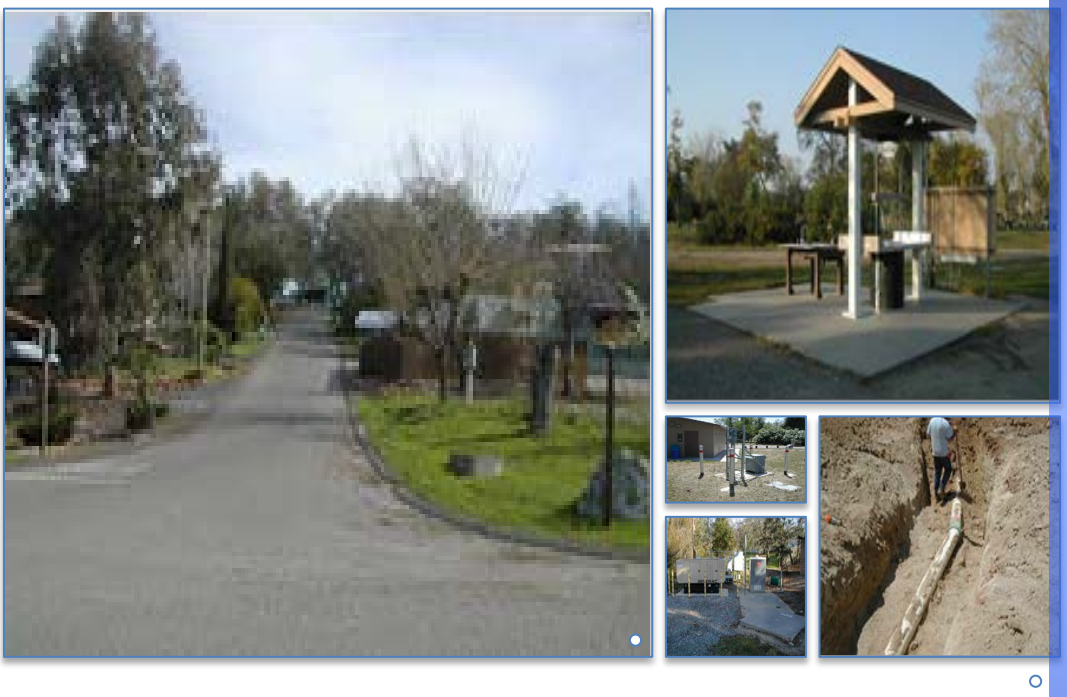
Sewer System Management Plan
Camanche & Pardee Recreation Areas

Water Operations Department



EBMUD

April 2019

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This Sewer System Management Plan covers the following sanitary sewer systems:

Camanche North Shore Recreation Area (WDID No. 5SSO10883)

Camanche South Shore Recreation Area (WDID No. 5SSO10884)

Pardee Recreation Area (WDID No. 5SSO11020)

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. Additionally, I certify that the provisions of the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, including electronic reporting of all sanitary sewer overflows and development and implementation of a sewer system management plan, will be complied with.

Legally Responsible Official: Roberto C. Cortez, P.E.

Title: Manager of Water Supply

Signature: _____

Update Date: 4/26/2019

Sewer System Management Plan Change Log

Section	Update Date	LRO Signature
5-Year Review Entire document was updated and reformatted based on SWRCB Guide	July 2018 Completed in April 2019	

Glossary of Terms

Asset and Infrastructure Management System (AIM)
A customized computerized maintenance management system developed by EBMUD.

Board of Directors
EBMUD's seven-member Board of Directors publicly elected from wards within the EBMUD service area.

California Integrated Water Quality System (CIWQS)
The State Water Resources Control Board online electronic reporting system that is used to report Sanitary Sewer Overflows (SSOs), certify completion of the SSMP, and provide information on the sanitary sewer system.

Capital Improvement Plan (CIP)
The CIP identifies future capital improvements to EBMUD's sanitary sewer system.

Central Valley Regional Water Quality Control Board (CVRWQCB)
CVRWQCB protects the quality of waters within Region 5, including CANS, CASS, and PARA.

Closed Circuit Television (CCTV)
Refers to the process and equipment used to internally inspect the condition of gravity flow sanitary sewers.

Computerized Maintenance Management System (CMMS)
Automated software systems for handling maintenance work orders, as well as associated inventory, purchasing, accounting, and human resources functions.

Corrective Maintenance (CM)
Maintenance activities intended to correct and/or repair failures of the sanitary sewer system components.

Depth of Flow to Diameter Ratio (d/D)
Depth of flow to pipe diameter ratio is a tool used to identify flow blockages in smaller pipes caused by debris build-up, avoiding potential backup into connected service laterals.

East Bay Municipal Utility District (EBMUD)
EBMUD is the publically owned treatment works, owner and operator of the sanitary sewer systems and wastewater treatment plants included in the SSMP.

Environmental Compliance Section (ECS)
EBMUD's work group responsible for compliance with environmental regulations.

Fats, Oils, and Grease (FOG)
Products typically associated with food preparation and cooking activities that can cause blockages in the sanitary sewer system.

Full-time Equivalent (FTE)

A metric to determine staff resources for a project. A 1.0 FTE is one full-time worker, while a 0.5 FTE requires half-time of a full-time worker.

Geographical Information System (GIS)

Software system used to capture, store, analyze, and manage geospatial data associated with EBMUD's assets, including sanitary sewer system.

Global Positioning System (GPS)

The handheld unit that can be used to determine the longitude and latitude of the components of a sanitary sewer system based on the time difference for signals from different satellites to reach the receiver.

Groundwater Infiltration (GWI)

Groundwater that enters the sanitary sewer pipes system through cracks and/or leaks.

Infiltration/Inflow (I/I)

Groundwater and stormwater that enter the sanitary sewer system, resulting in an increase in wastewater flow. Infiltration enters indirectly through defects in the sanitary sewer pipes. Inflow enters the sanitary sewer system directly through for example holes in manhole covers and stormwater cross-connections, including storm drains, surface area drains, and roof leaders.

Lateral

The piping that conveys wastewater, including domestic sewage from a building to the sanitary sewer system.

Legally Responsible Official (LRO)

The individual who has the authority to certify reports and other actions that are submitted through CIWQS. EBMUD's primary LRO is the Manager of Water Supply.

Mokelumne Watershed and Recreation Division

EBMUD's work groups responsible for protecting the Mokelumne Watershed and recreational areas, including CANS, CASS, and PARA.

National Pollutant Discharge Elimination System (NPDES) Permit Program

NPDES Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

Oakland Control Center (OCC)

EBMUD's secondary location to operate facilities around Pardee and Camanche Reservoirs remotely.

Operations and Maintenance (O&M)

Identified activities to properly operate and maintain the sanitary sewer system.

Operations and Maintenance Department (OMD)

The organization within EBMUD responsible for the sanitary sewer system at CANS, CASS, and PARA.

Pardee Area Control Center (ACC)
EBMUD's primary location to operate facilities around Pardee and Camanche Reservoirs remotely.

Pardee Section
EBMUD work group responsible for the operation and maintenance of the sanitary sewer system at CANS, CASS and PARA.

Plant Engineering Services
EBMUD work group responsible for providing support with capital improvement projects.

Preventative Maintenance (PM)
Identified proactive maintenance activities intended to prevent failures of the sanitary sewer system, e.g. cleaning, CCTV, repair.

