CITY ENGINEER.
9. MAXIMUM DEPTH OF COVER:

SEWER MAINS SHALL NOT BE DESIGNED WITH COVER EXCEEDING 15 FEET FROM FINISH SURFACE GRADE, UNLESS SPECIAL PERMISSION IS RECEIVED FROM THE CITY ENGINEER.

10. NO PRIVATE FORCE MAINS WILL BE ALLOWED IN THE CITY RIGHT-OF-WAY UNLESS PERMISSION IS RECEIVED FROM THE CITY ENGINEER.

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
	4-06	EDIT STD	APPROVED BY	SANITARY SEWER DESIGN CRITERIA
	MARK	DATE	REVISION	

PVC SEWER PIPE AND FITTINGS FOR GRAVITY SEWERS SHALL BE MADE FROM ALL NEW, RIGID, UNPLASTICIZED POLYVINYL CHLORIDE IN ACCORDANCE WITH ASTM STANDARD SPECIFICATION D 3034 WITH A WALL THICKNESS OF AT LEAST SDR 26. SDR VALUES AND PVC MATERIAL REQUIREMENTS SHALL BE PER SECTION 207-17 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK). JOINTS SHALL CONSIST OF AN INTEGRAL BELL AND RUBBER RING ELASTOMERIC SEAL (GASKETS) MEETING THE REQUIREMENTS OF ASTM D3212 AND ASTM F 477. THE PIPE AND FITTINGS SHALL BE ASSEMBLED WITH THE PIPE MANUFACTURER'S RECOMMENDED LUBRICANT.

ALL PIPE SHALL HAVE A "HOME" MARK TO INDICATE FULL PENETRATION OF THE SPIGOT WHEN THE JOINT IS MADE.

FOR USE IN SEWER PIPELINES FOR WHICH COMMERCIAL OR INDUSTRIAL AREAS ARE TRIBUTARY, SPECIFIC APPROVAL IS REQUIRED FOR PLASTIC PIPE.

ALL PVC PIPELINES ENTERING OR LEAVING A CONCRETE STRUCTURE SHALL HAVE A STANDARD MANHOLE GASKET, AS RECOMMENDED BY THE PIPE MANUFACTURER, FIRMLY CLAMPED AROUND THE PIPE EXTERIOR AND CAST INTO THE STRUCTURE BASE OR NEAR THE STRUCTURE WALL CENTER AS A WATER STOP.

INSTALLATION, BEDDING, AND BACKFILL REQUIREMENTS FOR PVC SEWER PIPE SHALL BE IN ACCORDANCE WITH ASTM D 2321 AS MODIFIED BY CITY OF REDDING STANDARD PAGE 610.00.

AFTER PIPE INSTALLATION AND PLACEMENT AND COMPACTION OF BACKFILL, BUT PRIOR TO PLACEMENT OF PAVEMENT, ALL PIPELINES SHALL BE CLEANED AND THEN SEPERATELY MANDRELLED TO MEASURE FOR OBSTRUCTIONS. OBSTRUCTIONS SHALL INCLUDE, BUT NOT BE LIMITED TO DEFLECTIONS, JOINT OFFSETS, AND SEWER CONNECTIONS/LATERAL PIPE INTRUSIONS. A CONTRACTOR-SUPPLIED RIGID MANDREL MEETING THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS SECTION 306-1.2.12 WITH AN EFFECTIVE CIRCULAR CROSS-SECTION HAVING A DIAMETER OF AT LEAST 95 PERCENT OF THE MAXIMUM AVERAGE INSIDE DIAMETER, PER ASTM 3034, SHALL BE PULLED THROUGH THE PIPE BY HAND NOT SOONER THAN 30 DAYS AFTER COMPLETION OF PLACEMENT AND DENSIFICATION OF BACKFILL. THE MINIMUM EFFECTIVE LENGTH OF THE MANDREL SHALL BE EQUAL TO ITS NOMINAL DIAMETER. OBSTRUCTIONS DUE TO DEFLECTION SHALL BE CORRECTED BY REPLACEMENT OF THE OVER-DEFLECTED PIPE; RE-ROUNDING IN PLACE WILL NOT BE ALLOWED.

IF A SECTION OF PIPELINE FAILS TO MEET THE MANDREL TEST AND IS REPAIRED AND FAILS A SECOND TIME, IT SHALL BE REPLACED WITH AN APPROVED RIGID OR SEMI-RIGID PIPE MATERIAL AND CONNECTED WITH FLEXIBLE RUBBER COUPLINGS WITH STAINLESS STEEL CLAMPS.

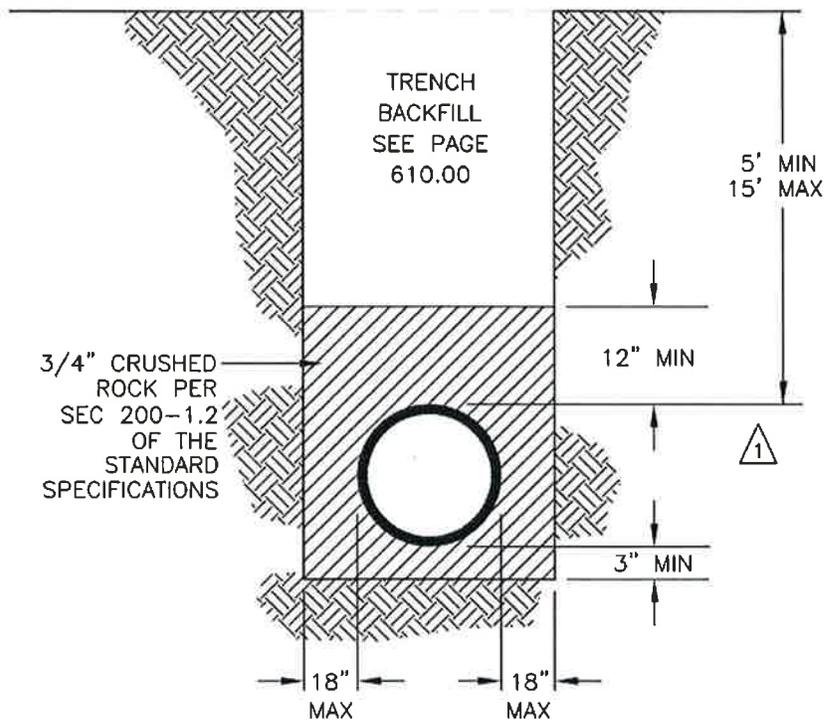
PVC PLASTIC SEWER PIPELINE MAY BE MANDREL TESTED AGAIN BEFORE THE TWELFTH MONTH FOLLOWING ACCEPTANCE AT THE DISCRETION OF THE MUNICIPAL UTILITIES DEPARTMENT. THE CONTRACTOR SHALL REPAIR ANY OBSTRUCTIONS CAUSED BY EXCESS DEFLECTION.

ALL DEFLECTION TESTING SHALL BE WITNESSED BY THE **CITY INSPECTOR** AND BE CONDUCTED BY THE CONTRACTOR'S FORCES AND AT THE CONTRACTOR'S EXPENSE.

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
	4-06	EDIT STD	APPROVED BY 	POLYVINYL CHLORIDE (PVC) SEWER PIPE
MARK	DATE	REVISION	CITY ENGINEER 3-20-07	

FLEXIBLE

PVC SDR 26 (8 INCH-15 INCH)



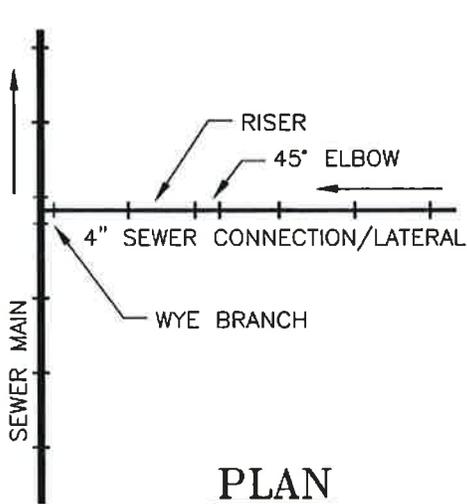
NOTES:

1. ALL FLEXIBLE PLASTIC SEWER MAINS SHALL BE MANDREL TESTED WITH 5% MAX DEFLECTION PRIOR TO TELEVIEWING. THE CONTRACTOR SHALL REPAIR ANY SEWER MAIN OBSTRUCTION CAUSED BY EXCESS DEFLECTION DUE TO THE USE OF SLEDS OR BOXES.
1. SEWER CONNECTIONS/LATERALS TO HAVE THE SAME BEDDING REQUIREMENTS AS SEWER MAINS.

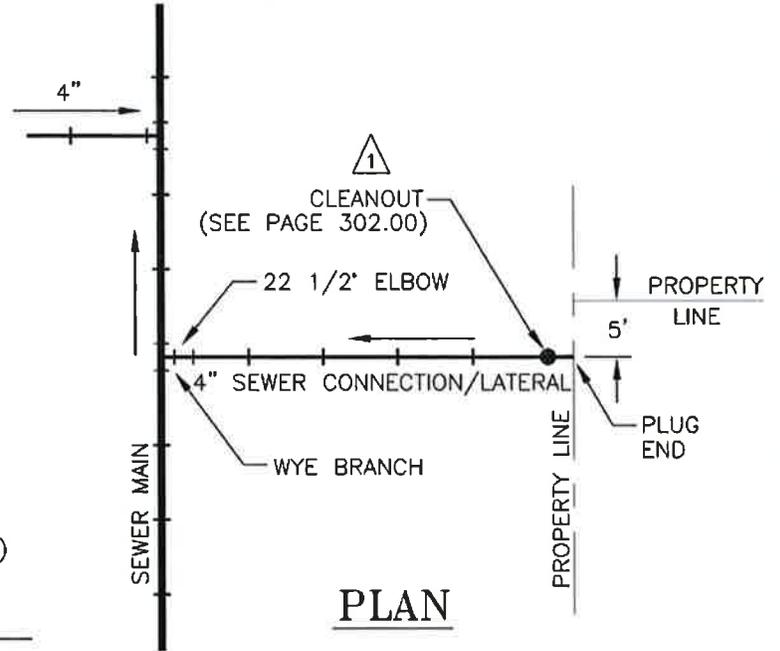
DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
1	4-06	EDIT NOTES & DETAIL	APPROVED BY	BEDDING FOR PLASTIC SEWER PIPE
	DATE	REVISION	<i>[Signature]</i> CITY ENGINEER 3-20-07	

NOTES:

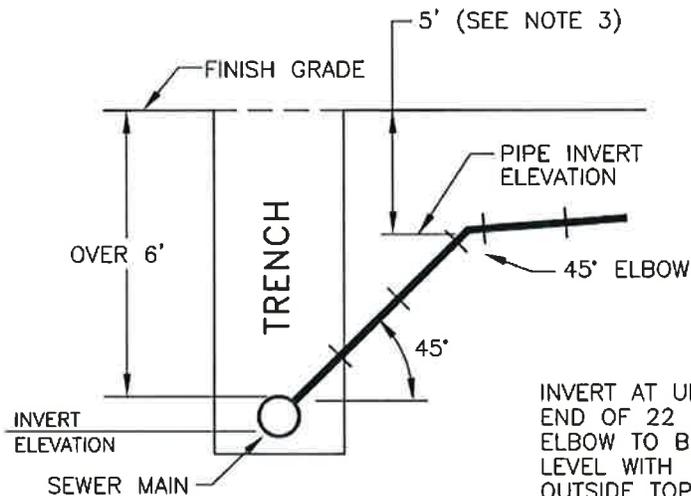
1. 90° TAPS ARE ACCEPTABLE.
2. RISERS SHALL BE INSTALLED WHEN DEPTH OF SEWER MAIN EXCEEDS 6 FT.
3. VERTICAL INSTALLATIONS (STOVEPIPING) WILL NOT BE ALLOWED.
4. WHERE SEWER MAIN IS IN AN EASEMENT, INSTALL A TEE BRANCH AND PLUG.
5. PLACE 1/2" OR 5/8" PLASTIC CONDUIT (SCRAP) UPRIGHT AT PROPERTY LINE OVER END OF SEWER CONNECTION/LATERAL.
6. SEWER TAPS ON LIVE SEWER MAINS SHALL BE PERFORMED BY CITY OF REDDING CREW ONLY. CONTACT THE CITY INSPECTOR TO SCHEDULE TAP.
7.  STAMP "S" INTO CURB AT LOCATION OF LATERAL.



PLAN

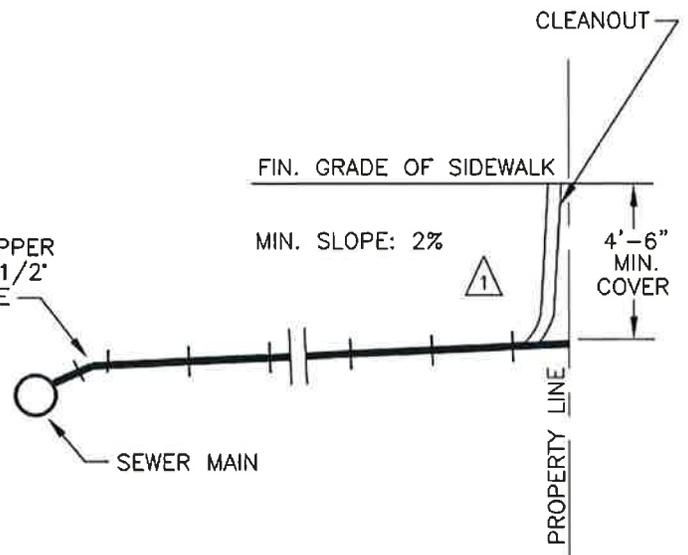


PLAN



ELEVATION

INVERT AT UPPER END OF 22 1/2' ELBOW TO BE LEVEL WITH OUTSIDE TOP OF SEWER MAIN

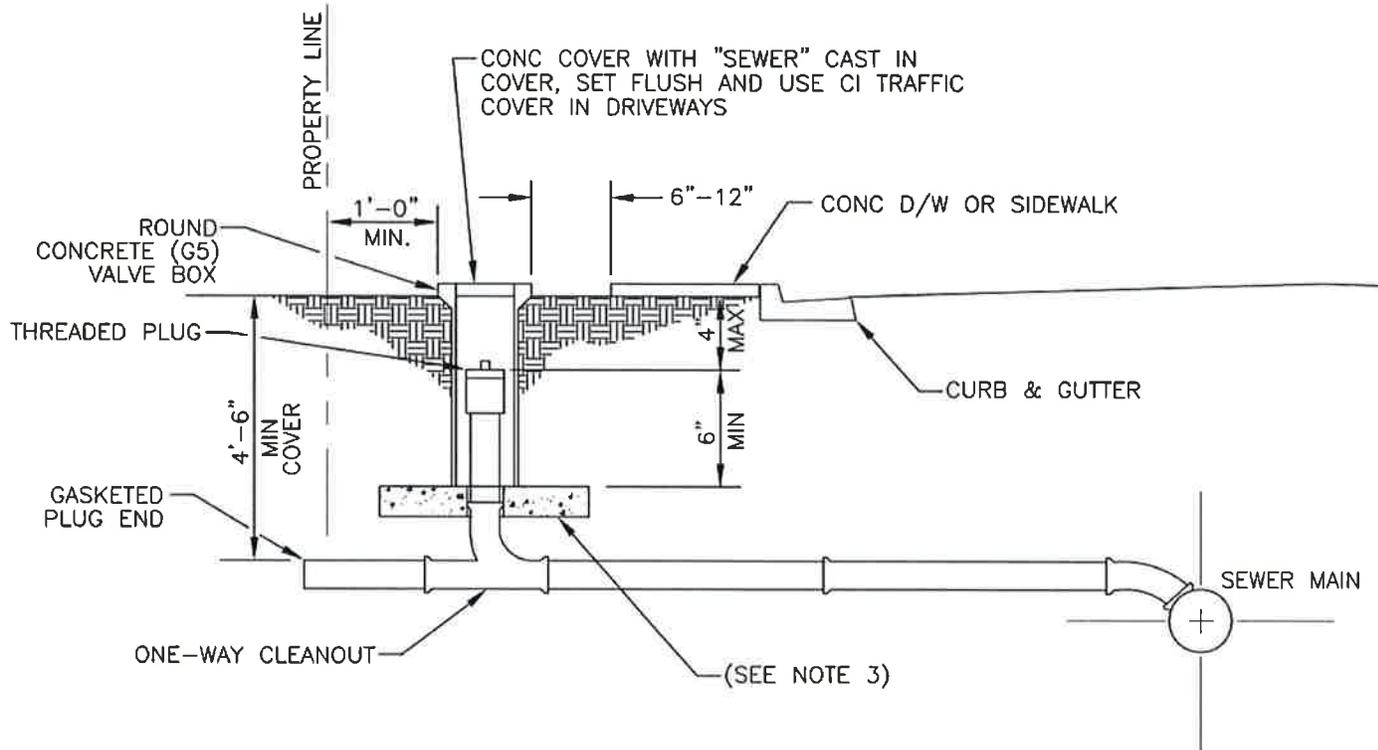


TYP. HOUSE CONNECTION

TYP. HOUSE CONNECTION RISER

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
	4-06	EDIT STD	APPROVED BY	
	MARK	DATE	REVISION	 CITY ENGINEER 3-20-07
			TYPICAL HOUSE CONNECTION	

THIS STANDARD IS APPLICABLE TO ALL NEW RESIDENTIAL CONSTRUCTION.



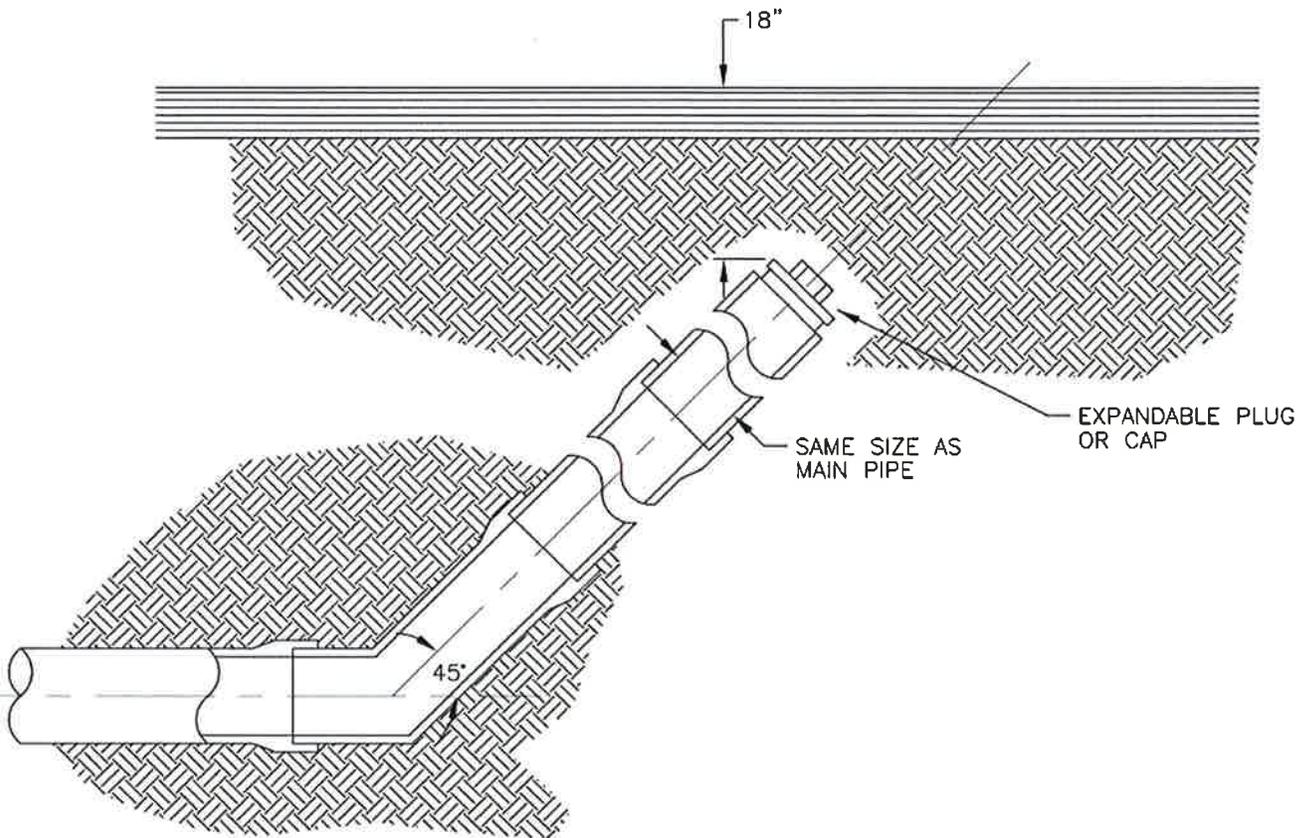
NOTES:

1. WHERE CONC D/W OR SIDEWALK EXISTS, LATERAL CLEANOUT SHALL BE PLACED AT THE BACK OF CONC. WITH 6"-12" CLR BETWEEN CONC AND CLEANOUT BOX. FOR ALL OTHER SITUATIONS, CLEANOUT SHALL BE PLACED 1' OFF THE PROPERTY LINE OR AS SHOWN ON THE PLANS.
2. ONCE THE NEW SEWER MAIN AND LATERALS HAVE BEEN TESTED, ACCEPTED AND APPROVED TO BE PUT ON-LINE, CONTRACTOR SHALL CONNECT THE BUILDING LATERAL TO THE NEW CLEANOUT.
3. WHERE LATERAL CLEANOUT IS LOCATED IN DRIVEWAYS OR OTHER AREAS SUBJECT TO VEHICULAR TRAFFIC, INSTALL A 4" THICK BY 24" SQ. PRECAST CONC BLOCK W/ 6" DIA. HOLE IN CENTER OVER THE CLEANOUT PIPE AS SHOWN.

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
			APPROVED BY	ONE-WAY LATERAL CLEANOUT
	4-06	NEW STD		
MARK	DATE	REVISION	CITY ENGINEER 3-20-07	

NOTES:

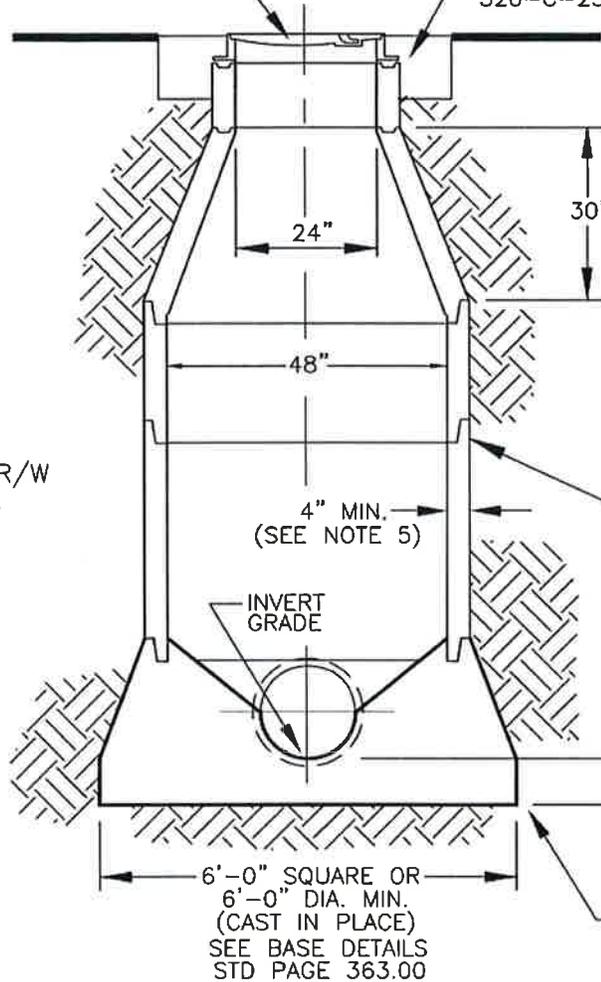
1. ALL WORK SHALL CONFORM TO THE CITY OF REDDING CONSTRUCTION STANDARDS AND STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.



DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
		APPROVED BY		<h2>SEWER MAIN TERMINATION</h2>
		 CITY ENGINEER 3-20-07		
MARK	DATE	REVISION		

STD. MANHOLE FRAME AND COVER
(PAGE 364.20 OR PAGE 364.30)
FINISH GRADE ADJUSTMENT (PAGE 612.00)

CONCRETE COLLAR
520-C-2500



BACKFILL SHALL BE
CLASS 'A' IN STREET R/W
AND CLASS 'C' IN ALL
OTHER LOCATIONS,
COMPACTION PER STD
PAGE 610.00

PRECAST REINFORCED
CONCRETE RISER SECTIONS.
BED EACH SECTION IN
FLEXIBLE JOINT SEALANT
(SEE NOTE 10)

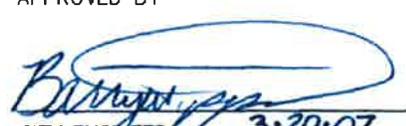
8" MIN.

POUR AGAINST UNDISTURBED
SOIL OR FORM. FOR PRECAST
SEE NOTE 9.

6'-0" SQUARE OR
6'-0" DIA. MIN.
(CAST IN PLACE)
SEE BASE DETAILS
STD PAGE 363.00

NOTES:

1. WHERE MANHOLES ARE NOT LOCATED IN STREETS OR TRAVELED WAY PLACE TOP OF MANHOLE 12" TO 24" ABOVE EXISTING GROUND UNLESS OTHERWISE SHOWN ON PLANS.
2. ALL CONCRETE USED IN MANHOLE SHALL BE PER PAGE 100.00.
3. ECCENTRIC TYPE CONC. CONE SECTION SHALL BE INSTALLED IN PLACE OF CONCENTRIC CONES WHEN DIRECTED BY THE ENGINEER. WHEN ECCENTRIC CONE SECTION IS INSTALLED, THE VERTICAL WALL SHALL BE INSTALLED DOWNSTREAM.
4. PIPE MAY BE LAID THROUGH A LINE MANHOLE EXCEPT WHEN A GRADE OR LINE CHANGE OCCURS. MINIMUM DROP THROUGH ALL OTHER MANHOLES SHALL BE THE DIFFERENCE IN DIAMETERS OF THE UPSTREAM AND THE DOWNSTREAM PIPES OR 0.20 FT. WHICH EVER IS GREATER.
5. PRECAST REINFORCED CONCRETE PIPE SEGMENTS SHALL CONFORM TO ASTM DESIGNATION: C478-70 4" MIN. THICKNESS.
6. PRECAST REINFORCED CONCRETE MANHOLE RISER SECTIONS SHALL BE FORMED WITH MALE AND FEMALE ENDS.
7. WHEN CLAY PIPE IS INSTALLED PIPE SECTION SHALL NOT EXTEND MORE THAN 12" FROM SIDE OF MANHOLE.
8. WHEN ABS PIPE IS USED, THE BARREL OF THE PIPE SHALL BE PRE-PRIMED WITH SOLVENT AND SPRINKLED WITH SAND IN ORDER TO PROVIDE A WATERTIGHT SEAL BETWEEN THE PIPE AND CONCRETE. THIS REQUIREMENT IS IN ADDITION TO THE USE OF THE WATERSTOP.
9. PRECAST CONCRETE BASES MANUFACTURED BY COOK CONC. PRODUCTS OR TEICHERT AGGREGATE OR EQUAL MAY BE USED IN LIEU OF POURED IN-PLACE BASES. SEE STD PAGE 363.00
10. ALL SEGMENTS SHALL BE BEDDED IN FLEXIBLE JOINT SEALANT:
 - A DOUBLE BEAD SHALL BE USED IF SEALANT IS 3/4-INCH OR 1-INCH DIAMETER.
 - A SINGLE BEAD SHALL BE USED IF THE SEALANT IS 1 1/4-INCH OR GREATER DIAMETER.
11. 6'-0" MANHOLES ARE TO BE CONSTRUCTED AT THOSE LOCATIONS WHERE PIPE SIZE IS 30" OR LARGER IN DIAMETER.

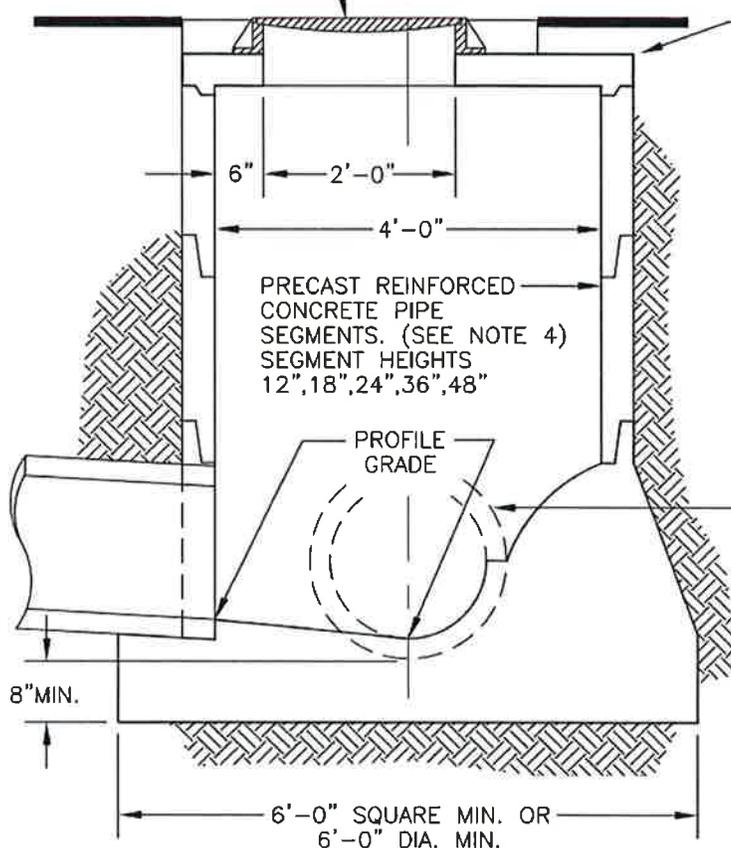
DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
MARK	4-06	MOD. NOTE	APPROVED BY	<p style="text-align: center;">TYPE 1 4 FT. SEWER MANHOLE</p>
	DATE	REVISION	 CITY ENGINEER 3-20-07	

NOTES:

1. WHERE MANHOLES ARE NOT LOCATED IN STREETS, PLACE TOP OF MANHOLE COVER 12" TO 24" ABOVE FINISHED GRADE UNLESS OTHERWISE SHOWN ON PLANS.
2. ALL CONCRETE USED IN MANHOLE BASE SHALL BE PER PAGE 100.00.
3. PIPE MAY BE LAID THROUGH A "LINE" MANHOLE EXCEPT WHERE A GRADE CHANGE OCCURS. MINIMUM DROP THROUGH ALL OTHER MANHOLES SHALL BE THE DIFFERENCE IN DIAMETER IN THE UPSTREAM AND DOWNSTREAM PIPES OR 0.20 FT., WHICHEVER IS GREATER.
4. PRECAST REINFORCED CONCRETE MANHOLE SECTION SHALL CONFORM TO ASTM DESIGNATION C478 (6" MIN. WALL THICKNESS). SECTIONS SHALL HAVE TONGUE AND GROOVE JOINTS.
5. ALL MANHOLE SEGMENTS SHALL BE BEDDED IN FLEXIBLE JOINT SEALANT (KENT-SEAL OR EQUAL). A DOUBLE BEAD SHALL BE USED IF SEALANT IS 3/4-INCH OR 1-INCH DIAMETER. AND A SINGLE BEAD IF SEALANT IS 1 1/4-INCH OR GREATER IN DIAMETER.
- △ 6. 6'-0" MANHOLES ARE TO BE CONSTRUCTED AT THOSE LOCATIONS WHERE PIPE SIZE IS 30" OR LARGER IN DIAMETER.

MANHOLE FRAME AND COVER (STD PAGE 364.20 OR PAGE 364.30)
FINISH GRADE ADJUSTMENT (STD. PAGE 612.00)

CENTERLINE MANHOLE



REINFORCED CONCRETE LID SHALL MEET AASHTO HS20-44 REQUIREMENTS. APPROVAL OF THE LID DESIGN BY THE CITY ENGINEER MUST BE OBTAINED PRIOR TO INSTALLATION.

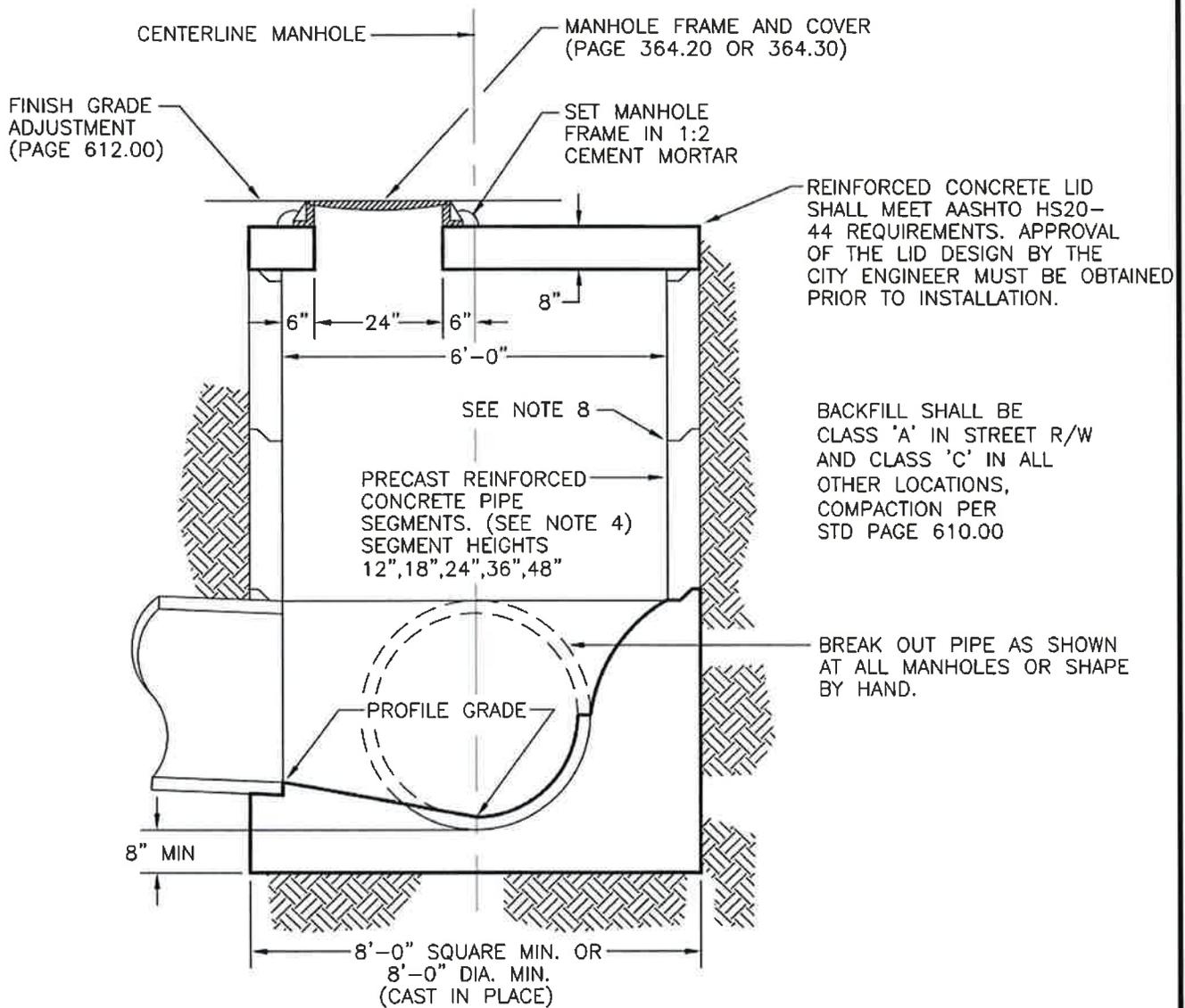
BACKFILL SHALL BE CLASS 'A' IN STREET R/W AND CLASS 'C' IN ALL OTHER LOCATIONS, COMPACTION PER STD PAGE 610.00

BREAK OUT PIPE AS SHOWN AT ALL MANHOLES OR SHAPE BY HAND.

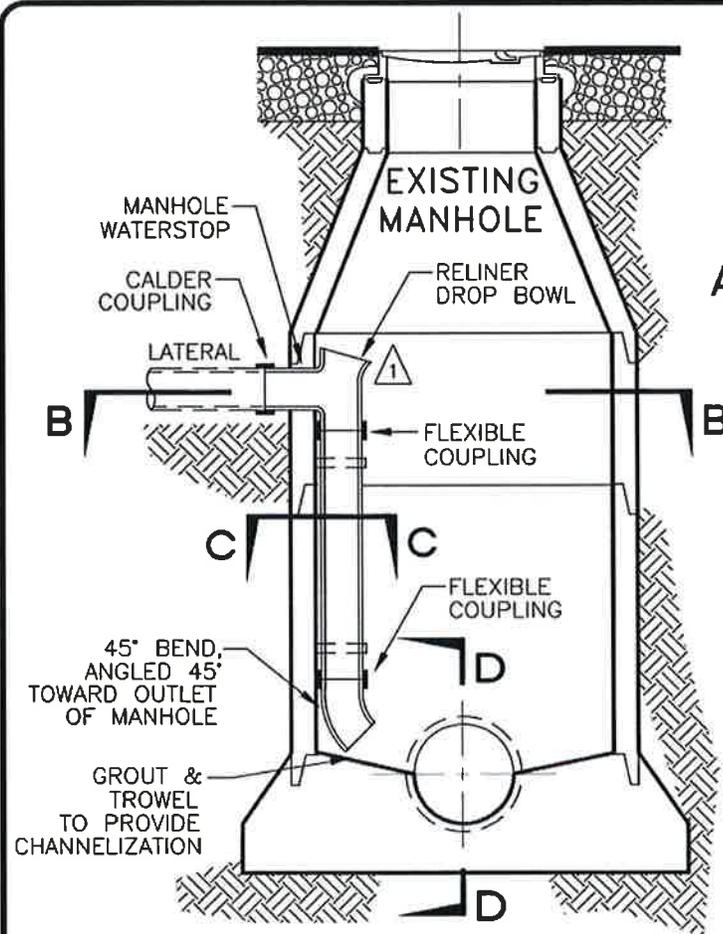
DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
△	4-06	ADDED NOTE	APPROVED BY  CITY ENGINEER 3-20-07	
	MARK	DATE	REVISION	TYPE 2 4 FT. SEWER MANHOLE

NOTES:

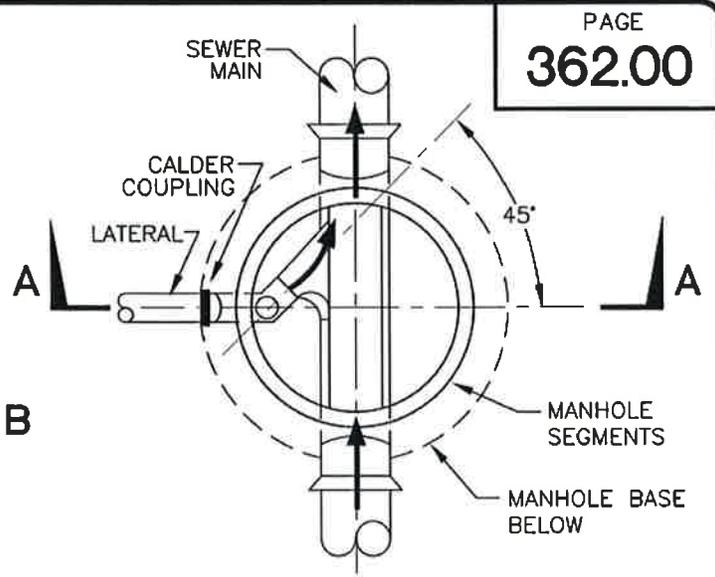
1. WHERE MANHOLES ARE NOT LOCATED IN STREETS, PLACE TOP OF MANHOLE COVER 12" TO 24" ABOVE FINISHED GRADE UNLESS OTHERWISE SHOWN ON PLANS.
2. ALL CONCRETE USED IN MANHOLE BASE SHALL BE PER PAGE 100.00.
3. PIPE MAY BE LAID THROUGH A "LINE" MANHOLE EXCEPT WHERE A GRADE CHANGE OCCURS. MINIMUM DROP THROUGH ALL OTHER MANHOLES SHALL BE THE DIFFERENCE IN THE UPSTREAM PIPES AND THE DOWNSTREAM PIPE OR 0.17 FT. WHICHEVER IS GREATER.
4. PRECAST REINFORCED CONCRETE MANHOLE SECTION SHALL CONFORM TO ASTM DESIGNATION C478 (6" MIN. WALL THICKNESS). SECTIONS SHALL HAVE TONGUE AND GROOVE JOINTS.
5. ALL MANHOLE SEGMENTS SHALL BE BEDDED IN FLEXIBLE JOINT SEALANT (KENT-SEAL OR EQUAL). A DOUBLE BEAD SHALL BE USED IF SEALANT IS 3/4-INCH OR 1-INCH DIAMETER. AND A SINGLE BEAD IF SEALANT IS 1 1/4-INCH OR GREATER IN DIAMETER.
6. 6'-0" MANHOLES ARE TO BE CONSTRUCTED AT THOSE LOCATIONS WHERE PIPE SIZE IS 30" OR LARGER IN DIAMETER.
7. ALL MANHOLE SEGMENTS SHALL BE BEDDED IN FLEXIBLE JOINT SEALANT. A DOUBLE BEAD SHALL BE USED IF SEALANT IS 3/4-INCH OR 1-INCH DIAMETER. AND A SINGLE BEAD IF SEALANT IS 1 1/4-INCH OR GREATER IN DIAMETER.



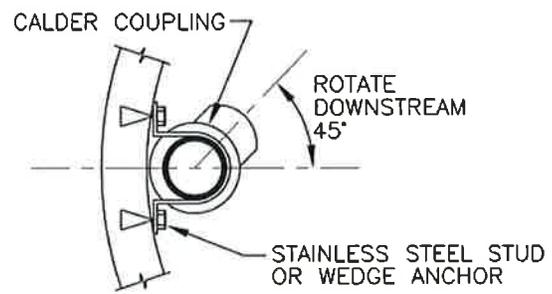
DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
		APPROVED BY		<p>STANDARD 6 FT. SEWER MANHOLE</p>
		 CITY ENGINEER 3-20-07		
MARK	DATE	REVISION		



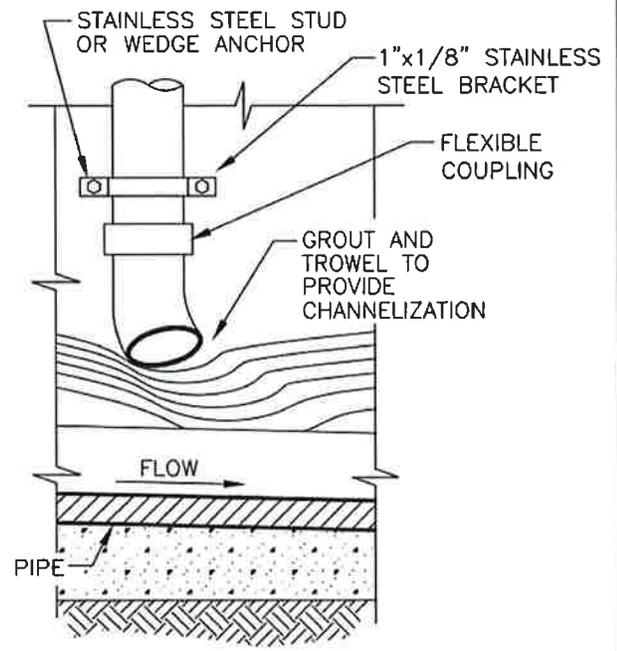
SECTION A-A



SECTION B-B



SECTION C-C

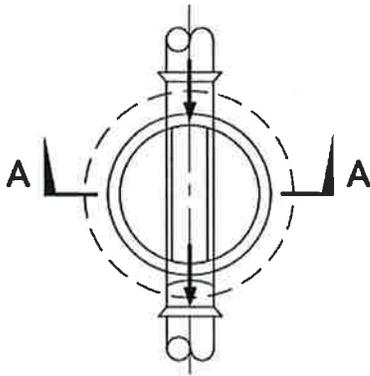


SECTION D-D

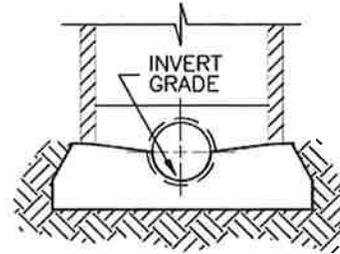
NOTES:

1. INSIDE DROP MANHOLES ALLOWED WHEN THE GRADE DIFFERENCE IS 6 FT. OR MORE ON EXISTING FACILITIES AND WITH SPECIAL APPROVALS BY THE CITY ENGINEER.
2. THIS TYPE OF DROP MANHOLE CONSTRUCTION MAY BE UTILIZED ONLY WHEN 8 INCH OR SMALLER PIPE IS USED.
3. VERTICAL PIPE SHALL BE 6 INCH FOR BOTH 6 INCH AND 8 INCH INCOMING LINES. 4 INCH VERTICAL PIPE MAY BE USED FROM 4 INCH INCOMING LINES.
4. ABS SCH 40 DWV PIPE SHALL BE USED IN THE DROP SECTION OF THE MANHOLE.
5. A CALDER COUPLING OR EQUAL SHALL BE USED ON THE JOINT IMMEDIATELY OUTSIDE THE MANHOLE.
6. A MINIMUM OF ONE STAINLESS STEEL BRACKET PER JOINT OF PIPE SHALL BE USED. A MINIMUM OF TWO BRACKETS SHALL BE USED PER MANHOLE INSTALLATION. BRACKET TO BE 1" X 1/8" STAINLESS STEEL ANCHORS PER BRACKET.
7. BACKFILL SHALL BE CLASS 'A' IN STREET R/W AND CLASS 'B' IN ALL OTHER LOCATIONS. COMPACTION PER STD PAGE 610.00.

