



City of Alameda Sewer System Management Plan Appendices

Preparation Supported by:



August 2014

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Appendix A

SWRCB Order No. 2006-003 – Statewide General Waste Discharge Requirements for Sanitary Sewer Systems

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

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

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

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

SEWER SYSTEM MANAGEMENT PLANS

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

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

REGULATORY CONSIDERATIONS

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

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

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

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

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

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

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

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

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

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

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

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

A. DEFINITIONS

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

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

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

B. APPLICATION REQUIREMENTS

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

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

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

C. PROHIBITIONS

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

D. PROVISIONS

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

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

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

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

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

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

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

Sewer System Management Plan (SSMP)

- (i) **Goal:** The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur.
- (ii) **Organization:** The SSMP must identify:
- (a) The name of the responsible or authorized representative as described in Section J of this Order.
 - (b) The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and
 - (c) The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services (OES)).
- (iii) **Legal Authority:** Each Enrollee must demonstrate, through sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:
- (a) Prevent illicit discharges into its sanitary sewer system (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc.);

- (b) Require that sewers and connections be properly designed and constructed;
 - (c) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;
 - (d) Limit the discharge of fats, oils, and grease and other debris that may cause blockages, and
 - (e) Enforce any violation of its sewer ordinances.
- (iv) **Operation and Maintenance Program.** The SSMP must include those elements listed below that are appropriate and applicable to the Enrollee's system:
- (a) Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities;
 - (b) Describe routine preventive operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventative Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;
 - (c) Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;
 - (d) Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained; and

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

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

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

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

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

- (vii) **FOG Control Program:** Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an Enrollee determines that a FOG program is not needed, the Enrollee must provide justification for why it is not needed. If FOG is found to be a problem, the Enrollee must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. This plan shall include the following as appropriate:
- (a) An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;
 - (b) A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area;
 - (c) The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;
 - (d) Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements;
 - (e) Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;
 - (f) An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section; and
 - (g) Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (f) above.
- (viii) **System Evaluation and Capacity Assurance Plan:** The Enrollee shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:
- (a) **Evaluation:** Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs

that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;

- (b) **Design Criteria:** Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and
 - (c) **Capacity Enhancement Measures:** The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.
 - (d) **Schedule:** The Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a)-(c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D. 14.
- (ix) **Monitoring, Measurement, and Program Modifications:** The Enrollee shall:
- (a) Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;
 - (b) Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;
 - (c) Assess the success of the preventative maintenance program;
 - (d) Update program elements, as appropriate, based on monitoring or performance evaluations; and
 - (e) Identify and illustrate SSO trends, including: frequency, location, and volume.
- (x) **SSMP Program Audits** - As part of the SSMP, the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the

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

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

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

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

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

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

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

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

Sewer System Management Plan Time Schedule

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

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

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

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

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

E. WDRs and SSMP AVAILABILITY

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

F. ENTRY AND INSPECTION

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

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

G. GENERAL MONITORING AND REPORTING REQUIREMENTS

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

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

H. CHANGE IN OWNERSHIP

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

I. INCOMPLETE REPORTS

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

J. REPORT DECLARATION

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

K. CIVIL MONETARY REMEDIES FOR DISCHARGE VIOLATIONS

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

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

L. SEVERABILITY

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

CERTIFICATION

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

AYE: Tam M. Doduc
Gerald D. Secundy

NO: Arthur G. Baggett

ABSENT: None

ABSTAIN: None



Song Her
Clerk to the Board

Appendix B

SWRCB Order No. WQ-2013-0058-EXEC – Amended Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems

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

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

1. The State Water Board is authorized to prescribe statewide general Waste Discharge Requirements (WDRs) for categories of discharges that involve the same or similar operations and the same or similar types of waste pursuant to Water Code section 13263(i).
2. Water Code section 13193 *et seq.* requires the Regional Water Quality Control Boards (Regional Water Boards) and the State Water Board (collectively, the Water Boards) to gather Sanitary Sewer Overflow (SSO) information and make this information available to the public, including but not limited to, SSO cause, estimated volume, location, date, time, duration, whether or not the SSO reached or may have reached waters of the state, response and corrective action taken, and an enrollee's contact information for each SSO event. An enrollee is defined as the public entity having legal authority over the operation and maintenance of, or capital improvements to, a sanitary sewer system greater than one mile in length.
3. Water Code section 13271, *et seq.* requires notification to the California Office of Emergency Services (Cal OES), formerly the California Emergency Management Agency, for certain unauthorized discharges, including SSOs.
4. On May 2, 2006, the State Water Board adopted Order 2006-0003-DWQ, "Statewide Waste Discharge Requirements for Sanitary Sewer Systems"¹ (hereafter SSS WDRs) to comply with Water Code section 13193 and to establish the framework for the statewide SSO Reduction Program.
5. Subsection G.2 of the SSS WDRs and the Monitoring and Reporting Program (MRP) provide that the Executive Director may modify the terms of the MRP at any time.
6. On February 20, 2008, the State Water Board Executive Director adopted a revised MRP for the SSS WDRs to rectify early notification deficiencies and ensure that first responders are notified in a timely manner of SSOs discharged into waters of the state.
7. When notified of an SSO that reaches a drainage channel or surface water of the state, Cal OES, pursuant to Water Code section 13271(a)(3), forwards the SSO notification information² to local government agencies and first responders including local public health officials and the applicable Regional Water Board. Receipt of notifications for a single SSO event from both the SSO reporter

¹ Available for download at:

http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2006/wqo/wqo2006_0003.pdf

² Cal OES Hazardous Materials Spill Reports available Online at:

[http://w3.calema.ca.gov/operational/mal haz.nsf/\\$defaultview](http://w3.calema.ca.gov/operational/mal haz.nsf/$defaultview) and <http://w3.calema.ca.gov/operational/mal haz.nsf>

and Cal OES is duplicative. To address this, the SSO notification requirements added by the February 20, 2008 MRP revision are being removed in this MRP revision.

8. In the February 28, 2008 Memorandum of Agreement between the State Water Board and the California Water and Environment Association (CWEA), the State Water Board committed to re-designing the CIWQS³ Online SSO Database to allow “event” based SSO reporting versus the original “location” based reporting. Revisions to this MRP and accompanying changes to the CIWQS Online SSO Database will implement this change by allowing for multiple SSO appearance points to be associated with each SSO event caused by a single asset failure.
9. Based on stakeholder input and Water Board staff experience implementing the SSO Reduction Program, SSO categories have been revised in this MRP. In the prior version of the MRP, SSOs have been categorized as Category 1 or Category 2. This MRP implements changes to SSO categories by adding a Category 3 SSO type. This change will improve data management to further assist Water Board staff with evaluation of high threat and low threat SSOs by placing them in unique categories (i.e., Category 1 and Category 3, respectively). This change will also assist enrollees in identifying SSOs that require Cal OES notification.
10. Based on over six years of implementation of the SSS WDRs, the State Water Board concludes that the February 20, 2008 MRP must be updated to better advance the SSO Reduction Program⁴ objectives, assess compliance, and enforce the requirements of the SSS WDRs.

IT IS HEREBY ORDERED THAT:

Pursuant to the authority delegated by Water Code section 13267(f), Resolution 2002-0104, and Order 2006-0003-DWQ, the MRP for the SSS WDRs (Order 2006-0003-DWQ) is hereby amended as shown in Attachment A and shall be effective on September 9, 2013.

Date

Thomas Howard
Executive Director

³ California Integrated Water Quality System (CIWQS) publicly available at <http://www.waterboards.ca.gov/ciwqs/publicreports.shtml>

⁴ Statewide Sanitary Sewer Overflow Reduction Program information is available at: http://www.waterboards.ca.gov/water_issues/programs/ssso/

ATTACHMENT A

STATE 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

This Monitoring and Reporting Program (MRP) establishes monitoring, record keeping, reporting and public notification requirements for Order 2006-0003-DWQ, "Statewide General Waste Discharge Requirements for Sanitary Sewer Systems" (SSS WDRs). This MRP shall be effective from September 9, 2013 until it is rescinded. The Executive Director may make revisions to this MRP at any time. These revisions may include a reduction or increase in the monitoring and reporting requirements. All site specific records and data developed pursuant to the SSS WDRs and this MRP shall be complete, accurate, and justified by evidence maintained by the enrollee. Failure to comply with this MRP may subject an enrollee to civil liabilities of up to \$5,000 a day per violation pursuant to Water Code section 13350; up to \$1,000 a day per violation pursuant to Water Code section 13268; or referral to the Attorney General for judicial civil enforcement. The State Water Resources Control Board (State Water Board) reserves the right to take any further enforcement action authorized by law.

A. SUMMARY OF MRP REQUIREMENTS

Table 1 – Spill Categories and Definitions

| CATEGORIES | DEFINITIONS [see Section A on page 5 of Order 2006-0003-DWQ, for Sanitary Sewer Overflow (SSO) definition] |
|---|---|
| CATEGORY 1 | Discharges of untreated or partially treated wastewater of any volume resulting from an enrollee's sanitary sewer system failure or flow condition that: <ul style="list-style-type: none">Reach surface water and/or reach a drainage channel tributary to a surface water; orReach 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). |
| CATEGORY 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. |
| CATEGORY 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. |

Table 2 – Notification, Reporting, Monitoring, and Record Keeping Requirements

| ELEMENT | REQUIREMENT | METHOD |
|---|---|---|
| NOTIFICATION (see section B of MRP) | <ul style="list-style-type: none"> • Within two hours of becoming aware of any Category 1 SSO greater than or equal to 1,000 gallons discharged to surface water or spilled in a location where it probably will be discharged to surface water, notify the California Office of Emergency Services (Cal OES) and obtain a notification control number. | Call Cal OES at: (800) 852-7550 |
| REPORTING (see section C of MRP) | <ul style="list-style-type: none"> • Category 1 SSO: Submit draft report within three business days of becoming aware of the SSO and certify within 15 calendar days of SSO end date. • Category 2 SSO: Submit draft report within 3 business days of becoming aware of the SSO and certify within 15 calendar days of the SSO end date. • Category 3 SSO: Submit certified report within 30 calendar days of the end of month in which SSO the occurred. • SSO Technical Report: Submit within 45 calendar days after the end date of any Category 1 SSO in which 50,000 gallons or greater are spilled to surface waters. • “No Spill” Certification: Certify that no SSOs occurred within 30 calendar days of the end of the month or, if reporting quarterly, the quarter in which no SSOs occurred. • Collection System Questionnaire: Update and certify every 12 months. | Enter data into the CIWQS Online SSO Database (http://ciwqs.waterboards.ca.gov/), certified by enrollee’s Legally Responsible Official(s). |
| WATER QUALITY MONITORING (see section D of MRP) | <ul style="list-style-type: none"> • Conduct water quality sampling within 48 hours after initial SSO notification for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters. | Water quality results are required to be uploaded into CIWQS for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters. |
| RECORD KEEPING (see section E of MRP) | <ul style="list-style-type: none"> • SSO event records. • Records documenting Sanitary Sewer Management Plan (SSMP) implementation and changes/updates to the SSMP. • Records to document Water Quality Monitoring for SSOs of 50,000 gallons or greater spilled to surface waters. • Collection system telemetry records if relied upon to document and/or estimate SSO Volume. | Self-maintained records shall be available during inspections or upon request. |

B. NOTIFICATION REQUIREMENTS

Although Regional Water Quality Control Boards (Regional Water Boards) and the State Water Board (collectively, the Water Boards) staff do not have duties as first responders, this MRP is an appropriate mechanism to ensure that the agencies that have first responder duties are notified in a timely manner in order to protect public health and beneficial uses.

1. For any Category 1 SSO greater than or equal to 1,000 gallons that results in a discharge to a surface water or spilled in a location where it probably will be discharged to surface water, either directly or by way of a drainage channel or MS4, the enrollee shall, as soon as possible, but not later than two (2) hours after (A) the enrollee has knowledge of the discharge, (B) notification is possible, and (C) notification can be provided without substantially impeding cleanup or other emergency measures, notify the Cal OES and obtain a notification control number.
2. To satisfy notification requirements for each applicable SSO, the enrollee shall provide the information requested by Cal OES before receiving a control number. Spill information requested by Cal OES may include:
 - i. Name of person notifying Cal OES and direct return phone number.
 - ii. Estimated SSO volume discharged (gallons).
 - iii. If ongoing, estimated SSO discharge rate (gallons per minute).
 - iv. SSO Incident Description:
 - a. Brief narrative.
 - b. On-scene point of contact for additional information (name and cell phone number).
 - c. Date and time enrollee became aware of the SSO.
 - d. Name of sanitary sewer system agency causing the SSO.
 - e. SSO cause (if known).
 - v. Indication of whether the SSO has been contained.
 - vi. Indication of whether surface water is impacted.
 - vii. Name of surface water impacted by the SSO, if applicable.
 - viii. Indication of whether a drinking water supply is or may be impacted by the SSO.
 - ix. Any other known SSO impacts.
 - x. SSO incident location (address, city, state, and zip code).
3. Following the initial notification to Cal OES and until such time that an enrollee certifies the SSO report in the CIWQS Online SSO Database, the enrollee shall provide updates to Cal OES regarding substantial changes to the estimated volume of untreated or partially treated sewage discharged and any substantial change(s) to known impact(s).
4. PLSDs: The enrollee is strongly encouraged to notify Cal OES of discharges greater than or equal to 1,000 gallons of untreated or partially treated wastewater that result or may result in a discharge to surface water resulting from failures or flow conditions within a privately owned sewer lateral or from other private sewer asset(s) if the enrollee becomes aware of the PLSD.

C. **REPORTING REQUIREMENTS**

1. **CIWQS Online SSO Database Account:** All enrollees shall obtain a CIWQS Online SSO Database account and receive a “Username” and “Password” by registering through CIWQS. These accounts allow controlled and secure entry into the CIWQS Online SSO Database.
2. **SSO Mandatory Reporting Information:** For reporting purposes, if one SSO event results in multiple appearance points in a sewer system asset, the enrollee shall complete one SSO report in the CIWQS Online SSO Database which includes the GPS coordinates for the location of the SSO appearance point closest to the failure point, blockage or location of the flow condition that caused the SSO, and provide descriptions of the locations of all other discharge points associated with the SSO event.
3. **SSO Categories**
 - i. **Category 1** – Discharges of untreated or partially treated wastewater of any volume resulting from an enrollee’s sanitary sewer system failure or flow condition that:
 - a. Reach surface water and/or reach a drainage channel tributary to a surface water; or
 - b. Reach a 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).
 - ii. **Category 2** – Discharges of untreated or partially treated wastewater greater than or equal to 1,000 gallons resulting from an enrollee’s sanitary sewer system failure or flow condition that does not reach a surface water, a drainage channel, or the MS4 unless the entire SSO volume discharged to the storm drain system is fully recovered and disposed of properly.
 - iii. **Category 3** – All other discharges of untreated or partially treated wastewater resulting from an enrollee’s sanitary sewer system failure or flow condition.
4. **Sanitary Sewer Overflow Reporting to CIWQS - Timeframes**
 - i. **Category 1 and Category 2 SSOs** – All SSOs that meet the above criteria for Category 1 or Category 2 SSOs shall be reported to the CIWQS Online SSO Database:
 - a. Draft reports for Category 1 and Category 2 SSOs shall be submitted to the CIWQS Online SSO Database within three (3) business days of the enrollee becoming aware of the SSO. Minimum information that shall be reported in a draft Category 1 SSO report shall include all information identified in section 8.i.a. below. Minimum information that shall be reported in a Category 2 SSO draft report shall include all information identified in section 8.i.c below.
 - b. A final Category 1 or Category 2 SSO report shall be certified through the CIWQS Online SSO Database within 15 calendar days of the end date of the SSO. Minimum information that shall be certified in the final Category 1 SSO report shall include all information identified in section 8.i.b below. Minimum information that shall be certified in a final Category 2 SSO report shall include all information identified in section 8.i.d below.

- ii. **Category 3 SSOs** – All SSOs that meet the above criteria for Category 3 SSOs shall be reported to the CIWQS Online SSO Database and certified within 30 calendar days after the end of the calendar month in which the SSO occurs (e.g., all Category 3 SSOs occurring in the month of February shall be entered into the database and certified by March 30). Minimum information that shall be certified in a final Category 3 SSO report shall include all information identified in section 8.i.e below.
- iii. **“No Spill” Certification** – If there are no SSOs during the calendar month, the enrollee shall either 1) certify, within 30 calendar days after the end of each calendar month, a “No Spill” certification statement in the CIWQS Online SSO Database certifying that there were no SSOs for the designated month, or 2) certify, quarterly within 30 calendar days after the end of each quarter, “No Spill” certification statements in the CIWQS Online SSO Database certifying that there were no SSOs for each month in the quarter being reported on. For quarterly reporting, the quarters are Q1 - January/ February/ March, Q2 - April/May/June, Q3 - July/August/September, and Q4 - October/November/December.

If there are no SSOs during a calendar month but the enrollee reported a PLSD, the enrollee shall still certify a “No Spill” certification statement for that month.
- iv. **Amended SSO Reports** – The enrollee may update or add additional information to a certified SSO report within 120 calendar days after the SSO end date by amending the report or by adding an attachment to the SSO report in the CIWQS Online SSO Database. SSO reports certified in the CIWQS Online SSO Database prior to the adoption date of this MRP may only be amended up to 120 days after the effective date of this MRP. After 120 days, the enrollee may contact the SSO Program Manager to request to amend an SSO report if the enrollee also submits justification for why the additional information was not available prior to the end of the 120 days.

5. **SSO Technical Report**

The enrollee shall submit an SSO Technical Report in the CIWQS Online SSO Database within 45 calendar days of the SSO end date for any SSO in which 50,000 gallons or greater are spilled to surface waters. This report, which does not preclude the Water Boards from requiring more detailed analyses if requested, shall include at a minimum, the following:

- i. **Causes and Circumstances of the SSO:**
 - a. Complete and detailed explanation of how and when the SSO was discovered.
 - b. Diagram showing the SSO failure point, appearance point(s), and final destination(s).
 - c. Detailed description of the methodology employed and available data used to calculate the volume of the SSO and, if applicable, the SSO volume recovered.
 - d. Detailed description of the cause(s) of the SSO.
 - e. Copies of original field crew records used to document the SSO.
 - f. Historical maintenance records for the failure location.
- ii. **Enrollee’s Response to SSO:**
 - a. Chronological narrative description of all actions taken by enrollee to terminate the spill.
 - b. Explanation of how the SSMP Overflow Emergency Response plan was implemented to respond to and mitigate the SSO.

- c. Final corrective action(s) completed and/or planned to be completed, including a schedule for actions not yet completed.

iii. **Water Quality Monitoring:**

- a. Description of all water quality sampling activities conducted including analytical results and evaluation of the results.
- b. Detailed location map illustrating all water quality sampling points.

6. **PLSDs**

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 sanitary sewer system assets may be voluntarily reported to the CIWQS Online SSO Database.

- i. The enrollee is also encouraged to provide notification to Cal OES per section B above when a PLSD greater than or equal to 1,000 gallons has or may result in a discharge to surface water. For any PLSD greater than or equal to 1,000 gallons regardless of the spill destination, the enrollee is also encouraged to file a spill report as required by Health and Safety Code section 5410 et. seq. and Water Code section 13271, or notify the responsible party that notification and reporting should be completed as specified above and required by State law.
- ii. If a PLSD is recorded in the CIWQS Online SSO Database, the enrollee must identify the sewage discharge as occurring and caused by a private sanitary sewer system asset and should identify a responsible party (other than the enrollee), if known. Certification of PLSD reports by enrollees is not required.

7. **CIWQS Online SSO Database Unavailability**

In the event that the CIWQS Online SSO Database is not available, the enrollee must fax or e-mail all required information to the appropriate Regional Water Board office in accordance with the time schedules identified herein. In such event, the enrollee must also enter all required information into the CIWQS Online SSO Database when the database becomes available.