Rainfall Dependent Inflow and Infiltration (RDI/I)
Rainfall that enters the sanitary sewer system through direct connections, including roof leaders, holes in manhole covers, or ill-fitting manhole covers, resulting in an immediate increase in wastewater flow.

Regulatory Compliance Office (RCO)
EBMUD's division that includes ECS and WHS work groups.

Rehabilitation and Replacement Plan (R&R)
A long-term strategy to address identified rehabilitation and repair needs for EBMUD's Upcountry infrastructure utilities, including wastewater collection, treatment, and disposal systems.

Sanitary Sewer Overflows (SSOs)
Discharge of any quantity of partially treated or untreated wastewater from the sanitary sewer system at any point upstream of the wastewater treatment plant. SSOs are typically caused by blockages, pipe failure, pump station failure, or capacity limitation.

Sanitary Sewer System
The system of pipes, pump stations, or other conveyances, upstream of the wastewater treatment plant headworks that collect and convey wastewater to the wastewater treatment plant.

Sewer System
See Sanitary Sewer System.

Sewer System Management Plan (SSMP)
The document that establishes procedures for management, operation, and maintenance of a sanitary sewer system.

SMART
Acronym for specific, measurable, achievable, relevant, and time-bounded criteria used to guide the development of measurable goals.

Statewide General Waste Discharge Requirements
State Water Resources Control Board Order No. 2006-0003-DWQ Waste Discharge Requirements for sanitary sewer systems.

State Water Resources Control Board (SWRCB)

The State Water Resources Control Board, under the authority of the California Environmental Protection Agency, is responsible for protecting the State's water resources.

Upcountry Wastewater Systems Master Plan (Master Plan)

Master Plan that provides a comprehensive plan to upgrade the District's Upcountry wastewater system to meet new standards and minimize the potential for sanitary sewer overflows.

Waste Discharge Requirements (WDRs)

The permit conditions for regulating potential discharges of wastes to the environment.

Water Supply Division

EBMUD's work group responsible for operating and maintaining the wastewater treatment plants and sanitary sewer systems at CANS, CASS and PARA.

Workplace Health and Safety (WHS)

EBMUD's work group responsible for occupational safety.

Introduction

Regulatory Background

On May 2, 2006, the State Water Resources Control Board (SWRCB) adopted Statewide General Waste Discharge Requirement for Sanitary Sewer Systems Order No. 2006-003-DWQ (Order 2006-003-DWQ) to address Water Code Section 13191, 2001, Assembly Bill 285 (Water Code) requirements and develop the framework for the Statewide Sanitary Sewer Overflow Reduction Program.

Order No. 2006-003-DWQ requires publicly-owned treatment facilities to develop and implement a system-specific Sewer System Management Plan (SSMP) to facilitate proper funding and management of the permitted sanitary sewer systems. The prescribed SSMP elements require provisions resulting in proper and efficient management, operation, and maintenance of the enrollee's sanitary sewer systems, in addition to risk management considerations and cost benefit analyses.

Order No. 2006-003-DWQ's Monitoring and Reporting Program requirements include specific Sanitary Sewer Overflow (SSO) notification, reporting, and recordkeeping requirements to meet the SSO reporting requirements in the Water Code and facilitate compliance monitoring and enforcement for violations. The required Spill Response Plan establishes standard procedures for immediate response to an SSO in a manner designed to minimize water quality impacts and potential public health and nuisance conditions.

Order No. 2006-003-DWQ requires development and implementation of an SSMP for sanitary sewer collection systems comprised of more than one mile of pipe that convey untreated wastewater to a publicly owned treatment facility. The SSMP must include the required eleven elements. If an element is not applicable, a statement to that effect must be included in the SSMP.

SSMP Adoption and Implementation

On July 13, 2010, EBMUD's Board of Directors adopted the SSMP through Motion 109-10, with an effective date of August 2, 2010. The SSMP was developed by EBMUD staff, including wastewater treatment, engineering, and environmental compliance. The document includes the eleven elements required by Order No. 2006-003-DWQ. The SMMP has been fully implemented. Pardee Section is the work group responsible for implementation of the SSMP with support from Mokelumne Watershed and Recreation Division, and Regulatory Compliance Office (RCO).

Overview of Sanitary Sewer Systems

EBMUD owns and operates the wastewater treatment plant and the respective sanitary sewer system at three recreation areas located within the Mokelumne Watershed, namely Camanche North Shore Recreation Area (CANS), Camanche South Shore Recreation Area (CASS), and Pardee Recreation Area (PARA). CANS and PARA are located in Amador County, and CASS is located in Calaveras County.

Figures 2 through 4 show the respective sanitary sewer system and the wastewater treatment and disposal facility for CANS, CASS, and PARA.

EBMUD maintains and repairs the sanitary sewer systems, including main lines, force mains, laterals, and lift stations. Maintenance of sewer laterals on mobile homes is the responsibility of the homeowner from the connection point cleanout to the residence.

The table below summarizes the elements of the sanitary sewer system for the three wastewater treatment plants:

Sewer Element*	CANS WDID 5SSO10883	CASS WDID 5SSO10884	PARA WDID 5SSO11020
Gravity Flow, miles	5.4	7.4	1.5
Force Main, miles	0.5	1.6	-
No. Sewer Laterals	159	342	132
No. Lift Stations	5	7	-

*line diameters: main = 4”- 8”, laterals = 4”, force mains = 3”- 4”

Figure 1 below shows the location of CANS (Item 7), CASS (Item 4), and PARA (Item 1) in relation to Camanche Reservoir and Pardee Reservoir.

