SACRAMENTO AREA SEWER DISTRICT
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Sewer System Management Plan

Category (check applicable):	**[x]Plan** [ ]Policy [ ]Process/Procedure [ ]Program [ ]Guidance		
Purpose:	The purpose of this document is to describe the Sewer System Management Plan (SSMP) of Sacramento Area Sewer District Collection System Operations (SacSewer,WDID #5SSO10912.)		
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SACRAMENTO AREA
SEWER DISTRICT
SERVING YOU 24/7

Local Collection System (WDID #5SSO10912)

Sewer System Management Plan

Developed in compliance with Waste Discharge Requirement
Water Quality Order Number 2022-0103-DWQ

April 23, 2025

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Sewer System Management Plan

1. Goal and Introduction

The purpose of this document is to provide the Sacramento Area Sewer District Collection System Operations (SacSewer) with a system-wide living management plan for the operation, maintenance, expansion, repair, and replacement of SacSewer's sewer collection system. The scale and complexity of the SSMP, and specific elements, match the size, scale and complexity of the SacSewer's sanitary sewer system. This document intends to be a day-to-day working management plan that also meets **Attachment D - Sewer System Management Plan (SSMP) – Required Elements** of **California's Statewide Waste Discharge Requirements (WDR) for Sanitary Sewer Systems General Order WQ 2022-0103-DWQ**.

On November 2, 2007, SacSewer certified that the mandatory "Goals" element of the SSMP was complete.

"The goal of the SacSewer SSMP is to provide a plan and schedule to continue to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent spills, as well as mitigate any spills that occur."

1.1 Regulatory Context

The first version of the Statewide WDR for Sanitary Sewer Systems was General Order No. 2006-0003-DWQ, adopted on May 2, 2006. It required publicly owned sewer collection systems that meet the order's requirements to complete an SSMP Development Plan and Schedule and implement an SSMP formally approved by the agency's governing body.

SacSewer submitted a Notice of Intent (NOI) for Coverage to the State Water Board on November 2, 2006. SacSewer received the Waste Discharge Identification Number **(WDID) #5SSO10912** and became an official enrollee effective November 16, 2006.

To comply with General Order No. 2006-003-DWQ, SacSewer created an SSMP Development Plan and Schedule, which was approved by SacSewer's Board of Directors on June 13, 2007. A scanned copy of SacSewer's SSMP Development Plan and Schedule can be found in Appendix A, Section 12. SacSewer implemented its first Board-approved SSMP on April 8, 2009.

SacSewer has complied with the General Monitoring and Reporting requirements by the online reporting of Sanitary Sewer Spills in the California Integrated Water Quality System (CIWQS) since September 2, 2007. On August 6, 2013, the State Water Board issued Order No. WQ 2013-0058-EXEC Amending Monitoring and Reporting Program (MRP) to replace the MRP established in General Order No. 2006-0003-DWQ. The MRP from Order No. WQ 2013-0058-EXEC became effective on September 9, 2013. SacSewer updated and implemented its Spill Emergency Response Plan to comply with the 2013 MRP update on the same date it became effective.

The latest version of the Statewide WDR General Order for Sanitary Sewer Systems, **General Order WQ 2022-0103-DWQ,** was approved on December 6, 2022, and became effective on June 5, 2023. To continue regulatory coverage from the previous General Order 2006-0003-DWQ to **General Order WQ 2022-0103-DWQ**, the Legally Responsible Official (LRO) is to electronically certify the Continuation of Existing Regulatory Coverage form in the CIWQS Database within 60 days prior to the Effective Date **of General Order WQ 2022-0103-DWQ**. SacSewer's LRO certified the Continuation of Existing Regulatory Coverage in CIWQS on May 3,

2023. A scanned copy of SacSewer's Continuation of Coverage Certification Letter can be found in Appendix B, Section 13.

1.2 SSMP Update Schedule

General Order No. 2006-003-DWQ required SacSewer to update its SSMP every five years, certify the SSMP by its governing board when significant updates to the SSMP are made, and upload the board-approved certified SSMP to the CIWQS Database.

To aid in spill reduction, SacSewer updates its SSMP when maintenance programs, strategies, and procedures change, in addition to what is required by the WDR. On September 28, 2011, SacSewer's Board of Directors delegated authority to the District Engineer, an LRO, to make non-consequential changes to the SSMP in between Board updates. SacSewer tracks changes to the SSMP in a Change Log initialed and dated by the LRO every time the SSMP is updated in between Board updates. The Change Log is located in the front of SacSewer's SSMP. To comply with General Order No. 2006-003-DWQ, SacSewer updated and certified its SSMP through its Board of Directors in May 2014 and March 2019. After each Board-approved certification, SacSewer posted the latest SSMP on its website and provided a link to the SSMP on the CIWQS website.

The next SSMP certification update for SacSewer to comply with the **General Order WQ 2022-0103-DWQ** is due on CIWQS by May 2, 2025. After which, updates and certifications of SacSewer's SSMP will be required every six years.

SacSewer will conduct periodic internal audits at least once every three years as required by the **General Order WQ 2022-0103-DWQ**. SacSewer is required to prepare and upload a report to the CIWQS website within six months after the end of an audit period. SacSewer's next SSMP internal audit will be for the three-year period ending May 2, 2027.

SacSewer developed an internal procedures that provides guidance on updating and storing the SSMP. For more information, see **SSMP Update and Storage Procedures, Section 501** of the SSMP Reference Document.

In addition to the SSMP certification and Internal SSMP audit dates, SacSewer has identified key near-term SSMP compliance dates as required by the **General Order WQ 2022-0103-DWQ** in **Table 1-1**.

Table 1-1 SSMP Compliance Schedule

Compliance Item	Near-Term Due Date	WDR Section
Annual Report of Category 4 Non-lateral Spills	Feb 1st of each calendar year	Attachment E1 Section 3.6
Annual Report of Category 2, 3, & 4 Lateral Spills	Feb 1st of each calendar year	Attachment E1 Section 3.6
Annual Report	April 1st of each calendar year	Section 5.11 Attachment E1 Section 3.9
Internal SSMP Audit	Within six months after May 2, 2027	Section 5.4 Attachment E1 Section 3.10
SSMP Update & Certification	May 2, 2025	Section 5.5 Attachment E1 Section 3.11
Electronic Sanitary Sewer System Service Area Boundary Map	December 31, 2025	Section 5.14 Attachment E1 Section 3.8

For compliance dates related to individual and monthly reporting of spills, please see SacSewer's **Spill Emergency Response Plan, Section 6** of the SSMP.

1.3 Sewer System Asset Overview

SacSewer provides service to residential, commercial, and industrial customers throughout unincorporated Sacramento County; the cities of Citrus Heights, Elk Grove, Folsom, Rancho Cordova, Sacramento, and West Sacramento; and the communities of Courtland, Locke, and Walnut Grove. As shown in **Figure 1-1 SacSewer Collection System Operations Service Area Map**, SacSewer's services vary based on the location within the service boundary.

SacSewer provides wastewater collection services to approximately 281 square miles of the greater Sacramento area. SacSewer owns only the Lower Lateral portion of the service line as referenced in Section 2.10.1 Lower Laterals (District) and Upper Laterals (Private) in the **Sacramento Area Sewer District Collection System Ordinance (Collection System Ordinance)**, effective June 7, 2024.