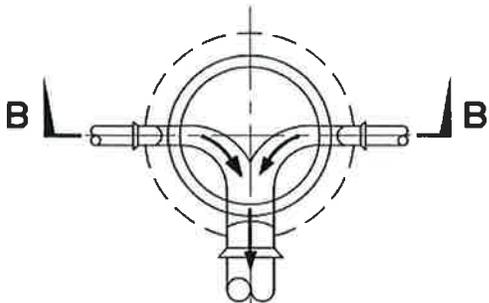
DWG DATE: 2-03	SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
△	4-06	EDIT NOTES & DETAIL	APPROVED BY CITY ENGINEER 3-20-07
MARK	DATE	REVISION	4 FT. INSIDE DROP MANHOLE EXISTING MANHOLE ONLY



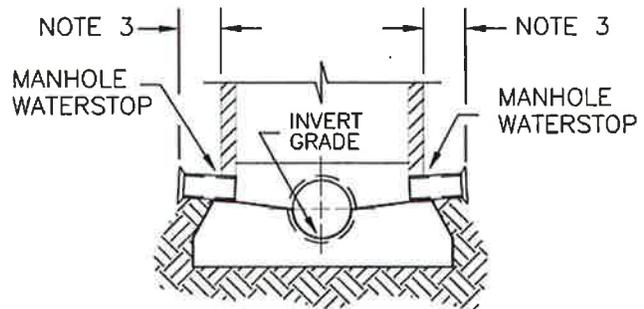
PLAN



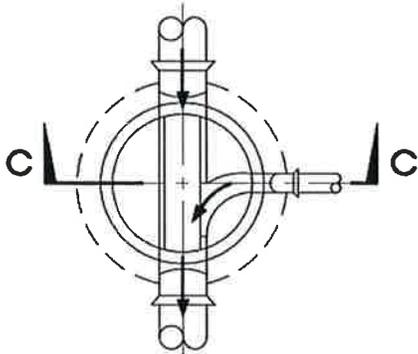
SECTION A-A



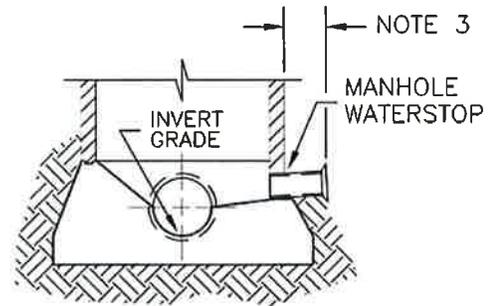
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SECTION B-B



PLAN



SECTION C-C

NOTES:

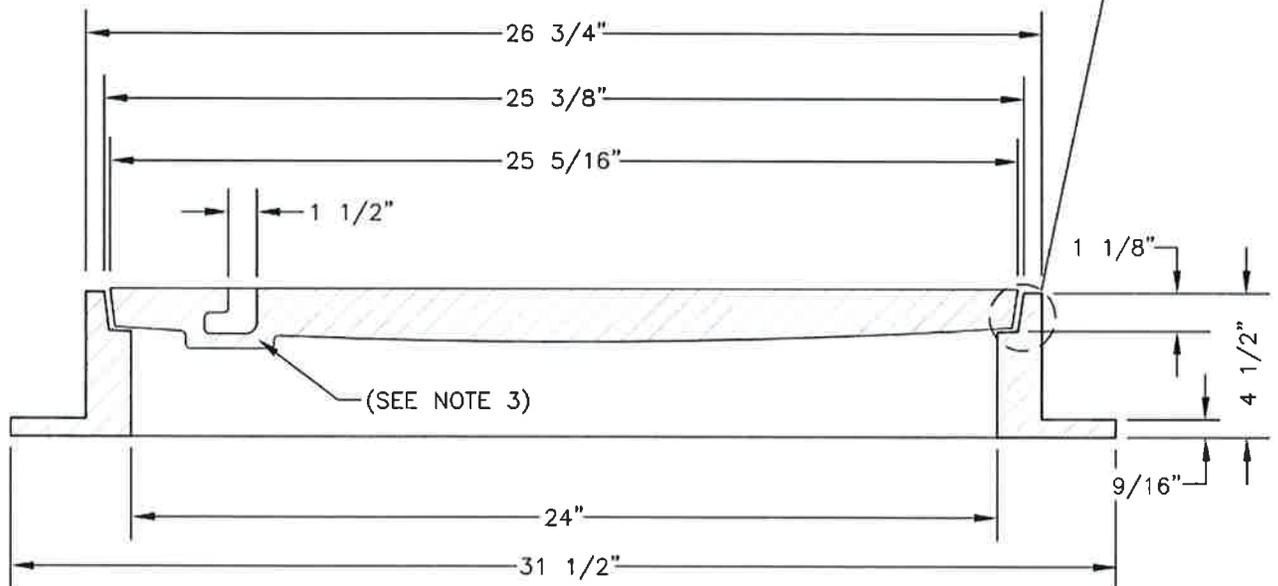
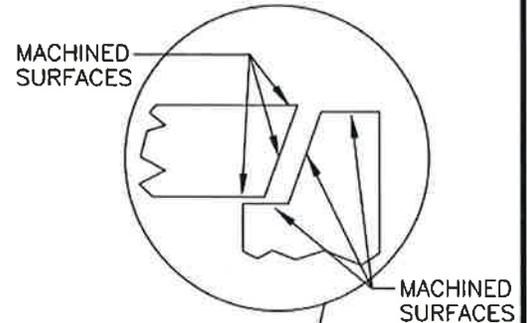
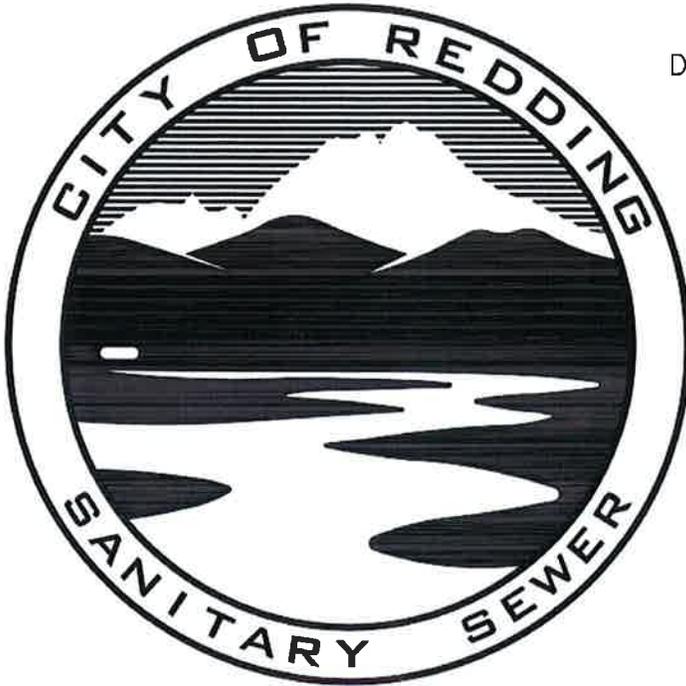
1. ALL CONCRETE USED IN MANHOLE SHALL BE PER PAGE 100.00.
2. PIPE MAY BE LAID THROUGH A LINE MANHOLE EXCEPT WHEN A GRADE OR LINE CHANGE OCCURS. MINIMUM DROP THROUGH ALL OTHER MANHOLES SHALL BE THE DIFFERENCE IN DIAMETERS OF THE UPSTREAM AND THE DOWNSTREAM PIPES OR 0.20 FT. WHICHEVER IS GREATER.
3. WHEN CLAY PIPE IS INSTALLED, PIPE SECTION SHALL NOT EXTEND MORE THAN 12" FROM SIDE OF MANHOLE.
4. WHEN ABS PIPE IS USED, THE BARREL OF THE PIPE SHALL BE PRE-PRIMED WITH SOLVENT AND SPRINKLED WITH SAND IN ORDER TO PROVIDE A WATERTIGHT SEAL BETWEEN THE PIPE AND CONCRETE. THIS REQUIREMENT IS IN ADDITION TO THE USE OF THE WATERSTOP.
5. PRECAST CONCRETE BASES MANUFACTURED BY COOK CONCRETE PRODUCTS OR TEICHERT AGGREGATE OR EQUAL MAY BE USED IN LIEU OF POURED IN-PLACE BASES.

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
		APPROVED BY		<p>MANHOLE BASE DETAIL</p>
		 CITY ENGINEER 3-20-07		
MARK	DATE	REVISION		

ACCEPTABLE
MANUFACTURERS

DOMESTIC MANUFACTURER ONLY

SEE CITY OF REDDING
MUNICIPAL UTILITIES 
SEWER DEPARTMENT
(530) 224-6069



NOTES:

1. FRAME AND COVER FULLY MACHINED ON SURFACES AS SHOWN TO PROVIDE NO-ROCK, NO-STICK FIT.
2. STANDARD COVER MARKINGS AVAILABLE: "SANITARY SEWER". CASTING SHALL BE ORDERED WITH THE APPROPRIATE MARKING.
-  3. CASTING SHALL BE FURNISHED WITH CLOSED PICKHOLES.
4. ALL PARTS OF ACCEPTABLE ASSEMBLIES ARE INTERCHANGEABLE.

DWG DATE: 2-03

SCALE: NTS

CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT



4-06

EDIT NOTES

APPROVED BY

CITY ENGINEER

3-20-07

**24 INCH
SEWER MANHOLE
COVER ASSEMBLY**

(STREET TYPE)

MARK

DATE

REVISION



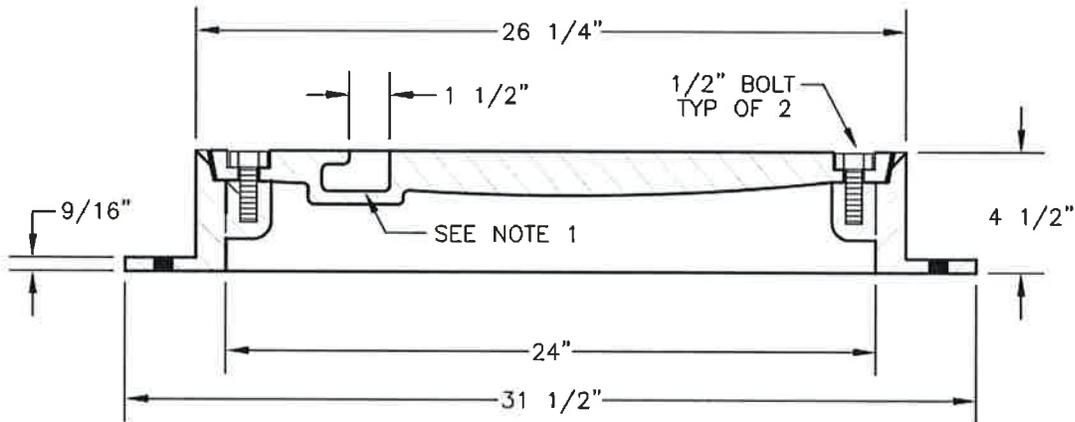
Holes for 1/2" DIA
RED HEAD MULTI SET
DROP-IN ANCHORS OR
APPROVED EQUAL
MIN. 2 1/2" EMBEDMENT
(TYP. OF 4)

MARKING ON ALL SANITARY
SEWER COVERS SHALL READ
"SANITARY SEWER"

ACCEPTABLE
MANUFACTURERS

DOMESTIC MANUFACTURER ONLY

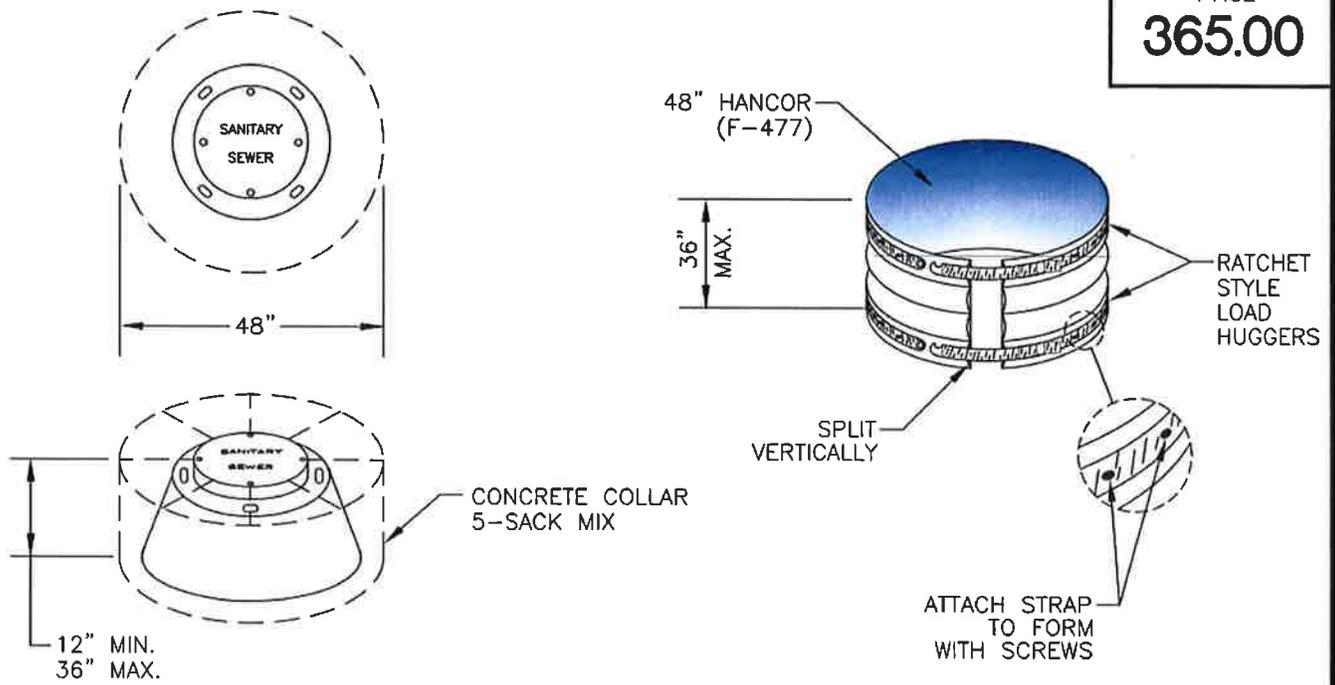
SEE CITY OF REDDING
MUNICIPAL UTILITIES $\triangle 1$
SEWER DEPARTMENT
(530) 224-6069



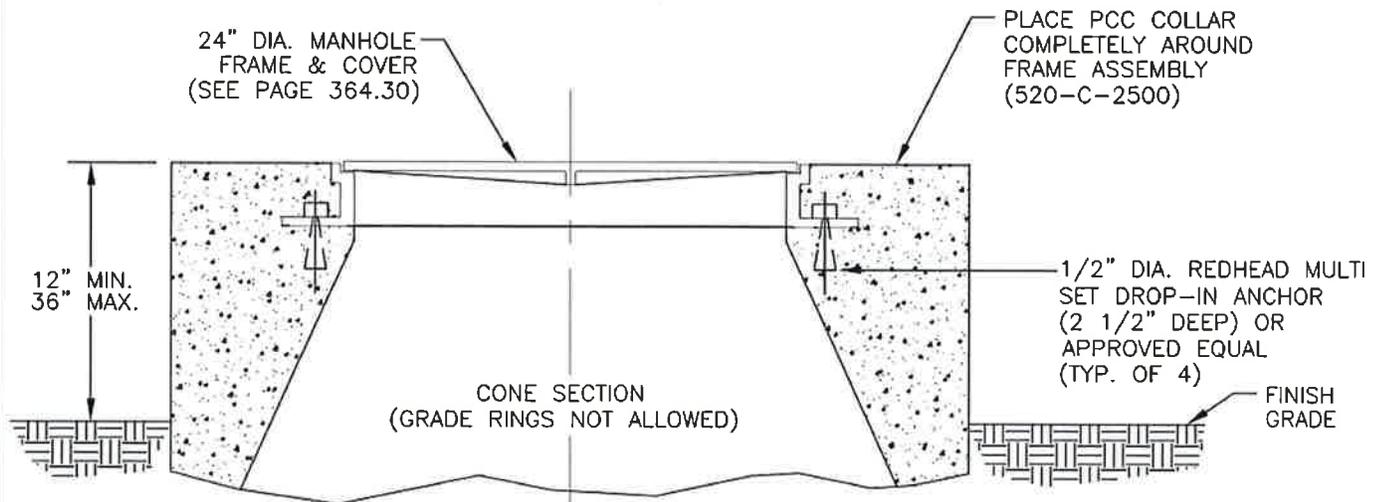
NOTES:

- $\triangle 1$. CASTING SHALL BE FURNISHED WITH CLOSED PICK HOLES.
- $\triangle 2$. ALL PARTS OF ACCEPTABLE ASSEMBLIES SHALL BE INTERCHANGEABLE.

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
$\triangle 1$	4-06	EDIT NOTES	APPROVED BY	SEWER MANHOLE COVER ASSEMBLY- BOLT DOWN
	DATE	REVISION	<i>[Signature]</i> CITY ENGINEER 3-20-07	



CONCRETE BUNKER FORM

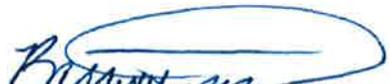


ADJUSTMENT DETAIL

TO BE USED IN UNIMPROVED AREAS
(SHOWING REQUIRED FRAME ASSEMBLY ANCHORAGE)

NOTE:

1. FOR SEWER MANHOLE CONST. SEE PAGE 360.00.

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
			APPROVED BY	<p>SEWER MANHOLE ADJUSTMENT DETAILS -UNIMPROVED AREAS-</p>
	4-06	NEW STD		
MARK	DATE	REVISION	CITY ENGINEER 3-20-07	

REQUIREMENT:

SAND AND SOIL INTERCEPTORS ARE REQUIRED FOR INDUSTRIAL AND COMMERCIAL ESTABLISHMENTS WHERE PRETREATMENT OF WASTEWATER EFFLUENT IS NECESSARY TO CAPTURE SOLIDS (SAND, SILTS ETC.) OR FLOATABLES (OILS ETC.).

THIS STANDARD APPLIES TO ALL NEW CONSTRUCTION, TENANT IMPROVEMENTS, REMODELS, AND EXISTING SYSTEMS WHICH ARE IN NEED OF UPGRADING.

SOI'S WILL BE SIZED FROM INDUSTRY SUBMITTED, CERTIFIED INDUSTRIAL WASTE SURVEY INFORMATION, OR BY CITY FIELD INSPECTION DATA. THE SIZING CRITERIA WILL FOLLOW THE UNIFORM PLUMBING CODE (U.P.C.) APPENDIX I-9. THE U.P.C. DOES NOT SPECIFY REQUIREMENTS FOR ALL SPECIFIC APPLICATIONS; HOWEVER, THE BASIC FORMULA MAY BE EASILY ADAPTED TO DIFFERING APPLICATIONS OR PARAMETERS.

SIZING CRITERIA:

1. PARAMETERS--THE PARAMETERS FOR SIZING SOI UNITS ARE HYDRAULIC LOADING, RETENSION TIME, AND STORAGE FACTOR FOR ONE OR MORE FIXTURES OR INDUSTRIAL APPLICATIONS.
2. SIZING FORMULA--THE SIZE OF THE SOI WILL BE DETERMINED BY USE OF THE FOLLOWING FORMULA:

$$\begin{matrix} \text{NUMBER OF UNITS X WASTE FLOW X RETENTION X STORAGE} & = & \text{INTERCEPTOR SIZE} \\ \text{WASHED PER HOUR*} & \text{RATE**} & \text{TIME***} & \text{FACTOR****} & \text{(LIQUID CAPACITY)} \end{matrix}$$

- * NUMBER OF UNITS WASHED PER HOUR (I.E., AUTO'S, ENGINES, PARTS, ETC.)
- ** WASTE FLOW RATE--GALLONS PER UNIT CLEANED (FOR INTERMITTENT USE), OR GALLONS PER HOUR (FOR CONSTANT USE)
- *** RETENSION TIME 2.0 HOURS
- **** STORAGE FACTORS--VEHICLE/EQUIPMENT/PARTS, ETC. WASHING
 - A. SELF SERVICE/PUBLIC 1.5 HOURS
 - B. EMPLOYEE OPERATED AUTOMATED/COMMERCIAL 2.0 HOURS
 - C. OTHER INDUSTRIAL/COMMERCIAL APPLICATIONS 2.0 HOURS

THE MINIMUM SIZE SOI ALLOWED BY THE CITY IS 100 GALLONS. ADJUSTMENTS FOR EXTUNUATING CIRCUMSTANCES WILL INCLUDE ESTABLISHMENT OF AN AGREED UPON SOI MAINTENENCE (PUMPING) SCHEDULE, BETWEEN THE FACILITY OWNER/OPERATOR AND THE CITY.

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
		APPROVED BY		SAND AND OIL INTERCEPTORS (SOI)
		 CITY ENGINEER 3-20-07		
MARK	DATE	REVISION		

DESIGN:

ALL NEW CONSTRUCTION AND UPGRADES, WHERE SOI'S ARE REQUIRED SHALL BE CONSTRUCTED TO INCLUDE A SAMPLE MONITORING STATION.

FACILITIES REQUIRED TO INSTALL ON SOI AND/OR SAMPLE MONITORING STATION, SHALL INSTALL UNITS OF APPROVED DESIGNS ON FILE WITH THE CITY'S PUBLIC WORKS CONSTRUCTION STANDARDS. THE USE OF AUXILIARY OR ALTERNATE PRETREATMENT SYSTEMS IN CONJUNCTION WITH OR IN LIEU OF AN SOI UNIT MUST BE APPROVED BY THE CITY'S INDUSTRIAL WASTE DIVISION PRIOR TO INSTALLATION.

STANDARD REV: SEPTEMBER 19, 2003

IF AN EXISTING UNDERSIZED UNIT IS STRUCTURALLY SOUND AND INSTALLED PROPERLY, THEN, IN LIEU OF REPLACING IT WITH A LARGER UNIT, THE OWNER MAY CHOOSE TO INSTALL AN ADDITIONAL UNIT IN SERIES WITH THE EXISTING UNIT TO SATISFY THE TOTAL SIZE CAPACITY REQUIRED.

THE ATTACHED STANDARD SOI DRAWING APPLIES TO UNITS OF 100 THROUGH 1,500 GALLON CAPACITY. UNITS OVER 1,500 GALLON CAPACITY MUST HAVE AT LEAST 3 COMPARTMENTS.

ALL SEALING WITH A FLEXIBLE JOINT SEALANT OF RISERS AND COVER RINGS SHALL BE THE RESPONSIBILITY OF THE OWNER/OPERATOR AND/OR CONTRACTOR. ALL GROUTING OF INTERNAL PLUMBING SHALL BE THE RESPONSIBILITY OF THE CUSTOMER AND/OR CONTRACTOR.

FINAL INSPECTION REQUIRES UNBOLTED MANHOLE LIDS WHICH OPEN FREELY.

ALL REQUIRED SOI'S SHALL BE INSTALLED AND PROPERLY MAINTAINED WITH ALL INTERNAL REQUIRED PLUMBING OF PROPER DESIGN AND LENGTH IN PLACE AT ALL TIMES.

REQUIREMENT:

OIL AND GREASE INTERCEPTORS ARE REQUIRED FOR INDUSTRIAL AND COMMERCIAL FOOD ESTABLISHMENTS WHERE PRETREATMENT OF WASTEWATER EFFLUENT IS INDICATED AS NECESSARY TO CAPTURE GREASES, OILS, OR FOOD SOLIDS.

THIS STANDARD APPLIES TO ALL NEW CONSTRUCTION, TENANT IMPROVEMENTS, REMODELS, AND EXISTING SYSTEMS WHICH ARE IN NEED OF UPGRADING.

OGI'S WILL BE SIZED FROM INDUSTRY SUBMITTED, CERTIFIED FOOD PREPARATION FACILITY SURVEY INFORMATION. THE SIZING CRITERIA WILL FOLLOW THE UNIFORM PLUMBING CODE (U.P.C.) APPENDIX H. THE INTERCEPTOR SIZE (IN GALLONS) WILL BE ESTABLISHED BY A FORMULA.

SIZING CRITERIA:

1. PARAMETERS--THE PARAMETERS FOR SIZING A GREASE INTERCEPTOR ARE HYDRAULIC LOADING AND GREASE STORAGE CAPACITY, FOR ONE OR MORE FIXTURES.
2. SIZING FORMULA--THE SIZE OF THE INTERCEPTOR SHALL BE DETERMINED BY THE FOLLOWING FORMULA:

$$\begin{matrix} \text{NUMBER OF MEALS} & \times & \text{WASTE FLOW} & \times & \text{RETENTION} & \times & \text{STORAGE} & = & \text{INTERCEPTOR SIZE} \\ \text{PER PER HOUR} & * & \text{RATE} & ** & \text{TIME} & *** & \text{FACTOR} & **** & \text{(LIQUID CAPACITY)} \end{matrix}$$

* MEALS SERVED AT PEAK HOUR (OR), TOTAL SEATING CAPACITY

** WASTE FLOW RATE:

- | | |
|--|---------------|
| A. WITH DISHWASHING MACHINE | 6 GALLON FLOW |
| B. WITHOUT DISHWASHING MACHINE | 5 GALLON FLOW |
| C. SINGLE SERVICE KITCHEN ¹ | 2 GALLON FLOW |
| D. FOOD WASTE DISPOSER ² | 1 GALLON FLOW |

*** RETENSION TIMES

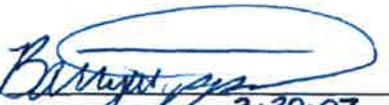
- | | |
|-------------------------------------|-----------|
| COMMERCIAL KITCHEN WASTE DISHWASHER | 2.5 HOURS |
| SINGLE SERVICE KITCHEN | 1.5 HOURS |

**** STORAGE FACTORS

- | | | |
|-----------------------------------|-------------------|-----|
| FULLY EQUIPPED COMMERCIAL KITCHEN | 8 HOUR OPERATION: | 1 |
| | 16 HOUR OPERATION | 2 |
| | 24 HOUR OPERATION | 3 |
| SINGLE SERVICE KITCHEN | | 1.5 |

¹ FAST FOOD FACILITIES USING ONLY PLASTIC UTENSILS, PAPER PLATES, ETC.

² FOOD WASTE DISPOSER ADD 1 TO A, B, OR C.

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
		APPROVED BY		OIL AND GREASE INTERCEPTORS (OGI)
		 CITY ENGINEER 3-20-07		
MARK	DATE	REVISION		

THE MINIMUM SIZE OGI ALLOWED BY THE CITY IS 1250 GALLONS. FOR VERY LARGE OGI REQUIREMENTS THE MAXIMUM SIZE REQUIREMENT WILL BE ESTABLISHED ON A CASE BY CASE BASIS. ADJUSTMENTS FOR FACILITIES REQUIRED TO INSTALL ON SOI AND/OR SAMPLE MONITORING STATION, SHALL INSTALL UNITS OF APPROVED DESIGNS ON FILE WITH THE CITY'S PUBLIC WORKS CONSTRUCTION STANDARDS. THE USE OF AUXILIARY OR ALTERNATE PRETREATMENT SYSTEMS IN CONJUNCTION WITH OR IN LIEU OF AN SOI UNIT MUST BE APPROVED

DESIGN:

ALL NEW CONSTRUCTION AND UPGRADES, WHERE SOI'S ARE REQUIRED SHALL BE CONSTRUCTED TO INCLUDE A SAMPLE MONITORING STATION. ALL FOOD WASTE DISPOSERS (GARBAGE GRINDERS) SHALL BE CONNECTED TO THE OGI INFLUENT PLUMBING.

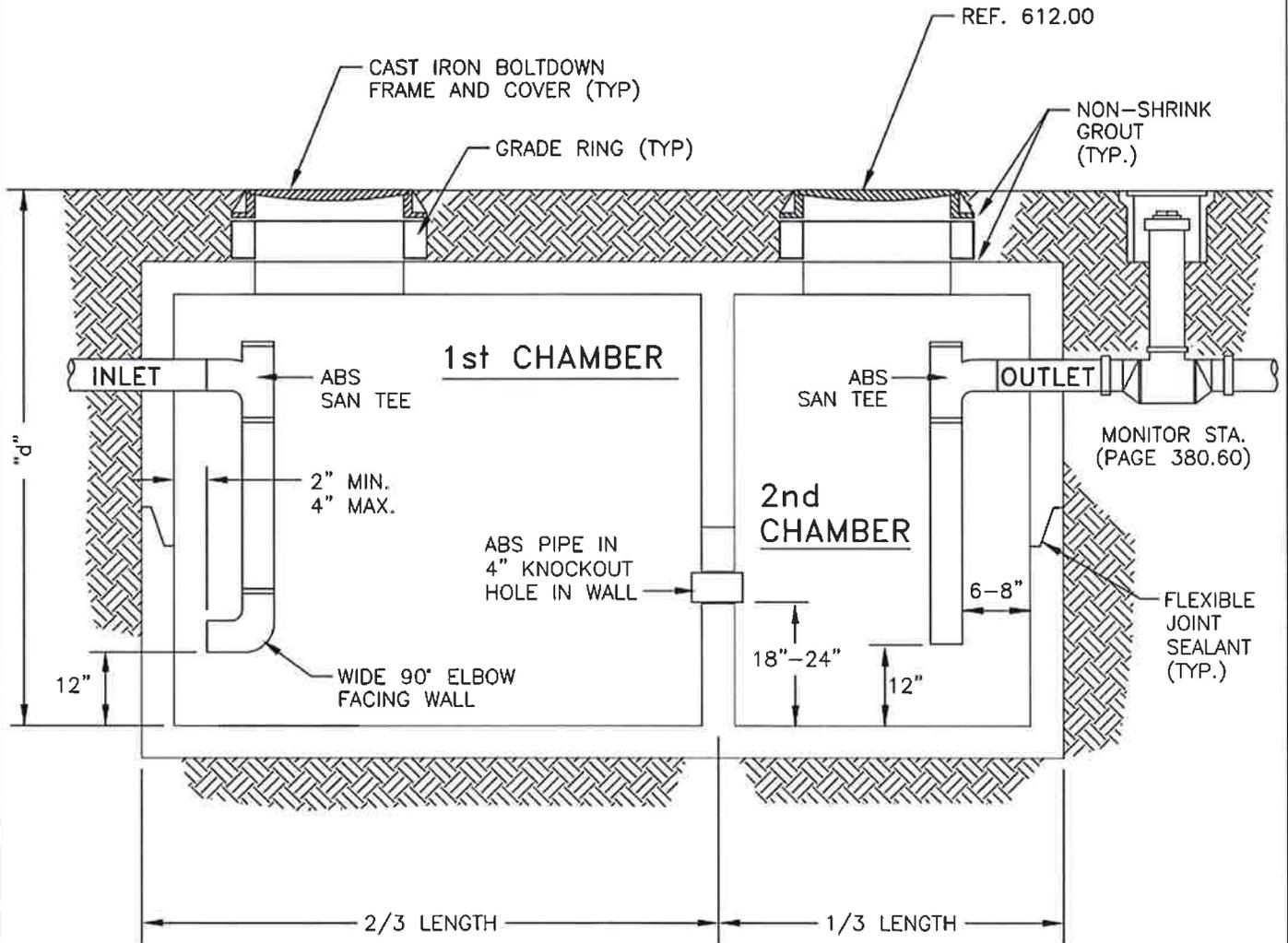
FACILITIES REQUIRED TO INSTALL OGI'S AND/OR SAMPLE MONITORING STATIONS, SHALL INSTALL UNITS OF APPROVED DESIGNS ON FILE WITH THE CITY'S PUBLIC WORKS CONSTRUCTION STANDARDS.

IF AN EXISTING UNDERSIZED UNIT IS STRUCTURALLY SOUND AND INSTALLED PROPERLY, THEN, IN LIEU OF REPLACING IT WITH A LARGER UNIT, THE OWNER MAY CHOOSE TO INSTALL AN ADDITIONAL UNIT IN SERIES WITH THE EXISTING UNIT TO SATISFY THE TOTAL SIZE CAPACITY REQUIRED. IN SUCH CASES THE BAFFLE WALL WITHIN THE EXISTING OGI MUST BE MODIFIED BY SCORING AND CUTTING A CENTERED 24-INCH MAXIMUM SQUARE HOLE IN THE BAFFLE WALL, WHICH BEGINS NO LESS THAN 12-INCHES FROM THE TOP OF THE BAFFLE WALL.

THE ATTACHED STANDARD SOI DRAWING APPLIES TO UNITS OF 100 THROUGH 1,500 GALLON CAPACITY. UNITS OVER 1,500 GALLON CAPACITY MUST HAVE AT LEAST 3 COMPARTMENTS.

ALL SEALING WITH A FLEXIBLE JOINT SEALANT OF RISERS AND COVER RINGS SHALL BE THE RESPONSIBILITY OF THE OWNER/OPERATOR AND/OR CONTRACTOR. ALL GROUTING OF INTERNAL PLUMBING SHALL BE THE RESPONSIBILITY OF THE OWNER/OPERATOR AND/OR CONTRACTOR. FINAL INSPECTION REQUIRES UNBOLTED MANHOLE LIDS WHICH OPEN FREELY.

ALL REQUIRED OGI'S SHALL BE INSTALLED AND PROPERLY MAINTAINED WITH ALL INTERNAL REQUIRED PLUMBING OF PROPER DESIGN AND LENGTH IN PLACE AT ALL TIMES.



NOTES:

1. MINIMUM WALL THICKNESS SHALL BE 4".
2. SYSTEMS THAT HAVE THE POTENTIAL OF SUPPORTING VEHICLES OR WHERE VEHICLES CAN BE LOCATED WITHIN DISTANCE "d" FROM THE CHAMBER WALL SHALL BE DESIGNED TO SUPPORT AASHTO HS20-44 LOADING. APPROVAL OF DESIGN MUST BE OBTAINED PRIOR TO INSTALLATION.
3. BACKFILL SHALL BE CLASS 'A' IN STREET R/W AND CLASS 'C' IN ALL OTHER LOCATIONS PER STD PAGE 610.00

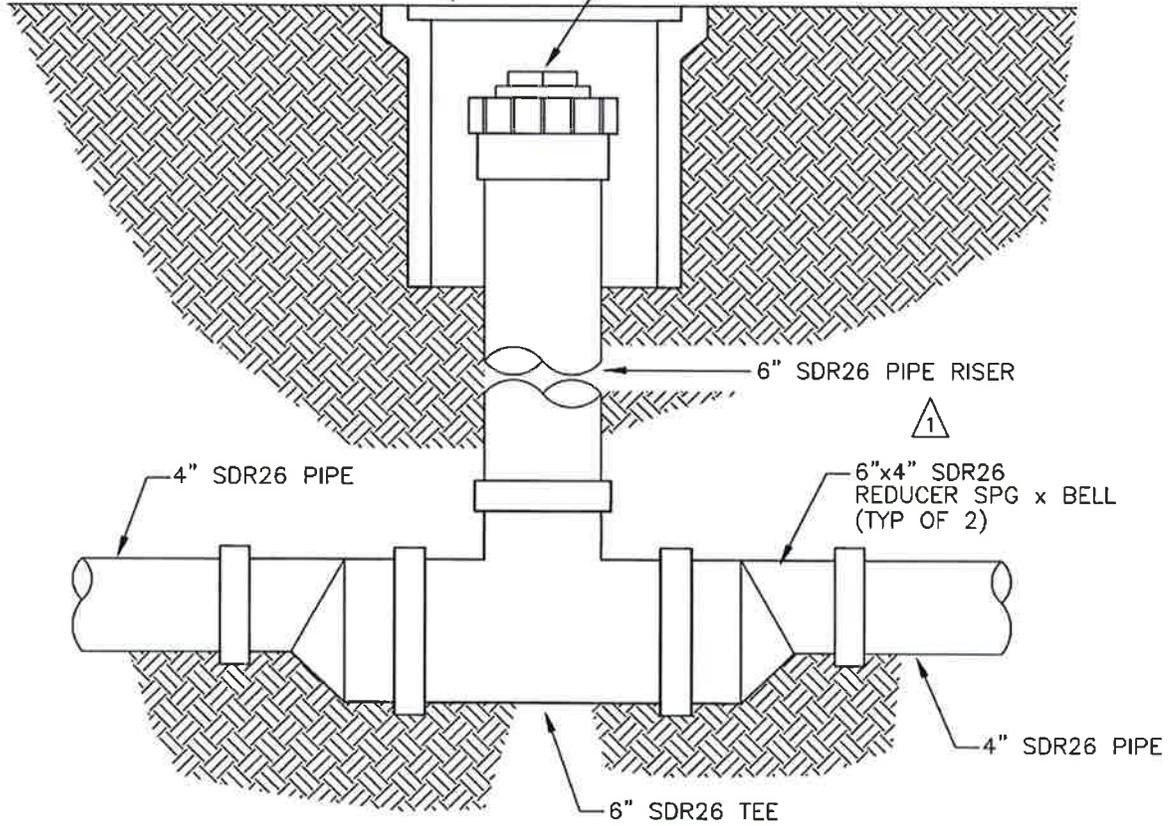
DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
		APPROVED BY		SAND AND OIL AND OIL AND GREASE INTERCEPTOR
		 CITY ENGINEER 3-20-07		
MARK	DATE	REVISION	SOI AND OGI	

NOTE:

MONITOR STATION MUST
BE INSTALLED LEVEL.