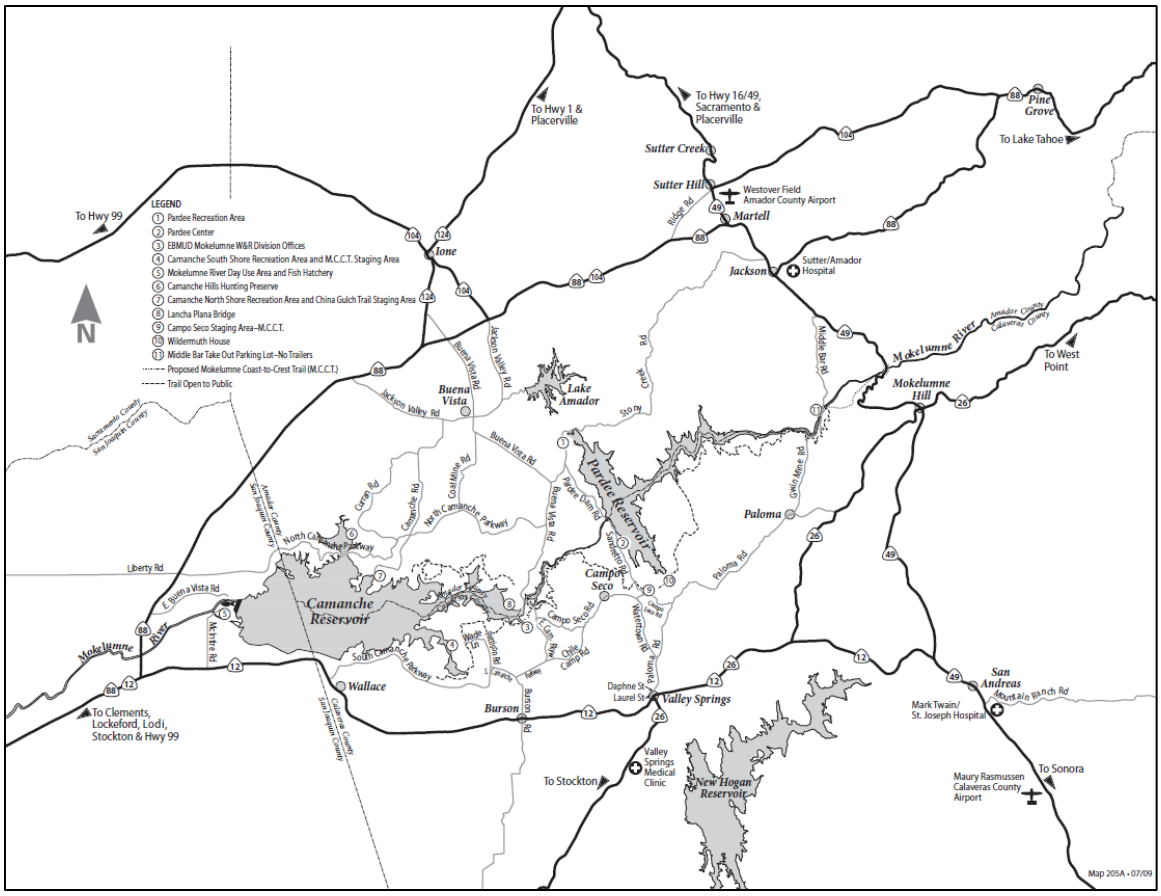


Figure 2 - CANS Wastewater System
yellow lines = sewer laterals, green = sanitary sewer lines, and purple = force mains (including treated effluent discharge to spray-fields)

Figure 3 - CASS Wastewater System
yellow lines = sewer laterals, green = sanitary sewer lines, and purple = force mains (including treated effluent discharge to spray-fields)

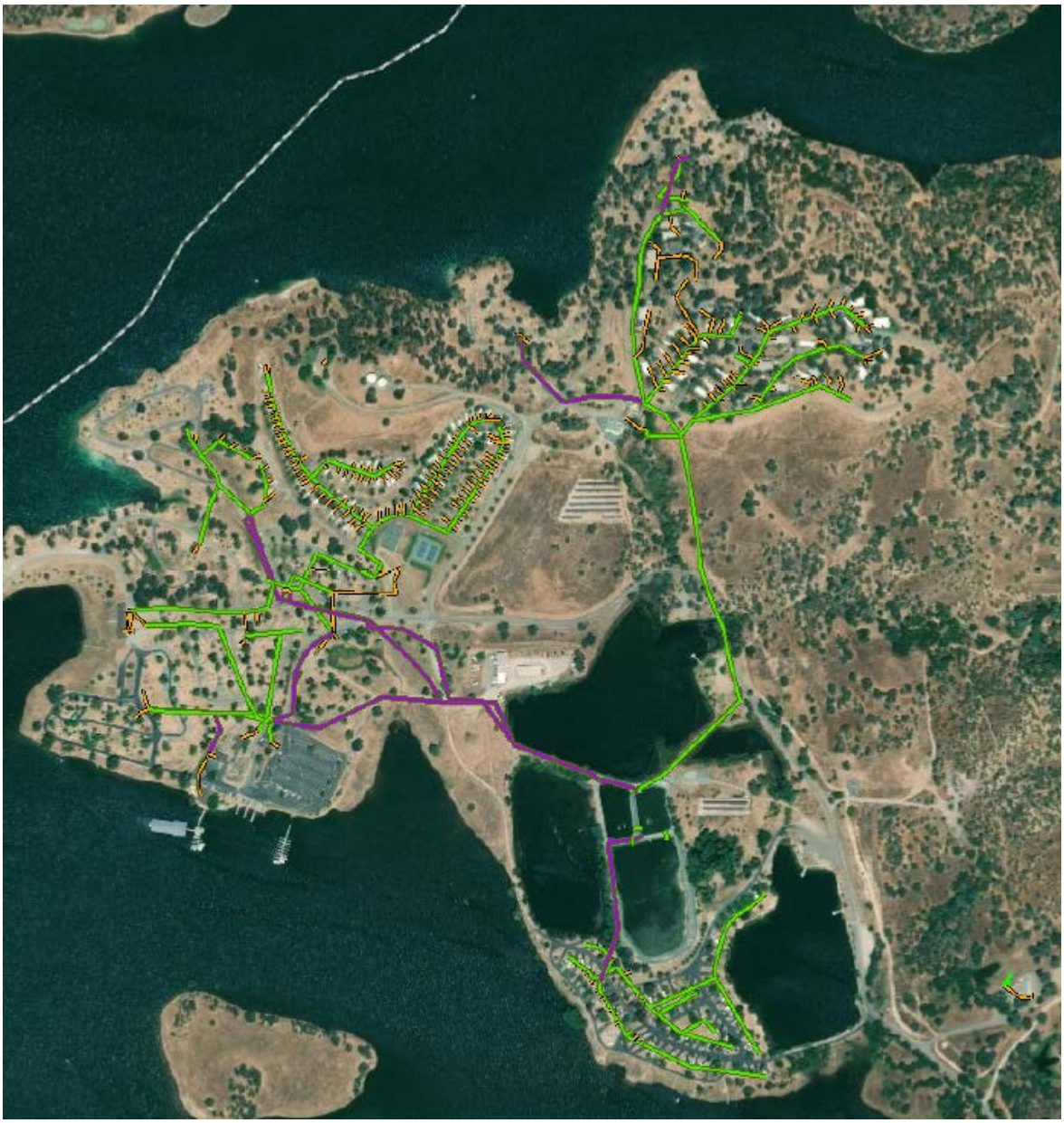


Figure 4 - PARA Wastewater System
yellow lines = sewer laterals, green = sanitary sewer lines, and purple = force main (including treated effluent discharge to spray-fields)

1.0 Goals

A summary of EBMUD's SSMP established goals are listed below. The goals are routinely reviewed and updated as necessary.

- Properly manage, operate, and maintain all parts of the wastewater collection system
- Minimize the frequency of SSO's from the District's collection system
- Mitigate the impact of SSO's from the District's collection system
- Maintain the current record of no SSO's since 2011

The goals are aligned with the SMART criteria and consider the following:

- District Strategic Plan
- Previous year's program performance and areas identified for improvements
- Legal and other applicable requirements
- Best management practices
- Financial and operational requirements

2.0 Organization

2.1 Authorized Representative

The Director of Operations and Maintenance Department (OMD) has delegated the duties of the LRO to the Manager of Water Supply, who has full responsibility for the development and implementation of the SSMP. The Manager of Water Supply is responsible for signing and certifying the SSMP and all respective documents and reports.