8. **Mandatory Information to be Included in CIWQS Online SSO Reporting**

All enrollees shall obtain a CIWQS Online SSO Database account and receive a "Username" and "Password" by registering through CIWQS which can be reached at CIWQS@waterboards.ca.gov or by calling (866) 792-4977, M-F, 8 A.M. to 5 P.M. These accounts will allow controlled and secure entry into the CIWQS Online SSO Database. Additionally, within thirty (30) days of initial enrollment and prior to recording SSOs into the CIWQS Online SSO Database, all enrollees must complete a Collection System Questionnaire (Questionnaire). The Questionnaire shall be updated at least once every 12 months.

i. **SSO Reports**

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

- a. **Draft Category 1 SSOs**: At a minimum, the following mandatory information shall be reported for a draft Category 1 SSO report:
1. SSO Contact Information: Name and telephone number of enrollee contact person who can answer specific questions about the SSO being reported.
 2. SSO Location Name.
 3. Location of the overflow event (SSO) by entering GPS coordinates. If a single overflow event results in multiple appearance points, provide GPS coordinates for the appearance point closest to the failure point and describe each additional appearance point in the SSO appearance point explanation field.
 4. Whether or not the SSO reached surface water, a drainage channel, or entered and was discharged from a drainage structure.
 5. Whether or not the SSO reached a municipal separate storm drain system.
 6. Whether or not the total SSO volume that reached a municipal separate storm drain system was fully recovered.
 7. Estimate of the SSO volume, inclusive of all discharge point(s).
 8. Estimate of the SSO volume that reached surface water, a drainage channel, or was not recovered from a storm drain.
 9. Estimate of the SSO volume recovered (if applicable).
 10. Number of SSO appearance point(s).
 11. Description and location of SSO appearance point(s). If a single sanitary sewer system failure results in multiple SSO appearance points, each appearance point must be described.
 12. SSO start date and time.
 13. Date and time the enrollee was notified of, or self-discovered, the SSO.
 14. Estimated operator arrival time.
 15. For spills greater than or equal to 1,000 gallons, the date and time Cal OES was called.
 16. For spills greater than or equal to 1,000 gallons, the Cal OES control number.
- b. **Certified Category 1 SSOs**: At a minimum, the following mandatory information shall be reported for a certified Category 1 SSO report, in addition to all fields in section 8.i.a :
1. Description of SSO destination(s).
 2. SSO end date and time.
 3. SSO causes (mainline blockage, roots, etc.).
 4. SSO failure point (main, lateral, etc.).
 5. Whether or not the spill was associated with a storm event.
 6. Description of spill corrective action, including steps planned or taken to reduce, eliminate, and prevent reoccurrence of the overflow; and a schedule of major milestones for those steps.
 7. Description of spill response activities.
 8. Spill response completion date.
 9. Whether or not there is an ongoing investigation, the reasons for the investigation and the expected date of completion.

10. Whether or not a beach closure occurred or may have occurred as a result of the SSO.
 11. Whether or not health warnings were posted as a result of the SSO.
 12. Name of beach(es) closed and/or impacted. If no beach was impacted, NA shall be selected.
 13. Name of surface water(s) impacted.
 14. If water quality samples were collected, identify parameters the water quality samples were analyzed for. If no samples were taken, NA shall be selected.
 15. If water quality samples were taken, identify which regulatory agencies received sample results (if applicable). If no samples were taken, NA shall be selected.
 16. Description of methodology(ies) and type of data relied upon for estimations of the SSO volume discharged and recovered.
 17. SSO Certification: Upon SSO Certification, the CIWQS Online SSO Database will issue a final SSO identification (ID) number.
- c. **Draft Category 2 SSOs**: At a minimum, the following mandatory information shall be reported for a draft Category 2 SSO report:
1. Items 1-14 in section 8.i.a above for Draft Category 1 SSO.
- d. **Certified Category 2 SSOs**: At a minimum, the following mandatory information shall be reported for a certified Category 2 SSO report:
1. Items 1-14 in section 8.i.a above for Draft Category 1 SSO and Items 1-9, and 17 in section 8.i.b above for Certified Category 1 SSO.
- e. **Certified Category 3 SSOs**: At a minimum, the following mandatory information shall be reported for a certified Category 3 SSO report:
1. Items 1-14 in section 8.i.a above for Draft Category 1 SSO and Items 1-5, and 17 in section 8.i.b above for Certified Category 1 SSO.

ii. **Reporting SSOs to Other Regulatory Agencies**

These reporting requirements do not preclude an enrollee from reporting SSOs to other regulatory agencies pursuant to state law. In addition, these reporting requirements do not replace other Regional Water Board notification and reporting requirements for SSOs.

iii. **Collection System Questionnaire**

The required Questionnaire (see subsection G of the SSS WDRs) provides the Water Boards with site-specific information related to the enrollee's sanitary sewer system. The enrollee shall complete and certify the Questionnaire at least every 12 months to facilitate program implementation, compliance assessment, and enforcement response.

iv. **SSMP Availability**

The enrollee shall provide the publicly available internet web site address to the CIWQS Online SSO Database where a downloadable copy of the enrollee's approved SSMP, critical supporting documents referenced in the SSMP, and proof of local governing board approval of the SSMP is posted. If all of the SSMP documentation listed in this subsection is not publicly available on the Internet, the enrollee shall comply with the following procedure:

- a. Submit an **electronic** copy of the enrollee's approved SSMP, critical supporting documents referenced in the SSMP, and proof of local governing board approval of the SSMP to the State Water Board, within 30 days of that approval and within 30 days of any subsequent SSMP re-certifications, to the following mailing address:

State Water Resources Control Board
Division of Water Quality
Attn: SSO Program Manager
1001 I Street, 15th Floor, Sacramento, CA 95814

D. WATER QUALITY MONITORING REQUIREMENTS:

To comply with subsection D.7(v) of the SSS WDRs, the enrollee shall develop and implement an SSO Water Quality Monitoring Program to assess impacts from SSOs to surface waters in which 50,000 gallons or greater are spilled to surface waters. The SSO Water Quality Monitoring Program, shall, at a minimum:

1. Contain protocols for water quality monitoring.
2. Account for spill travel time in the surface water and scenarios where monitoring may not be possible (e.g. safety, access restrictions, etc.).
3. Require water quality analyses for ammonia and bacterial indicators to be performed by an accredited or certified laboratory.
4. Require monitoring instruments and devices used to implement the SSO Water Quality Monitoring Program to be properly maintained and calibrated, including any records to document maintenance and calibration, as necessary, to ensure their continued accuracy.
5. Within 48 hours of the enrollee becoming aware of the SSO, require water quality sampling for, at a minimum, the following constituents:
 - i. Ammonia
 - ii. Appropriate Bacterial indicator(s) per the applicable Basin Plan water quality objective or Regional Board direction which may include total and fecal coliform, enterococcus, and e-coli.

E. RECORD KEEPING REQUIREMENTS:

The following records shall be maintained by the enrollee for a minimum of five (5) years and shall be made available for review by the Water Boards during an onsite inspection or through an information request:

1. General Records: The enrollee shall maintain records to document compliance with all provisions of the SSS WDRs and this MRP for each sanitary sewer system owned including any required records generated by an enrollee's sanitary sewer system contractor(s).
2. SSO Records: The enrollee shall maintain records for each SSO event, including but not limited to:
 - i. Complaint records documenting how the enrollee responded to all notifications of possible or actual SSOs, both during and after business hours, including complaints that do not

result in SSOs. Each complaint record shall, at a minimum, include the following information:

- a. Date, time, and method of notification.
 - b. Date and time the complainant or informant first noticed the SSO.
 - c. Narrative description of the complaint, including any information the caller can provide regarding whether or not the complainant or informant reporting the potential SSO knows if the SSO has reached surface waters, drainage channels or storm drains.
 - d. Follow-up return contact information for complainant or informant for each complaint received, if not reported anonymously.
 - e. Final resolution of the complaint.
- ii. Records documenting steps and/or remedial actions undertaken by enrollee, using all available information, to comply with section D.7 of the SSS WDRs.
 - iii. Records documenting how all estimate(s) of volume(s) discharged and, if applicable, volume(s) recovered were calculated.
3. Records documenting all changes made to the SSMP since its last certification indicating when a subsection(s) of the SSMP was changed and/or updated and who authorized the change or update. These records shall be attached to the SSMP.
 4. Electronic monitoring records relied upon for documenting SSO events and/or estimating the SSO volume discharged, including, but not limited to records from:
 - i. Supervisory Control and Data Acquisition (SCADA) systems
 - ii. Alarm system(s)
 - iii. Flow monitoring device(s) or other instrument(s) used to estimate wastewater levels, flow rates and/or volumes.

F. CERTIFICATION

1. All information required to be reported into the CIWQS Online SSO Database shall be certified by a person designated as described in subsection J of the SSS WDRs. This designated person is also known as a Legally Responsible Official (LRO). An enrollee may have more than one LRO.
2. Any designated person (i.e. an LRO) shall be registered with the State Water Board to certify reports in accordance with the CIWQS protocols for reporting.
3. Data Submitter (DS): Any enrollee employee or contractor may enter draft data into the CIWQS Online SSO Database on behalf of the enrollee if authorized by the LRO and registered with the State Water Board. However, only LROs may certify reports in CIWQS.
4. The enrollee shall maintain continuous coverage by an LRO. Any change of a registered LRO or DS (e.g., retired staff), including deactivation or a change to the LRO's or DS's contact information, shall be submitted by the enrollee to the State Water Board within 30 days of the change by calling (866) 792-4977 or e-mailing help@ciwqs.waterboards.ca.gov.

5. A registered designated person (i.e., an LRO) shall certify all required reports under penalty of perjury laws of the state as stated in the CIWQS Online SSO Database at the time of certification.

CERTIFICATION

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

Date

Jeanine Townsend
Clerk to the Board

Appendix C

Asset Management Implementation Plan (Updated August 2014)

Stipulated Order for Preliminary Relief
Case No. C 09-05684 RS

Final Consent Decree
Case Nos. C 09-00186-RS and C 09-05684-RS

Asset Management Implementation Plan

Prepared by the City of Alameda

February 1, 2013

Updated August 2014



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Appendix B - Sewer Hot Spot List and Map

Appendix C - FY 2014/15 Sewer Rehabilitation/Replacement Plan

Appendix D - 10-Year Financial Plan (to be updated in 2015)

List of Abbreviations and Definitions

| | |
|--------------------|--|
| AMIP | Asset Management Implementation Plan |
| AO | Findings of Violation and Order for Compliance (Administrative Order) |
| CCTV | Closed-Circuit Television |
| City | City of Alameda |
| CY | Calendar Year (January 1 to December 31) |
| EBMUD | East Bay Municipal Utility District |
| EPA | U.S. Environmental Protection Agency |
| FOG | Fats, Oils, and Grease |
| FY | Fiscal Year (July 1 to June 30) |
| Grid System | Portion of the sewer system characterized by pipes that have multiple pathways for flow should a temporary blockage or flow backup occur |
| GWDR | General Waste Discharge Requirements for Sanitary Sewer Systems |
| I/I or I&I | Infiltration and Inflow |
| Infiltration | Water other than wastewater that enters a sewer system through the ground through defects pipes, service laterals, or manholes |
| Inflow | Water other than wastewater that enters a sewer system through direct connections from roof leaders, area drains, foundation drains, or cross-connections between the storm and sanitary sewer systems, or through manhole covers. |
| Lower Lateral | The portion of the sewer lateral extending from the cleanout at the property line to the connection to the public sewer main |
| MH | Manhole or Maintenance Hole |
| NASSCO | National Association of Sewer Service Companies |
| NPDES | National Pollutant Discharge Elimination System |
| O&M | Operations and Maintenance |
| PACP | Pipeline Assessment Certification Program |
| PSL | Private Sewer Lateral |
| QA/QC | Quality Assurance/Quality Control |
| Rapid Infiltration | Infiltration that enters the sewer system very quickly during storm events |
| Rehabilitation | “Node-to-node” (e.g., manhole to manhole) lining or replacement of an entire pipe segment |
| Repair | Replacement of a short segment of a sewer main or lateral; also called “point repair” or “spot repair” |
| RTSP | EBMUD Regional Technical Support Program |
| RWQCB | Regional Water Quality Control Board, San Francisco Bay Region |
| SO | Stipulated Order for Preliminary Relief |
| SSO | Sanitary Sewer Overflow |
| SWRCB | State Water Resources Control Board |
| Upper Lateral | The portion of the sewer lateral extending from the building drain to the cleanout at the property line |
| WWF | EBMUD Wet Weather Facility |

1 Introduction

This Asset Management Implementation Plan (AMIP) was originally submitted by the City of Alameda (City) in compliance with the requirements of the Stipulated Order for Preliminary Relief (Case C 09-05684 RS) with the U.S. Environmental Protection Agency (EPA), the California State Water Resources Control Board (SWRCB), and the California Regional Water Quality Control Board, San Francisco Bay Regional (RWQCB) (“Plaintiffs”), and San Francisco Baykeeper (“Intervenor-Plaintiff”), as approved by the United States District Court, Northern District of California, on September 6, 2011. This AMIP has been updated to reflect the requirements of the Consent Decree with the above parties (Case Nos. C09-00186-RS and C09-05684-RS) as approved in September 2014.

1.1 Background

The City owns and operates a wastewater collection system that collects and conveys wastewater generated within the City to the East Bay Municipal Utility District (EBMUD) wastewater system. EBMUD also receives flows from six other “Satellite” collection system agencies: the cities of Albany, Berkeley, Emeryville, Oakland, and Piedmont, and the Stege Sanitary District.

EBMUD’s wastewater facilities include interceptor pipelines and pump stations that convey flow from the Satellite collection systems to its Main Wastewater Treatment Plant. During large storm events, some of the flow is diverted to three remote Wet Weather Facilities (WWFs). In 2009, the EPA, SWRCB, and RWQCB prohibited future discharges from the WWFs, and entered into a legal settlement with EBMUD to establish programs focused on reducing wet weather flows. Shortly thereafter, the EPA issued Findings of Violation and Orders for Compliance, also called Administrative Orders (AOs), to each of the seven EBMUD Satellite agencies requiring the development of specific plans and programs to reduce sanitary sewer overflows (SSOs) and control wet weather infiltration/inflow (I/I or I&I) into the collection systems. The AOs were subsequently replaced in 2011 by a Stipulated Order for Preliminary Relief (SO) with the EPA, SWRCB, and RWQCB.

In 2014, the seven Satellites and EBMUD entered into a Consent Decree with the Plaintiffs and Intervenor-Plaintiff. The Consent Decree replaces the 2011 SO, and requires that the AMIP be revised as necessary to reflect the Work requirements of the Consent Decree.

1.2 Wastewater Collection System

The City’s collection system includes approximately 136 miles of City-owned gravity sanitary sewers, 42 sewage pump stations, approximately 6 miles of pressure force mains, and approximately 20,000 service laterals. Approximately 128 miles of the total system pipeline length and 33 pump stations are located on the main part of the Alameda island and Harbor Bay Isle (Bay Farm Island), and approximately 14 miles of pipeline and 9 pump stations are located in the City-owned portion of Alameda Point, the former Alameda Naval Air Station. The remainder of Alameda Point (including an additional 3 miles of sewers) will be transferred to City ownership at a later date; however, the City maintains the entire Alameda Point collection system under a contract with the U.S. Navy.

There are over 10 miles of pipelines and seven pump stations in Alameda that are part of the EBMUD wastewater interceptor system. EBMUD is responsible for operation and maintenance of these facilities. There are also approximately 16 miles of privately-owned sewers that are the responsibility of individual homeowners’ associations. The U.S government owns and is responsible for the sanitary sewer system serving the Coast Guard housing area east of Alameda Point.

In Alameda, the maintenance and repair of the service laterals are the responsibility of individual property owners; however, the City’s practice is to repair or replace the lower portion of the laterals (located within the public right-of-way) from the property line cleanout to the connection to the City’s sewer main

whenever the public sewer main is rehabilitated or replaced, or if the lower lateral fails, whichever occurs first.

The City has rehabilitated or replaced over 20 percent of its gravity sewers and associated lower laterals over the past 30 years. Since 1988, the City has had a private sewer lateral (PSL) certification program requiring the testing and/or repair or replacement of the upper portion of sewer laterals at the time of property sale. Effective January 1, 2015, the City will join the EBMUD Regional Private Sewer Lateral Program.

1.3 Stipulated Order and Consent Decree Requirements

This AMIP addresses the requirements of Section VI, Paragraph 22 of the SO and the specific requirements of Section VIII of the Consent Decree (“Work – City of Alameda”) that relate to the SO requirements.

Sub-paragraph 22.B of the SO specifies the minimum requirements of the AMIP, as follows:

1. ***Routine inspection of the Collection System according to a specified schedule, and that includes the following:***
 - a) *Inspection methods to be used, including direct visual inspection and CCTV inspection, and whether CCTV equipment is owned, purchased, leased, or a combination;*
 - b) *An inspection schedule, and protocol for determining the regular time interval on which repeat inspections will be performed; and*
 - c) *A system for timely evaluation of inspection findings and documentation of the assessed condition.*
2. ***Collection System maintenance protocols, including:***
 - a) *A schedule for routine cleaning of the City of Alameda’s Collection System using standardized responses developed by the City to typical local problems that cause blockages such as debris, grease and roots. The City shall develop its routine cleaning schedule after evaluating the cleaning needs of the Collection System;*
 - b) *A list of locations where pipe blockages and SSOs have frequently occurred (hot spots), a hot spot cleaning schedule, and procedures for adjusting the hot spot cleaning schedule based on changing conditions;*
 - c) *Preventive measures to address blockage of sewer pipes by roots, including a description of root control methods; locations where root control methods may be used within the Collection System; and a schedule for application of root control methods;*
 - d) *A plan for staffing the sewer system cleaning and root control programs, indicating whether staffing duties will be carried out by agency staff, by staff from other agencies, or by private contractor(s). To the extent that any sewer cleaning or root control duties conducted under this program will be carried out by private contractor(s), the City of Alameda shall retain on file and make available for inspection for a period of three years after the completion of work a description of each contractor and a copy of each contract, or a description of the procurement process;*
 - e) *A Quality Assurance and Quality Control Program (“QA/QC Program”) to ensure proper sewer cleaning. The QA/QC Program shall include a plan for inspecting the cleaning quality, which specifies a minimum percentage of cleaned pipes to be inspected at regular intervals and a schedule for inspections, the procedures for conducting the inspections, the time interval for any necessary re-cleaning, and criteria for increasing and decreasing the frequency of inspection.*

3. **Condition based repair and replacement of sewer pipe plan.** *This plan shall include elimination of known improper flow connections, according to a schedule informed by the inspection results, and address both short-term (repairs of Acute Defects to occur within one year of completion of inspection and assessment) and long term repair, rehabilitation and replacement of sewer pipes. The plan shall include the following:*
 - a) *A schedule and 10-year financial plan for repair, rehabilitation, and replacement of sewer pipes. This schedule shall identify pipe reaches presently planned as priorities for rehabilitation or replacement over the next three years, with the understanding that the identified priorities are likely to be further developed and revised through the inspection and assessment process, and as a result of changed conditions. The City shall develop its schedule for repair, rehabilitation and replacement of sewer pipes using standardized responses developed by the City to observed defects, taking into account available peak flow rate data;*
 - b) *Measures to control inflow and infiltration as needed to reduced flows in the Collection System and reduce the frequency of SSOs; and*
 - c) *The budget allocated for emergency repair and replacement of sewer pipe, the length of sewer pipe which underwent emergency repair and replacement during the previous year, and the cost thereof.*

1.4 Organization and Contents of the AMIP

The AMIP includes four subsequent sections, as follows:

Section 2 – Asset Management Program Overview describes the overall goals and objectives of the AMIP; staff organization and responsibilities for implementation of the plan; information systems that will be used by the City in implementing the plan; and processes that will be used to update the AMIP to reflect new information and changed conditions.

Section 3 – Sewer Inspection and Condition Assessment addresses the requirements for “Routine inspection of the Collection System” in accordance with sub-paragraph 22.B.1 of the SO and Section VIII.B.43.b of the Consent Decree.

Section 4 – Sewer Maintenance addresses the requirements for “Collection System maintenance protocols” in accordance with sub-paragraph 22.B.2 of the SO and Section VIII.C.50-51 of the Consent Decree.

Section 5 – Sewer Repair and Replacement addresses the requirements for “Condition based repair and replacement of sewer pipe plan” in accordance with sub-paragraph 22.B.3 of the SO and Sections VIII.B.43.a, 46, and 47, and Section VIII.C.49 of the Consent Decree.

