San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

Treasure Island Sewer System Management Plan

Statewide General Waste Discharge Requirements for Sanitary Sewer Systems
Order. No. 2006-0003-DWQ

May 2022

CONTENTS

APPENDICES

SEWER SYSTEM MANAGEMENT PLAN

ELEMENT 1: SSMP GOAL

The first of the mandatory elements of a Sewer System Management Plan is a goal.

A. GOALS

The goal of the Treasure Island SSMP is to manage, operate, and maintain the wastewater collection system, and minimize and mitigate the impacts of SSOs when they occur.

B. SANITARY SEWER SYSTEM SERVICE AREA

The Treasure Island collection system serves Treasure Island (TI) and Yerba Buena Island (YBI). The service area population is approximately 2,500 people.

TI and YBI sits in the San Francisco Bay, between San Francisco and Oakland. Both islands are part of District 6 of the City and County of San Francisco (CCSF) and the collection system is serviced by the San Francisco Public Utilities Commission (SFPUC) under contract to the Treasure Island Development Authority (TIDA).

TIDA is a non-profit, public benefit agency responsible for the reuse and development of former Naval Station Treasure Island. The TI redevelopment project is divided into four Major Phases of development, depicted in Figure 1.1 below. As redevelopment proceeds and property is transferred from the Navy to TIDA, and from TIDA to the Master Developer, each subphase of work will have newly installed utility systems that will be subject to SFPUC approval and acceptance. As of 2021, approximately 77% of the new sewers in Major Phase 1, Sub-Phases 1 and 2, have been installed (70% on Treasure Island and about 84% on Yerba Buena Island)[1].

Figure 1.1 Treasure Island Major Phases Site Plan

[1] From the Treasure Island Wastewater Collection System 2020 Annual Status Report

The separate sanitary sewer collection system that serves both islands is partially owned by the Navy and partially owned by TIDA based on the parcels that have been transferred to-date. Unlike San Francisco, which is mostly served by a combined sewer system, TI and YBI are served by a separate sanitary sewer system. Table 1.1 summarizes the collection system conveyance assets as reported to the California Integrated Water Quality Information System (CIWQS)[2].

Table 1.1 Treasure Island Sewer System Mileage 2022

	TIDA	Navy
Miles of force mains and other pressure systems?	2.9	1.1
Miles of gravity sewers?	10.8	4.0
Estimated size distribution of GMs	**Percent (%) of total Miles**	
6 inches or less	47.2	35.0
8 inches	31.0	45.4
9-18 inches	11.5	13.2
19-36 inches	0.0	0.0
>36 inches	0.0	0.0
unknown	10.3	6.4
TOTAL (must equal 100)	100	100
Estimated size distribution of FMs	**Percent (%) of total Miles**	
6 inches or less	59.3	17.1
8 inches	10.9	16.4
9-18 inches	29.8	65.8
19-36 inches	0.0	0.0
>36 inches	0.0	0.0
unknown	0.0	0.7
TOTAL (must equal 100)	100	100

[2] See Appendix A for TIDA's and Navy's CIWQS Collection System Questionnaire content and methodology for determining data for the Treasure Island sewer system.

ELEMENT 2: ORGANIZATION

The Organization element of an SSMP must identify:

a) The name of the responsible or authorized representative.
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.
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)).

A. AUTHORIZED REPRESENTATIVE

The authorized representative for TIDA is the Treasure Island Director, Robert Beck, and the authorized representative for the Navy is the Navy Base Operations Manager, Patricia McFadden.

B. ORGANIZATION CHART

The separate sanitary sewer collection system that serves both TI and YBI is partially owned by the Navy and partially owned by TIDA based on the parcels transferred. The SFPUC WWE operates the separate sanitary sewer system on TI under an agreement with TIDA. SFPUC's Wastewater Enterprise (WWE) organization chart is available in Appendix B.

The SFPUC WWE is responsible for implementing the measures in the SSMP program. WWE consists of the following divisions:

- Business Strategy and Performance: provides workforce planning and financial planning services to each Division.
- Collection System: responsible for inspecting and cleaning the sewer system and minimizing harmful pollutants entering the sewer system through management of the Resource Recovery and Pollution Prevention Programs.
- Engineering: performs research, planning, design, construction, and start-up and troubleshooting of the City's wastewater facilities. WWE Engineering also provides review, comments, and feedback on all capital project planning, design, construction, and start-up activities.
- Maintenance: responsible for maintaining, repairing, and improving process equipment and facilities.
- Operations: responsible for the safe operation of all wastewater facilities within the National Pollutant Discharge Elimination System (NPDES) permit requirements.
- Regulatory Compliance: lead in coordinating WWE NPDES permit compliance.
- Urban Watershed Planning: develops green infrastructure plans, policies, regulations, watershed assessment and monitoring, and project design and delivery processes to protect water quality and improve the performance of San Francisco's collection system.

C. CHAIN OF COMMUNICATION: REPORTING SEWER SYSTEM OVERFLOWS

The procedures for reporting sewer overflows can be found in the Overflow Response, Mitigation, Documentation, and Sampling Standard Operating Procedures (SOP) in Appendix C.

SFPUC uses an Incident Command System (ICS) framework, a standardized hierarchical structure that allows for a cooperative response across departments to organize and coordinate response activities. The ICS is used for both planned and unplanned activities, including sewer overflows. During an overflow, the on-scene Sewer Operations Service Worker is the designated Incident Commander and coordinates with their direct supervisor or the On-Call Supervisor to provide notifications to the State and local health department.

All Sewer Operations staff received ICS training in the Summer of 2020.

ELEMENT 3: 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.
e) Enforce any violation of its sewer ordinances.

According to the Development Agreement[3] entered into by CCSF and Treasure Island Community Development, LLC, all CCSF provisions, rules, requirements, or regulations apply to the redevelopment project site of TI and YBI over the duration of the project.

A. PREVENT ILLICIT DISCHARGES

Article 4.1, Section 123[4] of the San Francisco Public Works Code describes the limitations and prohibitions associated with any discharge into the sanitary sewer system.

B. PROPER DESIGN AND CONSTRUCTION

The San Francisco Plumbing Code[5] is composed of the 2019 California Plumbing Code[6], which incorporates the 2018 Uniform Plumbing Code[7], and the 2019 San Francisco Plumbing Code Amendments. The 2019 California Plumbing Code describes the standards for proper design and construction of sewers and connections. Chapter 7 of the California Plumbing Code also specifies the minimum design and construction standards related to the sanitary drainage system.

The San Francisco Public Works Code Article 4, Section 117[8] requires that all public sewers and sewer laterals be constructed in accordance with current Standard Specifications and Plans.

C. ACCESSIBILITY

Article 4.1, Section 122[9] of the San Francisco Public Works Code ensures access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by San Francisco.

D. FATS, OILS AND GREASE (FOG)

[3] Development Agreement: https://sftreasureisland.org//sites/default/files/Documents/Master_Develpment_Submittals/Final_Docs_July_2011/Development_Agreement_Execution_Copy.pdf
[4] https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-515
[5] https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_building/0-0-0-85773
[6] https://www.iapmo.org/hidden/state-adopted-codes/cpc-2019/
[7] https://www.iapmo.org/publications/read-uniform-codes-online/
[8] https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-366
[9] https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-441

Article 4.1, Section 140[10] of the San Francisco Public Works Code describes the necessary control associated with Fats, oils, and grease (FOG).

E. ENFORCEMENT

Article 4.1, Section 120[11] and 132[12] of the San Francisco Public Works Code gives authority to the General Manager of SFPUC to administer and enforce any provisions in Article 4.1.

Chapter 1 of the San Francisco Plumbing Code authorizes enforcement of any provisions found in the San Francisco Public Works Code.

Article 4, Section 104[13] of the San Francisco Public Works Code gives the Director of Public Works of the City and County of San Francisco the authority to cause the abatement of any nuisance or hazard related to laterals or side sewers.

[10] https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-689
[11] https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-502
[12] https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-616
[13] https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-389

ELEMENT 4: 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.
e) Provide equipment and replacement part inventories, including identification of critical replacement parts.

A. SEWER SYSTEM MAP & ASSET INVENTORY

The San Francisco Department of Public Works maintains an Oracle Geographic Information System database of every collection system asset in the TI and YBI sewer system. The database includes information such as unique asset identifier, pipe length, pipe size, pipe material, and pipe year of construction. In addition to these physical attributes, the GIS also provides information on the location of the assets.

The information in this database is continually updated as assets are added, modified, or as new information becomes available. This GIS system is currently maintained by DPW but is being transferred to the SFPUC. SFPUC procedures for updating the system are being developed in anticipation of this transfer.

B. PREVENTATIVE MAINTENANCE

All of the existing utilities and treatment facilities are being replaced with new infrastructure by the development project. During the interim period prior to infrastructure replacement, TIDA intends to strategically invest in system improvements that will have the biggest impact. These improvements have been prioritized with consideration of the timing for their replacement by the development project, with priority placed on system components that will have the longest remaining useful life (i.e., replaced in the later development phases), and water quality protection. TIDA, the Navy, and SFPUC have evaluated the collection system and identified high priority pipelines for repairs and replacements in the near term prior to replacement by the ongoing redevelopment project. In general, the focus is on updating the pump stations. Information gathered from the pipeline assessment efforts (CCTV) will also be used to prioritize which pipelines, if any, require interim repairs and/or replacement. TIDA and Navy jointly submit an annual report to the Regional Water Quality Control Board

(RWQCB), presenting updates to the Repair and Rehabilitation Plan, and illustrating the current work accomplished during each reporting period and the work planned for upcoming reporting periods.

Pump Station Maintenance

A field crew from the Operations Division visits each pump station weekly to check the sumps, write up work orders for the Maximo system and determine if corrective action is necessary. In addition to the weekly inspection of the pump stations, there are scheduled quarterly, semi-annual and annual planned maintenance activities which include checking pump belts and oil levels, running the pumps, checking the electrical panels and connections and checking the output run time. These activities may reveal the need for corrective maintenance, which would be reported in the Maximo system.

C. REPAIR, REHABILITATION AND REPLACEMENT

The development of TI and YBI and associated infrastructure improvements will be implemented in four Major Phases[14]. As of 2021, all of the new sewers in Major Phase 1, Sub-Phases 1 and 2, have been installed on both Treasure Island and Yerba Buena Island. This equates to approximately 8,280 linear feet of gravity sewer and 8,135 linear feet of force main on Treasure Island, and 6,165 linear feet of gravity sewer on Yerba Buena Island. Significant progress has also occurred on construction of several new pump stations within the system. More information on system improvements, including project scopes and timelines, is provided in the Annual Status Report jointly submitted by TIDA and the Navy in response to the 2015 Notice of Violation (NOV), as required by the RWQCB until such time that they deem the Collection System NOV closed.

D. TRAINING

WWE is in the process of implementing a competency-based training (CBT) model for critical field activities. The CBT model involves the creation of standard operating procedures (SOPs), training, assessment, gap analysis, re-training if necessary, and certification.

Table 4.1 Sewer Operations Competency-Based Modules Training

Sewer Operations Competency-Based Modules	Implementation
Overflow Response and Reporting	Completed annually
Vacon/Combo Truck	In Development
Service Truck	In Development
CCTV	Scheduled for 2022
Maximo Work Orders	Scheduled for 2022

E. EQUIPMENT INVENTORY

The equipment listed in table below is used by Collection System Division staff for day-to-day operations and maintenance of the collection system and may be available for emergency response. Equipment is located at 1603 Griffith Street or 1550 Evans Street, San Francisco.

[14] Development project design applications and other documents can be located on the Treasure Island webpage: https://sf.gov/information/treasure-island-and-yerba-buena-island-development-project-approved-plans-and-documents

Table 4.2 Sewer Operations Equipment Inventory

Equipment #	Description
425-3000	Pickup 3/4 ton utility body
425-3001	Pickup 3/4 ton utility body
425-502	Pickup 3/4 ton utility body
425-503	Pickup 3/4 ton
425-504	Mini van windstar 4 doors
425-506	Pickup 3/4 ton
425-00003	Hybrid escape
425-00002	Hybrid escape
425-00023	Pickup 3/4 ton utility body
425-00040	Pickup 3/4 ton utility body
425- 614	TV Van
425-615	TV Van
425-00004	TV Van IBAK
425-00038	TV Van IBAK
425-0032	TV Van IBAK
425-0037	TV Van IBAK
425-00005	TV Van
425-00011	TV Van IBAK
425-630	Harben 2003
425-631	Crew cab
425-00039	Walking Crew Truck
425-00025	Harben 2013
425-00027	Harben 2013
425-632	Harben 2005
425-5000	Harben 2008

Equipment #	Description
425-5001	Harben 2008
425-5002	Harben 2008
425-00024	Harben 2013
425-990	generator for building
425-902	HarbenTrailer 2001
425-00042	Barricade truck
425-692	Barricade truck
425-742	Swap loader
429-L008	Vaccon
429-L007	Vaccon
429-L006	Vaccon
429-L004	Vaccon
429-L001	Vaccon
429-L002	Vaccon
429-L003	Vaccon
429-L005	Vaccon
426-00161	Arrow Board
426-704	10 Wheel Grit dump
426-00121	10 Wheel Grit
426-01242	Cargo trailer
426-01243	Cargo trailer
426-01244	Cargo trailer
705-00057	F150
705-00073	F250 Super Duty
705-00037	Colorado

[15]

[15] From the WWE Emergency Operations Plan (2020).

ELEMENT 5: DESIGN AND PERFORMANCE PROVISIONS

The following are required of the design and performance provisions element:

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.
b) Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects

A. DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS

The Standard Engineering Plans and Specifications for the City and County of San Francisco[16] describes the design standards and specifications for installation, rehabilitation and repair of sanitary sewer systems.

Section 13 of the Subdivision Regulations[17] for San Francisco is meant to supplement the Subdivision Code[18]. Together, the Subdivision Regulations and the Subdivision Code describe the standards of design for new sewer systems.

Chapter 7 of the complete California Plumbing Code specifies the minimum design and construction standards related to the sanitary drainage system.

City-wide regulations that are contained in the California Building Standards Code, including requirements of the San Francisco Building Code, Mechanical Code, Electrical Code, Plumbing Code, Fire Code or other uniform construction code, also apply to the Treasure Island redevelopment project[19]. Design and construction plans specific to the redevelopment of Treasure Island can be found in chapter 5 of the Major Phase 1 application[20].

B. INSPECTION

Section 3 of the Engineering Standard Specifications of the City and County of San Francisco describe procedures and standards for inspection and testing. The relevant sections related to inspection and testing are listed below:

- Section 304.13 Precast Reinforced Concrete Pipe Sewer, Material Testing
- Section 305.04 Vitrified Clay Pipe (VCP) Sewer, Testing
- Section 316.06 VCP Side Sewer Connections to Main Sewers, Side Sewer Investigation
- Section 319.02 Low Pressure Testing, Inspection and Testing
- Section 322.04 Polyethylene Pipe Sewer, Certificate of Compliance

Testing procedures are listed below:

[16] San Francisco Public Works Standard Specifications and Plans: https://www.sfpublicworks.org/services/standards-specifications-and-plans
[17] San Francisco Subdivision Regulations (2015): https://sfpublicworks.org/sites/default/files/4740-2015%20Subdivision%20Regulations_final.pdf
[18] San Francisco Subdivision Code: https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_subdivision/0-0-0-2
[19] Disposition and Development Agreement (2011), section 2.4.3.: https://sf.gov/sites/default/files/2022-03/Development_Agreement_Execution_Copy.pdf
[20] Major Phase 1 Application: https://sftreasureisland.org/majorphase1

- ASTM C 828-06 Standard Test Method for Low-Pressure Air Test of Vitrified Clay Pipelines
- ASTM C 924-02 Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method
- ASTM F 1417-92 Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
- ASTM C 1244-05a Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill

ELEMENT 6: 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.

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.

A. SUMMARY

WWE's Overflow Response, Mitigation, Documentation, and Sampling SOP (Appendix B) and in-field Response Packets (Appendix D and E) detail Sewer Operations' internal notification procedures, overflow response, external agency notification procedures, public response activities, and the containment, prevention and minimization of overflows.

WWE Sewer Operations completes CBT training for responding and reporting of sanitary sewer overflows on an annual basis.

ELEMENT 7: FATS, OILS AND GREASE (FOG) CONTROL PROGRAM

Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an Enrollee determines that a FOG program is not needed, the Enrollee must provide justification 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.
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.

A. PUBLIC EDUCATION AND OUTREACH

WWE's Pollution Prevention team provides FOG outreach and education to San Francisco residents through ads in the Nextdoor application and other social media posts, an annual calendar, and mail flyers. The SFPUC website[21] also contains commercial and residential information regarding the safe disposal of FOG.

SFPUC is a member of and provides support to the BACWA Bay Area Pollution Prevention Group, which organizes and funds regional campaigns. More information on these regional efforts, including FOG activities, is described in their annual reports[22].

B. FOG DISPOSAL

San Francisco residents can dispose of used cooking oil at the Recology Transfer Station, located at 501 Tunnel Avenue. Small amounts of used cooking oil may be disposed of in residential compost bins.

C. LEGAL AUTHORITY

SFPUC's legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG are described in Article 4.1, Section 140 of the San Francisco Public Works Code. Legal authority is also provided by the General Wastewater Discharge Permit for Food Service Establishments (FSEs). This Permit

[21] SFPUC Website, Used Cooking Oil Disposal: https://sfwater.org/index.aspx?page=465
[22] 2021 BACWA Bay Area Pollution Prevention Group annual report: https://bacwa.org/wp-content/uploads/2022/02/2021-BAPPG-Annual-Report.pdf

authorizes FSEs to discharge wastewater into San Francisco's sewer system, provided that such discharges are conveyed through the facilities' laterals and are in accordance with both Article 4.1 of the San Francisco Public Works Code as well as the conditions set forth in the Permit.

D. GREASE REMOVAL DEVICES

Under the FOG Control Ordinance, the grease capturing equipment required is determined by the FOG Discharger category. Category 1-3 FSEs, ranging from significant to less-significant producers of FOG, are required to install a grease removal device, or gravity grease interceptor. Category 4 FSEs are limited food preparation establishments and are not required to install grease capturing equipment.

An FSE may also file a request for a variance from the Grease Removal Device installation requirements of the FOG Control Ordinance if it is not feasible to install a Grease Removal Device due to lack of physical space. The determination as to whether an FSE qualifies for the variance will be at the sole discretion of the General Manager of the SFPUC.

FSEs are required to keep equipment maintenance and service logs or receipts on site and provide them upon request. All grease capturing equipment must be maintained such that the combined FOG accumulation does not exceed 25 percent of the total hydraulic depth of the equipment.

E. INSPECTION AND ENFORCEMENT

SFPUC's Source Control inspection and enforcement of FSEs is driven by the identification of FOG hotspots. Inspections include the following:

- Comprehensive walk-through of the facility to determine BMP compliance.
- Full assessment of kitchen equipment and potential FOG generation.
- Inspection of GCE maintenance records.
- Enforcement actions, as necessary, and ensure follow-up within two weeks.
- Scheduled visitation from the Pollution Prevention (P2) team to review BMPs with FSE management and staff or provide BMP resources for FSEs if appropriate.

If the likeliest source of the FOG appears to be residential, Source Control sends a referral to the Pollution Prevention program who is responsible for distributing educational outreach material.

F. IDENTIFICATION OF FOG "HOTSPOTS"

A hotspot is defined as a lateral(s) and or sewer main(s) with reported and/or documented FOG issues; this can be one asset, or when the source of FOG is unclear, a group of assets in close proximity to one another (i.e., within the same block). Hotspots are identified by the following criteria:

- Any assets in connection with an FSE that has experienced a FOG-related overflow within the last year.
- Any asset that has experienced two or more FOG-related overflows within the past two years.
- Other FOG-impacted assets that are referred to the FOG Program.

G. SOURCE CONTROL

Inspection, enforcement, and education and outreach are the means for FOG source control.

ELEMENT 8: SYSTEM EVALUATION AND CAPACITY ASSURANCE

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.
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 of the Order.

A. EVALUATION

TI is currently in the midst of a comprehensive redevelopment project that will reconstruct the entire infrastructure, including the separate sanitary sewer and storm drain systems, and the wastewater treatment facility. A Master Utility Plan and Infrastructure Plan[23] was developed to confirm adequate hydraulic capacity in all new pipes and pump stations.

Managing the existing system is focused on maintenance of assets nearing or beyond their useful life and not related to capacity deficiencies. As of 2022, there have been no overflows on TI caused by capacity deficiencies.

[23] Treasure Island Infrastructure Plan (2011): https://sftreasureisland.org//sites/default/files/Documents/Redevelopment/DDA_Exhibits/Ex._FF_Infrastructure_Plan.pdf

ELEMENT 9: 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.
e) Identify and illustrate SSO trends, including frequency, location, and volume.