G5 CONC BOX WITH LID
(PROVIDE TRAFFIC LID
WHEN LOCATED IN
TRAVELED WAY)

6" FILLER PIPE COLLAR
WITH 6" PLUG



△ PARTS LIST

- 6" SDR26 TEE ————— 1 EA
- 6"x4" SDR26 REDUCER ——— 2 EA
(SPG x BELL)
- 6" FILLER PIPE COLLAR ——— 1 EA
- 6" PLUG ————— 1 EA
- G5 CONCRETE BOX ————— 1 EA
- G5 SEWER LID ————— 1 EA

IF REQUIRED

- 4" ABS COUPLING ————— 1 EA
- 4" ABS x SDR BUSHING ——— 1 EA

DWG DATE: 2-03

SCALE: NTS

CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT

△

4-06

EDIT DETAIL

APPROVED BY

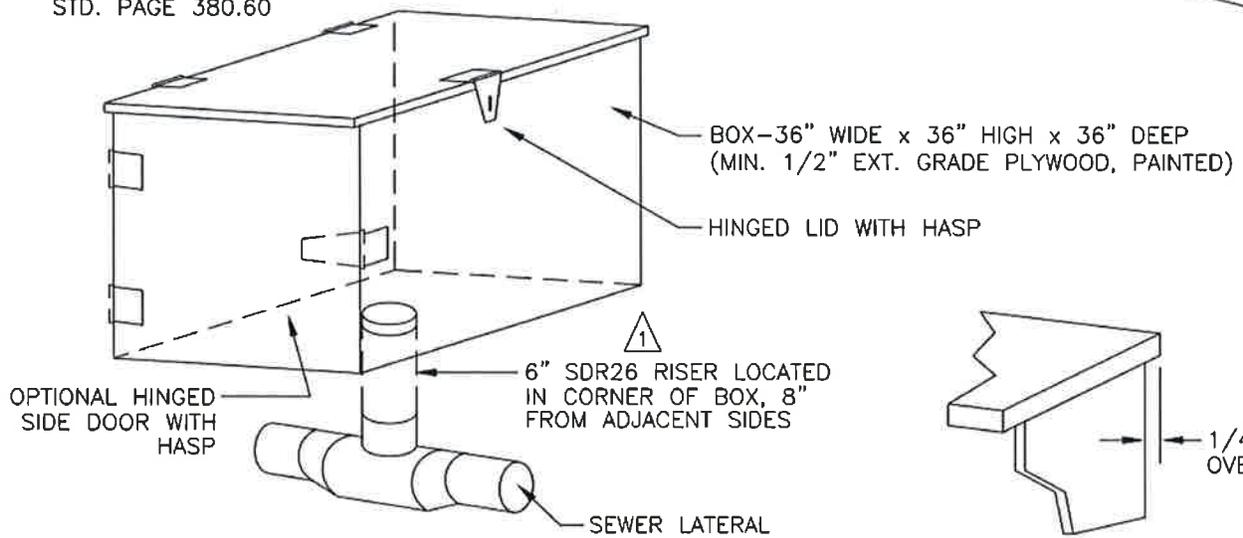
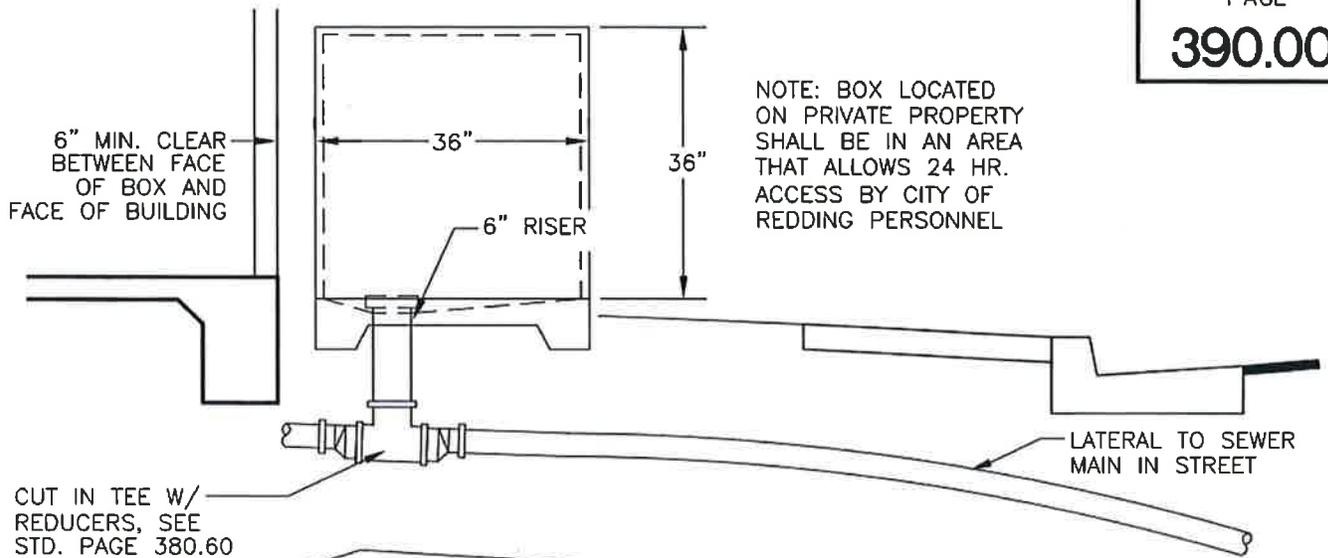
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CITY ENGINEER 3-20-07

**INTERCEPTOR
MONITOR STATION**

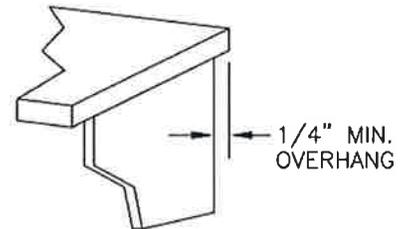
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DATE

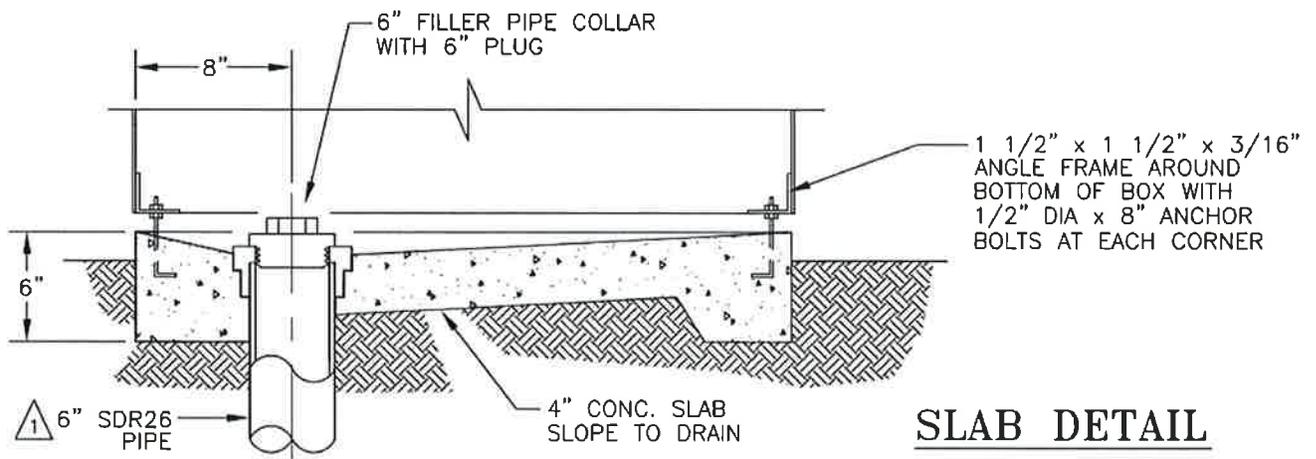
REVISION



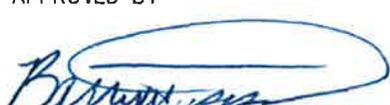
BOX DETAIL



LID DETAIL



SLAB DETAIL

DWG DATE: 2-03		SCALE: NTS	CITY OF REDDING • TRANSPORTATION & ENGINEERING DEPARTMENT	
1	4-06	EDIT DETAIL	APPROVED BY	ABOVE GRADE WASTEWATER MONITORING STATION
	MARK	DATE	REVISION	
			 CITY ENGINEER 3-20-07	

City of Weed CA

Sanitary Sewer Overflow and Backup Response Plan



Effective Date:

Revised Date:

Approved by:

Signature:

Date:

City of Weed CA
SSO/Backup Response Plan
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Sanitary Sewer Backup Packet (BP)

Instructions and Chain of Custody	envelope label
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Declination of Cleaning Services.....	-2
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Customer Service Packet	
Instructions	-envelope
Customer Information	CS-1
Sewer Spill Reference Guide.....	pamphlet
Regulatory Notifications Packet	See contents list above
Door Hanger	n/a
Sewer Spill Reference Guide pamphlet	pamphlet

Sanitary Sewer Overflow Packet (OP)

Instructions and Chain of Custody Envelope Label
Responding to a Sanitary Sewer Overflow OP-1
Sewer Overflow Report -2
Regulatory Notifications Packet See contents list above
Sewer Spill Reference Guide.....pamphlet
Public Posting n/a
Door Hanger n/a

Field Sampling Kit (FS)

Procedures for Sampling Receiving Waters and Posting
Warnings after a Sewage Spill FS-1
Sample Collection Chain of Custody Record-2
Kit Contents..... n/a
Cooler w/ice pack
Latex gloves
Safety glasses
2 ammonia-nitrogen sample bottles (1pt bottle w/H2SO4)
20 Sample bottle labels
Waterproof Pen (i.e. Sharpie®)
10 Total/Fecal Coliform sample bottles (100ml sterilized bottle)
Disposable Camera
Chain of Custody Form

Miscellaneous

- Public Posting
- Door Hangers
- Sewer Spill Reference Guide

Purpose, Policy and Definitions

PURPOSE

The purpose of this Sanitary Sewer Overflow and Backup Response Plan is to ensure that City of Weed (*City*) personnel follow established guidelines in responding to, relieving, cleaning and decontaminating sanitary sewer overflows and backups which may occur within the City's service area in order to safeguard public health and the environment.

POLICY

City employees are required to report all wastewater overflows found and to take the appropriate action to secure the wastewater overflow area, 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 in regards to sewer spills as set forth by the North Coast RWQCB and the California State Water Resources Control Board.

AUTHORITY

- Health & Safety Code Sections 5410-5416
- CA Water Code Section 13271
- Fish & Game Code Sections 5650-5656
- State Water Resources Control Board Order No. 2006-0003-DWQ

DEFINITIONS AS USED IN THIS SANITARY SEWER OVERFLOW & BACKUP RESPONSE PLAN

Sanitary sewer system – Any system of pipes, pump stations, sewer lines, or other conveyances, upstream of a wastewater treatment plant headworks used to collect and convey wastewater to the publicly owned treatment facility. Temporary storage and conveyance facilities (such as vaults, temporary piping, construction trenches, wet wells, impoundments, tanks, etc.) are considered to be part of the sanitary sewer system, and discharges into these temporary storage facilities are not considered to be SSOs.

Sanitary sewer overflow (SSO) - Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. SSOs include:

- (i) Overflows or releases of untreated or partially treated wastewater that reach waters of the United States;
- (ii) Overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States; and
- (iii) 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.

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: All discharges of sewage resulting from a failure in the City's sanitary sewer system that:

- Equal or exceed 1000 gallons, or
- Result in a discharge to a drainage channel and/or surface water; or
- Discharge to a storm drainpipe that was not fully captured and returned to the sanitary sewer system.

Category 2: All other discharges of sewage resulting from a failure in the City's sanitary sewer system.

Private Lateral Sewage Discharges – Sewage discharges that are caused by blockages or other problems within a privately owned lateral.

Untreated or partially treated wastewater – Any volume of waste discharged from the sanitary sewer system upstream of a wastewater treatment plant headworks.

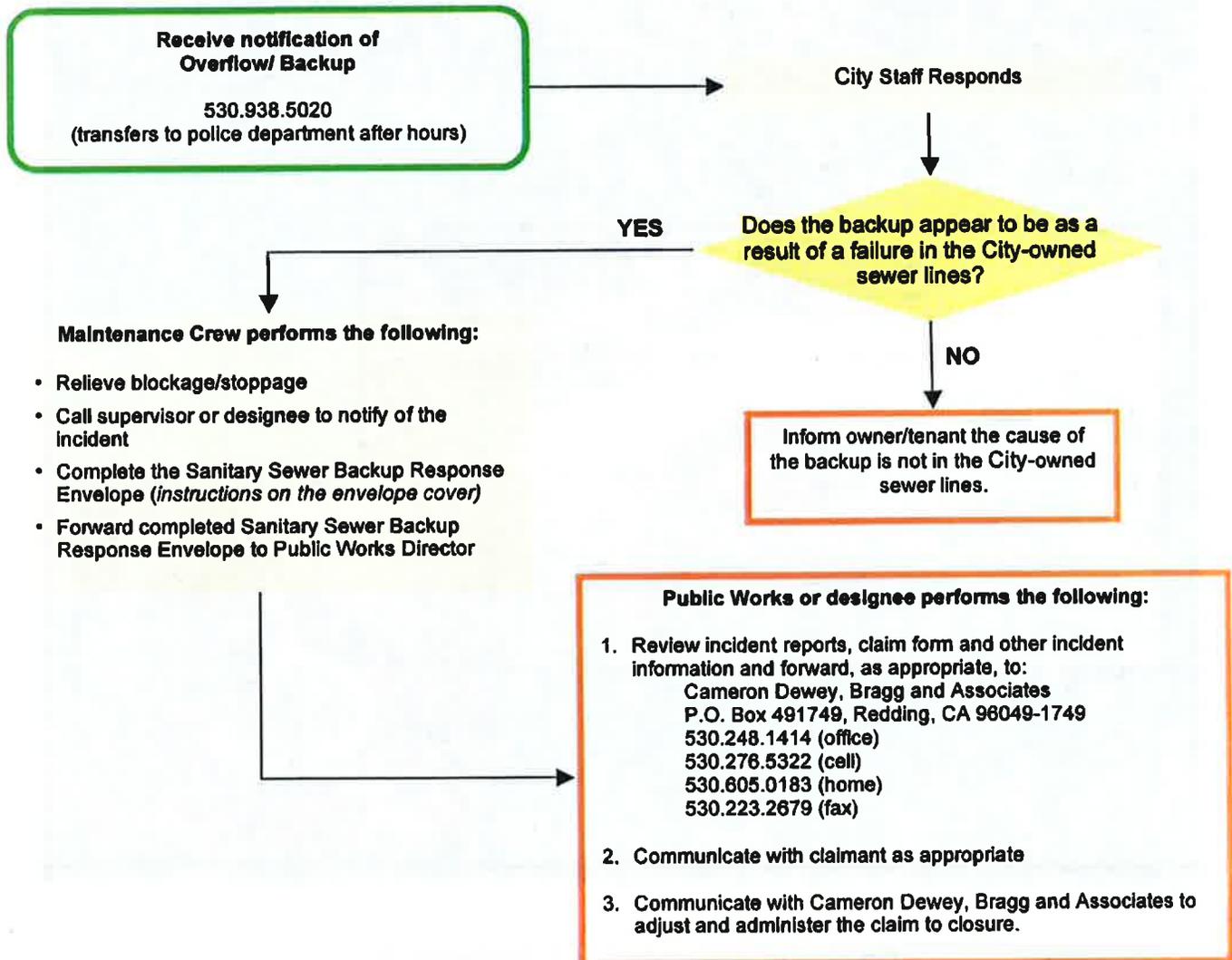
Nuisance - California Water Code section 13050, subdivision (m), defines nuisance as anything which meets all of the following requirements: a. Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. b. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. c. Occurs during, or as a result of, the treatment or disposal of wastes.

Sewer Backup Claims Handling Procedure Summary

SEWER BACKUP CLAIMS HANDLING POLICY

It is the Policy of the City of Weed CA (City) that claims forms shall be offered to anyone wishing to file a claim. The following procedures will be observed for all sewer backup claims:

1. City staff will provide instructions on how to obtain a claim form where it is possible that the sanitary sewer backup may have resulted from an apparent blockage in the City-owned sewer lines or whenever a customer requests a claim form. The claim may later be rejected if subsequent investigations into the cause of the loss indicate the City was not at fault. The claim will be processed pursuant to City procedures.
2. It is the responsibility of City staff to gather information regarding the incident and notify the Public Works Director or their designee.
3. It is the responsibility of the Public Works Director or their designee to review all claims and to oversee the adjustment and administration of the claim to closure.



City of Weed, CA

Sanitary Sewer Overflow and Backup Response Plan

Field Guide



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Sanitary Sewer Overflow and Backup Response Plan

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Customer Relations Practices Following a Sewer Backup

It is important for employees to communicate effectively with customers, especially in sewage overflow and backup situations. How we communicate - on the phone, in writing, or in person - is how we are perceived. Good communication with the homeowner results in greater confidence in our ability to address the problem satisfactorily, less chance of having the homeowner prolong the claims process, and less chance of him/her exaggerating the damage done to their property.

As a representative of your agency, you will occasionally have to deal with an angry homeowner. A sewer backup is a stressful event and even a reasonable homeowner can become upset should he/she perceive us as being indifferent, uncaring, unresponsive, or incompetent.

Although sometimes difficult, effective management of a sewage backup situation is critical. If it is not managed well, the situation can end up in a costly prolonged process with the homeowner. We want the homeowner to feel assured that we are responsive and the homeowner's best interest is a top priority.

A Few Communication Tips

1. Give the homeowner ample time to explain the situation or to vent. Show interest in what the homeowner has to say, no matter how many times you have heard it before, or how well you understand the problem.
2. As soon as possible, let the customer know that you will determine if the source of the sewer backup is in the public sewer and, if it is, will have it corrected as quickly as you can.
3. Acknowledge the homeowner's concerns. For example, if the homeowner seems angry or worried about property damage, say something like, "I understand you're concerned about the possible damage to your property, but a professional cleanup crew can restore the area, and if it is determined that the agency is at fault, the property owner has the right to file a claim for any reasonable repairs or losses resulting from this incident."
4. Express understanding and empathy for any inconveniences caused by the incident, but do not admit fault.
5. As much as possible, keep the homeowner informed on what is being done and will be done to correct the problem.
6. Keep focused on getting the job done in a very professional manner. Focus on the problem without unnecessary small talk with the homeowner.
7. Don't find fault or lay blame on anyone.

How to Use a Hydroflusher to Clear a Line Blockage

Overview

Procedures for opening and cleaning a blocked municipal sewer line with a high-velocity waterjet. Individual situations may be unique, but use these basic procedures for any jetting project.

Best tools: High-velocity flushing trucks. The jet may be a combination machine or a truck- or trailer-mounted jetter.

Types of municipal sewer systems:

- **Sanitary sewers** carry waste from homes and businesses to a municipal wastewater treatment plant
- **Storm sewers** carry stormwater runoff to streams and rivers. Storm sewers carry heavier waste (sand, silt and gravel) than sanitary sewers.

The size of the pipe and the type of sewer dictate cleaning procedures.

Safety

- **Wear necessary PPE:** Eye protection, coveralls, hardhat, work boots and work gloves.
- Follow the CalTrans (*MUTCD*) **Traffic Control Manual** and be aware of manhole hazards.
- Follow all OSHA rules when entering confined spaces (manholes)
- **Proper tools for manhole lid removal:** Gas tech, manhole lifter and traffic control
- **Never enter a manhole (confined-space) with the line under pressure because of the possibility of drowning or personal injury.**

Professional Standards

- Follow all safety rules
- Always consider every option available to hydroflush a municipal sewer system in a safe and cost effective manner.
- Ensure that the residents and businesses within the work area or jurisdiction do not experience problems due to high pressure back ups or damage.
- Effectively clean the sewer mains by incorporating these standard procedures of maintenance, experience, training and available tools to complete required day-to-day operations.

Locating the Blockage

STEP 1

- Determine the direction of flow in the system. Wastewater flows downhill in a gravity-based sewer.
- Use a sewer map and/or your familiarity with the area to identify the direction of flow, OR remove a manhole lid and look into the invert.

STEP 2

- Keep moving to the nearest downstream manhole until the blockage is located. A manhole filled with wastewater or with a flow line above the sewer shelf is typically the problem area.
- A full manhole means water and debris have entered the manhole, but because of a blockage downstream cannot drain away.
- The blockage is normally between the first empty manhole (downstream) and the first full manhole (upstream).

Setting up the Hydroflusher

STEP 1

- Position the vehicle/sewer-cleaning equipment at nearest downstream manhole below the stoppage on the side nearer the blockage.
- On steep lines where the downstream manholes are less than 5 feet deep, necessary precautions to prevent secondary overflows at downstream manholes must be taken. Form a containment barricade near the downstream manhole with use of sandbags, etc.

STEP 2

- Position the water jet over the 1st empty manhole downstream of the blockage

STEP 3

- If not already attached, attach 20'-25' of leader hose (a hose of a different color) to the regular hose – this serves as a benchmark for insertion & retrieval (NOTE: A leader hose helps prevent the hose from exiting the pipe prematurely & causing injury!)
DO NOT use the alternative method of marking the jet hose five feet from the end!

STEP 4

- Select a PENETRATING forward jet nozzle with a small angle (i.e. 15-degrees) for blockages.

STEP 5

- Install a nozzle extension between the end of the hose & the nozzle to prevent the nozzle and hose from turning up a service lateral causing damage.

STEP 6

- Lower the hose, nozzle extension & nozzle into the manhole & into the pipe invert
- Insert the jet hose through the Tiger Tail & tie the device in place to stabilize it. *Note: failure to use a Tiger Tail or Roller Guide may result in the hose being damaged while flushing the main!*

STEP 7

- Set up a vacuum truck/trailer or have a catcher available to completely capture and remove the debris to avoid future stoppages.
This is a must when breaking mainline stoppages and proper maintenance procedures!

Hydroflushing

STEP 1

- Ensure that the hose, the nozzle extension and nozzle are inserted into the pipe completely and the hose is protected by a hose guide device (*i.e. Tiger Tail*).
- Run the line with just enough pressure to reach the blockage. When you reach the blockage, the hose should stop.

STEP 2

- Begin hydro flushing. Adjust water pressure as needed, but do not exceed 2500psi.
- Clean the sewer from the lower end to the higher end of the flow so that when the hose is retrieved, it works with the downward grade of the pipe and allows for more efficient cleaning of remaining debris.

NOTE: *In sewer lines where toilets have bubbled or overflowed due to high pressure back flushing, a lower pressure must be used to prevent additional backups*

STEP 3

- If the hose does not advance, pull back on it and then let go (*Be careful not to strain your back!*). Repeat the steps until the hose breaks through the blockage.

STEP 4

- If the hose breaks through and the line is still plugged, run the hose until you hit another plug, then repeat the steps again.

STEP 5

- Clear the blockage by working from the lower end to the higher end of the flow.
- Pull the hose back in a slow continuous speed to ensure that the line is being cleaned sufficiently. Bringing the hose back to fast will leave the pipe with areas not cleaned, which is an unacceptable level of cleaning.

NOTE: *Always jet the line a few feet at a time, returning the debris to the manhole – completely remove debris so further blockages are not created downstream! Pulling heavy debris is time-consuming and laborious, and if not done properly can cause the hose and nozzle to be buried and stuck. Then you may need to dig up the sewer.*

- The debris is pulled to the manhole by the water flow and the returning hose and nozzle. Allow the hose to enter slowly on the initial passes and pull the hose and nozzle back occasionally to prevent them from exiting a defective pipe or becoming buried in debris.
- Remove the debris using the vacuum portion of the combination truck, or a debris removal hand tool. Anytime you hydro flush a sewer, remove the debris completely to avoid future stoppages. If this can't be done, then drag the debris into a high flow trunk main to prevent a stoppage from occurring downstream.
- Always look into the bottom of the manhole for the amount and type of debris being pulled from the pipe to determine the number of passes and the length of the passes needed to clean the sewer effectively.



STEP 6

Once you hear or see the rush of the water, turn off the pressure until the water level drops in the line. Once the flow is back to normal, run the hose up to the next manhole to insure that the line is free of all blockages, then pull the hose back. Check the upstream manholes to make sure the line is running.



STEP 7

Always rewind the jet hose with the water pressure on to avoid flattening the hose.

NOTE: Always turn down the water pressure once you see the leader hose – Run hose until spray from the nozzle fills the pipe, then shut down the water. Shutting the water down prematurely will lave material at/or upstream from the manhole causing another blockage in a very short time.

How to Use a Continuous Rodder

General Safety Guidelines

- Know your equipment: never operate the rodder in excess of it's rated capacity, speed, pressure and temperature
- Take your time: Trying to move too fast or trying to force a blockage can be disastrous
- Inspect equipment before AND after every job: check the condition of the rod, guides, engine and assemblies
- Wear the required PPE including gloves at all times when operating the rodding equipment
- Be aware of working near confined spaces:
 - Always suspect gas and test for it
 - Never smoke around a manhole
 - Never open a manhole while standing over it
 - Give the opening time to ventilate before beginning work
- Never touch the rod when it's rotating and never rotate the rod until everyone is clear
- Be aware of contamination hazards
- Use proper traffic safety procedures when setting up on the street
- Do not enter the manhole to change tools
- Never grasp the rod or coupling with your hands until all torque is relieved.

Setting up the Rodder

STEP 1

Start the rodder unit and let it warm up

STEP 2

Run out the rod until a coupling is between the guide hose and the end of the machine

STEP 3

Insert a length of cut rod through the open center hole of the coupling.
DO NOT TOUCH ROD CONTROL LEVERS DURING THIS STEP

STEP 4

Turn the pressure relief valve counter clockwise until it stops

STEP 5

Depress the lateral control lever to retrieve rod into the drive head assembly

STEP 6

Keeping the lever depressed, slowly turn the pressure relief valve clockwise until the rod moves into the machine and is stopped by the rod through the coupling

STEP 7

Holding the lever down, slowly turn the valve clockwise to increase the pressure. Watch the hydraulic oil pressure gauge on the control panel. Stop increasing the pressure when the needle reads 300 to 350 pounds (should be 350 pounds for robotic rodders). Pressure is now set for manual machines. Remove the rod from the coupling and begin work. Secure the lock ring to retain setting. For robotic rodders, continue to Step 8.

(Setting up the Rodder continued)

**Continue for
Robotic
Rodders
Only**

STEP 8

Set the manual pressure to 350 pounds using the above procedures. Reverse the rod travel and send the rod into the guide hose until the rod through the coupling hits the opening of the guide hose.

STEP 9

Leave the lateral control lever locked in the forward position and open the Robotic control box. Set the robotic pressure gauge to about 600 pounds

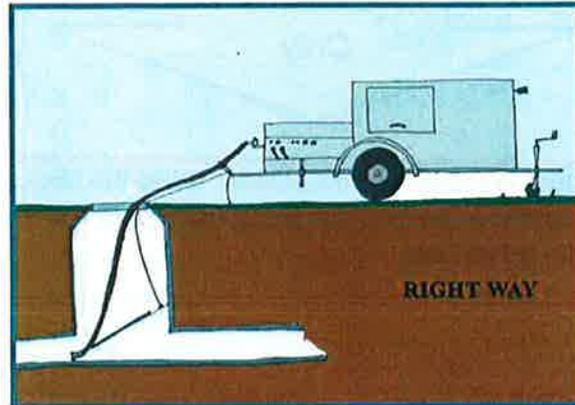
STEP 10

Flip the MODE switch to automatic and slowly turn the robotic pressure valve counter clockwise until the system activates. Note where on the valve this happens and then dial it down to the next mark. This ensures that the pressure is not too close to the manual or primary system.

STEP 11

The robotic system should now be set up for operation. **NOTE:** pressures may have to be adjusted periodically when working with heavy materials or on long runs.

Rod Guide Hose Set Up



STEP 1

Place the bell end approximately four to six inches inside the pipe to be cleaned.

STEP 2

Place the lower manhole brace so that it hits the barrel wall of the manhole at approximately a 35° to 45° angle. This will keep the bell end from creeping back up the manhole

STEP 3

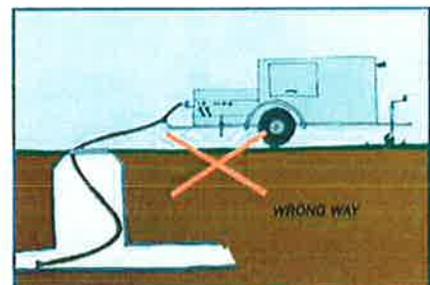
Pull the rodder forward to remove all slack from the guide hose.

STEP 4

Confirm that the rod guide hose has a smooth and low-angled entry into the manhole.

Avoid bends in the rod guide hose. Bends force the rod to turn while bent which generates heat which weakens the rod.

Without the manhole brace, the bell end of the hose can creep back into the manhole creating a severe bend.



Controlling Rod Torque

Productive Torque: The force needed to cut into and remove heavy roots and other debris. It can be seen as a gentle flexing of the rod—twisted up to 90 degrees.

Excessive Torque: Develops when the tool is not pulled away from the material it is bound in. It can result in rod damage and downtime in the field. It can be seen as rods twisting past 180 degrees, making the guide hose twist slowing down the reel and making the engine work too hard.

Testing for Rod Damage: Stretch 50-100 feet of rod out on a flat surface. Damaged rods will appear twisted, won't lie flat and bends will be obvious.

CONTROLLING ROD TORQUE IN THE FIELD

1 Test torque pressure

To test the torque pressure: Release the reel spin direction lever to neutral to see if the reel stops quickly or even begins to spin in reverse. If it does, then the tool is lodged and the rod is relieving the torque pressure.

2 Spin off torque

Move the tool a few feet from the obstruction, and allow the tool to spin off excessive torque. Keep the machine rotating so there is less time needed to resume rotation.

3 Resume rotation

Begin rotation again and continue until the material is penetrated.

4 Monitor

Continue to watch for torque building up on the rod. Repeat steps above as necessary.

Grease Removal Techniques

Tools:



Square Bar Corkscrew



Auger



Three-Blade Cutter

1

Attach auger to rod

Use an *Auger* or *Square Bar Corkscrew* auger that is at least one full pipe size smaller than the pipe. Send it up the pipe until it reaches the next manhole.

2

Make pilot hole

Turn auger at approximately 20-25 rpm and push slowly to cut away material. Refer to "Controlling Rod Torque" procedure to maintain control of the rod torque. If there is too much resistance, remove the auger and use the next smaller size.

3

Gaff auger to street

Relieve the torque from the rod and gaff it up to the street.

4

Attach larger auger

Attach a larger auger to the rod.

Use the next size auger if there was heavy resistance on the first pull. Use a pipe-sized auger if there was little resistance.

Continue

'rease Removal Techniques continued)

5

Make another pass

Lower the auger into the manhole. Rotate the rod **AFTER** the tool is safely inside the pipe. Use the same slow rotation (rpm) and speed as on the previous pass. Refer to "Controlling Rod Torque" procedure to maintain control of the torque.

6

Make a third pass

When the auger returns to the machine, reverse the direction and return it to the remote manhole. Keep the same rpm as the previous pass, but increase the speed slightly.

7

Repeat as needed

If a pipe-sized auger was not used on the second pass, increase the auger size and repeat the above procedure until a pipe-sized auger can be pulled through the pipe to the remote manhole.

8

Attach cutter

Attach a **Three-Blade Cutter** to the rod. Return this tool to the machine maintaining a slow speed, but increasing the rotation to 50-65 rpm. This tool will scour the pipe walls and remove all remaining material.

9

Remove guide hose

Remove the guide hose and then the scene according to agency procedures.

Root Removal Techniques

Tools:



*Square Bar
Corkscrew*



Auger



Concave Root Saw



Three-Blade Cutter

1

Attach auger to rod

Use an *Auger* or *Square Bar Corkscrew* auger that is at least one full pipe size smaller than the pipe. Send it up the pipe until it reaches the next manhole.

2

Make pilot hole

Turn auger at approximately 20-25 rpm and push slowly to cut away material. Refer to "Controlling Rod Torque" procedure to maintain control of the rod torque. If there is too much resistance, remove the auger and use the next smaller size.

3

Gaff auger to street

Relieve the torque from the rod and gaff it up to the street.

4

Attach larger auger

Attach a *Concave Root Saw* to the rod.

Use a pipe-sized saw if there was little resistance with the auger. Use a smaller size if there was heavy resistance with the auger.

Continue

Root Removal Techniques continued)

5

Back-cut

Lower the saw into the manhole. Rotate the rod AFTER the tool is safely inside the pipe. Slowly pull the saw back to the machine maintaining a slow speed, but increasing the rotation to 40-55 rpm. Refer to "Controlling Rod Torque" procedure to maintain control of the torque.

6

Return saw

When the root saw arrives at the machine, reverse the direction and return it to the remote manhole. Keep the same rpm as the previous pass, but increase the speed slightly. Refer to "Controlling Rod Torque" procedure to maintain control of the torque.

7

Repeat as needed

If a pipe-sized root saw was not used, increase the saw size and repeat the above procedure until a pipe-sized saw can be pulled through the pipe to the remote manhole.

8

Attach cutter

Attach a **Three-Blade Cutter** to the rod. Return this tool to the machine maintaining a slow speed, but increasing the rotation to 50-65 rpm. This tool will scour the pipe walls and remove all remaining material.

9

Remove guide hose

Remove the guide hose and then the scene according to agency procedures.

Emergency Stoppage Techniques

These procedures are to be used as a guide when dealing with emergency stoppages. Each situation is unique and may require different set up and operation. Consider access locations, length of pipe section, set up difficulties and traffic when following these basic steps.

Tool:



Square Bar Corkscrew

1

Locate manhole

Locate the closest dry manhole downstream from the surcharged manhole. If possible, set up and operate equipment from there.

If forced to work from the surcharged manhole, use extreme caution and make sure the tool is in the invert and the guide hose is properly set. Test the tool before full engagement to make sure it is in the pipe.

2

Select auger

The *Square Bar Corkscrew* is a good tool for tearing through blockages. Use one that is at least one full size smaller than the blocked pipe.

3

Clear obstruction

Push and rotate the tool up the pipe. As obstructions are met, pull back to relieve the torque and then return to the obstruction. Continue until the tool passes the obstruction. There should be a rush of water. If not, then there may be another obstruction further up the pipe.

Continue

Emergency Stoppage Techniques continued)

4

Prepare for water

When the stoppage is cleared, there will be a rush of wastewater and solids. **UNDER NO CIRCUMSTANCES SHOULD THERE BE ANYONE IN THE MANHOLE.** Lift the guide hose as needed to make sure the bell end is not preventing obstructions from getting by.

5

Move up the line

Once the flow has started, move the tool up the line to the next manhole. Dislodge settled debris and allow obstructions to pass. Pull the tool back slowly to the machine to make sure the obstruction is fully punctured and removed.

6

Return saw

Clean the pipe section with proper tools for removing any remaining materials. Pipe must be cleaned with pipe-sized tools to make sure the pipe is fully cleared. Refer to agency policy for the timing of this task.

Containment Procedures

Protection of the public's health and a safety is a top priority!

The overflow must be contained. Containment becomes more difficult if the overflow reaches the storm drain system or drainage way since the overflow can rapidly contaminate receiving waters such as creeks, streams, rivers, and other water bodies. During dry weather, the storm drain system can be used to store the overflow if it can be plugged downstream of the overflow or if the downstream storm drain pump station can be deactivated.

Options for containing the overflow

Overflow onto ground

- Rubber mats at catch basin or inlet
- Sand bags in gutter and around catch basin or inlet
- Dig earthen trench or build berm to create pond

Overflow in building

- Evacuate affected people if necessary
- Use sand bags/plastic sheeting if necessary
- Avoid electrical shock - have power turned off if outlets or other energized equipment is sitting in water or is wet

Overflow into storm drain/drainage way

- Trace overflow in storm drainage system to downstream end point
- Plug all affected storm system outlets and coordinate with appropriate personnel for strategy to contain spill
- Turn off storm water pump station

Required equipment for containing overflow

Overflow onto ground and in buildings

- Rubber mats
- Sand bags
- Plastic sheets
- Bypass pumps and pipe/hose
- Vacuum truck

Overflow into storm drain/drainage way

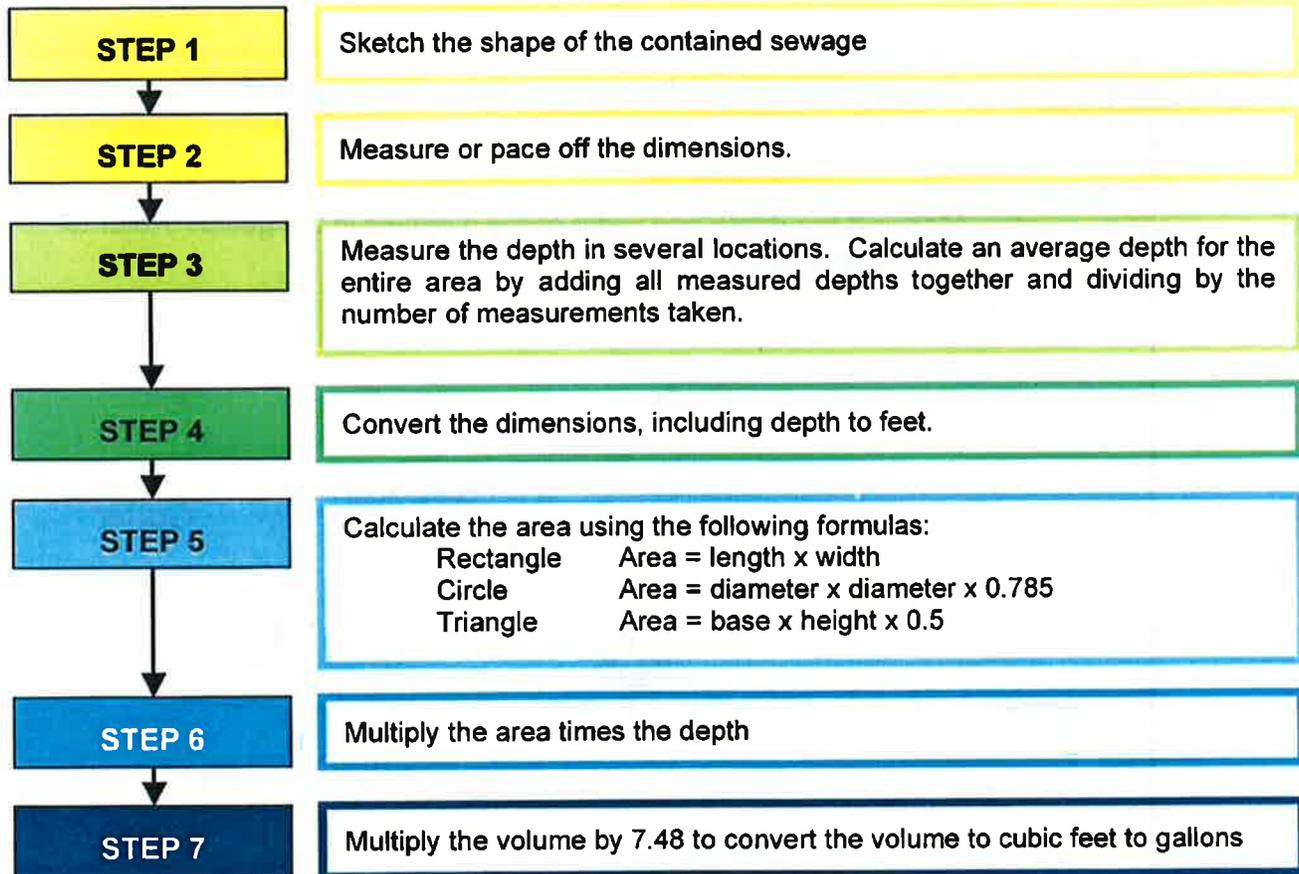
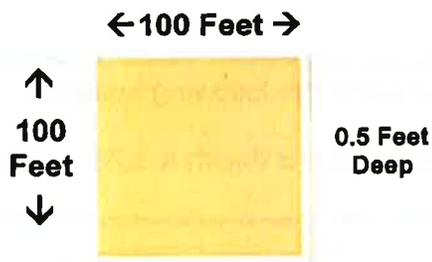
- Plugs
- Bypass pump
- Vacuum truck

Overflow at pump station

- Emergency generator
- Bypass pump

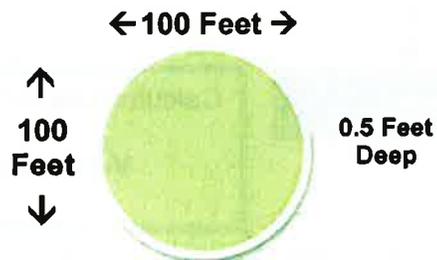
Flow Volume Estimation Procedures: Contained Volume

The volume of some small spills can be estimated using this method if the overflow is contained in one area and if it is not raining. In addition, the shape, dimensions, and depth of the spilled wastewater are needed. The shape and dimensions are used to calculate the area of the spills and the depth is used to calculate the volume.

**EXAMPLE:**

$$\text{Volume} = 100' \times 100' \times 0.5' \times 7.48$$

$$\text{Volume} = 37,400 \text{ gallons}$$

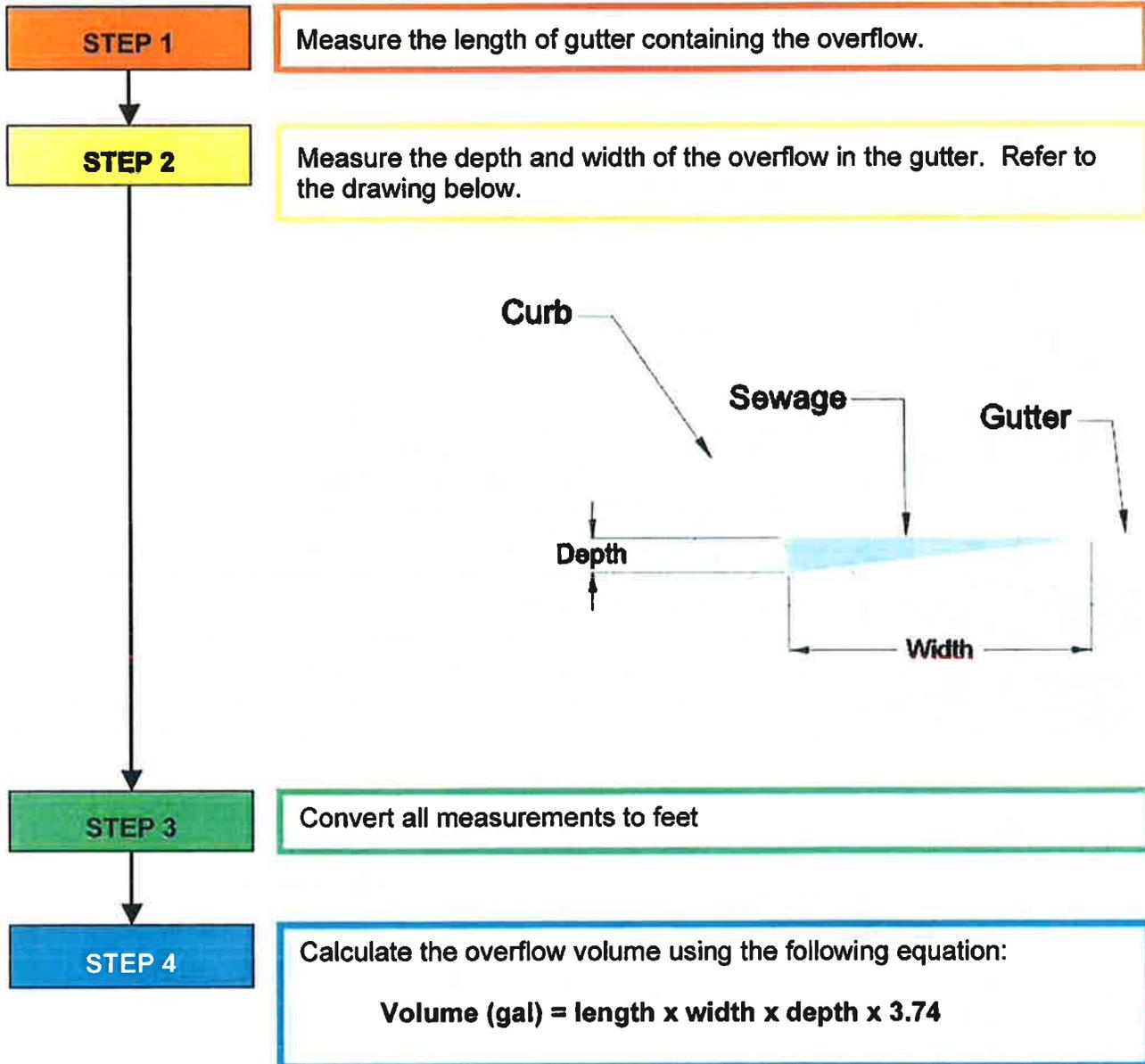
EXAMPLE:

$$\text{Volume} = 100' \times 100' \times .785 \times 0.5' \times 7.48$$

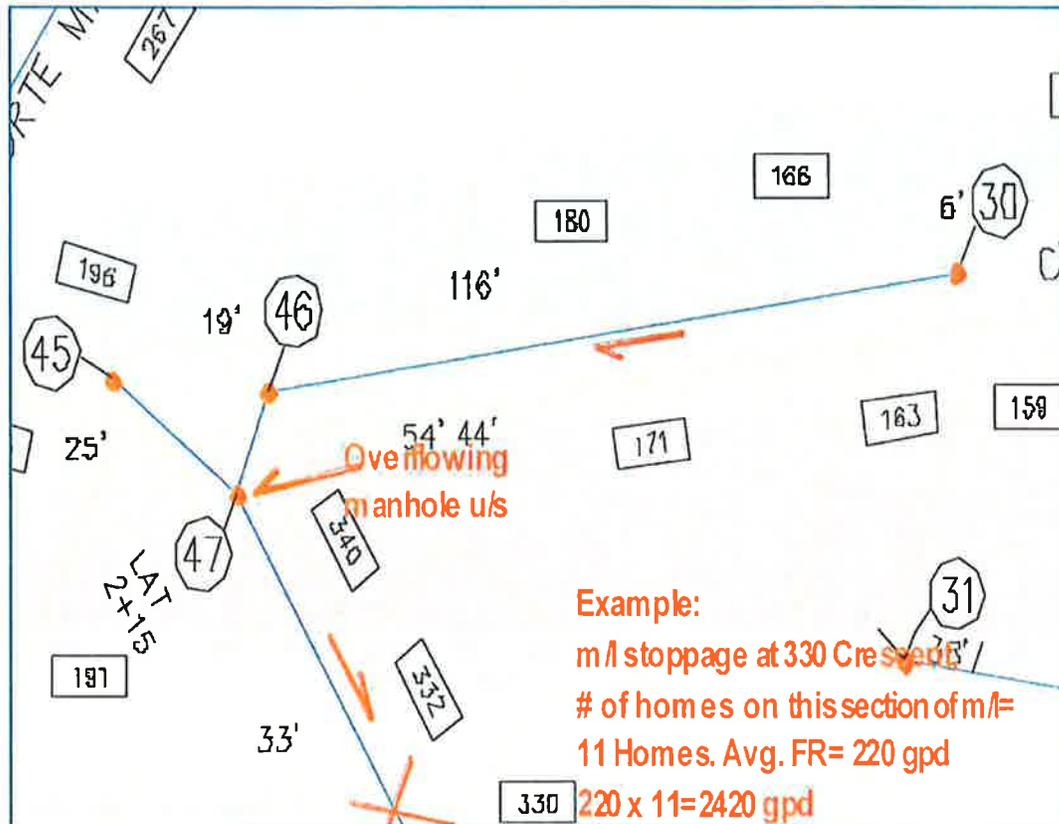
$$\text{Volume} = 29,359 \text{ gallons}$$

**Flow Volume Estimation Procedures:
Contained in a Roadway Gutter**

The volume of an overflow contained in a roadway gutter can be estimated by this method:



Flow Volume Estimation Procedures: Counting Upstream Connections



METHOD

1. Count the number of upstream connections.
2. Estimate the time that the overflow has been occurring (*Remember: the overflow was probably flowing before it was reported*).
3. Each residence contributes about 240 gallons per day or about 10 gallons per hour. Multiply the number of residences by 10 and by the number of hours. This gives you the number of gallons.

NOTES:

- a. Remember that 10-gallons per hour is an estimate. This number will be higher during peak water usage times and lower during low water usage times. Take this into account when estimating the overflow volume.
- b. This is a conservative estimate because stoppages rarely stop all of the flow.