1.5 Basis of AMIP Development

The AMIP builds upon City programs that are already in place for inspection, maintenance, and rehabilitation of the collection system; and plans that have been already been prepared and implemented under the Statewide Waste Discharge Requirements for Sanitary Sewer Systems and the City’s previous AO and SO, including the following:

- Sewer System Management Plan (Updated August 2014)
- Sewer System Cleaning and Root Control Program (Rev. 2, April 2011)
- Inflow Identification and Elimination Plan (July 2010)
- Subbasin Flow Monitoring and Infiltration/Inflow Assessment Plan (July 2010)
- Subbasin Flow Monitoring and Infiltration/Inflow Assessment (December 2012)

- Pump Station Prioritization Plan (July 2010)
- Pump Station Renovation Plan (July 2012)
- Sanitary Sewer System Hydraulic Analysis (May 2010)
- Sewer Rate Study (May 2010; update to be completed November 2014)

In particular, the AMIP is considered to be a part of the City's overall Sewer System Management Plan (SSMP), in that it provides additional detail on sewer maintenance, inspection, and rehabilitation activities. The SSMP addresses additional aspects of the City's management of its sewer system, including its legal authority; fats, oils, and grease (FOG) control program; design and performance standards; capacity evaluation and assurance planning; and overflow emergency response procedures.

2 Asset Management Program Overview

2.1 Asset Management Goals and Objectives

The overall goals of the City's sewer system asset management program are to:

- Protect public health and the environment
- Maintain customer satisfaction
- Manage the system and deliver service cost-effectively
- Comply with all applicable regulations, including National Pollutant Discharge Elimination System (NDPES) permits and California General Waste Discharge Requirements for Sanitary Sewer Systems (GWDR)

To achieve these goals, the specific objectives of the sewer system asset management program are to:

- Minimize sewer blockages, backups, and SSOs
- Minimize neighborhood disruption due to construction and maintenance activities
- Reduce wet weather discharges to San Francisco Bay by reducing I/I in the collection system
- Optimize the costs of maintenance and repair/rehabilitation programs

The programs described in this AMIP are designed to meet these goals and objectives, and include:

- Effective sewer system maintenance that includes routine (proactive) and preventive maintenance activities, including sewer cleaning and root control;
- System inspection and condition assessment to identify and help prioritize sewer maintenance, repair, rehabilitation, and replacement needs; and
- Sewer rehabilitation and I/I control programs to address structural and maintenance problems, maintain the long-term operational reliability of the system, improve neighborhood infrastructure, and help reduce wet weather flows.

Numeric targets associated with the above programs are summarized in **Table 1**. The City will use these targets as a means of measuring its performance in meeting its asset management goals and objectives.

Other related programs and activities that also address the City's overall asset management goals are described in other documents, including the City's Sewer System Management Plan, Pump Station Prioritization Plan, Pump Station Renovation Plan, and Sanitary Sewer System Hydraulic Analysis Report.

Table 1: Asset Management Program Performance Measures

| Program | Activity | Target |
|---|--------------------------------------|---|
| Sewer Maintenance | System-Wide Cleaning | Clean entire system (except Alameda Pont) by June 30, 2019. Thereafter, clean non-grid pipes at least once every 5 years and grid pipes at least once every 10 years. |
| | Cleaning QA/QC | Conduct random CCTV inspection following cleaning for at least 2% of pipes cleaned by City crews and contractors (note: routine cleaning by contractors will be done in conjunction with CCTV inspection). |
| Sewer Inspection and Condition Assessment | CCTV Inspection | Inspect all sewers that are more than 10 years old (except Alameda Point) by the end of 2015. Thereafter, set sewer inspection frequency based on previous CCTV results, maintenance history, or potential risk, no longer than every 20 years. |
| | CCTV Inspection QA/QC | Conduct detailed review of video and observation coding for at least 2% of pipes inspected by City crews and contractors. |
| | Manhole Inspection | Inspect all manholes on sewers scheduled for CCTV inspection. |
| Sewer Rehabilitation and I/I Control | Sewer Rehabilitation and Replacement | Rehabilitate approximately 3 miles of sewer per year on a cumulative basis |
| | Private Property Inflow Correction | Initiate notification of properties with inflow sources within 90 days of identification |

2.2 Staff Organization and Responsibilities

The City's sewer system asset management program is implemented by the City's Public Works Department under the leadership of the Director of Public Works. The Maintenance Division, under the direction of the Public Works Coordinator and the Public Works Maintenance Superintendent, is responsible for hot spot sewer cleaning and associated cleaning QA/QC, root control, maintenance-related sewer and manhole inspections, as well as other related maintenance activities such as SSO response and reporting, sewer blockage and complaint response, and emergency spot repairs. Chemical root control and select spot repairs are performed by contractors.

The Engineering Division, under the direction of the City Engineer and Public Works Coordinator, is responsible for routine cleaning conducted in conjunction with CCTV inspection, sewer and manhole inspections, condition assessment, inflow elimination, and sewer rehabilitation, including budgeting for sewer system capital improvements. Engineering design of sewer rehabilitation projects is performed by

City engineering staff or by consultants under the direction of City staff. Public Works Department inspectors provide inspection of sewer rehabilitation and replacement projects.

The Engineering Division also oversees the Private Sewer Lateral (PSL) program and coordinates with other City departments and agencies (e.g., Building, Finance, Information Technology, and EBMUD) as needed for implementation and enforcement of that program.

The Maintenance and Engineering Divisions coordinate on an on-going basis, including maintaining an engineering referral list for problems identified through maintenance activities such as CCTV inspection, service requests, maintenance flushing logs, lift station logs, sinkhole mitigation, and capital improvement program data. The two divisions are jointly responsible for preparing and updating this AMIP as well as other related documents, including the SSMP.

2.3 Information Systems

The City uses various information systems to support asset management activities. These systems include:

- **ESRI ArcMap Geographic Information System (GIS).** The GIS is used to generate sewer system maps and store system inventory data, including sewer attribute information such as pipe diameter, length, and material. The GIS is also used to define areas for cleaning and sewer inspection.
- **AutoCAD.** AutoCAD is used to create sewer mapping and design drawings.
- **Accela.** Accela is used to track building permits and plumbing permits for lateral testing, repair, and replacement. Two new permit designations (SLT and SLR) have been created for the PSL compliance program. (Note: Effective January 1, 2015, Alameda will join the Regional PSL Program and responsibility for tracking PSL compliance will be transferred to EBMUD.)
- **Comcate.** Comcate is used to generate work orders to respond to service requests from customers, as well as for normal pump station maintenance and hot spot cleaning.
- **Granite XP.** Granite XP records and stores data from cleaning and CCTV inspections conducted by City maintenance staff and contractors.
- **Other databases and spreadsheets.** The City uses MS Excel to track and record routine cleaning, manhole inspections, and results of other field activities.
- **InfoWorks CS sewer system hydraulic model.** The model is used to identify potential capacity deficiencies and determine the required sizes of sewer replacement and capacity improvement projects. The City owns a “viewer” version of the model which allows City staff to access and view model data and results.

2.4 Plan Updates and Reporting

The City intends to employ continuous improvement and adaptive management in implementing its asset management program. This means that system performance will be evaluated and assessed on an on-going basis, and plans and programs will be modified and updated based on actual performance and new information from sewer inspection and other field investigations. Performance measures will include the activity targets identified in Table 1; SSO and future flow trends will also be considered. The City will report on its progress in implementing its asset management program to the EPA, as required under the Consent Decree, and will include any proposed revisions to maintenance, inspection, and rehabilitation schedules and accompanying changes to the financial plan.

3 Sewer Inspection and Condition Assessment

3.1 Overall Program Description

The City conducts CCTV inspection of sewers under its on-going citywide program of video inspection and condition assessment (now in its seventh phase). Approximately 41 miles (over 30 percent of the system, not including Alameda Point) have been inspected since 2009. The data collected have been used to develop condition ratings for the inspected pipes and prioritize sewers for repair and replacement.

The City also performs CCTV inspections to investigate sewer main SSOs, troubleshoot problem areas, and conduct cleaning QA/QC.

3.2 Sewer Inspection Methods

The City uses both CCTV inspection and direct visual inspection of manholes to document the condition of gravity sewer facilities. Both of these activities may be performed by City staff or by contractors, depending on the availability of resources and the goals and requirements of specific activities or projects.

The City owns and operates a CUES CCTV inspection truck equipped with camera and equipment capable of inspecting sewer mains up to 15 inches in diameter (which comprise over 90 percent of the gravity system). The system uses Granite XP software to capture the CCTV observations recorded by the operator. City CCTV operators have been trained and certified under the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP). The City also has two push cameras which are used to inspect lower laterals and other small diameter sewers that cannot be accessed by the CCTV truck.

Contractors are required to use NASSCO PACP standards and deliver the data in a PACP compliant format. Data provided by contractors are merged and stored in the City's Granite XP database.

3.3 Basis of Sewer Pipe Condition Assessment Program

Over the past five years, the City has used a number of factors to identify and prioritize areas for sewer inspection, including:

- Relative age of sewer pipes
- Historical results of sewer surcharge monitoring.
- Backyard mains located within City easements on private properties
- Pipes located in the vicinity of water bodies
- Pipes located in areas susceptible to high groundwater table
- Pipes in landfill areas with Bay Mud sub-base
- Pipes with service call records to the City Maintenance Division
- Pipes with reports of grease build up
- Representative samples of sewers in various areas of the system
- Pipes located in streets scheduled for paving

By the end of 2015, the City plans to complete inspection and condition assessment of the remaining sewers in the system that have not yet been inspected under previous condition assessments during the past five years, or have not be rehabilitated or replaced during the past 10 years. This work will include approximately 60 percent of the system. This work will be conducted in conjunction with routine cleaning program activities (refer to Section 4 of this AMIP). Prioritization of areas for inspection will consider paving schedules, higher than average I/I rates (as identified in the City's Subbasin Flow Monitoring and I/I Assessment Report, submitted in December 2012), or other factors such as areas along

the perimeter of the island that were constructed on fill and are more prone to settlement and structural issues.

3.4 Evaluation and Documentation of CCTV Inspection Findings

As was done for all previous condition assessment work since 2009, CCTV inspection findings will be documented using the NASSCO PACP scoring system, which assigns a “grade” to each observed defect based on its type and severity. The PACP “quick rating” is used to generate an initial evaluation of pipe condition. Based on the PACP ratings, pipes with Grade 4 or 5 structural or maintenance defects will be reviewed in detail by City Engineering and/or Maintenance staff.

The City will track the results and decisions made based on the review. At a minimum, all inspected pipes with maintenance and structural defects with grades as indicated in the **Table 2** will undergo detailed review of the video record to determine the appropriate follow-up action. Based on the review, the required corrective action and/or schedule for next inspection will be determined and documented. Defect scoring will be used to prioritize sewer rehabilitation as part of the cyclic sewer program.

CCTV inspection data will also undergo QA/QC review by Engineering Division staff or quality review consultants to verify the quality of the video recording and accuracy of the recorded observations. At least 2 percent of CCTV inspections conducted for condition assessment by City crews or contractors will undergo detailed quality review.

3.5 CCTV Inspection Schedule

Following the baseline inspection program described above, the schedule for subsequent CCTV inspections will be based on pipe-specific condition assessment results, at a frequency not to exceed 20 years. Pipes with any Grade 5 or Grade 4 structural defects that are not otherwise addressed by corrective action per Table 2 will be re-inspected in 5 or 10 years, respectively; pipes with Grade 3 defects will be re-inspected in 15 years; and pipes with only Grade 1 or 2 defects or no defects will be reinspected in 20 years. However, the City may modify these default inspection frequencies for pipes that are considered more critical (higher risk), such as sewers located adjacent to waterways or in areas with known soil stability issues.

Table 2: Defects Requiring Corrective Action

| Condition | Corrective Action |
|---|--|
| Grade 4 or 5 Maintenance Defect | Address issue within 60 to 90 days |
| Grade 5 Structural Defect – Imminent Failure Likely | Repair or Rehabilitate Sewer within 1 year |
| Grade 5 Structural Defect – Imminent Failure Unlikely | If sewer main is scheduled for rehabilitation within next 5 years – no action; otherwise Reinspect Sewer in 5 years |
| Grade 4 Structural Defect | If sewer main is scheduled for rehabilitation within next 10 years– no action; otherwise Reinspect or Repair within 10 years |

Notes:

- 1) Corrective action for maintenance defects may include cleaning, root cutting, repair, rehabilitation, or continued monitoring, depending on the nature of the defect(s). An assessment of the required corrective action will be made through review of the inspection video and the maintenance history of the sewer segment by Maintenance and/or Engineering staff.
- 2) Decision to repair or rehabilitate sewers with Grade 4 or 5 structural defects will be based on the severity and type of defect; if re-inspection indicates that the sewer condition has not worsened since the previous inspection, then the corrective action could be deferred or subsequent inspection scheduled in accordance with the timeframes indicated in the table.

3.6 Manhole Inspection

The City initiated inspection of manholes in 2011, focusing initially on manholes identified as being located in areas prone to flooding, as listed in the City's July 2010 Inflow Identification and Elimination Plan. The manhole inspection observations were recorded in an Excel spreadsheet that notes the condition of each component of the manhole (lid, frame, cone, barrel, base) based on a damage rating ranging from 1 to 5 (1 indicating no damage and 5 indicating need for immediate repair). The City plans to continue manhole inspections in conjunction with CCTV inspection work.

4 Sewer Maintenance

The City's protocols for maintenance of the sanitary sewer system were initially established in the Sewer System Cleaning and Root Control Program that was submitted to EPA in July 2010 and subsequently revised in October 2010 and April 2011 in response to EPA comments. Elements of that plan are incorporated into this section of the AMIP.

4.1 Overall Program Description

The City's sewer cleaning program includes hydro-flushing, jetting, and (on occasion) bucket cleaning. Sewer cleaning is performed by City crews and also by contractors for special projects or in conjunction with closed-circuit television (CCTV) inspection of sewers. Sewer cleaning is performed for hot spot locations at frequencies of one year or less, and as part of routine cleaning of other gravity sewers.

4.2 Routine Cleaning

All sewers that are not part of the hot spot cleaning program (described below) are included in the routine cleaning program. Routine cleaning will initially be conducted in conjunction with the CCTV inspection for those sewers included in the CCTV program (see description in Section 3). All other pipes (primarily those that are less than 10 years old) will undergo their first cleaning prior to June 30, 2019, as required by the Consent Decree.

The sewers in the City's collection system are classified into two basic types: "grid" and "non-grid". The pipes in the grid system are characterized by having multiple pathways for flow should a temporary pipe blockage and flow backup occur. This allows the flow to be bypassed to another, non-obstructed pipe and be conveyed downstream in another direction, thereby preventing an SSO. Over 60 percent of the sewers in Alameda are part of the grid system. Each pipe is flagged as "grid" or "non-grid" in GIS based on the configuration of the surrounding system. A map showing the grid and non-grid pipes is included in **Appendix A**.

In accordance with the Consent Decree, after the initial round of routine cleaning, the City will clean the pipes that are not part of the grid system (excluding the sewers in Alameda Point) every 5 years and the grid system pipes every 10 years.

Sewer cleaning crews will record their observations regarding the nature and extent of the material removed during the sewer cleaning using the codes shown in **Table 3**. Pipes with heavy material would be scheduled for re-cleaning in 2 years or moved to the hot spot cleaning program, if warranted.

Note that for any pipe that experiences an SSO, the City's standard practice is to perform a failure analysis to identify the cause, and based on the results of the failure analysis, the sewer may undergo a localized repair or referred to Engineering for rehabilitation if a structural solution is indicated, or else placed on a more frequent cleaning schedule.

Table 3: Categorization of Sewer Cleaning Results

| | Clear | Light | Moderate | Heavy |
|--|--|---|---|--|
| Debris | Code: CL <ul style="list-style-type: none"> No observable debris | Code: DL <ul style="list-style-type: none"> Minor amount of debris 15 minutes or less to clean 1 pass | Code: DM <ul style="list-style-type: none"> Less than 5 gallons of debris per line segment 15-30 minutes to clean 2-3 passes | Code: DH <ul style="list-style-type: none"> More than 5 gallons of debris per line segment More than 30 minutes to clean More than 4 passes Operator concern for future stoppage |
| Grease | Code: CL <ul style="list-style-type: none"> No observable grease | Code: GL <ul style="list-style-type: none"> Minor amounts of grease 15 minutes or less to clean 1 pass | Code: GM <ul style="list-style-type: none"> Small “chunks” No “logs” 15-30 minutes to clean 2-3 passes | Code: GH <ul style="list-style-type: none"> Big “chunks” or “logs” More than 30 minutes to clean More than 4 passes Operator concern for future stoppage |
| Roots | Code: CL <ul style="list-style-type: none"> No observable roots | Code: RL <ul style="list-style-type: none"> Minor amounts of roots 15 minutes or less to clean 1 pass | Code: RM <ul style="list-style-type: none"> Thin stringy roots No “clumps” 15-30 minutes to clean 2-3 passes | Code: RH <ul style="list-style-type: none"> Thick roots Large “clumps” More than 30 minutes to clean More than 4 passes Operator concern for future stoppage |
| Other: Pipe wall fragments Soil/dirt/ rock | Code: CL <ul style="list-style-type: none"> No observable materials | Code: OL <ul style="list-style-type: none"> Specify material (if possible) Minor amounts of material | Code: OM <ul style="list-style-type: none"> Specify material Less than 5 gallons of material per line segment | Code: OH <ul style="list-style-type: none"> Specify material More than 5 gallons of material per line segment Operator concern for future stoppage |
| <p>This table was adapted from <i>Best Practices Manual: Hydroflush Cleaning of Small Diameter Sewers</i>, California Collection System Collaborative Benchmarking Group, February 2001.</p> | | | | |

4.3 Hot Spot Cleaning

Sewers with previous repeat SSOs (two or more SSOs at the same location in a single year due to the same cause) and/or identified by maintenance staff as having recurring maintenance issues (e.g., roots, grease, or debris accumulation) are defined as “hot spots.” The hot spot is defined as a “root blockage” or “FOG blockage” if, after cleaning operations, roots or grease are found to be the cause of a blockage or SSO, and the same problem is reported two or more times in a year. Other sewers may also be included as hot spots based on the decision of the Maintenance Superintendent.

Hot spots are divided into three groups, with two of the groups cleaned annually and one group cleaned every 90 days. The hot spot locations currently include 6.7 miles of pipes located along and in the areas around Webster Street and Park Street, and in several other areas of the system. The City’s current hot spot list and map are included in **Appendix B**. Historically, many hot spots were related to issues in lower laterals. The City has historically taken responsibility for unplugging lower lateral blockages as a courtesy to homeowners, but has now changed its policy to shift responsibility to the property owner. Therefore, the City has updated the hot spot list based on changes in maintenance protocols for lower laterals. Note that some of the hot spots are not necessarily locations where blockage or SSOs have actually occurred, but areas where aggressive preventive maintenance is considered warranted in order to avoid such occurrences (e.g., along busy commercial streets).

Hot spot locations are maintained in GIS on a Hot Spot Location Map, which is updated annually. Hot spots are added based on the criteria above, or may be removed based on the Maintenance Superintendent’s recommendation if the hot spot has not caused or contributed to an SSO for two consecutive years or if the pipe reach has been replaced.

Hot spot cleaning results will be recorded in accordance with the codes shown in Table 3. The initial frequency of cleaning for new hot spots will be 6 months. The City will adjust hot spot cleaning frequencies based on cleaning findings, as shown in **Table 4** below.

Table 4: Cleaning Schedule Changes Based on Cleaning Results

| Clear | Light | Moderate | Heavy |
|---|---|---|---|
| Decrease frequency to next lower frequency after 2 consecutive CL results (e.g. 6 mos. to 12 mos.) and CCTV inspection data showing no remaining defects that would cause a blockage or an SSO. | Continue current maintenance frequency. | Increase current maintenance frequency to next higher frequency (e.g. 6 mos. to 3 mos.) | Increase current maintenance frequency to next higher frequency (e.g. 6 mos. to 3 mos.) |

4.4 Root Control

The City uses hydroflushing, rodding, chemical root control, or a combination of these methods to control roots in the sewer system. Sewer mains are identified as potential candidates for chemical root control based on the number of lower lateral service requests caused by roots, observation of roots in the pipe through CCTV, if the main is in a backyard/sideyard easement, and/or if the main is shallow and in an area with trees. Root problems historically have been in sewer laterals rather than sewer mains. If there is root intrusion in a sewer lateral that causes a failure or break in the lower lateral, the City will repair or replace the lower lateral accordingly.

Sewer mains that are root foamed are re-treated every two years until root intrusion is no longer a problem or the pipe is replaced.

4.5 QA/QC Program

The City uses CCTV inspection as the primary method for ensuring the quality of pipeline cleaning, and applies a pipe cleanliness rating where 95 percent indicates adequate cleanliness. As part of its initial routine cleaning program in 2011, about 50 percent of the sewers that were cleaned by City crews also underwent CCTV inspection, typically within 30 days after cleaning. In the future, a random 2 percent sample of all cleaning conducted by City crews will undergo CCTV inspection after cleaning, and inadequately cleaned pipes will be re-cleaned within 30 days. Cleaning QA/QC results will be documented, and feedback and training as needed will be provided to maintenance staff.