Figure 1-1 SacSewer Collection System Operations Service Area Map

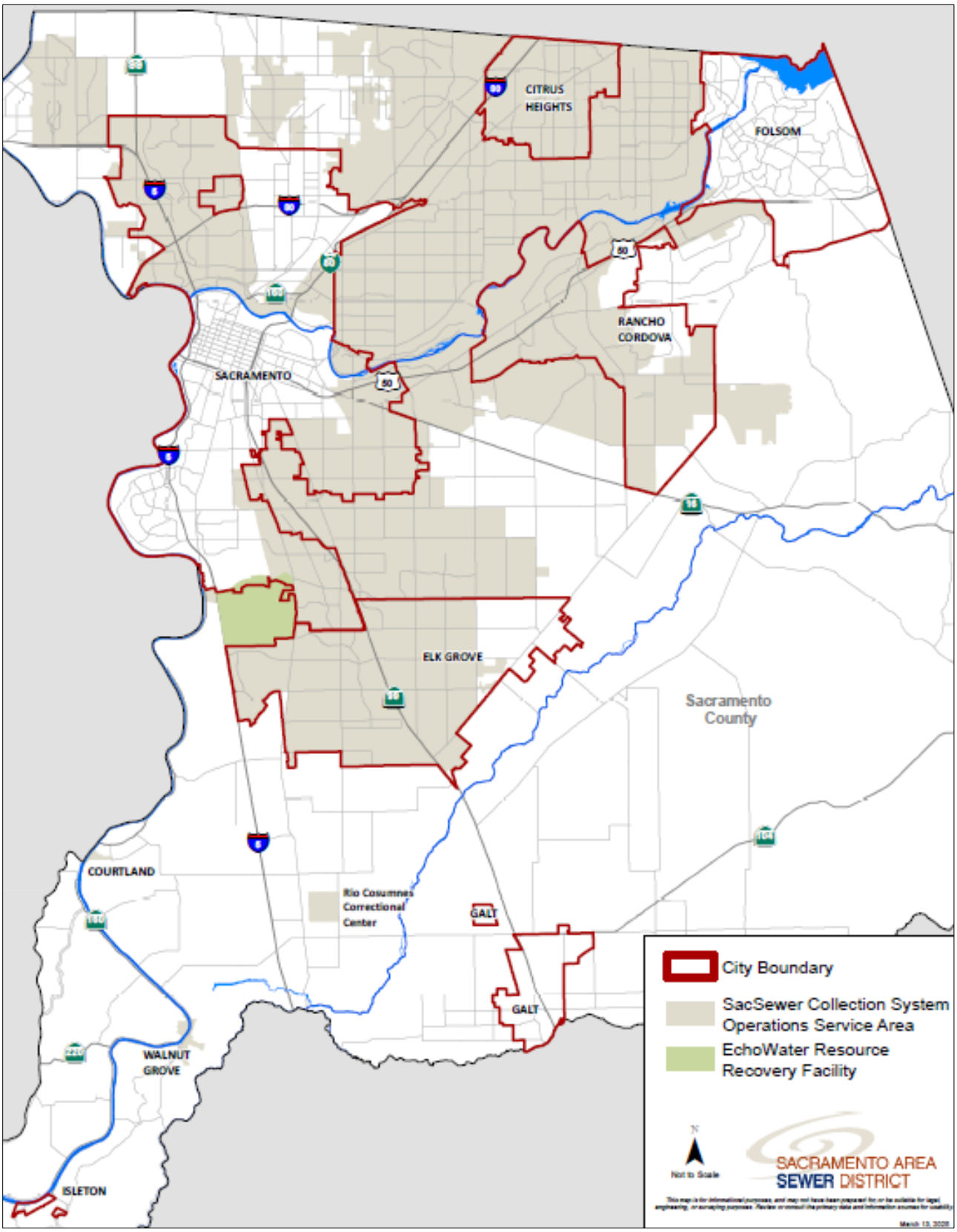

Table 1-2 shows counts of various assets and service connections owned by SacSewer as of January 2025. The asset and service connection counts for any given year are recorded and updated in SacSewer's Annual Report in CIWQS.

Table 1-2 Asset and Service Connection Counts – Year 2025

Assets	Quantity
Main Lines (gravity)	3,180 miles
Force Main (pressurized)	87 miles
Siphons	0
Number of Manholes	69,588
Lower Laterals	1,584 miles
Number of Pump Stations	106
Service Connections	**Quantity**
Population served	1.2 million
Residential Connections	290,237
Commercial Connections	12,075
Industrial Connections	92

SacSewer does not have a combined wastewater collection system. Thus, there are no structures diverting stormwater to the collection system.

SacSewer employs a computerized maintenance management system (CMMS) to document asset data, spill information, work orders, Preventive Maintenance (PM) schedules, emergency response, and records of completed work. For more information, see **Computerized Maintenance Management System, Section 4.1.1** of the SSMP**.**

SacSewer utilizes a Geographic Information System (GIS) to display location and asset data for the sewer collection system. For more information, see **Up-To-Date Systems Maps, Section 4.1.4** of the SSMP, and the **Mapping Update Strategy, Section 202** of the SSMP Reference Document.

1.4 SSMP Document Overview

Attachment D of **the General Order 2022-0103-DWQ** specifies the mandatory elements of the SSMP. These elements are listed in **Table 1-3** below, along with SacSewer's SSMP sections that satisfy the elements.

Table 1-3 WDR Mandatory Elements

WDR Attachment-D. Section	WDR Mandatory Element	SSMP Section	SSMP Reference Document
1	Sewer System Management Plan Goal and Introduction	1	501
2	Organization	2	-
3	Legal Authority	3	-
4	Operations and Maintenance Program	4	201-207 301-307 401-404
5	Design and Performance Provisions	5	-
6	Spill Emergency Response Plan	6	-
7	Sewer Pipe Blockage Control Program	3,4,7,11	502
8	System Evaluation, Capacity Assurance, and Capital Improvements	8	503
9	Monitoring, Measurement, Program Modifications, & Future Planning	9	504
10	Internal Audits	10	505
11	Communication Program	11	506

2. Organization

This section of the SSMP identifies SacSewer's organizational staff responsible for implementing the SSMP and is designed to comply with **Attachment D Section 2** of the **General Order WQ 2022-0103-DWQ**.

2.1 Organizational Lines of Authority

Figure 2-1 on the following page shows the organizational structure of SacSewer staff responsible for implementing the SSMP**,** including the LROs, as required by the **General Order WQ 2022-0103-DWQ**. On November 2, 2007, SacSewer's Board certified that the District Engineer is the responsible or authorized representative as described in Section J of Order No. 2006-0003-DWQ.

On September 12, 2021, the Board appointed the following person as the District Engineer.

District Engineer: Christoph Dobson

Under the **General Order WQ 2022-0103-DWQ**, the District Engineer continues to be the responsible or authorized representative for SacSewer.

2.2 Chain of Communication for Reporting Spills

The chain of communication for reporting spills is located in the most current version of SacSewer's **Spill Emergency Response Plan (SERP), Section 6** of the SSMP**,** and the **Customer Call Handling & Service Request Creation Procedures, Section 203** of the SSMP Reference Document. **Figure 2-1** on the following page shows the LROs for reporting spills.