A. PRIORITIZATION

The SSMP covers a broad spectrum of activities used to properly manage, operate, and maintain all parts of the sanitary sewer system, including but not limited to preventative maintenance; repair, rehabilitation and replacement; inspection and enforcement; and education and outreach.

The prioritization of these activities is determined by monitoring and measurement of issues within the collection system, such as overflows and asset failures, and the cause of these issues.

B. MEASURE OF EFFECTIVENESS OF SSMP PROGRAMS, PREVENTATIVE MAINTENANCE & OVERFLOW TRENDS

Performance indicator information is generated on a rolling five-year basis. Primary criteria data from the past five fiscal years are shown in the tables below; TIDA and Navy is not differentiated in this dataset.

Table 9.1 Number and Size of Overflows on TI

Performance Indicators	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Number of Sewer Overflows	**16**	**10**	**12**	**5**	**6**
Overflows greater than or equal to 1,000 gal	2	3	2	0	1
Overflows between 100-999 gal	6	5	7	3	4
Overflows between 10 to 99 gal	5	2	3	1	1
Overflows less than 10	3	0	0	1	0

Table 9.2 Volume of Overflows on TI in Gallons

Volume of Overflows	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Total volume contained and returned to sewer system for treatment (gal	4,721	23,560	6,107	1,095	7,169
Total volume to reach surface waters (gal)	0	19,800	0	0	25,300
Total volume of overflows (gal)	5,348	55,130	6,563	1,096	32,929
Percent of volume recovered	88%	43%	93%	99%	22%
Percent of volume to reach surface waters	0%	36%	0%	0%	77%

Table 9.3 Cause of Overflows on TI

Cause of Overflow	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Blockage	--	--	--	--	--
Debris	3	0	3	0	0
FOG[24]	6	2	1	1	0
Roots	2	3	1	2	0
Pipe Structure Problem/Failure	0	1	2	1	1
Pump Station Failure	0	1	4	1	5
Hydraulic Deficiency	0	0	0	0	0
Other[25]	5	3	1	0	0

Trends Analysis

General trends show a decrease in the number and size of overflows, with the exception of an overflow that reached surface waters in fiscal year 2020-2021, which was caused by damage inflicted on a force main while contractors attempted a repair on another nearby asset. Overflows caused by pipe blockages have decreased over time, while overflows caused by pump station failures have increased; pump station failures are currently being addressed with capital improvement projects[26]. SSMP performance indicator data will continue to be evaluated on an on-going basis and used to inform future management plan changes as applicable.

[24] All recorded instances of FOG-related overflows occurred in residential areas.
[25] Examples of "Other" include operator error, power failure, TIP's centrifuge (decommissioned in 2018) concentrate solids in the cake bin drain, asset damage caused by contractor operations, etc.
[26] More information on pump station improvement projects is reported in the Annual Status Report jointly submitted by TIDA and the Navy to the RWQCB.

ELEMENT. 10: 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.

B. SUMMARY

The Treasure Island SSMP is audited and updated on a biennial basis. The next audit is scheduled to take place in 2024.

ELEMENT 11: COMMUNICATION PROGRAM

The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented. The Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system.

COMMUNICATION PLAN

The SFPUC website provides Wastewater Enterprise information to Treasure Island residents, including information on sewer inspection and cleaning[27], sewer laterals[28], FOG control[29], the capital improvement program[30], and other key information related to SSMP programs.

Other methods of communicating any necessary sewer related information to the public include the Currents Newsletter (which is included in water/sewer bills or online), as well as communicating significant news issues to the local print media through the SFPUC Communications Division.

[27] https://sfpuc.org/construction-contracts/construction-projects/sewer-cleaning-and-repair
[28] https://sfpuc.org/learning/emergency-preparedness/sewer-laterals
[29] https://sfpuc.org/construction-contracts/pretreatment-program/fats-oils-grease-fog-control
[30] https://sfpuc.org/construction-contracts/sewer-system-improvement-program

Appendix A – 2021 CIWQS Collection System Questionnaire and Methodology

	Treasure Island CS Questionnaire						Notes
				Treasure Island - WHOLE	**NAVY**	**TIDA**	
	1	**SSS Category**		Municipal (Public)	Municipal (Public)	Municipal (Public)	SSS to City proportion calculated by TI to SF gravity sewer mileage
	2	**Population**		2500	675	1825	27/73 split per Liz Hirschhorn
	3	**Annual operation and maintenance budget**		$1,600,000.00	$432,000.00	$1,168,000.00	100% TIDA per Liz Hirschhorn
	4	**Annual capital expenditure**		$750,000.00	$202,500.00	$547,500.00	100% TIDA per Liz Hirschhorn
	5	**Entry Level employees (less than 2 years)**	6	0.094	0.094	0.094	
	7	**Supervisory Level**	4	0.063	0.063	0.063	
	8	**Managerial Level**	3	0.047	0.047	0.047	
	9	**Grade I CWEA**	0	0.000	0.000	0.000	
	10	**Grade II CWEA**	2	0.031	0.031	0.031	
	11	**Grade III CWEA**	1	0.016	0.016	0.016	
	12	**Grade IV CWEA**	2	0.031	0.031	0.031	
	13	**Office of Water programs at Cal State University Certificate of Completion**					
		Number of certified agency employees (Vol I)	1	0.016	0.016	0.016	
		Number of certified agency employees (Vol II)	0	0.000	0.000	0.000	
	14	**Miles of forced mains and other pressure systems?**		4	1.0800	2.9200	27/73 split
	15	**Miles of gravity sewers?**		14.8	3.9960	10.8040	
GRAVITY	16	**Estimated size distribution of assets**					
		6 inches or less		43.9	35.0	47.2	
		8 inches		34.9	45.4	31.0	
		9-18 inches		12.0	13.2	11.5	
		19-36 inches		0.0	0.0	0.0	
		>36 inches		0.0	0.0	0.0	
		unknown		9.2	6.4	10.3	
		TOTAL (must equal 100)		100	100	100	
FORCEMAIN	16	**Estimated size distribution of assets**					
		6 inches or less		47.9	17.1	59.3	
		8 inches		12.4	16.4	10.9	
		9-18 inches		39.5	65.8	29.8	
		19-36 inches		0.0	0.0	0.0	
		>36 inches		0.0	0.0	0.0	
		unknown		0.2	0.7	0.0	
		TOTAL (must equal 100)		100	100	100	

Same staff responds to TIDA/Navy infrastructure. Ratio of staff resource application calculated from the total miles of TI gravity sewers (14.8) divided by the total miles of SF gravity sewers (947)

	17	**Total miles of laterals (upper and lower)**		5	1.35	3.65	27/73 split
	18	**Which portion of laterals agency is responsible for?**			Upper & Lower laterals	Upper & Lower laterals	For bldgs not yet transferred from Navy to TIDA, Navy still owns the lateral even though TIDA pays its operator for their maintenance.
	19	**Estimated total miles of laterals your agency is responsible for**	0	5	1.35	3.65	Used same mileage as in Line 17
	20	**Number of service lateral connections**		225	60.75	164.25	27/73 split
	21	**Percentage of sewer system piping and number of pump stations that were constructed between the years of:**					
GRAVITY	21	2000- present		0	0	0	
		1980-1999		5	5	5	
		1960-1979		25	25	25	
		1940-1959		20	20	20	
		1920-1939		50	50	50	
		1900-1919		0	0	0	
		Before 1900		0	0	0	
		unknown age		0	0	0	
		TOTAL		**100**	**100**	**100**	
FORCEMAIN	21	2000- present		0	0	0	
		1980-1999		0	0	0	
		1960-1979		0	0	0	
		1940-1959		0	0	0	
		1920-1939		99.3	99.3	99.3	
		1900-1919		0	0	0	
		Before 1900		0	0	0	
		unknown age		0.7	0.7	0.7	
		TOTAL		**100**	**100**	**100**	
PUMP STATIONS ≥75k gal/d	21	2000- present		0	0	0	
		1980-1999		0	0	0	
		1960-1979		0	0	0	
		1940-1959		0	0	0	
		1920-1939		24	24	24	
		1900-1919		0	0	0	
		Before 1900		0	0	0	
		unknown age		1	1	1	
		TOTAL		**25**	25	25	Not a percentage
PUMP STATIONS <75k gal/d	21	2000- present		0	0	0	No pump stations <75K gal/d
		1980-1999		0	0	0	
		1960-1979		0	0	0	
		1940-1959		0	0	0	
		1920-1939		0	0	0	
		1900-1919		0	0	0	

		Before 1900		0	0	0	
		unknown age		0	0	0	
		TOTAL		**0**	**0**	**0**	
	22	**Estimated total miles of your sewer system not accessible for maintenance**		0.0000	0.0000	0.0000	
	23	**Miles of sewer system that were cleaned last year**		0.4500	0.1215	0.3285	From COGNOS report, 27/73 split
	24	**Miles of sewer system that were inspected (e.g. CCTV) last year**		0.4500	0.1215	0.3285	From COGNOS report, 27/73 split
	25	**Estimated Sewer System Flow characteristics**					
		Average Daily Dry Weather Flow		0.23	0.23	0.23	From Annual SMR
		Peak Daily Wet Weather Flow		1.2	1.2	1.2	
	26	**Where does SSS discharge to?**		WDID #386013001	WDID #386013001	WDID #386013001	Treasure Island Wastewater Treatment Plant and its collection system
	27	**Are there any tributary sanitary sewer systems?**		no	no	no	Same as 2014
	28	**How many gravity mainline aerial or underground crossing of water bodies are loaded throughout the sewer systems?**		0	0	0	Same as 2014
	29	**How many force main aerial or underground crossings of water bodies are located throughout the sewer system?**		1	1	0	Same as 2014
	30	**How many siphons used to convey sewage are located throughout the sewer system?**		0	0	0	Same as 2014

Appendix B - SFPUC's Wastewater Enterprise Organization Chart

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

WASTEWATER ENTERPRISE ORGANIZATIONAL CHART

Wastewater Enterprise
Updated July 2021

Division Manager
Manager / Superintendent
Supervisor / Chief
Acting
Vacant
Temporary Assignment
On Leave

Assistant General Manager
0955 Norby, Greg

Sr Management Assistant
1844 Empleo, Ella

Collection System Division Manager
0941 McDaniels, Chris(Acting)

Executive Secretary
1404 Rainey, Tohannie

Technical Services Manager
5211 Tran, Michael(Acting)

5207 Huang, Linda
5207 Kam, Hayden

5203 Borja, Mitchelle
5203 Van Loan, Marsha

5380 Tang, Katrina
5380 Trueblood, Elizabeth

5241 Ho, Ed

5203 Abadie, Meghan
5381 Bocanegra, Lucy

IT
1053 Ciardi, Vinnie

1093 Liu, Alan

R2P2
5620 Cleave, Autumn

9922 White, Nicola

Administration/Personnel
1822 Chow Phipps, Mabel

1406 Zhang, Shu

9920 Liu, Leeann
9920 Cardona, Andrea

Sewer Operations Manager
Vacant
McDaniels, Chris

1424 Limos, Charlene
1632 Ngwe, Mary

Plan It Maintenance Planner
7262 Roche, Kevin

1424 Chan, Sophia
7219 Jennings, Tesha

Fix It
0922 Vacant

Spot Repair
6319 Rivera, Jerardo (Acting)

1820 Qin, Kevin

6318 Oropeza, Jr Ray
6318 Reynoso, Elizabeth

7449 Hale, Lorenzo

Find It Manager I
0922 Whitlock Daniel

Main Sewer Inspection
7246 Mullen, Patrick

7355 Quibell, Paul
7355 Romb, Chad

7449 Alas, Robert
7449 Gray, Howard
7449 Johnson, Glendon
7449 Lomas-Gavlez, Jose
7449 Shives, Jeffrey
7449 Siragusa, Peter

Service & Minicam
7246 Pray, Daniel

7449 Armstrong, Ronnie
7449 Best, Warren
7449 Brumbaugh, Richard
7449 Carbajal, Manuel
7449 Lastra, Francisco
7449 Ledesma, Jose
7449 Mattias, Matthew
7449 Nevels, Don
7449 Spurlock, Louis

Facilities / TI / Vaccon Request
7449 Silvestri, Daniel (Acting)

7355 Carmack, Jonathan
7335 O'Shea, Brendan
7355 Wicks, David

7449 Moala, Thomas
7449 Scannell, John

7514 Bryant, Marcell
7514 Davis, Dewayne
7514 Mausia, Alfred
7514 Taufa, Pasanio
7514 Trang, Steven

7514 Latu, Kilifi

Swing Shift
7449 Azcarraga, Gabriel (Acting)

7355 Jones, Vicki
7355 Parra, Joseph I
7355 Sheehan, John

7449 Brumbaugh, Richard
7449 Bufka, Michael
7449 Gonzales, Frederick
7449 Meany, John
7449 Reiter, John
7449 Tabangcurat,,Froilan
7449 Tishma, Dan
7449 Wayne, Andy

Pretreatment Program Manager
0932 Candelaria, Linda (Acting)

Supervising Chemist
2488 Candelaria, Linda

Supervising Wastewater Control Inspector
6116 Donald, Brenda

Emergency Services
6116 Ilejay, Audie

6115 Burton, Eric

Field Monitoring
6116 Middleton, Mark

2481 Elaydo, Leilani
2481 Gomez, Carina
2481 Ng, Peter
2481 Palega, Yvonne
2481 Redondo, Eddy
2481 Smith, Jonathan

2482 Fung, Stanley
2482 Fok, Brian
2482 Fenderson, Nicole

6115 Albon, Christopher (Acting)
6115 Profis, Felix

Supervising Wastewater Control Inspector
6116 Hinson, Chuck

6115 Shaikh, Azim
6115 Paez, Tim

Business Strategy and Performance Division Manager
0941 Ving, Karri (on leave)
5602 Fisher, Manon (Acting)

Finance and Administration
1824 Cretan, John

Contract Administration
5602 Yun, Pauson

Budget Process Management Tracking
1823 Braun, Matt
1052 Ting Kelly
1406 Chan, Teresa

Personnel & Hiring
1823 Mena, Victor

Payroll and Employee Support
1222 Wang, Lily

Admin Staff
1820 Batiste, Rionda
1406 Zapletal, Nouane C
1404 McHenry, Diane
9914 Blunt, Chris

Policy and Planning
5602 Fisher, Manon

Strategy and Performance
vacant

Resource Recovery and Business Development
5642 Batijaka, Ryan
9922 Hoffman-Harris, Philip
9920 Harris, Malachi

Risk Management
1823 Maack, Emma

Workforce and Stakeholder Engagement
1825 Johnson, S (Acting)

Engagement & Communication
Vacant

Workforce Reliability
0923 Curtis, Catherine

WWETEC
1230 Anderson, Sam(Acting)
1230 Smock, Kristian (Acting)
1822 Giorgis, Michael

SE Community Center
0923 Rogers-Pharr, Emily
5408 Berry, Larry
1820 Butler, Bri'yana

Urban Watershed Planning Division Manager
0932 Minick, Sarah

Redevelopment Project
5602 Freeman, Craig

5602 Lee-Kim, Stacey

Watershed Planner
5602 Bloom, Sarah
5381 Lee, Vanessa (Ying Chik)

5601 Logsdon, Willis
9922 Corrales, Andrew

Green Infrastructure
5602 Adamow, Michael

5601 Teter, Kelly

Project Reviewer
5602 Kortkamp, Kent

5602 Martinsen,Shayne

Regulatory and Compliance Division Manager
0932 Chastain, Amy

Utility Specialist
5620 Vacant

NPDES Permits/Compliance
5620 Pang, Jennie

Public Service Aid
5601 Morrell, Caitlyn

WASTEWATER ENTERPRISE ORGANIZATIONAL CHART

Wastewater Enterprise
Updated July 2021

OEM

Division Manager
Manager / Superintendent
Supervisor / Chief
Acting
Vacant
Temporary Assignment
On Leave
On Leave

Assistant General Manager
0955 Norby, Greg

Sr Management Assistant
1844 Empleo, Ella

C6000 Operations Division Manager
0942 Engel, George

Engineering Division Manager
5212 Henderson, Brian

1404 Ramos, Michael

1446 Mingaracal, Cora (Acting)

Maintenance Division Manager
0941 Prather, Joel

C 0901 Executive Secretary I
1452 Heath, Jill (Acting)

Secretary II
1446 Ramos, Marilyn

Safety Consultant
5177 Khalilnaji, Napoleon

Management Assistant
1842 Olivencia, Ken

Westside OSP Superintendent
7252 Lauer, Mark(Acting)

Secretary
1446 Canas, Hernan

Watch 1
7252 Mendoza, Pedro
Chief Stationary Engineer

SEP
7373 Neal, Chris
7373 Nafezi, Ali
7373 VanderMey, Brian

7372 Barnes, Richard
7372 Gutierrez, Arthur
7372 Sison, Mike

Watch 2
7252 Ting, Gordon
Chief Stationary Engineer

SEP
7373 Cipriani, Randy
7373 Harvey, Marilene
7373 Lee, Gary

7372 Daniels, Kurt
7372 Maddox, Brian
7372 Nakai, Clifford
7372 O'Shea, Peter

Bayside Superintendent
5130 Clark, Andy

Executive Secretary
1450 Low, Sue

Bayside
7252 O'Connell, John
Chief Stationary Engineer

SEP Watch 3
7373 Alexander, James
7373 Limon, Jose (Acting)
7373 Hy, Brice (Acting)

7372 Cantor, Dario
7372 Clemings, Henry
7372 Cotto, Carlos
7372 Shultz, Sean

SEP Watch 4
7373 Rosete, Ed
7373 Talavera, Rod
7373 Cooley, Greg

7372 Eroh, James
7372 Griffin, Julanda
7372 Linn, Roger

SEP Solids
7373 Irias, Rubin (Acting)

7372 Johnson, March
7372 Gregory, Marco

7356 Garcia, Nicholas
7356 Thi, Richard
7375 Williams, Raven

SEP Liquids

7372 Bishop, Andre
7372 Condez, Bruce
7372 Eliasson, Eric
7372 Forristal, Matthew
7372 Garcia, Jesus
7372 Herrador, Dennis
7372 Medina, Flavio
7372 Mitchell, Robert

Senior Sanitary Engineer
5211 Jolis, Domenec

Wastewater Labs Lab Director
0933 Lee, K (WTR)

Bayside
7252 Mangubat, Imelda
Chief Stationary Engineer

NPF/Pump Station/ TI CPO Support

7372 Brown, Russell
7372 Johnson, Dalton
7372 Lamell, Anthony
7372 Laidlaw, Winnie
7372 Moore, Andre
7372 Ramirez, Alfredo
7372 Staples, Jon

Capital Program Delivery & Planning
5211 Ahmad, Meei-Lih

Environmental Engineering
5211 Leong, Linda
5241 Revilla, Nohemy
5207 Chiu, Gou Joanne
5201 Julius, Neema

SSIP
5211 Krishnaiah, Ravi
7238 Bush, Anthonio

SSIP
5130 Ng, Wesley

Process Engineering
5211 Ho, Chu-Fei

SEP Process
5241 Velasco, Albert
5201 Zhu, Jun Yu Megan

OSP Process
5203 Strong, Nathaniel
5201 Mendoza, Maria
5380 Ringe-Silva, Tomas
5381 Anaya, Luis

Wastewater Engineering Design Manager
5212 Wong, Joseph

Mechanical Engineering & Design
5211 Vacant

5241 Cuellar, Escuellar
5241 Navarro, Andrew
5207 Au-Yeung, Nancy1
5203 Whitt, Robert
5203 Wong, Jessalyn
5201 Lievanos, David
5201 Werner, David
5380 Casey, Sean
5380 Erny, Harrison

Technical Support & Informational Management Services
5602 Rivera, Eduardo

5366 Langit, Neville
5364 Kyaw, Matt
9920 Young, Kyle

Electrical Engineering & DCS
5211 Barraza, Sergio

Electrical Engineering

5207 Ha, David
5207 Tam, Stephen
5207 Wen, Stephen

DCS

1043 Dao, Huy
1043 Levitin, Yuri
1042 Budai, Steve
1042 Chung, Max
1042 Jereza, Tyrone
1094 Zhang, Xihui

5203 Harvey, Vincent

Maintenance Mechanical Unit Manager
5130 Kohmann, Steve (Acting)
0933 Vacant

Maintenance Planning & Reliablity
7263 Ting, Christina

Planning
7372 Yee, Raymond (Acting)
7262 Corrales, Jose
7262 Espadilla, Bernadette
7262 Guillermo, Leon
7262 Leary, Sharon
7262 Vaynshteyn, Leonid
7262 Wilkins, Lolita
7262 Yushprakh, Arkadiy

Reliability
5602 Spencer, Christine

7372 Feathers, Chester

Materials Coordinator
1944 Losno, Christian

Procurement

Acct/Documents
1634 Chan, Lisa
1632 Wong, Howard

Purchasing
1942 Pettit, Andrew
1950 Liu, Katie
1950 Xiao, Judy

Warehouse/Tool Room/Inventory/ Analysis
1950 Gonzalez, Jorge (1938Acting)
1934 Britto, Philip
1934 Foote, Necho (1936Acting)
1406 Perez, Eric (A) (1934Acting)