Bypass Pump Selection Table: 0-25 Feet Total Lift

Pipe Size (in)	Flow rate (gpm)	Hose Length (ft)															
18	4500	8"	8"	8"	8"												
18	4000	8"	8"	8"	8"	8"	8"	8"									
18	3500	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"						
18	3000	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"			
18	2500	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"
15	2000	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"
15	1500	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
15	1000	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
10	750	4"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
8	500	4"	4"	4"	4"	4"	4"	4"	6"	6"	6"	6"	6"	6"	6"	6"	6"
8	400	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	6"	6"	6"	6"
8	300	3"	3"	3"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"
4	200	3"	3"	3"	3"	3"	3"	3"	3"	3"	4"	4"	4"	4"	4"	4"	4"
4	100	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"
4	50	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"

Assumptions

- All losses are ignored except for frictional losses.
- Velocity heads are zero because of low speeds.
- Pump curves are from www.rainforrent.com.
 - 3" pump DV-80 @ 2800 rpm
 - 4" pump DV-100 @ 2200 rpm
 - 6" pump DV-150 @ 2200 rpm
 - 8" pump DV-200c @ 1900 rpm
- Hose diameter is same as pump size.
- Fire hose roughness coefficient C=120
- Inlet and outlet pressures are at atmospheric pressure.
- Average flow rates for pipe diameters are calculated using average slopes.
- Maximum 25 feet suction lift.

Pipe Size (in)	Avg Flow Rate (gpm)
4	270
6	314
8	486
10	764
12	1667
15	2153
18	4444

Bypass Pump Selection Table: 25-50 Feet Total Lift

Pipe Size (in)	Flow rate (gpm)	Hose Length (ft)															
18	4500	8"	8"	8"	8"												
18	4000	8"	8"	8"	8"	8"	8"	8"									
18	3500	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	
18	3000	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	
18	2500	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	
15	2000	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	
15	1500	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	
15	1000	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	
10	750	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	
8	500	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	
8	400	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	
8	300	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	
4	200	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	
4	100	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	
4	50	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	

Assumptions

- All losses are ignored except for frictional losses.
- Velocity heads are zero because of low speeds.
- Pump curves are from www.rainforrent.com.
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 - 8" pump DV-200c @ 1900 rpm
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- Average flow rates for pipe diameters are calculated using average slopes.
- Maximum 50 feet suction lift.

Pipe Size (in)	Avg Flow Rate (gpm)
4	270
6	314
8	486
10	764
12	1667
15	2153
18	4444

**Determining Overflow Rates From a Manhole:
Flow from a Manhole Picture Matching**

**Reference Sheet for Estimating Sewer Flow Rate
From Overflowing Sewer Maintenance Holes**

All estimates are calculated in gallons per minute (gpm)



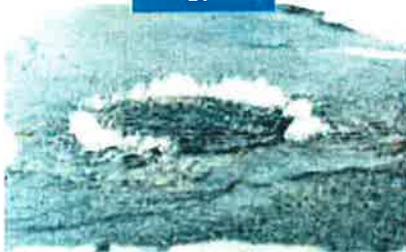
5 gpm



25 gpm



50 gpm



100 gpm



150 gpm



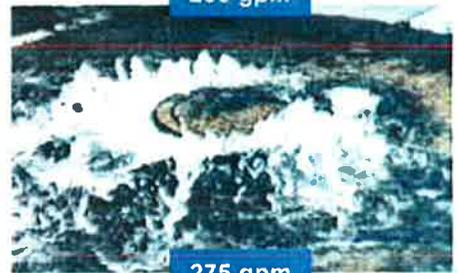
200 gpm



225 gpm



250 gpm



275 gpm

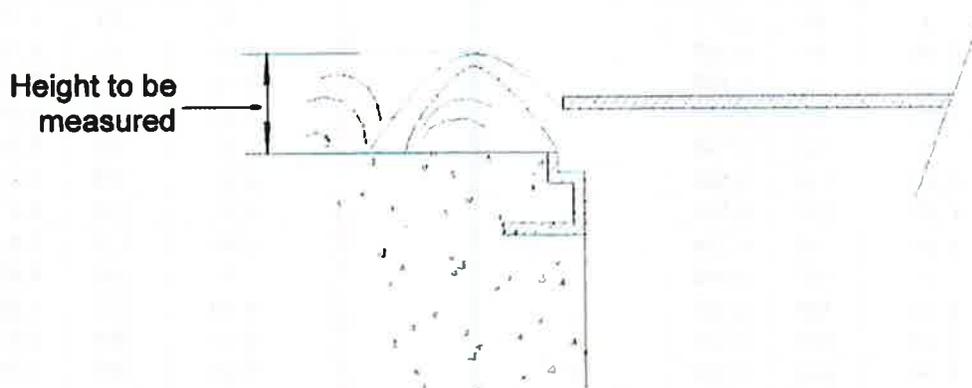
All photos were taken during a demonstration using metered water from a hydrant in cooperation with the city of San Diego's Water Department

**Determining Overflow Rates From a Manhole:
Flow From a Manhole with Cover in Place Tables**

The formula used to develop Table 1 measures the maximum height of the water coming out of the maintenance hole above the rim. The formula was taken from hydraulics and its application by A.H. Gibson (Constable & Co. Limited).

Example Overflow Estimation:

The maintenance hole cover is unseated and slightly elevated on a 24" casting. The maximum height of the discharge above the rim is 5 1/4 inches. According to Table 1, these conditions would yield an SSO of 185 gallons per minute.

FLOW OUT OF MH WITH COVER IN PLACE

This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.

Determining Overflow Rates From a Manhole:
Flow From a Manhole with Cover in Place Tables
24" COVER

Height of spout above M/H rim H in inches	S S O FLOW Q		Min. Sewer size in which these flows are possible
	in gpm	in MGD	
1/4	1	0.001	
1/2	3	0.004	
3/4	6	0.008	
1	9	0.013	
1 1/4	12	0.018	
1 1/2	16	0.024	
1 3/4	21	0.030	
2	25	0.037	
2 1/4	31	0.045	
2 1/2	38	0.054	
2 3/4	45	0.065	
3	54	0.077	
3 1/4	64	0.092	
3 1/2	75	0.107	
3 3/4	87	0.125	
4	100	0.145	
4 1/4	115	0.166	
4 1/2	131	0.189	
4 3/4	148	0.214	
5	166	0.240	
5 1/4	185	0.266	
5 1/2	204	0.294	
5 3/4	224	0.322	6"
6	244	0.352	
6 1/4	265	0.382	
6 1/2	286	0.412	
6 3/4	308	0.444	
7	331	0.476	
7 1/4	354	0.509	
7 1/2	377	0.543	
7 3/4	401	0.578	8"
8	426	0.613	
8 1/4	451	0.649	
8 1/2	476	0.686	
8 3/4	502	0.723	

36" COVER

Height of spout above M/H rim H in inches	S S O FLOW Q		Min. Sewer size in which these flows are possible
	in gpm	in MGD	
1/4	1	0.002	
1/2	4	0.006	
3/4	8	0.012	
1	13	0.019	
1 1/4	18	0.026	
1 1/2	24	0.035	
1 3/4	31	0.044	
2	37	0.054	
2 1/4	45	0.065	
2 1/2	55	0.079	
2 3/4	66	0.095	
3	78	0.113	
3 1/4	93	0.134	
3 1/2	109	0.157	
3 3/4	127	0.183	
4	147	0.211	
4 1/4	169	0.243	
4 1/2	192	0.276	
4 3/4	217	0.312	6"
5	243	0.350	
5 1/4	270	0.389	
5 1/2	299	0.430	
5 3/4	327	0.471	
6	357	0.514	
6 1/4	387	0.558	8"
6 1/2	419	0.603	
6 3/4	451	0.649	
7	483	0.696	
7 1/4	517	0.744	
7 1/2	551	0.794	
7 3/4	587	0.845	10"
8	622	0.896	
8 1/4	659	0.949	
8 1/2	697	1.003	
8 3/4	734	1.057	
9	773	1.113	

Disclaimer:

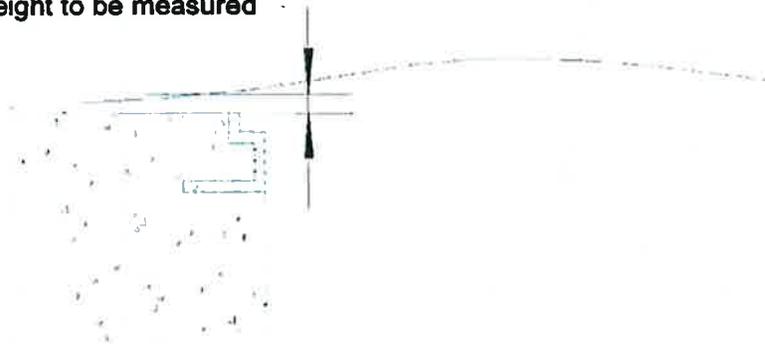
Ed Euyen, Civil Engineer, P.E. No. 33955, California developed this sanitary sewer overflow table, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

**Determining Overflow Rates From a Manhole:
Flow From a Manhole with Cover Removed Tables**

The maintenance hole cover is off and the flow coming out of a 36" frame maintenance hole at one-inch (1") height will be approximately 660 gallons per minute.

FLOW OUT OF MH WITH COVER REMOVED (TABLE 2)

Height to be measured



This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.

Determining Overflow Rates From a Manhole: Flow From a Manhole with Cover Removed Tables

24" FRAME

Water Height above M/H frame H in Inches	S S O FLOW Q		Min. Sewer size in which these flows are possible
	in gpm	in MGD	
1/8	28	0.04	
1/4	62	0.09	
3/8	111	0.16	
1/2	160	0.23	
5/8	215	0.31	6"
3/4	354	0.51	8"
7/8	569	0.82	10"
1	799	1.15	12"
1 1/8	1,035	1.49	
1 1/4	1,340	1.93	15"
1 3/8	1,660	2.39	
1 1/2	1,986	2.86	18"
1 5/8	2,396	3.45	18"
1 3/4	2,799	4.03	
1 7/8	3,132	4.51	
2	3,444	4.96	21"
2 1/8	3,750	5.4	
2 1/4	3,986	5.74	
2 3/8	4,215	6.07	
2 1/2	4,437	6.39	
2 5/8	4,569	6.58	24"
2 3/4	4,687	6.75	
2 7/8	4,799	6.91	
3	4,910	7.07	

36" FRAME

Water Height above M/H frame H in inches	S S O FLOW Q		Min. Sewer size in which these flows are possible
	in gpm	in MGD	
1/8	49	0.07	
1/4	111	0.16	
3/8	187	0.27	6"
1/2	271	0.39	
5/8	361	0.52	8"
3/4	458	0.66	
7/8	556	0.8	10"
1	660	0.95	12"
1 1/8	1,035	1.49	
1 1/4	1,486	2.14	15"
1 3/8	1,951	2.81	
1 1/2	2,424	3.49	18"
1 5/8	2,903	4.18	
1 3/4	3,382	4.87	
1 7/8	3,917	5.64	21"
2	4,458	6.42	
2 1/8	5,000	7.2	24"
2 1/4	5,556	8	
2 3/8	6,118	8.81	
2 1/2	6,764	9.74	
2 5/8	7,403	10.66	
2 3/4	7,972	11.48	30"
2 7/8	8,521	12.27	
3	9,062	13.05	
3 1/8	9,604	13.83	
3 1/4	10,139	14.6	
3 3/8	10,625	15.3	36"
3 1/2	11,097	15.98	
3 5/8	11,569	16.66	
3 3/4	12,035	17.33	
3 7/8	12,486	17.98	
4	12,861	18.52	
4 1/8	13,076	18.83	
4 1/4	13,285	19.13	
4 3/8	13,486	19.42	

Disclaimer:

Ed Euyen, Civil Engineer, P.E. No. 33955, California developed this sanitary sewer overflow table, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

Determining Overflow Rates From a Manhole:**Flow From a Manhole Pick Hole Tables**

The formula used to develop Table 3 is $Q=CcVA$, where Q is equal to the quantity of the flow in gallons per minute, Cc is equal to the coefficient of contraction (.63), V is equal to the velocity of the overflow, and A is equal to the area of the pick hole.² If all units are in feet, the quantity will be calculated in cubic feet per second, which when multiplied by 448.8 will give the answer in gallons per minute. (One cubic foot per second is equal to 448.8 gallons per minute, hence this conversion method).

Example Overflow Estimation:

The maintenance hole cover is in place and the height of water coming out of the pick hole seven-eighths of an inch in diameter (7/8") is 3 inches (3"). This will produce an SSO flow of approximately 4.7 gallons per minute.

FLOW OUT OF VENT OR PICK HOLE (TABLE 3)

Height to be measured



This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.

Determining Overflow Rates From a Manhole: Flow From a Manhole Pick Hole Tables

Height of spout above M/H cover H in inches	SSO FLOW Q in gpm
1/8	1.0
1/4	1.4
3/8	1.7
1/2	1.9
5/8	2.2
3/4	2.4
7/8	2.6
1	2.7
1 1/8	2.9
1 1/4	3.1
1 3/8	3.2
1 1/2	3.4
1 5/8	3.5
1 3/4	3.6
1 7/8	3.7
2	3.9
2 1/8	4.0
2 1/4	4.1
2 3/8	4.2
2 1/2	4.3
2 5/8	4.4
2 3/4	4.5
2 7/8	4.6
3	4.7
3 1/8	4.8
3 1/4	4.9
3 3/8	5.0
3 1/2	5.1
3 5/8	5.2
3 3/4	5.3
3 7/8	5.4
4	5.5
4 1/8	5.6
4 1/4	5.6
4 3/8	5.7
4 1/2	5.8
4 5/8	5.9
4 3/4	6.0
4 7/8	6.0
5	6.1

Height of spout above M/H cover H in inches	SSO FLOW Q in gpm
5 1/8	6.2
5 1/4	6.3
5 3/8	6.3
5 1/2	6.4
5 5/8	6.5
5 3/4	6.6
5 7/8	6.6
6	6.7
6 1/8	6.8
6 1/4	6.8
6 3/8	6.9
6 1/2	7.0
6 5/8	7.0
6 3/4	7.1
6 7/8	7.2
7	7.2
7 1/8	7.3
7 1/4	7.4
7 3/8	7.4
7 1/2	7.5
7 5/8	7.6
7 3/4	7.6
7 7/8	7.7
8	7.7
8 1/8	7.8
8 1/4	7.9
8 3/8	7.9
8 1/2	8.0
8 5/8	8.0
8 3/4	8.1
8 7/8	8.1
9	8.2
9 1/8	8.3
9 1/4	8.3
9 3/8	8.4
9 1/2	8.4
9 5/8	8.5
9 3/4	8.5
9 7/8	8.6
10	8.7

Unrestrained MH cover will start to lift

Note: This chart is based on a 7/8-inch diameter pick hole

Disclaimer: Ed Euyen, Civil Engineer, P.E. No. 33955, California developed this sanitary sewer overflow table, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

Sewer Overflow Response Tactics Guide

The following is intended to be used as a guide for generating ideas in how to respond to sewer overflows resulting from a variety of causes. Please bear in mind that each indicated response tactic may not be appropriate for a given sewer overflow. Always choose the tactic that best meets the circumstances at the time and the resources available. Protection of employee, public and environmental health should always be the top consideration when responding to a sewer overflow, regardless of its cause.

If you encounter an SSO due to:	These are the recommended solutions you should consider											
	Hydro-Jetter	Rodder	Vacuum Truck	TV Van*	Backhoe **	Hand Tools	By-Pass Piping	By - Pass Pumping	Manhole Entry***	Storage Tanks or Set Up Ponds	USA Request**	Backup Generators
Capacity due to gradient			■				■	■		■		
Capacity due to undersized line			■				■	■		■		
Capacity due to surcharged system										■		
Collapse	■	■	■		■		■	■			■	
Debris in Manhole			■			■			■			
Debris in line	■	■	■	■								
Grease	■	■	■	■								
Misc. blockage	■	■	■	■			■	■				
Roots	■	■	■	■			■	■				
Pump Station Failure								■				■
Power Failure								■				■

* CCTV operations may be required for this particular task

** USA Services MUST be contacted prior to start of excavation (1-800-227-2600)

*** Confined space entry procedures MUST be followed!

Regulatory Notifications Packet

Instructions to First Responder:

- 1. Hand this packet to the person responsible for and authorized to make regulatory notifications.
- 2. Enter name and title of that individual on the front of the Sewer Backup or Sewer Overflow Response Envelope.

Instructions for Reporting Authority:

- 1. Open this packet
- 2. Refer to the Guide to Reporting to Regulatory Authorities for instructions.

Contents:

Form	Page Number
Guide To Reporting To Regulatory Authorities	RN-1
Fax Reporting Form: to Water Board	-2
Fax Reporting Form: to Local Health Agency	-3

Print on 6"x9" envelope

Regulatory Notifications Packet
Guide To Reporting To Regulatory Authorities

Primary Reporting Summary

Refer to Side B for contact information, timeframes and reporting procedures

If the backup or SSO:	Then contact:
<ul style="list-style-type: none"> • 1,000 gal, and/or • Results in a discharge into a drainage channel or a surface water, and/or • Discharged to a storm drain and was not fully recovered 	<ul style="list-style-type: none"> • Governor's Office of Emergency Services • Regional Water Quality Control Board • State Water Resources Control Board
<ul style="list-style-type: none"> • Reached surface water 	<ul style="list-style-type: none"> • All of the above plus Fish and Game
<ul style="list-style-type: none"> • Required posting of public warning signs, and/or • Results in a discharge into a drainage channel or a surface water 	<ul style="list-style-type: none"> • County Health Department
<ul style="list-style-type: none"> • Was caused by problems with a private service lateral 	<ul style="list-style-type: none"> • Optional reporting to Regional Water Quality Control Board and State Water Resources Control Board
<ul style="list-style-type: none"> • All SSOs & Backups due to failure in public sewer 	<ul style="list-style-type: none"> • State Water Resources Control Board

Persons authorized to perform regulatory reporting:

- Public Works Director
- Police Lieutenant
-
-
-

Legally Responsible Official (LRO) authorized to electronically sign SWRCB online SSO reports:

Public Works Director
530.938.5020 (business hours)
(after hours)
(cell phone)

Additional External Notifications:

Report to:	Business hours	After hours	Trigger for reporting:

Internal Reporting Requirements:

Report to:	Business hours	After hours	Trigger for reporting:
City Administrator	530.938.5020		Spills greater than 1,000-gallons, that impact surface waters or impact private property.
Finance Director	530.938.5020		Spills greater than 1,000-gallons, that impact surface waters or impact private property.

**Regulatory Notifications Packet
Guide To Reporting To Regulatory Authorities**

Primary Reporting Agency Contact Information and Procedures:

Regulatory Agency	Contact Information	Report if Backup or Overflow meets any of the following conditions	Timeframe
California Emergency Management Agency	Telephone: 800-852-7550	<ul style="list-style-type: none"> Results in a discharge into a drainage channel or a surface water, and/or Discharged to a storm drain & not fully recovered (regardless of volume) 	Within 2 hours of becoming aware of the discharge
		<ul style="list-style-type: none"> 1,000 gallons 	Immediate reporting required as soon as practical
Regional Water Quality Control Board: North Coast RWQCB Notify the Regional Water Quality Control Board of the known details of the SSO using RN-2 as a guide.	Main Telephone: 707.576.2220 Main Fax: 707.523.0135 Website <u>City Contact</u> Telephone: Fax:	<ul style="list-style-type: none"> Results in a discharge into a drainage channel or a surface water, and/or Discharged to a storm drain & not fully recovered (regardless of volume) 	Within 2 hours of becoming aware of the discharge AND within 24 hrs submit certification to Reg. WQCB that OES and County Health Dep't have been notified.
		<ul style="list-style-type: none"> 1,000 gallons 	Immediate reporting required as soon as practical
		<ul style="list-style-type: none"> Was caused by problems with a private service lateral 	Optional reporting within 30 Days
State Water Resources Control Board 1. Go to the CIWQS Online SSO Reporting Database 2. Enter User Name & Password. 3. Enter requested information using information on the completed Sewer Overflow Report	<u>Website:</u> http://www.swrcb.ca.gov/ciwqs/ (refer to RN2) <u>Notes:</u> <ul style="list-style-type: none"> All electronic reports must be certified by the Legally Responsible Official If SSO was from a private service lateral, provide all information available, indicate cause as being a private service lateral and identify responsible party, if known. 	<ul style="list-style-type: none"> 1,000 gallons, and/or Discharged to a storm drain & not fully recovered (regardless of volume) , and/or Reached surface water 	Immediate reporting required If you leave any requested information blank, then you must return within 15 days and complete
		<ul style="list-style-type: none"> All SSOs & Backups due to failure in public sewer 	Reporting required within 30 days after end of the month the SSO occurs in
		<ul style="list-style-type: none"> Was caused by problems with a private service lateral 	Optional reporting within 30 days
County Health Department Siskiyou County Public Health Department: Environmental Health Services Notify County Health Department of the known details of the SSO using RN-3	Telephone: 530.841.2100 Fax: 530.841.4076	<ul style="list-style-type: none"> Results in a discharge into a drainage channel or a surface water 	Immediate reporting required (within 2 hours of becoming aware of the discharge)
		<ul style="list-style-type: none"> Required Posting of Public Warning Signs 	Immediate reporting required as soon as practical
CA Dept. of Fish & Game Northern Region	530.225.2300	<ul style="list-style-type: none"> Reached surface water 	Immediate reporting required

Refer to Side A for additional reporting requirements, if any.

Sanitary Sewer Overflow Report for IMMEDIATE REPORTING BY FAX

North Coast RWQCB

SSO Two (2) Hour Notification/24-Hour Certification.

This does not replace the requirement to report to
CIWQS-SSO eReporting Program within 3 days of the spill.

OES Telephone Number: 1-800-852-7550

Important: * = Required Field

1. OES Control number* _____
 2. Method of 2hr/24hr Report to Regional Board. Check all that apply.
___ Fax (707.523.0135) ___ Voice Mail (707.576.2220) ___ Staff Contacted: _____
(Staff name)
 3. Date Reported: * ____/____/____ (mm/dd/yyyy)
 4. Time Reported: * ____:____ (hh:mm)
 5. Reported By: * _____ Phone Number: * (____) _____ - _____
 6. Reporting Sewer Agency: * _____
 7. Responsible Sewer Agency: * _____
- Overflow Street Location/Comments -please indicate the spill cause, sources, and final spill destination entered:* (e.g., drainage channel/surface water entered) _____
- _____
- _____
- City: * _____ ZIP Code: * _____ County: * _____

SSO Description if information is not available, please input 00:00 for time and 00 for gallons

9. Overflow Start Estimate: Date:* ____/____/____ (mm/dd/yyyy)
Time:* ____:____ (hh:mm)
10. Overflow End: Date:* Date:* ____/____/____ (mm/dd/yyyy)
Time:* ____:____ (hh:mm)
11. Estimated Overflow Flow Rate: * _____ (gallons per minute)
12. Estimated Total Overflow Volume:* _____ (gallons)
13. Overflow Volume Recovered: * _____ (gallons)
14. Person Completed:* _____ Date: ____/____/____ (mm/dd/yyyy)
Official Title: * _____ Phone Number * _____
Email:* _____
5. When Did You Notify Your Local Health Department?: * Date: ____/____/____ (mm/dd/yyyy)
* Time: ____:____ (hh:mm)

Regulatory Notifications Packet

IMMEDIATE REPORTING BY FAX To Local Health Agency

TO:
Siskiyou County Public Health Department: Environmental Health Services
Fax: 530.841.4076
Telephone: 530.841.2100
Re:

FROM:
City of Weed CA
Fax: 530.938.5096
Telephone: 530.938.5020
DATE:
of Pages:

- URGENT
 FOR REVIEW
 PLEASE COMMENT
 PLEASE REPLY

NOTICE OF SANITARY SEWER OVERFLOW

In accordance with California Health and Safety Code Section 5410 et. seq.

Overflow Street Location/Comments -please indicate the spill cause, sources, and final spill destination entered:* (e.g., drainage channel/surface water entered) _____

City: * _____ ZIP Code: * _____ County: * _____

SSO Description if information is not available, please input 00:00 for time and 00 for gallons

Overflow Start Estimate: Date:* ____/____/____ (mm/dd/yyyy)

Time:* ____:____(hh:mm)

Overflow End: Date:* ____/____/____ (mm/dd/yyyy)

Time:* ____:____(hh:mm)

Estimated Overflow Flow Rate: * _____ (gallons per minute)

Estimated Total Overflow Volume:* _____ (gallons)

Overflow Volume Recovered: * _____ (gallons)

Person Completed:* _____ Date: ____/____/____(mm/dd/yyyy)

Official Title: * _____ Phone Number * _____

Email:* _____ Time spill was noticed: _____

Notifications:

- Notified Regional Water Quality Control Board
 Notified Office of Emergency Services

Field Sampling Kit: Table of Contents

<u>Form</u>	<u>Form Number</u>
Procedures for Sampling Receiving Waters and Posting Warnings after a Sewage Spill.....	FS-1
Sample Collection Chain of Custody Record	-2

The Field Sample Kit contains:

- Cooler w/ice pack
- Latex gloves
- Safety glasses
- 2 ammonia-nitrogen sample bottles (1pt bottle w/H₂SO₄)
- 20 Sample bottle labels
- Waterproof Pen (i.e. Sharpie®)
- 10 Total/Fecal Coliform sample bottles (100ml sterilized bottle)
- Disposable Camera
- Chain of Custody form

Field Sampling Kit: Procedures For Sampling Receiving Waters and Posting Warnings After A Sewage Spill

COLLECT SAMPLES AS FOLLOWS:

1. Get Field Sampling Kit
2. Get ice pack from a convenience store and place in cooler
3. Determine point spill entered waterway – photograph this location (*include a reference point in the photo*)
4. Don the PPE from the Sampling Kit

- COLLECT ALL SAMPLES AGAINST THE DIRECTION OF THE WATER FLOW! (FACE UPSTREAM)
- COLLECT UPSTREAM SAMPLE FIRST!
- COLLECT SAMPLES WELL AWAY FROM THE BANK (preferably where water is visibly flowing) AND 6" BELOW THE SURFACE
- AVOID SAMPLING DEBRIS OR SCUM LAYER FROM THE SURFACE.
- PHOTOGRAPH EVIDENCE OF DEAD FISH!

5. SAMPLING:

- a. Move 50' upstream of point where spill entered waterway (reference sample)
- b. Remove the seal from the coliform sample container (100ml or smaller container) just prior to collecting your sample. A chemical has been added to the sample container. Leave the chemical in the bottle and do not rinse.
 1. Remove the cap immediately before collecting each sample.
 2. Do not allow the inside of the cap to touch anything
 3. Holding the bottle in one hand, face upstream and lower the bottle 6" below the water surface. Then sweep the bottle upstream and out of the water. Be careful not to disturb the bottom sediment. Pour a little water out so that bottle is filled to the line. Immediately replace the cap.
- c. Open the larger container (*ammonia-nitrogen sample container*) and follow collection process above (steps 5a-c) to fill to just below the neck of the jar.

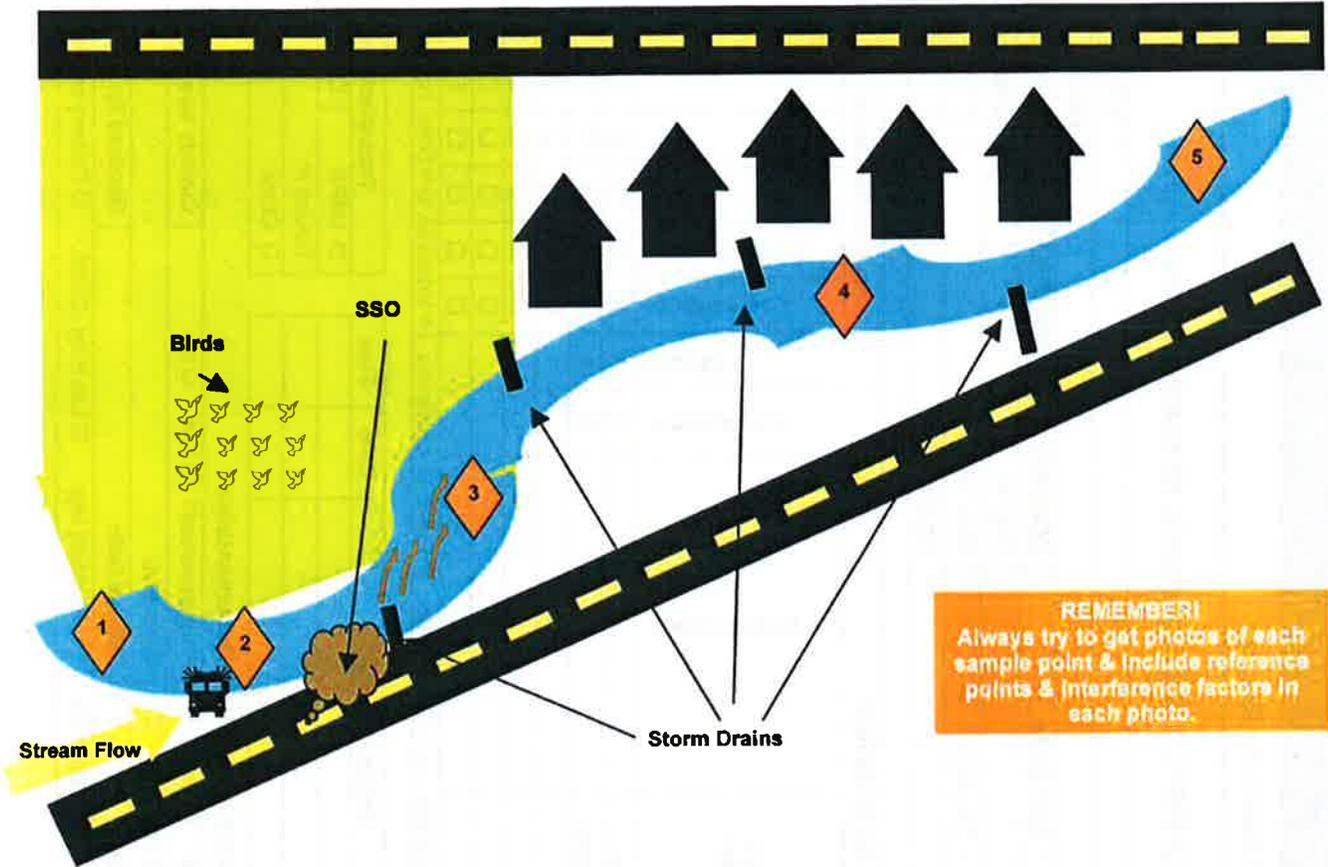
NOTE: The ammonia-nitrogen sample bottle contains sulfuric acid – LEAVE THE ACID IN THE BOTTLE AND DO NOT ALLOW IT TO TOUCH YOUR SKIN!
- d. Label all of the samples with their location and note the date and time collected
- e. Place samples in cooler on the ice pack
- f. Take a photo of this sample location (*include a reference point in the photo*)
- g. Move at least 10' downstream of point where spill entered waterway and repeat steps 5a-f

7. Complete the Chain of Custody form from the Sampling Kit

8. Immediately contact: Baker Environmental
Telephone: 530.842.7987
and inform them the following samples require processing:
- a. Total and Fecal Coliform – *Holding time = <4hours*
 - b. Ammonia-Nitrogen – *Holding Time = 28 days*

9. Take cooler containing the samples and completed chain of custody to Baker Environmental at 550 N Main St Yreka, CA 96097 Samples should be taken to lab within 6 hours of collection time.
10. Post warning signs as directed by the County Environmental Health Department.
11. Repeat sampling daily from time the spill is known until the results of two consecutive sets of samples indicate the return to the normal level or cessation of monitoring is authorized by the County Department of Environmental Health.
12. Remove Warning Signs and lift restrictions when authorized by the County Environmental Health Department.

Field Sampling Kit: Procedures For Sampling Receiving Waters and Posting Warnings After A Sewage Spill



- 1** Sample Location 1: Baseline Sample, no observable interference from birds, animals, runoff, etc
- 2** Sample Location 2: Baseline Sample, observable interference from birds, animals, runoff, etc
NOTE: Only collect this sample if you observe any possible interfering factors upstream from the spill location
- 3** Sample Location 3: Immediately downstream of SSO entry point
- 4** Sample Location 4: Further downstream of SSO entry point – note any possible interfering factors
- 5** Sample Location 5: Further downstream of SSO entry point – note any possible interfering factors

NOTE: This example is provided for illustrative purposes only! Base each sampling event on the geography, drainage and interference factors (i.e. birds, animals, runoff, etc) of the area impacted.

Field Sampling Kit: Sample Collection Chain of Custody Record

INSTRUCTIONS TO EMPLOYEE: Complete all shaded boxes.

Customer Name	PO#
Customer Address	WO#
Customer Telephone	Turnaround Requirement
Program Name	<input type="checkbox"/> Normal (21 days)
Lab Program Coordinator	<input type="checkbox"/> Rush: _____
Sampled By	<input type="checkbox"/> Other: _____

LIMS# (issued by Lab)	SAMPLE COLLECTION INFORMATION				Sample Name	# Containers	Matrix*	Analysis Requested		QA/QC Requirements		Remarks/Notes
	Date	Time	Type					Ammonia/BOD	Coliform (fecal/total)	<input checked="" type="checkbox"/> Lab Standard	<input type="checkbox"/> Special (see attached)	
			Composite	Grab								
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	Upstream	2	A	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	Downstream	2	A	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
				<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>		
				<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>		
				<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>		
				<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>		

*Matrix: P = Potable Water, W = Wastewater, A = Ambient Water, G = Groundwater, S = Soil, B = Biosolids, I = Industrial, O = Other (specify in remarks)

Relinquished	Date	Time	Relinquished to	Date	Time

Sample Receiving Documentation

Container intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	Correct container? <input type="checkbox"/> Yes <input type="checkbox"/> No	Field preserved? <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody tape intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Cooled? <input type="checkbox"/> Yes <input type="checkbox"/> No	Temp. Blank? <input type="checkbox"/> Yes <input type="checkbox"/> No (°C)	Comments:	
Sample distribution: <input type="checkbox"/> Lab bench <input type="checkbox"/> Ice chest <input type="checkbox"/> Walk-in cooler shelf #	Disposal Date:	Disposed by: (inits.)	
C-O-C Distribution Date: _____ By: _____	<input type="checkbox"/> Lab Admin File <input type="checkbox"/> Prog/proj Mgr. <input type="checkbox"/> Lab Prog. Coord. <input type="checkbox"/> Delivery courier <input type="checkbox"/> Pick-up courier		

Transport/Shipping Information
<input type="checkbox"/> USPS <input type="checkbox"/> UPS <input type="checkbox"/> FedEx
Tracing #: _____
<input type="checkbox"/> Other: _____

Backup Response Packet: Table of Contents

<u>Form</u>	<u>Form Number</u>
Instructions and Chain of Custody	envelope label
Responding to a Sanitary Sewer Backup.....	BP-1
Declination of Cleaning Services (3-copy NCR)	-2
First Responder Form	-3
Building History Form.....	-4
Sewer Overflow Report.....	-5
Lateral TV Report	-6
Claims Submittal Checklist	-7
Customer Service Packet	
Instructions.....	envelope
Customer Information.....	CS-1
Sewer Spill Reference Guide	pamphlet
Regulatory Notifications Packet	
Instructions.....	envelope
Guide to Reporting to Regulatory Authorities	RN-1
Fax Reporting Form: to Water Board	-2
Fax Reporting Form: to Local Health Agency.....	-3
Door Hanger	n/a
Sewer Spill Reference Guide.....	pamphlet

Packet Assembly Instructions:

In order to properly gather and distribute all the necessary information at the scene of a sewer backup, it is recommended the Sanitary Sewer Backup Packets be created and placed in all field vehicles that may be used to respond to a sewer backup. The following instructions will guide you through the assembly of the Packet.

1. Determine how many packets you wish to assemble.
2. Obtain the same number of 10"x12" Tyvek (*water & tear resistant*) envelopes, and twice as many 6" x 9" envelopes.
3. Print the Customer Service instructions on the front of half of the 6" x 9" envelopes. Then place one copy of each of the Customer Service Envelope forms listed above in each envelope.
4. Print the Regulatory Notifications instructions on the front of half of the 6" x 9" envelopes. Then place one copy of each of the Regulatory Notifications Envelope forms listed above in each envelope.
5. Place the two small envelope packets and all other forms listed above into the Tyvek envelope.
6. Insert a door hanger and a Sewer Spill Reference Guide pamphlet into the Tyvek envelope.
7. Insert a new disposable camera into the Tyvek envelope.
8. Tape or otherwise secure to the front of each envelope a copy of the Packet instructions ("Read This First").
9. Place two staples through the top of the envelope.
10. Place at least one complete Packet in each field vehicle that may be used to respond to a sewer backup.

For pre-assembled packets contact DKF Solutions Group at 707.373.9709 or losscontrol@sbcglobal.net

In the event of a **Sewer Backup** into a home/business
READ THIS FIRST

	Trigger	Contact Immediately	Telephone
<input type="checkbox"/>	For all backups into/onto private property due to problems in the public sewer	Cameron Dewey, Bragg and Associates	530.248.1414 (office) 530.276.5322 (cell) 530.605.0183 (home)
<input type="checkbox"/>	If the backup is into a business	Public Works Director	530.938.5020
<input type="checkbox"/>	For any media requests	Police Public Information Officer	530.938.5020 or 530.938.5000
<input type="checkbox"/>	For cleaning services	ServiceMaster by Cronic	530.228.8800
		CleanRite Buildrite	1.800.870.0030

Instructions

Maintenance Crew

- 1st: Open this envelope.
- 2nd: Follow the instructions on the card: "Responding to a Sanitary Sewer Backup."
- 3rd: If the backup appears to be due to a failure in the City-owned sewer line & the customer is home, give them the Customer Service Packet and have them initial this envelope below:

Customer acknowledgement of receipt of Customer Service Packet: _____

If customer is not home, complete the Door Hanger and hang it on the customer's door.
- 5th: Complete the Chain of Custody record (right) and forward this packet to the Public Works Director.

Public Works Director

- 1st: Open this envelope. Review forms.
- 2nd: Complete the Claims Submittal Checklist (enclosed).
- 3rd: Forward the Regulatory Notifications Packet to the person authorized to make required notifications (enter name and title of that individual to the right).
- 4th: Copy all items on the Claims Submittal Checklist for internal archiving purposes and forward the originals to the City Administrator or designee.

Public Works Director

Refer to Claims Handling Procedure Summary

Chain of Custody

Print Name _____

Initial _____

Date _____

Time _____

Print Name _____

Initial _____

Date _____

Time _____

Regulatory Notification Packet given to:

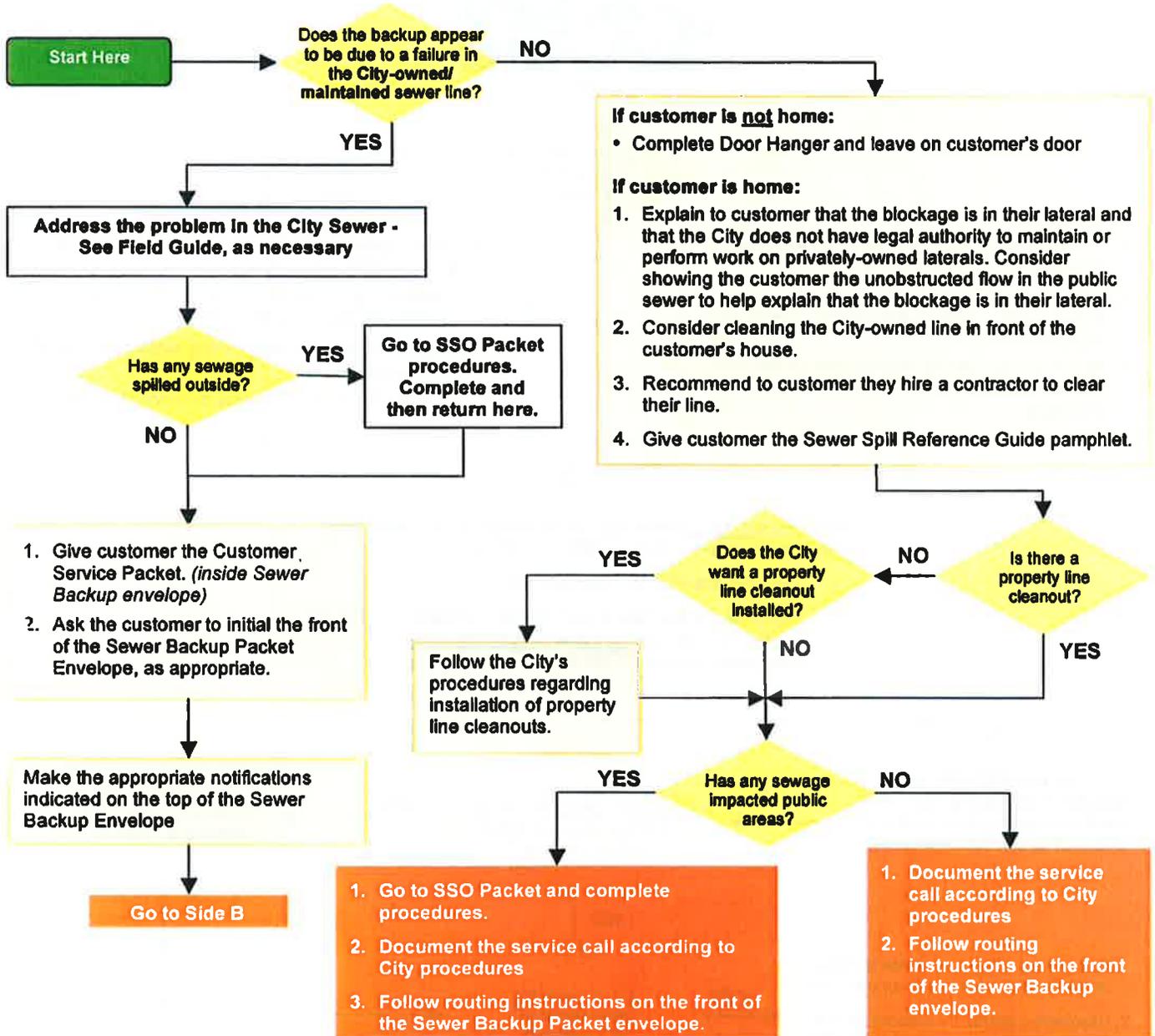
Name _____

Title _____

City of Weed CA

Sanitary Sewer Overflow and Backup Response Plan

Responding to a Sanitary Sewer Backup



MEDIA AND PUBLIC RELATIONS GUIDELINES:

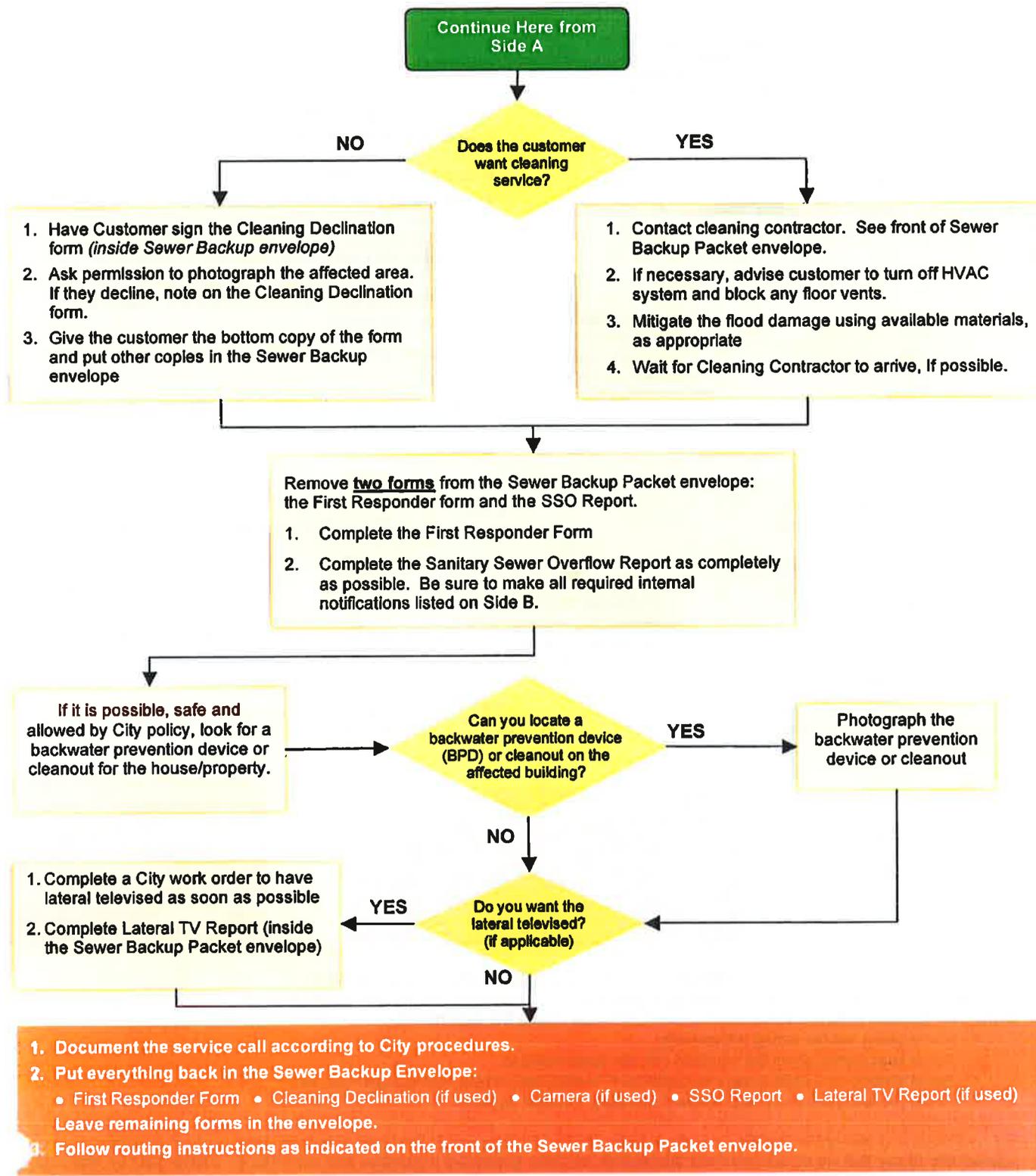
Exercise caution in contacts with the public or media when you respond to a spill. Any information you provide or statements you make may become pertinent in the event of possible court action, it is important to:

- Avoid giving out the wrong information,
- Avoid speculating about the situation you are responding to,
- Avoid making accusations against customers, businesses or other public agencies, and
- Avoid providing incorrect facts about a company or other agency.