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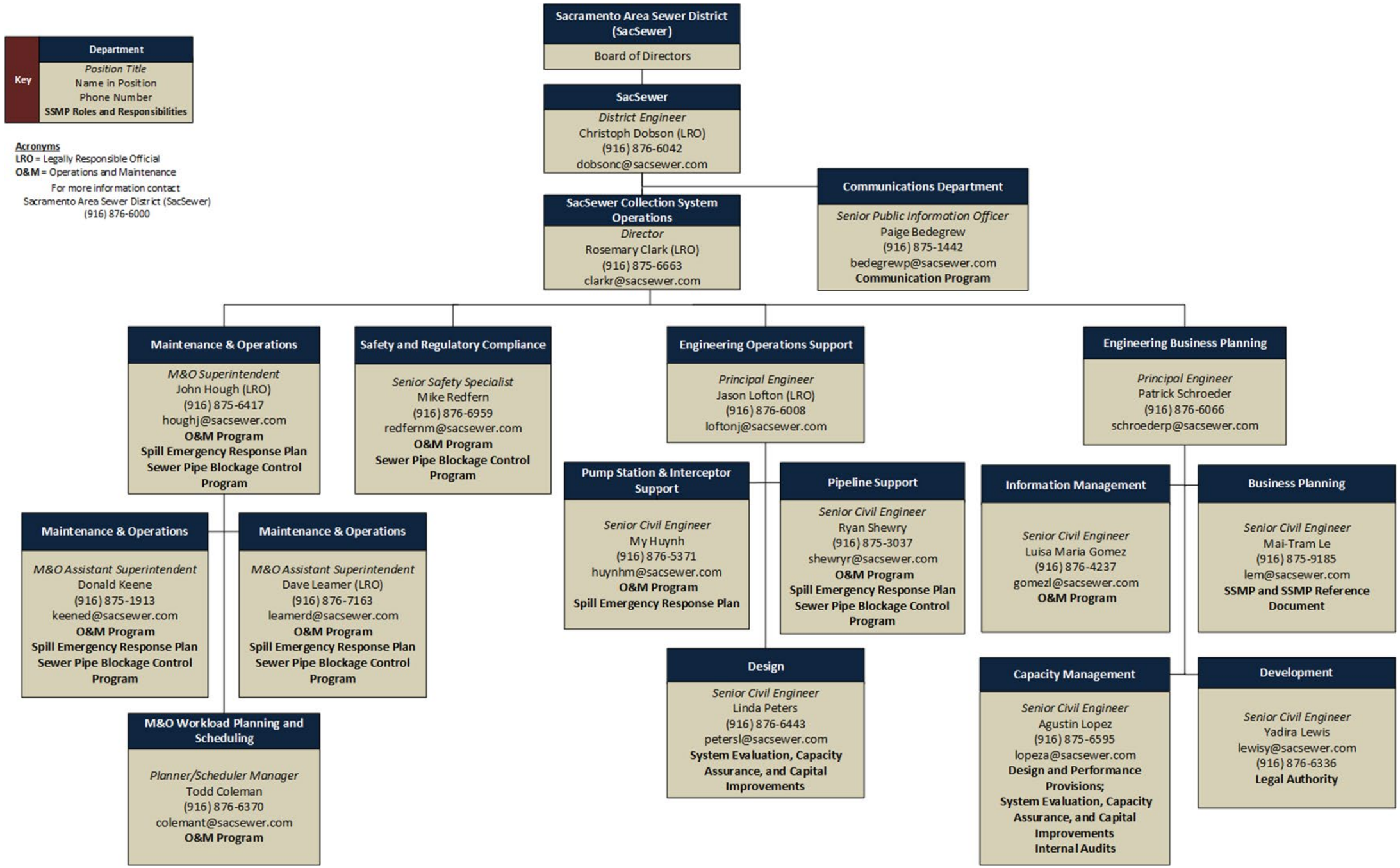
Figure 2-1 Staff Responsible for Implementing SacSewer's SSMP



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3. Legal Authority

This section describes SacSewer's legal authority and was designed to comply with **Attachment D Section 3** of the **General Order WQ 2022-0103-DWQ**. The **Collection System Ordinance** provides SacSewer with the Legal Authority that includes the following:

- prevent illicit discharges into the sanitary sewer system from unauthorized stormwater; chemical dumping, unauthorized debris; fats, oils, grease (FOG); and trash, including rags and other debris that may cause blockages
- require that sewers and connections be properly designed and constructed
- ensure access for maintenance, inspection, or repairs for portions of laterals owned by SacSewer
- enforce any violation of its sewer ordinance

When SacSewer finds an inconsistency or shortcoming in the **Collection System Ordinance** or when SacSewer programs are modified, the **Collection System Ordinance** is reviewed and updated as necessary. The **Collection System Ordinance** is aligned with current practices, ensuring the legal authority for the required SSMP elements is maintained. The **Collection System Ordinance** can be found on SacSewer's public website at **https://www.sacsewer.com/ordinances/**

For collaboration with storm sewer agencies to coordinate emergency spill responses, ensure access to storm sewer systems during spill events, and prevent unintentional cross-connections of sanitary sewer infrastructure to storm sewer infrastructure, SacSewer has been meeting annually with surrounding collection systems that are satellites to the Interceptor System (WDID #5SSO11045). This information is detailed in SacSewer's **Spill Emergency Response Plan, Section 6** of the SSMP.

4. Operation and Maintenance Program

This section describes SacSewer's **Operation and Maintenance Program,** designed to prevent spills throughout the collection system and comply with **Attachment D Section 4** of the **General Order WQ 2022-0103-DWQ**.

SacSewer is responsible for operating and maintaining both gravity and pressurized assets. Gravity assets include main line, lower lateral, and manhole pipes. Pressurized assets include force mains and pump station components. There are several different failure modes within the gravity and pressurized collection system that can cause spills or shorten asset life.

In support of SacSewer's goals of reducing/preventing spills, meeting SSMP regulatory requirements, achieving identified service commitment targets, and operating in a cost-effective manner, SacSewer's **Operations and Maintenance Program** is divided into three sub-programs. The three sub-programs are designed to optimize the management of SacSewer's assets. The **Operation and Maintenance Program** consists of the following:

- **Management Program**
- **Condition Assessment Program**
- **Blockage Control Program**

Each sub-program under the **Operations and Maintenance Program** consists of several strategies, maintenance programs, and procedures developed to sustain SacSewer's assets and manage risk at a socially, environmentally, and economically viable level.

4.1 Management Program

The purpose of the **Management Program** is to provide information on the strategies and procedures that:

- Describes computer applications, training, and mapping update needed to support daily tasks.

- Documents procedures for handling customer calls, determining repairs and replacement of assets, and investigating damage by other external excavators.
- Defines strategy for performing business case evaluations.

The **Management Program** includes the following applications, strategies, and procedures:

1. **Computer Maintenance Management System**
2. **Equipment Inventory**
3. **Training**
4. **Up-to-Date System Maps**
5. **Customer Call Handling & Service Request Creation Procedures**
6. **Main Line Maintain-Repair-Replace Decision Procedures**
7. **Lower Lateral Maintain- Repair-Replace Decision Procedures**
8. **Damage by Others Investigation Procedures**
9. **Business Case Evaluation Strategy**

For additional information on the strategies and procedures developed under the **Management Program**, please see the **Management Program, Section 200** of the SSMP Reference Document.

4.1.1 Computerized Maintenance Management System

SacSewer employs a CMMS called Maximo to document asset data, work orders (WO), preventive maintenance (PM), work planning & scheduling, service requests (SR), spill emergency response, vendor, and vehicle & equipment (V&E) data. Staff collect and update data daily. SacSewer utilizes the CMMS data to create reports identifying performance trends such as work orders completed on time, production rates, etc.

4.1.2 Equipment Inventory

The CMMS also documents SacSewer's owned vehicle & equipment and replacement part inventories, including identifying critical replacement parts.

4.1.3 Training

SacSewer provides regular staff training in sanitary sewer system operations and maintenance. Training includes safety tailgates, spill response procedures, job plans, on-the-job training, etc. as described in the **Training Strategy, Section 201** of the SSMP Reference Document.