As described in the previous section on routine inspection, the City also coordinates routine sewer cleaning and CCTV inspection by contractor, thereby using the CCTV inspection results to confirm the quality of cleaning. The City's cleaning and CCTV specifications require the contractor to submit CCTV data and video on a periodic basis for quality review by the City. Inadequate cleaning will be identified, and the contractor will be required to re-clean the sewer within 30 days.

4.6 Staffing

With the exception of chemical root control application and cleaning in association with CCTV inspection for sewer condition assessment, sewer maintenance activities are carried out by staff of the City's Public Works Department Maintenance Division. The Department currently employs 11 field staff (including one currently vacant position) and 1 supervisor for the operation and maintenance of the sanitary sewer system, including pump stations. This level of staff is adequate for performing the hot spot sewer cleaning, CCTV inspection for cleaning QA/QC, pump station maintenance, operations support, and a portion of routine cleaning, manhole inspections, and CCTV inspection for sewer condition assessment as needed.

The majority of routine cleaning for the initial cycle of system-wide cleaning will be performed by contractors in conjunction with CCTV inspection. The City has incorporated the requirements of this AMIP with respect to cleaning QA/QC and recording of cleaning and inspection results into its cleaning and inspection contract specifications.

5 Sewer Repair and Replacement

5.1 Overall Program Description

The City has had an on-going program for repair, rehabilitation, and replacement of its sewer system since the 1980s and, to date, has rehabilitated or replaced over 20 percent of its gravity sewer mains. The program has included rehabilitation and replacement of sewers in subbasins identified in its 1986 Sewer System Evaluation Survey (SSES) as being cost-effective for rehabilitation to reduce I/I. These areas were subsequently included in the I/I Correction Program mandated under Cease and Desist Orders issued by the RWQCB to the EBMUD Satellites in 1986 and revised in 1993. The City also conducts sewer rehabilitation to address maintenance issues, including sewers with historical blockages or SSOs, as well as pipes identified as having significant structural problems. Under its rehabilitation program, the City also rehabilitates or replaces the lower portion of sewer laterals whenever the associated mainline sewer is rehabilitated or replaced, replaces all manholes unless they are in good condition or have been replaced under previous rehabilitation projects.

It should be noted that in the context of this AMIP, the term sewer "rehabilitation" refers to "node-to-node" (e.g., manhole-to-manhole) lining or replacement of an entire pipe segment, and the term "repair" refers to a point repair (typically excavation and replacement of a 2 to 10-foot segment of pipe), generally performed to address a localized emergency condition, such as a sink hole.

5.2 Basis of Sewer Rehabilitation Program

The City schedules sewers for rehabilitation in its 5-year CIP, called its “cyclic sewer replacement program.” Sewers are identified for rehabilitation and projects are defined based on several factors, including history of recurring maintenance problems, coordination with street paving, and condition assessment results. As noted above, previous projects conducted under its 1993 I/I Correction Program Compliance Plan had been targeted toward I/I reduction, as determined by the 1986 SSES. The City has completed its Subbasin Flow Monitoring and I/I Assessment (submitted to EPA on December 1, 2012), which describes its future approach for targeting high priority areas for sewer rehabilitation. As noted in that plan, the City will include relative peak I/I rates as a key criterion in prioritizing areas for rehabilitation. As also noted in that report, EBMUD’s analysis indicates that flows from Alameda have minimal impact on discharges from its WWFs; therefore, Alameda’s sewer rehabilitation plan will be focused on improving the physical condition of its own collection system to preserve its structural integrity and minimize maintenance problems and SSOs, and reducing I/I as part of the overall regional goal of reducing wet weather flows.

The City is developing a “pipe rating model” that will be used to prioritize sewer rehabilitation based on relative risk scores, calculated based on the likelihood and consequences of pipe failure. Likelihood of failure factors will include pipe structural condition based on CCTV inspection; pipe age and material (where inspection data is not available); relative peak I/I rates; soil conditions (e.g., location in fill areas); and history of SSOs or recurring maintenance problems. Consequence of failure factors will include the relative size of the sewer (and indicator of the number of customers impacted by a failure, cost of repair, and/or size of a potential SSO); proximity to water bodies; and location in busy streets, commercial areas, or adjacent to community or public safety facilities such as hospitals and fire stations. The results of the pipe rating model will be used to define annual sewer rehabilitation projects to meet Consent Decree requirements.

The City’s current sewer rehabilitation CIP targets an average of 3 miles of sewer replacement annually, or about 2 percent of the system per year. The City will review this plan annually and make adjustments based on additional information from maintenance, paving programs, CCTV inspection, and results from EBMUD’s Regional Technical Support Program (targeted at finding sources of inflow and rapid infiltration). The updated plans will be included in the City’s annual reporting under the Consent Decree. The City also replaces lower laterals in conjunction with sewer main replacement.

In addition to planned CIP projects, the City also conducts sewer and manhole, point repairs that are identified as critical issues (“acute defects”) based on information from maintenance and inspection activities. The City has an annual budget of \$300,000 for such repairs, which are done by contractor.

5.3 Infiltration/Inflow Control Measures

5.3.1 Inflow Identification and Elimination

The City’s Inflow Identification and Elimination Program initially called for a 10-year program of smoke testing of the entire collection system to identify potential sources of direct inflow into the system, and inspection and repair, if needed, of approximately 465 manholes and other sewer structures located in areas prone to flooding. The program included documenting the results of these investigations and follow-up actions as needed, including enforcement for inflow sources located on private property.

The City decided to accelerate the smoke testing work by completing 6 of the original 10 phases of the program in 2011, 2012, and 2013 (total of about 80 miles of the system). Effective in 2014, the program was discontinued, as the Consent Decree now requires EBMUD to conduct inflow identification efforts as

part of its Regional Technical Support Program (RTSP). Under the Consent Decree, the City will be responsible for follow-up and enforcement for identified private inflow or “rapid infiltration” sources identified through the RTSP, and for repair of sources within the public portion of the system.

The City developed for its smoke testing program, and intends to use for the RTSP, a database to track follow-up actions for inflow or “rapid infiltration” sources on private property. Within 90 days of receiving notice from EBMUD of both High Priority and Non High Priority sources on private property, the City will issue a notice of non-compliance to the property owner with any associated materials to support the finding of non-compliance. For High Priority sources, if the City has not received verification that the illicit connection has been corrected within 6 months, a second notice of non-compliance will be sent to the property owner with an additional 6 months for correction and notification of future assessment of fines. If the City has not received verification that the illicit connection has been corrected within one year from the date of the first notice, the City will issue a final notice of non-compliance stating the City’s intent to pursue the passage of a City Council resolution for the work to be done by the City with the expenses assessed upon the property owner. For Non High Priority sources, the degree of enforcement will be determined based on the severity of the case.

For High Priority sources found in the public portion of the system, the City will either perform the repair through the emergency/spot repair budget and/or integrate the information into the City’s pipe rating model to re-prioritize sewer main rehabilitation.

The City is also conducting inspection of manholes identified as potential for inflow in areas prone to flooding. Based on these results, a capital improvement project will be budgeted to address manholes that the City determines are in need of repair or rehabilitation.

5.3.2 Infiltration Identification and Reduction

Areas and sources of infiltration may be identified through flow monitoring, smoke testing, and sewer, manhole, and lateral inspections. Infiltration reduction in the public portion of the system will be implemented through the sewer rehabilitation program described in this section of the AMIP. The City’s Private Sewer Lateral (PSL) compliance program (and starting in 2015, the Regional PSL Program) will be the primary vehicle for addressing infiltration from defective upper laterals.

5.3.3 I/I Prevention

Application of appropriate standards for design and construction of new sewer facilities and for sewer rehabilitation and replacement, and enforcement of the applicable provisions of the Alameda Municipal Code, are the primary methods for preventing I/I in the City’s collection system. The City’s Public Works Department maintains a book of Standard Subdivision Improvements Specifications and Design Criteria, which contains design standards for sewers. The City sewer design standards are required for both new installation and replacement facilities. The City has four full time construction inspectors, who report to the Construction Inspection and Survey Supervisor within the Public Works Department. All sewer construction and rehabilitation work is inspected to make sure that it meets the City’s design standards. All sewers constructed by contractors are cleaned, tested and video inspected before acceptance. Sewer laterals on private property are tested in accordance with Uniform Plumbing Code and City of Alameda Ordinance in the presence of a City Building Inspector from the City’s Planning and Building Department.

Under the Consent Decree, the City will also participate, together with the other Satellites and EBMUD, in the development of Regional Standards for sewer installation, rehabilitation, and repair.

5.4 Schedule for Sewer Repair, Rehabilitation and Replacement

The City's planned sewer rehabilitation and replacement projects for FY 2014/15 are shown in **Appendix C**. Subsequent years' projects will be based on the results of the pipe rating model, expected to be completed by early summer 2015. Upon completion, Appendix C will be updated with prioritized capital projects addressing the remaining portion of the system not already rehabilitated from its original installation. Note that the rehabilitation plan may continually be adjusted based on results of additional condition assessment or other relevant information. The City will report adjustments to the rehabilitation plan and schedule in its Annual Reports under the Consent Decree.

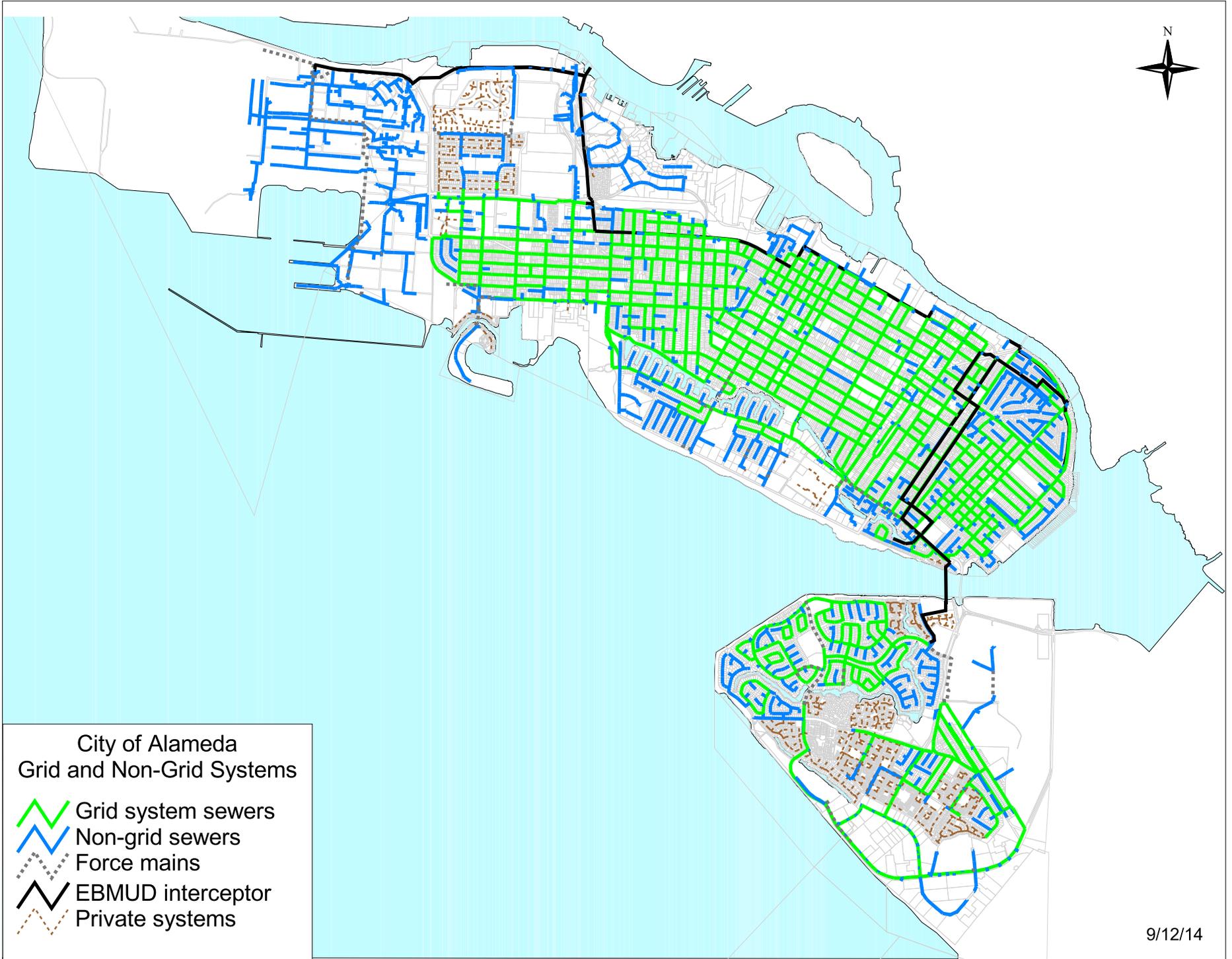
5.5 Emergency Repair and Replacement

As noted above, the City has an annual contract of \$300,000 for point repairs. The number and cost of emergency repairs will be reported in the City's Annual Reports under the Consent Decree.

5.6 10-Year Capital Improvement Plan and Financial Plan

The City's CIP includes repair, rehabilitation, and replacement of sewer pipelines, lower laterals, and manholes, as discussed in this AMIP, as well as upgrades to sewer pump stations. The City funds its sewer program through a combination of debt financing and revenues from sewer fees. The City is in the process of completing a rate study and preparing an updated financial plan. The study will be completed in late 2014, and rate adjustments will commence in FY 2015/16. At that time, the updated 10-year financial plan will be included in **Appendix D**.

Appendix A - Map of Grid and Non-Grid Systems



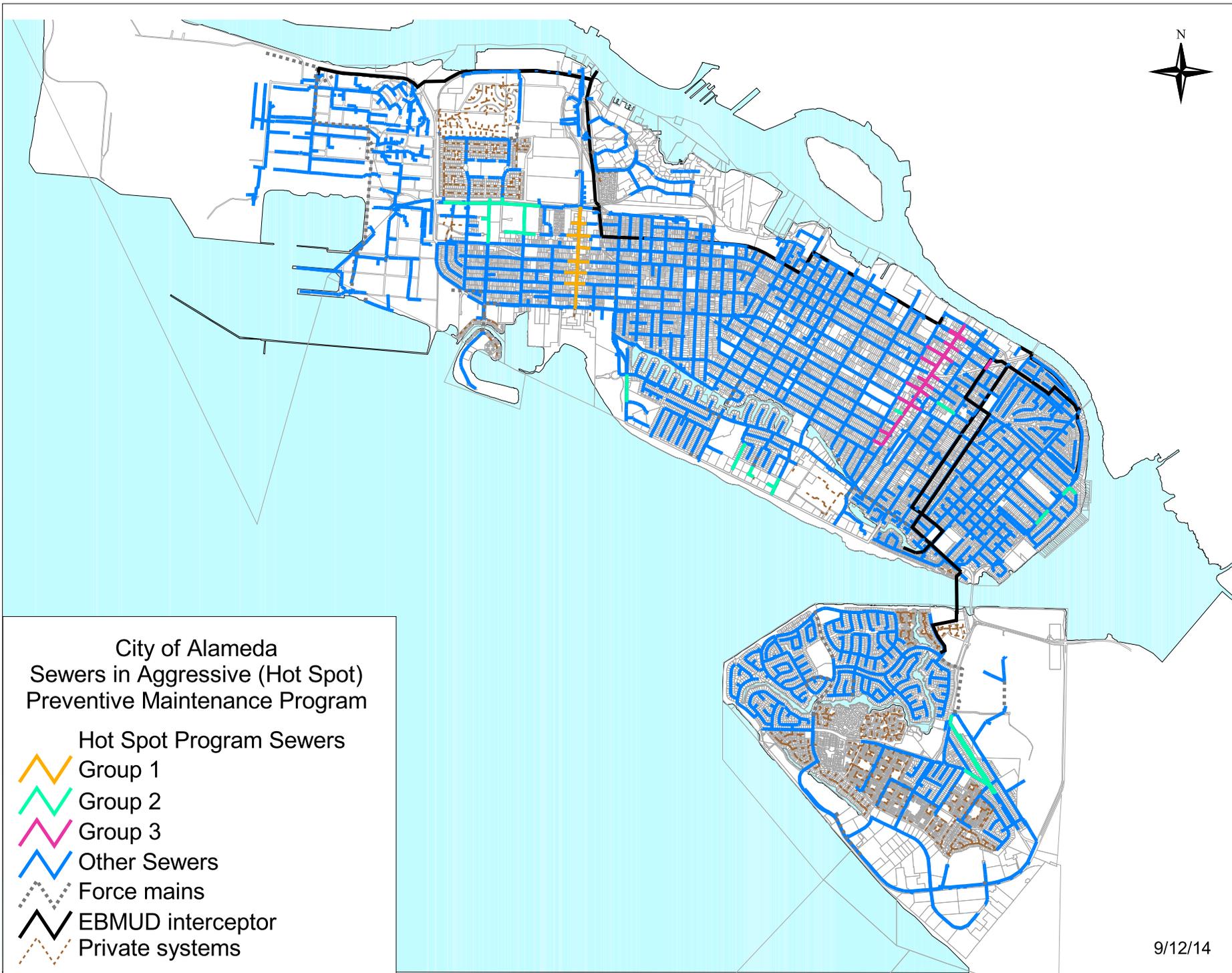
City of Alameda
Grid and Non-Grid Systems

- Grid system sewers
- Non-grid sewers
- Force mains
- EBMUD interceptor
- Private systems

Appendix B - Sewer Hot Spot List and Map

City of Alameda
Sewers in Aggressive (Hot Spot) Cleaning Program

| Group 1 | Group 2 | Group 2 (cont'd.) | Group 3 |
|-----------------|-------------------|--------------------------|-----------------|
| 1220013-9110021 | 10012901-10013008 | 9120807-9120806 | 9420509-9420508 |
| 1220017-9110026 | 10012902-10012901 | 9120808-9120807 | 9420523-9420524 |
| 1220202-9110029 | 10012903-10012902 | 9120809-9130113 | 9420524-9420508 |
| 1220203-1220202 | 10013001-9811706 | 9120810-9120809 | 9420525-9420524 |
| 9110001-9110203 | 10013002-10013001 | 9120812-9120811 | 9420526-9420525 |
| 9110002-9110001 | 10013003-10013002 | 9120813-9120812 | 9420604-9420802 |
| 9110003-9110002 | 10013004-10013003 | 9120814-9120813 | 9420606-9420605 |
| 9110006-9110039 | 10013005-10013004 | 9130014-9120814 | 9420606-9420802 |
| 9110007-9110002 | 10013006-10013005 | 9130112-9130113 | 9420622-9741009 |
| 9110008-9110007 | 10013007-10013006 | 9130113-9120808 | 9420801-9420524 |
| 9110009-9110039 | 10013008-10013007 | 9211008-9211007 | 9420802-9421304 |
| 9110011-9110009 | 10013009-10013008 | 9211009-9211008 | 9420804-9420802 |
| 9110017-9110007 | 10013011-10013002 | 9211010-9211009 | 9420807-9420606 |
| 9110018-9110017 | 10013012-10013011 | 9211011-9211010 | 9420810-9420606 |
| 9110019-9110018 | 10013013-10013012 | 9211015-9211010 | 9420811-9420837 |
| 9110021-9110018 | 10013014-10013013 | 9211016-9211010 | 9420812-9420810 |
| 9110023-9110021 | 10013015-10013014 | 9212011-9212001 | 9420813-9420812 |
| 9110025-9110021 | 10013016-10013015 | 9212012-9212011 | 9420815-9420812 |
| 9110026-9110025 | 10013017-10013016 | 9212013-9212011 | 9420816-9420815 |
| 9110027-9110026 | 10013018-10013017 | 9230301-1210011 | 9420817-9420815 |
| 9110028-9110027 | 10013023-10013011 | 9230302-9230301 | 9420818-9420817 |
| 9110031-9120000 | 9120301-9120807 | 9230303-9230302 | 9420821-9420817 |
| 9110032-9110031 | 9120302-9120301 | 9421126-9421124 | 9420822-9420821 |
| 9110033-1220203 | 9120303-9120302 | 9633101-9633205 | 9420824-9420823 |
| 9110035-9121209 | 9120304-9120303 | 9633102-9633101 | 9420825-9420823 |
| 9110039-9110032 | 9120305-9120304 | 9633102-9633205 | 9420830-9420823 |
| 9121105-9110026 | 9120306-9120305 | 9633103-9633102 | 9420835-9741010 |
| 9121107-9110029 | 9120307-9120304 | 9633107-9633106 | 9420837-9420810 |
| 9121209-9110033 | 9120308-9120307 | 9633108-9633107 | 9421103-9421300 |
| | 9120400-9120809 | 9633501-9633101 | 9421303-9421304 |
| | 9120401-9120400 | 9731209-9731208 | 9421304-9420801 |
| | 9120402-9120401 | 9731210-9731213 | 9421305-9421304 |
| | 9120403-9120402 | 9731211-9731210 | 9421306-9421305 |
| | 9120420-9120401 | 9731212-9731210 | 9741003-9741001 |
| | 9120421-9120420 | 9731213-9731209 | 9741005-9741003 |
| | 9120422-9120421 | 9731216-9731212 | 9741006-9741005 |
| | 9120501-9120809 | 9741007-9741006 | 9741008-9420830 |
| | 9120503-9120501 | 9811703-9811702 | 9741008-9741006 |
| | | 9811706-9811703 | 9741009-9741008 |
| | | | 9741010-9741008 |
| | | | 9742001-9741001 |
| | | | 9742003-9741003 |