Be courteous and attempt to provide accurate information to questions within the limits above. In some cases, it may be appropriate to say that we do not have any information, or delay answering a question and say when an answer may be available.

In most cases, refer media requests to the media coordinator indicated on the Sewer Backup Packet envelope.

Responding to a Sanitary Sewer Backup



Backup Response Packet: Declination of Sewage Cleaning Services

Customer Information				
NAME:		ADDRESS:		TELEPHONE:
ON (date)	AT (time)	Approximately (quantity)	GALLONS OF: <input type="checkbox"/> Sewage <input type="checkbox"/> Grey Water <input type="checkbox"/> Toilet Bowl Water <input type="checkbox"/> Odor <input type="checkbox"/> Other (describe):	
Overflowed from (or odor emanating from) <input type="checkbox"/> Toilet <input type="checkbox"/> Shower/Tub <input type="checkbox"/> Washer <input type="checkbox"/> Other (describe):			The overflow affected the following areas (check one): <input type="checkbox"/> Bathroom <input type="checkbox"/> Bedroom <input type="checkbox"/> Hallway <input type="checkbox"/> Garage <input type="checkbox"/> Kitchen <input type="checkbox"/> Crawlspace <input type="checkbox"/> Other (specify):	
The overflow affected the following flooring: <input type="checkbox"/> Tile <input type="checkbox"/> Wood Flooring <input type="checkbox"/> Linoleum <input type="checkbox"/> Carpet <input type="checkbox"/> Other (specify):		and/or additional materials: <input type="checkbox"/> Area Rugs <input type="checkbox"/> Towels <input type="checkbox"/> Clothing <input type="checkbox"/> Other (specify):		
Photos: <input type="checkbox"/> Were Not Taken <input type="checkbox"/> Were Taken, number of photos: _____				
This Form Completed By: _____				Date: _____ Time: _____

CUSTOMER, please read the following and sign below:

'We acknowledge that City of Weed CA (City) has offered to provide professional cleaning and decontamination services to remediate the sewage backup and/or overflow described above and that we declined the offer. We further understand and acknowledge that because we have declined, any necessary remediation activities will be conducted without City assistance, and that the City will not accept responsibility for work performed by persons other than those engaged by the City. The City will also not accept responsibility for any charges related to this incident that are not usual and customary. Please refer to the Customer Service Packet for whom to contact if you have any questions.

Customer Signature*:		Date:
The information above was explained to the customer by the following employee:	Name:	Title:
	Signature:	Date:

*Note to responders: if customer declines to sign this form, have a co-worker sign as a witness and check here

Recommendations to customer to clean up the spill:

- Keep pets and children out of the affected area
- Turn off heating/air conditioning systems
- Wear rubber boots, rubber gloves, and goggles during cleanup of the affected area.
- Remove and discard items that cannot be washed and disinfected (such as: mattresses, rugs, cosmetics, baby toys, etc.)
- Remove and discard drywall and insulation that has been contaminated with sewage or flood waters.
- Thoroughly clean all hard surfaces (such as flooring, concrete, molding, wood and metal furniture, countertops, appliances, sinks and other plumbing fixtures) with hot water and laundry or dish detergent.
- Help the drying process with fans, air conditioning units, and dehumidifiers.
- After completing cleanup, wash your hands with soap and water. Use water that has been boiled for 1 minute (allow the water to cool before washing your hands.) OR use water that has been disinfected (solution of 1/8 teaspoon of household bleach per 1 gallon of water). Let it stand for 30 min. If water is cloudy, use ¼ teaspoon of household bleach per 1 gallon of water.
- Wash all clothes worn during the cleanup in hot water and detergent (wash separately from uncontaminated clothes).
- Wash clothes contaminated with flood or sewage water in hot water and detergent. Use a laundromat for washing large quantities of clothes and linens until your onsite wastewater system has been professionally inspected and services.
- See immediate attention if you become injured or ill.

Distribution Instructions – Top Copy to City records; Middle Copy to Assistant City Manager; Bottom Copy to Customer

Backup Response Packet: First Responder Form

Fill out this form as completely as possible.
Ask customer if you may enter the home. If so, take photos of damaged and undamaged areas.

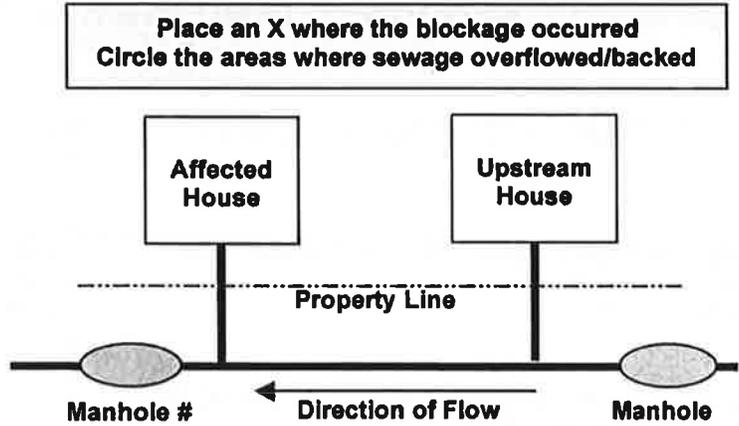
PERSON COMPLETING THIS FORM:		PHONE:
		DATE:
		TIME:
TIME STAFF ARRIVED ON-SITE:		
DID CUSTOMER CALL CLEANING CONTRACTOR? <input type="checkbox"/> Yes <input type="checkbox"/> No If YES, name of contractor:		
RESIDENT:	PROPERTY MANAGERS:	
STREET ADDRESS:	STREET ADDRESS:	
CITY, STATE AND ZIP:	CITY, STATE AND ZIP:	
PHONE:	PHONE:	
<input type="checkbox"/> NEAREST UPSTREAM MANHOLE VISIBLY HIGHER THAN THE DRAIN THAT OVERFLOWED? <input type="checkbox"/> Yes <input type="checkbox"/> No		
# OF PEOPLE LIVING AT RESIDENCE:		
Approximate Age of Home:	# of Bathrooms:	# of Rooms Affected:
Approximate Amount of Spill (gallons):	Approximate Time Sewage Has Been Sitting (hrs/days):	
Numbers of Pictures Taken	Digital or Film?	
Does property have Curbside Cleanout?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Unknown	
Does the Customer have a Backwater Prevention Device (BPD)?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Unknown	
If yes, was the BPD operational at the time of the overflow?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Unknown	
Have there ever been any previous spills at this location?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Unknown	
Has the Resident Had Any Plumbing Work Done Recently? <i>If YES, please describe:</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO	

GO TO SIDE B

Backup Response Packet: First Responder Form

SANITARY SEWER LINE BLOCKAGE LOCATION

PLEASE CHECK THE BOX THAT DESCRIBES YOUR OBSERVATIONS			
Customer Cleanout Was:	Public Cleanout was:		
	Non - Existent	Full	Empty
Non-Existent			
Full			
Empty			



Did sewage go under buildings? Yes No Unsure

Recommended Follow-Up Action(s):

Backup Response Packet: Building History Form

PERSON COMPLETING THIS FORM:		DATE:
		PHONE:
RESIDENT NAME:	# OF RESIDENTS AT THIS ADDRESS:	
DATE OF OVERFLOW:	APPROXIMATE GALLONS SPILLED:	
WERE RESIDENTS RELOCATED TO A HOTEL? <input type="checkbox"/> Yes <input type="checkbox"/> No <i>if Yes, where:</i>		
NAME OF EMPLOYEE(S) RESPONDING TO SPILL:	NAME OF CLEANING CONTRACTOR (if known):	
WAS PROPERTY FINISHED FLOOR ELEVATION DETERMINED? <input type="checkbox"/> Yes <input type="checkbox"/> No IS FINISHED FLOOR 12" OR MORE BELOW NEAREST UPSTREAM MANHOLE? <input type="checkbox"/> Yes <input type="checkbox"/> No	ANY PLUMBING PERMITS W/IN LAST 3 YEARS? <input type="checkbox"/> Yes <input type="checkbox"/> No If "YES", please describe: ANY ACTIVE PLUMBING PROJECTS OBSERVED: <input type="checkbox"/> Yes <input type="checkbox"/> No If YES, please describe: WHEN WAS THIS LINE SEGMENT LAST CLEANED? REPAIRED (date & describe repairs):	
WAS A BACKFLOW PREVENTION DEVICE (BPD) INSTALLED ON PROPERTY? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown WAS BPD FUNCTIONING? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown WAS LATERAL TV'd? <input type="checkbox"/> Yes <input type="checkbox"/> No If YES, please include copy of Lateral TV report IS THIS PROPERTY REQUIRED TO HAVE A BPD INSTALLED BY ORDINANCE? <input type="checkbox"/> Yes <input type="checkbox"/> No		
HAVE THERE EVER BEEN ANY OTHER SPILLS AT THIS LOCATION? <i>If so, when?</i>		

Place completed form in Sewer Backup Envelope and follow routing instructions.

Backup Response Packet: Sanitary Sewer Overflow Report

INSTRUCTIONS: Complete all items EXCEPT those that are shaded gray

Spill Category (check one): Category 1 Category 2

A. SPILL LOCATION

Spill Location Name:		
Latitude Coordinates:		Longitude Coordinates:
Street Name and Number:		
Nearest Cross Street	City:	Zip Code:
County: Santa Clara	Spill Location Description:	

B. SPILL DESCRIPTION

Spill Appearance Point: <input type="checkbox"/> Building/Structure <input type="checkbox"/> Force Main <input type="checkbox"/> Gravity Sewer <input type="checkbox"/> Other Sewer System Structure (i.e. cleanout)	
<input type="checkbox"/> Pump Station	<input type="checkbox"/> Manhole- Structure ID#: <input type="checkbox"/> Other (specify):
Did the spill reach a drainage channel and/or surface water? <input type="checkbox"/> Yes (Category 1) <input type="checkbox"/> No	
If the spill reached a storm sewer, was it fully captured and returned to the Sanitary Sewer? <input type="checkbox"/> Yes <input type="checkbox"/> No (Category 1)	
Was this spill from a private lateral? <input type="checkbox"/> Yes <input type="checkbox"/> No If YES, name of responsible party:	
Final Spill Destination: <input type="checkbox"/> Beach <input type="checkbox"/> Building structure <input type="checkbox"/> Other paved surface <input type="checkbox"/> Storm drain <input type="checkbox"/> Street/curb & gutter	
<input type="checkbox"/> Surface water <input type="checkbox"/> Unpaved surface <input type="checkbox"/> Other (specify):	
Estimated spill volume (in gallons – 1,000gal or more = Category 1):	Method calculated:
Est. volume of SSO recovered (gal):	Were photos taken? <input type="checkbox"/> No <input type="checkbox"/> Yes – how many?
Estimated volume of spill reaching surface water, drainage channel, or not recovered from a storm drain (gal):	

C. SPILL OCCURRING TIME

Estimated spill start date and time:	
Date and time spill reported to sewer crew:	Date and time sewer crew arrived:
Estimated spill end date and time:	

CAUSE OF SPILL

Location of Blockage: <input type="checkbox"/> Main <input type="checkbox"/> Lateral <input type="checkbox"/> Private Lateral <input type="checkbox"/> Other	
SSO cause (check all that apply): <input type="checkbox"/> Debris/Blockage <input type="checkbox"/> Flow exceeded capacity <input type="checkbox"/> Grease <input type="checkbox"/> Operator error <input type="checkbox"/> Roots	
<input type="checkbox"/> Pipe problem/failure	<input type="checkbox"/> Pump station failure <input type="checkbox"/> Rainfall exceeded design <input type="checkbox"/> Vandalism <input type="checkbox"/> Inflow/infiltration
<input type="checkbox"/> Animal carcass	<input type="checkbox"/> Electrical power failure <input type="checkbox"/> Bypass <input type="checkbox"/> Debris from laterals <input type="checkbox"/> Construction Debris
<input type="checkbox"/> Other (specify):	
Weather conditions prior 72 hours: <input type="checkbox"/> Sunny Weather <input type="checkbox"/> Cloudy Weather <input type="checkbox"/> Measurable Rain <input type="checkbox"/> Rain for Several Days	
If SSO is caused by wet weather, choose size of storm: <input type="checkbox"/> 1-yr <input type="checkbox"/> 2-yr <input type="checkbox"/> 5-yr <input type="checkbox"/> 10-yr <input type="checkbox"/> 50-yr <input type="checkbox"/> 100-yr <input type="checkbox"/> >100-yr <input type="checkbox"/> Unknown	
Diameter (in inches) of pipe at point of blockage/spill cause (if applicable):	
Sewer pipe material at point of blockage/spill cause (if applicable):	
Description of terrain surrounding point of blockage/spill cause: <input type="checkbox"/> Flat <input type="checkbox"/> Mixed <input type="checkbox"/> Steep	

E. SPILL RESPONSE

Spill response activities (check all that apply): <input type="checkbox"/> Cleaned up <input type="checkbox"/> Contained all/portion of spill <input type="checkbox"/> TV inspection <input type="checkbox"/> Restored flow	
<input type="checkbox"/> Returned all/portion of spill to sanitary sewer <input type="checkbox"/> Other (specify):	
Spill response completed (date & time):	Name of impacted waters (if applicable):
Visual inspection result of impacted waters (if applicable):	
Any fish killed? <input type="checkbox"/> Yes <input type="checkbox"/> No	Any ongoing investigation? <input type="checkbox"/> Yes <input type="checkbox"/> No
Name of impacted beach (if applicable):	Were health warnings posted? <input type="checkbox"/> Yes <input type="checkbox"/> No
Health warning/beach closure posting/details:	
Were samples of impacted waters collected? <input type="checkbox"/> Yes <input type="checkbox"/> No If YES, select the analyses: <input type="checkbox"/> DO <input type="checkbox"/> Ammonia <input type="checkbox"/> Bactl <input type="checkbox"/> Other	
Recommended corrective actions: <input type="checkbox"/> Add sewer to PM Program <input type="checkbox"/> Adjust PM schedule <input type="checkbox"/> Adjust PM method	
<input type="checkbox"/> Rehab sewer <input type="checkbox"/> Replace sewer <input type="checkbox"/> Enforcement action against FOG source <input type="checkbox"/> Other (specify):	

F. NOTIFICATION DETAILS

ES contacted date and time (if applicable):	Spoke to:
OES Control Number (if applicable):	

GO TO SIDE B

Backup Response Packet: Sanitary Sewer Overflow Report

Immediate Regulatory Reporting Guide:

If any of the following conditions exist, immediately contact one of the individuals on the list below and request that they make notifications as indicated in the Regulatory Notifications Packet:

- Estimated volume is greater than 1,000 gallons
- SSO was discharged to a drainage channel or surface waters
- SSO was discharged to a storm drain and not fully captured and returned

PERSON	CELL PHONE	BUSINESS HOURS
Public Works Director		530.938.5020
Police Lieutenant	530.938.5000 (Police Dispatch)	530.938.5000 (Police Dispatch)

RECOMMENDED FOLLOW-UP ACTIONS TO PREVENT FUTURE OCCURRENCES	
CURRENT PM FREQUENCY:	DATE OF LAST PM:
RECOMMENDED ACTIONS: <input type="checkbox"/> TV <input type="checkbox"/> REPAIR LINE SEGMENT <input type="checkbox"/> OTHER (describe): <input type="checkbox"/> RE-RUN <input type="checkbox"/> CHANGE CLEANING SCHEDULE <input type="checkbox"/> REPLACE LINE SEGMENT	
NOTES:	

Place completed form in Sewer Backup Envelope and follow routing instructions.

Backup Response Packet: Lateral TV Report

PLEASE COMPLETE AS THOROUGHLY AS POSSIBLE

PERSON COMPLETING THIS FORM:

DATE:
PHONE:

CAMERA TYPE:

LOCATION OF CAMERA ENTRY:

AFFECTED PROPERTY STREET ADDRESS:

LOCATION OF CAMERA STOP:

CITY, STATE AND ZIP:

DESCRIBE AREA TV'd:

PHONE

UPSTREAM MANHOLE #:

PLEASE CHECK ALL THAT WERE DISCOVERED – *Describe Extent & Location Using Camera Entry Point As Reference:*

TIME OF OVERFLOW:

TIME BLOCKAGE RELIEVED:

TIME LATERAL TV'd:

Broken Lateral – Describe:

Depth:

DEPTH OF LATERAL:

Roots – Severity: Light Moderate Heavy

Grease – Severity: Light Moderate Heavy

Sag – Describe:

Depth:

**RECOMMENDED
FOLLOW UP WORK ACTIONS:**

BPD – Describe:

Location:

Cleanout – Describe:

Location:

Joint/Junction – Describe:

Depth

Grade – Describe:

Grit – Severity: Light Moderate Heavy

Other – Describe:

Mark for USA location? Yes No

Lateral Locations Marked in Green Paint? Yes No

SIGNATURE OF EMPLOYEE PERFORMING TV WORK:

DATE

If applicable, place completed form in Sewer Backup Envelope and follow routing instructions.

Backup Response Packet: Claims Submittal Checklist

Public Works Director

1. Complete the following information:

Title: _____
Name: _____
Phone: _____
Today's Date: _____

2. Complete the Building History Form
3. Copy the items listed below and retain for internal archiving purposes.
4. Place the originals back in the Backup Response Envelope and forward envelope with original forms to Assistant City Manager:

- Form BP-2: Declination of Cleaning Services
- Form BP-3: First Responder Form
- Form BP-4: Building History Form
- Form BP-5: Sanitary Sewer Overflow Report
- Form BP-6 Lateral TV Report *(if applicable)*
- Form BP-7: Claims Submittal Checklist *(this form)*
- All photos taken *(hardcopy or electronic)*
- Any other information you feel is important in this claim

Public Works Director or Other Reporting Authority

Go to Regulatory Notifications Packet and make all appropriate notifications.

Public Works Director or Designee

1. Verify claims packet is complete.
2. Notify:

Cameron Dewey, Bragg and Associates
P.O. Box 491749, Redding, CA 96049-1749
Telephone: 530.248.1414 (office) 530.276.5322 (cell) 530.605.0183 (home)
Fax: 530.223.2679

Customer Service Packet

Contents:

<u>Form</u>	<u>Form Number</u>
Customer Information Letter.....	CS-1
Sewer Spill Reference Guide.....	pamphlet

Instructions:

1. Review the Customer Information letter to determine actions that need to be taken immediately.
2. See the Customer Information letter for information about filing a claim.
3. Review the Sewer Spill Reference Guide pamphlet.

This packet provided by:

Name: _____
Title: _____
Telephone: _____

If you have any questions contact:

Public Works Director at 530.938.5020 (office) 530.859.5028 (cell)

Backup Response Packet:

Customer Information Regarding Sewer Backup Claims

Dear Property Owner:

We recognize that sewer back flow incidents can be stressful and require immediate response when all facts concerning how an incident occurred are unknown. Rest assured that we do all we can to prevent this type of event from occurring. Nevertheless, occasionally tree roots or other debris in the sewer lines cause a backup into homes immediately upstream of the blockage. At this time the City of Weed (City) is investigating the cause of this incident.

If the City is found to be responsible for the incident, we are committed to cleaning and restoring your property, and to protecting the health of those affected during the remediation process.

The cleaning contractor(s) provided by the City have been selected because of their adherence to established protocols that are designed to assure all parties thorough, cost-effective and expeditious cleaning services. You also have the right to select your own cleaning contractor, but the City does not guarantee payment of fees/expenses incurred and reserves the right to dispute fees/expenses deemed not usual and customary.

If you need to temporarily relocate while your home is being cleaned, please contact the Public Works Director at 530.938.5020 (office) 530.859.5028 (cell) to discuss the necessary arrangements. The Public Works Director has the responsibility for processing any claims for damages that are submitted. If you wish to discuss this matter, or submit a claim for damages, please contact the Public Works Director at 530.938.5020 (office) 530.859.5028 (cell).

What you need to do now:

The City has prepared this brief set of instructions to help you minimize the impact of the loss by responding promptly to the situation.

- Do not attempt to clean the area yourself, let the cleaning and restoration company handle this.
- Keep people and pets away from the affected area(s).
- Turn off heating/air conditioning systems.
- Do not remove items from the area – the cleaning and restoration company will handle this.
- If you had recent plumbing work, contact your plumber or contractor and inform them of this incident.
- If you intend to file a claim, do so as soon as practical in order to have your claim considered. To obtain a claim form contact City Clerk at 530.938.5020.

Sanitary Sewer Overflow Packet: Table of Contents

<u>Form</u>	<u>Form Number</u>
Instructions and Chain of Custody	envelope label
Responding to a Sanitary Sewer Overflow	OP-1
Sewer Overflow Report.....	-2
Regulatory Notifications Packet	
Instructions.....	envelope
Guide to Reporting to Regulatory Authorities.....	RN-1
Fax Reporting Form: To Water Board	-2
Fax Reporting Form: To Local Health Agency	-3
Sewer Spill Reference Guide.....	pamphlet
Public Posting	n/a
Door Hanger	n/a

Packet Assembly Instructions:

In order to properly gather and distribute all the necessary information at the scene of a sewer overflow, it is recommended the Sanitary Sewer Overflow Packets be created and placed in all field vehicles that may be used to respond to a sewer backup. The following instructions will guide you through the assembly of the Packet.

1. Determine how many packets you wish to assemble.
2. Obtain the same number of 10"x12" Tyvek (*water & tear resistant*) envelopes, and the same number of 6" x 9" envelopes.
3. Print the Regulatory Notifications instructions on the front of half of the 6" x 9" envelopes. Then place one copy of each of the Regulatory Notifications Envelope forms listed above in each envelope.
4. Place a Regulatory Notifications Envelope and all other forms listed above into each Tyvek envelope.
5. Insert a door hanger into each Tyvek envelope.
6. Insert a laminated public posting sign ("Warning Raw Sewage") in each envelope.
7. Insert a new disposable camera into each Tyvek envelope.
8. Tape or otherwise secure to the front of each envelope a copy of the Packet instructions ("Read This First").
9. Place two staples through the top of the envelope.
10. Place at least one complete Packet in each field vehicle that may be used to respond to a sewer backup.

For pre-assembled packets contact DKF Solutions Group at 707.373.9709 or losscontrol@sbcglobal.net

READ THIS FIRST

In the event of a Sanitary Sewer Overflow

Check here if you believe that fats, oils and/or grease (FOG) caused or contributed to the SSO

Instructions

Maintenance Crew

- 1st: Open this envelope.
- 2nd: Follow the instructions on the card: "Responding to a Sanitary Sewer Overflow"
- 3rd: Reference the Field Binder as necessary
- 4th: Complete the Chain of Custody record (right) and forward this packet to the Utilities Supervisor



Public Works Director

- 1st: Open this envelope. Review forms.
- 2nd: Forward the Regulatory Notifications Packet to the person authorized to make required notifications (enter name and title of that individual to the right).
- 3rd: Archive this packet and all other information regarding this overflow incident according to City policy.

Chain of Custody

Print Name: _____

Initial: _____

Date: _____

Time: _____

Print Name: _____

Initial: _____

Date: _____

Time: _____

Regulatory Notifications Packet given to:

Name: _____

Title: _____

To have receiving waters sampled

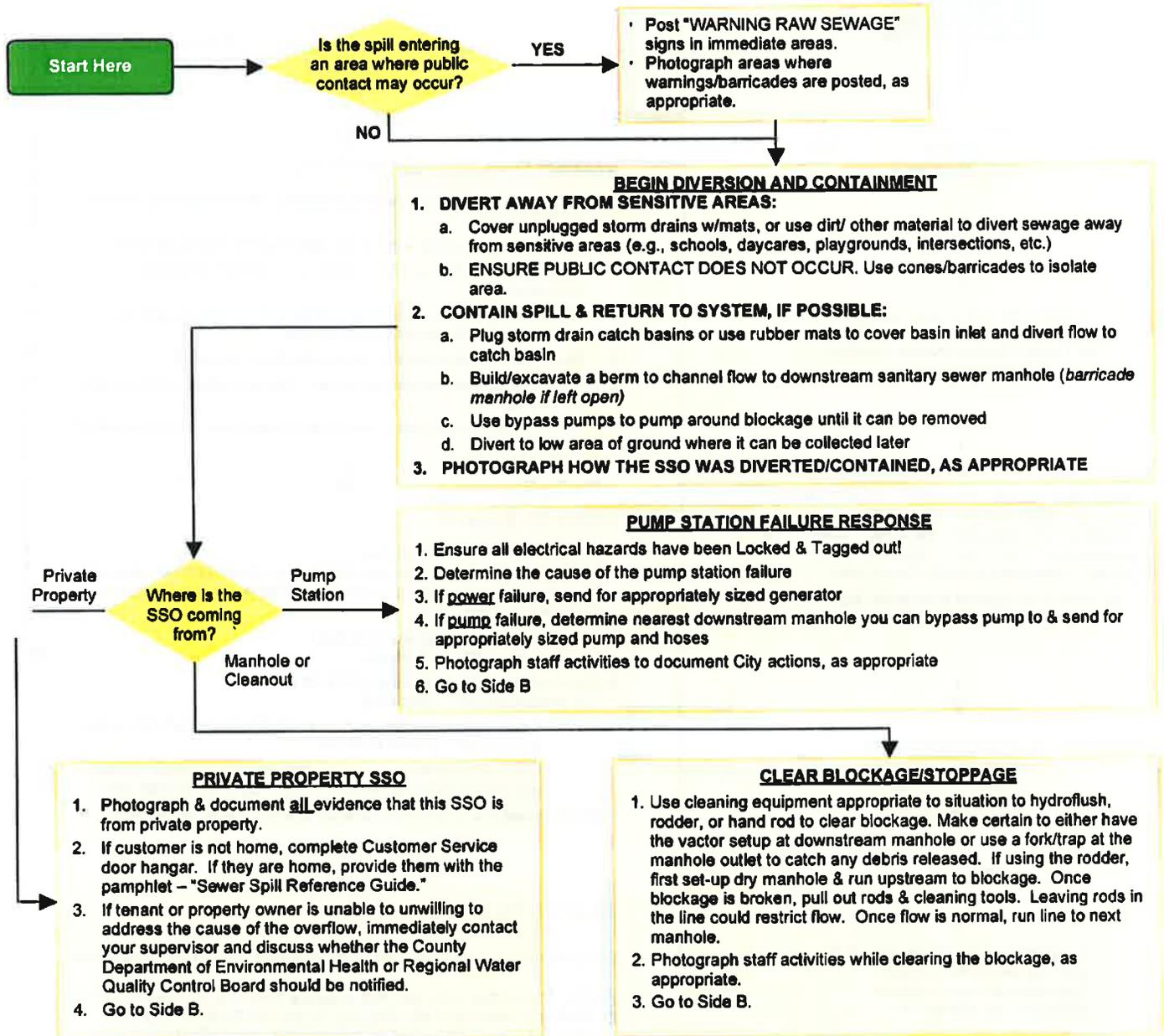
	Contact	Telephone
Business Hours	Baker Environmental	530.842.7987 (Business Hours)
After Hours	Baker Environmental	AFTER HOURS NUMBER?

For any media requests:

Contact	Telephone
Police Public Information Officer	530.938.5020 or 530.938.5000

City of Weed CA
Sanitary Sewer Overflow and Backup Response Plan

Responding to a Sanitary Sewer Overflow



MEDIA AND PUBLIC RELATIONS GUIDELINES:

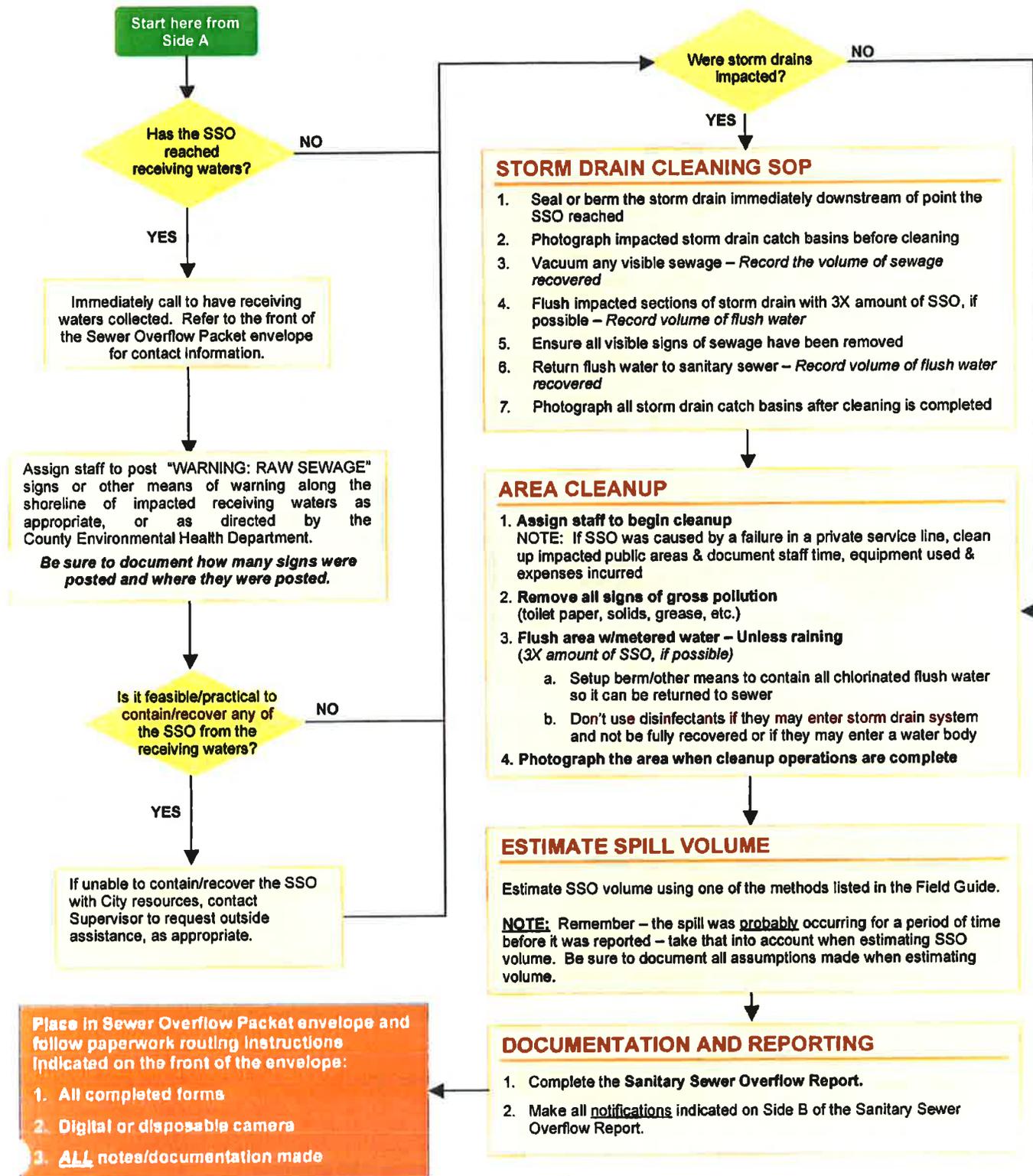
Exercise caution in contacts with the public or media when you respond to a spill. Any information you provide or statements you make may become pertinent in the event of possible court action, it is important to:

- Avoid giving out the wrong information,
- Avoid making accusations against customers, businesses or other public agencies, and
- Avoid speculating about the situation you are responding to
- Avoid providing incorrect facts about a company or other agency.

Be courteous and attempt to provide accurate information to questions within the limits above. In some cases, it may be appropriate to say that we do not have any information, or to delay answering a question and then to say when an answer might be available.

In most cases, refer media requests to the media coordinator indicated on the front of the Sewer Overflow Packet envelope.

Responding to a Sanitary Sewer Overflow



SSO Packet: Sanitary Sewer Overflow Report

INSTRUCTIONS: Complete all items EXCEPT those that are shaded gray

Spill Category (check one): Category 1 Category 2

A. SPILL LOCATION

Spill Location Name: _____

Latitude Coordinates: _____ Longitude Coordinates: _____

Street Name and Number: _____

Nearest Cross Street _____ City: _____ Zip Code: _____

County: Santa Clara _____ Spill Location Description: _____

B. SPILL DESCRIPTION

Spill Appearance Point: Building/Structure Force Main Gravity Sewer Other Sewer System Structure (i.e. cleanout)
 Pump Station Manhole- Structure ID#: _____ Other (specify): _____

Did the spill reach a drainage channel and/or surface water? Yes (Category 1) No

If the spill reached a storm sewer, was it fully captured and returned to the Sanitary Sewer? Yes No (Category 1)

Was this spill from a private lateral? Yes No If YES, name of responsible party: _____

Final Spill Destination: Beach Building structure Other paved surface Storm drain Street/curb & gutter
 Surface water Unpaved surface Other (specify): _____

Estimated spill volume (in gallons – 1,000gal or more = Category 1): _____ Method calculated: _____

Est. volume of SSO recovered (gal): _____ Were photos taken? No Yes – how many? _____

Estimated volume of spill reaching surface water, drainage channel, or not recovered from a storm drain (gal): _____

C. SPILL OCCURRING TIME

Estimated spill start date and time: _____

Date and time spill reported to sewer crew: _____ Date and time sewer crew arrived: _____

Estimated spill end date and time: _____

D. CAUSE OF SPILL

Location of Blockage: Main Lateral Private Lateral Other

SSO cause (check all that apply): Debris/Blockage Flow exceeded capacity Grease Operator error Roots
 Pipe problem/failure Pump station failure Rainfall exceeded design Vandalism Inflow/infiltration
 Animal carcass Electrical power failure Bypass Debris from laterals Construction Debris
 Other (specify): _____

Weather conditions prior 72 hours: Sunny Weather Cloudy Weather Measurable Rain Rain for Several Days

If SSO is caused by wet weather, choose size of storm: 1-yr 2-yr 5-yr 10-yr 50-yr 100-yr >100-yr Unknown

Diameter (in inches) of pipe at point of blockage/spill cause (if applicable): _____

Sewer pipe material at point of blockage/spill cause (if applicable): _____

Description of terrain surrounding point of blockage/spill cause: Flat Mixed Steep

E. SPILL RESPONSE

Spill response activities (check all that apply): Cleaned up Contained all/portion of spill TV inspection Restored flow
 Returned all/portion of spill to sanitary sewer Other (specify): _____

Spill response completed (date & time): _____ Name of impacted waters (if applicable): _____

Visual inspection result of impacted waters (if applicable): _____

Any fish killed? Yes No Any ongoing investigation? Yes No

Name of impacted beach (if applicable): _____ Were health warnings posted? Yes No

Health warning/beach closure posting/details: _____

Were samples of impacted waters collected? Yes No If YES, select the analyses: DO Ammonia Bacti Other

Recommended corrective actions: Add sewer to PM Program Adjust PM schedule Adjust PM method
 Rehab sewer Replace sewer Enforcement action against FOG source Other (specify): _____

NOTIFICATION DETAILS

OES contacted date and time (if applicable): _____ Spoke to: _____

OES Control Number (if applicable): _____

GO TO SIDE B

SSO Packet: Sanitary Sewer Overflow Report

Immediate Regulatory Reporting Guide:

If any of the following conditions exist, immediately contact one of the individuals on the list below and request that they make notifications as indicated in the Regulatory Notifications Packet:

- Estimated volume is greater than 1,000 gallons
- SSO was discharged to a drainage channel or surface waters
- SSO was discharged to a storm drain and not fully captured and returned

PERSON	CELL PHONE	BUSINESS HOURS
Public Works Director		530.938.5020
Police Lieutenant	530.938.5000 (Police Dispatch)	530.938.5000 (Police Dispatch)

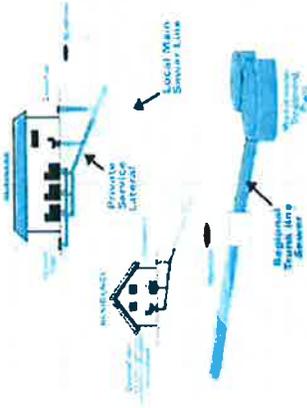
RECOMMENDED FOLLOW-UP ACTIONS TO PREVENT FUTURE OCCURRENCES	
CURRENT PM FREQUENCY:	DATE OF LAST PM:
RECOMMENDED ACTIONS:	<input type="checkbox"/> TV <input type="checkbox"/> RE-RUN <input type="checkbox"/> CHANGE CLEANING SCHEDULE <input type="checkbox"/> REPAIR LINE SEGMENT <input type="checkbox"/> REPLACE LINE SEGMENT <input type="checkbox"/> OTHER (describe):
NOTES:	

Place completed form in Sewer Backup Envelope and follow routing instructions.

How a Sewer System Works

A property owner's sewer pipes are called **service laterals** and are connected to larger local main and regional trunk lines.

Service laterals run from the connection at the home to the connection with the public sewer. These laterals are the responsibility of the property owner and must be maintained by the property owner.



Is My Home Required to Have a Backflow Prevention Device?

Section 710.1 of the 2007 California Plumbing Code states: "Where a fixture is installed on a floor level that is lower than the next upstream manhole cover of the public or private sewer, serving such drainage piping, **shall** be protected from backflow of sewage by installing an approved type of backwater valve."

The intent of Section 710.1 is to protect the building interior from mainline sewer overflows or surcharges.

Additionally, Section 710.6 states: "Backwater valves **shall** be located where they will be accessible for inspection and repair at all times and, unless continuously exposed, shall be enclosed in a masonry pit fitted with an adequately sized removable cover."



If you have a sewage spill from your private sewer line, contact:

City of Weed CA
530.938.5020 (Business Hours)
530.938.5020 (After Hours – please note this number transfers to the Police Department after hours)

Siskiyou County Department of Environmental Health
530.841.2100
California Health and Safety Code, Sections 5410-5416 requires:

- No person shall discharge raw or treated sewage or other waste in a manner that results in contamination, pollution, or a nuisance.
- Any person who causes or permits a sewage discharge to any state waters:
 - Must immediately notify the local health agency of the discharge.
 - Shall reimburse the local health agency for services that protect the public's health and safety.
 - Who fails to provide the required notice to the local health agency is guilty of a misdemeanor and shall be punished by a fine (between \$500-\$1,000) and/or imprisonment for less than one year.

North Coast Regional Water Quality Control Board

707.576.2220
Requires the prevention, mitigation, response to, and reporting of sewage spills.

California Office of Emergency Services

800.852.7550
California Water Code, Article 4, Chapter 4, Sections 13268-13271 & California Code of Regulations, Title 23, Division 3, Chapter 9.2, Article 2, Sections 2250-2260 require:

- Any person who causes or permits sewage in excess of 1,000 gallons to be discharged to state waters shall immediately notify the Office of Emergency Services.
- Any person who fails to provide the notice required by this section is guilty of a misdemeanor and shall be punished by a fine (less than \$20,000) and/or imprisonment for not more than one year.



Sewer Spill Reference Guide

Your Responsibilities as a Private Property Owner

Provided to you by:

City of Weed CA
PO Box 470
Weed, CA 96094
530.938.5020

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David Patzer, DKF Solutions Group
All Rights Reserved

Why do sewage spills happen?
Sewage spills occur when the wastewater in underground pipes overflows through a manhole, cleanout, or broken pipe. Most spills are relatively small and can be stopped and cleaned up quickly, but left unattended they can cause health hazards, damage to homes and businesses, and threaten the environment, local waterways, and beaches.

CAUTION!

When trying to locate a sewer problem, never open manholes or other public sewer structures. Only our crews are allowed to open & inspect these structures.

Common causes of sewage spills:

- Grease build-up
- Tree roots
- Broken/cracked pipes
- Missing or broken cleanout caps
- Undersized sewers
- Groundwater/rainwater entering the sewer system through pipe defects and illegal connections

Prevent most sewage backups with a Backwater Overflow Device

This type of device can help prevent sewage backups into homes and businesses. If you don't already have a Backwater Overflow Device, contact a professional plumber or contractor to install one as soon as possible.

Protect the environment!

If you let sewage from your property discharge to a gutter or storm drain, you may be subject to penalties and/or out-of-pocket costs for clean-up and enforcement efforts. A property owner may be charged for costs incurred by agencies responding to spills from private properties.

What to look for:

Sewage spills can be a very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed. Don't dismiss unaccounted-for wet areas. Look for:

- Drain backups inside the building.
- Wet ground and/or water leaking around manhole lids onto your street.
- Leaking water from cleanouts or outside drains
- Unusual odorous wet areas: sidewalks, external walls, ground/landscape around a building.

The following are indicators of a possible obstruction in your sewer line:

- Water comes up in floor drains, showers or toilets.
- Toilets, showers or floor drains below ground level drain very slowly.

What to do if there is a spill:

Immediately notify the City of Dunsmuir. Our crews locate the blockage and determine if it is in the public sewer; if it is the crew removes the blockage and arranges for cleanup.

If the backup is in your private internal plumbing or in the private service laterals, you are required to immediately:

- Control and minimize the spill by shutting off or not using the water
- Keep sewage out of the storm drain system using sandbags, dirt and/or plastic sheeting
- Call a plumbing professional to clear blockages and make repairs as needed. Look in the yellow pages under "Plumbing Drain & Sewer Cleaning" or "Sewer Contractors."
- Always notify your sewer/public works department or public sewer district of sewage spills.

Spill cleanup inside the home:

For large clean ups, a professional cleaning firm should be contacted to clean up impacted areas. You can locate local firms by looking in the Yellow Pages under "Water Damage" or "Fire Damage." If you hire a contractor, it is recommended to get estimates from more than one company. Sometimes, homeowner's insurance will pay for the necessary cleaning due to sewer backups. Not all policies have this coverage, so check with your agent.

If you decide to clean up a small spill inside your home, protect yourself from contamination by observing the following safety measures. Those persons whose resistance to infection is compromised should not attempt this type of clean up.

Other Tips:

- Keep children and pets out of the affected area until cleanup has been completed.
- Turn off heating/air conditioning systems
- Wear rubber boots, rubber gloves, and goggles during cleanup of the affected area.
- Discard items that cannot be washed and disinfected (such as: mattresses, rugs, cosmetics, baby toys, etc.)
- Remove and discard drywall and insulation that has been contaminated with sewage or flood waters.

- Thoroughly clean all hard surfaces (such as flooring, concrete, molding, wood and metal furniture, countertops, appliances, sinks and other plumbing fixtures) with hot water and laundry or dish detergent.
- Help the drying process with fans, air conditioning units, and dehumidifiers.