Contractors awarded a job or a project by SacSewer are responsible for their own training program in addition to being trained in SacSewer's spill response procedures and sanitary sewer system operations and maintenance.

4.1.4 Up-to-Date System Maps

SacSewer utilizes GIS to display sewer system location and asset data. The computerized map shows various information, including pipe sizes, manhole rim elevations, pipe materials, manhole depths, along with the locations of pipes, manholes, pump stations, force mains, and sewer laterals.

The stormwater facilities are owned and operated by local jurisdictions. These jurisdictions are responsible for the accuracy and timeliness of stormwater facilities mapping updates. These stormwater mapping resources are then readily available to SacSewer staff.

SacSewer maintains the sewer and stormwater system map per the most current version of the **Mapping Update Strategy, Section 202** of the SSMP Reference Document. The policy specifies mapping documentation procedures, mapping update timelines, and mapping rollout procedures.

4.1.5 Customer Call Handling & Service Request Creation

Customers call SacSewer for a variety of sewer-related issues and questions. SacSewer Dispatch or County Central receives calls, gathers as much relevant information as possible, prepares a service request to document the information, and forwards the information to the appropriate group within SacSewer. The **Customer Call Handling & Service Request Creation Procedures, Section 203** of the SSMP Reference Document, outlines the procedures for handling sewer problem customer calls and initiating service requests.

4.1.6 Main Line Maintain-Repair-Replace Decision-Making

The **Main Line Maintain-Repair-Replace Decision Procedures, Section 204** of the SSMP Reference Document**,** documents and ensures consistent decision-making in determining the best preventive or corrective maintenance for when issues are observed in main lines from a televised inspection (TVI). SacSewer developed these decision-making processes to ensure risks are considered in the process of identifying the most economical solution.

4.1.7 Lower Lateral Maintain-Repair-Replace Decision-Making

The **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205** of the SSMP Reference Document, documents and ensures consistent decision-making in determining the best preventive or corrective maintenance for when issues are observed in lower laterals from a televised inspection. SacSewer developed these decision-making processes to ensure risks are considered in the process of identifying the most economical solution.

4.1.8 Damage by Others Investigation

The **Damage by Others Investigation Procedures, Section 206** of the SSMP Reference Document, ensures consistency in the investigation and reporting of damages to any SacSewer asset caused by an external excavator. This information will assist SacSewer in knowing who is financially responsible for the damage and assist in the recovery of all associated costs.

4.1.9 Business Case Evaluation Strategy

When addressing defects found in the sewer collection system, SacSewer follows the decision-making process outlined in the **Main Line Maintain-Repair-Replace Decision Procedures** and **Lower Lateral Maintain-Repair-Replace Decision Procedures**. Further investigation and analysis are sometimes needed to determine the appropriate corrective action. The **BCE Strategy, Section 207,** describes when business case evaluations are performed to determine the best preventive or corrective maintenance action to address issues observed with SacSewer assets.

4.2 Condition Assessment Program

The purpose of the **Condition Assessment Program** is to provide information on the strategies and procedures that:

- Provide direction for when televised inspections of main lines, lower laterals, and manholes are required.
- Define strategies to reduce and respond to loss of support, crush collapse, and damage by other failures cost-effectively.
- Define strategies to reduce and respond to pump station structure and component failures cost-effectively.
- Documents procedure for performing comprehensive pump station condition assessments.

The **Condition Assessment Program** includes the following strategies and procedures:

- **Televised Inspection Strategy**
- **Crush Collapse Failure Mode Strategy**
- **Loss of Support Failure Mode Strategy**
- **Pump Station Structure Failure Mode Strategy**
- **Pump Station Component Failure Mode Strategy**
- **Pump Station Condition Assessment Program Procedures**
- **Damage by Others Failure Mode Strategy**

For additional information on the strategies and procedure developed under the **Condition Assessment Program**, please see the **Condition Assessment Program, Section 300** of the SSMP Reference Document.

4.2.1 Televised Inspection

The **Televised Inspection Strategy, Section 301** of the SSMP Reference Document, provides direction for when TVIs of main lines, lower laterals, and manholes are generated.

4.2.2 Crush Collapse Failures

Crush collapse failure mode is when assets fail due to either the degradation of the asset (such as corrosion of the asset structure) or when excessive forces are applied, causing the pipe to crack or break. If this type of failure leads to the asset collapsing, it is considered a crush collapse failure. The **Crush Collapse Failure Mode Strategy, Section 302** of the SSMP Reference Document, is used to cost-effectively reduce the frequency of spills caused by a crush collapse failure.

4.2.3 Loss of Support Failures

Loss of support failure mode is when pipeline assets failure due to compromised structure or support such as soil eroding of soil beneath a buried pipe, broken pipeline support pier, or eroded pipe hangers. This type of failure mode results in the pipe separating at joints or structurally failing. The **Loss of Support Failure Mode Strategy, Section 303** of the SSMP Reference Document, defines the proactive and reactive approaches to cost-effectively reduce loss of support failures.

4.2.4 Pump Station Structures Failures

Pump stations consist of wet wells, valve vaults, and force mains. Some pump stations also have buildings. These various asset classes have different approaches to mitigate structural failure risk. The **Pump Station Structure Failure Mode Strategy, Section 304** of the SSMP Reference Document, addresses SacSewer's actions to assess the risk of pressurized assets failures and identify cost-effective approaches to minimize failures.

4.2.5 Pump Station Component Failures

Pump station component failures may cause sewer spills or prevent the conveyance of sewage. Various failure modes can cause a pump station component failure. The **Pump Station Component Failure Mode Strategy, Section 305** of the SSMP Reference Document, aims to identify circumstances where non-structural pump station components may fail and approaches to minimize failures cost-effectively.

4.2.6 Pump Station Condition Assessment

The purpose of the **Pump Station Condition Assessment Program Procedures, Section 306** of the SSMP Reference Document, is to identify and record the condition of pump station components and provide a comprehensive assessment of those pump stations. It describes the proper responses to specific conditions and performance ratings. The findings are used to develop recommendations for any necessary repair, rehabilitation, or replacement.

4.2.7 Damage by Other Failures

Collection system failures caused by others are when any external excavator causes damage to SacSewer's assets. The **Damage by Others Failure Mode Strategy, Section 307** of the SSMP Reference Document, defines strategies used to mitigate and reduce damage by caused by others to SacSewer's assets.

4.3 Blockage Control Program

The purpose of the **Blockage Control Program, Section 400,** is to provide information on the strategies and procedures that:

- Prevent spills in pipes caused by roots, grease, debris, and other pipe-blocking substances.
- Documents the procedures to verify main lines are cleaned adequately.
- Define the strategies for adjusting preventive maintenance schedules for main line and lower laterals.

The **Blockage Control Program** includes the following strategies and procedures:

- **Blockage Failure Mode Strategy**
- **Quality Control Procedures of MLSM Cleanings**
- **Main Line Cleaning Frequency Adjustment Strategy**
- **Lower Lateral Cleaning Frequency Adjustment Strategy**

For additional information on the strategies and procedures developed under the **Blockage Control Program**, please see the **Blockage Control Program** of the SSMP Reference Document.

4.3.1 Blockage Failures

Blockages in the sewer pipes impede the movement of sewage through the collection system. The blockage failure mode is when debris, roots, or grease blockages cause a spill. The **Blockage Failure Mode Strategy, Section 401** of the SSMP Reference Document, defines the strategy to cost-effectively reduce the frequency of blockage-caused spills.

4.3.4 Quality Control of MLSM Cleanings

The purpose of the **Quality Control Procedures of MLSM Cleanings, Section 402** of the SSMP Reference Documents, is to define the procedures to evaluate the effectiveness of SacSewer's MLSM Program and verify that SacSewer's main lines are cleaned adequately.