Facilities/ER Response Superintendent
5130 Jones, Steve

Maintenance I&C/ Electrical Unit Manager
7276 Maraviglia, Mike (Acting)
0933 Vacant

Electricians
7336 Cahee, Mark (Acting)

SEP
7329 Diaz, Fernando
7336 Howell, John
7336 Trice, Brandell
7336 Cano, Rodrigo

Westside Facilities
7336 Trice, Roderick
9922 Magana, Carlos
9920 Frank, Ray

NPF/TI/PS
7329 Marcum, Stuart
7336 Franzel, Christopher

Electricians
7276 Hastings, Merwan (Acting)

Westside Facilities
7345 Clarkson, Dave (Acting)
7345 DeLeon, Raul
7345 Monterrosa, Christopher
7345 Ruiz, Brian

Bayside Facilities
7238
7345 Aung, Thu
7345 De Natale, Neil
7345 Nguyen, Long
7345 Patterson, Jack
7345 Seckinger, Joel

NPF/TI
7345 Rivas, Richard
7510 Malaney, James

Pump Stations
7345 Bell, Tim

OSP Process Control & Recycled Water
7252 Conroy, Howard
7252 Andrews, Darrell
Chief Stationary Engineer

Watch 1
7373 Biser, Neal
7373 Work, James

7372 Logia, John

Watch 2
7373 Cipriani, Randy
7373 Hayes, Maurice

7372 Shrayber, Ernst

Watch 3
7373 Faaita, James
7373 Ting, Vincent (Acting)

7372 Sabin, Steve

Watch 4
7373 Bell, Lorenzo (Acting)
7373 Salerno, Jonathan (Acting)

7372 Dennis, Michael
7372 Banks, Todd

7373 Borick, Armin

7372 Anderson, Sam
7372 Banks, Craig
7372 Corbilla, Alex
7372. Pelayo, George
7372 Rivera, Ed
7372 Scott, Ryan
7372 Recycled Water

1406 Palega, Lalonnie

Wastewater Labs Lab Manager
2489 Kwan, Dolson

LIMS
1054 Liu, Alex (WTR)

2487 Chin, Kai (WTR)

SEP/TI Process
2488 Tran, Phuong
2486 Buzon-Cordial, Melissa
2486 Nguyen, Mike
2486 San Juan, Iris

2482 Woodard, Dartanian
2481 Bell, Cliff
2481 Connolly, Laura
2481 Lee, Jonathan
2481 Tseng, Yee Shin (Melody)

OSP Process
2488 Chan, Lily

2486 Garcia-Murillo, Estela
2486 Portell, Anna

2481 Paredes, Louis

SEP Organic
2488 Okuma, Blair

2487 Yang, Li

2486 Ali, Dina
2486 Mays, Grant

2481 Sison, Danielle

Metals Analysis
2488 Rattonetti, Anthony

2486 Arteaga, Miguel
2486 Cheung, Wai Fung (WTR)
2486 Hu, Danny (WTR)
2486 Lo, Philip
2486 Molloy, Maria

2482 Trinh, Bill (WTR)

(OSP) Marine Biology
2485 Duggan, R (N. Resources)

2484 Peterson, H (N. Resources)

2483 Conception,M (N. Resources)
2483 McGregor, P (N. Resources)
2483 Loveland, A (N. Resources)
2483 O'Donohue, D (N. Resources)
2483 Peterson, H (N. Resources)
2483 Taggert, L (N. Resources)

QA/QC
2488 Mazuca, Lisa

2487 Hansrai, Karen
2487 Liu, Winnie

7252 Ma, Jianmin
Chief Stationary Engineer

Westside Special Projects
7372 Brownlee, Jonathan
7372 Jacobs, Thomas

7252 Nakadegawa, Tomio
Chief Stationary Engineer

OSP West
7373 Harper, Maurice
7372 Camacho, Peter
7372 Fang, Jimmy
7372 Hulka, Alfred
7372 Lau, Warren
7514 Gerbich, Matthew
7514 Larsen, Fred

OSP East
7373 Wong, Brannon
7372 Barajas, Sergio
7372 Batti, Chelse
7372 Gonzalez, Victor
7514 Uiagalelei, Doria

7514 White, Terrance

7373 Brosas, Marlon (Acting)
7252 Vacant
Chief Stationary Engineer

SEP North
7373 Huang, William
7372 Camacho, Martin
7372 Cacdac, Jona
7372 Craig, Stephen
7372 DeBono, Michael
7372 Larkin-Oliveira, Bernadette
7372 Massey, Carlos
7514 Johnson, Kevin

SEP North
7373 DeBono, Christopher(Acting)
7372 Chinn, Richard
7372 Gallardo, Christian
7372 Garcia, Edgar
7372 Hui, Wai Man
7372 Winston, Keith

Welding Shop
7372 Hartwell, Fred (Acting)
7372 Darbonne, Daniel

Hydraulics
7373 Ciappara, Nathan
7372 Chhina, Harpreet

Machine Shop
7337 Otani, Alvin
7332 Hess, Paul
7332 Sur, Darrell
7331 Simpkins, Mark
7327 McMartin, Brittany

7252 Garcia, Ciro
Chief Stationary Engineer

SEP South
7373 Fontes, Julio
7372 Cermak, Chris

7372 Gibson, Daniel
7372 Hawkins, Kevin
7372 Martin, John
7372 Menil, Pat
7372 Wong, James
7356 Gourdine, Yolando
7514 Crenshaw, Dave

NPF/TI
7373 Lee, Ray
7372 Camacho, Peter
7372 Chhina, Harpreet
7372 Fragoza, Darin
7372 Hall, Rickey
7372 Hansen, Jacob
7372 Miller, John
7372 Towfique, Zabie
7514 Maraviglia, Dylan

7373 Truesdell, James (Acting)
7252 Vacant
Chief Stationary Engineer

Facilities/SECC
7373 Barca, Desmond
7372 DeLeon, Ronald
7372 Gulley, Dominic

Maintenance Engines
7372 Crittendon, Anthony

HVAC
7373 Anderson, Nicholas
7372 Quismorio, Ferdinand
7372 Hansen, Jered

Crew 202
Custodial Service

2718 Li, K (SEP)
2708 Forks, B (SEP)
2708 Guo, G (SEP)
2708 San, P (SEP)
2708 Chau, D (SEP)
2708 Yu, Q.Y. (SEP)
2708 Wong, W.C. (NFP & Lab)
2708 Chiu, A (OSP)
2708 Fong, T (OSP)
2708 Morales, J (2725 Oakdale)
2708 Chau, R (2725 Oakdale & OSP)
2708 Mills, M (SEC)
2708 Song, J (SEC)
2708 White, J (SEC)

7252 Keel, Alan
Chief Stationary Engineer

Carpenters
7226 O'Brien, Thomas
7344 Lagomarsino, Matthew

Painters
7242 Lacy, Michael
7346 Rice, Dermot
7346 DeGracia-Sanchez, Alberto
7346 Geikas, Dean
7346 Becerra,Ricardo

Plumbers
7213 Arrachea, Anthony
7347 Jackson, Raymond
7347 Eliades, Tim

Laborers
7215 Flaherty, Patrick
7514 Arnold, Donald
7514 Banks, Todd
7514 Hession, Bernie
7514 Johnson, Vincent
7514 Liu, Liulaumea
7514 Ogans,Craig
7514 Taufa, Uli
7514 Wong, Vincent

Gardeners
3422 Brown, Jima

GI/NPF Gardeners
3422 Dos Santos Allen, Casey
3417 Childers, Stephen
3417 Humphries, Nancy
3417 Means, Manuel

Fleet Services
7410 Chin, Tom(7208Acting)

7208 Martini, Paul (Prop F)

1820 Pon, Rylan

Appendix C - Overflow Response, Mitigation, Documentation, and Sampling Standard Operating Procedures

Overflow Response, Mitigation, Documentation, and Sampling

Standard Operating Procedures

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

SOP-CSD100 / MAY 2019

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ADMINISTRATIVE

A. Introduction

1. This SOP contains the instructions and steps that SFPUC WWE employees will follow to respond to an Overflow in the Combined and Separated Systems. All work shall be performed safely in compliance with applicable standards and in a manner that minimizes adverse impacts.

B. References

1. State Water Resources Control Board Order No. 2006-003-DWQ, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems.

2. State of California Water Resources Control Board Order NO. WQ 2013-0058-EXEC, Amending Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems.

3. San Francisco Bay Regional Water Quality Control Board, Order No. R2-2013-0029, NPDE S No. CA0037664.

4. United States Environmental Protection Agency, Region 9, Order No. R2-2009-0062, NPDES NO. CA0037681, Waste Discharge Requirements for the City and County of San Francisco, Oceanside Water Pollution Control Plant (Southwest Outfall) and Collection System to Include the Westside Wet Weather Facility.

5. Federal Register, Part VII, Combined Sewer Overflow Control Policy Notice, April 1994.

C. Objectives

1. Upon completion of training, the employee will be aware of the steps to:
    a. Receive an Overflow Report
    b. Respond to an Overflow
    c. Determine the Cause of the Overflow
    d. Break a Blockage
    e. Overflow Removal and Clean Up
    f. Start Time Estimation
    g. Eyeball Method Estimation
    h. Measured Volume Method Estimation

i. Duration and Flow Method Estimation

j. Overflow Sampling Notification

k. CIWQS Data Entry and Certification (Designated Data Submitters and LRO only) (Includes SOCS Annual Reporting Data Generation)

D. Equipment/Personnel Required

1. Personnel – Response (1 Sewer Service Worker minimum)

2. PPE – Hard hat, gloves, safety shoes, respiratory protection, eye protection, face shield, hearing protection, safety clothing, sampling safety clothing

3. Equipment – Response Vehicle, Combination Truck, Harben Truck, Overflow Response Tools/Systems (e.g., berms, bags, field test kits, public warning signage)

E. Terminology

1. NOTE is used when information is available that can assist the Operator in accomplishing his or her task. Information is advisory in nature.

2. CAUTION is used when special cautions must be taken by the Operator. Failure to following prescribed steps may cause serious bodily injury, damage equipment, or violate federal/state/local/PUC regulation.

3. WARNING is used when special cautions must be taken by the Operator. Failure to follow prescribed steps will cause loss of life or limb and severely damage equipment.

4. Combined System Discharge (CSD). A CSD is an authorized discharge during a wet weather day from an approved combined sewer discharge point list in Table 2 of Order No. R2-2009-0062 and R2-2013-0029.

5. Sewer Overflow in the Combined System (SOCS). Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a ***Combined Sewer System (CSS)*** that is not a CSD. SOCS include:

a. Overflows or releases of untreated or partially treated wastewater that reach waters of the United States.

b. Overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States.

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

6. Sanitary Sewer Overflow (SSO). Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a ***Sanitary Sewer System***. SSOs include:

   a. Overflows or releases of untreated or partially treated wastewater that reach waters of the United States.

   b. Overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States.

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

7. State Water Resources Control Board WDR Overflow Categories:

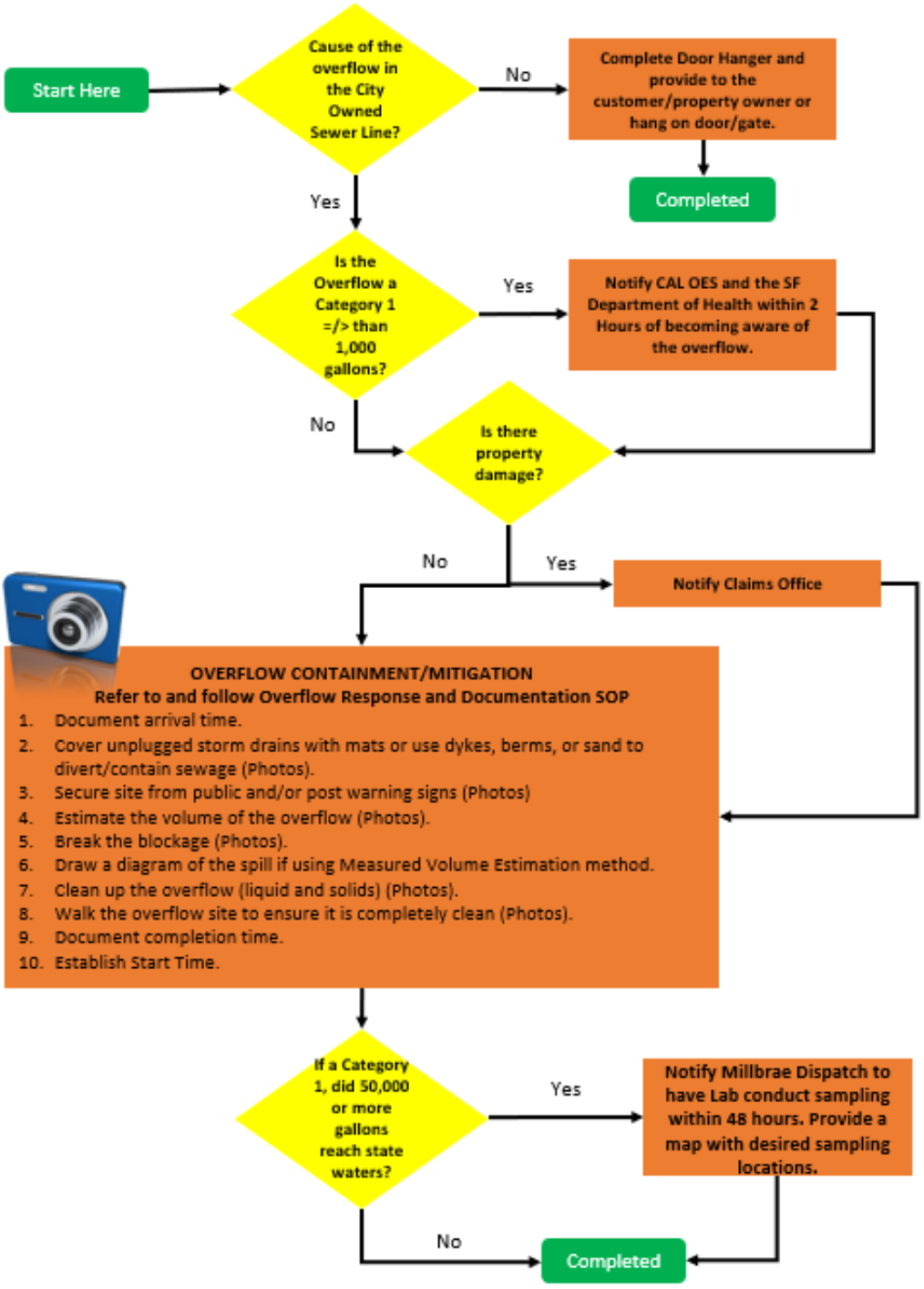
CATEGORIES	DEFINITIONS
1	Discharges of untreated or partially treated wastewater of ***any volume*** resulting from an enrollee's Sanitary Sewer System failure or flow condition that: Reach surface water and/or reach a drainage channel tributary to a surface water; or Reach a municipal separate storm sewer system and are not fully captured and returned to the Sanitary Sewer System not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the municipal separate Storm Sewer System is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or ground water infiltration basin (e.g., infiltration pit, percolation pond).
2	Discharge of untreated or partially treated wastewater of ***1,000 gallons or greater*** resulting from an enrollee's Sanitary Sewer System failure or flow condition that ***do not*** reach surface water, a drainage channel, or a municipal separate Storm Sewer System unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly.
3	***All other discharges*** of untreated or partially treated wastewater resulting from an enrollee's Sanitary Sewer System failure or flow condition.
Private Lateral Sewage Discharge (PLSD)	Discharges of untreated or partially treated wastewater resulting form blockages or other problems within a ***privately owned sewer lateral*** connected to the enrollee's Sanitary Sewer System or from private sewer assets. PLSDs that the enrollee becomes aware of may be ***voluntarily*** reported to the CIWQS SSO Database.

8. Sewer Overflow in the Combined System (SOCS) Overflow Categories:

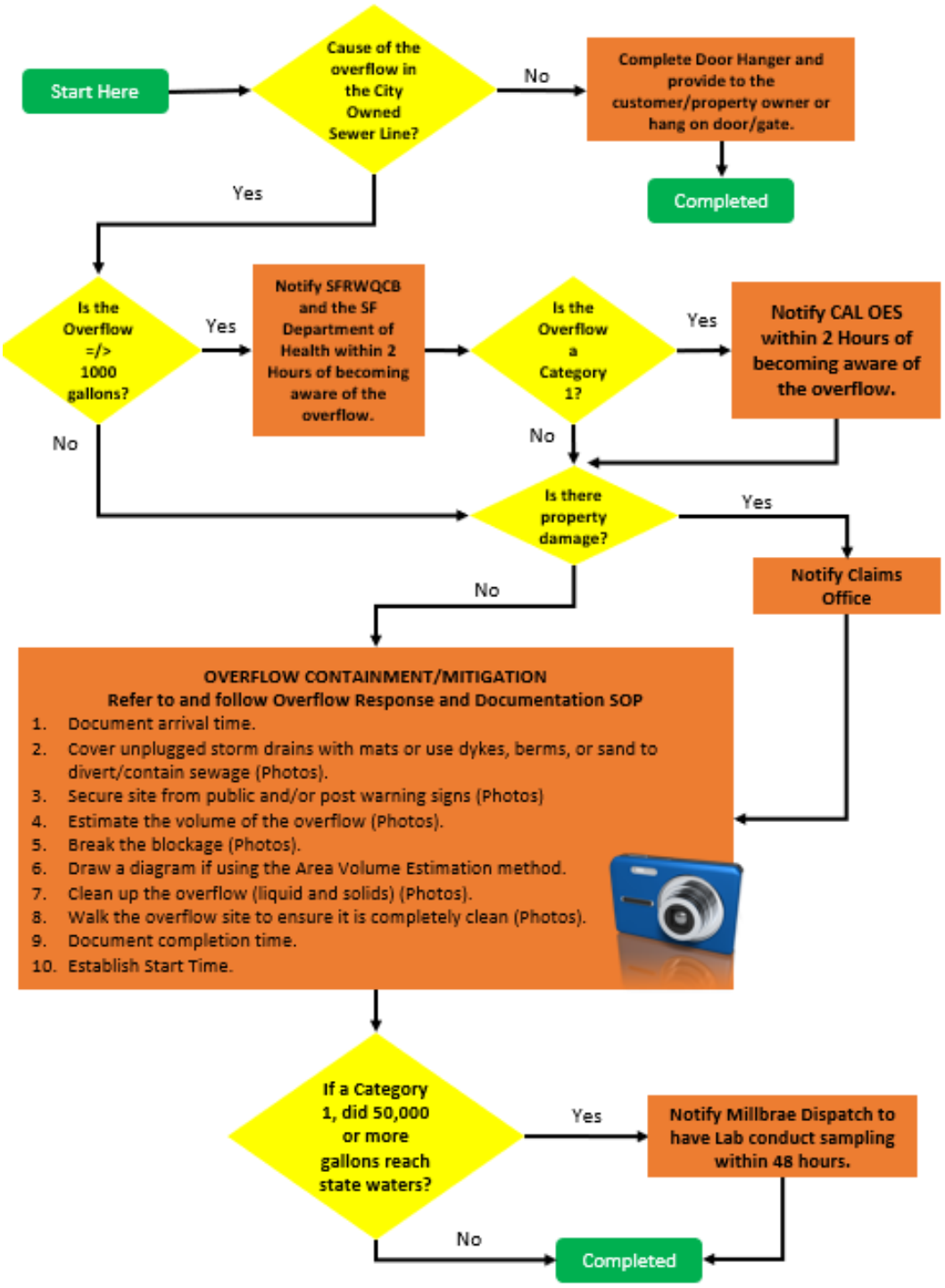
CATEGORIES	DEFINITIONS
1	Discharges of untreated or partially treated wastewater of ***any volume*** resulting from a Combined Sewer System failure or flow condition that: Reach surface water and/or reach a drainage channel tributary to a surface water; and Does not meet the criteria for a Combined Sewer Discharge (CSD).
2	Discharges of untreated or partially treated wastewater of ***1,000 gallons or greater*** resulting from a Combined Sewer System failure or flow condition that ***did not*** reach surface water or a drainage channel.
3	***All other discharges*** of untreated or partially treated resulting from a Combined Sewer System failure or flow condition.
Private Lateral Sewage Discharge (PLSD)	Discharges of untreated or partially treated wastewater resulting from blockages or other problems within a ***privately owned sewer lateral*** connected to the Combined Sewer System or from other private sewer assets.