City of Alameda
Sewers in Aggressive (Hot Spot)
Preventive Maintenance Program

- Hot Spot Program Sewers
- Group 1
- Group 2
- Group 3
- Other Sewers
- Force mains
- EBMUD interceptor
- Private systems

**Appendix C - FY 2014/15 Sewer Rehabilitation/Replacement
Plan**

City of Alameda
FY 2014/15 Sewer Rehabilitation/Replacement Plan

| Project Location | Project Extents | Estimated Sewer Length (lf) |
|-------------------------|-----------------------------------|------------------------------------|
| Bay Street | Central Ave. and Clinton Ave. | 2,000 |
| Paru Street | Central Ave. and Clinton Ave. | 2,000 |
| Sherman Street | San Antonio Ave. and End (lagoon) | 1,500 |
| Hawthorne Street | San Antonio Ave. and End (lagoon) | 800 |
| Pacific Avenue | Main St. and Fourth St. | 900 |
| Lincoln Avenue | Eighth St. and Grand St. | 4,500 |
| St. Charles | | 700 |
| Northside Posey Tube | | 1,000 |
| Total | | 13,400 |

Appendix D - 10-Year Financial Plan (to be updated in 2015)

Chapter 2 Appendices

Appendix 2-A Key Staff Contact Information

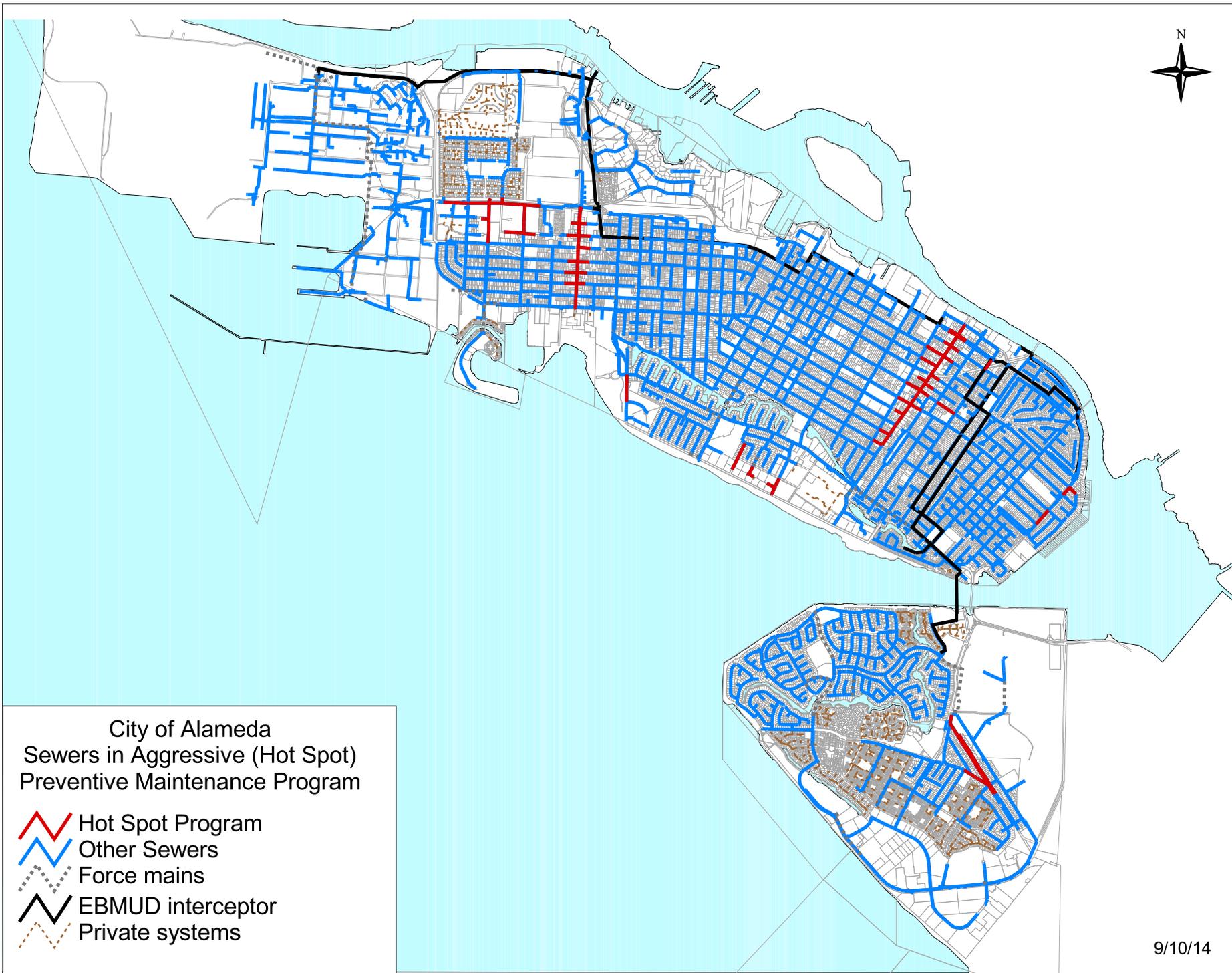
| Position | Name | Phone Number |
|---|------------------------|----------------|
| Public Works Director | Bob Haun | (510) 747-7979 |
| Deputy Public Works Director | Liam Garland | (510) 747-7962 |
| Public Works Coordinator | Erin Smith | (510)747-7938 |
| City Engineer | Ed Sommerauer (acting) | (510) 747-7939 |
| Assistant Engineer | Shilpa Patel | (510) 747-7945 |
| Assistant Engineer | Philip Lee | (510) 747-7942 |
| Associate Civil Engineer | Carol Clark | (510) 747-7944 |
| Construction Inspection Supervisor | Flavio Barrantes | (510) 747-7952 |
| Senior Construction Inspector | Greg Stoia | (510) 747-7953 |
| Public Works Maintenance Superintendent | Jesse Barajas | (510) 747-7924 |
| Public Works Maintenance Supervisor | Max Arbios | (510) 747-7922 |
| Sewer Shop Team Leader | Patrick Papalagi | (510) 747-7900 |
| Plumbing Shop Team Leader | Victor Erdei | (510) 747-7900 |

Chapter 3 Appendices

None

Chapter 4 Appendices

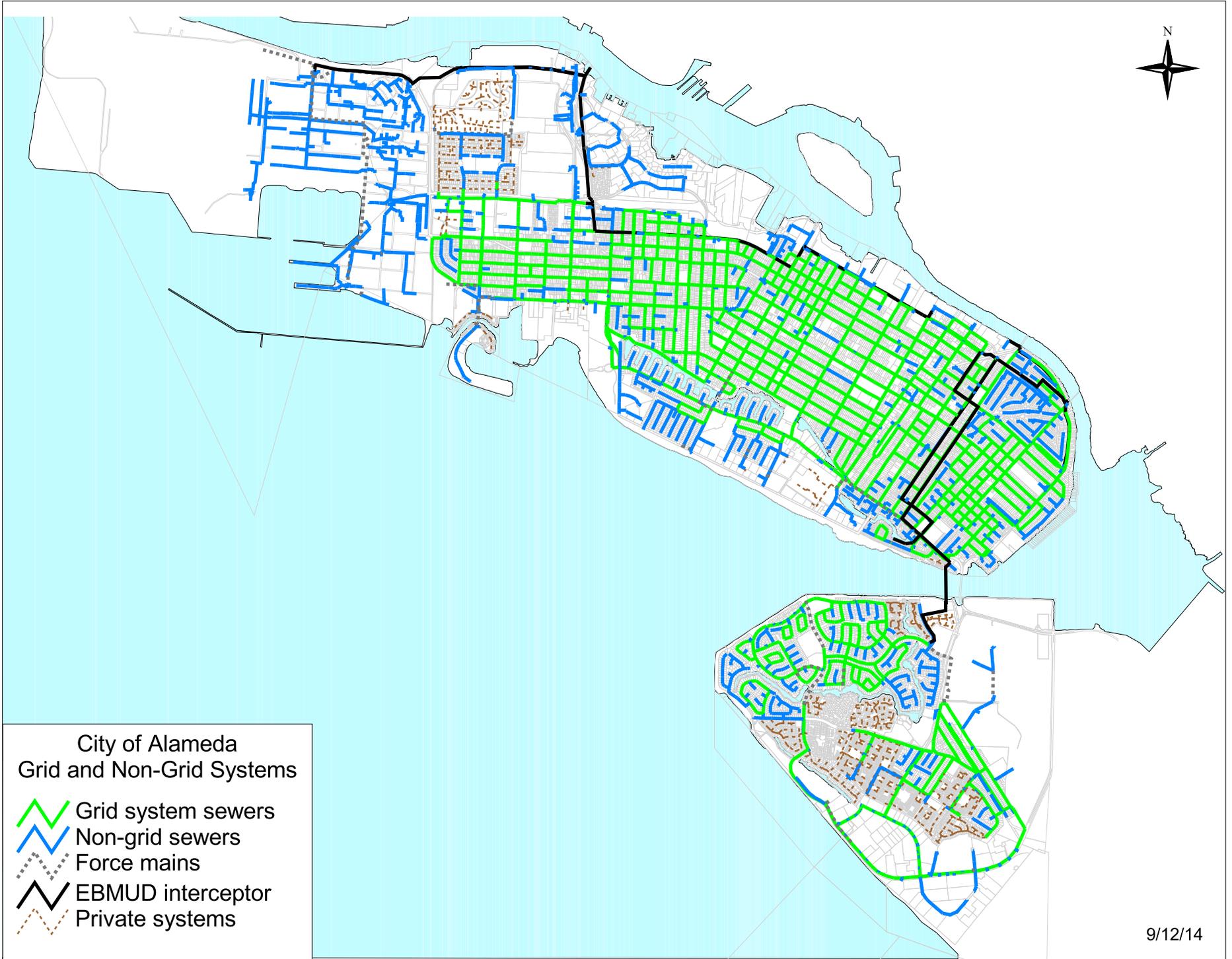
Appendix 4-A Map of Sewers in Hot Spot Cleaning Program



City of Alameda
Sewers in Aggressive (Hot Spot)
Preventive Maintenance Program

-  Hot Spot Program
-  Other Sewers
-  Force mains
-  EBMUD interceptor
-  Private systems

Appendix 4-B Map of Grid and Non-Grid Systems



City of Alameda
Grid and Non-Grid Systems

- Grid system sewers
- Non-grid sewers
- Force mains
- EBMUD interceptor
- Private systems

Appendix 4-C Pump Station Maintenance Procedures

LIFT STATION INSPECTION AND CLEANING

Inspection

1. Inspect wet well, control panel and all associated equipment for damage. Clean control panel as required.
2. Check all functions of lift station controls (level controls, HOA position, floats, SCADA function).

Cleaning

1. Scrape walls of wet well to remove accumulations of grease and various other debris.
2. Apply grease emulsifier to walls of wet well and to surface of water in wet well.
3. Wash down wet well with high-pressure hot water while simultaneously pumping down level and adding emulsifier.
4. Repeat last step as necessary to remove grease, solids, and sediment.
5. Apply final coating of emulsifier to wall of wet well and to surface of water.

| Pump Station Monthly Maintenance Report Station Location | | | |
|--|------|----------|------------------------|
| _____ Month: Day: Year: Staff : | | | |
| Maintenance Task | Time | Initials | Notes And Observations |
| <i>Inspect Grounds</i> | | | |
| <i>Wash Down Wet Wells</i> | | | |
| <i>Test Level Controls</i> | | | |
| <i>Check amps</i> | | | |
| <i>Note:</i> | | | |
| <i>Exercise Pumps</i> | | | |
| <i>Exercise Valves</i> | | | |
| ISO and Checks | | | |
| <i>Check Inflow</i> | | | |
| <i>Manhole</i> | | | |
| <i>Check Discharge</i> | | | |
| <i>Manhole</i> | | | |
| <i>Inferred temp Motors</i> | | | |
| NOTE : | | | |
| <i>Test Back Floats</i> | | | |
| <i>Test Sump Pump</i> | | | |
| <i>Station Lighting</i> | | | |
| Comments | | | |
| <i>ON/Off Settings</i> | | | |
| <i>High/low level settings</i> | | | |

Appendix 4-D Sewer Equipment and Materials Inventory Lists

Sewer Collection System Equipment

| Description | Use |
|--|--------------------------------|
| Tractor / Backhoe | Sewer Repairs |
| Tractor / Backhoe (Standby) | Sewer Repairs |
| Vac-Con Jetter / Vacuum | Sewer Cleaning / Repairs |
| Vactor Jetter / Vacuum | Sewer and Storm Drain Cleaning |
| Dump Truck | Sewer Cleaning / Repairs |
| Dump Truck (Standby) | Sewer Cleaning / Repairs |
| Flat-Bed Truck F-350 | Sewer Cleaning / Repairs |
| Utility Truck F-450 | Sewer Cleaning / Repairs |
| Utility Truck C-30 | Sewer Cleaning / Repairs |
| Compressor / Jack Hammer | Sewer Repairs |
| Concrete Saw | Sewer Repairs |
| Walk Behind Concrete Saw | Sewer Repairs |
| Trench Shoring Jacks | Sewer Repair |
| Trench Shoring Jack Pump | Sewer Repair |
| Vibra Plate | Sewer Repairs (asphalt) |
| Wakers (2 ea) | Sewer Repairs (compaction) |
| Emergency Bypass Pump (with level control unit) | Sewer Cleaning / Repairs |
| Emergency Bypass Pump (with level control unit and transducer) | Sewer Cleaning / Repairs |
| Emergency Bypass Pump | Sewer Cleaning / Repairs |
| Emergency Lighting | Sewer Cleaning / Repairs |
| Gas Generators (4 ea) | Power for tools at Job Site |
| Sewer Snakes (4 ea) | Sewer Cleaning |
| CCTV lateral camers (2 ea) | Sewer Cleaning / Repairs |
| Pipe Locator | Sewer Cleaning / Repairs |
| Tripod and related equip | Confined Space Entry |
| Blowers (2 ea) | Confined Space Entry |
| Gas Detector (4 ea, Certified Annually) | Confined Space Entry |
| 25-ft Pole Camera | Sewer Inspection |
| CCTV Mainline Camera/Mobile Van | Sewer/Storm Inspections |
| Standby Generator (2ea) | |
| Portable Generator (1 ea) | |

Sewer Collection System Materials Inventory

| Item Description | Quantity |
|---|--|
| 4" PVC Sewer Pipe and Coupling (Hard Coupling and Rubber Coupling) | 400' Pipe, 10 hard & 10 rubber couplings |
| 6" PVC sewer Pipe and Coupling (Hard Coupling and Rubber Coupling) | 200' Pipe, 10 hard & 10 rubber couplings |
| 8" PVC Sewer Pipe and Coupling (Hard Coupling and Rubber Coupling) | 100' Pipe, 5 hard & 5 rubber couplings |
| 4" PVC WYEs (4"X4), 22 degree ells, 45 degree ells | 5 of each |
| 6" PVC WYEs (4"X4), 22 degree ells, 45 degree ells | 5 of each |
| 8" PVC WYEs (4"X4), 22 degree ells, 45 degree ells | 2 of each |
| Manhole Covers | 2 ea |
| Cleanout boxes and covers | 5 ea |

Appendix 4-E Pump Station Standardized Equipment List

- Flygt N-Series Submersible and Dry-Pit Submersible Pumps (> 2 HP)
- Barnes Submersible Grinder Pumps (low flow and low head - 2 HP or less)
- Cummins Power Generation (stationary standby emergency generators)
- Eaton Insight motor monitor
- Unitronics Pump Controller with pump vision and motor vision
- MOSCAD (Motorola SCADA)
- PMC, VL2000 Series Submersible Hydrostatic (Pressure) Level Transmitter
- MJK 7030 Float Type Level Switches Floats

Chapter 5 Appendices

Appendix 5-A Sanitary Sewer Design Standards and Specifications Update

SANITARY SEWER DESIGN STANDARDS AND SPECIFICATIONS UPDATE

1. SANITARY SEWAGE DESIGN QUANTITIES:

The City of Alameda Sewage design quantities were developed in 1965. The residential flow quantity was based on 240 gallons per day (gpd)/person (Peak flow which also includes infiltration and inflow). The sewage flow rate for the commercial and industrial establishment was estimated at 19,380 or 0.03 cubic feet per second (cfs)/net acre. The City of Alameda uses a peak to average ratio of 2/1.

A literature review shows that the design flow quantities for residential and commercial establishments are within the range: Residential flow (120 gpd/person-250 gpd/person), and commercial flow (4500 to 160,000 gpd/acre).

TABLE 1

The following table shows the City of Alameda Sanitary Sewage Peak Flow Quantities modified for 2000:

| Zoning | Type of Development | D.U. Net Acre | Persons per D.U. | G.P.D. per Person | Gallons Per Day Per Unit |
|------------|-------------------------|--------------------------------------|------------------------------------|-------------------|--------------------------|
| R-1 | Single Family | 8.7 | 3.5 | 240 | 840 |
| R-2 | Duplex | 21.8 | 3.2 | 240 | 768 |
| R-3 | Restricted Apartments | 21.8 | 3.2 | 240 | 768 |
| R-4 | Neighborhood Apartments | 29.0 | 2.8 | 240 | 672 |
| R-5 | General Apartments | 43.6 | 2.8 | 240 | 672 |
| R-6 | Hotel Apartment | 87.1 | 2.5 | 240 | 600 |
| Commercial | | 19,380gpd/net acre=.030 cfs/net acre | | | |
| Parks | | .005 cfs/net acre | | | |
| Schools | | | Peak Sewage Flow | | |
| K-4 | | | 25% enrolment *.0003714 cfs/person | | |
| 5-8 | | | 50% enrolment *.0003714 cfs/person | | |
| High | | | 100% enrolment*.0003714 cfs/person | | |

For the projects completed under I/I correction, the City has adopted the Five-year Design Storm that will produce a rainfall intensity of 1.57 in/hr with a seven-hour duration. The City uses the criteria to certify projects that have been completed under I/I correction program.

TABLE 2

A survey of other jurisdictions sanitary sewer design flows was conducted for comparison with the of City of Alameda design flows as shown in the table below:

| Jurisdiction | Residential Average Flow | Residential Peak Flow | I/I Factor | Commercial/Industrial Flows | Peak Flow Comparison with Alameda Residential R1, using 30.5 person per acre | Industrial Flow Comparison with Alameda |
|-----------------------------|---------------------------------|----------------------------------|--|---|---|--|
| City of Alameda | 140 gallons per person per day | 240gallons per person per day | Included in the peak flow | 19,380gpd/net acre | 7,320 gallons per day | 19,380 gallons per day per net acre |
| City of San Leandro | 100 gallons per person per day | 250gallons per person per day | 1000 gallons/acre-day (average) not included in the peak flow | Actual water consumption | 8,625 gallons per day | |
| Union Sanitary District | 80 gallons per person per day | 320 gallons per person per day | Included in the peak flow | 0.1-0.15 gallons per day per square foot (4,356 -6,534 gallons per day /acre) | 9,760 gallons per day | 4,356-6,534 gallons/acre per day |
| Vallejo Sanitation District | 80 gallons per person per day | 97.86 gallons per person per day | 4000 gallons per day per acre for pre 1970 construction and 600 gallons per day per acre for new development (not included in the peak flow) | 20 gallons per person per day | 6,985 gallon per day | Assuming 200 persons per acre=4000 gallons |
| Stege Sanitary District | 100 gallons per person per day | 150 gallons per person per day | 3000 gallons per acre per day (not included in the peak flow) | Commercial area: 1,500-4,500 gallons per acre per day; Light Industrial areas: 2,000-4,000 gallons per acre per day; Heavy Industrial: 200-400 gallons per acre per day | 7,575 gallons per day | Commercial Area: 1500 – 4,500 gallons per acre per day; Light Industrial areas: 2,000-4,000 gallons per day per acre; Heavy Industrial: 200-400 gallons per acre per day |

The current residential design flow for Alameda is very close to other communities reached out in the survey, taking into account the infiltration and inflow factor in the design flow, except for Union Sanitary District. It is recommended that the City revisit the current design flow for commercial and industrial establishment, which is almost twice other jurisdiction flow quantity. The use of new watertight pipes makes it feasible to use the current design residential flow for another 10 years.