4.3.5 Main Line Cleaning Frequency Adjustment

The purpose of the **Main Line Cleaning Frequency Adjustment Strategy, Section 403** of the SSMP Reference Document, is to reduce the number of spills experienced by main lines currently placed on the MLSM Program that may have incorrect cleaning frequencies assigned or that, over time, require adjustments to its cleaning frequency.

4.3.6 Lower Lateral Cleaning Frequency Adjustment

The purpose of the **Lower Lateral Cleaning Frequency Adjustment Strategy, Section 404** of the SSMP Reference Document, is to reduce the number of spills experienced by lower laterals currently placed on the LLSM Program that may have incorrect cleaning frequencies assigned or that, over time, require adjustments to its cleaning frequency.

5. Design and Performance Provisions

SacSewer maintains the **Sacramento Area Sewer District Standards and Specifications (Standards)** that comply with **Attachment D Section 5** of the **General Order WQ 2022-0103-DWQ**. The **Standards** include design criteria and construction standards and specifications for the construction, installation, repair, and rehabilitation of existing and proposed sewer collection system. It also contains procedures and standards for inspecting and testing newly constructed, installed, repaired, and rehabilitated sewer system assets. The **Standards** are reviewed annually and updated as changes are needed. The **Standards** can be found on SacSewer's public website at **https://www.sacsewer.com/standards-specifications/**

6. Spill Emergency Response Plan

SacSewer maintains a **Spill Emergency Response Plan (SERP)** containing procedures that comply with **Attachment D Section 6, E1, and E2** of the **General Order WQ 2022-0103-DWQ**. SacSewer meets annually with surrounding sewer entities that contribute sewer flows to the sewer collection system. SacSewer also meets annually and collaborates with surrounding drainage entities that may be affected by SacSewer spills. This information is detailed in SacSewer's **SERP**. The latest **SERP** can be found on SacSewer's public website at **https//www.sacsewer.com/spill-emergency-response-plan/**

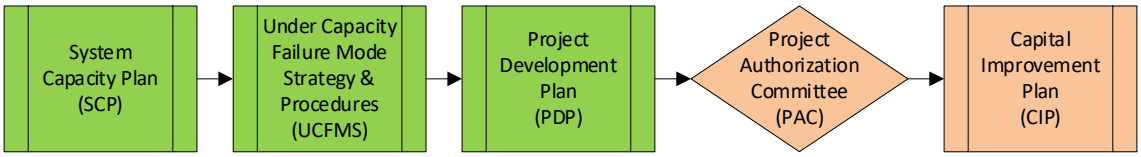
7. Sewer Pipe Blockage Control Program

SacSewer recognizes that sewer pipe blockage substances such as FOG, roots, rags, and debris represent a significant challenge in SacSewer's efforts to operate its collection that meets regulatory requirements, achieves identified service commitment targets, and is cost-effective. SacSewer's **Stop the Clog Strategy, Section 502** of the SSMP Reference Document, captures all of SacSewer's efforts related to compliance with the WDR-mandated sewer pipe blockage control requirements. The strategy also contains the details of SacSewer's approach to preventing and mitigating sewer pipe blocking substances in the collection system.

8. System Evaluation, Capacity Assurance, and Capital Improvements

SacSewer's **System Evaluation, Capacity Assurance, and Capital Improvements Process**, as shown in **Figure 8-1**, consists of several sub-processes designed to identify, assess, and plan the improvement of capacity deficient areas within the collection system and comply with **Attachment D Section 8** of the **General Order WQ 2022-0103-DWQ**.

Figure 8-1 System Evaluation, Capacity Assurance, and Capital Improvements Process



The **System Capacity Plan (SCP)** identifies areas within the collection system that have potential capacity deficiencies. Once identified, these areas undergo further investigation through the **Under Capacity Failure Mode Strategy & Procedures** to determine which areas meet the criteria for a **Project Development Plan (PDP).** In general, a future sewer infill project that involves increasing pipe capacity and/or decreasing system flow could improve the area's performance. The **PDP** process is used to evaluate sewer infill alternatives considering life cycle costs, risk, environmental, social, and service commitment impacts. A cost-benefit sensitivity analysis is also performed. Alternative solutions for the capacity deficient area are then presented to the **Project Authorization Committee (PAC)**, who then selects the best alternative for the area that provides the optimal balance between cost, benefit, and risk. Lastly, the area is added to the

Capital Improvement Plan (CIP), where the estimated project schedule, completion dates, and projected costs for all portions of the capital improvement plan are tracked.

8.1 System Capacity Plan

SacSewer's **System Capacity Plan** (formerly referred to as the Master Plan), is updated approximately every five years. The **System Capacity Plan** has the following two major components:

- an evaluation of the existing system's capacity performance and identification of potential infill projects
- design of a new trunk sewer system to serve future development

The **System Capacity Plan** establishes performance criteria and storm events used to evaluate the system performance, identify potentially capacity-deficient locations, develop preliminary infill solutions, and size new facilities to serve future development. SacSewer's 10-year Design Storm and 5-year Performance Storm are applied to the hydraulic models to assess how SacSewer's system would perform under existing and build-out conditions. Model-predicted spills identify potentially capacity-deficient systems, which are organized into two different planning periods:

- **Planning Period 1:** Model-predicted spills under existing conditions
- **Planning Period 2:** Model-predicted spills under buildout conditions (excluding Planning Period 1 systems)

Planning Period 1 systems of potential capacity deficiencies then undergo further investigation and verification through the **Under Capacity Failure Mode Strategy**.

For more information, the **System Capacity Plan** can be found on SacSewer's public website at **https://www.sacsewer.com/system-capa**city-plans/

8.2 Under Capacity Failure Mode Strategy & Procedures

The **Under Capacity Failure Mode Strategy & Procedures (UCFMS), Section 503** of the SSMP Reference Document, defines the process of verifying capacity deficiencies flagged in the **System Capacity Plan** and identifying the need for capital improvement projects. The **UCFMS** specifies a series of threshold triggers and performance criteria to ensure consistency in evaluating potential capacity deficiencies in SacSewer's collection system. Infill projects for systems that meet the **UCFMS** Corrective Action Trigger will be further developed in a **PDP**.

8.3 Project Development Plan

PDPs are required for projects, programs, or business practice changes meeting the expenditure levels requiring PAC approval. A **PDP** is used to make financial, environmental, and social decisions and provides justification that the recommended alternative meets the following asset management objectives:

- Service Commitments
- Life cycle costs
- Risks

PDPs evaluate alternative analysis, and an alternative recommendation based on life cycle costs, risks, environmental, social, and service commitment impacts. PDPs include the following:

- Problem or opportunity statement
- Solutions related to the problem or opportunity statement
- Life cycle costs using asset management principles and if the solution deviates from approved standards

- Potential impacts to the public, staff, and environment
- Alternative analysis and PAC decisions
- Scope, budget, and schedule for PAC approval

8.4 Project Authorization Committee

The **PAC** consists of the Executive Team and standing members. The PAC typically meets monthly to present project information that helps the Executive Team make decisions that consider financial, environmental, and social impacts, as applicable, for SacSewer projects. Project-specific participants and subject matter experts are invited as necessary to discuss presented projects, programs, or business practice changes. Optional members may attend depending on their involvement in what's presented. Meeting participants are encouraged to ask questions and provide feedback.