PROCEDURES

1. SSO Response and Documentation Flowchart



2. SOCS Response and Documentation Flowchart



3. Receiving a Report and Arriving on Scene of an Overflow

3.1 Receiving Overflow Report

Step 1: Document initial information

NOTE

Capture the following information:

- Address
- Phone Number
- Time Worker is Dispatched
- Time caller first noticed the overflow
- Caller Name
- Time Call Was Received
- Initial Responder Name

Step 2: Determine location of the overflow

- Combined or Separated System
- Overflow can affect or be located in an area where combined and separated systems overlap

Step 3: Conduct vehicle pre-trip

- Verify vehicle contains Overflow Response equipment

Step 4: Proceed to the location of the reported overflow

Step 5: Document arrival time

Step 6: Task Complete

4. Overflow Response

NOTE

Upon arrival, immediately capture video/pictures of the event and determine the cause of the overflow. If the overflow is:

SSO/SOCS Category 1 and is/could possibly be =/> 1,000 gallons. Immediately notify the On-Call Supervisor and inform them that the overflow appears to be a Category 1, it is => 1,000 gallons, and to call CalOES within 2 hours and the SF DPH. The first responder will call CalOES (800-852-7550) ***if they cannot reach the On-Call Supervisor***. Record the OES Control Number and Date/Time CalOES receives the initial report.

SOCS => 1,000 gallons and Not a Category 1, call the SF DPH and the SFRWQCB.

Refer to the SSO or SOCS overflow App or OERP packet for contact information and reporting process.

NOTE

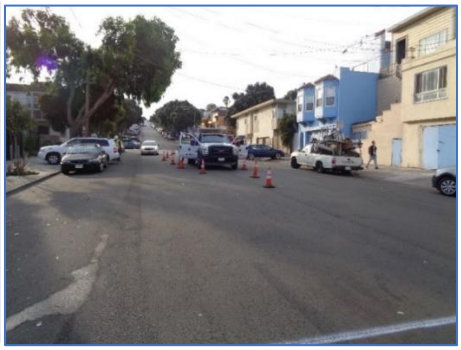
As soon as possible, determine if assistance/additional resources are required.

4.1 Initial Response

Step 1: Start the SSO or SOCS App or OERP Packet

Step 2: Setup Traffic Control and signage

- Refer to and follow California Manual on Uniform Traffic Control Devices, Current Edition
- Traffic Control is required if vehicle or personnel are in or working near the street



Step 3: Secure site from the public

- If public can or will come in contact with the overflow
- Post warning signs if the overflow will be a prolonged event
- Use cones, signage, and/or tape

Step 4: Take pictures including wide/panoramic shot of entire overflow

- Origin (all overflowing manholes, vents, or catch basins) of the overflow to recapture point and containment efforts
- Public access restrictions including any property damage such as flooded building(s), both affected and unaffected areas
- If there is property damage, contact the claims office

Step 5: Determine the problem causing the overflow

- If overflow is coming from a Manhole, Catch Basin, or multiple Air Inlets, refer to Section 4.3
- Regardless of where the overflow originates from, always check the main on every service call

Step 6: Determine if overflow needs to be contained

- The overflow must be contained if located in a separated system or reaches an MS4
- Call your Supervisor if containment is necessary to prevent entry into an MS4
- Determine if the downstream storm pump station should be shut down to prevent discharge to state waters
- The overflow does not need to be contained if originating from the combined system and is draining into a catch basin within the combined system
- Plug MS4 lines if necessary to contain the overflow in a separated system
- Use barricades, berms, sand bags, or PIG Spill Blockers


Step 7: Task Complete

4.2 Overflow Debris Removal and Site Clean Up

NOTE

In the combined system, the overflow is returned or hosed downed to the nearest catch basin.

In both the combined and separated systems, consider removing/replacing soil if the overflow was in a sensitive area (e.g., School, Park, etc.)

Step 1: Vacuum and/or clean to remove overflow wastewater

- Vacuum after breaking the blockage
- Including storm drains if in a combined sewer area and the overflow entered MS4

Step 2: Remove solid waste from overflow area

- Clean and remove all solid waste and material
- Clean soil last

CAUTION

Do not use disinfectant on streets flowing to an MS4.

Step 3: Disinfect (combined system) and spray down the overflow area

- Return water to the catch basin if in a combined system area
- Keep water out of the storm drain and return to the sewer line if in a separated system area
- Do not overspray onto vehicles




Step 4: Walk the site of the overflow to ensure it is completely clean

Step 5: Take pictures of the cleaned overflow area

Step 6: Remove plugs in MS4 lines near separated systems

- If installed

Step 7: Remove public access barriers

- If necessary

Step 8: Remove traffic control devices

- If necessary

Step 9: Document completion time

Step 10: Task Complete

4.3 Overflow at Manhole/Catch Basin/Multiple Air Inlet Overflow

NOTE

It is possible to have a stoppage on a hill and not see the high water in the Upstream Manhole or catch basin because the invert may be higher than the elevation of the spill. If the Upstream Manhole is on a hill above the Downstream Manhole, refer Section 3.4 to check for a blockage on a hill.

Step 1: Check maps and determine direction of flow

Step 2: Open and check the Upstream Manhole

- Note the flow or lack of flow
- Check whether it is holding water which would indicate a blockage downstream

Step 3: Close the Upstream Manhole

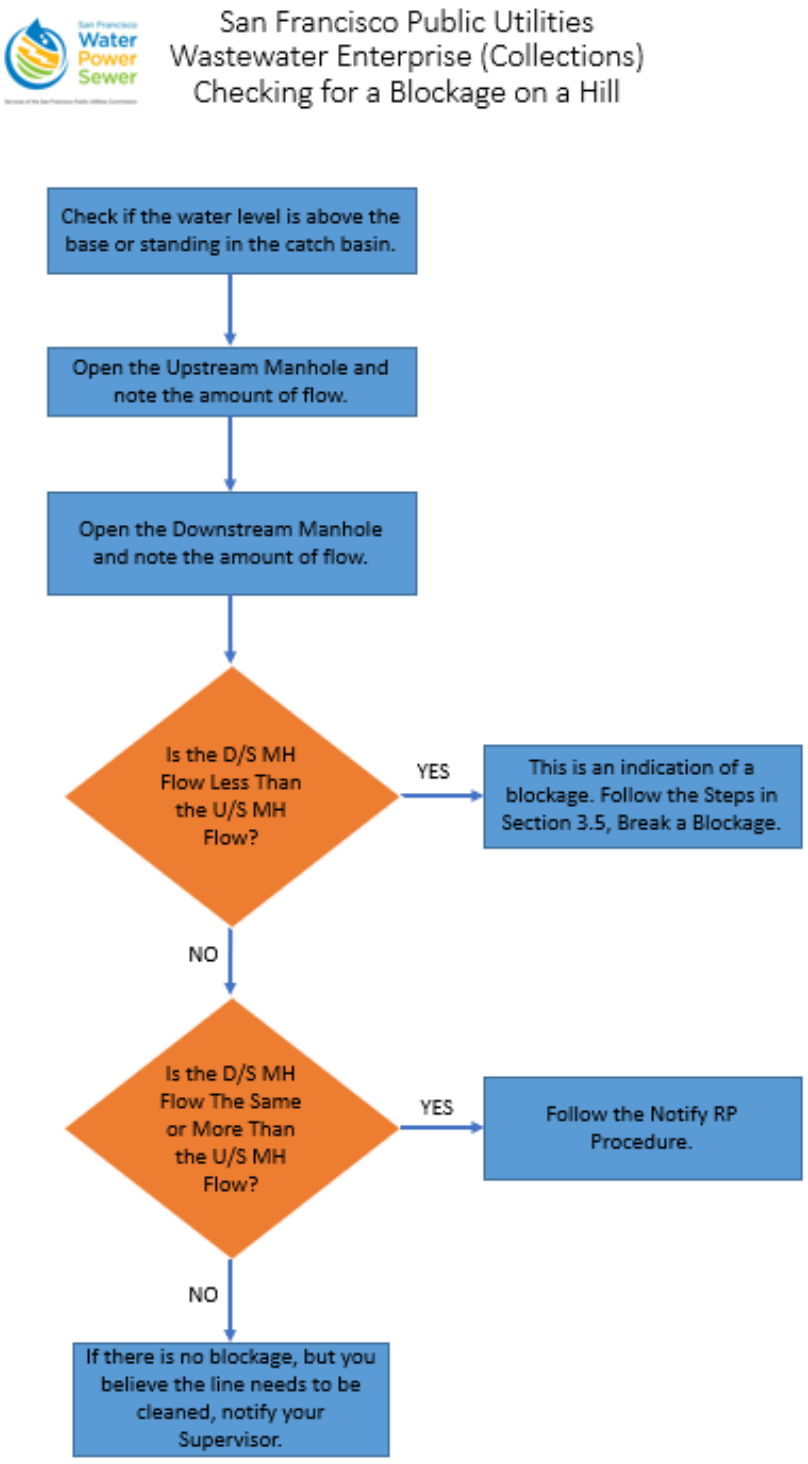
Step 4: Open and check the downstream manhole

- If the flow is the same or more than the upstream manhole, it is possibly not a SOCS/SSO, refer to and follow the Private Lateral Sewage Discharge (PLSD) SOP
- If the flow is less than the upstream manhole, it is likely a SOCS/SSO (especially on a hill), proceed to Step 5

Step 5: Call and request a Combination Truck to break the blockage and any other resources as needed

Step 6: Task Complete

4.4 Checking for a Blockage on a Hill



4.5 Break a Blockage

Step 1: Determine the location of the blockage

- Follow the sewer line downstream and inspect consecutive manholes with sewage backed up in them until you locate the first manhole with normal or no flow. This will be the manhole the jetter will set up on.
- The stoppage will be at some point in the sewer line between the normal/no flow manhole and the next upstream manhole which has sewage backed up in it

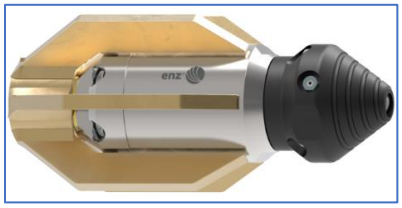
Step 2: Setup traffic control at setup manhole

Step 3: Position the combination truck at setup manhole

Step 4: Select appropriate nozzle for breaking a stoppage

- This would be either a Pipe Wolf (6”-15”), Tadpole/Polywog with penetrator (18” – 24”), Warthog or Bulldog with penetrator

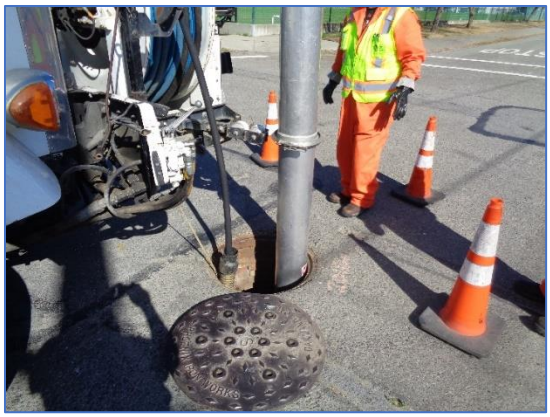




Step 5: Set footage counter to zero prior to jetting

Step 6: Begin sending the nozzle upstream until encountering the blockage

- At this point the jetter hose will usually stop and you will have some slack hose in the manhole the truck is setup on



Step 7: Note the footage counter reading where the stoppage is located

Step 8: Increase the water pressure and repeatedly withdraw and pay out hose

- Until the nozzle penetrates the blockage

Step 9: Document the time the blockage was broken/cleared

Step 10: Stop jetting

- Wait until the backed-up sewage behind the obstruction has drained
- This will greatly reduce the likelihood of forcing sewage up a lateral and into a building

Step 11: Work the nozzle back and forth

- To further break up the cause of the blockage

NOTE

If using a Warthog or Bulldog, skip to Step 14.

Step 12: Stop work and pull back to the manhole

Step 13: Change to a cleaning nozzle

Step 14: Clean the sewer line

- Work the cleaning nozzle back and forth in the area of the stoppage in case any material is adhering to the pipe
- Remove solids/debris that can cause another blockage

Step 15: Check the upstream manhole(s)

- Washdown any accumulated debris

Step 16: Verify sewer main has a normal flow

Step 17: Task Complete

5. Overflow Volume Estimation

5.1 Overflow Start Time Estimation

Step 1: Determine the start time of the overflow

NOTE

The following items will help in determining start time:
- Interview caller and ask:
* Where did you see sewage overflow from?
* What time did you notice the sewage?
* Was there a time you did not notice sewage overflowing?
- Add additional comments made by the caller that will assist in determining start time.
- Observations from odors and sounds (e.g., water running in a normally dry creek) can be used to determine start time.
- SCADA Force Main data
- Cameras (Traffic, Residential, etc.)

Overflows that occur in right-of-way are usually observed and reported promptly. Overflows that occur out of the public view can go on longer before detection.

Conditions at the Overflow site change over time.
- Initially there will be limited deposits of toilet paper and other sewage solids.
- After a few hours, paper and solids start to build up.
- After a day or two the sewage solids form a light-colored residue.
- After a week or more, the sewage can become septic and stain the concrete black.
- The quantity of toilet paper and other materials of sewage origin increase over time.

Step 2: Complete the start time determination worksheet or field app

Step 3: Document start time in the App or OERP packet

- Include information on how this time was determined

Step 4: Task Complete

5.2 Determine Estimation Method

NOTE

Determine the method to conduct volume estimation.
- If the entire overflow can be seen, use the Eyeball or Measured Volume methods.
- If the entire overflow is completely contained, use Measured Volume method.
- If some of the overflow was not captured, use one of the three Flow Rate Duration methods.
- If the overflow is from a Force Main or Pump Station, use SCADA data.
- During rain events (does not include NPDES wet weather events), use flow modeling data and rain gauge data.

5.3 Eyeball Estimate Method

NOTE

This method is useful for contained Overflows up to approximately 100 gallons. Do not use this method if the Overflow appears to be more than four (4) drums.

Step 1: Imagine the amount of water that would spill from a bucket or a barrel.

- A bucket contains 5 gallons and a drum contains 55 gallons.

Step 2: If the Overflow is larger than 55 gallons, try to break the standing water into drums

- Multiply this drum estimation by 55 gallons

Size of bucket(s) or barrel(s)	How many of this Size?	Multiplier	Total Volume Estimated
1 gal. water jug		X 1	
5 gal. bucket		X 5	
32 gal. trash can		X 32	
55 gal drum		X 55	
Total Volume Estimated Using Eyeball Method			

Step 3: Task Complete

5.4 Measured Volume Method

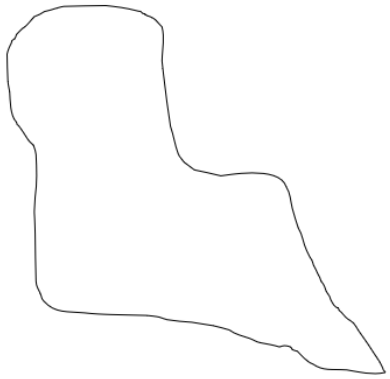
NOTE

The volume of most small Overflows that have been contained can be estimated using this method. The shape, dimensions, and the depth of the contained wastewater are needed. The shape and dimensions are used to calculate the area of the Overflows and the depths is used to calculate volume.

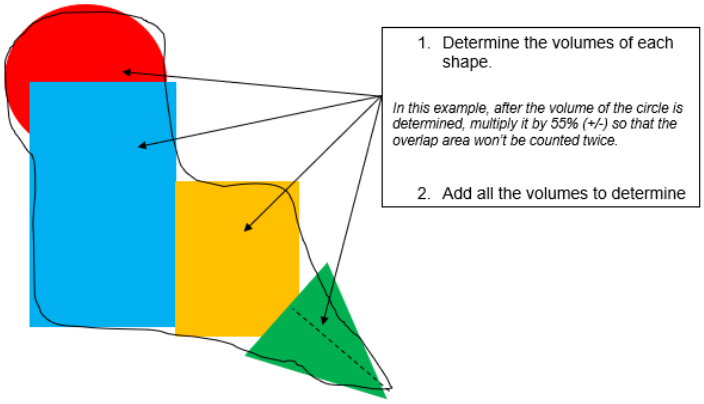
Step 1: Determine the overflow surface area(s)

- Asphalt, Concrete, Dirt, Landscape, etc.

Step 2: Sketch the shape of the contained sewage



Step 3: Develop the geometric shapes within the overflow shape



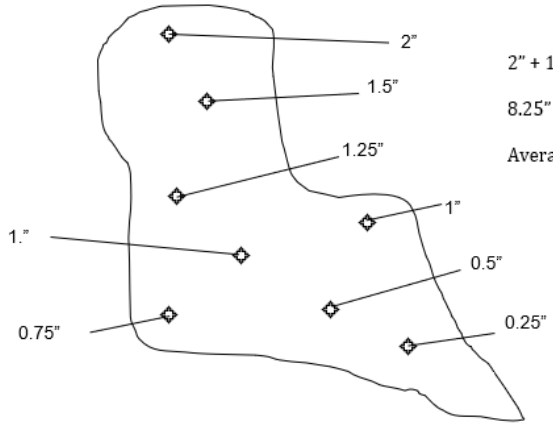
Step 4: Take a picture of the overflow area

Step 5: Measure or pace off the dimensions

Step 6: Measure the depth at several locations and select an average

Step 7: Convert the dimensions, including depth, to feet

- The following graphic is for hard surfaces
- Refer to Overflow training for estimated unimproved areas such as a field or dirt parking lot



2" + 1.5" + 1.25" + 1" + 1" + 0.75" + 0.5" + 0.25" = 8.25"

8.25" / 8 measurements = 1.03"

Average Depth = 1.03"

NOTE

Wet Stain on a Concrete Surface - For a stain on concrete, use 0.0026'. This number is 1/32" converted to feet. For a stain on asphalt use 0.0013' (1/64").
Sewage "Ponding" or Contained – Measure actual depth of standing sewage whenever possible. When depth varies, measure several (representative) points, determine the average and use that number in your formula to determine volume.

Step 8: Calculate the area in square feet using the following formulas

NOTE

Rectangle:	Area = length (feet) x width (feet)
Circle:	Area = radius (feet) x radius (feet) x 3.14
Triangle:	Area = base (feet) x height (feet) x 0.5

Step 9: Multiply the area (square feet) times the average depth (in feet) to obtain the volume in cubic feet

Step 10: Multiply the volume in cubic feet by 7.48 to convert it to gallons

Step 11: Document the volume estimate

Step 12: Retain the drawing(s) and photo(s) with any calculations

- To include in any report

Step 13: Task Complete

5.5 Duration and Flow Rate Method

NOTE

Calculating the volume of larger Overflows, where it is difficult or impossible to measure the area and depth, requires a different approach. In this method, the separate estimates are made of the duration of the Overflow and the flow rate.

The duration is the elapsed time from the time the Overflow started to the time the flow was restored.

NOTE

The flow rate is the average flow that has left the sewer system during the time of the Overflow.

There are three ways to estimate the flow rate:

1. Use of the WWE Flow Rate Estimating Tool. *See Appendix A for examples of different flow rates*. These pictures show water flowing from a manhole cover. The first responder shall select the appropriate flow rate from the tool. Photographs/videos must be taken of the actual overflowing manhole(s), air inlet(s), and drain inlet(s) for inclusion in any reports.

2. Counting Connections. Once the location of the Overflow is known, the number of upstream connections can be determined from the sewer maps. Multiply the number of connections from the engineering specifications. This works only in the upper end of the system in residential areas. Use the duration pattern worksheet.

NOTE

The following example is given to estimate Overflow volume:

Once the duration and flow rate have been estimated, the volume of the Overflow is the product of the duration in hours or days, and the flow rate in gallons per hour or gallons per day.

Overflow Start Time = 1123
Overflow End Time = 1435
Overflow Duration = 3 hours and 12 minutes
Overflow Duration in Minutes (3 X 60 = 180) 180 minutes plus 12 minutes
3.3GPM X 192Min = 633.6 Gallons (Round up to the nearest whole gallon, in this case 634 Gallons)

Step 1: Establish flow rate

Step 2: Take photographs to document the observations

- They can be helpful if questions arise later in the process

NOTE

It is important to remember that Overflows may not be continuous. Blockages are not usually complete (some flow continues). In this case the Overflow would occur during the peak flow periods (typically 0800 to 2000 each day).

Step 3: Establish end time

- Field crews on-site observe the "blow down" that occurs when the blockage has been removed.
- The "blow down" can also be observed in downstream flow meters, if installed

Start Date and Time	1.
End Date and time	2.
Total time elapsed of SSO event (subtract line 1 from line 2. Show time in minutes)	3.
Average flow rate GPM (account for diurnal pattern)	4.
Total volume estimate using duration and flow rate method (Line 3 x Line 4)	5.