- After completing cleanup, wash your hands with soap and water. Use water that has been boiled for 1 minute (allow the water to cool before washing your hands.) OR use water that has been disinfected (solution of 1/8 teaspoon of household bleach per 1 gallon of water). Let it stand for 30 min. If water is cloudy, use ¼ teaspoon of household bleach per 1 gallon of water.

- Wash clothes worn during cleanup in hot water and detergent (wash apart from uncontaminated clothes).

- Wash clothes contaminated with sewage in hot water and detergent. Consider using a laundromat until your onsite wastewater system has been professionally inspected and serviced.

- Seek immediate attention if you become injured or ill.

Spill cleanup outside the home:

- Keep children and pets out of the affected area until cleanup has been completed.

- Wear rubber boots, rubber gloves, and goggles during cleanup of affected area.

- Clean up sewage solids (fecal material) and place in properly functioning toilet or double bag and place in garbage container.

- On hard surfaces areas such as asphalt or concrete, it is safe to use a 2% bleach solutions, or ½ cup of bleach to 5 gallons of water, but don't allow it to reach a storm drain as the bleach can harm the environment.

- After cleanup, wash hands with soap and water. Use water that has been boiled for 1 minute (allow to cool before washing your hands.) OR use water that has been disinfected (solution of 1/8 teaspoon of household bleach per 1 gallon of water). Let it stand for 30 min. If water is cloudy, use ¼ teaspoon of household bleach per 1 gallon of water.

- Wash clothes worn during cleanup in hot water and detergent (wash apart from uncontaminated clothes).

- Wash clothes contaminated with sewage in hot water and detergent. Consider using a laundromat until your onsite wastewater system has been professionally inspected and serviced.

- Seek immediate attention if you become injured/fill.

**SSO/Backup Response Plan
Public Posting**

DANGER

RAW SEWAGE • AVOID CONTACT



PELIGRO

AGUA CONTAMINADA • EVITE TODO CONTACTO

For more information — Para mas informacion

**City of Weed CA
530.938.5020**

PRINT THIS PAGE ON ORANGE PAPER

City of Weed CA

On (date) _____, at (location) _____

we responded to a reported blockage of the sanitary sewer service to your property.

We discovered a blockage in:

- The sanitary sewer main and cleared the line
- The City-maintained portion of your sanitary sewer lateral and cleared the line.
- Your portion of the sanitary sewer lateral, which is your responsibility to maintain. We also found the City's portion of the lateral and the main to be flowing normally.

If you require assistance to clear your portion of the lateral you can look in the Yellow Pages of your telephone book under "Sewer Contractors" or "Plumbing Drains & Sewer Cleaning". If you plan to hire a contractor we recommend getting estimates from more than one company.

City representative notes: _____

City representative: _____

**For questions or comments, please call
City of Weed CA
530.938.5020**

***For Sewer Emergencies
at Night and on Weekends, please call
530.938.5020
(transfers to police department after hours)***

City of Weed CA

On (date) _____, at (location) _____

we responded to a reported blockage of the sanitary sewer service to your property.

We discovered a blockage in:

- The sanitary sewer main and cleared the line
- The City-maintained portion of your sanitary sewer lateral and cleared the line.
- Your portion of the sanitary sewer lateral, which is your responsibility to maintain. We also found the City's portion of the lateral and the main to be flowing normally.

If you require assistance to clear your portion of the lateral you can look in the Yellow Pages of your telephone book under "Sewer Contractors" or "Plumbing Drains & Sewer Cleaning". If you plan to hire a contractor we recommend getting estimates from more than one company.

City representative notes: _____

City representative: _____

**For questions or comments, please call
City of Weed CA
530.938.5020**

***For Sewer Emergencies
at Night and on Weekends, please call
530.938.5020
(transfers to police department after hours)***

City of Weed SEWER SYSTEM CAPACITY EVALUATION

INTRODUCTION AND SUMMARY

The City of Weed (City) provides sewer service to a population of approximately 2,947. The sewer system is owned and operated by the City of Weed Public Works Department, Utilities Maintenance Division. The total annual budget for system operation, maintenance, and administration is approximately \$275,000. The collection system consists of approximately 23 miles of gravity sewer line.

The purpose of this evaluation is to identify capacity deficiencies in the existing sewer mainline system, prioritize the deficient reaches, recommend alternatives to eliminate the deficiencies, and provide the City with a basis on which to build a future infrastructure management system.

HYDRAULIC MODEL EXPLANATION

In order to identify capacity deficiencies in the sewer mainline system based on current and future conditions, a hydraulic model of the City's sewer system was developed. MWH Soft's H2OMAP Sewer modeling software was used to model the system. The City's current map of the sewer collection system was used for inputting pipeline alignments and sizes. When available, as-built drawings such as the 1999 Sanitary Sewer Improvements Project plans were used for manhole rim and invert elevations. A survey of manhole elevations was conducted along the three interceptors to obtain accurate manhole rim and invert elevations to the Shastina and Weed Wastewater Treatment Plants (WWTPs). If pipeline slopes could not be determined from available data, minimum recommended design standard pipe slopes were assumed. These slopes are shown in Table 1.

Table 1 – Minimum Recommended Design Standard Sewer Slope

Pipe Diameter	Minimum Slope
6-inch	S=0.0055
8-inch	S=0.0035
10-inch	S=0.0025
12-inch	S=0.002
15-inch	S=0.0015

Note: Minimum slopes are based on a roughness coefficient of 0.013 and a velocity of 2 FPS.

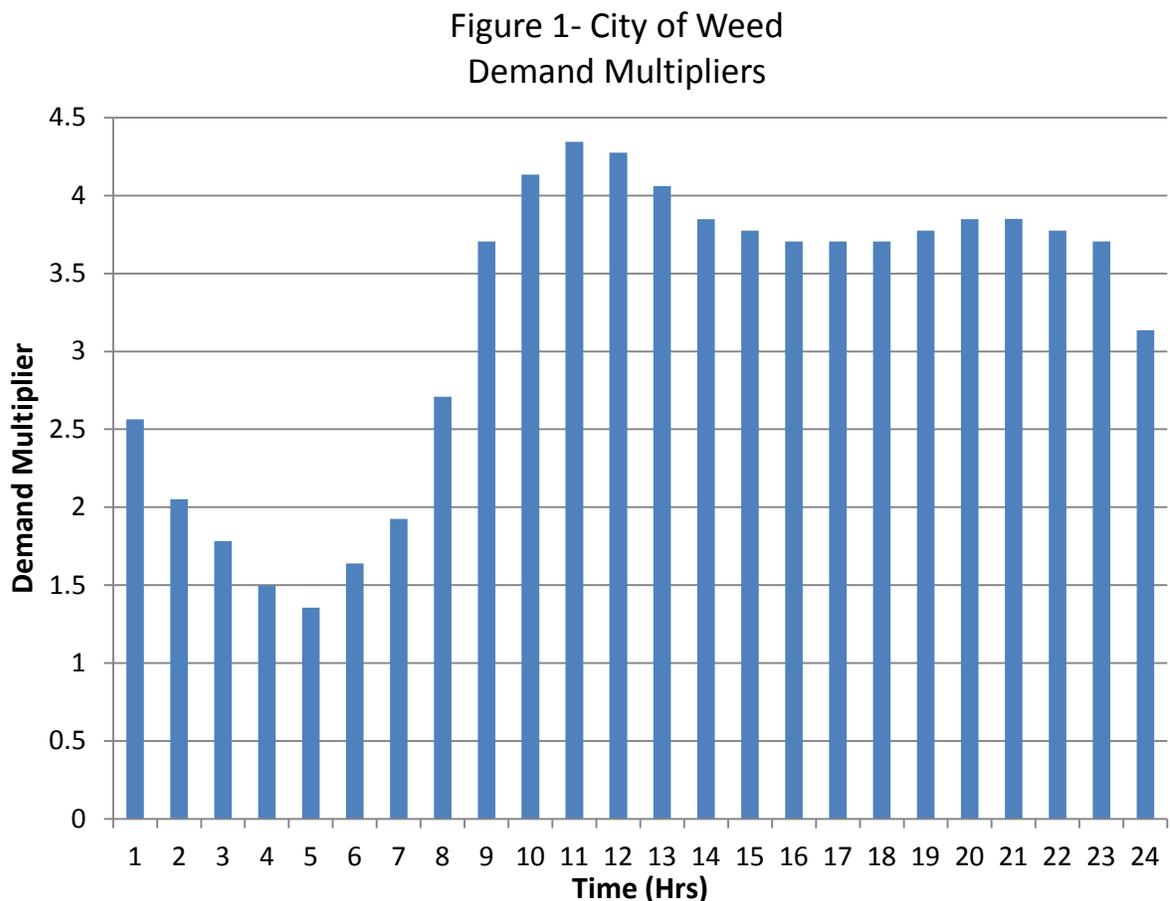
Model Scenarios

In order to determine sewer capacity deficiencies, four model scenarios were created as follows:

1. 2012 Average Dry Weather Flow (2012 ADWF)
2. 2012 Peak Wet Weather Flow (2012 PWWF)
3. 2022 Average Dry Weather Flow (2022 ADWF)
4. 2022 Peak Wet Weather Flow (2022 PWWF)

Peaking Factors

Time dependant peaking factors were applied to ADWF loads. These peaking factors account for changes in loads during the course of a typical day. The variations in wastewater flows seen at WWTPs tend to follow a diurnal pattern, as shown in Figure 1 (Metcalf and Eddy 2003).



Note: Model peaking factors were adjusted for both systems (Weed and Shastina) to reflect flow at the peak hour equal to PWWFs seen at the WWTPs.

Model Loads

Both the 2012 ADWF and 2012 PWWF model scenarios utilized a base load derived from summer average monthly flow measurements seen at the WWTPs over a three-year period. The loading distribution was taken from the City of Weed 2006 Master Sewer Plan Update. Because Weed and Shastina WWTPs serve different areas of the city, the two systems were adjusted separately to accurately represent flow conditions seen at each WWTP. Base loads used for the 2006 Master Sewer Plan Update were globally increased for each system to equal 2012 ADWFs.

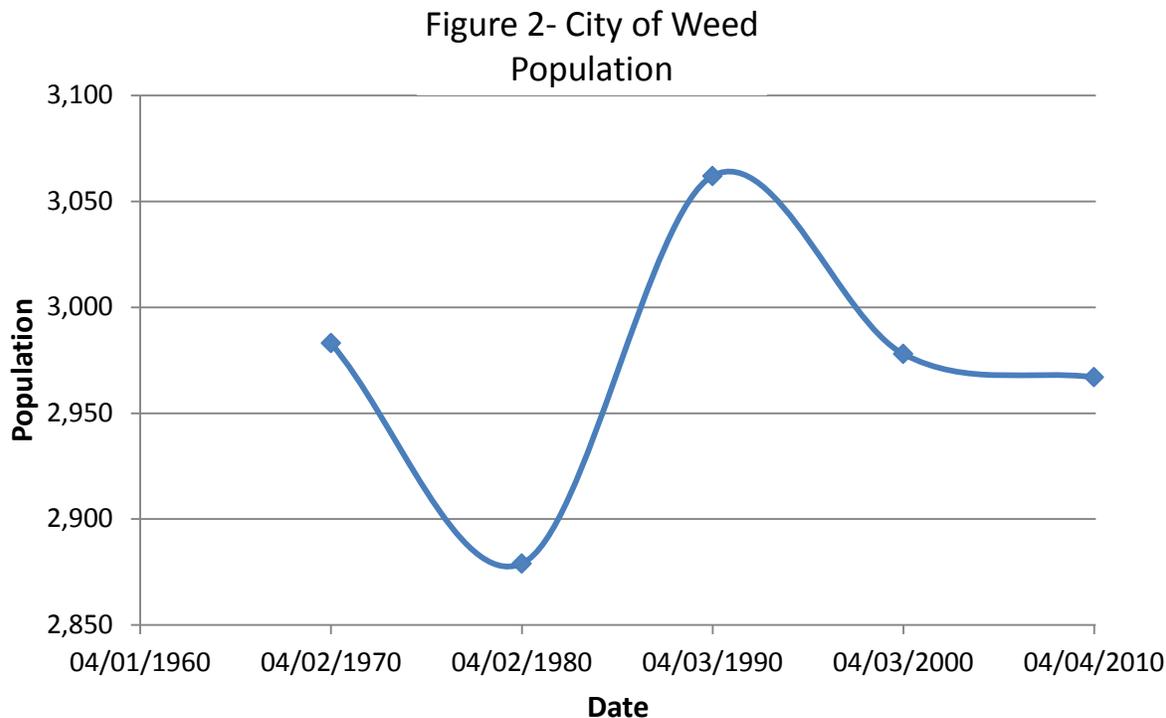
The 2012 PWWF and 2022 PWWF scenarios include a second load set that represents additional flow into the sewer system from Inflow and Infiltration (I&I). The I&I loads were taken from the City of Weed 2006 Master Sewer Plan Update and adjusted by a factor of 2.0 and 0.2 to match the 2012 PWWF scenarios seen at the Weed and Shastina WWTPs of 1.2 MGD and 0.9 MGD, respectively. PWWF conditions were determined by reviewing historical influent data to the WWTPs.

It is generally assumed that I&I rates will decrease in the future if areas are improved where I&I rates exceed 5,000 gallons per acre per day (GPAD). This is based on the assumption the City will focus their future I&I remediation efforts in identified high I&I areas, and that these efforts will ultimately reduce future I&I rates below 5,000 GPAD. Although the Shastina system had minimal I&I, it is recognized that as collection systems age, I&I rates tend to increase due to deteriorating pipe joints, manholes, and private laterals. Therefore, it is assumed a minimum I&I rate be set to 1,500 GPAD.

Both the 2022 ADWF and the 2022 PWWF scenarios used the same base load as the 2012 scenario, with an additional 28 household equivalents (HEs) added for expected development in the Weed Collection System, and 80 HEs for the Shastina Collection System. This is based on a 1% growth rate for the City, per City Staff's recommendations. The 1% growth rate was distributed between the two systems based on proposed developments outlined in the 2006 Master Sewer Plan Update. Base loads were then applied throughout the collection systems to account for projected growth.

Expected Growth

According to 1970 to 2010 U.S. Census Bureau population data, the City of Weed has seen a net decrease in population, See Figure 2.



Although the City has seen a net decrease in population over the last two decades, it is believed this decrease has had little effect on the peak flows experienced at the WWTP due to the high I&I component. Therefore, a 1% growth rate was used to project future loads for the 2022 scenario.

Model Calibration

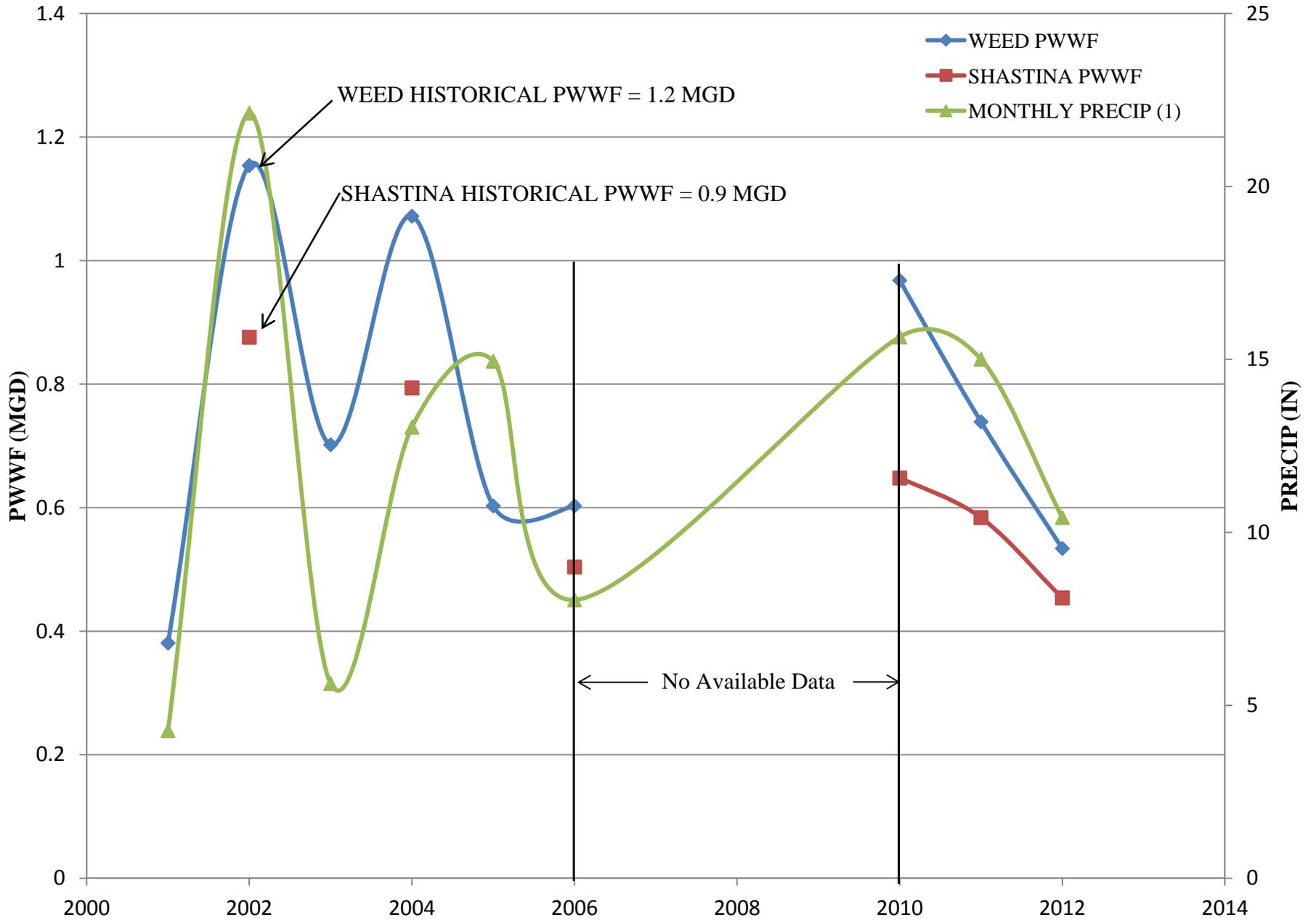
The hydraulic model was calibrated by adjusting the loading multiplier shown in Figure 1. By modifying this multiplier, scenario flows were adjusted to match actual flows seen at the WWTPs during peak hour. The 2012 PWWF scenario flows were set equal to historical flows seen at the WWTPs in December 2002, shown in Figure 3.

Model Peak Flows

Flows for the hydraulic model for each scenario at the Shastina and Weed WWTPs are as follows:

	Shastina	Weed
Scenario	Flow (MGD)	Flow (MGD)
2012 ADWF	0.33	0.18
2012 PWWF	0.90	1.20
2022 ADWF	0.35	0.19
2022 PWWF	1.57	1.34

**FIGURE 3
CITY OF WEED
HISTORICAL FLOW DATA**



Notes:

1. Monthly precipitation is taken from Mt. Shasta weather station corresponding to the month with PWWF.

Model Evaluation Criteria Results

The hydraulic model results were evaluated on the basis of the adjusted depth to diameter ratio. See the following equation;

$$Adj. d/D = \frac{\text{Adjusted Liquid Level}}{\text{Pipe Diameter}} = 1$$

The adjusted liquid level is the depth of liquid seen in a given pipe, adjusted to account for sewage backup from downstream lines. A ratio of 1 indicates a line is completely full and at the limits of its design capacity. Existing pipelines at this condition are recommended for replacement to mitigate any deficiencies. Cost estimates attached hereto also include additional areas where pipes are near capacity with an adj.d/D greater than 0.7, indicating the pipe is approximately 70% full.

MODEL EVALUATION

To evaluate the City's available capacity, four simulations were used to determine if the City's current sewer collection system can handle current and ten-year projected flows. The results for each simulation are discussed below.

Figures 4 and 5 illustrate the sewer collection system deficiencies for the 2012 and 2022 condition, respectively. Deficient sewers are shown in red and sewers at 70% capacity are shown in blue. Manholes to be replaced are also shown in red. Figure 5 does not show 2012 pipe deficiencies, as it is assumed these deficiencies will be corrected before 2022 occurs.

Existing System Evaluation

2012 ADWF

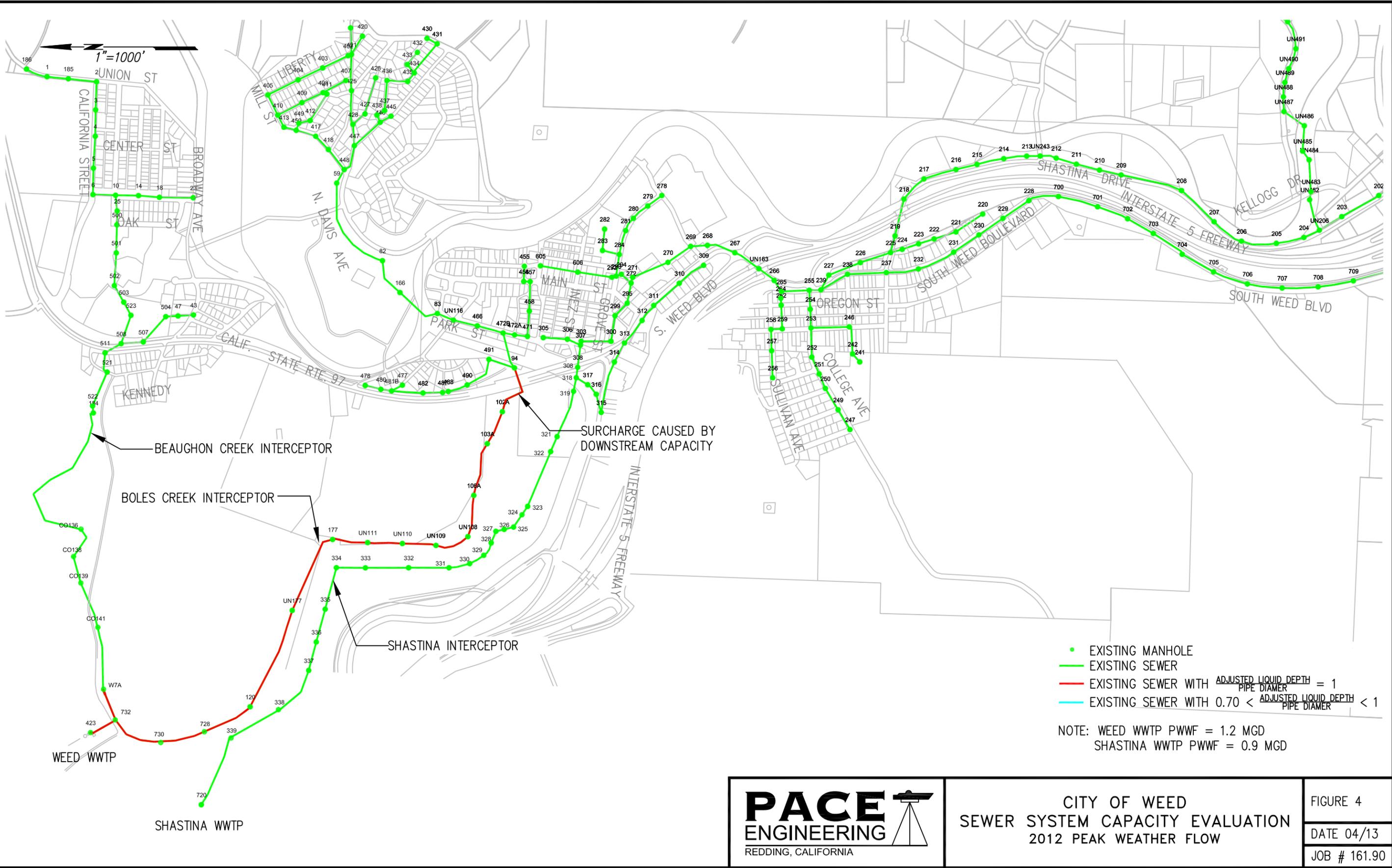
The 2012 ADWF scenario indicates the existing collection system is not exceeding maximum capacity during the dry season.

2012 PWWF

The 2012 PWWF scenario identified several gravity sewer lines at maximum capacity, see Figure 4. Deficiencies occur primarily along the Boles Creek Interceptor, between Columbus Way and the Weed WWTP (MH 94 to 423). Additional deficiencies occur along the Beaugn Creek interceptor (MH 184 to 423). The model indicates these deficiencies reach maximum capacity at approximately 8 AM and persist for the duration of the day.

2022 ADWF

The 2022 ADWF scenario does not identify any sewers at or above maximum capacity.



CITY OF WEED
SEWER SYSTEM CAPACITY EVALUATION
2012 PEAK WEATHER FLOW

FIGURE 4
DATE 04/13
JOB # 161.90

2022 PWWF

The 2022 PWWF scenario shows capacity deficiencies beyond the 2012 PWWF scenario, see Figure 5. Additional 2022 PWWF deficiencies are evident in the Shastina interceptor between, Highway 97 and the Shastina WWTP (MH 322 to 323), and (MH 327 to 334). Additional deficiencies are also shown in town between Boles Street and Park Street (MH 271-300). These deficiencies occur for most of the day.

Modeled Proposed System Improvements

Proposed improvements are discussed in this section, which are separated by WWTPs to show where these improvements are needed. The H2OMAP Sewer model indicates existing mainline sewer capacities are adequately sized for summer loads, after investigating ADFW conditions for both 2012 and 2022. However, due to a large I&I component, the existing system is undersized to handle historical and projected PWWFs, therefore sewer line capacities need to be increased. These recommendations are based on model scenarios and will need further field investigation prior to implementation.

Figures 6 and 7 depict recommended system improvements necessary to accommodate the 2012 and 2022 conditions, respectively. System improvements are shown in red.

2012 Condition

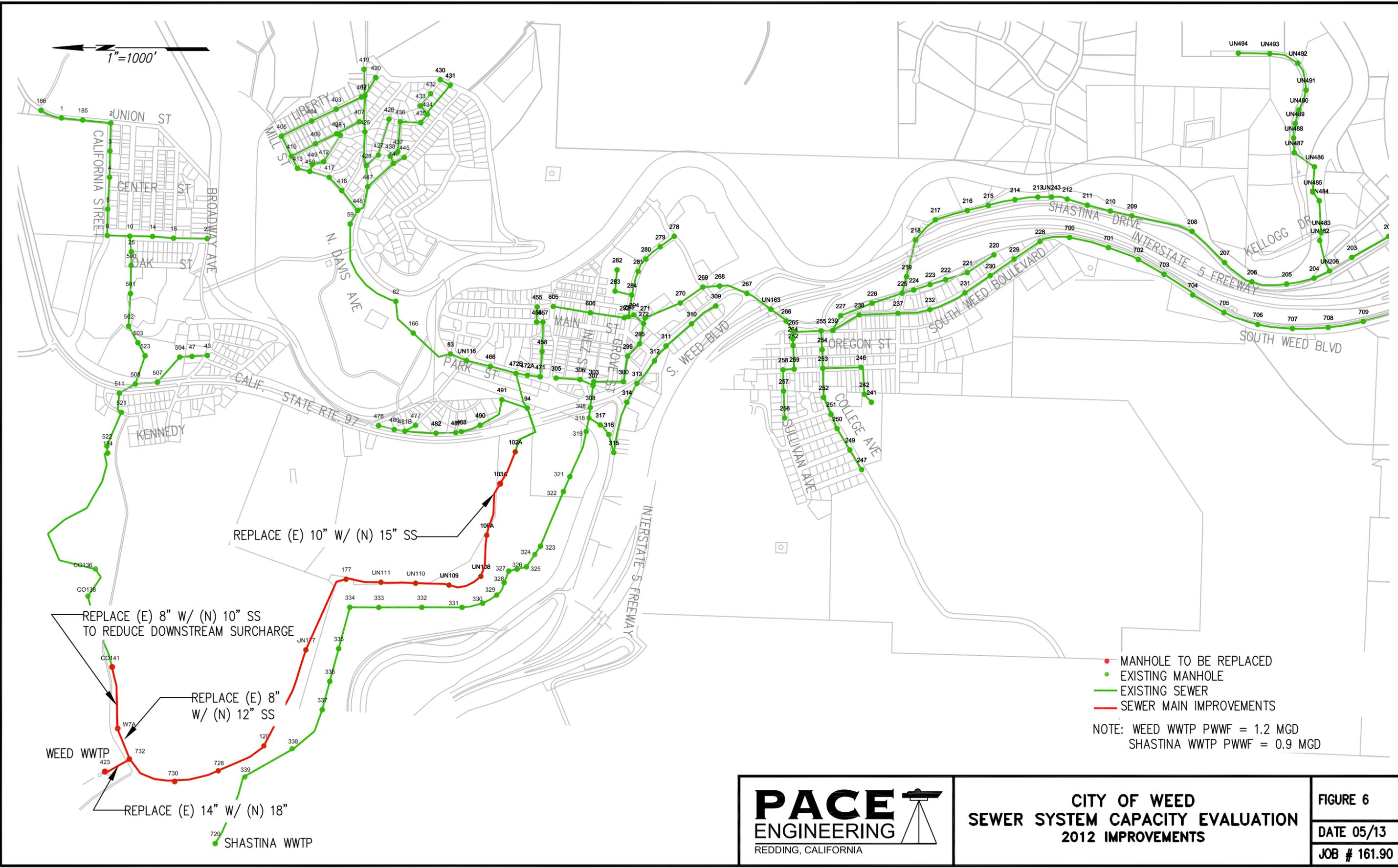
In order to increase sewer main capacities under PWWF conditions, the following sewer improvements are needed as shown in Figure 6:

Boles Creek Interceptor

- Replace approximately 6,920 Ft of 10-inch with 15-inch pipe from Columbus Way to MH 732
- Install 13 new manholes along dirt road to the Weed WWTP

Beaughon Creek Interceptor

- Replace approximately 970 Ft of 8-inch pipe with 10-inch pipe from cleanout (CO)141 to CO W7A
- Replace approximately 290 Ft of 8-inch pipe with 12-inch pipe from CO W7A to MH732
- Install two new manholes at cleanout W7A and CO 141
- Replace approximately 320 Ft of 14-inch main to the Weed WWTP with 18-inch main
- Install new manhole at entrance of Weed WWTP

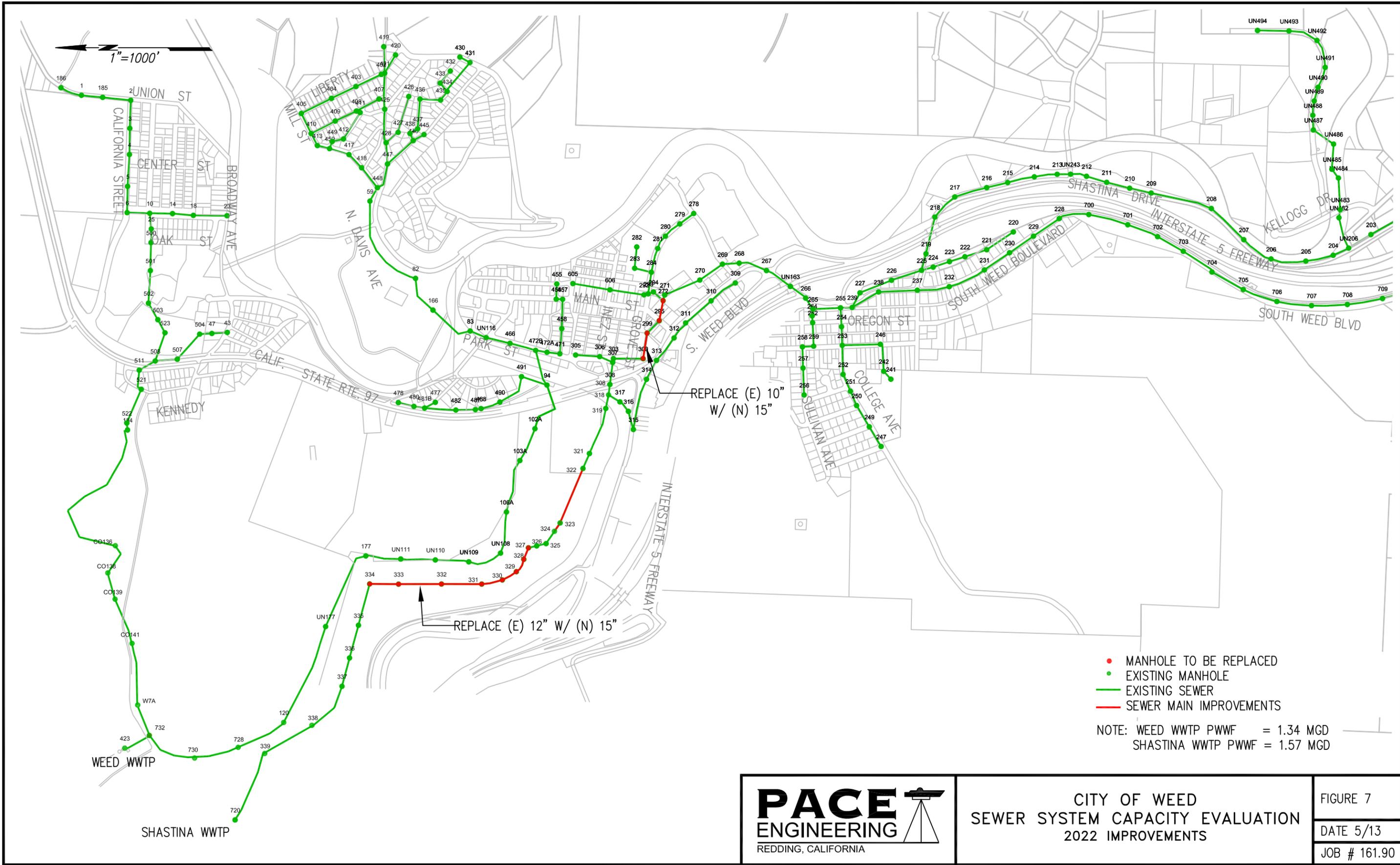


● MANHOLE TO BE REPLACED
 ● EXISTING MANHOLE
 — EXISTING SEWER
 — SEWER MAIN IMPROVEMENTS
 NOTE: WEED WWTP PWWF = 1.2 MGD
 SHASTINA WWTP PWWF = 0.9 MGD



CITY OF WEED
SEWER SYSTEM CAPACITY EVALUATION
2012 IMPROVEMENTS

FIGURE 6
DATE 05/13
JOB # 161.90



● MANHOLE TO BE REPLACED
 ● EXISTING MANHOLE
 — EXISTING SEWER
 — SEWER MAIN IMPROVEMENTS

NOTE: WEED WWTP PWWF = 1.34 MGD
 SHASTINA WWTP PWWF = 1.57 MGD



CITY OF WEED
 SEWER SYSTEM CAPACITY EVALUATION
 2022 IMPROVEMENTS

FIGURE 7
DATE 5/13
JOB # 161.90

2022 Condition

Due to the age and condition of existing sewer mains, the proposed improvements for accommodating 2022 PWWFs consist of replacing undersized sewer mains with larger mains. The following sewer improvements are needed to meet 2022 PWWF conditions as shown in Figure 7:

Shastina Interceptor

- Replace approximately 1,500 Ft of 12-inch pipe with 15-inch pipe from MH 322 to 334
- Install 8 new manholes along dirt road to the Shastina WWTP
- Replace approximately 290 Ft of 10-inch pipe with 15-inch pipe from MH 271 to 300
- Install 4 new manholes in this alignment

Proposed System Improvement Evaluation

The 2012 and 2022 recommended improvements, described in the previous section, are sized to accommodate historical and predicted PWWFs. The 2012 recommended improvements to the Boles Creek and Beaughon Creek interceptors reduce the adjusted liquid level to pipe diameter ratio so the sewer mains are well below maximum capacity. However, after applying the predicted 2022 PWWF, the reach between CO W7A and MH 732 along the Beaughon Creek interceptor would exceed capacity. Therefore, it is recommended this reach have a 12-inch main to meet future needs. The 2022 PWWF scenario resulted in some deficiencies along the Shastina interceptor. However, with recommended improvements the risk of sewer lines exceeding maximum capacity will be significantly lowered. With minimal population growth in the City of Weed over the last three decades, it is assumed these improvements will be adequate for loads exceeding 2022. However, if improvements are not completed prior to the next large storm, similar to that seen in December 2002, surcharge is likely to occur.

APPENDIX G-1

Engineer's Opinion of Cost

**City of Weed
ENGINEER'S OPINION OF COST**

Project cost estimates, in May 2013 dollars, were prepared for collection system improvements necessary to correct existing deficiencies and accommodate expected 2022 flow conditions. Construction costs were determined based on recently bid sewer collection system projections in Northern California. A 20% construction contingency has been factored in, as well as a 30% allowance for indirect and engineering costs. Estimated project costs for the 2012 flow condition are shown in Table 1 for the Weed Collection System. Estimated project costs for both the Weed and Shastina Collection Systems are shown for 2022 flow conditions in Tables 2 and 3, respectively.



CITY OF WEED
2012 SEWER DEFICIENCY IMPROVEMENT PROJECT PHASE I
PROJECT COST ESTIMATE

TABLE 1: Weed Interceptor Improvements

NO.	DESCRIPTION	QTY	UNIT	INSTALLED COST		TOTAL COST
				UNIT	TOTAL	
2012 SEWER DEFICIENCY IMPROVEMENT PROJECT						
Maximum Adjusted d/D = 1						
1	18" Sewer Main w/ Class "B" Backfill (Depth < 8-ft)	320	LF	\$150	\$48,000	\$48,000
2	15" Sewer Main w/ Class "B" Backfill (Depth < 8-ft)	6,920	LF	\$130	\$899,600	\$899,600
3	10" Sewer Main w/ Class "B" Backfill (Depth <8-ft)	970	LF	\$100	\$97,000	\$97,000
4	12" Sewer Main w/ Class "B" Backfill (Depth <8-ft)	290	LF	\$120	\$34,800	\$34,800
5	Sewer Manholes (4-ft dia), complete	16	EA	\$4,000	\$64,000	\$64,000
Subtotal for 2012 Sewer Deficiency Improvement Project						\$1,143,400
Construction Contingency @ 20%						\$228,700
TOTAL ESTIMATED CONSTRUCTION COST						\$1,372,000
Indirect and Engineering @ 30%						\$411,600
ESTIMATED PROJECT COST (May 2013 Dollars)						\$1,784,000



CITY OF WEED
2022 SEWER DEFICIENCY IMPROVEMENT PROJECT PHASE II
PROJECT COST ESTIMATE

TABLE 2: Shastina Interceptor Improvements

NO.	DESCRIPTION	QTY	UNIT	INSTALLED COST		TOTAL COST
				UNIT	TOTAL	
2022 SEWER DEFICIENCY IMPROVEMENT PROJECT						
Maximum Adjusted d/D = 1						
1	15" Sewer Main w/ Class "A-1" Backfill (Depth < 8-ft)	290	LF	\$150	\$43,500	\$43,500
2	15" Sewer Main w/ Class "B" Backfill (Depth < 8-ft)	1,500	LF	\$130	\$195,000	\$195,000
3	Sewer Manholes (4-ft dia), complete	12	EA	\$4,000	\$48,000	\$48,000
0.70 ≤ Maximum Adjusted d/D < 1						
1	15" Sewer Main w/ Class "A-1" Backfill (Depth < 8-ft)	288	LF	\$150	\$43,200	\$43,200
2	15" Sewer Main w/ Class "B" Backfill (Depth < 8-ft)	481	LF	\$130	\$62,530	\$62,530
3	15" Sewer Main W/ Class "C" Backfill (Depth < 8-ft)	776	LF	\$120	\$93,120	\$93,120
Subtotal for 2022 Sewer Deficiency Improvement Project						\$485,350
Construction Contingency @ 20%						\$97,100
TOTAL ESTIMATED CONSTRUCTION COST						\$582,000
Indirect and Engineering @ 30%						\$174,600
ESTIMATED PROJECT COST (May 2013 Dollars)						\$757,000

APPENDIX G-2

H2OMAP Version 9.0 Model Results

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 ADWF (0.51 MGD) - Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
17	1	185	0.00	00:00 hr	0.00	0.00
21	2	3	0.00	00:00 hr	0.00	0.00
23	3	4	0.00	00:00 hr	0.00	0.00
25	4	5	0.00	00:00 hr	0.00	0.00
27	5	6	0.00	00:00 hr	0.00	0.00
29	6	10	0.00	00:00 hr	0.00	0.15
37	10	25	0.03	10:01 hr	0.16	0.16
35	14	10	0.00	00:00 hr	0.00	0.15
33	18	14	0.00	00:00 hr	0.00	0.00
31	23	18	0.00	00:00 hr	0.00	0.00
441	25	500	0.03	10:01 hr	0.11	0.11
51	43	47	0.00	00:00 hr	0.00	0.00
49	47	504	0.00	00:00 hr	0.00	0.00
71	59	82	0.06	10:06 hr	0.16	0.16
67	82	166	0.08	10:06 hr	0.15	0.16
197	83	UN116	0.08	10:12 hr	0.20	0.20
181	94	102A	0.12	10:20 hr	0.21	0.26
545	120	728	0.12	11:08 hr	0.28	0.29
195	166	83	0.08	10:10 hr	0.16	0.18
165	177	UN177	0.12	10:57 hr	0.33	0.33
555	184	CO136	0.06	10:24 hr	0.19	0.23
19	185	2	0.00	00:00 hr	0.00	0.00
15	186	1	0.00	00:00 hr	0.00	0.00
411	200	201	0.02	09:56 hr	0.07	0.07
413	201	202	0.02	10:01 hr	0.07	0.07
415	202	203	0.02	10:01 hr	0.07	0.07
417	203	UN206	0.02	10:01 hr	0.07	0.07
421	204	205	0.06	10:00 hr	0.12	0.12
423	205	206	0.06	10:06 hr	0.12	0.12
425	206	207	0.06	10:03 hr	0.12	0.12
427	207	208	0.06	10:06 hr	0.12	0.12
429	208	209	0.07	10:08 hr	0.11	0.11
431	209	210	0.07	10:13 hr	0.11	0.11
433	210	211	0.07	10:09 hr	0.11	0.11
435	211	212	0.07	10:10 hr	0.11	0.11
437	212	UN243	0.07	10:12 hr	0.11	0.11
377	213	214	0.07	10:12 hr	0.12	0.12
379	214	215	0.07	10:13 hr	0.12	0.12
381	215	216	0.07	10:14 hr	0.12	0.12
383	216	217	0.07	10:17 hr	0.12	0.12
385	217	218	0.07	10:18 hr	0.10	0.13

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 ADWF (0.51 MGD) - Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
387	218	219	0.07	10:20 hr	0.16	0.16
389	219	225	0.07	10:21 hr	0.16	0.16
367	220	221	0.00	00:00 hr	0.00	0.00
369	221	222	0.00	00:00 hr	0.00	0.00
371	222	223	0.00	00:00 hr	0.00	0.00
373	223	224	0.00	00:00 hr	0.00	0.00
375	224	225	0.00	00:00 hr	0.00	0.10
391	225	226	0.07	10:21 hr	0.12	0.15
393	226	227	0.07	10:25 hr	0.18	0.18
395	227	239	0.07	10:30 hr	0.18	0.18
409	228	229	0.00	00:00 hr	0.00	0.00
407	229	230	0.00	00:00 hr	0.00	0.00
405	230	231	0.00	00:00 hr	0.00	0.00
403	231	232	0.00	00:00 hr	0.00	0.00
401	232	237	0.00	00:00 hr	0.00	0.00
399	237	238	0.00	00:00 hr	0.00	0.00
397	238	239	0.00	00:00 hr	0.00	0.08
365	239	255	0.07	10:28 hr	0.14	0.16
351	241	242	0.00	00:00 hr	0.00	0.00
353	242	246	0.00	00:00 hr	0.00	0.00
357	246	253	0.00	00:00 hr	0.00	0.07
341	247	249	0.00	00:00 hr	0.00	0.00
343	249	250	0.00	00:00 hr	0.00	0.00
345	250	251	0.00	00:00 hr	0.00	0.00
347	251	252	0.00	00:00 hr	0.00	0.00
349	252	253	0.00	00:00 hr	0.00	0.07
359	253	254	0.09	10:00 hr	0.13	0.16
361	254	255	0.09	10:01 hr	0.19	0.22
363	255	265	0.21	10:25 hr	0.20	0.20
333	256	257	0.00	00:00 hr	0.00	0.00
335	257	258	0.00	00:00 hr	0.00	0.00
337	258	259	0.00	00:00 hr	0.00	0.00
339	259	262	0.00	00:00 hr	0.00	0.00
325	262	264	0.00	00:00 hr	0.00	0.00
329	264	265	0.00	00:00 hr	0.00	0.11
331	265	266	0.23	10:15 hr	0.18	0.18
323	266	UN163	0.23	10:16 hr	0.18	0.18
317	267	268	0.23	10:20 hr	0.24	0.24
319	268	269	0.23	10:21 hr	0.19	0.19
315	269	270	0.23	10:20 hr	0.17	0.19
313	270	271	0.23	10:29 hr	0.21	0.21