PAC approval is required for large capital investments and significant operational changes. Expenditure thresholds for projects, program, and business practice changes can be found in SacSewer's **Project Authorization Committee (PAC)/Project Development Plan (PDP) Guidelines.**

8.5 Capital Improvement Plan

The **Asset Management Plan, Section 9.2.1** of the SSMP and the **Long-Term Financial Plan** (**LTFP**) contain the plan to rehabilitate and replace capital assets, along with a schedule for rehabilitation and replacement. The **LTFP** describes SacSewer's methodology to ensure financial health, using details from audited reports and budgets. The **LTFP** looks at funding sources and compares them to a financial needs forecast. The **LTFP** can be found on SacSewer's public website at **https://www.sacsewer.com/financial-reports/**

System evaluation, capacity assurance, and the associated approach to forecasting capacity-related capital investment needs are addressed in the **System Capacity Plan** and the **Under Capacity Failure Mode Strategy & Procedures**. The results from these evaluations are then used to estimate capital funding and operating funding needs for capacity-related projects. The **Asset Management Plan** describes the projected funding needs for operations and the renewal and rehabilitation of assets.

Projects to address hydraulic deficiencies are tracked from conceptual planning through project closeout. SacSewer's **CIP** consists of three lists: 1) Capital Project List (CPL) included in SacSewer's **Annual Budget Book,** available on SacSewer's public website at **https://www.sacsewer.com/financial-reports/**, 2) Capital Funding Projections (CFP) are included in SacSewer's **LTFP,** and 3) Long-Range Projections (LRP) are reported in the **Asset Management Plan**. These three lists have estimated project schedules and completion dates for all portions of the capital improvement plan.

SacSewer completes its **CIP** projects with coordination between maintenance and operations staff and engineering staff/consultants during the planning, design, and construction phases. SacSewer also coordinates with other utility agencies that SacSewer's Capital Improvement Plan Projects impact during all stages of the projects.

SacSewer's implementation of its capital improvement plan projects ensures its system's short-term and long-term resilience.

9. Monitoring, Measurement, Program Modifications, & Future Planning

9.1 Monitoring, Measurement, & Program Modifications Strategy

SacSewer owns and operates a variety of physical assets. It is important to monitor the most common causes of failure, recognize the consequences of failure, and identify the best practices to prevent failures. By doing this, SacSewer can refocus efforts, move financial resources, and implement program modifications that will help reduce spills and sustain asset life. The **Monitoring, Measurement, & Program Modifications Strategy,**

Section 504 of the SSMP Reference Document, was designed to monitor and measure the effectiveness of the SSMP while meeting requirements identified in the **General Order WQ-2022-0103-DWQ**. Additionally, it describes SacSewer's process for making maintenance program, strategy, and procedure modifications.

9.2 Future Planning

9.2.1 Assets Management Plan

The **Asset Management Plan** is a report describing SacSewer's asset portfolio and the asset life cycle projections. The purpose of the **Asset Management Plan** is to demonstrate responsible management, communicate and justify funding requirements, comply with regulatory requirements, and assist in the long-term sustainability of SacSewer's assets. The **Asset Management Plan** also describes the projected funding needs for the operations and the renewal/rehabilitation of assets. Costs are estimated and projected during the development of new approaches or changes to existing ones. This information is then communicated to SacSewer's Chief Financial Officer for inclusion in the expense projections that make up the revenue needs projections. The **Asset Management Plan** Report is an internal document, updated annually, and provided to the public upon request. The executive summary of the latest **Asset Management Plan** can be found on SacSewer's public website at **https://www.sacsewer.com/asset-management-plan/**

9.2.2 Staffing Projections

M&O Field Staffing Projections (Staffing Projections) provide information to be used as a planning tool to determine the amount of work and resources needed for SacSewer staff to maintain its collection system effectively. The **Staffing Projections** are used with the Service Level Agreements to ensure adequate resources are allocated for the sanitary sewer system operation, maintenance, and repair. The **Staffing Projections** is an internal document. It is updated annually and is provided to the public upon request.

9.2.3 5-Year Strategic Plan

The **5-Year Strategic Plan (2017-2022)** outlines SacSewer's vision, mission, and values as a public utility dedicated to high-quality service and environmental and financial stability. The plan also outlines specific goals, objectives, and work plans SacSewer will pursue to continue evolving and building on success. The latest **5-Year Strategic Plan** can be found on SacSewer's public website at **https://www.sacsewer.com/strategic-plans/**

10. Internal Audits

SacSewer is required to conduct an internal audit of its SSMP at a minimum frequency of once every three years, as required by the **General Order WQ 2022-0103-DWQ**. A report will be prepared after an audit period, and within six months after the end of an audit period, the LRO must submit the audit report to the CIWQS website. SacSewer uses the **SSMP Audit Procedures, Section 505** of the SSMP Reference Document, as guidance when conducting an internal audit. The next audit for SacSewer will be for the three years ending May 2, 2027. The audit report will be submitted to CIWQS by November 2, 2027.

11. Communication Program

SacSewer's Communication Program was designed to comply with **Attachment D Section 11** of the **General Order WQ 2022-0103-DWQ**. SacSewer has provided and will continue to provide information to its customers and the public about the SSMP as described in the **SSMP Communication Strategy, Section 506** of the SSMP Reference Document. SacSewer communicates with tributary and satellite sewer systems as needed.

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12. Appendix A - Board Approved Plan and Schedule

CSD-1
COUNTY SANITATION DISTRICT 1
Wastewater Collection For a Growing Sacramento

27

APPROVED
BOARD OF DIRECTORS
CD-1225
JUN 13 2007
By Cindy H. Turner
Clerk of the Board

10545 Armstrong Avenue
Mather
California
95655
Tele: [916] 876-6000
Fax: [916] 876-6160
www.csd-1.com

DATE: June 13, 2007

TO: Honorable Board of Directors
County Sanitation District 1

FROM: County Sanitation District 1 (CSD-1)

SUBJECT: **Development Plan and Schedule for the CSD-1 Sewer System Management Plan (SSMP)**

RECOMMENDATION:

It is recommended that your Board approve the SSMP Development Plan and Schedule to comply with the Waste Discharge Requirements (WDRs) for CSD-1.

BACKGROUND:

On May 2, 2006, the California State Water Resources Control Board (SWRCB) adopted Statewide General Waste Discharge Requirements (WDRs), Order No. 2006-0003, for all publicly owned sanitary sewer collection systems.

CSD-1 is subject to the requirements of the General WDRs. The WDRs require that all publicly owned collection systems greater than one mile in length take all feasible steps to prevent Sanitary Sewer Overflows (SSO's), develop a Sewer System Management Plan (SSMP), and comply with reporting requirements.

The Statewide WDR requires that the agencies governing board approve the SSMP Development Plan and Schedule at a public meeting. The action your Board takes today by adopting this plan and schedule satisfies this requirement. The SSMP Development Plan and Schedule identifies the milestone dates for completing each element of the SSMP and identifies the responsible party for completing the SSMP plan sections. As the attached table illustrates, this is the first of many tasks the District will be undertaking and committing resources to develop a SSMP and comply with the WDR.

County Sanitation District 1

Honorable Board of Directors
June 13, 2007
Page 2

CONCLUSION:

It is recommended that the SSMP Development Plan and Schedule be approved and that the District Engineer be authorized to certify approval of the plan to the SWRCB.