Step 4: Task complete

5.6 Sampling Notification

NOTE

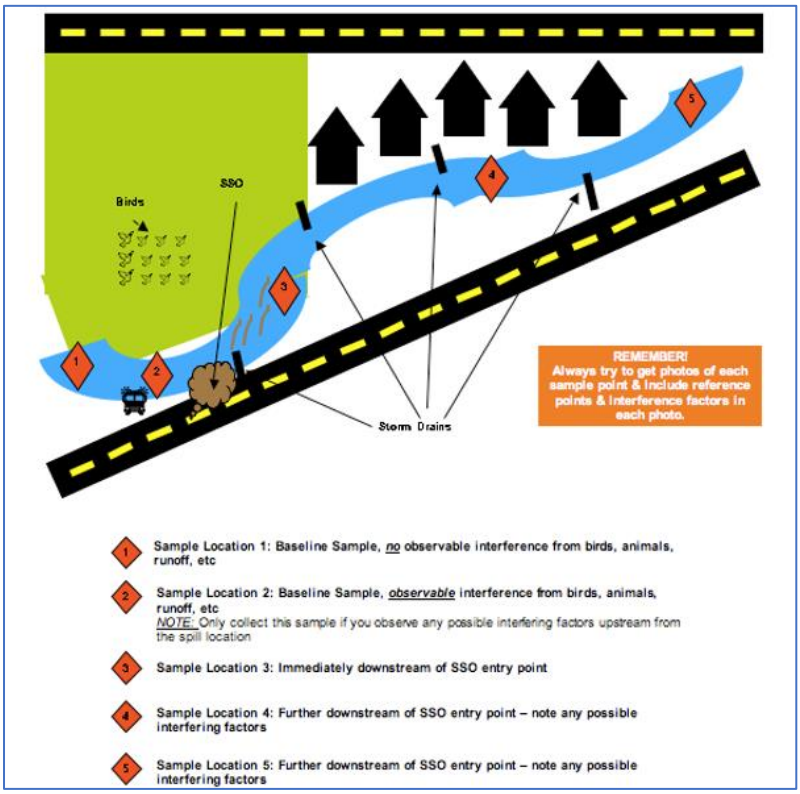
Sampling is *required* if the SOCS or SSO is a Category 1 and is equal to or greater than 50,000 gallons. Water Quality Monitoring

Step 1: Contact the 24 Hour Millbrae Dispatch (650) 872-5900 for sample collection

Step 2: Document the call in the Overflow App or OERP Packet

Step 3: Photograph, map and mark the sampling location

- To assist the lab in determining sampling locations



Step 4: Task Complete

6. Documenting an Overflow

NOTE

The App or Overflow Emergency Response Plan (OERP) packet (for either a SSO or SOCS) is filled out as the incident progresses. Data/information should be captured throughout the incident and filled in when/as time permits.

6.1 Complete the App or Overflow Emergency Response Plan Packet

Step 1: Verify all required information is captured

- App is Primary and Hardcopy OERP is the backup
- Completed as more information is obtained as the event unfolds

Step 2: Save the Report in the App or deliver the hardcopy packet to the designated Supervisor

Step 3: Task Complete

6.2 Wet Weather Overflow Estimation Support

NOTE

In the event of a wet weather overflow and estimating the total volume is not possible by field crews, support can obtained from the Hydraulics group. If possible, provide your supervisor with the following information:

Start/Stop Time of Overflow
Manhole(s) / Catch Basin Asset Numbers
Height of the overflow from the manhole and/or catch basin
Pictures of the Overflow
Pictures of Damage
Drawing of Overflow Area
High Water Marks

Step 1: Collect information

Step 2: Provide to Supervisor

Step 3: Task Complete

7. CIWQS Reporting and Certification

NOTE

Data Submitter and Legally Responsible Official will verify the data from the App or OERP Hardcopy, and CIWQS match ***before*** submitting Drafts, Ready To Certify, and Certified overflow reports.

Data Submitter and Supervisor will verify the data from the App or OERP Hardcopy match before submitting a SOCS report in accordance with the current NPDES permit.

CIWQS Clock starts upon log in. Data Submitter or LRO has 59:59 to complete each session.

Save Work-In-Progress option resets the clock.

7.1 Write/Submit SSO or SOCS Report from App or OERP Hardcopy

Step 1: Complete the applicable report

- CIWQS for SSO
- SOCS for the combined system
- Refer to San Francisco Bay Regional Water Quality Control Board Order No. R2-2013-0029, Pages 17 and 18 for SOCS report

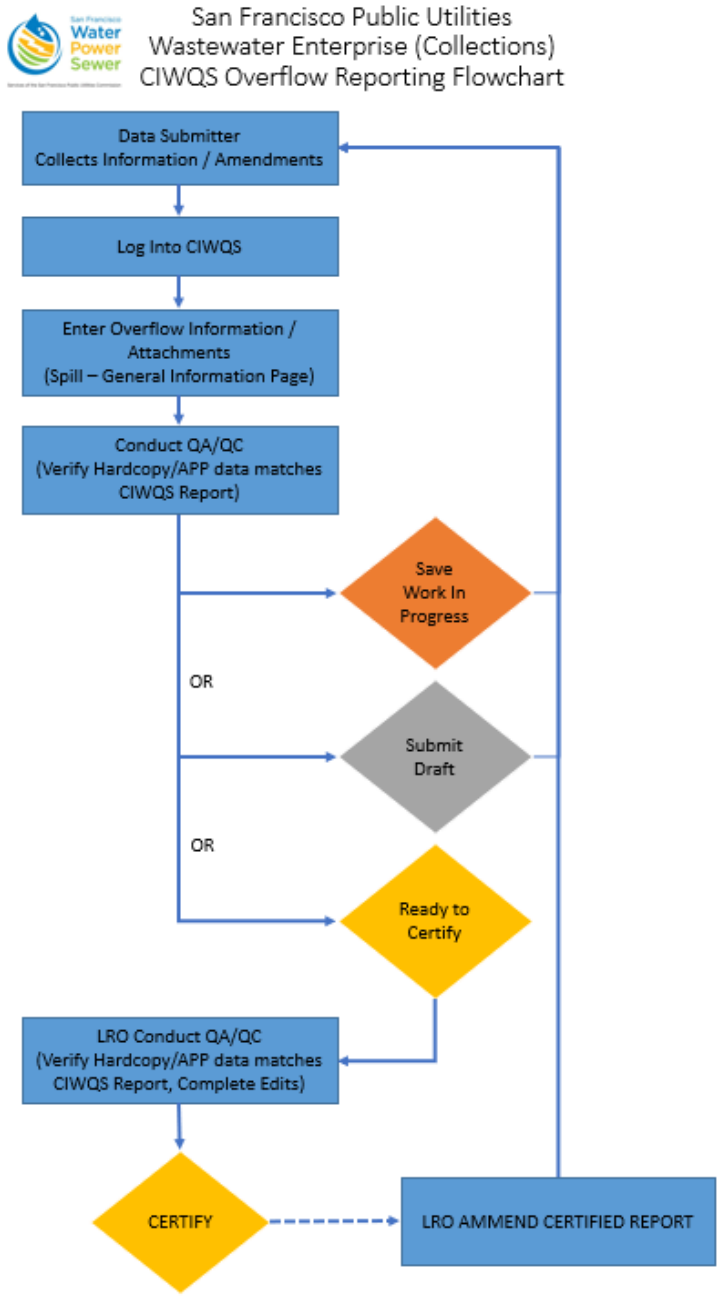
Step 2: Save Report in CIWQS and Click Send or Save SOCS report in App

Step 3: Task Complete

7.2 Enter CIWQS Data and Certify Report

Step 1: Complete Flow Chart steps

- Refer to and follow Enrollee's Guide to the CIWQS Data Base, State Water Resources Control Board, Section 2.3 as applicable



Step 2: Task Complete

APPENDIX A FLOW RATE ESTIMATING TOOL (27 ¾" Lid)

1 GPM

3 GPM

5 GPM

7 GPM

10 GPM

15 GPM

20 GPM

25 GPM

30 GPM

35 GPM

40 GPM

45 GPM

50 GPM

1/4” Air Vent
Bubble Height

75 GPM

1” Air Vent
Bubble Height

100 GPM

1.5 ” Air Vent
Bubble Height

125 GPM

2” Air Vent
Bubble Height

150 GPM

3” Air Vent
Bubble Height

175 GPM

3.5” Air Vent
Bubble Height

200 GPM

4” Air Vent
Bubble Height

APPENDIX B SPILL CAUSE

Air Relief Valve (ARV)/Blow Off Valve (BOV) Failure
Construction Diversion Failure
CS Maintenance Caused Spill/Damage
Damage by Others Not Related to CS Construction/Maintenance
Debris from Construction
Debris from Lateral
Debris-General
Debris Wipes/Non-Dispersible
Flow Exceeded Capacity (Separate CS Only)
Grease Deposition (FOG)
Inappropriate Discharge to CS
Natural Disaster
Operator Error
Other (Specify Below)
Pipe Structural Problem/Failure
Pipe Structural Problem/Failure – Installation
Pump Station Failure – Controls
Pump Station Failure – Mechanical
Pump Station Failure – Power
Rainfall Exceeded Design, I and I (Separate CS Only)
Root Intrusion
Siphon Failure
Surcharged Pipe (Combined CS Only)
Vandalism

Appendix D - Sewer Operations SOCS Overflow Response Packets

Sewer Overflow in the Combined System (SOCS) Response Packet (Version 14)

- ❑ A SOCS Category 1 =/> 1000 gallons, immediately contact the following within 2 hours:
  - CALOES (800) 852-7550
  - SFDPH ((415) 215-0805

- ❑ If this SOCS is equal to or greater than 1,000 gallons, immediately contact the SF Regional Water Quality Control Board: (510) 622-2369 and the SF Department of Public Health: (415) 215-0805

- ❑ **For Water Sampling:** Millbrae Dispatch (650) 872-5900

- ❑ **For any media inquiries/requests:** Contact your Supervisor or Manager

SEWER SERVICE WORKER:	**CHAIN OF CUSTODY:**
❑ Open this envelope. ❑ Follow the instructions on the Overflow Response Flowchart. ❑ Complete the chain of custody record (to the right) and deliver this package to the SOCS inbox located outside of the designated Supervisors office.	Print Name: _____ Initial: _____ Date: _____ Time: _____

SEWER REPAIR SUPERVISOR:	**CHAIN OF CUSTODY:**
❑ Open this envelope and review forms. Contact the Sewer Service Worker if needed to obtain additional information. ❑ Complete NPDES SOCS report. ❑ File this package. 1/7/2020 12:33 PM	Print Name: _____ Phone #: _____ Initial: _____ Date: _____ Time: _____

SFPUC: SOCS Emergency Response Plan	A-1 Side A
Sewer Overflow in the Combined System (SOCS) Regulatory Reporting Guide	

Reporting Instructions

Deadline	**See reverse side for contact information and definitions of the overflow categories.**		
	Category 1	Category 2	Category 3
2 Hours after awareness of an Overflow	If SOCS is equal to or greater than 1,000 gallons, call the San Francisco Regional Water Quality Control Board (SFRWQCB) and SF Department of Public Health. A SOCS Category 1 of any volume, call CAL-OES and SFDPH.	If SOCS is equal to or greater than 1,000 gallons, call the San Francisco Regional Water Quality Control Board (SFRWQCB) and SF Department of Public Health.	-
As soon as possible	If SOCS impacts private property that may be a failure of the sewer main and/or if a claim for damages may be submitted against the city, notify the Claims Office.		
48 after awareness of an Overflow	If 50,000 gallons or more were not recovered, begin water quality sampling.	-	-
3 Business Days after awareness of an Overflow	Submit draft SOCS report.	Submit draft SOCS report.	-
15 Days after response conclusion	Certify SOCS report in accordance with NPDES. Update as needed.	Certify SOCS report in accordance with NPDES. Update as needed.	-
30 Days after end of calendar month in with Overflow occurred.			Certify spill report. Update as needed.

CONTACT INFORMATION

CAL OES	(800) 852-7550
SF Department of Public Health	(415) 215-0805
Claims Office (Refer to current City Attorney Investigator On-Call List after work hours)	Theresa Lacson-Kuan M-F 8AM-5PM (925) 285-6416
Millbrae Dispatch (Water Quality Sampling)	Natural Resources Land Management Division (NRLMD) (650) 872-5900
San Francisco Regional Water Quality Control Board (SFRWQCB)	Phone: (510) 622-2369 Fax: (510) 622-2460
State Water Resources Control Board	(916) 341-5586

CATEGORIES	DEFINITIONS
1	Discharges of untreated or partially treated wastewater of any volume resulting from a Combined Sewer System failure or flow condition that: Reach surface water and/or reach a drainage channel tributary to a surface water; and Does not meet the criteria for a Combined Sewer Discharge (CSD).
2	Discharges of untreated or partially treated wastewater of 1,000 gallons or greater resulting from a Combined Sewer System failure or flow condition that did not reach surface water or a drainage channel.
3	All other discharges of untreated or partially treated resulting from a Combined Sewer System failure or flow condition.
Private Lateral Sewage Discharge (PLSD)	Discharges of untreated or partially treated wastewater resulting from blockages or other problems within a privately owned sewer lateral connected to the Combined Sewer System or from other private sewer assets.

SFPUC: Overflow Emergency Response Plan

Sewer Overflow in the Combined System (SOCS) Flowchart

B-1

Start Here

Cause of the overflow in the City Owned Sewer Line?

No

Complete Door Hanger and provide to the customer/property owner or hang on door/gate.

Completed

Yes

Is the Overflow =/> 1000 gallons?

Yes

Notify SFRWQCB and the SF Department of Health within 2 Hours of becoming aware of the overflow.

Is the Overflow a Category 1?

Yes

Notify CAL OES within 2 Hours of becoming aware of the overflow.

No

No

Is there property damage?

Yes

Notify Claims Office

No

OVERFLOW CONTAINMENT/MITIGATION

Refer to and follow Overflow Response and Documentation SOP

1. Document arrival time.
2. Cover unplugged storm drains with mats or use dykes, berms, or sand to divert/contain sewage (Photos).
3. Secure site from public and/or post warning signs (Photos)
4. Estimate the volume of the overflow (Photos).
5. Break the blockage (Photos).
6. Draw a diagram if using the Area Volume Estimation method.
7. Clean up the overflow (liquid and solids) (Photos).
8. Walk the overflow site to ensure it is completely clean (Photos).
9. Document completion time.
10. Establish Start Time.

If a Category 1, did 50,000 or more gallons reach state waters?

Yes

Notify Millbrae Dispatch to have Lab conduct sampling within 48 hours.

No

Completed

SFPUC: Overflow Emergency Response Plan	C-1
Sewer Overflow in the Combined System (SOCS) Notifications	

NOTIFICATIONS	
CAL OES (800) 852-7550	
Notification Date/Time:	
Name of Who You Spoke To:	
OES Control Number:	
SF Regional Water Quality Control Board (510) 622-2369	
Notification Date/Time:	
Name of Whom You Spoke To: Left Message: ☐	
SF Department of Health (415) 215-0805	
Notification Date/Time:	
Name of Whom You Spoke To: Left Message: ☐	
Millbrae Lab (650) 872-5900	
Notification Date/Time:	
Name of Whom You Spoke To: Left Message: ☐	
Claims Office (During Work Hours:(925) 285-6416) On Call List After Work Hours	
Notification Date/Time:	
Name of Whom You Spoke To: Left Message: ☐	

SFPUC: Overflow Emergency Response Plan	D-1
Sewer Overflow in the Combined System (SOCS) Location and Volume by Destination	

MAXIMO WORK ORDER #: _____

SOCS FIELD REPORT		
PHYSICAL LOCATION DETAILS		
Spill Location Name		
Latitude of spill location		
Longitude of spill location		
County	San Francisco	
Regional Water Quality Control Board	Region 2 – San Francisco Bay	
VOLUMES BY DESTINATION	Volume Spilled (Gallons)	Volume Recovered (Gallons)
2.a/2.b Estimated spill volume that reached a separate storm drain that flows to a surface body of water? (If not all recovered, this is a Category 1)		
2.c/2d Estimated spill volume that directly reached a drainage channel that flows to a surface water body? (Any volume spilled is a Category 1)		
2.e/2.f Estimated spill volume discharged directly to a surface water body? (Any volume spilled is a Category 1)		
2.g/2.h Estimated spill volume discharged to land? (Includes discharges directly to land, and discharges to a storm drain system or drainage channel that flows to a storm water infiltration/retention structure, field, or other non-surface water location. Also, includes backups to building structures). (*Includes discharges to Combined System*).		
	Volume Spilled	Volume Recovered
Total Volume Spilled (Verify this matches the volume reported in the SOCS annual report		

SFPUC: Overflow Emergency Response Plan	D-2
Sewer Overflow in the Combine System (SOCS) Location, Appearance Points, and Destination	

SOCS FIELD REPORT	
Spill location description.	
Number of appearance points.	
Spill appearance points. (Circle all that are apply) Catch Basin Backflow Prevention Device Force Main Gravity Mainline Inside Building/Structure Lateral Clean Out (Private / Public) Lower Lateral (Private / Public) Manhole Pump Station Upper Lateral (Private / Public) Other Sewer System Structure	
Spill appearance point explanation. (Enter information here if “Other” or multiple appearance points were selected):	
Final spill destination. (Circle all that apply). Beach Building/Structure Combined Storm Drain Drainage Channel Other (Specify Below) Paved Surface Separate Storm Drain Street/Curb and Gutter Surface Water Unpaved Surface	
Explanation of final spill destination. (Enter information if “Other” was selected.	

SFPUC: Overflow Emergency Response Plan	D-3
Sewer Overflow in the Combined System (SOCS) Time Milestones	

DATE/TIME DETERMINATIONS		
	DATE	TIME
Estimated Spill Start Date/Time		
SFPUC Notified Date/Time		
Estimated Operator Arrival Date/Time		
Estimated Spill End Date/Time		
Spill Response Completion Date/Time		

USE START/END TIME WORKSHEET (WS-1)

SFPUC: Overflow Emergency Response Plan	D-4
Sewer Overflow in the Combine System Cause	

SOCS FIELD REPORT

Spill cause: (Circle One)

Air Relief Valve (ARV)/Blow Off Valve (BOV) Failure
Construction Diversion Failure
CS Maintenance Caused Spill/Damage
Damage by Others Not Related to CS Construction/Maintenance (Specify Below)
Debris from Construction
Debris from Lateral
Debris-General
Debris-Rags
Debris Wipes/Non-Dispersible
Flow Exceeded Capacity (Separate CS Only)
Grease Deposition (FOG)
Inappropriate Discharge to CS
Natural Disaster
Operator Error
Other (Specify Below)
Pipe Structural Problem/Failure
Pipe Structural Problem/Failure – Installation
Pump Station Failure – Controls
Pump Station Failure – Mechanical
Pump Station Failure – Power
Rainfall Exceeded Design, I and I (Separate CS Only)
Root Intrusion
Siphon Failure
Surcharged Pipe (Combined CS Only)
Vandalism

Spill cause explanation: (Required if Spill Cause is “Other”)

SFPUC: Overflow Emergency Response Plan	D-5
Sewer Overflow in the Combined System (SOCS) Failures, Association, Asset, and Response Activities	

SOCS FIELD REPORT

Where did failure occur?

Air Relief Valve (ARV)/Blow Off Valve (BOV) Failure Force Main Gravity Mainline
Lower Lateral (Public) Manhole Other (Specify Below) Pump Station Failure – Controls
Pump Station Failure – Mechanical Pump Station Failure – Power
Siphon Upper Lateral (Public)

Explanation of where failure occurred: (Required if Where Failure Occurred is "Other")

Was Spill associated with a storm event?	YES	NO
Diameter of sewer pipe at the point of blockage or failure.		Inches
Material of sewer pipe at the point of blockage or failure.		
Estimated age of sewer asset at the point of blockage or failure (if applicable):		YEARS

Spill Response Activities. (Circle all that apply) Cleaned-Up Mitigated Effects of Spill
Contained All or Portion of Spill Other (Specify Below) Restored Flow
Returned All Spoil to Sanitary Sewer System Property Owner Notified
Other Enforcement Agency Notified

Explanation of spill response activities: (Required if spill response activities is "Other")

Sewer Overflow in the Combined System (SOCS) Failures, Association, Asset, and Response Activities

SOCS FIELD REPORT

Spill corrective action taken: (Circle all that apply)

Added Sewer To Preventive Maintenance Program
Adjusted Schedule/Method of Preventive Maintenance
Enforcement Action Against FOG Source
Inspected Sewer Using CCTV to Determine Cause
Other (Specify Below)
Plan Rehabilitation or Replacement of Sewer
Repaired Facilities or Replaced Defect

Explanation of corrective action taken: (Required if spill corrective action is “Other”)

Is there an ongoing investigation?	YES	NO
Health warnings posted?	YES	NO
Did spill result in beach closure	YES	NO

Name of Impacted Beach(es): (Enter N/A if none)

Name of impacted surface waters:

SSO FIELD REPORT

Water quality samples analyzed for: (Circle all that apply)

Dissolved Oxygen
Other Chemical Indicators(s) – Specify Below
Biological Indicator(s) – Specify Below
No Water Quality Samples Taken
Not Applicable to the Spill
Other (Specify Below)

Explanation of water quality samples analyzed for: (Required if water quality samples analyzed for is "Other chemical indicator(s)", "Biological indicator(s)", or "Other")

Water quality sample results reported to: (Circle all that apply) County Health Agency
Regional Water Quality Control Board Other (Specify Below) No Water Quality Samples Taken
Not Applicable to this Spill

Explanation of water quality sample results reported to: (Required if water quality sample results reported to is “Other”)

Method and explanation of volume estimation methods used: (Circle all that apply)
Eyeball Estimate Measured Volume Duration and Flow Rate
PUC Overflow Flow Rate Estimating Tool
Other (Explain): _____

SFPUC: Overflow Emergency Response Plan	
Sewer Overflow in the Combined System (SOCS) Estimation Method Calculations	**WS-1**

Start Time Determination/Notes

Caller Interview: Where did you see sewage spill from? Manhole ☐ Inside Building ☐

Vent/Clean Out ☐ Catch Basin ☐ Wet Well/Lift Station ☐ Other _____

Comments: _____

_____

Last Time Caller Observed NO Spill occurring: _____ AM / PM Date _____ /_____ /_____

Comments: _____

_____

If the volume of the SOCS and rate of flow are known, divide volume by rate of flow to get duration of SOCS event.