2. SANITARY SEWER SYTEM DESIGN CRITERIA AND SPECIFICATIONS

- a. Pipe Size. All new sanitary sewer mains shall be a minimum of eight (8) inches in diameter. All new laterals shall be a minimum of four (4) inches in diameter. Minimum size of house laterals serving two or more houses shall be six (6) inches.
- b. Location and Alignment. Wherever possible, sanitary sewer mains shall be located at the centerline of the street. Pipe shall be laid in a straight line, both as to plan and elevation. A standard manhole shall be constructed at any change in vertical or horizontal alignment.
- c. Capacity. All sanitary sewers shall be designed to have a capacity equal to or greater than the peak quantity of sewage. Quantities of sewage shall be determined from Table 1, except that if the dwelling unit density of a proposed development is greater than the tabulated value, the greater density shall be used.

Sanitary sewers downstream from pump station plants shall be designed to handle the maximum discharge from the pump plant plus the peak flow from other areas contributing to the sewer.

- d. Slope. All new sanitary sewer mains shall have a minimum invert grade that shall provide a velocity of 1.5 feet per second for the average flow. Average flow shall be assumed to be one-half of the peak flow. All sanitary sewers shall be designed on this basis where the depth of sewage in the pipe is 25% or more (at average flow). If the depth of sewage in the pipe is less than 25% at average flow, a minimum 8-inch pipe shall be used at a slope that will provide a half-full pipe velocity of 2-feet per second. The n value for the new PVC and HDPE pipe varies between 0.01- 0.013.
- e. Cover. All new sanitary sewer mains shall have a minimum cover to the top of pipe of 4 feet 6 inches in the street. All house laterals shall have a minimum cover of 4 feet 6 inches to the top of pipe as measured from the top of curb. If, due to the design of the system, a small percentage of the house laterals should have less cover, the cover of these particular house laterals may be reduced to 3 feet 6 inches and cast iron laterals used. For cover depth less than 3 feet, the pipe must be analyzed for the superimposed loads including the backfill load and H2O Caltrans. See Section under Pipe Strength for the design loads.
- f. Materials. In general, sanitary sewer mains shall be constructed of PVC, HDPE. Clay pipe, cast iron pipe, and ductile iron pipe may also be used to the approval of the City Engineer. PVC pipe shall have a minimum Standard Dimension Ratio (SDR) of 26 for pipes that will be installed using open

excavation. HDPE shall have a minimum Standard Dimension Ratio (SDR) of 17 for pipes that will be installed using trenchless method. The inner wall of the pipe shall be white, light green or natural. Yellow, black, and light purple are not acceptable. The outer wall of the pipe shall be black, white, light green or natural. Yellow and light purple are not acceptable.

- g. Pipe Strength. For PVC and HDPE pipes shall be designed to provide for backfill loading and super-loading (H20) on the pipe (except that super-loading need not be provided for in areas not subject to vehicle traffic or in areas covered by concrete residential driveways). Maximum allowable deflection shall be 5% for flexible pipe. The design load shall be the sum of the backfill load and super-load and shall be the higher value when both of these loads are computed with:

1. Depth of cover equal to distance between finished grade and top of pipe.
2. Depth of cover equal to above minus 1.0 foot.

If pipe of sufficient strength is not available, modify bedding and backfill material as necessary.

- h. Excavation of Trench. The ground shall be excavated in open trenches, the sides of which shall be parallel to and at equal distances on each side of the sanitary sewer centerline. At no time shall there be more than 200 lineal feet of the trench opened along any single sanitary sewer route, including the section opened ahead of the pipe laying and the section behind the pipe laying which has not been completely backfilled. Open trenches will be plated during non-working hours. This is to include asphalt concrete fillets around the perimeter of plates.

The Contractor shall conform to the rules and regulations pertaining to safety established by the California Division of Occupational Safety and Health of the Industrial Relations Department, except where otherwise shown on the plans or otherwise approved by the Engineer, maximum trench width shall be as follows:

- For pipe size 4" use maximum trench width 28"
- For pipe size 8" use maximum trench width 36"
- For pipe size 10" use maximum trench width 36"
- For pipe size 12" use maximum trench width 36"
- For pipe size 15" use maximum trench width 38"

All storm drains, water pipes, gas pipes, and conduits or other structures must be properly supported where crossing or lying along the trench.

All pipes shall be laid in crushed gravel to the top of the pipe. The crushed gravel shall conform to the requirements for Class 1, Type A, permeable

materials as described in Section 68, Article 1.025, of the Standard Specifications. Crushed gravel shall extend a minimum of twelve inches (12") below the pipe. The crushed gravel shall be placed by tamping or ramming with proper tools so as not to injure or disturb the pipe. If deemed necessary by the Engineer, the contractor will be required to use a vibratory plate to further compact the crushed gravel. The trench shall be filled simultaneously on both sides of the pipe so that injurious side pressures do not occur. If the trench material is unsuitable, excavation shall be to an additional depth below the pipe, as directed by the Engineer, and this excavation filled with crushed gravel so that the pipe may be well bedded and resting upon a satisfactory base. Pipe jointing shall be in conformance with manufacturer's recommendations.

Any settlement resulting from improper bedding placement will be addressed as removal of defective work.

All pipes must be carefully handled at all times. Only suitable and proper equipment and appliances shall be used for the safe loading, hauling, unloading, handling, and placing of materials. Special care shall be exercised so that the preformed joints will not be damaged. Any pipe with a joint damaged or flattened will cause that pipe to be rejected. All rejected materials shall be promptly removed from the site.

All pipes shall be laid true to line and grade, without break or sudden offsets in the flow line. Pipe shall be protected during handling against impact shocks and free fall. As the work progresses, the interior of the pipe shall be cleared of all dirt and debris of every description.

The lubricant used for field assembly of all pipe shall have no detrimental effect on the gasket, joint, fitting or pipe, and shall be as recommended by the manufacturer.

- i. Deflection Test. The deflection test for PVC and DHPE pipe shall be performed by pulling a rigid ball or mandrel through the pipeline. The rigid ball or mandrel shall have a diameter equal to 95% of the base inside diameter of the pipe being tested. When the rigid ball mandrel cannot be pulled through the pipeline, the Contractor shall locate and correct to the satisfaction of the City Engineer. After the defect is corrected and trench re-backfilled and compacted, the section of line shall then be retested to compliance. The cost for any operations associated with the retesting shall be borne by the Contractor.
- j. Low Air Pressure Testing of the PVC and HDPE lines. Testing of the lines shall be done at such time that the subbase has been compacted and accepted by the City Engineer.

The Low Pressure Air Test shall be the accepted method used to determine watertight integrity of the sanitary sewer line. The Low Pressure Air Test shall be done in the presence of the Engineer and in accordance with the following procedure:

1. Plug and securely brace the ends of each reach of pipeline to be tested.
2. Pressurize line until internal air pressure reaches 4.0 pounds per square inch gage. When prevailing water is above the storm or sanitary sewer or force main line being tested, increase all pressures used in this test by 0.43 psi for each foot the water is above the flow line of the pipe.
3. Allow at least two minutes for the air pressure to stabilize, adding additional air as required to maintain 4.0 psig.
4. The Engineer shall observe the pressure gage attached to the pipeline and when the pressure decreases to 3.5 psig, a timing period shall be started. The timing period shall be stopped when the pressure has decreased to 2.5 psig.
5. The portion of line being tested shall be termed "acceptable" if the time required in minutes for the pressure to decrease from 3.5 psig to 2.5 psig is not less than two minutes for the 4" pipe, five minutes for the 8" pipe, six minutes for the 10" pipe, seven and one-half minutes for the 12" pipe, eight and one-half minutes for the 14" pipe, nine minutes for the 16", ten minutes for the 18" pipe, or 11.5 minutes for 20" pipe.
6. If adjoining laterals are tested concurrently with the sanitary sewer main, one half of the above listed respective time for the largest lateral tested shall be added to the respective required time listed for the sanitary sewer main.
7. If the line fails to meet the above requirements, the source of the leak shall be located and corrected to the satisfaction of the Engineer. After the leak or leaks are corrected and the trench is rebackfilled and compacted, the section of line shall then be retested to compliance.

Because of the inherent danger involved in air testing, extreme care shall be exercised in placing and bracing the pipe plugs, and no one shall be allowed in the manhole during testing.

After completion of a test, the air pressure shall be released slowly through the valve, which is incorporated in the test equipment. Air test plugs shall not be removed until the air pressure is no longer measurable. Caution shall also be taken to avoid over pressurizing and damaging an otherwise acceptable line.

- k. Television Camera: The television camera used for inspection work shall be color format, specifically designed and constructed for use in sewers. Lighting and camera quality shall allow a clear, in-focus picture of the entire periphery of the pipe for a minimum distance of six feet. The camera shall

have a 350 line per inch, or greater resolution. The camera shall be operative under 100 percent humidity conditions. Cameras for use in sewers 8-inches in diameter and larger shall be of the “articulating head” type to allow laterals and defects to be viewed directly. To ensure acceptable picture quality under all possible conditions that may be encountered during the inspection, a variable intensity control for lighting, and a remote adjustment for camera focus, shall be provided for the operator.

The camera, television monitor, and other components of the video system shall be capable of producing a color picture of quality adequate to identify major defects and locate laterals accurately.

1. Inspection Procedures: The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the condition of the sewer. In no event will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire sewer section, the Contractor shall set up his equipment so that the inspection can be performed from the opposing manhole. If, again, the camera fails to pass through the sewer section, the inspection shall be considered complete and no additional inspection work shall be required of the Contractor.

When manually operated winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two manholes of the section being inspected to insure good communications between members of the crew. The importance of accurate distance measurements is emphasized. Measurement for location of defects shall be made by means of a camera-mounted transmitter and aboveground receiver. Marking on the cable, which requires interpolation for depth of the manhole, will not be permitted. To establish criteria for video picture quality to be maintained throughout the project, the Contractor shall furnish videotape of a previous sewer inspection that meets these specifications for quality. This tape shall become the property of the Owner. It will be used as a standard to judge the acceptability of videotapes produced on this project.

The audio portion of the inspection report, recorded at the time of inspection, shall be intelligible in its entirety. The information contained on the audio recording shall include (1) the location of the sewer, (2) the location of the manholes involved including manhole identification number as shown on plans, (3) the direction of travel, (4) a description of conditions in the sewer as they are encountered, and (5) the location and entrance condition of service laterals.

- m. Manholes. Standard precast concrete manholes shall be constructed at all changes in horizontal or vertical alignment or whenever there is a change in pipe material and at intervals not to exceed 350 feet for 8-inch and 10-inch pipe and 450 feet for 12-inch pipe and larger. Pipe shall be laid through a

manhole wherever possible. Manholes shall also be constructed at all sewer intersections (exception for house laterals). Drops shall be designed across manholes wherever pipe size changes or the direction of flow changes. These drops shall be 0.10 of a foot. Any sewer line of 100 feet or more in length shall have a manhole on its upper end unless it is temporarily or otherwise approved by the City Engineer. Where a sewer lateral enters a manhole, the flow of the lateral line should be brought in at the centerline of the main. Drop manholes shall be used where the difference in flow lines is 18 inches or greater. The manhole frame at the ground surface shall be set to an exact elevation and sloped in accordance with the final grade. Inspection of the base material prior to concrete placement is mandatory.

n. Manhole Vacuum Testing.

All sewer manholes shall be vacuum tested after backfill and aggregate base has been placed and met compaction requirements. Test shall be witnessed by the City Public Works Inspector. Contractor shall contact the city inspector 48-hours in advance of testing. Vacuum test procedure and requirements shall be as follows:

1. All openings in the manholes shall be sealed with plugs and a rubber ring “donut” type plug inserted inside the opening of the cone.
2. The specified test period is as follows:

| manhole depth in feet | test period in minutes |
|-----------------------|------------------------|
| 0-5 | 4.5 |
| 5-10 | 5.5 |
| 10-15 | 6.0 |
| >15 | 6.5 |
3. Manholes that fail the test shall be patched as required and retested.
4. A vacuum regulator shall be provided on the vacuum pump such that no greater than 15 psi can be applied to the manhole during the test. All manholes that do not meet the leakage test or are unsatisfactory from visual inspection shall be replaced to the satisfaction of the city engineer.

o. Cleanouts. Any sewer main line less than 100 feet in length shall have a standard 45° cleanout on its upper end. Two-way cleanouts shall be installed for each house lateral and shall be installed in accordance with City Standard Drawings 8396-Case 34 and 8397-Case 34.

p. House Laterals. All house laterals shall be placed at right angles to the sanitary sewer main at the proper location and connected to the main by the use of a wye branch of the proper size and an eighth bend. The use of saddles or other such taps during the construction of the sanitary sewer main will not be permitted. House lateral shall be installed at a slope of 2% between the new cleanout and the main.

Chapter 6 Appendices

Appendix 6-A Overflow Emergency Response Plan

Bound Separately

Chapter 7 Appendices

Appendix 7-A EBMUD Regional FOG Program

| | |
|---|-------------------------------------|
|  | SEWER SYSTEM MANAGEMENT PLAN |
| Effective Date: 4/24/2013 | Document Name: FOG Program |
| Supersedes: Version 6 | Document ID: E4 - SSMP FOG.doc |
| Version 7 | Approved by: Director of Wastewater |

Background

The East Bay Municipal Utility District (EBMUD) collection system consists of a regional interceptor system with large diameter pipes that receive wastewater from seven city and community satellite collection systems including the cities of Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont, and Stege Sanitary District. These collection system agencies individually own the upstream collection systems that collect and transport wastewater to the EBMUD's interceptor system. The EBMUD system has no private lateral connections and has not had any fats, oils and grease (FOG) related sanitary sewer overflows (SSOs). As such, a FOG control program is not needed for the EBMUD collection system. As a service to the satellite collection systems, EBMUD worked closely with the wastewater collection system agencies in its wastewater service area and established a regional FOG control program to control grease discharges from restaurants and other food service establishments (FSE). This regional FOG control program was established to reduce FOG related SSOs and consists of FOG hotspot investigations, FSE and gravity grease interceptor inspections, enforcement support, hotspot reporting, database management, and outreach. These components are summarized below.

Regional FOG Control Program

Source Identification: Targeted Hotspot Investigation

Discharges from FSEs, residential sites and food manufacturing facilities are potential sources for causing grease-related SSOs and blockages in the satellite agencies' sewer collection systems. The collection system agencies report locations of grease-related SSOs or blockages and areas of increased maintenance due to grease build up, known as hotspots, to EBMUD. In response, EBMUD performs hotspot investigations including FSEs inspections to verify their ability to generate grease, camera investigations to determine if there are grease discharges to the sewer from the FSEs, and gravity grease interceptor inspections in hotspot areas. Those FSEs that generate grease and are found to cause or contribute to grease-related blockages or SSOs are required to install grease control devices (GCD) approved by the regulating collection system agency.



SEWER SYSTEM MANAGEMENT PLAN

| | |
|---------------------------|--------------------------------|
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| Version 7 | Document ID: E4 - SSMP FOG.doc |

Gravity Grease Interceptor Inspections

EBMUD performs gravity grease interceptor inspections for FSEs in hotspots as well as for FSEs that are not in hotspots. FSEs with gravity grease interceptors are inspected to determine their operating condition and the adequacy of their pumping schedule or maintenance. More frequent servicing/maintenance and repairs may be required if necessary.

Enforcement Support

An escalating (progressive) enforcement support structure is established for FSEs by the regulating collection system agency.

Hotspots Reporting

EBMUD provides the collection system agencies with quarterly FOG hotspot investigation reports. These reports provide the number of hotspots reported and inspections performed, FSEs identified to cause or contribute to FOG related blockages/SSOs, grease control devices (GCD) installation status, and a summary of residential outreach materials distributed during a given quarter. EBMUD also provides the collection system agencies with a Regional FOG Program Annual Report which documents all of the efforts and progress over the course of the year to address FOG-related issues service-area wide.

FOG Control Database

EBMUD maintains a FOG control database to manage the information about FSEs and their grease generating capability, inspections, FOG hotspots, GCDs, requirements and agency enforcement status information for FSEs, as well as residential outreach distributed.

Outreach

Public education and outreach that promotes proper handling and disposal of FOG is an ongoing effort through various methods and media. EBMUD provides education and outreach materials for FSEs in multiple languages as a component of the overall program.

EBMUD also provides information to residents on how to properly dispose of household cooking oil. This outreach effort includes partnerships with other organizations such as regional non-governmental organizations, and local retail

**SEWER SYSTEM MANAGEMENT PLAN**

Effective Date: 4/24/2013

Document Name: FOG Program

Version 7

Document ID: E4 - SSMP FOG.doc

outlets. Residential hotspot response includes targeted outreach materials in multiple languages. Additional outreach information for businesses and residents, including residential grease drop off locations, is available on EBMUD's website: <http://www.ebmud.com/fog>

FOG Disposal (Grease Control Device waste)

EBMUD's Main Wastewater Treatment Plant serves as a receiving facility for grease waste from both inside and outside of the EBMUD's service area. In addition to the EBMUD Main Wastewater Treatment Plant, EBMUD established new residential cooking drop-off sites in El Cerrito and at the local Recycling Center and the Oakland Whole Foods grocery store as well as at various apartment complexes in the wastewater service area. EBMUD continues to work with the satellite agencies to establish new drop off locations for residents.

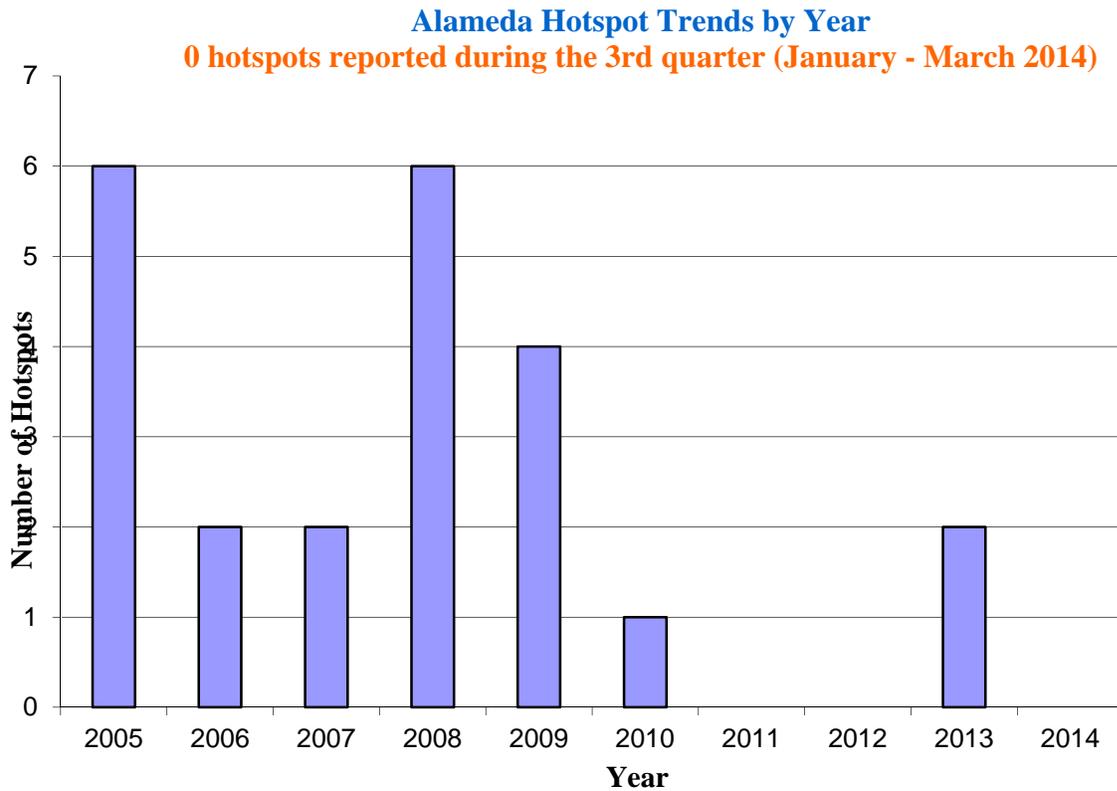
Appendix 7-B Example FOG Control Program Quarterly Summary Report

FOG CONTROL PROGRAM QUARTERLY SUMMARY QUARTER 3 (JANUARY 2014 – MARCH 2014) CITY OF ALAMEDA

Hotspot Investigation Summary

No hotspots were reported this quarter. Chart 1 demonstrates hotspot trends by year for the City of Alameda.