Respectfully submitted,

Christoph Dobson
Collection Systems Manager

APPROVED:

Mary K. Snyder
District Engineer

CD/PKS:jc

Attachments: SSMP Development Plan and Schedule for CSD-1

Contact for additional information:
Christoph Dobson
Collection Systems Manager
876-6042

CSD-1 SSMP Development Plan and Schedule		
Main Task	**Due Date**	**Responsible Party**
Application for Permit Coverage (Completed)	Nov 11, 2006	Mary Snyder
SSMP Development Plan and Schedule (This Board item)	Aug 2, 2007	Patrick Schroeder
Reporting Program	Sept 2, 2007	Christoph Dobson
Goals and Organization Structure	Nov 2, 2007	Patrick Schroeder
Overflow Emergency Response Plan	Nov 2, 2008	Patrick Schroeder
Legal Authority	Nov 2, 2008	Patrick Schroeder
Operation and Maintenance Program	Nov 2, 2008	Patrick Schroeder
Fats, Oils and Grease Control Program	Nov 2, 2008	Patrick Schroeder
Design and Performance	May 2, 2009	Patrick Schroeder
System Evaluation and Capacity Assurance Plan	May 2, 2009	Patrick Schroeder
Final SSMP, incorporating all of the SSMP requirements	May 2, 2009	Patrick Schroeder

COUNTY SANITATION DISTRICT NO. 1
RESOLUTION NO. CD-1225

SSMP DEVELOPMENT PLAN AND SCHEDULE – SACRAMENTO COUNTY SANITATION DISTRICT NO. 1 SEWER SYSTEM MANAGEMENT PLAN

BE IT RESOLVED AND ORDERED that the Board of Directors of the SACRAMENTO COUNTY SANITATION DISTRICT NO. 1 (CSD-1), a sanitation district organized under the laws of the State of California, hereby approves a Sewer System Management Plan (SSMP) Development Plan and Schedule, in the form hereto attached, and authorizes the District Engineer or her designee to certify approval of the SSMP Development Plan and Schedule in the California State Water Resources Control Board's (SWRCB) electronic database to comply with the SWRCB statewide general Waste Discharge Requirements (WDR's).

ON A MOTION by Director Yee, and seconded by Director MacGlashan, the foregoing resolution was passed and adopted by the Board of Directors of the Sacramento County Sanitation District No. 1, State of California, this 13th day of June, 2007, by the following vote, to wit:

AYES: Directors, Bruins, Dickinson, MacGlashan, Nottoli, Peters, Scherman, Skoglund, Yee, McCarty

NOES: Directors, none

ABSENT: Directors, Howell

ABSTAIN: Directors, none

Ken McCarty
Chair of the Board of Directors
Sacramento County Sanitation District No. 1, a sanitation district organized under the laws of the State of California.

(SEAL)

ATTEST: Cindy H. Turner
Clerk of the Board of Supervisors of Sacramento County, California, and ex-officio Secretary of the Board of Directors of the Sacramento County Sanitation District No. 1

In accordance with Section 25103 of the Government Code of the State of California a copy of the document has been delivered to the Chairman on JUN 13 2007
By: Georgine Dawlens
Deputy Clerk, Board of Directors

FILED
JUN 13 2007
BOARD OF DIRECTORS
By: Cindy H. Turner
Clerk of the Board

13. Appendix B – Continuation of Coverage Certification

State Water Resources Control Board

Date: May 03, 2023

David Leamer
Sacramento Area Sewer District
10060 Goethe Road
Sacramento, CA 95827

NOTICE OF APPLICABILITY; CONTINUATION OF REGULATORY COVERAGE; STATEWIDE SANITARY SEWER SYSTEMS GENERAL ORDER, 2022-0103-DWQ

Dear David Leamer

Thank you for certifying your Continuation of Existing Regulatory Coverage form in the California Integrated Water Quality System (CIWQS) database. This Notice of Applicability serves as confirmation of the continuation of regulatory coverage from Order 2006-0003-DWQ to Order 2022-0103-DWQ for:

- Agency name: Sacramento Area Sewer District
- Sanitary Sewer System name: Sacramento Area Sewer District CS
- Waste Discharge Identification Number (WDID): 5SSO10912
- Certification date: May 03, 2023

As of the June 5, 2023 effective date, General Order 2022-0103-DWQ serves as the new statewide waste discharge requirements regulating sanitary sewer systems. The General Order, including all Attachments, is enforceable by the State Water Resources Control Board and the applicable Regional Water Quality Control Board. As of June 5, 2023, Order 2006-0003-DWQ is rescinded (except for enforcement purposes) and previously-held regulatory coverage under Order 2006-0003-DWQ is terminated.

If you have any questions regarding the statewide Sanitary Sewer Systems General Order or this Notice of Applicability, please email your questions to SanitarySewer@waterboards.ca.gov.

Sincerely,

Karen Mogus, Deputy Director
Division of Water Quality

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

1001 I Street, Sacramento, CA 95814 | Mailing Address: P.O. Box 100, Sacramento, CA 95812-0100 | www.waterboards.ca.gov

14. Appendix C – Abbreviations

ARV	Air Relief Valve
BCE	Business Case Evaluation
BIS	Backup Into Structures
BPX	Broken Pipe or Hole in Pipe
Cal-OES	California Office of Emergency Services
CARV	Combination Air Release Valves
CAT	Change Advisory Team
CCTV	Closed Circuit Television Inspection
CDS	Cul-de-sac
CFP	Capital Funding Projections
CIP	Capital Improvement Plan
CIPP	Cured-in-Place Pipe
CIT	Collaboration and Innovation Team
CIWQS	California Integrated Water Quality System
CMMS	Computerized Maintenance Management System
CO	Cleanout
Collection System Ordinance	Sacramento Area Sewer District Collection System Ordinance
Communications	SacSewer's Department of Communications
County Central	Sacramento County Central
CPL	Capital Project List
CPL	Cracked Pipe - Light
CPM	Cracked Pipe – Moderate
CPS	Cracked Pipe – Severe
CRS	Severe Corrosion
CSA	Customer Service Assistant
District Engineer	Sacramento Area Sewer District General Manager
DWR	Sacramento County Department of Water Resources
EMD	Environmental Management Department
ERP	Enforcement Response Process
FCSM	Facilities Scheduled Maintenance Program
FOG	Fats, Oils, and Grease
FSE	Food Service Establishments

GGF	Grease Generating Facilities
GIS	Geographic Information System
HMP	Hazardous Materials Plan
IIPP	Injury & Illness Prevention Program
INT	Intersection
ISD	SacSewer's Internal Service Department
IT	Information Technology
LL	Lower Lateral
LLAIP	Lower Lateral Area Inspection Program
LOS	Level of Service
LLSI	Lower Lateral Scheduled Inspection Program
LLSM	Lower Lateral Scheduled Maintenance Program
LRO	Legally Responsible Official
LRP	Long-Range Projections
LTFP	Long-Term Financial Plan
M&O	Maintenance and Operations
MHSM	Manhole Scheduled Maintenance Program
ML	Main Line
MLCA	Main Line Critical Asset Program
MLESRH	Main Line Easement Rehabilitation Program
MLQC	Main Line Quality Control
MLSI	Main Line Schedule Inspection Program
MLSM	Main Line Scheduled Maintenance Program
MRP	Monitoring and Reporting Program
NOI	Notice of Intent
NPV	Net Present Value
OJS	Offset Joint Severe
OPT	Organizational Planning Team
ORG	Orangeburg Pipe
OVM	Moderate Oval Pipe
OVS	Severe Oval Pipe
PAC	Project Authorization Committee
PAP	Project Authorization Process
PDP	Project Development Plan