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 ADWF (0.51 MGD) - Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
311	271	272	0.23	10:26 hr	0.21	0.29
293	272	295	0.27	10:18 hr	0.37	0.37
301	278	279	0.00	00:00 hr	0.00	0.00
303	279	280	0.00	00:00 hr	0.00	0.00
305	280	281	0.00	00:00 hr	0.00	0.00
307	281	284	0.00	00:00 hr	0.00	0.00
297	282	283	0.00	00:00 hr	0.00	0.00
299	283	284	0.00	00:00 hr	0.00	0.00
309	284	293	0.00	00:00 hr	0.00	0.00
287	292	293	0.00	00:00 hr	0.00	0.00
289	293	294	0.00	00:00 hr	0.00	0.00
291	294	272	0.00	00:00 hr	0.00	0.23
159	295	299	0.27	10:12 hr	0.22	0.25
153	299	300	0.27	10:23 hr	0.29	0.29
149	300	303	0.27	10:24 hr	0.24	0.28
145	303	307	0.27	10:18 hr	0.27	0.27
137	305	306	0.00	00:00 hr	0.00	0.00
141	306	307	0.00	00:00 hr	0.00	0.20
143	307	308	0.27	10:20 hr	0.27	0.27
113	308	318	0.30	10:15 hr	0.13	0.18
129	309	310	0.00	00:00 hr	0.00	0.00
131	310	311	0.00	00:00 hr	0.00	0.00
133	311	312	0.00	00:00 hr	0.00	0.00
127	312	313	0.00	00:00 hr	0.00	0.00
125	313	314	0.00	00:00 hr	0.00	0.00
123	314	315	0.00	00:00 hr	0.00	0.00
121	315	316	0.00	00:00 hr	0.00	0.00
119	316	317	0.00	00:00 hr	0.00	0.00
115	317	318	0.00	00:00 hr	0.00	0.17
109	318	319	0.33	10:16 hr	0.23	0.25
111	319	321	0.33	10:20 hr	0.27	0.27
103	321	322	0.33	10:20 hr	0.24	0.27
105	322	323	0.33	10:25 hr	0.31	0.31
101	323	324	0.33	10:26 hr	0.29	0.29
99	324	325	0.33	10:27 hr	0.22	0.22
95	325	326	0.33	10:27 hr	0.19	0.23
97	326	327	0.33	10:30 hr	0.28	0.28
91	327	328	0.33	10:27 hr	0.24	0.28
93	328	329	0.33	10:31 hr	0.32	0.32
87	329	330	0.33	10:32 hr	0.29	0.33
89	330	331	0.33	10:32 hr	0.37	0.37

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 ADWF (0.51 MGD) - Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
85	331	332	0.33	10:37 hr	0.35	0.35
83	332	333	0.33	10:42 hr	0.30	0.31
81	333	334	0.33	10:44 hr	0.32	0.32
73	334	335	0.33	10:43 hr	0.22	0.22
77	335	336	0.33	10:46 hr	0.21	0.21
79	336	337	0.33	10:46 hr	0.15	0.17
557	337	338	0.33	10:49 hr	0.19	0.19
567	338	339	0.33	10:48 hr	0.19	0.20
569	339	720	0.33	10:52 hr	0.20	0.20
549	402	403	0.00	00:00 hr	0.00	0.00
547	403	404	0.00	00:00 hr	0.00	0.00
205	404	405	0.00	00:00 hr	0.00	0.00
207	405	410	0.00	00:00 hr	0.00	0.00
553	407	408	0.00	00:00 hr	0.00	0.00
225	408	409	0.00	00:00 hr	0.00	0.00
227	409	410	0.00	00:00 hr	0.00	0.00
209	410	413	0.00	00:00 hr	0.00	0.00
217	411	412	0.00	00:00 hr	0.00	0.00
219	412	449	0.00	00:00 hr	0.00	0.00
211	413	450	0.00	00:00 hr	0.00	0.00
515	417	418	0.00	00:00 hr	0.00	0.00
215	418	448	0.01	10:03 hr	0.13	0.13
231	419	421	0.00	00:00 hr	0.00	0.00
245	420	421	0.00	00:00 hr	0.00	0.00
467	421	425	0.00	00:00 hr	0.00	0.00
469	425	428	0.00	00:00 hr	0.00	0.00
247	426	427	0.00	00:00 hr	0.00	0.00
249	427	428	0.00	00:00 hr	0.00	0.00
241	428	447	0.03	09:59 hr	0.12	0.12
251	430	431	0.00	00:00 hr	0.00	0.00
253	431	434	0.00	00:00 hr	0.00	0.00
267	432	433	0.00	00:00 hr	0.00	0.00
471	433	434	0.00	00:00 hr	0.00	0.00
255	434	435	0.00	00:00 hr	0.00	0.00
257	435	436	0.00	00:00 hr	0.00	0.00
259	436	437	0.00	00:00 hr	0.00	0.00
261	437	438	0.00	00:00 hr	0.00	0.00
263	438	446	0.00	00:00 hr	0.00	0.00
273	445	446	0.00	00:00 hr	0.00	0.00
265	446	447	0.00	00:00 hr	0.00	0.05
243	447	448	0.03	10:00 hr	0.09	0.09

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 ADWF (0.51 MGD) - Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
69	448	59	0.04	10:00 hr	0.11	0.14
221	449	450	0.00	00:00 hr	0.00	0.00
213	450	417	0.00	00:00 hr	0.00	0.00
275	455	456	0.00	00:00 hr	0.00	0.00
277	456	457	0.00	00:00 hr	0.00	0.00
279	457	458	0.00	00:00 hr	0.00	0.00
281	458	471	0.00	00:00 hr	0.00	0.00
201	466	472B	0.08	10:12 hr	0.14	0.14
283	471	472A	0.00	00:00 hr	0.00	0.00
485	477	481B	0.00	00:00 hr	0.00	0.00
479	478	480	0.00	00:00 hr	0.00	0.00
481	480	481B	0.00	00:00 hr	0.00	0.00
189	482	487	0.00	00:00 hr	0.00	0.00
191	487	488	0.00	00:00 hr	0.00	0.00
475	488	490	0.00	00:00 hr	0.00	0.00
193	490	491	0.00	00:00 hr	0.00	0.00
473	491	94	0.00	00:00 hr	0.00	0.17
443	500	501	0.03	10:03 hr	0.12	0.12
459	501	502	0.03	10:03 hr	0.13	0.13
453	502	503	0.03	10:05 hr	0.16	0.16
455	503	523	0.03	10:05 hr	0.11	0.11
465	504	507	0.01	10:01 hr	0.05	0.05
463	507	508	0.01	09:56 hr	0.05	0.05
57	508	511	0.05	10:09 hr	0.10	0.10
59	511	521	0.05	10:08 hr	0.13	0.28
61	521	522	0.05	10:10 hr	0.14	0.15
63	522	184	0.06	10:12 hr	0.20	0.20
461	523	508	0.04	10:08 hr	0.11	0.11
161	605	606	0.00	00:00 hr	0.00	0.00
163	606	292	0.00	00:00 hr	0.00	0.00
513	700	228	0.00	00:00 hr	0.00	0.00
511	701	700	0.00	00:00 hr	0.00	0.00
509	702	701	0.00	00:00 hr	0.00	0.00
507	703	702	0.00	00:00 hr	0.00	0.00
505	704	703	0.00	00:00 hr	0.00	0.00
503	705	704	0.00	00:00 hr	0.00	0.00
501	706	705	0.00	00:00 hr	0.00	0.00
499	707	706	0.00	00:00 hr	0.00	0.00
497	708	707	0.00	00:00 hr	0.00	0.00
495	709	708	0.00	00:00 hr	0.00	0.00
493	710	709	0.00	00:00 hr	0.00	0.00

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 ADWF (0.51 MGD) - Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
491	711	710	0.00	00:00 hr	0.00	0.00
489	712	711	0.00	00:00 hr	0.00	0.00
487	713	712	0.00	00:00 hr	0.00	0.00
571	728	730	0.12	11:19 hr	0.27	0.30
583	730	732	0.12	11:25 hr	0.28	0.32
585	732	423	0.18	11:30 hr	0.26	0.26
167	102A	103A	0.12	10:22 hr	0.28	0.28
169	103A	106A	0.12	10:29 hr	0.30	0.30
171	106A	UN108	0.12	10:34 hr	0.30	0.30
285	472A	472B	0.00	00:00 hr	0.00	0.01
183	472B	94	0.11	10:14 hr	0.22	0.22
477	481B	482	0.00	00:00 hr	0.00	0.00
575	CO136	CO138	0.06	10:30 hr	0.23	0.23
577	CO138	CO139	0.06	10:32 hr	0.23	0.23
579	CO139	CO141	0.06	10:33 hr	0.17	0.17
561	CO141	W7A	0.06	10:42 hr	0.19	0.19
173	UN108	UN109	0.12	10:37 hr	0.28	0.28
175	UN109	UN110	0.12	10:41 hr	0.26	0.27
177	UN110	UN111	0.12	10:44 hr	0.28	0.28
179	UN111	177	0.12	10:48 hr	0.28	0.31
199	UN116	466	0.08	10:12 hr	0.12	0.13
321	UN163	267	0.23	10:17 hr	0.18	0.21
295	UN177	120	0.12	11:02 hr	0.24	0.26
419	UN206	204	0.02	10:05 hr	0.07	0.09
439	UN243	213	0.07	10:11 hr	0.12	0.12
541	UN482	UN206	0.00	00:00 hr	0.00	0.03
539	UN483	UN482	0.00	00:00 hr	0.00	0.00
537	UN484	UN483	0.00	00:00 hr	0.00	0.00
535	UN485	UN484	0.00	00:00 hr	0.00	0.00
533	UN486	UN485	0.00	00:00 hr	0.00	0.00
531	UN487	UN486	0.00	00:00 hr	0.00	0.00
529	UN488	UN487	0.00	00:00 hr	0.00	0.00
527	UN489	UN488	0.00	00:00 hr	0.00	0.00
525	UN490	UN489	0.00	00:00 hr	0.00	0.00
523	UN491	UN490	0.00	00:00 hr	0.00	0.00
521	UN492	UN491	0.00	00:00 hr	0.00	0.00
519	UN493	UN492	0.00	00:00 hr	0.00	0.00
517	UN494	UN493	0.00	00:00 hr	0.00	0.00
559	W7A	732	0.06	10:43 hr	0.21	0.31

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD)- Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
181	94	102A	0.80	10:20 hr	0.59	1.00
545	120	728	0.81	11:10 hr	1.00	1.00
165	177	UN177	0.81	10:58 hr	1.00	1.00
571	728	730	0.81	11:23 hr	1.00	1.00
583	730	732	0.81	11:27 hr	1.00	1.00
585	732	423	1.21	11:28 hr	1.00	1.00
167	102A	103A	0.81	10:25 hr	1.00	1.00
169	103A	106A	0.81	10:30 hr	1.00	1.00
171	106A	UN108	0.81	10:36 hr	1.00	1.00
173	UN108	UN109	0.81	10:38 hr	1.00	1.00
175	UN109	UN110	0.81	10:43 hr	1.00	1.00
177	UN110	UN111	0.81	10:45 hr	1.00	1.00
179	UN111	177	0.81	10:50 hr	1.00	1.00
295	UN177	120	0.81	11:06 hr	0.69	1.00
559	W7A	732	0.38	10:42 hr	0.58	1.00
89	330	331	0.90	10:34 hr	0.67	0.67
293	272	295	0.72	10:19 hr	0.66	0.66
183	472B	94	0.74	10:16 hr	0.63	0.63
85	331	332	0.90	10:37 hr	0.62	0.62
577	CO138	CO139	0.33	10:33 hr	0.58	0.58
87	329	330	0.90	10:31 hr	0.50	0.58
575	CO136	CO138	0.33	10:28 hr	0.58	0.58
197	83	UN116	0.54	10:12 hr	0.57	0.57
93	328	329	0.90	10:30 hr	0.56	0.56
81	333	334	0.90	10:43 hr	0.55	0.55
555	184	CO136	0.33	10:25 hr	0.47	0.54
105	322	323	0.90	10:26 hr	0.53	0.53
83	332	333	0.90	10:41 hr	0.51	0.53
195	166	83	0.54	10:11 hr	0.44	0.51
153	299	300	0.72	10:18 hr	0.50	0.50
311	271	272	0.61	10:23 hr	0.34	0.50
101	323	324	0.90	10:26 hr	0.49	0.49
561	CO141	W7A	0.33	10:40 hr	0.46	0.49
473	491	94	0.00	00:00 hr	0.00	0.49
91	327	328	0.90	10:28 hr	0.41	0.48
63	522	184	0.33	10:12 hr	0.48	0.48
97	326	327	0.90	10:29 hr	0.47	0.47
149	300	303	0.72	10:19 hr	0.39	0.47
103	321	322	0.90	10:21 hr	0.41	0.47
59	511	521	0.24	10:10 hr	0.29	0.47
111	319	321	0.90	10:21 hr	0.46	0.46

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD)- Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
145	303	307	0.72	10:20 hr	0.46	0.46
143	307	308	0.72	10:24 hr	0.45	0.45
71	59	82	0.41	10:08 hr	0.44	0.44
159	295	299	0.72	10:22 hr	0.35	0.43
109	318	319	0.90	10:18 hr	0.39	0.42
67	82	166	0.54	10:08 hr	0.40	0.42
579	CO139	CO141	0.33	10:35 hr	0.41	0.41
291	294	272	0.00	00:00 hr	0.00	0.41
317	267	268	0.61	10:21 hr	0.40	0.40
201	466	472B	0.54	10:14 hr	0.38	0.40
95	325	326	0.90	10:28 hr	0.32	0.39
99	324	325	0.90	10:28 hr	0.37	0.37
73	334	335	0.90	10:44 hr	0.36	0.36
361	254	255	0.23	10:00 hr	0.30	0.35
199	UN116	466	0.54	10:12 hr	0.32	0.35
77	335	336	0.90	10:46 hr	0.35	0.35
321	UN163	267	0.61	10:23 hr	0.30	0.35
313	270	271	0.61	10:24 hr	0.35	0.35
69	448	59	0.23	10:03 hr	0.26	0.35
61	521	522	0.24	10:14 hr	0.31	0.35
141	306	307	0.00	00:00 hr	0.00	0.34
453	502	503	0.13	10:08 hr	0.33	0.33
569	339	720	0.90	10:51 hr	0.33	0.33
567	338	339	0.90	10:49 hr	0.32	0.33
37	10	25	0.13	10:01 hr	0.32	0.32
557	337	338	0.90	10:49 hr	0.32	0.32
363	255	265	0.57	10:23 hr	0.32	0.32
29	6	10	0.00	00:00 hr	0.00	0.32
35	14	10	0.00	00:00 hr	0.00	0.32
215	418	448	0.07	10:03 hr	0.31	0.31
315	269	270	0.61	10:25 hr	0.28	0.31
319	268	269	0.61	10:21 hr	0.31	0.31
285	472A	472B	0.00	00:00 hr	0.00	0.30
393	226	227	0.20	10:26 hr	0.30	0.30
395	227	239	0.20	10:29 hr	0.30	0.30
113	308	318	0.82	10:16 hr	0.22	0.30
331	265	266	0.61	10:17 hr	0.30	0.30
323	266	UN163	0.61	10:20 hr	0.30	0.30
115	317	318	0.00	00:00 hr	0.00	0.29
79	336	337	0.90	10:46 hr	0.25	0.28
365	239	255	0.20	10:28 hr	0.22	0.27

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD)- Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
241	428	447	0.16	10:01 hr	0.27	0.27
359	253	254	0.23	10:00 hr	0.21	0.26
387	218	219	0.20	10:20 hr	0.25	0.25
389	219	225	0.20	10:21 hr	0.25	0.25
459	501	502	0.13	10:06 hr	0.25	0.25
391	225	226	0.20	10:23 hr	0.19	0.25
443	500	501	0.13	10:03 hr	0.24	0.25
461	523	508	0.16	10:09 hr	0.23	0.23
455	503	523	0.13	10:08 hr	0.23	0.23
441	25	500	0.13	10:02 hr	0.21	0.22
57	508	511	0.23	10:09 hr	0.22	0.22
243	447	448	0.16	10:01 hr	0.21	0.21
385	217	218	0.19	10:18 hr	0.16	0.20
377	213	214	0.19	10:14 hr	0.19	0.19
379	214	215	0.19	10:15 hr	0.19	0.19
381	215	216	0.19	10:16 hr	0.19	0.19
383	216	217	0.19	10:17 hr	0.19	0.19
439	UN243	213	0.19	10:13 hr	0.19	0.19
329	264	265	0.00	00:00 hr	0.00	0.19
421	204	205	0.15	10:05 hr	0.18	0.18
423	205	206	0.15	10:08 hr	0.18	0.18
425	206	207	0.15	10:10 hr	0.18	0.18
427	207	208	0.15	10:07 hr	0.18	0.18
437	212	UN243	0.17	10:13 hr	0.18	0.18
431	209	210	0.17	10:10 hr	0.18	0.18
433	210	211	0.17	10:12 hr	0.18	0.18
435	211	212	0.17	10:14 hr	0.18	0.18
429	208	209	0.17	10:13 hr	0.18	0.18
375	224	225	0.00	00:00 hr	0.00	0.16
419	UN206	204	0.05	10:06 hr	0.11	0.15
397	238	239	0.00	00:00 hr	0.00	0.14
465	504	507	0.07	10:01 hr	0.13	0.13
463	507	508	0.07	10:02 hr	0.12	0.12
417	203	UN206	0.05	10:03 hr	0.11	0.11
413	201	202	0.05	10:01 hr	0.11	0.11
415	202	203	0.05	10:05 hr	0.11	0.11
411	200	201	0.05	09:59 hr	0.11	0.11
357	246	253	0.00	00:00 hr	0.00	0.10
349	252	253	0.00	00:00 hr	0.00	0.10
265	446	447	0.00	00:00 hr	0.00	0.10
541	UN482	UN206	0.00	00:00 hr	0.00	0.05

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD)- Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
469	425	428	0.00	00:00 hr	0.00	0.01
249	427	428	0.00	00:00 hr	0.00	0.01
17	1	185	0.00	00:00 hr	0.00	0.00
21	2	3	0.00	00:00 hr	0.00	0.00
23	3	4	0.00	00:00 hr	0.00	0.00
25	4	5	0.00	00:00 hr	0.00	0.00
27	5	6	0.00	00:00 hr	0.00	0.00
33	18	14	0.00	00:00 hr	0.00	0.00
31	23	18	0.00	00:00 hr	0.00	0.00
51	43	47	0.00	00:00 hr	0.00	0.00
49	47	504	0.00	00:00 hr	0.00	0.00
19	185	2	0.00	00:00 hr	0.00	0.00
15	186	1	0.00	00:00 hr	0.00	0.00
367	220	221	0.00	00:00 hr	0.00	0.00
369	221	222	0.00	00:00 hr	0.00	0.00
371	222	223	0.00	00:00 hr	0.00	0.00
373	223	224	0.00	00:00 hr	0.00	0.00
409	228	229	0.00	00:00 hr	0.00	0.00
407	229	230	0.00	00:00 hr	0.00	0.00
405	230	231	0.00	00:00 hr	0.00	0.00
403	231	232	0.00	00:00 hr	0.00	0.00
401	232	237	0.00	00:00 hr	0.00	0.00
399	237	238	0.00	00:00 hr	0.00	0.00
351	241	242	0.00	00:00 hr	0.00	0.00
353	242	246	0.00	00:00 hr	0.00	0.00
341	247	249	0.00	00:00 hr	0.00	0.00
343	249	250	0.00	00:00 hr	0.00	0.00
345	250	251	0.00	00:00 hr	0.00	0.00
347	251	252	0.00	00:00 hr	0.00	0.00
333	256	257	0.00	00:00 hr	0.00	0.00
335	257	258	0.00	00:00 hr	0.00	0.00
337	258	259	0.00	00:00 hr	0.00	0.00
339	259	262	0.00	00:00 hr	0.00	0.00
325	262	264	0.00	00:00 hr	0.00	0.00
301	278	279	0.00	00:00 hr	0.00	0.00
303	279	280	0.00	00:00 hr	0.00	0.00
305	280	281	0.00	00:00 hr	0.00	0.00
307	281	284	0.00	00:00 hr	0.00	0.00
297	282	283	0.00	00:00 hr	0.00	0.00
299	283	284	0.00	00:00 hr	0.00	0.00
309	284	293	0.00	00:00 hr	0.00	0.00

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD)- Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
287	292	293	0.00	00:00 hr	0.00	0.00
289	293	294	0.00	00:00 hr	0.00	0.00
137	305	306	0.00	00:00 hr	0.00	0.00
129	309	310	0.00	00:00 hr	0.00	0.00
131	310	311	0.00	00:00 hr	0.00	0.00
133	311	312	0.00	00:00 hr	0.00	0.00
127	312	313	0.00	00:00 hr	0.00	0.00
125	313	314	0.00	00:00 hr	0.00	0.00
123	314	315	0.00	00:00 hr	0.00	0.00
121	315	316	0.00	00:00 hr	0.00	0.00
119	316	317	0.00	00:00 hr	0.00	0.00
549	402	403	0.00	00:00 hr	0.00	0.00
547	403	404	0.00	00:00 hr	0.00	0.00
205	404	405	0.00	00:00 hr	0.00	0.00
207	405	410	0.00	00:00 hr	0.00	0.00
553	407	408	0.00	00:00 hr	0.00	0.00
225	408	409	0.00	00:00 hr	0.00	0.00
227	409	410	0.00	00:00 hr	0.00	0.00
209	410	413	0.00	00:00 hr	0.00	0.00
217	411	412	0.00	00:00 hr	0.00	0.00
219	412	449	0.00	00:00 hr	0.00	0.00
211	413	450	0.00	00:00 hr	0.00	0.00
515	417	418	0.00	00:00 hr	0.00	0.00
231	419	421	0.00	00:00 hr	0.00	0.00
245	420	421	0.00	00:00 hr	0.00	0.00
467	421	425	0.00	00:00 hr	0.00	0.00
247	426	427	0.00	00:00 hr	0.00	0.00
251	430	431	0.00	00:00 hr	0.00	0.00
253	431	434	0.00	00:00 hr	0.00	0.00
267	432	433	0.00	00:00 hr	0.00	0.00
471	433	434	0.00	00:00 hr	0.00	0.00
255	434	435	0.00	00:00 hr	0.00	0.00
257	435	436	0.00	00:00 hr	0.00	0.00
259	436	437	0.00	00:00 hr	0.00	0.00
261	437	438	0.00	00:00 hr	0.00	0.00
263	438	446	0.00	00:00 hr	0.00	0.00
273	445	446	0.00	00:00 hr	0.00	0.00
221	449	450	0.00	00:00 hr	0.00	0.00
213	450	417	0.00	00:00 hr	0.00	0.00
275	455	456	0.00	00:00 hr	0.00	0.00
277	456	457	0.00	00:00 hr	0.00	0.00

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD)- Current System

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
279	457	458	0.00	00:00 hr	0.00	0.00
281	458	471	0.00	00:00 hr	0.00	0.00
283	471	472A	0.00	00:00 hr	0.00	0.00
485	477	481B	0.00	00:00 hr	0.00	0.00
479	478	480	0.00	00:00 hr	0.00	0.00
481	480	481B	0.00	00:00 hr	0.00	0.00
189	482	487	0.00	00:00 hr	0.00	0.00
191	487	488	0.00	00:00 hr	0.00	0.00
475	488	490	0.00	00:00 hr	0.00	0.00
193	490	491	0.00	00:00 hr	0.00	0.00
161	605	606	0.00	00:00 hr	0.00	0.00
163	606	292	0.00	00:00 hr	0.00	0.00
513	700	228	0.00	00:00 hr	0.00	0.00
511	701	700	0.00	00:00 hr	0.00	0.00
509	702	701	0.00	00:00 hr	0.00	0.00
507	703	702	0.00	00:00 hr	0.00	0.00
505	704	703	0.00	00:00 hr	0.00	0.00
503	705	704	0.00	00:00 hr	0.00	0.00
501	706	705	0.00	00:00 hr	0.00	0.00
499	707	706	0.00	00:00 hr	0.00	0.00
497	708	707	0.00	00:00 hr	0.00	0.00
495	709	708	0.00	00:00 hr	0.00	0.00
493	710	709	0.00	00:00 hr	0.00	0.00
491	711	710	0.00	00:00 hr	0.00	0.00
489	712	711	0.00	00:00 hr	0.00	0.00
487	713	712	0.00	00:00 hr	0.00	0.00
477	481B	482	0.00	00:00 hr	0.00	0.00
539	UN483	UN482	0.00	00:00 hr	0.00	0.00
537	UN484	UN483	0.00	00:00 hr	0.00	0.00
535	UN485	UN484	0.00	00:00 hr	0.00	0.00
533	UN486	UN485	0.00	00:00 hr	0.00	0.00
531	UN487	UN486	0.00	00:00 hr	0.00	0.00
529	UN488	UN487	0.00	00:00 hr	0.00	0.00
527	UN489	UN488	0.00	00:00 hr	0.00	0.00
525	UN490	UN489	0.00	00:00 hr	0.00	0.00
523	UN491	UN490	0.00	00:00 hr	0.00	0.00
521	UN492	UN491	0.00	00:00 hr	0.00	0.00
519	UN493	UN492	0.00	00:00 hr	0.00	0.00
517	UN494	UN493	0.00	00:00 hr	0.00	0.00

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD) - System with Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
89	330	331	0.9	10:34 hr	0.673	0.673
293	272	295	0.722	10:19 hr	0.657	0.657
559	W7A	732	0.38	10:42 hr	0.408	0.644
181	94	102A	0.804	10:20 hr	0.586	0.636
183	472B	94	0.739	10:16 hr	0.625	0.625
85	331	332	0.9	10:37 hr	0.622	0.622
577	CO138	CO139	0.326	10:33 hr	0.584	0.584
87	329	330	0.9	10:31 hr	0.496	0.583
575	CO136	CO138	0.326	10:28 hr	0.577	0.577
197	83	UN116	0.539	10:12 hr	0.574	0.574
93	328	329	0.9	10:30 hr	0.557	0.557
81	333	334	0.9	10:43 hr	0.55	0.55
555	184	CO136	0.326	10:25 hr	0.467	0.542
105	322	323	0.9	10:26 hr	0.532	0.532
83	332	333	0.9	10:41 hr	0.514	0.532
165	177	UN177	0.81	10:58 hr	0.523	0.523
583	730	732	0.81	11:25 hr	0.431	0.519
585	732	423	1.208	11:26 hr	0.512	0.512
195	166	83	0.539	10:11 hr	0.44	0.505
153	299	300	0.721	10:18 hr	0.499	0.499
311	271	272	0.608	10:23 hr	0.338	0.495
101	323	324	0.9	10:26 hr	0.491	0.491
473	491	94	0	00:00 hr	0	0.485
91	327	328	0.9	10:28 hr	0.409	0.482
179	UN111	177	0.81	10:50 hr	0.441	0.481
63	522	184	0.326	10:12 hr	0.48	0.48
97	326	327	0.9	10:29 hr	0.47	0.47
149	300	303	0.721	10:19 hr	0.394	0.469
103	321	322	0.9	10:21 hr	0.408	0.469
171	106A	UN108	0.81	10:36 hr	0.468	0.468
59	511	521	0.237	10:10 hr	0.293	0.465
169	103A	106A	0.81	10:30 hr	0.463	0.464
111	319	321	0.9	10:21 hr	0.462	0.462
145	303	307	0.721	10:20 hr	0.455	0.455
143	307	308	0.722	10:24 hr	0.453	0.453
571	728	730	0.81	11:19 hr	0.424	0.441
167	102A	103A	0.81	10:25 hr	0.439	0.441
71	59	82	0.412	10:08 hr	0.436	0.436
545	120	728	0.81	11:08 hr	0.435	0.436
177	UN110	UN111	0.81	10:45 hr	0.427	0.433
173	UN108	UN109	0.81	10:38 hr	0.428	0.428

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD) - System with Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
159	295	299	0.722	10:22 hr	0.353	0.425
109	318	319	0.9	10:18 hr	0.387	0.423
67	82	166	0.539	10:08 hr	0.397	0.417
175	UN109	UN110	0.81	10:43 hr	0.406	0.415
579	CO139	CO141	0.326	10:35 hr	0.411	0.411
291	294	272	0	00:00 hr	0	0.408
317	267	268	0.608	10:21 hr	0.4	0.4
201	466	472B	0.539	10:14 hr	0.383	0.399
295	UN177	120	0.81	11:03 hr	0.36	0.397
95	325	326	0.9	10:28 hr	0.315	0.392
99	324	325	0.9	10:28 hr	0.367	0.367
73	334	335	0.9	10:44 hr	0.364	0.364
361	254	255	0.229	10:00 hr	0.304	0.351
199	UN116	466	0.539	10:12 hr	0.32	0.35
77	335	336	0.9	10:46 hr	0.348	0.348
321	UN163	267	0.609	10:23 hr	0.297	0.347
313	270	271	0.608	10:24 hr	0.345	0.345
69	448	59	0.229	10:03 hr	0.256	0.345
61	521	522	0.237	10:14 hr	0.308	0.345
561	CO141	W7A	0.326	10:40 hr	0.331	0.345
141	306	307	0	00:00 hr	0	0.339
453	502	503	0.125	10:08 hr	0.334	0.334
569	339	720	0.9	10:51 hr	0.332	0.332
567	338	339	0.9	10:49 hr	0.323	0.327
37	10	25	0.125	10:01 hr	0.322	0.322
557	337	338	0.9	10:49 hr	0.322	0.322
363	255	265	0.567	10:23 hr	0.32	0.32
29	6	10	0	00:00 hr	0	0.316
35	14	10	0	00:00 hr	0	0.316
215	418	448	0.07	10:03 hr	0.314	0.314
315	269	270	0.609	10:25 hr	0.278	0.31
319	268	269	0.608	10:21 hr	0.309	0.309
285	472A	472B	0	00:00 hr	0	0.303
393	226	227	0.198	10:26 hr	0.301	0.301
395	227	239	0.199	10:29 hr	0.301	0.301
113	308	318	0.816	10:16 hr	0.218	0.301
331	265	266	0.608	10:17 hr	0.297	0.297
323	266	UN163	0.608	10:20 hr	0.297	0.297
115	317	318	0	00:00 hr	0	0.289
79	336	337	0.9	10:46 hr	0.246	0.284
365	239	255	0.198	10:28 hr	0.219	0.268

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD) - System with Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
241	428	447	0.16	10:01 hr	0.266	0.266
359	253	254	0.23	10:00 hr	0.207	0.255
387	218	219	0.198	10:20 hr	0.253	0.253
389	219	225	0.198	10:21 hr	0.253	0.253
459	501	502	0.125	10:06 hr	0.252	0.252
391	225	226	0.199	10:23 hr	0.192	0.246
443	500	501	0.125	10:03 hr	0.241	0.246
461	523	508	0.157	10:09 hr	0.23	0.23
455	503	523	0.125	10:08 hr	0.226	0.226
441	25	500	0.125	10:02 hr	0.208	0.224
57	508	511	0.228	10:09 hr	0.215	0.224
243	447	448	0.159	10:01 hr	0.205	0.205
385	217	218	0.186	10:18 hr	0.158	0.204
377	213	214	0.186	10:14 hr	0.186	0.186
379	214	215	0.186	10:15 hr	0.186	0.186
381	215	216	0.186	10:16 hr	0.186	0.186
383	216	217	0.186	10:17 hr	0.186	0.186
439	UN243	213	0.186	10:13 hr	0.186	0.186
329	264	265	0	00:00 hr	0	0.185
421	204	205	0.147	10:05 hr	0.183	0.183
423	205	206	0.147	10:08 hr	0.183	0.183
425	206	207	0.147	10:10 hr	0.183	0.183
427	207	208	0.147	10:07 hr	0.183	0.183
437	212	UN243	0.172	10:13 hr	0.179	0.182
431	209	210	0.172	10:10 hr	0.179	0.179
433	210	211	0.172	10:12 hr	0.179	0.179
435	211	212	0.172	10:14 hr	0.179	0.179
429	208	209	0.172	10:13 hr	0.177	0.177
375	224	225	0	00:00 hr	0	0.159
419	UN206	204	0.048	10:06 hr	0.106	0.145
397	238	239	0	00:00 hr	0	0.136
465	504	507	0.071	10:01 hr	0.133	0.133
463	507	508	0.071	10:02 hr	0.12	0.12
417	203	UN206	0.048	10:03 hr	0.114	0.114
413	201	202	0.048	10:01 hr	0.112	0.112
415	202	203	0.048	10:05 hr	0.108	0.111
411	200	201	0.048	09:59 hr	0.109	0.11
357	246	253	0	00:00 hr	0	0.103
349	252	253	0	00:00 hr	0	0.103
265	446	447	0	00:00 hr	0	0.103
541	UN482	UN206	0	00:00 hr	0	0.053

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD) - System with Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
469	425	428	0	00:00 hr	0	0.007
249	427	428	0	00:00 hr	0	0.007
17	1	185	0	00:00 hr	0	0
21	2	3	0	00:00 hr	0	0
23	3	4	0	00:00 hr	0	0
25	4	5	0	00:00 hr	0	0
27	5	6	0	00:00 hr	0	0
33	18	14	0	00:00 hr	0	0
31	23	18	0	00:00 hr	0	0
51	43	47	0	00:00 hr	0	0
49	47	504	0	00:00 hr	0	0
19	185	2	0	00:00 hr	0	0
15	186	1	0	00:00 hr	0	0
367	220	221	0	00:00 hr	0	0
369	221	222	0	00:00 hr	0	0
371	222	223	0	00:00 hr	0	0
373	223	224	0	00:00 hr	0	0
409	228	229	0	00:00 hr	0	0
407	229	230	0	00:00 hr	0	0
405	230	231	0	00:00 hr	0	0
403	231	232	0	00:00 hr	0	0
401	232	237	0	00:00 hr	0	0
399	237	238	0	00:00 hr	0	0
351	241	242	0	00:00 hr	0	0
353	242	246	0	00:00 hr	0	0
341	247	249	0	00:00 hr	0	0
343	249	250	0	00:00 hr	0	0
345	250	251	0	00:00 hr	0	0
347	251	252	0	00:00 hr	0	0
333	256	257	0	00:00 hr	0	0
335	257	258	0	00:00 hr	0	0
337	258	259	0	00:00 hr	0	0
339	259	262	0	00:00 hr	0	0
325	262	264	0	00:00 hr	0	0
301	278	279	0	00:00 hr	0	0
303	279	280	0	00:00 hr	0	0
305	280	281	0	00:00 hr	0	0
307	281	284	0	00:00 hr	0	0
297	282	283	0	00:00 hr	0	0
299	283	284	0	00:00 hr	0	0
309	284	293	0	00:00 hr	0	0

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD) - System with Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
287	292	293	0	00:00 hr	0	0
289	293	294	0	00:00 hr	0	0
137	305	306	0	00:00 hr	0	0
129	309	310	0	00:00 hr	0	0
131	310	311	0	00:00 hr	0	0
133	311	312	0	00:00 hr	0	0
127	312	313	0	00:00 hr	0	0
125	313	314	0	00:00 hr	0	0
123	314	315	0	00:00 hr	0	0
121	315	316	0	00:00 hr	0	0
119	316	317	0	00:00 hr	0	0
549	402	403	0	00:00 hr	0	0
547	403	404	0	00:00 hr	0	0
205	404	405	0	00:00 hr	0	0
207	405	410	0	00:00 hr	0	0
553	407	408	0	00:00 hr	0	0
225	408	409	0	00:00 hr	0	0
227	409	410	0	00:00 hr	0	0
209	410	413	0	00:00 hr	0	0
217	411	412	0	00:00 hr	0	0
219	412	449	0	00:00 hr	0	0
211	413	450	0	00:00 hr	0	0
515	417	418	0	00:00 hr	0	0
231	419	421	0	00:00 hr	0	0
245	420	421	0	00:00 hr	0	0
467	421	425	0	00:00 hr	0	0
247	426	427	0	00:00 hr	0	0
251	430	431	0	00:00 hr	0	0
253	431	434	0	00:00 hr	0	0
267	432	433	0	00:00 hr	0	0
471	433	434	0	00:00 hr	0	0
255	434	435	0	00:00 hr	0	0
257	435	436	0	00:00 hr	0	0
259	436	437	0	00:00 hr	0	0
261	437	438	0	00:00 hr	0	0
263	438	446	0	00:00 hr	0	0
273	445	446	0	00:00 hr	0	0
221	449	450	0	00:00 hr	0	0
213	450	417	0	00:00 hr	0	0
275	455	456	0	00:00 hr	0	0
277	456	457	0	00:00 hr	0	0

APPENDIX G
H2OMAP Version 9.0 Hydraulic Model Results
2012 PWWF (2.1 MGD) - System with Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adjusted d/D
279	457	458	0	00:00 hr	0	0
281	458	471	0	00:00 hr	0	0
283	471	472A	0	00:00 hr	0	0
485	477	481B	0	00:00 hr	0	0
479	478	480	0	00:00 hr	0	0
481	480	481B	0	00:00 hr	0	0
189	482	487	0	00:00 hr	0	0
191	487	488	0	00:00 hr	0	0
475	488	490	0	00:00 hr	0	0
193	490	491	0	00:00 hr	0	0
161	605	606	0	00:00 hr	0	0
163	606	292	0	00:00 hr	0	0
513	700	228	0	00:00 hr	0	0
511	701	700	0	00:00 hr	0	0
509	702	701	0	00:00 hr	0	0
507	703	702	0	00:00 hr	0	0
505	704	703	0	00:00 hr	0	0
503	705	704	0	00:00 hr	0	0
501	706	705	0	00:00 hr	0	0
499	707	706	0	00:00 hr	0	0
497	708	707	0	00:00 hr	0	0
495	709	708	0	00:00 hr	0	0
493	710	709	0	00:00 hr	0	0
491	711	710	0	00:00 hr	0	0
489	712	711	0	00:00 hr	0	0
487	713	712	0	00:00 hr	0	0
477	481B	482	0	00:00 hr	0	0
539	UN483	UN482	0	00:00 hr	0	0
537	UN484	UN483	0	00:00 hr	0	0
535	UN485	UN484	0	00:00 hr	0	0
533	UN486	UN485	0	00:00 hr	0	0
531	UN487	UN486	0	00:00 hr	0	0
529	UN488	UN487	0	00:00 hr	0	0
527	UN489	UN488	0	00:00 hr	0	0
525	UN490	UN489	0	00:00 hr	0	0
523	UN491	UN490	0	00:00 hr	0	0
521	UN492	UN491	0	00:00 hr	0	0
519	UN493	UN492	0	00:00 hr	0	0
517	UN494	UN493	0	00:00 hr	0	0

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 ADWF Results (0.54 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
293	272	295	0.29	10:28 hr	0.38	0.38
89	330	331	0.34	10:33 hr	0.38	0.38
85	331	332	0.34	10:40 hr	0.36	0.36
87	329	330	0.34	10:34 hr	0.29	0.34
93	328	329	0.34	10:33 hr	0.32	0.32
81	333	334	0.34	10:45 hr	0.32	0.32
105	322	323	0.34	10:26 hr	0.31	0.32
83	332	333	0.34	10:43 hr	0.30	0.31
153	299	300	0.29	10:28 hr	0.30	0.30
311	271	272	0.24	10:26 hr	0.21	0.29
101	323	324	0.34	10:26 hr	0.29	0.29
149	300	303	0.29	10:32 hr	0.24	0.29
91	327	328	0.34	10:30 hr	0.25	0.29
97	326	327	0.34	10:31 hr	0.28	0.28
103	321	322	0.34	10:25 hr	0.25	0.28
145	303	307	0.29	10:28 hr	0.28	0.28
59	511	521	0.05	10:07 hr	0.13	0.28
143	307	308	0.29	10:28 hr	0.28	0.28
111	319	321	0.34	10:21 hr	0.28	0.28
159	295	299	0.29	10:26 hr	0.22	0.26
109	318	319	0.34	10:17 hr	0.23	0.26
317	267	268	0.24	10:29 hr	0.25	0.25
181	94	102A	0.12	10:20 hr	0.21	0.25
95	325	326	0.34	10:28 hr	0.19	0.24
291	294	272	0.00	00:00 hr	0.00	0.24
555	184	CO136	0.06	10:23 hr	0.19	0.23
559	W7A	732	0.06	10:40 hr	0.16	0.23
577	CO138	CO139	0.06	10:32 hr	0.23	0.23
575	CO136	CO138	0.06	10:30 hr	0.23	0.23
99	324	325	0.34	10:28 hr	0.22	0.22
361	254	255	0.09	10:01 hr	0.19	0.22
73	334	335	0.34	10:46 hr	0.22	0.22
183	472B	94	0.11	10:14 hr	0.22	0.22
321	UN163	267	0.24	10:23 hr	0.19	0.22
313	270	271	0.24	10:28 hr	0.22	0.22
77	335	336	0.34	10:49 hr	0.21	0.21
141	306	307	0.00	00:00 hr	0.00	0.21
197	83	UN116	0.08	10:12 hr	0.20	0.20
569	339	720	0.34	10:51 hr	0.20	0.20
363	255	265	0.23	10:25 hr	0.20	0.20
567	338	339	0.34	10:53 hr	0.20	0.20

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 ADWF Results (0.54 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
557	337	338	0.34	10:48 hr	0.20	0.20
393	226	227	0.09	10:27 hr	0.20	0.20
395	227	239	0.08	10:27 hr	0.20	0.20
63	522	184	0.06	10:12 hr	0.20	0.20
315	269	270	0.24	10:26 hr	0.18	0.19
319	268	269	0.24	10:24 hr	0.19	0.19
583	730	732	0.12	11:24 hr	0.16	0.19
165	177	UN177	0.12	10:57 hr	0.19	0.19
585	732	423	0.18	11:28 hr	0.19	0.19
323	266	UN163	0.24	10:26 hr	0.19	0.19
331	265	266	0.24	10:21 hr	0.19	0.19
113	308	318	0.32	10:23 hr	0.14	0.19
195	166	83	0.08	10:10 hr	0.16	0.18
179	UN111	177	0.12	10:46 hr	0.17	0.18
571	728	730	0.12	11:17 hr	0.16	0.18
115	317	318	0.00	00:00 hr	0.00	0.18
171	106A	UN108	0.12	10:36 hr	0.18	0.18
79	336	337	0.34	10:55 hr	0.15	0.18
169	103A	106A	0.12	10:29 hr	0.17	0.17
473	491	94	0.00	00:00 hr	0.00	0.17
365	239	255	0.09	10:30 hr	0.15	0.17
579	CO139	CO141	0.06	10:33 hr	0.17	0.17
545	120	728	0.12	11:07 hr	0.17	0.17
167	102A	103A	0.12	10:22 hr	0.17	0.17
389	219	225	0.09	10:22 hr	0.17	0.17
387	218	219	0.09	10:22 hr	0.17	0.17
177	UN110	UN111	0.12	10:44 hr	0.16	0.16
359	253	254	0.09	10:00 hr	0.13	0.16
453	502	503	0.03	10:05 hr	0.16	0.16
71	59	82	0.06	10:06 hr	0.16	0.16
173	UN108	UN109	0.12	10:37 hr	0.16	0.16
391	225	226	0.09	10:23 hr	0.13	0.16
37	10	25	0.03	10:01 hr	0.16	0.16
175	UN109	UN110	0.12	10:41 hr	0.16	0.16
67	82	166	0.08	10:06 hr	0.15	0.16
29	6	10	0.00	00:00 hr	0.00	0.15
35	14	10	0.00	00:00 hr	0.00	0.15
295	UN177	120	0.12	11:00 hr	0.14	0.15
61	521	522	0.05	10:13 hr	0.14	0.15
201	466	472B	0.08	10:12 hr	0.14	0.14
561	CO141	W7A	0.06	10:40 hr	0.14	0.14