Chart 1



Food Service Establishments

At time of this report a total of 278 food service establishments are present in the City of Alameda.

Inspection Summary

| | Quarterly Inspection Totals |
|---|-----------------------------|
| This Quarter (January – March 2014) | 1 |
| Previous Quarter (October – December 2013) | 6 |

Inspection Summary

| Hotspot Number | Facility Name | Facility Address | Date of Inspection | Inspection Type |
|----------------|---------------|-------------------------|--------------------|-------------------------------|
| NA | Lucky # 700 | 815 Marina Village Pkwy | 3/20/2014 | Grease Interceptor Inspection |

Grease Interceptor Summary

- Lucky # 700 at 815 Marina Village Pkwy was inspected on March 20, 2014. The current GI service frequency of once three months appears adequate.

Grease Control Devices Summary

No update this quarter

Commercial Outreach Summary

No update this quarter

Residential Outreach Summary

No update this quarter

Appendix 7-C EBMUD FOG Brochure

Fats, Oils, and Grease are naturally produced during cooking and baking.

Common sources of FOG include:

- Meat fats
- Lard
- Shortening
- Butter
- Margarine
- Fatty/greasy food scraps
- Baked goods and pastries
- Cream-based sauces
- Cooking oil
- Oily salad dressing

Do Not Put Any of These Items Down the Drain

Call EBMUD's Environmental Services Hotline at 510-287-1651 or visit www.ebmud.com/cleanbay where you can:

- Request a free grease scraper
- Find the closest grease disposal location
- Get additional information



rev. 7/10

Avoid a Clog



Keep Grease Out of Your Drain

EBMUD Pollution Prevention

Helping to Protect the Environment



EAST BAY MUNICIPAL UTILITY DISTRICT

When **fats, oils and grease (FOG)** are put down your drain they can cause many problems further down the sewer pipe. Liquified grease and fat from animal products will solidify and clog pipes much like a clog in a human artery. Liquid oils can also coat pipes and contribute to blockages. Blockages may cause a sewage backup into your home, resulting in expensive clean up costs and repairs to your sewer pipes, home and belongings. Blockages may also trigger an overflow or backup of sewage into streets or waterways creating a public health risk and threatening the environment.



You Can Help! Please Do Not Dispose of Any Cooking Oils or Grease Down the Drain

By following the guidelines below you may avoid sewer overflows, backups, and costly repairs:

- ✓ Pour all cooled cooking fats, oils and grease that will harden (bacon grease, meat drippings) into a waxed food container such as a milk carton or container with a lid and dispose of it in the garbage or your kitchen scrap recycling.
- ✓ Mix small amounts of liquid grease into your kitchen scrap recycling (where available) or place in a lidded container with an absorbent material such as cat litter, and dispose of in the garbage.
- ✓ Wipe down greasy pots, pans or dishes with a paper towel or newspaper before washing. Dispose of paper in the garbage or your kitchen scrap recycling (where available).
- ✓ Using your EBMUD scraper, scrape greasy food scraps from pots, pans, and dishes into the garbage or kitchen scrap recycling (where available), not a garbage disposal.
- ✓ Do not wash grease down the drain or garbage disposal.
- ✓ For cooking oil (liquid oil/vegetable oil) please see drop-off locations at www.ebmud.com/cleanbay

Appendix 7-D EBMUD Approved Grease Haulers

| Name | Phone Number |
|---|-----------------------|
| A-1 Septic Tank Service | (510) 697-8083 |
| A-1 Septic Tank Service | (800) 730-4471 |
| All Valley Environmental, Inc. | (559) 498-8378 |
| Able Septic | (408) 377-9990 |
| Ameriguard Maintenance Services | (800) 347-7876 ext 14 |
| Bay Pumping | (831) 320 5229 |
| Burr Plumbing & Pumping | (408) 287-2877 |
| Evergreen Recycling, Inc. | (650) 952-5000 |
| Magnum Fire Protection | (510) 742-0775 |
| Miller & Gibson (prev Able Septic Tank Service) | (408) 377-9990 |
| Miller & Gibson (prev Able Septic Tank Service) | (408) 398-4990 |
| ModestoTallow/Florin Tallow Co. | (209) 522-7224 |
| ModestoTallow/Florin Tallow Co. | (800) 564-7204 |
| One More Time | (800) 624-5504 |
| Pioneer Liquid Transport | (800) 804-7327 |
| Sacramento Rendering Co. | (800) 339-6493 |
| Salinas Tallow | (800) 621-9000 |
| San Jose Tallow | (408) 452-8777 |

Appendix 7-E Grease SSO and Blockage Reporting Form

FORM 1
GREASE SSO AND BLOCKAGE REPORTING FORM



EVENT NUMBER: _____ (EBMUD use)

COLLECTION SYSTEM INFORMATION

Date of Incident: _____ **Date of Report:** _____

Blockage

 SSO

 Increased Maintenance

Contact Info
 Agency Name: _____ Agency Contact: _____

Agency Contact Phone Number: _____

Site Info
 Name: _____

Reporting Address: _____ Nearest Cross Street: _____

Hotspot Address (if different): _____

City: _____ Zip Code: _____

Upstream Structure Reference: _____ Downstream Structure Reference: _____

1. Does this location have a history of grease blockages? Yes No
 If yes,

2. Date of last incident? _____

3. Is it a known residential only area? Yes No
 If yes, is it mostly multi-family or single family? Multi-family Single Family Both

Additional info attached: Line History Work report CCTV footage Other _____

City Main Line Privately owned service lateral Lower lateral (agency responsibility)

Additional info available: _____

Send notifications to:

| | |
|---|--|
| EBMUD P.O. 24055, MS 702 Oakland, CA 94607-4240 | EBMUD Contact Name: Nadia Borisova Phone number: (510) 287-1065 Fax number: (510) 287-0621 e-mail: nborisov@ebmud.com |
|---|--|

EBMUD RESPONSE INFORMATION

Date received by EBMUD: _____ **Received by:** _____

Initial Review Response: Investigation Field Inspection

Response Details

____ (Please attach additional detail sheets, if necessary)

Report submitted by: _____ **Date:** _____

Chapter 8 Appendices

Appendix 8-A Sanitary Sewer System Hydraulic Modeling Analysis Executive Summary

Executive Summary

This report summarizes the results and recommendations of the Sanitary Sewer System Hydraulic Model Analysis for the City of Alameda (City). The Hydraulic Analysis Report was prepared by RMC Water and Environment (RMC) in close coordination with City staff. The hydraulic model and the recommendations included herein will be used to guide improvements to the City's sanitary sewer system to accommodate current and future development and to ensure that the City continues to provide a high level of service to its customers.

This Executive Summary is presented in three parts:

- **Background and Purpose of Hydraulic Analysis** introduces the Alameda sewer system and presents the context of this analysis.
- **How the Hydraulic Analysis Report was Prepared** describes the scope and methodologies of the planning effort, including key planning and technical assumptions incorporated into the sewer system capacity analysis.
- **Recommended Capacity Improvement Program** presents the recommended Capital Improvement Program (CIP), including capacity improvement projects, priorities, and estimated costs. In addition, recommendations are presented for implementing the proposed capacity improvement program.

ES-1 Background and Purpose of Hydraulic Analysis

Alameda's sanitary sewer system includes 34 City-owned pump stations and about 140 miles of 6-inch through 27-inch diameter sewers that discharge into a network of large diameter interceptor pipelines and pump stations owned and operated by the East Bay Municipal Utility District (EBMUD). Wastewater collected by these interceptors flows to the Alameda siphons and ultimately to EBMUD's wastewater treatment plant in Oakland. The existing sewer system on Alameda Point (portion of system located northwest of Main Street on the former Alameda Naval Air Station site) is not included in this study. Although the City maintains the Alameda Point sewers under contract, the City does not own these sewers. Flows from Alameda Point are conveyed via an EBMUD pump station and force main to the Alameda siphon inlet structure, and therefore do not impact any portion of the City's sewer system.

The capacity of Alameda's sewer system was last evaluated in the 1980s as part of the East Bay Infiltration/Inflow Study Sewer System Evaluation Survey (SSES). Since that time, flows in the system have changed due to new development and redevelopment, as well as sewer system rehabilitation conducted by the City based on the results of the SSES. Additional growth is projected in the future, which will further increase wastewater flows.

This hydraulic analysis will help the City meet the requirements to complete a capacity evaluation and capacity assurance plan as part of preparing its Sewer System Management Plan (SSMP), as well as provide information to update projected sewer improvement project needs in the City's Capital Improvement Program (CIP). The SSMP addresses the overall management, operation, and maintenance of the sanitary sewer system and is required for all sewer system agencies by the San Francisco Bay Regional Water Quality Control Board, as well as under the Statewide General Waste Discharge Requirements adopted in 2006 by the State Water Resources Control Board.

ES-2 How the Hydraulic Analysis Report was Prepared

A model of the City's sewer system was developed using InfoWorks CS™, a GIS-based hydraulic modeling software package. In addition to the City of Alameda sewer system, EBMUD's interceptor system facilities in Alameda were also included in the model; however, EBMUD's infrastructure was not evaluated as part of this hydraulic analysis. The modeled sewer system is shown in **Figure ES-1**. The project team used a systematic process that incorporated GIS sewer and parcel data, land use planning information, flow monitoring data, and design criteria for estimating wastewater flows in a computer hydraulic model of the sewer system. The model was used to assess how the system would perform under existing and future dry and wet weather flow scenarios, and to identify gravity pipes, pressure force mains, and pumps stations that may not have sufficient capacity to convey the predicted flows.

Capacity Assessment Considers Existing and Future Planning Scenarios

Two planning scenarios were evaluated for this study. The existing scenario examined the current capacity of the sewer system based on existing development and flow monitoring data collected in the winters of 2005/2006 and 2007/2008. The future scenario was based on potential future developments and redevelopments as identified by City Planning staff and documented in EBMUD's Water Supply Management Program (WSMP) 2040, and the assumption that currently vacant or underutilized parcels will be developed in the future. These future developments will result in an approximate 27 percent increase in base wastewater flows compared to existing flows.

Hydraulic Model Identifies Potential Capacity Deficiencies

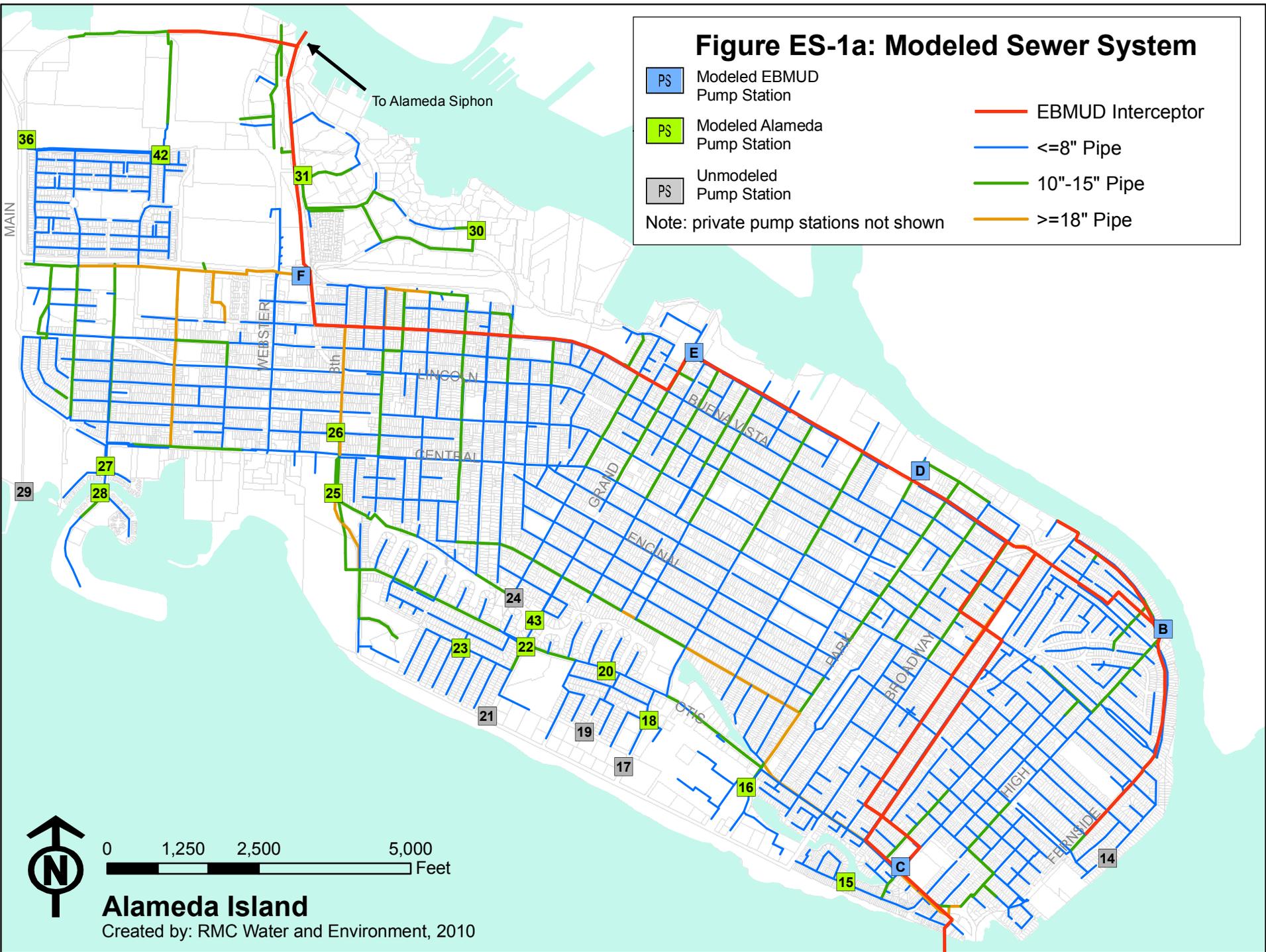
For both of the planning scenarios examined, projected dry and wet weather flows were simulated in the hydraulic model. The model was calibrated to actual flow monitoring data to ensure that it represents an accurate depiction of system conditions during both dry and wet weather conditions. The model integrates various dry and wet weather flow parameters to determine system capacity under different flow and planning scenarios. Key flow components incorporated into the model include base (dry weather) wastewater flow (BWF); groundwater infiltration (GWI), which occurs when water seeps into pipes under the ground through cracks and pipe joints; and rainfall-dependent infiltration and inflow (RDI/I) during storm events. For this analysis, a 5-year recurrence frequency rainfall event, assumed to fall under saturated soil conditions (i.e., maximum GWI and RDI/I response), was selected as the "design storm". This design storm was originally established as the basis for wet weather planning for EBMUD and its tributary collection systems (including Alameda) in the 1980s.

Proposed Improvement Projects Address Potential Capacity Deficiencies

Model results for both existing and future flow conditions under dry and wet weather flow scenarios were examined to determine where improvement projects would be needed to alleviate capacity deficiencies. When assessing pipe deficiencies, it was assumed that all pumps would be retrofitted, if required, to provide sufficient capacity to handle predicted peak flow conditions. This ensures that the model is accurately predicting peak flows in downstream pipes because sewage is not being held-up at the pump stations, and is a better representation of future flow conditions, assuming the City will upgrade its pump stations where needed to provide required capacity. Pipe deficiencies were identified based on the level of pipe surcharge, specifically, if surcharge exceeded one foot and reached to less than six feet of the ground surface during wet weather flows. Additionally, any pipe that surcharged during peak dry weather flows was considered deficient (even if surcharge was less than 1-foot). While surcharging should generally be avoided, these surcharge criteria allow the City to focus capital spending on areas with the greatest risk of causing sewer overflows. Where capacity improvement projects were identified, new pipes were sized to avoid surcharge under design peak flow conditions.

Figure ES-1a: Modeled Sewer System

| | | | |
|---|------------------------------|---|-------------------|
|  | Modeled EBMUD Pump Station |  | EBMUD Interceptor |
|  | Modeled Alameda Pump Station |  | <=8" Pipe |
|  | Unmodeled Pump Station |  | 10"-15" Pipe |
| Note: private pump stations not shown | |  | >=18" Pipe |



Alameda Island
 Created by: RMC Water and Environment, 2010

Figure ES-1b: Modeled Sewer System

-  Modeled EBMUD Pump Station
 -  Modeled Alameda Pump Station
 -  Unmodeled Pump Station
 -  EBMUD Interceptor
 -  <=8" Pipe
 -  10"-15" Pipe
 -  >=18" Pipe
- Note: private pump stations not shown



0 1,250 2,500 5,000 Feet

Harbor Bay Isle

Created by: RMC Water and Environment, 2010

Pump stations were evaluated based on their performance under future dry weather flow conditions and under design storm wet weather flows. In addition to comparing pump capacities to peak inflows, other factors were considered when assessing pump capacity deficiencies such as, for example, the capacity of upstream pipe to “store” the flow or the ability of a high-level bypass to reroute flow around the pump station when water level reaches a certain height. Based on the results of this comprehensive analysis, three different deficiencies were identified: 1) pump stations with insufficient capacity, 2) pump stations with acceptable but less than optimal capacity, and 3) pump stations that need standby or redundant capacity.

ES-3 Recommended Capacity Improvement Program

The Capital Improvement Program (CIP) recommended in this study is designed to provide adequate sewer system capacity for the City’s existing and anticipated future development. For deficient gravity pipes, improvement projects were developed, including the following information about each gravity pipe project:

- Description and location of the project
- Planning-level capital cost estimates
- Relative priority rating

Pump station capacity improvements have been identified and prioritized, but specific projects and cost estimates have not been developed as part of this study. Pump stations projects were handled separately from gravity pipe projects because the City has conducted a comprehensive pump station condition assessment under a separate project. Based on integrating the findings contained in this report with the results of the condition assessment work, the City has developed detailed pump station improvement projects (and costs) as part of the condition assessment work.