2.2 Responsibilities within the SSMP

The following table lists staff responsible for implementing specific measures in the SSMP Program:

Name, Title, and Contact Information	SSMP Program Responsibility
Roberto Cortez, Manager of Water Supply (510)-287-1035	LRO, manager of work groups responsible for maintenance and operation of sanitary sewer systems and wastewater treatment plants
William Pulsifer, Pardee Superintendent (209) 772-8201	Manages the overall operation of the sanitary sewer systems and wastewater treatment plants
Dillon Cowan, Pardee Assistant Superintendent (209) 772-8267	Oversees work groups responsible for preventing and responding to SSOs
Kent Lambert, Manager Watershed and Recreation (209) 772-8203	Manages the contracts and communication with the concessionaires
Armond Gauthier, Senior Engineer (510) 287-1520	Manages sanitary sewer systems' capital improvement projects
Chandra Johannesson, Manager of Environmental Compliance (510) 287-0412	Manages environmental response and reporting of SSOs

Details on the work groups responsible for all aspects of the SSMP are included below, followed by a copy of the relevant section of EBMUD's Organization Chart.

The work groups responsible for the development, maintenance, and implementation of the SSMP report to either the Director of OMD or the Director of Water and Natural Resources Department. Both Directors report to the General Manager. The General Manager reports to the EBMUD Board of Directors.

The Director of OMD oversees the entire Operations and Maintenance Department, including over 700 employees. The Director of OMD is responsible for the safe, effective, and compliant operation of the CANS, CASS, and PARA sanitary sewer systems. The Director of OMD has delegated the duties of the LRO to the Manager of Water Supply.

The Manager of Water Supply reports to the Operations Manager. The Manager of Water Supply is responsible for the development and implementation of the SSMP, plans strategy, sets direction, leads staff, allocates resources, and delegates responsibility.

The Superintendent of Pardee Section reports to the Manager of Water Supply. The Superintendent of Pardee Section oversees a group of highly skilled staff and is responsible for operations and maintenance of all wastewater collection systems.

The Power, Treatment and Transmission Maintenance Supervisors report to the Superintendent of Pardee Section. The Power, Treatment and Transmission Maintenance Supervisors oversee the daily work of Maintenance Specialist, Instrument Technicians, and Electrical Technicians. Supervisors are responsible for managing work orders, setting priorities of work performed, and for completing the corrective and preventive maintenance of the waste water collection system.

Maintenance Specialist, Instrument Technicians, and Electrical Technicians report to Power, Treatment and Transmission Maintenance Supervisors. The Maintenance Specialists, Instrument Technicians, and Electrical Technicians are responsible for completing the corrective and preventive maintenance work on the waste water collection system as determined by work orders and/or Supervisors.

Treatment Plant Specialists report to the Water and Wastewater Supervisor. The Treatment Plant Specialists are licensed water and wastewater treatment operators. They are responsible for operating the water and wastewater treatment systems at CANS, CASS, and PARA

RCO staff includes Environmental Compliance and Workplace Health and Safety Specialists. They report respectively to the Manager of Environmental Compliance and Manager of Workplace Health and Safety. They are responsible for maintaining necessary permits up to date; they collect, compile, and organize operational data. They prepare and submit monthly, quarterly, and annual reports. They communicate with regulatory agencies and report events related to SSOs.

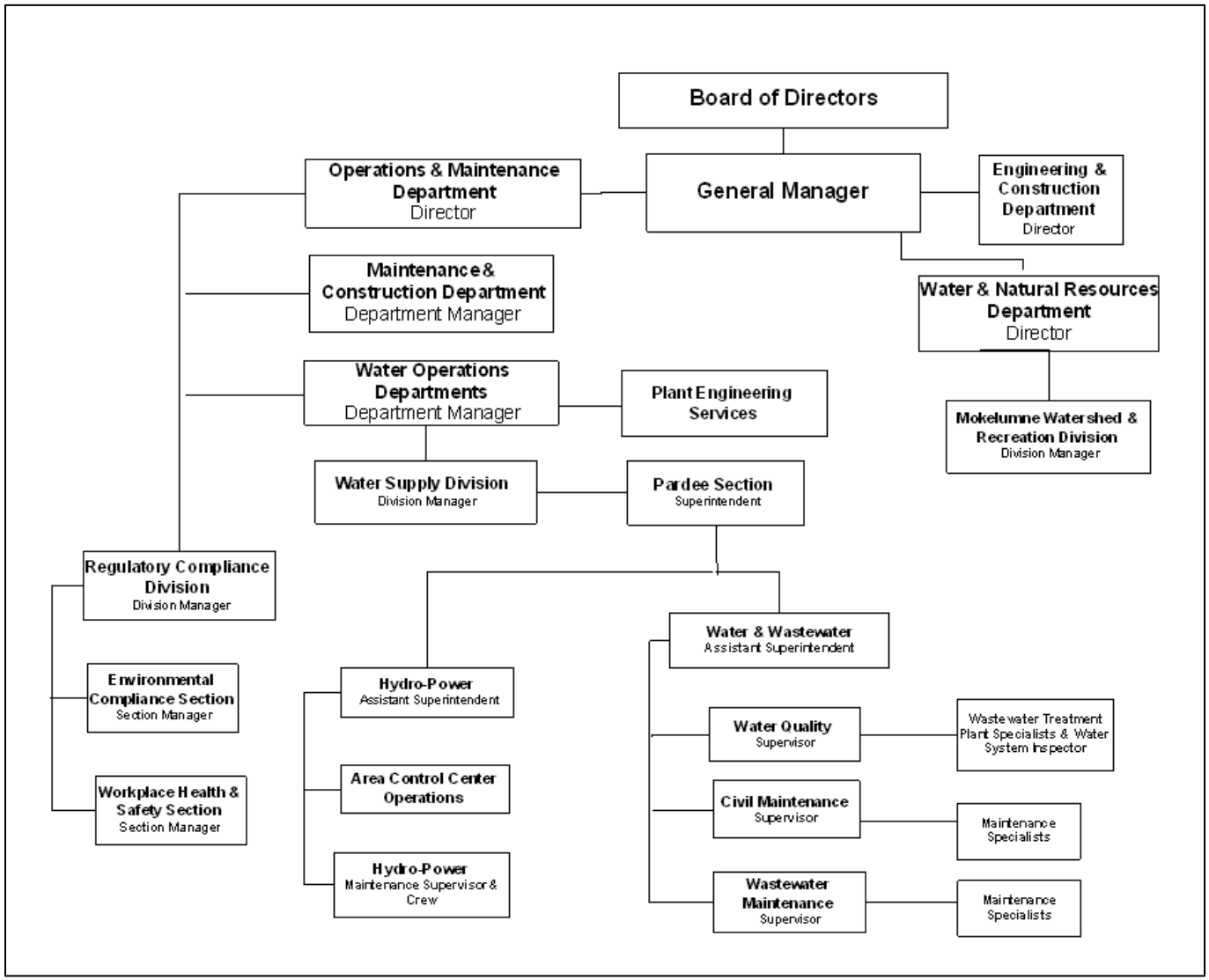
Plant Engineering Services staff report to the Operations Manager. Plant Engineering Services provides engineering support for the operation and maintenance staff. They are also responsible for working to develop a comprehensive capital improvement program, prioritizing needed improvements, providing planning, design, and construction/project management services.

Manager of Mokelumne Watershed and Recreation Division (MWRD) is responsible for the management of EBMUD's recreation areas at Pardee and Camanche Reservoirs. The Manager of MWRD supervises EBMUD's rangers. The work group enforces local ordinances, rules and regulations relating to use of recreation areas. They are also responsible for interacting and communicating with permanent residents, seasonal tenants, and visitors at CANS, CASS, and PARA.