_____Gallons ÷ _____GPM = _____ Minutes (SOCS Duration). Subtract the Duration from the SOCS End Date/Time to establish the SOCS Start Date/Time.

Other Efforts to Determine Start Time: _____

_____

Other Comments Regarding Spill Start Time: _____

_____

_____

Estimated SOCS Start Time: _____ AM / PM Date: _____ / _____ / _____

SOCS End Time: _____ AM / PM Date: _____ / _____ / _____

SFPUC: Overflow Emergency Response Plan	WS-2
Sewer Overflow in the Combined System (SOCS) Estimation Method Calculations	

Eyeball Estimate Method: Imagine a bucket(s) or barrel(s) of water tipped over.

Size of bucket(s) or barrel(s)	How many of this size?	Multiplier	Total Volume Estimated
1 Gallon Water Jug		X 1	
5 Gallon Bucket		X 5	
32 Gallon Trash Can		X 32	
55 Gallon Drum		X 55	
Total Volume Estimated Using Eyeball Method			

Measured Volume Method: This may take several calculations as you may have to break down the Odd shaped spill to rectangles, circles, and polygons. It is important that, if possible, measure depth in several locations and use an average depth. Use the SOCS Volume Estimate by Area Work Sheet to Sketch the shapes and show your work.

Duration and Flow Rate Method:

Start Date and Time	1.
End Date and Time	2.
SOCS Event Total Time Elapsed (Subtract Line 1 from Line 2. Show in minutes)	3.
Average Flow Rate GPM (Account for diurnal flow pattern)	4.
Total Volume Estimated Using Duration and Flow Method (Line 3 x Line 4)	5.

See SFPUC WWE Overflow Response, Mitigation, Documentation, and Reporting SOP, Appendix A for examples of manhole flow rates from a 27 ¾" lid.

SFPUC: Overflow Emergency Response Plan	WS-3-1
SOCS Measured Volume Estimation Method Calculations (27 ¾”Manhole Cover Flow Rates)	

1 GPM

3 GPM

5 GPM

7 GPM

10 GPM

15 GPM

SOCS Measured Volume Estimation Method Calculations (27 ¾”Manhole Cover Flow Rates)

WS-3-2

20 GPM

25 GPM

30 GPM

35 GPM

40 GPM

45 GPM

SFPUC: Overflow Emergency Response Plan	WS-3-3
SOCS Measured Volume Estimation Method Calculations (27 ¾”Manhole Cover Flow Rates)	

50 GPM

1/4” Air Vent
Bubble Height

75 GPM

1” Air Vent
Bubble Height

100 GPM

1.5 ” Air Vent
Bubble Height

125 GPM

2” Air Vent
Bubble Height

SOCS Measured Volume Estimation Method Calculations (27 ¾”Manhole Cover Flow Rates)

WS-3-4

150 GPM

3” Air Vent
Bubble Height

175 GPM

3.5” Air Vent
Bubble Height

200 GPM

4” Air Vent
Bubble Height

SFPUC: Overflow Emergency Response Plan	WS-4
Sewer Overflow in the Combined System (SOCS) Containment	

SPILL CONTAINMENT

Containment Implemented: _____ AM PM

Date: _____ / _____ / _____

Containment Measures: Plugged Storm Drain(s) Washed Down

Vacuum Up Sewage Other Measures: _____

_____

_____

Comments: _____

_____

_____

_____

_____

_____

_____

TAKE PHOTOS OF CONTAINMENTS EFFORTS/OUTCOMES

SFPUC: Overflow Emergency Response Plan	WS-5
Sewer Overflow in the Combined System (SOCS) Clean Up, Milestones, and Reporting	

CLEAN UP

Clean Up Begin: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

Clean Up Complete: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

Describe Clean Up Operations: _____

_____

OTHER IMPORTANT MILESTONES

Contacted Supervisor: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

Requested Additional EE's/Equip: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

Requested Additional EE's/Equip: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

Requested Additional EE's/Equip: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

_____: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

CAUSE OF SPILL

Spill Cause: ☐ Roots Grease ☐ Debris ☐ Vandalism ☐ Pump/Lift Sta Failure ☐ Other: _____

☐ Spill Caused to be determined by CCTV inspection. (Attach TV Report to this form)

Final Cause Determination: _____

_____

Proper Operation and Maintenance Determination:

Date Last Cleaned: _____ Date Last TV'd: _____ Date Last Replaced/Rehabilitated: _____

Follow-up or Corrective Action Taken: _____

_____

_____

Sewer Overflow in the Combined System (SOCS) Volume by Area Estimation Worksheet

WS-6

CONVERSIONS

** To convert inches into feet: Divide the inches by 12.

Example: 27" / 12 = 2.25'

Or Use Chart A

Example: 1 ¾" = ?

1" (0.08') + ¾" (0.06') = 0.14'

** One Cubic Foot = 7.48 gallons of liquid.

Chart A

Conversion:

Inches to Feet

Wet Asphalt	=	.0013
Wet Concrete	=	.0026
1/8"	=	0.01'
1/4"	=	0.02'
3/8"	=	0.03'
1/2"	=	0.04'
5/8"	=	0.05'
3/4"	=	0.06'
7/8"	=	0.07'
1"	=	0.08'
2"	=	0.17'
3"	=	0.25'
4"	=	0.33'
5"	=	0.42'
6"	=	0.50'
7"	=	0.58'
8"	=	0.67'
9"	=	0.75'

SFPUC: Overflow Emergency Response Plan	WS-7
Sewer Overflow in the Combined System (SOCS) Area Estimation Worksheet	

GEOMETRY

For the purposes of this work sheet, the unit of measurement will be in feet for formula examples.

Area is two-dimensional - represented in square feet. (Length x Width)

Volume is three-dimensional - represented in cubic feet. (Length x Width x depth) or (Diameter Squared) D^2 x 0.785 x depth.

A Note about Depth

Wet Stain on a Concrete Surface - For a stain on concrete, use 0.0026'. This number is 1/32" converted to feet. For a stain on asphalt use 0.0013' (1/64"). These were determined to be a reasonable depth to use on the respective surfaces through a process of trial and error by SPUC staff. A known amount of water (one gallon) was poured onto both asphalt and concrete surfaces. Once the Area was determined as accurately as possible, different depths were used to determine the volume of the wetted footprint until the formula produced a result that (closely) matched the one gallon spilled. 1/32" was the most consistently accurate depth on concrete and 1/64" for asphalt. This process was repeated several times.

Sewage "Ponding" or Contained – Measure actual depth of standing sewage whenever possible. When depth varies, measure several (representative) points, determine the average and use that number in your formula to determine volume.

Area/Volume Formulas

Area is two dimensional and is represented as Square Feet (SQ/FT)

Volume is three dimensional and is represented as Cubic Feet (CU/FT)

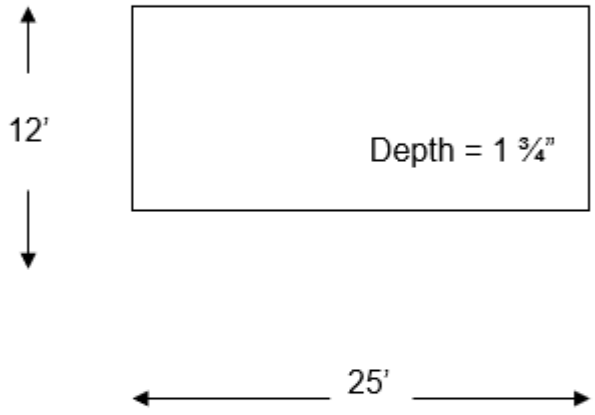
One Cubic Foot = 7.48 gallons

Sewer Overflow in the Combined System (SOCS) Volume by Area Estimation Worksheet

WS-8

AREA/VOLUME OF A RECTANGLE OR SQUARE

Formula: **Length x Width x Depth** = Volume in Cubic Feet



Length (25') x Width (12') x Depth (0.14')

25' x 12' x 0.14' = 42 Cubic Feet.

Now the Volume in Cubic Feet is known.

There are 7.48 Gallons in one Cubic Foot

Chart A

Conversion:

Inches to Feet

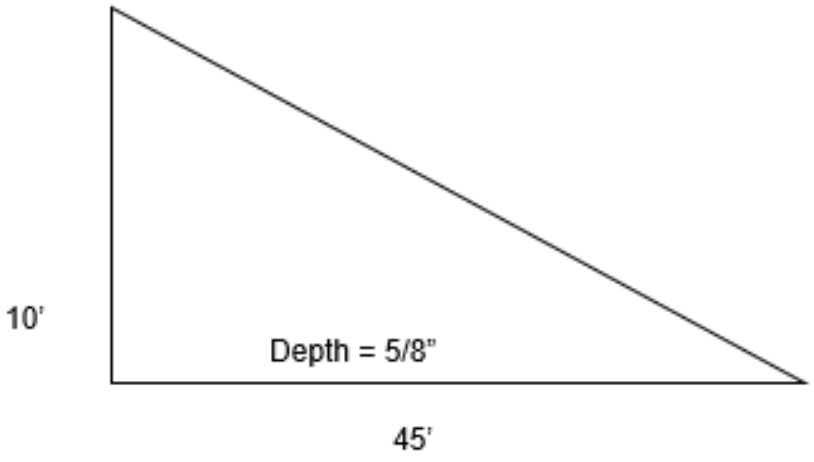
Wet Asphalt	=	.0013
Wet Concrete	=	.0026
1/8"	=	0.01'
1/4"	=	0.02'
3/8"	=	0.03'
1/2"	=	0.04'
5/8"	=	0.05'
3/4"	=	0.06'
7/8"	=	0.07'
1"	=	0.08'
2"	=	0.17'
3"	=	0.25'
4"	=	0.33'
5"	=	0.42'
6"	=	0.50'
7"	=	0.58'
8"	=	0.67'
9"	=	0.75'

Sewer Overflow in the Combined System (SOCS) Volume by Area Estimation Worksheet

WS-9

AREA/VOLUME OF A RIGHT TRIANGLE

Base x Height x 0.5 x Depth = Volume in Cubic Feet



Base (45') x Height (10') x 0.5 x Depth (.05') x 7.48 gallons/cubic foot = **84 gallons**

For Isosceles Triangles (two sides are equal lengths), Break it down into two Right Triangles and compute area as you would for the Right Triangle above.

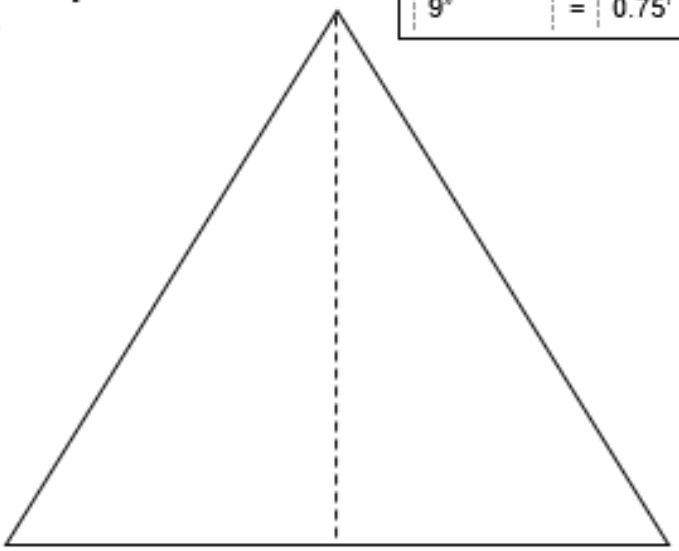


Chart A

Conversion:

Inches to Feet

Wet Asphalt	=	.0013
Wet Concrete	=	.0026
1/8"	=	0.01'
1/4"	=	0.02'
3/8"	=	0.03'
1/2"	=	0.04'
5/8"	=	0.05'
3/4"	=	0.06'
7/8"	=	0.07'
1"	=	0.08'
2"	=	0.17'
3"	=	0.25'
4"	=	0.33'
5"	=	0.42'
6"	=	0.50'
7"	=	0.58'
8"	=	0.67'
9"	=	0.75'

SFPUC: Overflow Emergency Response Plan	WS-10
Sewer Overflow in the Combined System (SOCS) Volume by Area Estimation Worksheet	

Surface: ☐ Asphalt ☐ Concrete ☐ Dirt ☐ Landscape ☐ Inside Building

☐ Other _____

1. Draw a sketch on this page using the **SOCS Volume Estimate by Area Work Sheet** immediately after this page, or use a copy of the PUC Block Book to draw on and attach it to this package.
2. Draw shapes and dimensions used on your sketch.
3. Use correct formula for various shapes.

SFPUC: Overflow Emergency Response Plan	
Sewer Overflow in the Combine System (SOCS) Volume by Area Estimation Worksheet	**WS-11 Side A**

Area #1 **(Rectangle)** L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

Area #2 **(Rectangle)** L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

Area #3 **(Rectangle)** L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

SFPUC: Overflow Emergency Response Plan

Sewer Overflow in the Combined System (SOCS) Volume by Area Estimation Worksheet

WS-11 Side B

Area #4

(Rectangle) L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

Area #5

(Rectangle) L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

Area #6

(Rectangle) L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

Total Volume: #1 _____ + #2 _____ + #3 _____ + #4 _____ + #5 _____ + #6 _____

= _____ Gallons Spilled

SFPUC: Overflow Emergency Response Plan	WS-12
Sewer Overflow in the Combined System (SOCS) Volume by Area Estimation Worksheet	

Area Volume of Circle/Cylinder

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

(Circle) Dia x Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Diameter = Any straight line segment that passes through the center of a circle

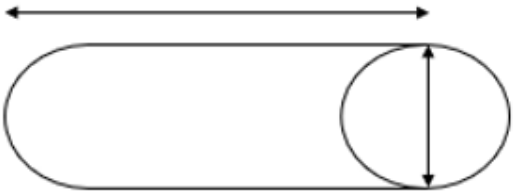
For our purposes: It is the measurement across the widest part of the circle.

Dia X Dia (D2 x 0.785 = Volume in cubic feet.

Example:

27 x 27 x 0.785 x 0.03 = 17.17 Cubic Feet

17.17 Cubic Feet x 7.48 Gallons/Cubic Feet = 128 Gallons



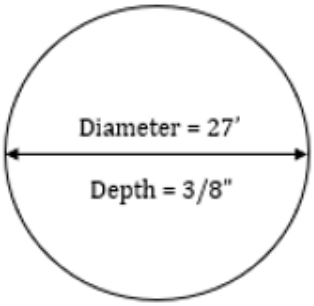
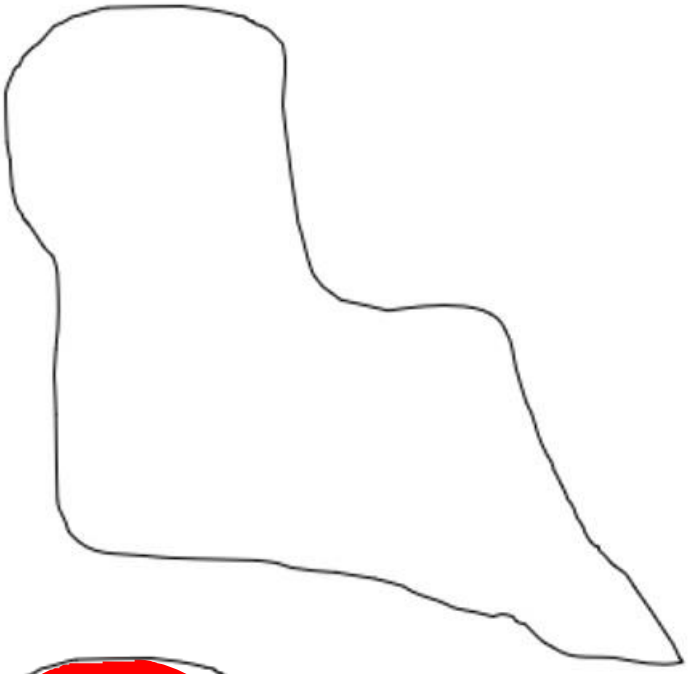


Chart A		
Conversion: Inches to Feet		
Wet Asphalt	=	.0013
Wet Concrete	=	.0026
1/8"	=	0.01'
1/4"	=	0.02'
3/8"	=	0.03'
1/2"	=	0.04'
5/8"	=	0.05'
3/4"	=	0.06'
7/8"	=	0.07'
1"	=	0.08'
2"	=	0.17'
3"	=	0.25'
4"	=	0.33'
5"	=	0.42'
6"	=	0.50'
7"	=	0.58'
8"	=	0.67'
9"	=	0.75'

SFPUC: Overflow Emergency Response Plan	
Sewer Overflow in the Combined System (SOCS) Volume by Area Estimation Worksheet	**WS-13 Side A**

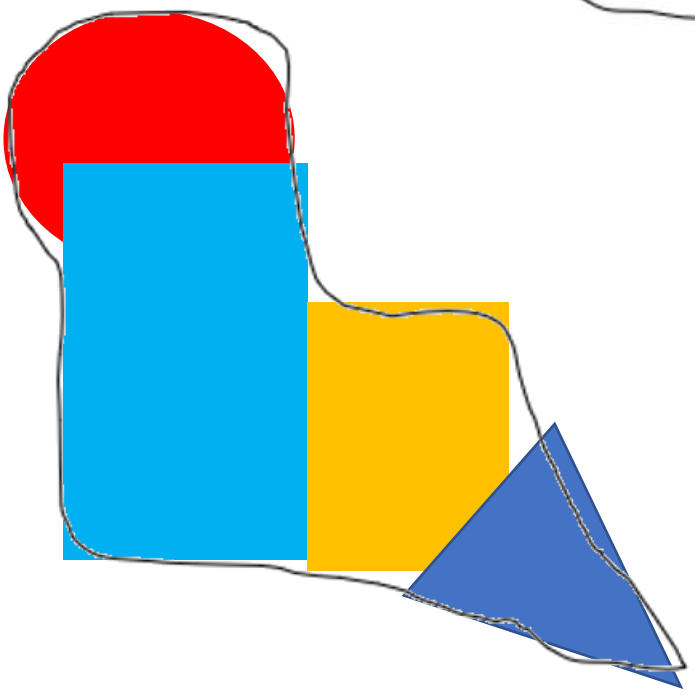
Step 1

Sketch the outline of the spill in a black line.