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 ADWF Results (0.54 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
69	448	59	0.04	10:00 hr	0.11	0.14
385	217	218	0.08	10:19 hr	0.11	0.14
199	UN116	466	0.08	10:12 hr	0.12	0.13
215	418	448	0.01	10:03 hr	0.13	0.13
421	204	205	0.07	10:01 hr	0.13	0.13
423	205	206	0.07	10:03 hr	0.13	0.13
425	206	207	0.07	10:06 hr	0.13	0.13
427	207	208	0.07	10:13 hr	0.13	0.13
459	501	502	0.03	10:03 hr	0.13	0.13
377	213	214	0.08	10:15 hr	0.13	0.13
379	214	215	0.08	10:17 hr	0.13	0.13
381	215	216	0.08	10:21 hr	0.13	0.13
383	216	217	0.08	10:18 hr	0.13	0.13
439	UN243	213	0.08	10:13 hr	0.13	0.13
443	500	501	0.03	10:02 hr	0.12	0.12
437	212	UN243	0.08	10:17 hr	0.12	0.12
431	209	210	0.08	10:14 hr	0.12	0.12
433	210	211	0.08	10:16 hr	0.12	0.12
435	211	212	0.08	10:17 hr	0.12	0.12
429	208	209	0.08	10:11 hr	0.12	0.12
329	264	265	0.00	00:00 hr	0.00	0.12
241	428	447	0.03	09:59 hr	0.12	0.12
455	503	523	0.03	10:05 hr	0.11	0.11
441	25	500	0.03	10:01 hr	0.11	0.11
461	523	508	0.04	10:08 hr	0.11	0.11
397	238	239	0.00	10:26 hr	0.03	0.11
375	224	225	0.00	00:00 hr	0.00	0.11
419	UN206	204	0.03	10:03 hr	0.08	0.11
57	508	511	0.05	10:05 hr	0.10	0.10
243	447	448	0.03	10:00 hr	0.09	0.09
417	203	UN206	0.03	10:04 hr	0.09	0.09
411	200	201	0.03	09:56 hr	0.09	0.09
413	201	202	0.03	09:59 hr	0.09	0.09
415	202	203	0.03	10:05 hr	0.09	0.09
349	252	253	0.00	00:00 hr	0.00	0.07
357	246	253	0.00	00:00 hr	0.00	0.07
465	504	507	0.01	10:01 hr	0.05	0.05
503	705	704	0.00	09:19 hr	0.05	0.05
501	706	705	0.00	09:17 hr	0.05	0.05
505	704	703	0.00	09:23 hr	0.05	0.05
463	507	508	0.01	09:56 hr	0.05	0.05

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 ADWF Results (0.54 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
265	446	447	0.00	00:00 hr	0.00	0.05
403	231	232	0.00	09:33 hr	0.04	0.04
541	UN482	UN206	0.00	00:00 hr	0.00	0.04
401	232	237	0.00	10:04 hr	0.04	0.04
407	229	230	0.00	09:43 hr	0.04	0.04
405	230	231	0.00	09:55 hr	0.04	0.04
409	228	229	0.00	09:42 hr	0.04	0.04
399	237	238	0.00	10:13 hr	0.03	0.03
507	703	702	0.00	09:23 hr	0.03	0.03
509	702	701	0.00	09:31 hr	0.03	0.03
511	701	700	0.00	09:51 hr	0.03	0.03
513	700	228	0.00	09:43 hr	0.02	0.03
499	707	706	0.00	00:00 hr	0.00	0.03
285	472A	472B	0.00	00:00 hr	0.00	0.01
119	316	317	0.00	00:00 hr	0.00	0.00
121	315	316	0.00	00:00 hr	0.00	0.00
123	314	315	0.00	00:00 hr	0.00	0.00
125	313	314	0.00	00:00 hr	0.00	0.00
127	312	313	0.00	00:00 hr	0.00	0.00
129	309	310	0.00	00:00 hr	0.00	0.00
131	310	311	0.00	00:00 hr	0.00	0.00
133	311	312	0.00	00:00 hr	0.00	0.00
137	305	306	0.00	00:00 hr	0.00	0.00
15	186	1	0.00	00:00 hr	0.00	0.00
161	605	606	0.00	00:00 hr	0.00	0.00
163	606	292	0.00	00:00 hr	0.00	0.00
17	1	185	0.00	00:00 hr	0.00	0.00
189	482	487	0.00	00:00 hr	0.00	0.00
19	185	2	0.00	00:00 hr	0.00	0.00
191	487	488	0.00	00:00 hr	0.00	0.00
193	490	491	0.00	00:00 hr	0.00	0.00
205	404	405	0.00	00:00 hr	0.00	0.00
207	405	410	0.00	00:00 hr	0.00	0.00
209	410	413	0.00	00:00 hr	0.00	0.00
21	2	3	0.00	00:00 hr	0.00	0.00
211	413	450	0.00	00:00 hr	0.00	0.00
213	450	417	0.00	00:00 hr	0.00	0.00
217	411	412	0.00	00:00 hr	0.00	0.00
219	412	449	0.00	00:00 hr	0.00	0.00
221	449	450	0.00	00:00 hr	0.00	0.00
225	408	409	0.00	00:00 hr	0.00	0.00

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 ADWF Results (0.54 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
227	409	410	0.00	00:00 hr	0.00	0.00
23	3	4	0.00	00:00 hr	0.00	0.00
231	419	421	0.00	00:00 hr	0.00	0.00
245	420	421	0.00	00:00 hr	0.00	0.00
247	426	427	0.00	00:00 hr	0.00	0.00
249	427	428	0.00	00:00 hr	0.00	0.00
25	4	5	0.00	00:00 hr	0.00	0.00
251	430	431	0.00	00:00 hr	0.00	0.00
253	431	434	0.00	00:00 hr	0.00	0.00
255	434	435	0.00	00:00 hr	0.00	0.00
257	435	436	0.00	00:00 hr	0.00	0.00
259	436	437	0.00	00:00 hr	0.00	0.00
261	437	438	0.00	00:00 hr	0.00	0.00
263	438	446	0.00	00:00 hr	0.00	0.00
267	432	433	0.00	00:00 hr	0.00	0.00
27	5	6	0.00	00:00 hr	0.00	0.00
273	445	446	0.00	00:00 hr	0.00	0.00
275	455	456	0.00	00:00 hr	0.00	0.00
277	456	457	0.00	00:00 hr	0.00	0.00
279	457	458	0.00	00:00 hr	0.00	0.00
281	458	471	0.00	00:00 hr	0.00	0.00
283	471	472A	0.00	00:00 hr	0.00	0.00
287	292	293	0.00	00:00 hr	0.00	0.00
289	293	294	0.00	00:00 hr	0.00	0.00
297	282	283	0.00	00:00 hr	0.00	0.00
299	283	284	0.00	00:00 hr	0.00	0.00
301	278	279	0.00	00:00 hr	0.00	0.00
303	279	280	0.00	00:00 hr	0.00	0.00
305	280	281	0.00	00:00 hr	0.00	0.00
307	281	284	0.00	00:00 hr	0.00	0.00
309	284	293	0.00	00:00 hr	0.00	0.00
31	23	18	0.00	00:00 hr	0.00	0.00
325	262	264	0.00	00:00 hr	0.00	0.00
33	18	14	0.00	00:00 hr	0.00	0.00
333	256	257	0.00	00:00 hr	0.00	0.00
335	257	258	0.00	00:00 hr	0.00	0.00
337	258	259	0.00	00:00 hr	0.00	0.00
339	259	262	0.00	00:00 hr	0.00	0.00
341	247	249	0.00	00:00 hr	0.00	0.00
343	249	250	0.00	00:00 hr	0.00	0.00
345	250	251	0.00	00:00 hr	0.00	0.00

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 ADWF Results (0.54 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
347	251	252	0.00	00:00 hr	0.00	0.00
351	241	242	0.00	00:00 hr	0.00	0.00
353	242	246	0.00	00:00 hr	0.00	0.00
367	220	221	0.00	00:00 hr	0.00	0.00
369	221	222	0.00	00:00 hr	0.00	0.00
371	222	223	0.00	00:00 hr	0.00	0.00
373	223	224	0.00	00:00 hr	0.00	0.00
467	421	425	0.00	00:00 hr	0.00	0.00
469	425	428	0.00	00:00 hr	0.00	0.00
471	433	434	0.00	00:00 hr	0.00	0.00
475	488	490	0.00	00:00 hr	0.00	0.00
477	481B	482	0.00	00:00 hr	0.00	0.00
479	478	480	0.00	00:00 hr	0.00	0.00
481	480	481B	0.00	00:00 hr	0.00	0.00
485	477	481B	0.00	00:00 hr	0.00	0.00
487	713	712	0.00	00:00 hr	0.00	0.00
489	712	711	0.00	00:00 hr	0.00	0.00
49	47	504	0.00	00:00 hr	0.00	0.00
491	711	710	0.00	00:00 hr	0.00	0.00
493	710	709	0.00	00:00 hr	0.00	0.00
495	709	708	0.00	00:00 hr	0.00	0.00
497	708	707	0.00	00:00 hr	0.00	0.00
51	43	47	0.00	00:00 hr	0.00	0.00
515	417	418	0.00	00:00 hr	0.00	0.00
517	UN494	UN493	0.00	00:00 hr	0.00	0.00
519	UN493	UN492	0.00	00:00 hr	0.00	0.00
521	UN492	UN491	0.00	00:00 hr	0.00	0.00
523	UN491	UN490	0.00	00:00 hr	0.00	0.00
525	UN490	UN489	0.00	00:00 hr	0.00	0.00
527	UN489	UN488	0.00	00:00 hr	0.00	0.00
529	UN488	UN487	0.00	00:00 hr	0.00	0.00
531	UN487	UN486	0.00	00:00 hr	0.00	0.00
533	UN486	UN485	0.00	00:00 hr	0.00	0.00
535	UN485	UN484	0.00	00:00 hr	0.00	0.00
537	UN484	UN483	0.00	00:00 hr	0.00	0.00
539	UN483	UN482	0.00	00:00 hr	0.00	0.00
547	403	404	0.00	00:00 hr	0.00	0.00
549	402	403	0.00	00:00 hr	0.00	0.00
553	407	408	0.00	00:00 hr	0.00	0.00

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
291	294	272	0.00	00:00 hr	0.00	1.00
293	272	295	1.35	10:39 hr	1.00	1.00
311	271	272	1.20	10:38 hr	0.49	1.00
81	333	334	1.55	11:08 hr	1.00	1.00
85	331	332	1.55	11:04 hr	1.00	1.00
87	329	330	1.55	10:56 hr	0.71	1.00
89	330	331	1.55	10:59 hr	1.00	1.00
91	327	328	1.55	10:54 hr	0.56	1.00
93	328	329	1.55	10:55 hr	1.00	1.00
83	332	333	1.55	11:06 hr	0.74	0.89
105	322	323	1.55	10:53 hr	0.78	0.78
153	299	300	1.35	10:41 hr	0.76	0.76
559	W7A	732	0.49	10:43 hr	0.47	0.70
101	323	324	1.55	10:53 hr	0.70	0.70
149	300	303	1.35	10:41 hr	0.57	0.69
145	303	307	1.35	10:42 hr	0.67	0.67
143	307	308	1.35	10:44 hr	0.67	0.67
103	321	322	1.55	10:47 hr	0.56	0.67
97	326	327	1.55	10:54 hr	0.66	0.66
111	319	321	1.55	10:46 hr	0.65	0.65
181	94	102A	0.82	10:20 hr	0.59	0.64
183	472B	94	0.75	10:16 hr	0.63	0.63
159	295	299	1.35	10:38 hr	0.50	0.63
577	CO138	CO139	0.36	10:32 hr	0.62	0.62
575	CO136	CO138	0.36	10:30 hr	0.61	0.61
317	267	268	1.20	10:36 hr	0.60	0.60
109	318	319	1.55	10:44 hr	0.53	0.59
393	226	227	0.65	10:32 hr	0.59	0.59
395	227	239	0.65	10:33 hr	0.58	0.58
197	83	UN116	0.55	10:12 hr	0.58	0.58
555	184	CO136	0.36	10:25 hr	0.49	0.57
585	732	423	1.33	11:24 hr	0.54	0.54
95	325	326	1.55	10:54 hr	0.42	0.54
583	730	732	0.83	11:25 hr	0.44	0.54
165	177	UN177	0.83	10:58 hr	0.53	0.53
195	166	83	0.55	10:11 hr	0.45	0.51
321	UN163	267	1.20	10:33 hr	0.43	0.51
63	522	184	0.36	10:13 hr	0.51	0.51
313	270	271	1.20	10:37 hr	0.50	0.50
141	306	307	0.00	00:00 hr	0.00	0.50
99	324	325	1.55	10:53 hr	0.50	0.50

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
73	334	335	1.55	11:10 hr	0.49	0.49
473	491	94	0.00	00:00 hr	0.00	0.49
59	511	521	0.27	10:09 hr	0.31	0.49
179	UN111	177	0.83	10:50 hr	0.45	0.49
389	219	225	0.65	10:27 hr	0.48	0.48
387	218	219	0.65	10:26 hr	0.47	0.47
171	106A	UN108	0.83	10:36 hr	0.47	0.47
169	103A	106A	0.83	10:30 hr	0.47	0.47
77	335	336	1.55	11:11 hr	0.47	0.47
363	255	265	1.13	10:33 hr	0.47	0.47
391	225	226	0.65	10:28 hr	0.35	0.47
361	254	255	0.30	10:01 hr	0.35	0.46
315	269	270	1.20	10:36 hr	0.40	0.45
167	102A	103A	0.83	10:25 hr	0.44	0.45
319	268	269	1.20	10:36 hr	0.45	0.45
569	339	720	1.55	11:16 hr	0.45	0.45
571	728	730	0.83	11:19 hr	0.43	0.45
545	120	728	0.83	11:08 hr	0.44	0.44
177	UN110	UN111	0.83	10:45 hr	0.43	0.44
365	239	255	0.68	10:35 hr	0.41	0.44
567	338	339	1.55	11:14 hr	0.43	0.44
71	59	82	0.41	10:08 hr	0.44	0.44
173	UN108	UN109	0.83	10:38 hr	0.43	0.43
579	CO139	CO141	0.36	10:35 hr	0.43	0.43
557	337	338	1.55	11:13 hr	0.43	0.43
323	266	UN163	1.20	10:33 hr	0.43	0.43
331	265	266	1.20	10:33 hr	0.43	0.43
67	82	166	0.55	10:08 hr	0.40	0.42
175	UN109	UN110	0.83	10:43 hr	0.41	0.42
113	308	318	1.46	10:43 hr	0.29	0.41
201	466	472B	0.55	10:14 hr	0.39	0.40
295	UN177	120	0.83	11:03 hr	0.36	0.40
115	317	318	0.00	00:00 hr	0.00	0.39
561	CO141	W7A	0.36	10:42 hr	0.35	0.38
385	217	218	0.61	10:24 hr	0.29	0.38
79	336	337	1.55	11:12 hr	0.32	0.38
61	521	522	0.27	10:13 hr	0.33	0.37
453	502	503	0.15	10:07 hr	0.36	0.36
199	UN116	466	0.55	10:12 hr	0.32	0.35
37	10	25	0.15	10:01 hr	0.35	0.35
69	448	59	0.23	10:03 hr	0.26	0.35

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
29	6	10	0.00	00:00 hr	0.00	0.34
35	14	10	0.00	00:00 hr	0.00	0.34
377	213	214	0.61	10:20 hr	0.34	0.34
379	214	215	0.61	10:21 hr	0.34	0.34
381	215	216	0.61	10:22 hr	0.34	0.34
383	216	217	0.61	10:23 hr	0.34	0.34
421	204	205	0.50	10:08 hr	0.34	0.34
423	205	206	0.50	10:09 hr	0.34	0.34
425	206	207	0.50	10:11 hr	0.34	0.34
427	207	208	0.50	10:14 hr	0.34	0.34
439	UN243	213	0.61	10:20 hr	0.34	0.34
437	212	UN243	0.53	10:19 hr	0.31	0.33
215	418	448	0.07	10:03 hr	0.32	0.32
397	238	239	0.03	10:25 hr	0.12	0.32
431	209	210	0.53	10:17 hr	0.32	0.32
433	210	211	0.53	10:18 hr	0.32	0.32
435	211	212	0.53	10:18 hr	0.32	0.32
419	UN206	204	0.36	10:06 hr	0.29	0.31
429	208	209	0.53	10:15 hr	0.31	0.31
285	472A	472B	0.00	00:00 hr	0.00	0.31
417	203	UN206	0.36	10:06 hr	0.31	0.31
413	201	202	0.36	10:02 hr	0.30	0.30
415	202	203	0.36	10:05 hr	0.29	0.30
411	200	201	0.36	10:00 hr	0.29	0.30
359	253	254	0.30	10:00 hr	0.24	0.29
375	224	225	0.00	00:00 hr	0.00	0.29
459	501	502	0.15	10:05 hr	0.27	0.27
241	428	447	0.16	10:01 hr	0.27	0.27
443	500	501	0.15	10:02 hr	0.26	0.27
329	264	265	0.00	00:00 hr	0.00	0.27
461	523	508	0.19	10:08 hr	0.25	0.25
455	503	523	0.15	10:08 hr	0.24	0.24
441	25	500	0.15	10:01 hr	0.22	0.24
57	508	511	0.26	10:09 hr	0.23	0.24
243	447	448	0.16	10:01 hr	0.21	0.21
503	705	704	0.03	10:05 hr	0.19	0.19
501	706	705	0.03	10:03 hr	0.18	0.19
505	704	703	0.03	10:09 hr	0.18	0.18
403	231	232	0.03	10:21 hr	0.15	0.15
401	232	237	0.03	10:22 hr	0.15	0.15
407	229	230	0.03	10:17 hr	0.15	0.15

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
405	230	231	0.03	10:20 hr	0.14	0.15
541	UN482	UN206	0.00	00:00 hr	0.00	0.14
409	228	229	0.03	10:15 hr	0.14	0.14
465	504	507	0.07	10:01 hr	0.13	0.13
463	507	508	0.07	10:02 hr	0.12	0.12
349	252	253	0.00	00:00 hr	0.00	0.12
357	246	253	0.00	00:00 hr	0.00	0.12
399	237	238	0.03	10:24 hr	0.10	0.11
507	703	702	0.03	10:10 hr	0.10	0.10
265	446	447	0.00	00:00 hr	0.00	0.10
509	702	701	0.03	10:15 hr	0.10	0.10
511	701	700	0.03	10:15 hr	0.10	0.10
513	700	228	0.03	10:13 hr	0.09	0.09
499	707	706	0.00	00:00 hr	0.00	0.09
249	427	428	0.00	00:00 hr	0.00	0.01
469	425	428	0.00	00:00 hr	0.00	0.01
119	316	317	0.00	00:00 hr	0.00	0.00
121	315	316	0.00	00:00 hr	0.00	0.00
123	314	315	0.00	00:00 hr	0.00	0.00
125	313	314	0.00	00:00 hr	0.00	0.00
127	312	313	0.00	00:00 hr	0.00	0.00
129	309	310	0.00	00:00 hr	0.00	0.00
131	310	311	0.00	00:00 hr	0.00	0.00
133	311	312	0.00	00:00 hr	0.00	0.00
137	305	306	0.00	00:00 hr	0.00	0.00
15	186	1	0.00	00:00 hr	0.00	0.00
161	605	606	0.00	00:00 hr	0.00	0.00
163	606	292	0.00	00:00 hr	0.00	0.00
17	1	185	0.00	00:00 hr	0.00	0.00
189	482	487	0.00	00:00 hr	0.00	0.00
19	185	2	0.00	00:00 hr	0.00	0.00
191	487	488	0.00	00:00 hr	0.00	0.00
193	490	491	0.00	00:00 hr	0.00	0.00
205	404	405	0.00	00:00 hr	0.00	0.00
207	405	410	0.00	00:00 hr	0.00	0.00
209	410	413	0.00	00:00 hr	0.00	0.00
21	2	3	0.00	00:00 hr	0.00	0.00
211	413	450	0.00	00:00 hr	0.00	0.00
213	450	417	0.00	00:00 hr	0.00	0.00
217	411	412	0.00	00:00 hr	0.00	0.00
219	412	449	0.00	00:00 hr	0.00	0.00

APPENDIX G

H2O MAP Version 9.0 Hydraulic Model Results

2022 PWWF Results (2.9 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
221	449	450	0.00	00:00 hr	0.00	0.00
225	408	409	0.00	00:00 hr	0.00	0.00
227	409	410	0.00	00:00 hr	0.00	0.00
23	3	4	0.00	00:00 hr	0.00	0.00
231	419	421	0.00	00:00 hr	0.00	0.00
245	420	421	0.00	00:00 hr	0.00	0.00
247	426	427	0.00	00:00 hr	0.00	0.00
25	4	5	0.00	00:00 hr	0.00	0.00
251	430	431	0.00	00:00 hr	0.00	0.00
253	431	434	0.00	00:00 hr	0.00	0.00
255	434	435	0.00	00:00 hr	0.00	0.00
257	435	436	0.00	00:00 hr	0.00	0.00
259	436	437	0.00	00:00 hr	0.00	0.00
261	437	438	0.00	00:00 hr	0.00	0.00
263	438	446	0.00	00:00 hr	0.00	0.00
267	432	433	0.00	00:00 hr	0.00	0.00
27	5	6	0.00	00:00 hr	0.00	0.00
273	445	446	0.00	00:00 hr	0.00	0.00
275	455	456	0.00	00:00 hr	0.00	0.00
277	456	457	0.00	00:00 hr	0.00	0.00
279	457	458	0.00	00:00 hr	0.00	0.00
281	458	471	0.00	00:00 hr	0.00	0.00
283	471	472A	0.00	00:00 hr	0.00	0.00
287	292	293	0.00	00:00 hr	0.00	0.00
289	293	294	0.00	00:00 hr	0.00	0.00
297	282	283	0.00	00:00 hr	0.00	0.00
299	283	284	0.00	00:00 hr	0.00	0.00
301	278	279	0.00	00:00 hr	0.00	0.00
303	279	280	0.00	00:00 hr	0.00	0.00
305	280	281	0.00	00:00 hr	0.00	0.00
307	281	284	0.00	00:00 hr	0.00	0.00
309	284	293	0.00	00:00 hr	0.00	0.00
31	23	18	0.00	00:00 hr	0.00	0.00
325	262	264	0.00	00:00 hr	0.00	0.00
33	18	14	0.00	00:00 hr	0.00	0.00
333	256	257	0.00	00:00 hr	0.00	0.00
335	257	258	0.00	00:00 hr	0.00	0.00
337	258	259	0.00	00:00 hr	0.00	0.00
339	259	262	0.00	00:00 hr	0.00	0.00
341	247	249	0.00	00:00 hr	0.00	0.00
343	249	250	0.00	00:00 hr	0.00	0.00

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2012 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
345	250	251	0.00	00:00 hr	0.00	0.00
347	251	252	0.00	00:00 hr	0.00	0.00
351	241	242	0.00	00:00 hr	0.00	0.00
353	242	246	0.00	00:00 hr	0.00	0.00
367	220	221	0.00	00:00 hr	0.00	0.00
369	221	222	0.00	00:00 hr	0.00	0.00
371	222	223	0.00	00:00 hr	0.00	0.00
373	223	224	0.00	00:00 hr	0.00	0.00
467	421	425	0.00	00:00 hr	0.00	0.00
471	433	434	0.00	00:00 hr	0.00	0.00
475	488	490	0.00	00:00 hr	0.00	0.00
477	481B	482	0.00	00:00 hr	0.00	0.00
479	478	480	0.00	00:00 hr	0.00	0.00
481	480	481B	0.00	00:00 hr	0.00	0.00
485	477	481B	0.00	00:00 hr	0.00	0.00
487	713	712	0.00	00:00 hr	0.00	0.00
489	712	711	0.00	00:00 hr	0.00	0.00
49	47	504	0.00	00:00 hr	0.00	0.00
491	711	710	0.00	00:00 hr	0.00	0.00
493	710	709	0.00	00:00 hr	0.00	0.00
495	709	708	0.00	00:00 hr	0.00	0.00
497	708	707	0.00	00:00 hr	0.00	0.00
51	43	47	0.00	00:00 hr	0.00	0.00
515	417	418	0.00	00:00 hr	0.00	0.00
517	UN494	UN493	0.00	00:00 hr	0.00	0.00
519	UN493	UN492	0.00	00:00 hr	0.00	0.00
521	UN492	UN491	0.00	00:00 hr	0.00	0.00
523	UN491	UN490	0.00	00:00 hr	0.00	0.00
525	UN490	UN489	0.00	00:00 hr	0.00	0.00
527	UN489	UN488	0.00	00:00 hr	0.00	0.00
529	UN488	UN487	0.00	00:00 hr	0.00	0.00
531	UN487	UN486	0.00	00:00 hr	0.00	0.00
533	UN486	UN485	0.00	00:00 hr	0.00	0.00
535	UN485	UN484	0.00	00:00 hr	0.00	0.00
537	UN484	UN483	0.00	00:00 hr	0.00	0.00
539	UN483	UN482	0.00	00:00 hr	0.00	0.00
547	403	404	0.00	00:00 hr	0.00	0.00
549	402	403	0.00	00:00 hr	0.00	0.00
553	407	408	0.00	00:00 hr	0.00	0.00

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2022 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
149	300	303	1.35	10:41 hr	0.57	0.69
145	303	307	1.35	10:43 hr	0.67	0.67
143	307	308	1.35	10:44 hr	0.67	0.67
97	326	327	1.548	10:53 hr	0.66	0.66
89	330	331	1.548	10:58 hr	0.65	0.65
111	319	321	1.548	10:46 hr	0.65	0.65
181	94	102A	0.816	10:20 hr	0.59	0.64
183	472B	94	0.751	10:16 hr	0.63	0.63
577	CO138	CO139	0.357	10:32 hr	0.62	0.62
311	271	272	1.2	10:38 hr	0.49	0.61
575	CO136	CO138	0.357	10:30 hr	0.61	0.61
103	321	322	1.548	10:47 hr	0.56	0.60
85	331	332	1.548	11:02 hr	0.60	0.60
317	267	268	1.2	10:36 hr	0.60	0.60
109	318	319	1.548	10:42 hr	0.53	0.59
393	226	227	0.649	10:32 hr	0.59	0.59
395	227	239	0.649	10:33 hr	0.58	0.58
197	83	UN116	0.55	10:12 hr	0.58	0.58
555	184	CO136	0.357	10:25 hr	0.49	0.57
559	W7A	732	0.486	10:43 hr	0.36	0.57
87	329	330	1.548	10:56 hr	0.48	0.56
585	732	423	1.331	11:24 hr	0.54	0.54
95	325	326	1.548	10:52 hr	0.42	0.54
583	730	732	0.825	11:25 hr	0.44	0.54
159	295	299	1.35	10:38 hr	0.50	0.54
93	328	329	1.548	10:55 hr	0.54	0.54
81	333	334	1.548	11:08 hr	0.53	0.53
165	177	UN177	0.825	10:58 hr	0.53	0.53
105	322	323	1.548	10:51 hr	0.52	0.52
83	332	333	1.548	11:05 hr	0.50	0.52
195	166	83	0.55	10:11 hr	0.45	0.51
321	UN163	267	1.2	10:33 hr	0.43	0.51
63	522	184	0.357	10:13 hr	0.51	0.51
313	270	271	1.2	10:37 hr	0.50	0.50
141	306	307	0	00:00 hr	0.00	0.50
99	324	325	1.548	10:53 hr	0.50	0.50
293	272	295	1.35	10:39 hr	0.49	0.49
73	334	335	1.548	11:09 hr	0.49	0.49
473	491	94	0	00:00 hr	0.00	0.49
59	511	521	0.269	10:09 hr	0.31	0.49
179	UN111	177	0.825	10:50 hr	0.45	0.49

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2022 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
101	323	324	1.548	10:51 hr	0.48	0.48
389	219	225	0.649	10:27 hr	0.48	0.48
387	218	219	0.649	10:26 hr	0.47	0.47
171	106A	UN108	0.825	10:36 hr	0.47	0.47
169	103A	106A	0.825	10:30 hr	0.47	0.47
77	335	336	1.548	11:11 hr	0.47	0.47
91	327	328	1.548	10:54 hr	0.40	0.47
363	255	265	1.134	10:33 hr	0.47	0.47
391	225	226	0.649	10:28 hr	0.35	0.47
361	254	255	0.301	10:01 hr	0.35	0.46
291	294	272	0	00:00 hr	0.00	0.46
315	269	270	1.2	10:36 hr	0.40	0.45
167	102A	103A	0.825	10:25 hr	0.44	0.45
319	268	269	1.2	10:36 hr	0.45	0.45
569	339	720	1.548	11:16 hr	0.45	0.45
571	728	730	0.825	11:19 hr	0.43	0.45
545	120	728	0.825	11:08 hr	0.44	0.44
567	338	339	1.548	11:13 hr	0.43	0.44
177	UN110	UN111	0.825	10:45 hr	0.43	0.44
365	239	255	0.68	10:35 hr	0.41	0.44
71	59	82	0.413	10:08 hr	0.44	0.44
173	UN108	UN109	0.825	10:38 hr	0.43	0.43
579	CO139	CO141	0.357	10:35 hr	0.43	0.43
557	337	338	1.548	11:13 hr	0.43	0.43
323	266	UN163	1.2	10:33 hr	0.43	0.43
331	265	266	1.2	10:33 hr	0.43	0.43
67	82	166	0.55	10:08 hr	0.40	0.42
175	UN109	UN110	0.825	10:43 hr	0.41	0.42
113	308	318	1.457	10:43 hr	0.29	0.41
201	466	472B	0.55	10:14 hr	0.39	0.40
295	UN177	120	0.825	11:03 hr	0.36	0.40
115	317	318	0	00:00 hr	0.00	0.39
153	299	300	1.35	10:41 hr	0.39	0.39
385	217	218	0.613	10:24 hr	0.29	0.38
79	336	337	1.548	11:11 hr	0.32	0.38
61	521	522	0.269	10:13 hr	0.33	0.37
561	CO141	W7A	0.357	10:42 hr	0.35	0.36
453	502	503	0.145	10:07 hr	0.36	0.36
199	UN116	466	0.55	10:12 hr	0.32	0.35
37	10	25	0.145	10:01 hr	0.35	0.35
69	448	59	0.231	10:03 hr	0.26	0.35

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2022 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
29	6	10	0	00:00 hr	0.00	0.34
35	14	10	0	00:00 hr	0.00	0.34
377	213	214	0.613	10:20 hr	0.34	0.34
379	214	215	0.613	10:21 hr	0.34	0.34
381	215	216	0.613	10:22 hr	0.34	0.34
383	216	217	0.613	10:23 hr	0.34	0.34
421	204	205	0.5	10:08 hr	0.34	0.34
423	205	206	0.5	10:09 hr	0.34	0.34
425	206	207	0.5	10:11 hr	0.34	0.34
427	207	208	0.5	10:14 hr	0.34	0.34
439	UN243	213	0.613	10:20 hr	0.34	0.34
437	212	UN243	0.528	10:19 hr	0.31	0.33
215	418	448	0.071	10:03 hr	0.32	0.32
397	238	239	0.032	10:25 hr	0.12	0.32
431	209	210	0.528	10:17 hr	0.32	0.32
433	210	211	0.528	10:18 hr	0.32	0.32
435	211	212	0.528	10:18 hr	0.32	0.32
419	UN206	204	0.359	10:06 hr	0.29	0.31
429	208	209	0.528	10:15 hr	0.31	0.31
285	472A	472B	0	00:00 hr	0.00	0.31
417	203	UN206	0.359	10:06 hr	0.31	0.31
413	201	202	0.359	10:02 hr	0.30	0.30
415	202	203	0.359	10:05 hr	0.29	0.30
411	200	201	0.359	10:00 hr	0.29	0.30
359	253	254	0.301	10:00 hr	0.24	0.29
375	224	225	0	00:00 hr	0.00	0.29
459	501	502	0.145	10:05 hr	0.27	0.27
241	428	447	0.159	10:01 hr	0.27	0.27
443	500	501	0.145	10:02 hr	0.26	0.27
329	264	265	0	00:00 hr	0.00	0.27
461	523	508	0.189	10:08 hr	0.25	0.25
455	503	523	0.145	10:08 hr	0.24	0.24
441	25	500	0.145	10:01 hr	0.22	0.24
57	508	511	0.26	10:09 hr	0.23	0.24
243	447	448	0.159	10:01 hr	0.21	0.21
503	705	704	0.032	10:05 hr	0.19	0.19
501	706	705	0.032	10:03 hr	0.18	0.19
505	704	703	0.032	10:09 hr	0.18	0.18
403	231	232	0.032	10:21 hr	0.15	0.15
401	232	237	0.032	10:22 hr	0.15	0.15
407	229	230	0.032	10:17 hr	0.15	0.15

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2022 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
405	230	231	0.032	10:20 hr	0.14	0.15
541	UN482	UN206	0	00:00 hr	0.00	0.14
409	228	229	0.032	10:15 hr	0.14	0.14
465	504	507	0.071	10:01 hr	0.13	0.13
463	507	508	0.071	10:02 hr	0.12	0.12
349	252	253	0	00:00 hr	0.00	0.12
357	246	253	0	00:00 hr	0.00	0.12
399	237	238	0.032	10:24 hr	0.10	0.11
507	703	702	0.032	10:10 hr	0.10	0.10
265	446	447	0	00:00 hr	0.00	0.10
509	702	701	0.032	10:15 hr	0.10	0.10
511	701	700	0.032	10:15 hr	0.10	0.10
513	700	228	0.032	10:13 hr	0.09	0.09
499	707	706	0	00:00 hr	0.00	0.09
249	427	428	0	00:00 hr	0.00	0.01
469	425	428	0	00:00 hr	0.00	0.01
119	316	317	0	00:00 hr	0.00	0.00
121	315	316	0	00:00 hr	0.00	0.00
123	314	315	0	00:00 hr	0.00	0.00
125	313	314	0	00:00 hr	0.00	0.00
127	312	313	0	00:00 hr	0.00	0.00
129	309	310	0	00:00 hr	0.00	0.00
131	310	311	0	00:00 hr	0.00	0.00
133	311	312	0	00:00 hr	0.00	0.00
137	305	306	0	00:00 hr	0.00	0.00
15	186	1	0	00:00 hr	0.00	0.00
161	605	606	0	00:00 hr	0.00	0.00
163	606	292	0	00:00 hr	0.00	0.00
17	1	185	0	00:00 hr	0.00	0.00
189	482	487	0	00:00 hr	0.00	0.00
19	185	2	0	00:00 hr	0.00	0.00
191	487	488	0	00:00 hr	0.00	0.00
193	490	491	0	00:00 hr	0.00	0.00
205	404	405	0	00:00 hr	0.00	0.00
207	405	410	0	00:00 hr	0.00	0.00
209	410	413	0	00:00 hr	0.00	0.00
21	2	3	0	00:00 hr	0.00	0.00
211	413	450	0	00:00 hr	0.00	0.00
213	450	417	0	00:00 hr	0.00	0.00
217	411	412	0	00:00 hr	0.00	0.00
219	412	449	0	00:00 hr	0.00	0.00

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2022 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
221	449	450	0	00:00 hr	0.00	0.00
225	408	409	0	00:00 hr	0.00	0.00
227	409	410	0	00:00 hr	0.00	0.00
23	3	4	0	00:00 hr	0.00	0.00
231	419	421	0	00:00 hr	0.00	0.00
245	420	421	0	00:00 hr	0.00	0.00
247	426	427	0	00:00 hr	0.00	0.00
25	4	5	0	00:00 hr	0.00	0.00
251	430	431	0	00:00 hr	0.00	0.00
253	431	434	0	00:00 hr	0.00	0.00
255	434	435	0	00:00 hr	0.00	0.00
257	435	436	0	00:00 hr	0.00	0.00
259	436	437	0	00:00 hr	0.00	0.00
261	437	438	0	00:00 hr	0.00	0.00
263	438	446	0	00:00 hr	0.00	0.00
267	432	433	0	00:00 hr	0.00	0.00
27	5	6	0	00:00 hr	0.00	0.00
273	445	446	0	00:00 hr	0.00	0.00
275	455	456	0	00:00 hr	0.00	0.00
277	456	457	0	00:00 hr	0.00	0.00
279	457	458	0	00:00 hr	0.00	0.00
281	458	471	0	00:00 hr	0.00	0.00
283	471	472A	0	00:00 hr	0.00	0.00
287	292	293	0	00:00 hr	0.00	0.00
289	293	294	0	00:00 hr	0.00	0.00
297	282	283	0	00:00 hr	0.00	0.00
299	283	284	0	00:00 hr	0.00	0.00
301	278	279	0	00:00 hr	0.00	0.00
303	279	280	0	00:00 hr	0.00	0.00
305	280	281	0	00:00 hr	0.00	0.00
307	281	284	0	00:00 hr	0.00	0.00
309	284	293	0	00:00 hr	0.00	0.00
31	23	18	0	00:00 hr	0.00	0.00
325	262	264	0	00:00 hr	0.00	0.00
33	18	14	0	00:00 hr	0.00	0.00
333	256	257	0	00:00 hr	0.00	0.00
335	257	258	0	00:00 hr	0.00	0.00
337	258	259	0	00:00 hr	0.00	0.00
339	259	262	0	00:00 hr	0.00	0.00
341	247	249	0	00:00 hr	0.00	0.00
343	249	250	0	00:00 hr	0.00	0.00

APPENDIX G
H2O MAP Version 9.0 Hydraulic Model Results
2022 PWWF Results (2.9 MGD) - System with 2022 Improvements

ID	From ID	To ID	Maximum Flow (mgd)	Maximum Flow Time (hour)	Maximum d/D	Maximum Adj d/D
345	250	251	0	00:00 hr	0.00	0.00
347	251	252	0	00:00 hr	0.00	0.00
351	241	242	0	00:00 hr	0.00	0.00
353	242	246	0	00:00 hr	0.00	0.00
367	220	221	0	00:00 hr	0.00	0.00
369	221	222	0	00:00 hr	0.00	0.00
371	222	223	0	00:00 hr	0.00	0.00
373	223	224	0	00:00 hr	0.00	0.00
467	421	425	0	00:00 hr	0.00	0.00
471	433	434	0	00:00 hr	0.00	0.00
475	488	490	0	00:00 hr	0.00	0.00
477	481B	482	0	00:00 hr	0.00	0.00
479	478	480	0	00:00 hr	0.00	0.00
481	480	481B	0	00:00 hr	0.00	0.00
485	477	481B	0	00:00 hr	0.00	0.00
487	713	712	0	00:00 hr	0.00	0.00
489	712	711	0	00:00 hr	0.00	0.00
49	47	504	0	00:00 hr	0.00	0.00
491	711	710	0	00:00 hr	0.00	0.00
493	710	709	0	00:00 hr	0.00	0.00
495	709	708	0	00:00 hr	0.00	0.00
497	708	707	0	00:00 hr	0.00	0.00
51	43	47	0	00:00 hr	0.00	0.00
515	417	418	0	00:00 hr	0.00	0.00
517	UN494	UN493	0	00:00 hr	0.00	0.00
519	UN493	UN492	0	00:00 hr	0.00	0.00
521	UN492	UN491	0	00:00 hr	0.00	0.00
523	UN491	UN490	0	00:00 hr	0.00	0.00
525	UN490	UN489	0	00:00 hr	0.00	0.00
527	UN489	UN488	0	00:00 hr	0.00	0.00
529	UN488	UN487	0	00:00 hr	0.00	0.00
531	UN487	UN486	0	00:00 hr	0.00	0.00
533	UN486	UN485	0	00:00 hr	0.00	0.00
535	UN485	UN484	0	00:00 hr	0.00	0.00
537	UN484	UN483	0	00:00 hr	0.00	0.00
539	UN483	UN482	0	00:00 hr	0.00	0.00
547	403	404	0	00:00 hr	0.00	0.00
549	402	403	0	00:00 hr	0.00	0.00
553	407	408	0	00:00 hr	0.00	0.00

City of Weed
Sanitary Sewer Management Program
Performance Measure Indicators

Overflow Prevention / Collection System Maintenance					
Performance Indicator	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
	Actual	Actual	Actual	Actual	Actual
<u>INPUT</u>					
Total SSO response time (receipt of notification to site arrival)					
Total person-hours spent in responding to and alleviating SSO's					
Total miles of SS in the system					
Total number of gravity sewer system maintenance personnel					
Total number of pumping plant maintenance personnel					
Total number of scheduled manhole inspections					
<u>WORKLOAD / OUTPUT</u>					
Total number of SSO's responded to in 12-month period					
Number of SSO's > 1,000 gallons responded to					
Number of SSO's responded to within 30-minutes of less					
Total miles of sewer line maintained					
Total number of pump stations maintained					
Total number of manhole inspections completed					
Total FOG related SSO's cleared					
Total root related SSO's cleared					
Total SSO's due to other causes (debris, vandalism,etc.)					
Total number of capacity related SSO's					
Total number of SSO's due to pump station malfunction					
Total number of stoppages					
Miles of sewer on monthly check-n-clean					
Miles of sewer on quarterly check-n-clean					
<u>EFFICIENCY</u>					
Number of SSO's per 100 miles of sewer line					
Number of stoppages per 100 miles of sewer line					
Number of SSO's that reached "Waters of the United States"					
Number of pump stations with one or more malfunctions					
Number of pump stations per electro-mechanic crew					
Average response time per SSO					

City of Weed
Sanitary Sewer Management Program
Performance Measure Indicators

Performance Indicator	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
	Actual	Actual	Actual	Estimated	Projected
Percent decrease in length of sewer line on quarterly of less schedule					
EFFECTIVENESS / OUTCOME					
Percentage of SSO's > 1,000 gallons					
Percentage of SSO's due to FOG					
Percentage of SSO's due to roots					
Percentage of SSO's due to other causes					
Percentage of SSO's that reached "Waters of the United States"					
Percentage of sewer on quarterly of less frequent schedules					
Percentage of pump stations with one or more malfunctions resulting in an SSO					
Percentage of SSO's with response time less than 30-minutes					
Percentage of stoppages not resulting in SSO					
OBJECTIVE: To establish baseline performance measures for effective operations and maintenance of the community sewer system					
EXPLANATORY NOTES:					

APPENDIX I

SEWER MAINTENANCE ACTIVITY REPORT
Work Completed: January 1, 20xx to December 31, 20xx

Number of parcels added/annexed to system during 20xx - XX

Total length of pipe in system as of December 31, 20xx - XXX,XXX L.F.

Total number of manholes in system as of December 31, 20xx - XXX

Total number of pump stations in system as of December 31, 20xx - XX

Total number of siphons in system as of December 31, 20xx - XX

PREVENTATIVE MAINTENANCE ACTIVITIES

Sewer Pipe

- Hydro cleaned xx,xxx l.f. of pipe
- Mechanically rodded x,xxx l.f. of pipe
- CCTV inspected and recorded xx,xxx l.f. of pipe
- Chemically treated (root control) x,xxx l.f. of pipe
- Repaved xxx l.f of pipe trench due to subsidence

Manholes

- Inspected xxx manholes
- Adjusted xx manhole frames and lids

Pump Stations

- Performed xxx inspections of pump stations
- Performed xx equipment repairs/overhauls
- Responded to xx alarma/service requests

Siphons

- Performed xxx inspections of siphons
- Mechanically or hydro cleaned xx siphons, of which xx were two or more times

SERVICE REQUEST RESPONSES

- xx Blockages / Stoppages
- xx Overflows
- xx Floodouts
- xx Rodent/Insect complaints
- xx Odor complaints
- xx Others (record type)
- False alarms

CONSTRUCTION ACTIVITY

- Installed x,xxx l.f. of pipe lining material
- Removed and replaced xxx l.f. of pipe
- Service saddles / connections installed = xx