2.3 Chain of Communication

Figure 5 shows the organization of the work groups responsible for the development and implementation of the SSMP. The chain of communication for reporting and responding to SSOs is contained in *Section 6 – Overflow Emergency Response Plan*.

Figure 5 Mokelumne SSMP Organization Chart



3.0 Legal Authority

CANS, CASS, and PARA recreation areas are operated through EBMUD-issued agreements with retained concessionaires. The agreements include provisions to regulate illicit discharges and control FOG blockages in the sanitary sewer systems. EBMUD implements its established rules and regulations pertaining to the sanitary sewer systems through the concessionaires. These rules and regulations reside in the documents listed below and are updated on an as-needed basis:

- *EBMUD Watershed Rules and Regulations*
- *Camanche Mobile home Park Rules and Regulations*
- *Camanche South Shore Long-term RV Park Rules and Regulations*
- *Pardee RV Park Rules and Site Use Conditions*

As owner and operator of the sanitary systems, EBMUD has the authority and obligation to ensure that the sewer laterals and RV connections are properly designed and constructed, allowing access for inspections and necessary maintenance work.

EBMUD's Board of Directors has adopted resolutions in accordance with applicable sections of the California Health and Safety Code, and the California Public Utilities Code, authorizing EBMUD to issue enforcement action (infraction), including fines for violations of its sanitary sewer system rules and regulations, thereby protecting against SSOs and noncompliance with the WDRs. EBMUD issues enforcement actions directly to the occupant or owner as detailed in the following sections.

3.1 Emergency Termination of Service

The Manager of Water Supply or Pardee Section Superintendent, as applicable, are hereby authorized and empowered to terminate sanitary sewage service immediately to any premises for the purpose of halting or preventing any discharge into the sewerage facilities which the Manager of Water Supply or Pardee Superintendent, reasonably determines to constitute a detrimental discharge, or otherwise significantly imperils the public health, safety or welfare. In such case, the Manager of Water Supply or Pardee Superintendent will notify the Mokelumne Watershed and Recreation Manager, who shall make a reasonable effort to notify the occupants or the owners of the premises prior to halting or preventing such discharge; provided, however, that the failure of the occupant or owner to receive such notice shall not affect any action taken hereunder, so long as the determination of detrimental discharge or imperilment of the public health, safety or welfare made by the Manager of Water Supply or Pardee Superintendent, was reasonable and made in good faith.

In the event that the Manager of Water Supply or Pardee Superintendent terminates sanitary sewerage service to any premises pursuant to the provisions of this Section, the Manager of Water Supply or

Pardee Superintendent shall notify the Mokelumne Watershed and Recreation Manager of the termination. The Mokelumne Watershed and Recreation Manager shall then notify the occupant and owner of the premises (if such persons are not the same as the user) in writing that sanitary sewerage service has been terminated, and shall provide said occupant and owner an opportunity to be heard on the matter of termination not more than ten (10) days following such termination.

3.2 Notice of Violation

In addition to implementing the established procedure to terminate sewage service as detailed in Section 3.1, the Manager of Water Supply or Pardee Superintendent shall notify the Mokelumne Watershed and Recreation Manager if any occupant or owner who violates or is threatening to violate any waste discharge requirement of the rules and regulations included in the documents listed under Section 3.0. If appropriate, the Mokelumne Watershed and Recreation Manager shall serve upon such user a written *Notice of Violation* (NOV) stating the nature of the violation(s) and ordering cessation thereof. Service of such notice shall be made by Mokelumne Watershed and Recreation staff or by certified or registered mail through the U.S. Postal Service. Within thirty days of receipt of the NOV, the occupant or owner shall submit a written response, including an explanation of the cause of the violation(s) to the Mokelumne Watershed and Recreation Manager. The Mokelumne Watershed and Recreation Manager, and the Manager of Water Supply or Pardee Superintendent shall review the NOV response and determine if further enforcement action is necessary.

A violation of a waste discharge requirement for any Mokelumne Watershed Mobile-home Park, Recreational Vehicle Park or Mokelumne Watershed rules and regulations may result in citation and/or eviction proceedings.

4.0 Operations and Maintenance Program

EBMUD maintains systems and procedures to conduct all appropriate and applicable operations and maintenance (O&M) activities for the sanitary sewer systems at CANS, CASS, and PARA. The elements include sanitary sewer system maps, a preventive O&M program, routine inspections, rehabilitation and replacement (R&R) program, training, and contingency equipment and replacement inventories.

4.1 Sanitary Sewer System Maps

The District relies on a single collection system map for each of its three wastewater systems, including:

- A Geographic Information System (GIS) base map is used for managing map attributes as current as possible and depicting maintenance and repair issues and resolutions.
- Hard copy scale drawings broken down into individual pages bound in 11" X 17" map books.

4.1.1 GIS Database Map

EBMUD has developed a map of each of its Mokelumne sanitary sewer systems using a GIS database. The GIS map contains manholes, pipelines, pump stations, and wastewater treatment and disposal facilities. Also included for reference in the database are aerial photos of the wastewater service areas and maps of roads and property boundaries.

The GIS database was built from the following information sources:

- Global Positioning System (GPS) data – The GPS locations of the manholes were collected by EBMUD.
- As-built drawings – The rim and invert elevations of the manholes were added from as-built drawings and field verifications.
- Aerial photo – Includes depictions of roads and area boundaries, general overview of facilities, locations of lift stations, sizes and types of pipes, force mains, manholes, cleanouts, valves, etc. Maps of facilities were established based on an aerial photo of the wastewater service area.

The GIS database for the sanitary sewer system is currently stored on a standalone PC workstation and routinely backed up on a network server. Printouts from the GIS database are located on EBMUD's internal online document storage system.

4.1.2 Map Updates

Sanitary sewer system maps are routinely reviewed for accuracy and field verified to ensure current conditions are depicted. Maps are updated accordingly. Maps are also updated any time new facilities are added or existing facilities are modified. Updates to the base map and map book set will continue to be edited by hand until the set can be replaced by a fully developed GIS map system.

4.2 Preventive Maintenance

EBMUD conducts routine maintenance and preventive maintenance (PM) activities by dedicated EBMUD Pardee Maintenance staff for its sanitary sewer systems.

4.2.1 Computerized Maintenance Management System (CMMS)

The Asset and Infrastructure Management System (AIM) is a customized CMMS developed by EBMUD. AIM is used by Pardee Section staff to:

- Request maintenance services and manage both planned and unplanned maintenance activities
- Track equipment inventory and maintenance
- Plan and prioritize maintenance work
- Maintain timely and accurate activity records which can be easily accessible and used for appropriate analysis and reporting

The asset hierarchy in AIM includes EBMUD's Mokelumne sanitary sewer systems and wastewater treatment plants. Components specific to the sanitary sewer systems in AIM include:

- Sanitary Sewer System Mains and Laterals
- Sewer Lift Stations
- Manholes
- Cleanouts
- Other utilities that impact or may be impacted by the operation and maintenance of EBMUD's sanitary sewer system

All identified maintenance and job plans are documented and stored in AIM.

4.2.2 Preventive Maintenance, Inspections and Activities

EBMUD has an established routine sewer main and lateral cleaning program (Program) to preserve wastewater equipment and facilities from failure and deterioration that could lead to sanitary sewer system overflows. The Pardee Wastewater Maintenance staff performs the inspections, cleaning, and other PM activities for all wastewater collection, lift stations, and treatment systems. The intent of the Program is to complete all aspects of the inspection and cleaning for each sanitary sewer system on a three-year cycle.