Step 2

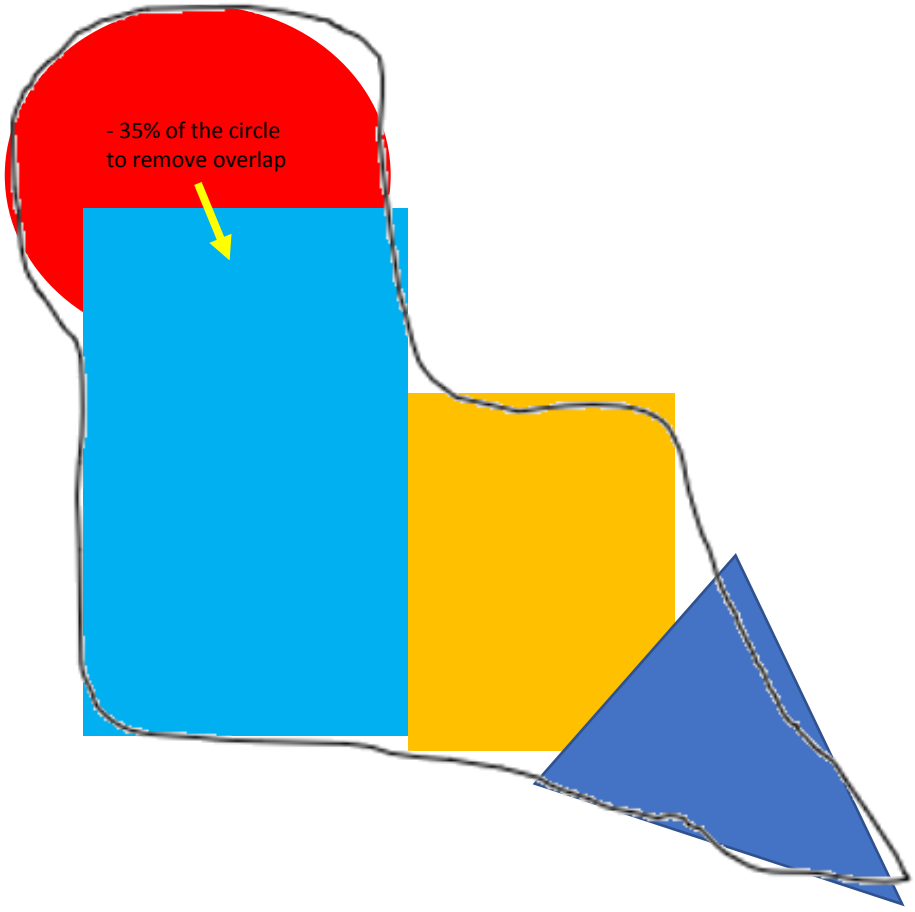
Break the sketch down into recognizable shapes (circles, squares, etc.) as well as you can.



SFPUC: Overflow Emergency Response Plan	
Sewer Overflow in the Combined System (SOCS) Volume by Area Estimation Worksheet	**WS-13 Side B**

Step 3

Determine the volume of each shape. (Note: In this example, after the volume of the circle is determined, multiply it by approximately 65% so that the overlap with the rectangle area won't be counted twice.)

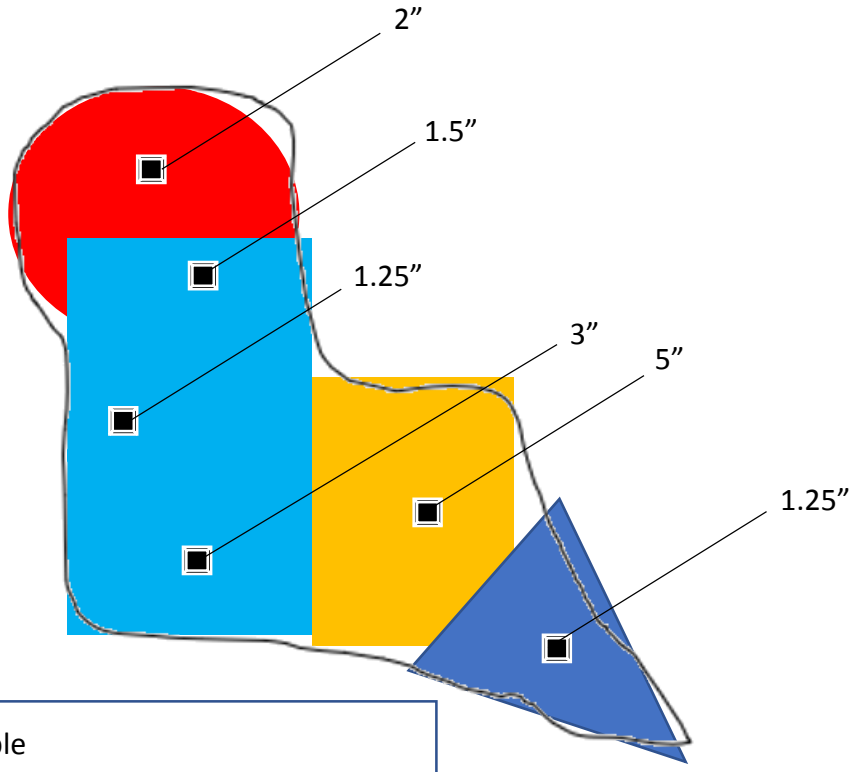


Sewer Overflow in the Combined System (SOCS) Volume by Area Estimation Worksheet

WS-13 Side C

Step 4

If the spill is of varying depths, take several measurements at different depths and find the average.
If the spill affects a dry unimproved area such as a field or dirt parking lot, determine the area of the wetted ground in the same manner as you would on a hard surface. Using a round-pointed shovel, dig down into the soil until you find dry soil. Do this in several locations within the wetted area and measure the depth of the wet soil. Average the measurement/thickness of the wet soil and determine the average depth of the wet soil.



Average Depth Example

2” + 1.5” +1.25” + 3” + 5” + 1.25” = 14.0”
14.0” ÷ 6 measurements = 2.33”
Average Depth = 2.33” (0.194’)

SFPUC: Overflow Emergency Response Plan	WS-14
Sewer Overflow in the Combined System (SOCS) Volume by Area Estimation Worksheet	

Drawing Worksheet

SFPUC: Overflow Emergency Response Plan	WS-15
Sewer Overflow in the Combined System (SOCS) Worksheet	

Drawing Worksheet

SFPUC: Overflow Emergency Response Plan	WS-16
Sewer Overflow in the Combined System (SOCS) Worksheet	

Drawing Worksheet

Appendix E - Sewer Operations SSO Overflow Response Packets

Sanitary Sewer Overflow (SSO) Response Packet (Version 15)

- ❑ If this is a Category 1 SSO greater than or equal to 1,000 gallons, immediately contact the following within 2 hours:
  - CALOES (800) 852-7550
  - SF Department of Public Health: (415) 215-0805

- ❑ **For Water Sampling:** Millbrae Dispatch (650) 872-5900

- ❑ **For any media inquiries/requests:** Contact your Supervisor or Manager

SEWER SERVICE WORKER:	**CHAIN OF CUSTODY:**
❑ Open this envelope. ❑ Follow the instructions on the Overflow Response Flowchart. ❑ Complete the chain of custody record (to the right) and deliver this package to the SSO inbox located outside of the designated Supervisors office.	**Print Name:** _____ **Initial:** _____ **Date:** _____ **Time:** _____

SEWER REPAIR SUPERVISOR:	**CHAIN OF CUSTODY:**
❑ Open this envelope and review forms. Contact the Sewer Service Worker if needed to obtain additional information. ❑ Enter data into CIWQS. ❑ File this package.	Print Name: _____ Phone #: _____ Initial: _____ Date: _____ Time: _____

SFPUC: Overflow Emergency Response Plan	A-1 Side A
SSO Regulatory Reporting Guide	

Reporting Instructions

Deadline	**See reverse side for contact information and definitions of the overflow categories.**		
	Category 1	Category 2	Category 3
2 Hours after awareness of an Overflow	If SSO is equal to or greater than 1,000 gallons, call CAL OES and SF Department of Public Health	-	-
As soon as possible	If SSO impacts private property that may be a failure of the sewer main and/or if a claim for damages may be submitted against the city, notify the Claims Office.		
48 hours after awareness of an Overflow	If 50,000 gallons or more were not recovered, begin water quality sampling	-	-
3 Business Days after awareness of an Overflow	Submit draft report in the CIWQS database.	Submit draft report in the CIWQS database.	-
15 Days after response conclusion	Certify spill report in CIWQS. Update as needed until 120 days after overflow end date.	Certify spill report in CIWQS. Update as needed until 120 days after overflow end date	-
30 Days after end of calendar month in with Overflow occurred.			Certify spill report in CIWQS. Update as needed until 120 days after overflow end date
45 Days after Overflow end date.	If 50,000 gallons or more was not recovered, submit CIWQS SSO Technical Report in CIWQS.	-	-

CONTACT INFORMATION

CAL OES	(800) 852-7550
SF Department of Health	(415) 215-0805
Claims Office (Refer to current City Attorney Investigator On-Call List after work hours)	Theresa Lacson-Kuan M-F 8AM-5PM (925) 285-6416
Millbrae Dispatch (Water Quality Sampling)	Natural Resources Land Management Division (NRLMD) (650) 872-5900
San Francisco Regional Water Quality Control Board (SFRWQCB)	Phone: (510) 622-2369 Fax: (510) 622-2460
State Water Resources Control Board	(916) 341-5586

Category	Definition
1	Discharges of untreated or partially treated wastewater of any volume resulting from an enrollee's sanitary sewer system failure or flow condition that: - Reach surface water and/or reach a drainage channel tributary to a surface water; or - Reach a Municipal Separate Storm Sewer System (MS4) and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the MS4 is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or groundwater infiltration basin (e.g., infiltration pit, percolation pond).
2	Discharges of untreated or partially treated wastewater of 1,000 gallons or greater resulting from an enrollee's sanitary sewer system failure or flow condition that do not reach surface water, a drainage channel, or a MS4 unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly.
3	All other discharges of untreated or partially treated wastewater resulting from an enrollee's sanitary sewer system failure or flow condition.
Private Lateral Sewage Discharge (PLSD)	Discharges of untreated or partially treated wastewater resulting from blockages or other problems **within a privately owned sewer lateral** connected to the enrollee's sanitary sewer system or from other private sewer assets. PLSDs that the enrollee becomes aware of may be **voluntarily** reported to the California Integrated Water Quality System (CIWQS) Online SSO Database.

Sanitary Sewer Overflow Flowchart

B-1

Start Here

Cause of the overflow in the City Owned Sewer Line?

No

Complete Door Hanger and provide to the customer/property owner or hang on door/gate.

Completed

Yes

Is the Overflow a Category 1 =/> than 1,000 gallons?

Yes

Notify CAL OES and the SF Department of Health within 2 Hours of becoming aware of the overflow.

No

Is there property damage?

No

Yes

Notify Claims Office

OVERFLOW CONTAINMENT/MITIGATION

Refer to and follow Overflow Response and Documentation SOP

1. Document arrival time.
2. Cover unplugged storm drains with mats or use dykes, berms, or sand to divert/contain sewage (Photos).
3. Secure site from public and/or post warning signs (Photos)
4. Estimate the volume of the overflow (Photos).
5. Break the blockage (Photos).
6. Draw a diagram of the spill if using Measured Volume Estimation method.
7. Clean up the overflow (liquid and solids) (Photos).
8. Walk the overflow site to ensure it is completely clean (Photos).
9. Document completion time.
10. Establish Start Time.

If a Category 1, did 50,000 or more gallons reach state waters?

Yes

Notify Millbrae Dispatch to have Lab conduct sampling within 48 hours. Provide a map with desired sampling locations.

No

Completed

SFPUC: Overflow Emergency Response Plan	C-1
Sanitary Sewer Overflow Notifications	

NOTIFICATIONS	
CAL OES (800) 852-7550	
Notification Date/Time:	
Name of Whom You Spoke To:	
OES Control Number:	
SF Department of Health (415) 215-0805	
Notification Date/Time:	
Name of Whom You Spoke To: Left Message: ☐	
Millbrae Lab (650) 872-5900	
Notification Date/Time:	
Name of Whom You Spoke To: Left Message: ☐	
Claims Office (During Work Hours:(925) 285-6416) On Call List After Work Hours	
Notification Date/Time:	
Name of Whom You Spoke To: Left Message: ☐	

SFPUC: Overflow Emergency Response Plan	D-1
Sanitary Sewer Overflow Location and Volume by Destination	

MAXIMO WORK ORDER #: _____

SSO FIELD REPORT		
PHYSICAL LOCATION DETAILS		
Spill Location Name		
Latitude of spill location		
Longitude of spill location		
County	San Francisco	
Regional Water Quality Control Board	Region 2 – San Francisco Bay	
VOLUMES BY DESTINATION	Volume Spilled (Gallons)	Volume Recovered (Gallons)
2.a/2.b Estimated spill volume that reached a separate storm drain that flows to a surface body of water? (If not all recovered, this is a Category 1)		
2.c/2d Estimated spill volume that directly reached a drainage channel that flows to a surface water body? (Any volume spilled is a Category 1)		
2.e/2.f Estimated spill volume discharged directly to a surface water body? (Any volume spilled is a Category 1)		
2.g/2.h Estimated spill volume discharged to land? (Includes discharges directly to land, and discharges to a storm drain system or drainage channel that flows to a storm water infiltration/retention structure, field, or other non-surface water location. Also, includes backups to building structures).		
	Volume Spilled	Volume Recovered
Total Volume Spilled (Verify this matches the table in between 2.h and 3 in CIWQS)		

SFPUC: Overflow Emergency Response Plan	D-2
Sanitary Sewer Overflow Location, Appearance Points, and Destination	

SSO FIELD REPORT	
Spill location description.	
Number of appearance points.	
Spill appearance points. (Circle all that are apply) Backflow Prevention Device Force Main Gravity Mainline Inside Building/Structure Lateral Clean Out (Private / Public) Lower Lateral (Private / Public) Manhole Pump Station Upper Lateral (Private / Public) Other Sewer System Structure	
Spill appearance point explanation. (Enter information here if “Other” or multiple appearance points were selected):	
Final spill destination. (Circle all that apply). Beach Building/Structure Combined Storm Drain Drainage Channel Other (Specify Below) Paved Surface Separate Storm Drain Street/Curb and Gutter Surface Water Unpaved Surface	
Explanation of final spill destination. (Enter information if “Other” was selected.	

Sanitary Sewer Overflow Time Milestones

DATE/TIME DETERMINATIONS		
	DATE	TIME
Estimated Spill Start Date/Time		
SFPUC Notified Date/Time		
Estimated Operator Arrival Date/Time		
Estimated Spill End Date/Time		
Spill Response Completion Date/Time		

USE START/END TIME WORKSHEET (WS-1)

Sanitary Sewer Overflow Cause

SSO FIELD REPORT

Spill cause: (Circle One)

Air Relief Valve (ARV)/Blow Off Valve (BOV) Failure
Construction Diversion Failure
CS Maintenance Caused Spill/Damage
Damage by Others Not Related to CS Construction/Maintenance (Specify Below)
Debris from Construction
Debris from Lateral
Debris-General
Debris-Rags
Debris Wipes/Non-Dispersible
Flow Exceeded Capacity (Separate CS Only)
Grease Deposition (FOG)
Inappropriate Discharge to CS
Natural Disaster
Operator Error
Other (Specify Below)
Pipe Structural Problem/Failure
Pipe Structural Problem/Failure – Installation
Pump Station Failure – Controls
Pump Station Failure – Mechanical
Pump Station Failure – Power
Rainfall Exceeded Design, I and I (Separate CS Only)
Root Intrusion
Siphon Failure
Surcharged Pipe (Combined CS Only)
Vandalism

Spill cause explanation: (Required if Spill Cause is “Other”)

SFPUC: Overflow Emergency Response Plan	D-5
Sanitary Sewer Overflow Failures, Association, Asset, and Response Activities	

SSO FIELD REPORT

Where did failure occur?

Air Relief Valve (ARV)/Blow Off Valve (BOV) Failure Force Main Gravity Mainline
Lower Lateral (Public) Manhole Other (Specify Below) Pump Station Failure – Controls
Pump Station Failure – Mechanical Pump Station Failure – Power
Siphon Upper Lateral (Public)

Explanation of where failure occurred: (Required if Where Failure Occurred is "Other")

Was Spill associated with a storm event?	YES	NO
Diameter of sewer pipe at the point of blockage or failure.		Inches
Material of sewer pipe at the point of blockage or failure.		
Estimated age of sewer asset at the point of blockage or failure (if applicable):		YEARS

Spill Response Activities. (Circle all that apply) Cleaned-Up Mitigated Effects of Spill
Contained All or Portion of Spill Other (Specify Below) Restored Flow
Returned All Spoil to Sanitary Sewer System Property Owner Notified
Other Enforcement Agency Notified

Explanation of spill response activities: (Required if spill response activities is "Other")

SSO FIELD REPORT

Spill corrective action taken: (Circle all that apply)

Added Sewer To Preventive Maintenance Program
Adjusted Schedule/Method of Preventive Maintenance
Enforcement Action Against FOG Source
Inspected Sewer Using CCTV to Determine Cause
Other (Specify Below)
Plan Rehabilitation or Replacement of Sewer
Repaired Facilities or Replaced Defect

Explanation of corrective action taken: (Required if spill corrective action is “Other”)

Is there an ongoing investigation?	YES	NO
Health warnings posted?	YES	NO
Did spill result in beach closure	YES	NO

Name of Impacted Beach(es): (Enter N/A if none)

Name of impacted surface waters:

Sanitary Sewer Overflow Water Quality Samples and Volume Estimation Method

SSO FIELD REPORT

Water quality samples analyzed for: (Circle all that apply)

Dissolved Oxygen
Other Chemical Indicators(s) – Specify Below
Biological Indicator(s) – Specify Below
No Water Quality Samples Taken
Not Applicable to the Spill
Other (Specify Below)

Explanation of water quality samples analyzed for: (Required if water quality samples analyzed for is "Other chemical indicator(s)", "Biological indicator(s)", or "Other")

Water quality sample results reported to: (Circle all that apply) County Health Agency Regional Water Quality Control Board Other (Specify Below) No Water Quality Samples Taken Not Applicable to this Spill

Explanation of water quality sample results reported to: (Required if water quality sample results reported to is “Other”)

Method and explanation of volume estimation methods used: (Circle all that apply)
Eyeball Estimate Measured Volume Duration and Flow Rate
PUC Overflow Flow Rate Estimating Tool
Other (Explain): _____

SFPUC: Overflow Emergency Response Plan	WS-1
Sanitary Sewer Overflow (SSO) Estimation Method Calculations	

Start Time Determination/Notes

Caller Interview: Where did you see sewage spill from? Manhole ☐ Inside Building ☐

Vent/Clean Out ☐ Catch Basin ☐ Wet Well/Lift Station ☐ Other _____

Comments: _____

_____

Last Time Caller Observed NO Spill occurring: _____ AM / PM Date _____ /_____ /_____

Comments: _____

_____

If the volume of the SSO and rate of flow are known, divide volume by rate of flow to get duration of SSO event.

_____Gallons ÷ _____GPM = _____ Minutes (SSO Duration). Subtract the Duration from the SSO End Date/Time to establish the SSO Start Date/Time.

Other Efforts to Determine Start Time: _____

_____

Other Comments Regarding Spill Start Time: _____

_____

_____

Estimated SSO Start Time: _____ AM / PM Date: _____ / _____ / _____

SSO End Time: _____ AM / PM Date: _____ / _____ / _____

SFPUC: Overflow Emergency Response Plan	WS-2
Sanitary Sewer Overflow Estimation Method Calculations	

Eyeball Estimate Method: Imagine a bucket(s) or barrel(s) of water tipped over.

Size of bucket(s) or barrel(s)	How many of this size?	Multiplier	Total Volume Estimated
1 Gallon Water Jug		X 1	
5 Gallon Bucket		X 5	
32 Gallon Trash Can		X 32	
55 Gallon Drum		X 55	
Total Volume Estimated Using Eyeball Method			

Measured Volume Method: This may take several calculations as you may have to break down the Odd shaped spill to rectangles, triangles, and circles. It is important that, if possible, measure depth in several locations and use an average depth. Use the SSO Volume Estimate by Area Work Sheet to Sketch the shapes and show your work.

Duration and Flow Rate Method:

Start Date and Time	1.
End Date and Time	2.
SSO Event Total Time Elapsed (Subtract Line 1 from Line 2. Show in minutes)	3.
Average Flow Rate GPM (Account for diurnal flow pattern)	4.
Total Volume Estimated Using Duration and Flow Method (Line 3 x Line 4)	5.

See SFPUC WWE Overflow Response, Mitigation, Documentation, and Reporting SOP, Appendix A for examples of manhole flow rates from a 27 ¾" lid.

SFPUC: Overflow Emergency Response Plan	WS-3-1
Sanitary Sewer Overflow Measured Volume Estimation Method Calculations (27 ¾”Manhole Cover Flow Rates)	

1 GPM

3 GPM

5 GPM

7 GPM

10 GPM

15 GPM

Sanitary Sewer Overflow Measured Volume Estimation Method Calculations (27 ¾”Manhole Cover Flow Rates)

20 GPM

25 GPM

30 GPM

35 GPM

40 GPM

45 GPM

Sanitary Sewer Overflow Measured Volume Estimation Method Calculations (27 ¾”Manhole Cover Flow Rates)

WS-3-3

50 GPM

1/4” Air Vent
Bubble Height

75 GPM

1” Air Vent
Bubble Height

100 GPM

1.5 ” Air Vent
Bubble Height

125 GPM

2” Air Vent
Bubble Height

Sanitary Sewer Overflow Measured Volume Estimation Method Calculations (27 ¾”Manhole Cover Flow Rates)

WS-3-4

150 GPM

3” Air Vent
Bubble Height

175 GPM

3.5” Air Vent
Bubble Height

200 GPM

4” Air Vent
Bubble Height

Sanitary Sewer Overflow Containment

WS-4

SPILL CONTAINMENT

Containment Implemented: _____ ☐ AM ☐ PM

Date: _____ / _____ / _____

Containment Measures: ☐ Plugged Storm Drain(s) ☐ Washed Down

☐ Vacuum Up Sewage ☐ Turn Off Downstream Pump Station (Mission Bay & Treasure Is.)