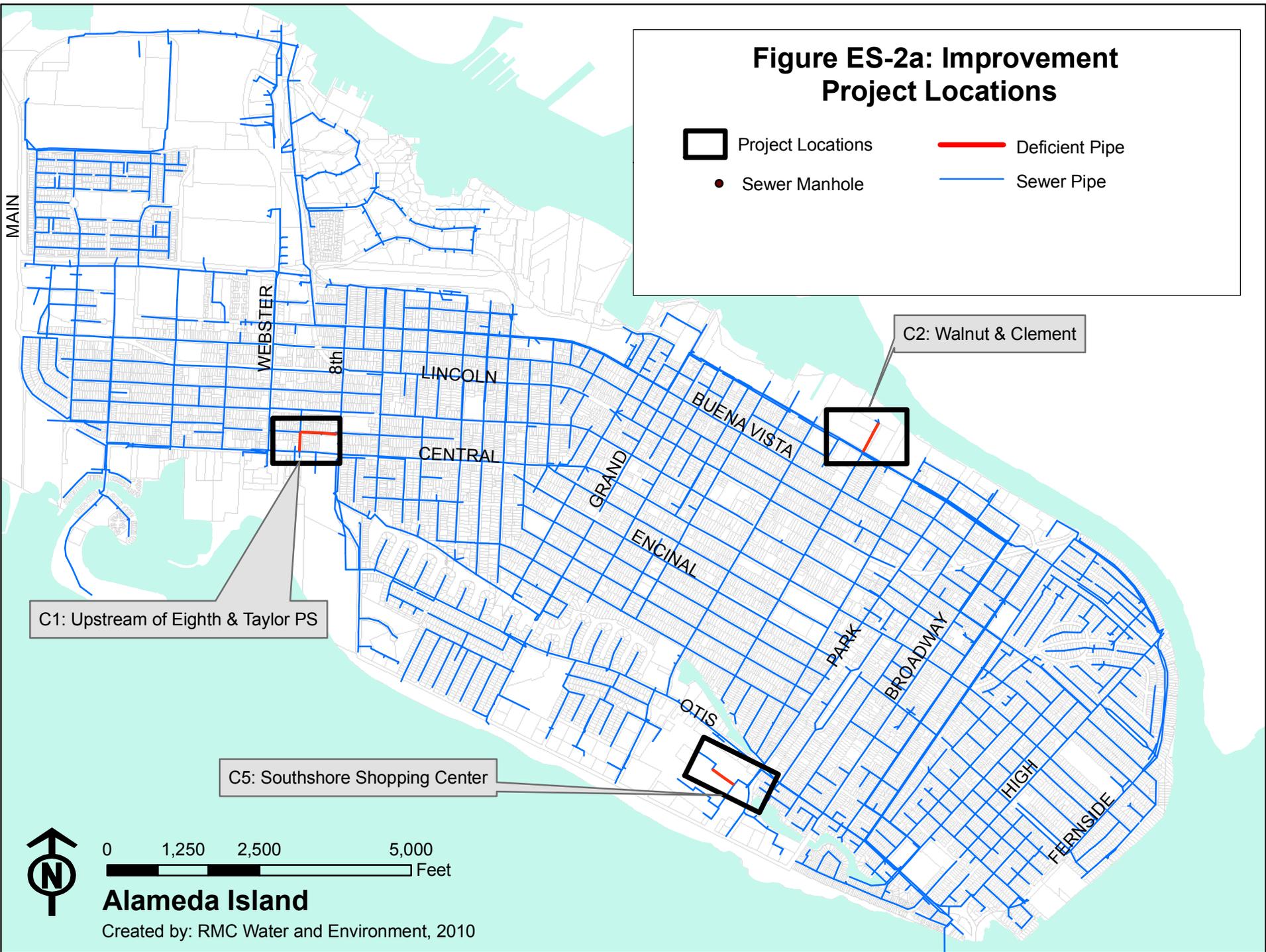
Gravity Pipe Improvement Projects

Three gravity sewer capacity improvement projects were identified based on the results of the hydraulic analysis. **Figure ES-2** shows the project locations. The total estimated capital cost of these projects is approximately \$2.8 million, as shown in **Table ES-1**. These cost estimates include baseline construction costs for gravity sewers using trenchless methods, lower lateral replacement costs, and cost allowances for project mobilization and demobilization and traffic control. The total estimated capital costs also include a 30 percent allowance for contingencies for unknown conditions and an allowance of 25 percent of construction cost for engineering, administration, and legal costs. The estimated costs are considered planning or conceptual level estimates and are considered to have an estimated accuracy range of -30 to +50 percent, suitable for budget planning purposes.

Gravity pipe improvement projects were prioritized based on whether the deficiency was caused by existing or future conditions. Project C-1 is needed to resolve an existing capacity deficiency whereas Projects C-2, C-3, C-4, and C-5 are triggered by future developments or redevelopments. Therefore, Project C-1 is considered priority 1 and all other projects are considered priority 2. Note that the location of and need for priority 2 projects should be verified prior to implementation based on the final land uses and proposed sewerage plans for these future developments.

Figure ES-2a: Improvement Project Locations

-  Project Locations
-  Deficient Pipe
-  Sewer Manhole
-  Sewer Pipe



C1: Upstream of Eighth & Taylor PS

C2: Walnut & Clement

C5: Southshore Shopping Center



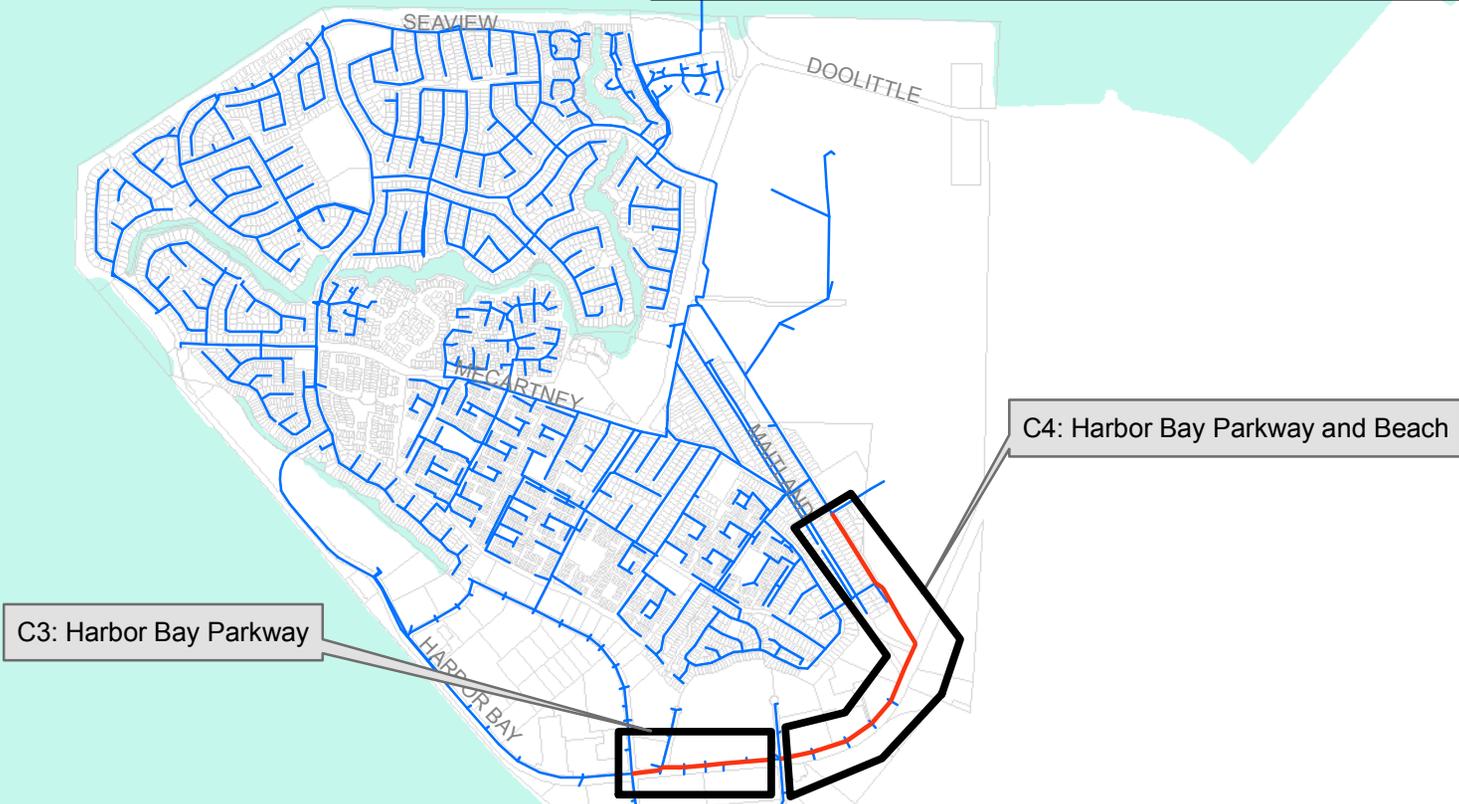
0 1,250 2,500 5,000 Feet

Alameda Island

Created by: RMC Water and Environment, 2010

Figure ES-2b: Improvement Project Locations

- Project Locations
- Sewer Manhole
- Deficient Pipe
- Sewer Pipe



0 1,250 2,500 5,000 Feet

Harbor Bay Isle

Created by: RMC Water and Environment, 2010

Table: ES- 1: CIP Project Summary

| CIP No. | Project Description & Location | Priority | Estimated Capital Cost (2010 Dollars) |
|---|--|----------|---------------------------------------|
| C-1 | Upsize 6" pipe to 8" upstream of Eighth and Taylor Pump Station | 1 | \$322,000 |
| C-2 | Upsize 6" pipe to 8" at Walnut Street and Clement Ave | 2 | \$186,000 |
| C-3 | Upsize 10" pipe to 15" along Harbor Bay Parkway between Loop Road and Harbor Bay Parkway 1 pump station | 2 | \$599,000 |
| C-4 | Upsize 12" pipes to 15" and 15" pipes to 21", along Harbor Bay Parkway and Beach Road from just downstream of the HB1 pump station to Seminary Ave | 2 | \$1,501,000 |
| C-5 | Upsize 8" pipe to 10" pipe near Southshore Shopping Center | 2 | \$155,000 |
| Total Estimated Capital Investment | | | \$2,763,000 |

Pump Station Improvement Projects

The pump station capacity analysis revealed that, at a minimum, seven pump stations should be retrofitted with additional capacity (Grand Otis, Aughinbaugh, BFI, Park/Otis, Eight/Portola, and Harbor Bay Parkway 1, and Tideway). Based on this analysis, these seven pump stations have the potential to severely back up under the design storm event and in some cases during dry weather flow conditions, which may cause water levels in manholes to rise close to ground elevation.

The pump station analysis also identified several other pump stations (Pond/Otis, Willow/Whitehall, Sand Beach, Verdemar, and Dublin) as having less than optimal, yet acceptable, capacity. More specifically these pump stations backed up during some scenarios, but backup was not extensive, nor did water levels rise close to ground elevation. For these pump stations, it is recommend that if the City's ongoing condition assessment work finds these pumps to be in poor condition and refurbishment or replacement is needed, then new, larger pumps should be installed. If these pumps are not replaced, the system may back up during wet weather flows which, over time, may cause maintenance problems in upstream sewers.

It is recommended that standby pumps be installed at two pump stations, Channing and Haile, to improve reliability of the system. These two stations have only one pump (zero firm capacity) and no high-level bypass line. A failure of either of these pumps could cause significant backup and potential overflows in the system.

Lastly, the capacity analysis found that force mains in the system are appropriately sized, so no force main improvement projects are necessary for the existing system. If the deficient pumps are retrofitted with additional capacity (in accordance with the recommendations in this report), the existing force mains would have adequate capacity to convey the peak design flows.

Recommended pump station capacity improvements are listed in **Table ES-2**.

Table ES- 2: Pump Station Capacity Improvement Recommendations

| Pump No. | Pump Station Name | Recommendation | Recommended Firm Capacity (MGD) |
|----------|----------------------|--|---------------------------------|
| 22 | Grand Otis | Install more capacity | 0.89 |
| 5 | Aughinbaugh | Install more capacity | 0.41 |
| 12 | BFI | Install more capacity | 3.10 |
| 25 | Eighth/Portola | Install more capacity | 1.60 |
| 16 | Park/Otis | Install more capacity | 1.20 |
| 10 | Harbor Bay Parkway I | Install more capacity | 1.17 |
| 8 | Tideway | Install more capacity | 0.35 |
| 20 | Pond/Otis | Install more capacity if pump is in poor condition | 0.21 |
| 9 | Willow/Whitehall | Install more capacity if pump is in poor condition | 0.23 |
| 18 | Verdemar | Install more capacity if pump is in poor condition | 0.17 |
| 27 | Dublin | Install more capacity if pump is in poor condition | 0.34 |
| 23 | Sand Beach | Install more capacity if pump is in poor condition | 0.14 |
| 3 | Channing | Install standby capacity | Same Capacity |
| 42 | Haile | Install standby capacity | Same Capacity |

Project Implementation Recommendations

The City should begin implementation of the Capital Improvement Program recommended in this Report, starting with the highest priority projects. This plan does not specify an implementation schedule, as the City will need to balance sewer improvements with the need for other capital projects (specifically, pump improvements). The following items should be considered in project scheduling and design, and in future updates of the Sanitary Sewer System Hydraulic Analysis.

- Move forward with further planning and design of the Priority 1 projects.
- All pipe improvement projects detailed in this report are based on pipe replacement. The decision to parallel or replace existing sewers should consider the physical condition and remaining useful life of the existing pipelines; the availability of pipeline corridors for new sewer construction; and operation and maintenance concerns.
- The hydraulic model has been developed to assist the City in performing capacity analyses and updating the Sewer System Management Plan (SSMP) in the future. The model should be kept up-to-date with any changes to existing sewer connections, development plans, and sewer system facilities.
- The City should continue with the current sewer inspection and condition assessment program, identifying sewers that should be replaced due to poor condition. To the extent possible, these improvements should be coordinated with the recommended capacity-related improvements.
- The City should assess its sewer rates and connection fees as needed to ensure adequate funding for the recommended capacity improvement CIP.

In addition to the project implementation recommendations listed above, the City should continue to address I/I through continued inspection and rehabilitation of sewer mains and lower laterals. The findings in this Report should also be updated whenever there are major changes in planning assumptions or significant additional rehabilitation of the sewer system.

Chapter 9 Appendices

Chapter 10 Appendices

Appendix 10-A 2014 SSMP Audit Report

**City of Alameda
Biennial Sewer System Management Plan Audit Report**

Date: June 5, 2014

Audit Team:

- Bob Haun, Public Works Director
- Jesse Barajas, Public Works Maintenance Superintendent
- Max Arbios, Public Works Supervisor
- Flavio Barrantes, Construction Inspection Supervisor
- Shilpa Patel, Assistant Engineer
- Gisa Ju & Nishant Parulekar, RMC Water & Environment (consultants)

The purpose of the Sewer System Management Plan (SSMP) Audit is to evaluate the effectiveness of the City of Alameda's SSMP and to identify whether updates are needed. This document was designed to meet the requirements of State Water Resources Control Board Order No. 2006-0003-DWQ as revised by Order No. WQ 2013-0058-EXEC. Documentation of SSMP audits are kept on file at the City of Alameda Public Works Department, and an indication is made in the California Integrated Water Quality System (CIWQS) database that the audit was completed.

Directions: Please indicate **YES** or **NO** for each question. To answer the following questions, refer to the text of the SSMP Element, any referenced material in the text, all corresponding attachments, and any data collected to assist in assessing SSMP effectiveness. For any **NO** responses describe the updates or changes needed and the timeline to completion in "Description of Scheduled Updates/Changes to the SSMP" on the last page of this form.

ELEMENT 1. GOALS

1. Are the goals stated in the SSMP still appropriate and accurate? **YES / NO**

ELEMENT 2. ORGANIZATION

2. Is the SSMP up-to-date with organization and staffing contact information? **YES / NO**

Section needs to be updated with more description of the roles and responsibilities of each position for SSMP implementation. Chain of communication and contact information for notification and reporting SSOs needs to be updated.

ELEMENT 3. LEGAL AUTHORITY

3. Does the SSMP reference up-to-date information about legal authority? **YES / NO**

Section needs to be updated to incorporate revised sewer lateral testing provisions adopted by Ordinance No. 3048 in June 2012.

4. Does the City have sufficient legal authority to control sewer use and maintenance? **YES / NO**

ELEMENT 4. OPERATIONS AND MAINTENANCE PROGRAM**4.a Map of the Sanitary Sewer System**

5. Does the SSMP reference up-to-date information about maps? **YES / NO**

Section needs to be updated to discuss latest GIS mapping

6. Are collection system maps complete, up-to-date, and sufficiently detailed? **YES / NO**

However, City needs to develop a formalized process to continue to keep the maps up-to-date and develop a consolidated set of maps that can be used by both field crews and for computerized applications requiring GIS mapping.

4.b Preventative Maintenance Program

7. Does the SSMP contain up-to-date information about preventive operations and maintenance activities? **YES / NO**

8. Are the City's preventive maintenance activities sufficient and effective in reducing and preventing SSOs and blockages? **YES / NO**

Since 2010, the City's has averaged 5.5 SSOs per year, or 3.8 per 100 miles.

4.c Rehabilitation and Replacement Plan

9. Does the SSMP contain up-to-date information about the rehabilitation and replacement program? **YES / NO**

10. Does the SSMP contain up-to-date information about Closed Circuit Television (CCTV) inspections? **YES / NO**

11. Are scheduled inspections and the condition assessment system effective in identifying, prioritizing, and addressing deficiencies? **YES / NO**

12. Does the Capital Improvement Plan (CIP) address prioritized projects for collection system assets? **YES / NO**

4.d Training

13. Does the SSMP contain up-to-date information about existing training programs? **YES / NO**

14. Do supervisors believe their staff are sufficiently trained? **YES / NO**

Staff need training in the new monitoring and reporting requirements, and annual refresher training in overflow response procedures.

15. Are staff satisfied with the training opportunities and support offered to them? **YES / NO**

4.e Equipment and Replacement Part Inventories

16. Does the SSMP reference up-to-date information about equipment and replacement part inventories? **YES / NO**

ELEMENT 5. DESIGN AND PERFORMANCE PROVISIONS

17. Does the SSMP contain up-to-date information about design and construction standards? **YES / NO**

ELEMENT 6. SSO & BACKUP RESPONSE PLAN

18. Does the SSMP contain an up-to-date version of SSO Response Plan? **YES / NO**
OERP needs to be updated to reflect the new monitoring and reporting program requirements.

19. Is the Response Plan effective in handling SSOs? (if **YES**, indicate specific information under the “Evaluation of the Effectiveness of the SSMP” section below) **YES / NO**

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

20. Does the SSMP reference or contain up-to-date information about the City’s FOG control program? **YES / NO**

21. Is the current FOG program effective in documenting and controlling FOG sources? **YES / NO**

City is averaging only about one FOG-related SSO per year.

22. Are all public outreach materials for the FOG program current? **YES / NO**

ELEMENT 8. SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

23. Does the SSMP reference or contain up-to-date information about the City’s capacity assessment activities and documentation? **YES / NO**

Section needs to be updated to document the 2010 Sewer System Hydraulic Model Analysis and results.

24. Is the City sufficiently addressing hydraulic deficiencies? **YES / NO**

The Hydraulic Analysis indicated very few capacity deficiencies in the gravity sewer system. The City is upgrading pump stations to address pump station capacity deficiencies.

ELEMENT 9. MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

25. Does the SSMP reference up-to-date information about the City’s data collection and organization (e.g. use of CMMS, performance indicators, etc.)? **YES / NO**

The SSMP should indicate specific performance measures that can be used to quantitatively evaluate the City’s SSMP and SSO performance.

26. Is the City’s data collection and organization sufficient to evaluate the effectiveness of the SSMP? **YES / NO**

ELEMENT 10. SSMP PROGRAM AUDITS

27. Will this SSMP Audit be completed by every two years starting in 2014? **YES / NO**

ELEMENT 11. COMMUNICATION PROGRAM

28. Is the City's website up-to-date, including information related to providing an opportunity for public input on the SSMP? **YES / NO**
Website needs to updated to include information about the SSMP and a copy of the latest version of the document.

Evaluation of the Effectiveness of the SSMP

The City's sewer system programs as embodied in the SSMP have been effective in maintaining a low level of SSOs. Since 2010, the number of SSOs has averaged 5.5 per year, or 3.8 per 100 miles, which is below average for San Francisco Bay Area agencies; and percent of SSO volume recovered has averaged 86% over that period, with only 10% of volume discharged to surface water.

The City has effective programs in place for controlling FOG (through participation in EBMUD's Regional FOG Control Program), and has targeted sewer mains in easements and sidewalks (which are most prone to root intrusion from laterals) for chemical root control. The City's CCTV inspection and rehabilitation program over the past five years have targeted sewers with recurring maintenance problems, potential structural deficiencies (based on age and pavement condition), higher than average I/I rates, and proximity to water bodies. The City is on track to rehabilitate or replace an average of 2.6 miles of sewers per year, which is an annual rate of approximately 2% of the system (not including Alameda Point, where sewers will be replaced as the redevelopment occurs).

The City is making greater use of GIS and computerized data management systems (e.g., Granite XP for capturing cleaning and CCTV data) in order to monitor performance and provide effective information to prioritize maintenance and rehabilitation activities.

The City has also conducted smoke testing to identify sources of direct inflow to the sewer system, and is strengthening its private sewer lateral compliance program to continue to address I/I and minimize potential private sewer lateral blockages and overflows.

Over the past three years, the City has been implementing a major pump station upgrade program to improve pump station reliability; and has standardized its pump station equipment to allow for more efficient and reliable equipment operations, faster repair time on incidents that could result in SSOs, and reduction in training requirements.

Description of Scheduled Updates/Changes to the SSMP

See comments under each SSMP element for description of needed changes and updates to the SSMP. The SSMP is scheduled to be updated in June 2014 and brought to City Council for adoption in July 2014 or at the time the Consent Decree is lodged. The 2014 SSMP will be a major revision to the previous document, will be re-organized in numbered sections

corresponding to the SSMP elements, and will include additional detail, as well as an introduction that lists the WDR prohibitions and provisions and provides an overview and historical perspective of the City of Alameda sewer system. The SSMP will incorporate programs that are required under the City's current Stipulated Order and anticipated Consent Decree with the U.S. EPA and State and Regional Water Boards.

Chapter 11 Appendices

None