Condition assessment inspections may be conducted if routine and non-routine inspections and testing indicate accumulation of debris and/or other items of concern in the sewer main line(s). Final assessments of completed capital improvement projects may require smoke testing, video inspections, leak check of manholes, root treatment, and/or inflow assessments. .

The Pardee Wastewater Maintenance staff has the expertise and equipment available to conduct all required activities, including CCTV inspection, hydro-jetting, mechanical rodding, vacuuming, root treatment and removal, and flushing. Cleaning and treatment schedules are based on conventions of

best management practices for O&M of sewer collection systems within the regional industry as well as an extensive history of practical operation of the sanitary sewer systems at the three recreation areas.

4.3 Rehabilitation and Replacement (R&R) Program

EBMUD's Rehabilitation and Replacement Program is managed through the Upcountry Wastewater Systems Master Plan (Master Plan). The Master Plan is a living document that establishes long-term strategies to address identified rehabilitation and replacement needs for the District's Upcountry infrastructure utilities, including wastewater collection systems. Through the Master Plan, infrastructure elements are assessed followed by prioritization of identified rehabilitation and replacement needs, including a sound justification for required respective capital funding. Prioritization of identified rehabilitation and replacement projects is based on:

- Public and employee safety
- Environmental and regulatory requirements
- Enhancing infrastructure reliability
- Ensuring the wastewater systems meet respective current and future capacity needs, in addition to complying with current standards

The following table includes a summary of the current scheduled Upcountry sanitary sewer system rehabilitation and replacement projects. These dates may change based on available resources and funding.

Improvement Projects[1]	**Start Date**	**In Service Date**
CASS WW Collection System – DESIGN[2]	August 2019	October 2020
CASS WW Collection System – CONSTRUCTION[2]	October 2020	April 2022
CANS WW Collection System – DESIGN[3]	April 2021	May 2022
CANS WW Collection System – CONSTRUCTION[3]	May 2022	October 2023
PARA WW Collection System – DESIGN[3]	September 2022	September 2023
PARA WW Collection System – CONSTRUCTION[3]	October 2023	November 2024

Notes:
1. Improvement projects consist of lift station rehabilitation, force main replacement, manhole rehabilitation, collection pipe and service lateral replacement.
2. Budget resources approved
3. Pending budget approval

4.3.1 Budget

EBMUD maintains a five-year Capital Improvement Program (CIP) and an annual operating budget. The CIP and operating budget are prepared as part of EBMUD's biennial budget process.

Bonds and revenue are the main source of funding for operation, maintenance, rehabilitation, and replacement of the sanitary sewer systems. Capital improvement projects are partly funded through revenue collected from the operation of the recreation areas and mobile home parks lease rates.

EBMUD's Upcountry operating budget consists of resources necessary to operate and maintain the sanitary sewer systems and the treatment and disposal facilities. Required resources include staff, energy, chemicals, parts and materials, vehicles, fuel, and outside contracts.

The budget for labor costs and other labor-related expenses are based on the District's salary schedule and staffing plan, in addition to historical data, trending/projections, and inflation factors.

4.4 Training

EBMUD's Workplace Health and Safety (WHS) Section conducts safety training on confined space entry, lock-out/tag-out, and other relevant safety-related subjects. Procedures are established through Required Safety Practices (RSPs) and made available on the RCO's website.

The Environmental Compliance Section (ECS) conducts annual environmental compliance refresher training to ensure that the Pardee Section operation and maintenance staff are current on environmental issues, including guidelines on proper emergency response and reporting procedures for sanitary sewer overflows. The guidelines and procedure are documented in the ECS Manual and made available on RCO's website. Additional systems training for Pardee staff is conducted by Supervisors and other relevant Pardee subject matter experts through on-the-job training. Training records are maintained by the work groups conducting the training as well as by the Pardee Section.

4.4.1 SSMP/SSO Response Training

All EBMUD personnel assigned to the Pardee Section who are/or who may be responsible to have any role in the response to SSOs receive initial and annual refresher training in the proper response procedures in general and specifically for their role(s.) This includes staff assigned to the Wastewater Maintenance Crews, Water Quality Crew, Supervisors, Assistant Superintendents, the Superintendent, and staff who receive 24-hour Standby/On-Call Duty assignments. In addition to proper field response and event responsibilities, these employees are trained to be up-to-date on new and emerging industry technologies, new and upgraded local facilities, and new and revised regulatory requirements.

4.4.2 Maintenance Specialist Training

The Wastewater Crew consists of a supervisor and five maintenance specialists. EBMUD retains dedicated multi-skilled maintenance staff, through providing ongoing skill-based and site-specific training programs. Prior to journey-level employment, an individual must meet basic-level job

classification requirements. A probationary employment period is used to assess skill and competency levels.

Training is provided through several platforms, including on-the-job training, independent study, meetings, classroom lectures, vendor presentations, and orientations on new equipment/facility.

4.4.3 Operations Training

The sanitary sewer system is operated and maintained by the Pardee Wastewater Crew. The Wastewater Crew works together with the Pardee Water Quality Crew, which operates the wastewater treatment plants at CANS, CASS, and PARA. The two workgroups receive routine sanitary sewer system training, in addition to the general training detailed above.

4.4.4 Contractor Training

Contractors are not typically used for routine maintenance and operation of the sanitary sewer systems. When contractors are retained for specific projects, submittal of appropriate training and qualification records are required and verified.

4.5 Contingency Equipment and Replacement Inventories

EBMUD owns and maintains a limited supply of emergency response equipment, such as pumps, generators, piping, etc. In addition, EBMUD maintains contracts with local vendors to provide emergency equipment to supplement the inventory on an as-needed basis.

EBMUD maintains a spare parts inventory for the Mokelumne Area sanitary sewer systems and lift stations. These parts are selected based on manufacturers' recommendations and experience with the parts that are likely to cause a failure, i.e. critical parts. The spare parts inventory records are kept in the Pardee Wastewater Supervisor's Office and the Pardee Section Warehouse.

4.5.1 Additional Resources

EBMUD has ongoing relationships and contracts with local suppliers, vendors, and service providers. The wide range of equipment and supplies sources is instrumental for the ongoing of continuing operation and maintenance of the sanitary sewer systems, in addition to SSO emergency response.

5.0 Design and Construction Standards

5.1 Design Standards

EBMUD has standard designs, and construction and testing methods for new or rehabilitated sanitary sewer systems. All sewer mains, laterals and lift stations located in the recreation areas are designed and constructed using EBMUD design and construction standards. The work is conducted by EBMUD staff or a retained contractor with District oversight.

The design and construction standards include specifications, drawings, and details to rehabilitate, install, and/or abandon all elements of the Upcountry sanitary sewer systems, including sewer lift stations. These specifications provide reasonable assurance that the constructed sanitary sewer systems will perform properly and maintain structural integrity for expected life span with minimal infiltration or maintenance problems. Design flow and capacity for sewer mains are described in the Master Plan.