☐ Other Measures: _____

_____

_____

Comments: _____

_____

_____

_____

_____

_____

_____

TAKE PHOTOS OF CONTAINMENTS EFFORTS/OUTCOMES

Sanitary Sewer Overflow Clean Up/Milestones/Reporting

WS-5

CLEAN UP

Clean Up Begin: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

Clean Up Complete: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

Describe Clean Up Operations: _____

_____

OTHER IMPORTANT MILESTONES

Contacted Supervisor: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

Requested Additional EE's/Equip: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

Requested Additional EE's/Equip: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

Requested Additional EE's/Equip: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

_____: _____ ☐ AM ☐ PM Date: _____ / _____ / _____

CAUSE OF SPILL

Spill Cause: ☐ Roots Grease ☐ Debris ☐ Vandalism ☐ Pump/Lift Sta Failure ☐ Other: _____

☐ Spill Caused to be determined by CCTV inspection. (Attach TV Report to this form)

Final Cause Determination: _____

_____

Proper Operation and Maintenance Determination:

Date Last Cleaned: _____ Date Last TV'd: _____ Date Last Replaced/Rehabilitated: _____

Follow-up or Corrective Action Taken: _____

_____

_____

Sanitary Sewer Overflow Volume by Area Estimation Worksheet

WS-6

CONVERSIONS

** To convert inches into feet: Divide the inches by 12.

Example: 27" / 12 = 2.25'

Or Use Chart A

Example: 1 ¾" = ?

1" (0.08') + ¾" (0.06') = 0.14'

** One Cubic Foot = 7.48 gallons of liquid.

Chart A

Conversion:

Inches to Feet

Wet Asphalt	=	.0013
Wet Concrete	=	.0026
1/8"	=	0.01'
1/4"	=	0.02'
3/8"	=	0.03'
1/2"	=	0.04'
5/8"	=	0.05'
3/4"	=	0.06'
7/8"	=	0.07'
1"	=	0.08'
2"	=	0.17'
3"	=	0.25'
4"	=	0.33'
5"	=	0.42'
6"	=	0.50'
7"	=	0.58'
8"	=	0.67'
9"	=	0.75'

SFPUC: Overflow Emergency Response Plan	WS-7
Sanitary Sewer Overflow Volume by Area Estimation Worksheet	

GEOMETRY

For the purposes of this work sheet, the unit of measurement will be in feet for formula examples.

Area is two-dimensional - represented in square feet. (Length x Width)

Volume is three-dimensional - represented in cubic feet. (Length x Width x depth) or (Diameter Squared) D^2 x 0.785 x depth.

A Note about Depth

Wet Stain on a Concrete Surface - For a stain on concrete, use 0.0026'. This number is 1/32" converted to feet. For a stain on asphalt use 0.0013' (1/64"). These were determined to be a reasonable depth to use on the respective surfaces through a process of trial and error by SPUC staff. A known amount of water (one gallon) was poured onto both asphalt and concrete surfaces. Once the Area was determined as accurately as possible, different depths were used to determine the volume of the wetted footprint until the formula produced a result that (closely) matched the one gallon spilled. 1/32" was the most consistently accurate depth on concrete and 1/64" for asphalt. This process was repeated several times.

Sewage "Ponding" or Contained – Measure actual depth of standing sewage whenever possible. When depth varies, measure several (representative) points, determine the average and use that number in your formula to determine volume.

Area/Volume Formulas

Area is two dimensional and is represented as Square Feet (SQ/FT)

Volume is three dimensional and is represented as Cubic Feet (CU/FT)

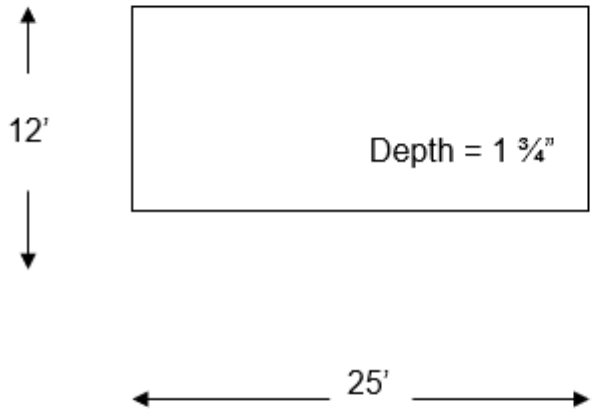
One Cubic Foot = 7.48 gallons

Sanitary Sewer Overflow Volume by Area Estimation Worksheet

WS-8

AREA/VOLUME OF A RECTANGLE OR SQUARE

Formula: **Length x Width x Depth** = Volume in Cubic Feet



Length (25') x Width (12') x Depth (0.14')

25' x 12' x 0.14' = 42 Cubic Feet.

Now the Volume in Cubic Feet is known.

There are 7.48 Gallons in one Cubic Foot

Chart A

Conversion:

Inches to Feet

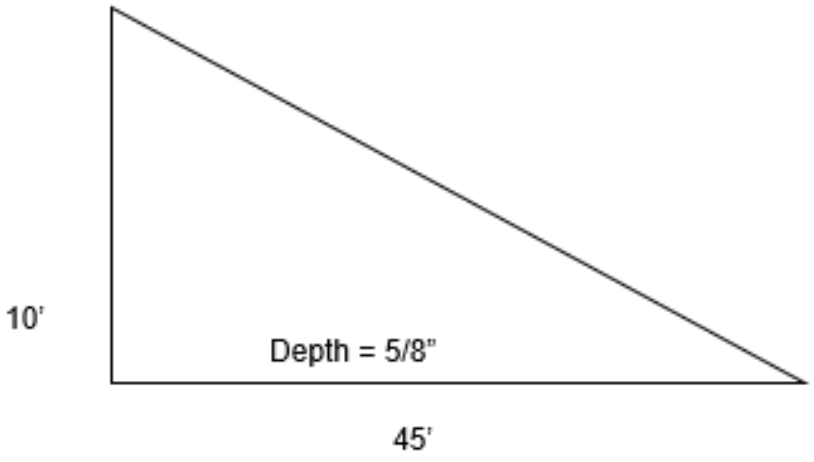
Wet Asphalt	=	.0013
Wet Concrete	=	.0026
1/8"	=	0.01'
1/4"	=	0.02'
3/8"	=	0.03'
1/2"	=	0.04'
5/8"	=	0.05'
3/4"	=	0.06'
7/8"	=	0.07'
1"	=	0.08'
2"	=	0.17'
3"	=	0.25'
4"	=	0.33'
5"	=	0.42'
6"	=	0.50'
7"	=	0.58'
8"	=	0.67'
9"	=	0.75'

Sanitary Sewer Overflow Volume by Area Estimation Worksheet

WS-9

AREA/VOLUME OF A RIGHT TRIANGLE

Base x Height x 0.5 x Depth = Volume in Cubic Feet



Base (45') x Height (10') x 0.5 x Depth (.05') x 7.48 gallons/cubic foot = **84 gallons**

For Isosceles Triangles (two sides are equal lengths), Break it down into two Right Triangles and compute area as you would for the Right Triangle above.

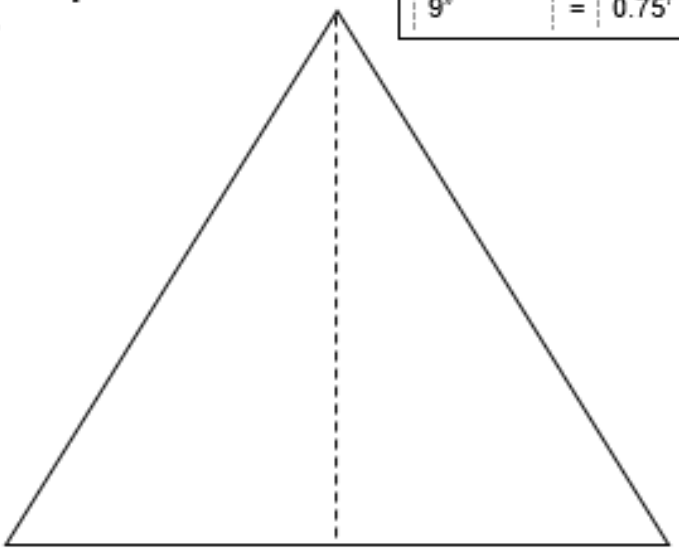


Chart A

Conversion:

Inches to Feet

Wet Asphalt	=	.0013
Wet Concrete	=	.0026
1/8"	=	0.01'
1/4"	=	0.02'
3/8"	=	0.03'
1/2"	=	0.04'
5/8"	=	0.05'
3/4"	=	0.06'
7/8"	=	0.07'
1"	=	0.08'
2"	=	0.17'
3"	=	0.25'
4"	=	0.33'
5"	=	0.42'
6"	=	0.50'
7"	=	0.58'
8"	=	0.67'
9"	=	0.75'

SFPUC: Overflow Emergency Response Plan	WS-10
Sanitary Sewer Overflow (SSO) Volume by Area Estimation Worksheet	

Surface: ☐ Asphalt ☐ Concrete ☐ Dirt ☐ Landscape ☐ Inside Building

☐ Other _____

1. Draw a sketch on this page using the **SSO Volume Estimate by Area Work Sheet** immediately after this page, or use a copy of the PUC Block Book to draw on and attach it to this package.
2. Draw shapes and dimensions used on your sketch.
3. Use correct formula for various shapes.

Sanitary Sewer Overflow Volume by Area Estimation Worksheet

WS-11 Side A

Area #1

(Rectangle) L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

Area #2

(Rectangle) L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

Area #3

(Rectangle) L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

Sanitary Sewer Overflow Volume by Area Estimation Worksheet

WS-11 Side B

Area #4

(Rectangle) L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

or

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

Area #5

(Rectangle) L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

==========

Area #6

(Rectangle) L x W = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Triangle) L X W X .5 = SQ FT x Depth = Volume x 7.48 x %Wet = Gallons

Length _____ x Width _____ x .5 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

---

(Circle) Dia X Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

Total Volume: #1 _____ + #2 _____ + #3 _____ + #4 _____ + #5 _____ + #6 _____

= _____ Gallons Spilled

SFPUC: Overflow Emergency Response Plan	WS-12
Sanitary Sewer Overflow Volume by Area Estimation Worksheet	

Area Volume of Circle/Cylinder

Dia _____ x Dia _____ x 0.785 x Depth _____ x 7.48 x ____ %Wet = _____ Gallons

(Circle) Dia x Dia x 0.785 x Depth = SQFT x Depth = Volume x 7.48 x %Wet = Gallons

Diameter = Any straight line segment that passes through the center of a circle

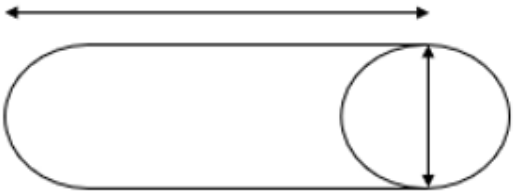
For our purposes: It is the measurement across the widest part of the circle.

Dia X Dia (D2 x 0.785 = Volume in cubic feet.

Example:

27 x 27 x 0.785 x 0.03 = 17.17 Cubic Feet

17.17 Cubic Feet x 7.48 Gallons/Cubic Feet = 128 Gallons



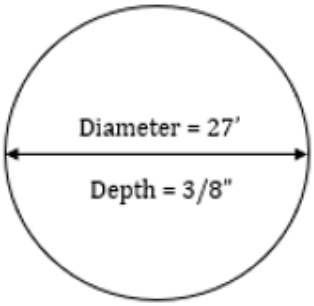


Chart A		
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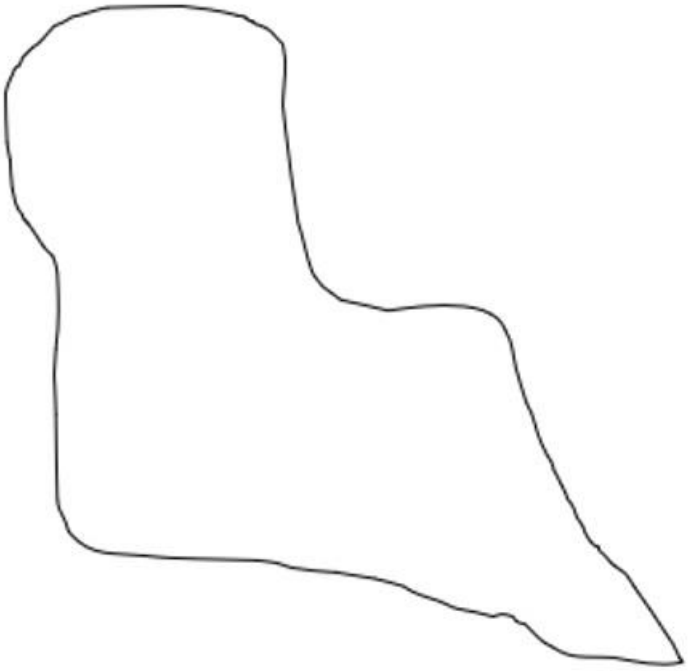
2"	=	0.17'
3"	=	0.25'
4"	=	0.33'
5"	=	0.42'
6"	=	0.50'
7"	=	0.58'
8"	=	0.67'
9"	=	0.75'

SFPUC: Overflow Emergency Response Plan	
Sanitary Sewer Overflow Volume by Area Estimation Worksheet	**WS-13 Side A**

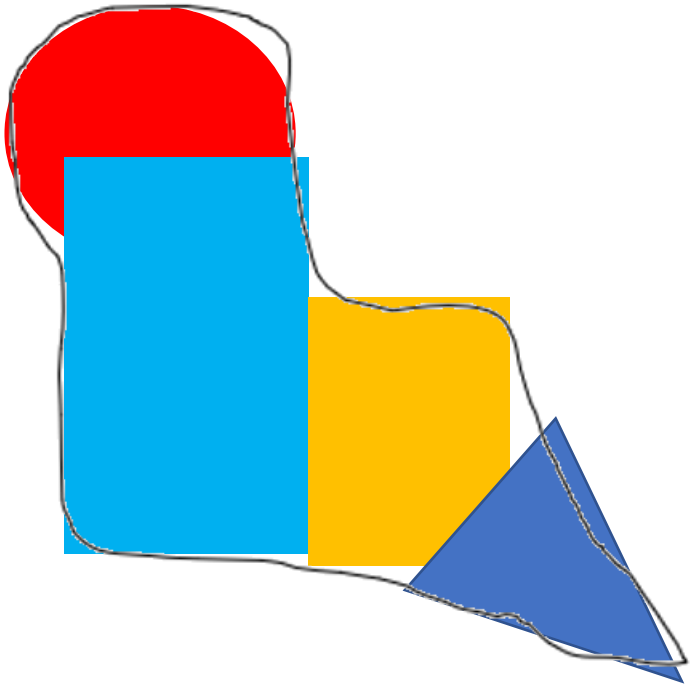
Step 1

Sketch the outline of the spill in a black line.



Step 2

Break the sketch down into recognizable shapes (circles, squares, etc.) as well as you can.

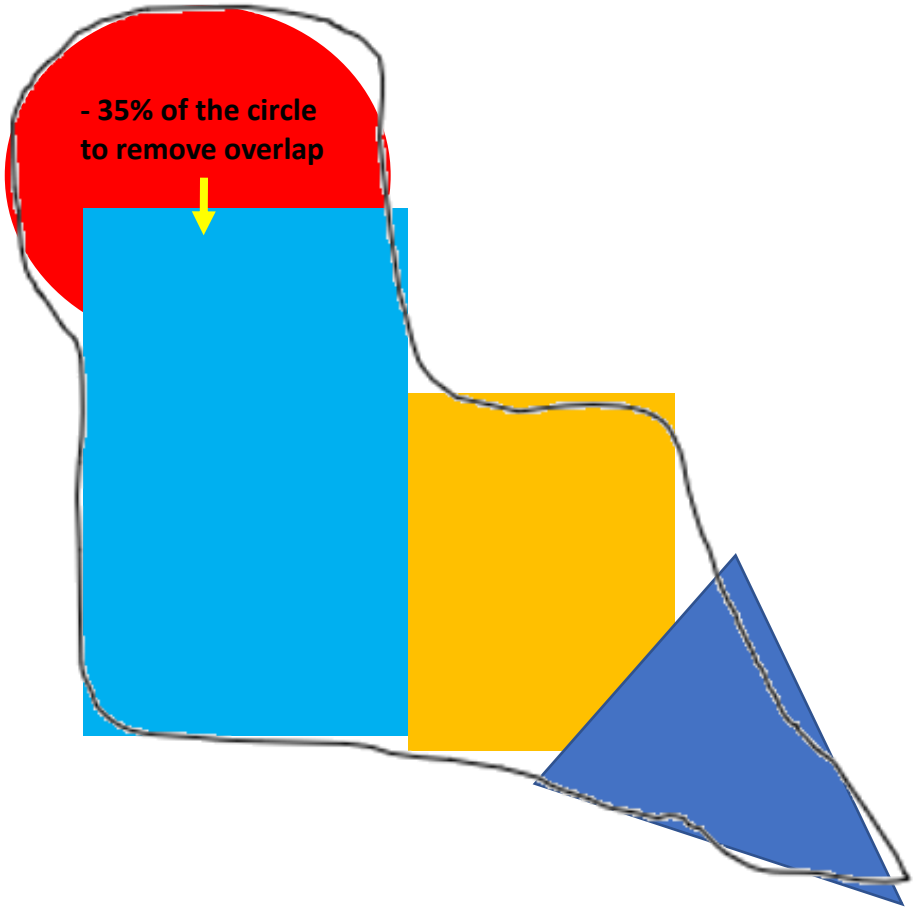


Sanitary Sewer Overflow Volume by Area Estimation Worksheet

WS-13 Side B

Step 3

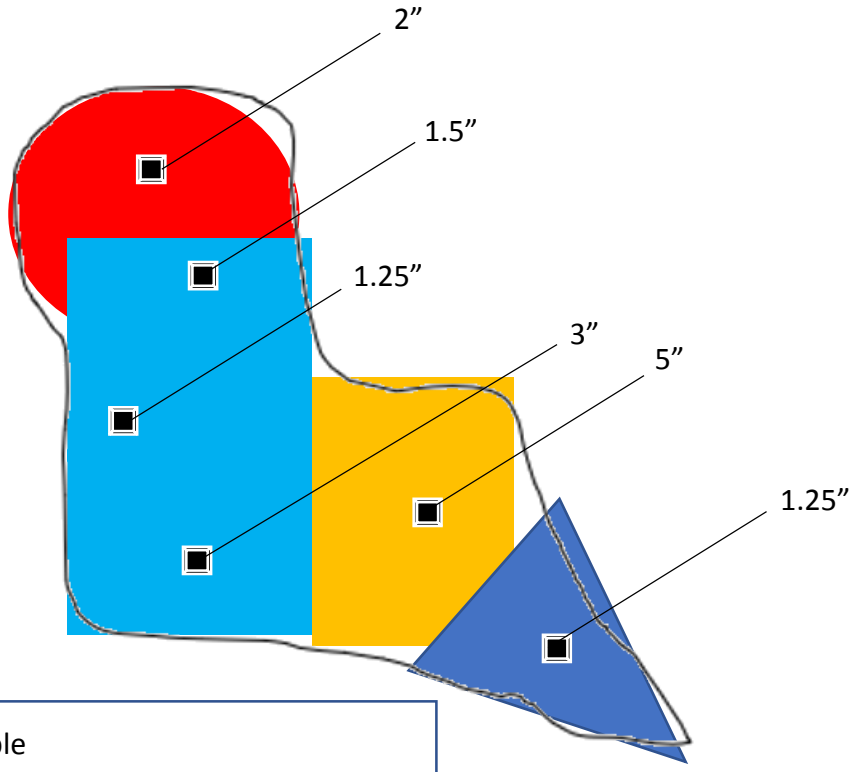
Determine the volume of each shape. (Note: In this example, after the volume of the circle is determined, multiply it by approximately 65% so that the overlap with the rectangle area won't be counted twice.)



SFPUC: Overflow Emergency Response Plan	
Sanitary Sewer Overflow Volume by Area Estimation Worksheet	**WS-13 Side C**

Step 4

If the spill is of varying depths, take several measurements at different depths and find the average.
If the spill affects a dry unimproved area such as a field or dirt parking lot, determine the area of the wetted ground in the same manner as you would on a hard surface. Using a round-pointed shovel, dig down into the soil until you find dry soil. Do this in several locations within the wetted area and measure the depth of the wet soil. Average the measurement/thickness of the wet soil and determine the average depth of the wet soil.



Average Depth Example

2” + 1.5” +1.25” + 3” + 5” + 1.25” = 14.0”
14.0” ÷ 6 measurements = 2.33”
Average Depth = 2.33” (0.194’)

Drawing Worksheet

Drawing Worksheet

Drawing Worksheet