EBMUD routinely reviews and updates its design and construction standards based on:

- New or changes to industry standards
- New or changes to existing codes (Local, State or Federal)
- Lessons learned and feedback on previous projects

5.2 Inspection and Testing Standards

EBMUD's standard specifications include methods and requirements for testing and accepting the construction of pipe, manhole, cleanout, and sewer laterals in the sanitary sewer system. Prior to acceptance, EBMUD requires inspection by CCTV to detect obstructions or defects in the sanitary sewer system. The specifications also include methods and requirements for testing the mechanical and electrical equipment, in addition to the functionality of the sewer lift stations.

EBMUD reviews and updates its inspection and testing standards based on:

- Changes to industry standards
- Changes to existing codes (Local, State or Federal)
- Lessons learned and feedback on previous projects

6.0 Overflow Emergency Response Program

EBMUD's overflow emergency response program includes established plans and procedures to protect the environment and public health, in addition to satisfying strict regulatory reporting requirements. Guidelines and procedures have been developed for notification and reporting, chain of communication, and appropriate response, mobilization, abatement, and mitigation standards and best management practices. The emergency response procedures are documented in the *Pardee Area Control Center (ACC) Emergency Notification Guidelines* (Guidelines).

6.1 Initial Notification

During normal business hours, Pardee Section Supervisors may receive information regarding potential SSOs from EBMUD staff, concessionaires, contractors, or the general public. During off-hours, reports of potential SSOs are directed to the Pardee ACC operators or the Oakland Control Center (OCC) operators when Pardee ACC operators are off-duty. A Pardee Section Supervisor or the Pardee Standby Supervisor will evaluate the reported information and dispatch staff to the site. Upon confirmation of the SSO, additional resources may be requested and further notifications made in accordance with the established procedures. ECS or designated standby staff will notify the appropriate regulatory agencies within the mandated reporting time periods in accordance with RCO's procedures.

6.2 Response Mobilization and Public Notification

Upon determining the level of response required, all necessary actions shall be taken to contain and control the SSO, mitigate environmental and public health impacts, and document the SSO. During business hours, the Pardee Wastewater Maintenance Supervisor is responsible for dispatching additional persons and equipment to assist with the response. During the off-hours, the Standby Supervisor is responsible for dispatching additional staff and equipment. If the size and extent of the spill is beyond EBMUD's capability to respond in a timely manner, the District's retained emergency response contractors are available to dispatch necessary clean-up resources.

If the SSO is in the vicinity of a swimming, bathing, boating, or any other recreation area where public health could be affected, public notification/posting procedures are handled by the EBMUD Mokelumne Watershed and Recreation Division. The affected areas may be restricted or closed to the public with appropriate warning signs posted. The Mokelumne Watershed and Recreation Division are responsible for security and will coordinate with EBMUD's Public Affairs Office if additional public and/or other media communication is required (see Section 11, Communication Program).

6.3 SSO Abatement and Impact Mitigation Plan

The level of response will depend whether the spillage has migrated or has a high potential to migrate to surface waters, contaminate drinking water, or threaten public health. If no impact to surface waters is determined, SSO response and clean-up measures may entail stopping the upstream source temporarily until cleanup and repairs can be completed, and containing spillage materials while cleaning the point of blockage.

For overflows that have migrated to surface waters or threaten to migrate to surface waters, the procedures specify immediate actions to stop the source and then contain the sewage. The most effective actions providing immediate cessation of spillage flow will be considered first, such as blocking a manhole cover or building an earthen berm or using sandbags.

Necessary documentation of the site conditions will be recorded during the initial assessment phases by the first responders, so it will be available to report to applicable regulatory agencies. Estimates of spillage flow rates and when the overflow began are calculated for reporting in addition to determining the appropriate clean-up methods and required equipment to quickly recover the sewage. Time permitting, representative environmental samples may be collected to document the extent of environmental and public health impacts.

7.0 FOG Control Program

EBMUD's FOG Control Program consists of preventative maintenance on potential and identified hot spot areas, including routine service of grease traps in recreation area restaurants and mobile homes. In addition, EBMUD provides educational outreach material to RV sanitary sewer connection users and mobile home residents on how to appropriately manage their FOG.

7.1 Legal Authority for FOG Control Program

EBMUD's Board of Directors has adopted the appropriate resolutions to ensure EBMUD has the authority to prohibit the discharge of non-sewage materials into the sanitary sewer system or any action which may cause, threaten to cause, or is capable of causing damage or impacting the operation of the sewerage facilities. In addition, EBMUD has the authority to take all necessary steps to adequately maintain, operate, and prevent spills from its sanitary sewer collection systems, including but not limited to, implementing a FOG program. Each wastewater treatment facility's specific WDRs also require maintaining the sanitary sewer system in good working order, operating as efficiently as possible, and taking all reasonable steps to minimize and/or prevent any adverse impact to the waters of the State.

7.2 Source Identification

Wastewater discharges from residential mobile home park sites, RV hook-up connections, common area use sites, and the recreation area food service facilities are potential sources for grease-related blockages in the sanitary sewer systems. Source control measures include appropriate level of inspections and maintenance upstream of identified sanitary sewer hot spot areas of blockages.

7.3 Inspections and Routine Maintenance

- Hotspot areas: Residential users of the mobile home parks report locations of any SSOs or blockages to EBMUD. Hotspots are prioritized for sewer lateral system inspections to identify the inflow source(s) and potential blockage points and/or causes, e.g. FOG, roots, debris, rocks, solid materials, etc. Accelerated maintenance schedules are implemented as necessary.

- Non-hotspot areas: Sanitary sewer system inspections are performed routinely at all campgrounds, RV parks, and ancillary recreation areas. Routine maintenance is performed on grease traps at the concessionaire's food service locations as required.

7.4 Enforcement

EBMUD takes enforcement action against users and occupants identified as the source or contributing source of a FOG obstruction. Section 3 details the enforcement response to violations of EBMUD's established rules and regulations. Enforcement response may range from issuance of a Notice of Violation to termination of sewerage service for egregious violators.

7.5 Public Education and Outreach

EBMUD's FOG Control Program includes public education and outreach on proper handling and disposal of FOG. Sewerage use concerns and issues may be discussed at routine meetings between Camanche Regional Park Advisory Board members and EBMUD. Outreach material may include a door hangar packet with a plastic grease scraper for cooking utensils, an informative brochure on handling and disposal of FOG, and a second educational brochure on not using a toilet as a trash bin. The door hangar packets are distributed to homeowners through the concessionaires.

8.0 System Evaluation and Capacity Assurance Plan

The following details a capacity assessment, Infiltration and Inflow (I&I) program, and a Capital Improvement Program (CIP) to maintain or improve each sanitary sewer system's existing capacity.

8.1 System Assessment – Capacity

The District's Upcountry Wastewater Systems Master Plan (Master Plan), dated June 2002, was developed to provide a comprehensive plan to upgrade the three sanitary sewer systems to meet new regulatory standards and to minimize the potential for SSOs. The Master Plan identifies necessary capacity-related improvement projects based on an evaluation of the existing capacity in addition to identifying I&I issues.

In 2005, EBMUD conducted a comprehensive condition assessment of the three sanitary sewer systems. The capacity assessment element included hydraulic modeling of the CANS, CASS, and PARA sanitary sewer systems under current and future flows. The I&I data collected through the Master Plan was included in the model. The following provides a summary of the capacity assessment's methodology, data, and findings.

8.1.1 Hydraulic Model

A static sanitary sewer hydraulic model was developed using a Microsoft Excel spreadsheet calculation tool. Diameters, slopes, and lengths of identified sanitary sewer mainlines were recorded in the spreadsheet. Using a combination of recorded flow monitoring data and flow estimation, peak hour, maximum day, and average day flow inputs were calculated.

8.1.2 Flow Monitoring and System Capacity Analysis

The existing sanitary sewer system was assessed for capacity deficiencies based on the following:

- Criteria that identified maximum values for the depth of flow in a pipe under peak hour flow conditions
- Minimum scouring velocity requirement under peak day conditions
- Flows quantified from a combination of the recorded flow monitoring data and flow estimations

8.1.3 Flow Basin Development and Monitoring

The flow basin development and monitoring were completed as follows:

- Reviewed the existing sanitary sewer systems to identify flow-monitoring basins
- Consolidated sanitary sewer system features into basins that generally grouped facilities by geographic location and types of users
- Included wet and dry season monitoring

8.1.4 Flow Estimation

The flow estimation required the following:

- Flow input data for each point along a pipe alignment to develop the peak hour, peak day, and average day flow inputs for the model
- Identification of individual flow contributions for each asset along the pipe alignments that made up each flow basin

8.1.5 Capacity Assessment

The analysis of the collected model capacity data included the following:

- Using predetermined criteria, flagging for sanitary sewer overflow (SSO) potential, surcharging, and hydraulic diameter (d/D values) greater than standard design objectives
- Identifying pipe slope and flow velocity that were less than the recommended minimum standard design values
- Developing improvement recommendations

The following includes the major findings for the capacity assessment:

- Sanitary Sewer Systems: All the pipe segments analyzed met the capacity assessment under the peak hour, peak day, and average day, conditions. A limited number of pipe segments did not meet the capacity criteria under the peak hour condition; however, these segments were located in a portion of the system very unlikely to experience a peaking factor condition.

- Lift Stations: No capacity limitations were identified

- Force Mains: No capacity limitations were identified

8.2 Infiltration and Inflow Program

The Master Plan assessed and evaluated the inflow and infiltration (I&I) in the CASS, CANS, and PARA sanitary sewer systems. A water balance analysis was completed for each system, evaluating system performance and I&I inflows during average rainfall years and 100-year return rainfall years.

8.2.1 RDI/I Analysis

The rainfall dependent inflow and infiltration (RDI/I) return ratio (R %) was reviewed to determine the sanitary sewer flow attributed to rainfall (I/I) in a sewer basin. RDI/I results in line segments that had a greater than 20% return ratio were considered to have I&I issues. If the RDI/I return ratio was less than 20%, but greater than 10%, it was considered to have limited I&I. None of the identified monitored sites in the study experienced an average RDI/I ratio greater than 15%.

EBMUD conducts routine maintenance and preventive maintenance (PM) activities for its sanitary sewer systems. The sewer lines are video inspected for breaks, obstacles, and defects that could lead to I&I issues. Sanitary sewer system piping that has not been recently repaired or rehabilitated is inspected, then cleaned and repaired as necessary, to improve existing operations and further reduce system I&I.

In 2007, EBMUD completed a cured-in-place lining project on the CANS system to reduce I&I issues. This project reduced I&I flows in the collection system pipelines by 50%.

8.3 Capacity Enhancement Measures

EBMUD's Master Plan establishes long-term strategies to address sanitary sewer system capacity needs. Through the Master Plan, capacity deficiencies are identified, followed by development of enhancement measures with a sound justification for respective capital funding needs. Prioritization of these capacity enhancements projects is based on the following:

- Public and employee safety concerns
- Environmental and regulatory requirements
- Enhancing infrastructure reliability
- Ensuring the wastewater systems meet respective current and future capacity needs, in addition to complying with current standards

8.3.1 Budget

EBMUD maintains a five-year Capital Improvement Program (CIP) and an annual operating budget. The CIP and operating budget are prepared as part of EBMUD's biennial budget process.

Bonds and revenue are the main source of funding for operation, maintenance, rehabilitation and replacement of the sanitary sewer systems. Capital improvement projects are partly funded through revenue collected from the operation of the recreation areas and mobile home parks lease rates.

EBMUD's Upcountry operating budget consists of resources necessary to operate and maintain the sanitary sewer systems, in addition to the treatment and disposal facilities. Required resources include staff, energy, chemicals, parts and materials, vehicles, fuel, and outside contracts.

The budget for labor costs and other labor-related expenses is based on the District's salary schedule and staffing plan, in addition to historical data, trending/projections, and inflation factors.

8.3.5 Schedule

There are no current capacity enhancement projects scheduled as no deficiencies were identified during the 2005 capacity assessment. In addition, there are no current plans to expand the existing sanitary sewer systems.

9.0 Monitoring, Measurement, and Program Modifications

The effectiveness of the SSMP is tracked and documented through an annual audit process (see Section 10). The audit includes an assessment of the preventative maintenance activities conducted during the prior twelve months. In addition, the root cause of any SSO that occurred in the past year is determined and, if applicable the PM program is modified accordingly.

Individual SSMP elements or documents referenced herein are updated as necessary based on the findings of the annual audit, in the event of an SSO, or other event that triggers a review of the SSMP or referenced documents.

SSO events are reported through the California Integrated Water Quality System (CIWQS). EBMUD tracks the frequency, volume, location, and trends, implementing corrective actions as necessary.

10.0 SSMP Audits

10.1 Internal Audit Process

Internal audits are performed annually to determine relevance and effectiveness of each element of the SSMP. Audits include a review of progress and success of corrected deficiencies identified in the previous year's audit report.

10.2 Correcting Deficiencies

If deficiencies or modifications are identified as part of the annual audit, the SSMP shall be updated accordingly. Significant updates are assigned to a lead individual, including a proposed schedule for implementation.

10.3 Report Submittal and Record Keeping

Copies of the internal audits are kept on file with the SSMP at Pardee Center and/or electronically in the SSMP folder.

11.0 Communications Program

11.1 Requirements

The Statewide General Waste Discharge Requirements state the following:

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

11.2 District-wide Public Communications and Outreach

The District maintains public outreach and communications efforts with its customers, general public, and concessionaires. Pertinent information may be provided upon admittance to the recreation areas and/or posted on public access bulletin boards.

The public has 24-hour access to District staff for reporting sanitary sewer concerns, including SSOs.

11.3 Specific SSMP related Public Communication and Outreach

EBMUD's public communication and outreach implementation efforts supporting the SWRCB's requirements include:

- Posting a summary of the SSMP on the District's public website, www.ebmud.com, listing contact information to facilitate questions and comments
- Posting signs during emergency response to supplement EBMUD website advisory postings. Listed contact information provides access to District staff who can address questions and provide additional information
- Training of concessionaires to direct public questions or concerns regarding the SSMP development or implementation to ECS
- Incorporating specific mechanisms for community participation, including input, coordination, and facilitation by the Mokelumne Watershed and Recreation Division and the District's Public Affairs Office
- Participating in the Camanche Regional Park Advisory Board meetings, which include local officials, concessionaires, residents, and the general public

References

EBMUD Watershed Rules and Regulations

Camanche Mobile home Park Rules and Regulations

Camanche South Shore Long-term RV Park Rules and Regulations

Pardee RV Park Rules and Site Use Conditions

Pardee Area Control Center (ACC) Emergency Notification Guidelines

Upcountry Wastewater Systems Master Plan