PDP-1	Project Development Plan Phase #1
PDP-2	Project Development Plan Phase #2
PM	Preventive Maintenance
PPE	Personal Protective Equipment
Pump Station Support	SacSewer's Engineering Operations Support Section – Pump Station & Interceptor Support Group
QC	Quality Control
RDI&I	Rainfall-Dependent Inflow and Infiltration
RFC	Request for Change
SacSewer	Sacramento Area Sewer District Collection System Operations
SC	Steering Committee
SCADA	System Control and Data Acquisition
SCP	System Capacity Plan
SERP	Spill Emergency Response Plan
SME	Subject matter expert
SPCCP	Spill Prevention Control and Countermeasure Plan
SR	Service Request
SRV	Sewer Relief Valve
SSMP	Sewer System Management Plan
ST	Street
Staffing Projections	M&O Field Staffing Projections
Standards	Sacramento Area Sewer District Standards and Specifications
SWPPP	Storm Water Pollution Prevention Program
S & RC	SacSewer's Safety & Regulatory Compliance
Training	SacSewer's Training and Organizational Development Section
TVI	Televised Inspection
TRRO	Treatment and Resource Recovery Ordinance
UCFMS	Under Capacity Failure Mode Strategy

15. Appendix D – Definitions

Annual Report

An Annual Report (previously termed as Collection System Questionnaire in Order 2006-0003-DWQ) is a mandatory report in which the Enrollee provides a calendar-year update of its efforts to prevent spills.

Aerial crossings

A sewage pipe above the creek floor may or may not have support structures in the creek. The crossing material is typically ductile iron or steel pipe.

Business Case Evaluation

A BCE is an evaluation of alternatives to a problem. A BCE is used to economically compare alternatives against each other to provide a basis for selecting a preferable, cost-effective alternative solution. BCE alternatives typically include status quo, maintain, repair, replacement, or other alternatives that may be appropriate, and consider risks involved with each alternative, if any. Typically, a 40-year net present value (NPV) is used to compare alternatives, but may be adjusted if a different NPV time span is more appropriate.

California Integrated Water Quality System (CIWQS)

CIWQS is the statewide database providing mandatory electronic reporting as required in State and Regional Water Board-issued waste discharge requirements.

Creek

A low-lying area that may or may not have an active stream flowing within it. Low-lying areas include any depression, gully, ravine, or canyon.

Covered crossings

A sewage pipe that is buried as it crosses the creek.

Enrollee

An Enrollee is a public, private, or other non-governmental entity that has obtained approval for regulatory coverage under this General Order, including:

- A state agency, municipality, special district, or other public entity that owns and/or operates one or more sanitary sewer systems:
    - Greater than one (1) mile in length (each individual sanitary sewer system);
    - One mile or less in length where the State Water Resources Control Board or a Regional Water Quality Control Board requires regulatory coverage under this Order or
- A federal agency, private company, or other non-governmental entity that owns and/or operates a sanitary sewer system of any size where the State Water Resources Control Board or a Regional Water Quality Control Board requires regulatory coverage under this Order in response to a history of spills, proximity to surface water, or other factors supporting regulatory coverage.

Exposed crossings

A sewage pipe exposed on the floor of the creek. The crossing may or may not be in a carrier pipe or encased in concrete that protects the pipe and provides support.

Governing Entity

A governing entity includes but is not limited to the following:

- A publicly elected governing board, council, or commission of a municipal agency;
    - A Department or Division director of a federal or state agency that is not governed by a board;
- A governing board or commission of an organization or association; and
- A private system owner/manager that is not governed by a board.

Infill Project

Formally relief project is a project in a geographical area within the SacSewer service area that discharges or has been planned to discharge to the 1999 trunk sewer collection system, as defined in the SacSewer Collection System Ordinance.

Lateral (including Lower and Upper Lateral)

A lateral is an underground segment of a smaller diameter pipe that transports sewage from a customer's building or property (residential, commercial, or industrial) to the Enrollee's main sewer line in a street or easement. Upper and lower lateral boundary definitions are subject to local jurisdictional codes and ordinances or private system ownership.

A lower lateral is the portion of the lateral located between the sanitary sewer system main and either the property line, sewer clean out, curb line, established utility easement boundary, or other jurisdictional locations.

An upper lateral is the portion of the lateral from the property line, sewer cleanout, curb line, established utility easement boundary, or other jurisdictional locations to the building or property.

Legally Responsible Official

A Legally Responsible Official is an official representative designated by the Enrollee, with the authority to sign and certify submitted information and documents required by this General Order.

Parallel pipeline

A pipeline within a creek that extends in the same direction as the creek.

Pump Station Component

Any item relating to the pressurized sewer system that is not structural.

Pump Station Structure

Includes wet wells, force mains, CARVs, dry pits, valve vaults, and buildings.

Resilience

Resilience is the ability to recover from or adjust to adversity or change and grow from disruptions. Resilience can be built through planning, preparing for, mitigating, and adapting to changing conditions.

Sanitary Sewer System

A sanitary sewer system is a system that is designed to convey sewage, including but not limited to pipes, manholes, pump stations, siphons, wet wells, diversion structures, and/or other pertinent infrastructure, upstream of a wastewater treatment plant headworks, including:

- Laterals owned and/or operated by the Enrollee;
- Satellite sewer systems and/or
- Temporary conveyance and storage facilities, including but not limited to temporary piping, vaults, construction trenches, wet wells, impoundments, tanks, and diversion structures.

For this document, sanitary sewer systems include only systems owned and/or operated by the Enrollee.

Satellite Sewer System

A satellite sewer system is a portion of a sanitary sewer system owned or operated by a different owner than the owner of the downstream wastewater treatment facility, ultimately treating the sewage.

Sewer System Management Plan

A sewer system management plan is a living document an Enrollee develops and implements to effectively manage its sanitary sewer system(s) in accordance with General Order WQ 2022-0103-DWQ.

Sewage

Sewage and its associated wastewater, is untreated or partially treated domestic, municipal, commercial and/or industrial waste (including sewage sludge) and any mixture of these wastes with inflow or infiltration of stormwater or groundwater, conveyed in a sanitary sewer system.

Spill

A spill is a discharge of sewage from any portion of a sanitary sewer system due to a sanitary sewer system overflow, operational failure, and/or infrastructure failure. Exfiltration of sewage is not considered to be a spill under this General Order if the exfiltrated sewage remains in the subsurface and does not reach a surface water of the State.

Training

Training is in-house or external education and guidance needed that provide the knowledge, skills, and abilities to comply with General Order WQ 2022-0103-DWQ.

Waste Discharge Identification Number (WDID)

A waste discharge identification number (WDID) identifies each individual sanitary sewer system enrolled under this General Order. A WDID number is assigned to each enrolled system upon an Enrollee's approved regulatory coverage.

Waters of the State

Waters of the State are surface waters or groundwater within the boundaries of the state as defined in Water Code section 13050(e), in which the State and Regional Water Boards have authority to protect beneficial uses. Waters of the State include, but are not limited to, groundwater aquifers, surface waters, saline waters, natural washes and pools, wetlands, sloughs, and estuaries, regardless of flow or whether water exists during dry conditions.

Waters of the State include waters of the United States.

Waters of the United States

Waters of the United States are surface waters or waterbodies subject to federal jurisdiction per the Clean Water Act.

SACRAMENTO AREA SEWER DISTRICT

REFERENCE DOCUMENT FOR THE SEWER SYSTEM MANAGEMENT PLAN

(for WDID#s 5SSO10912 & 5SSO11045)

Approved By:

Rosemary Clark
Director Of Operations

DocuSigned by:
Rosemary Clark
B6FF20AC21174D7...
Signature

3/25/2025
Effective Date

Sacramento Area Sewer District
10060 Goethe Road
Sacramento, CA 95827

Review and revise at least every 3-years

Table of Contents

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100 Overview

100 Section Overview

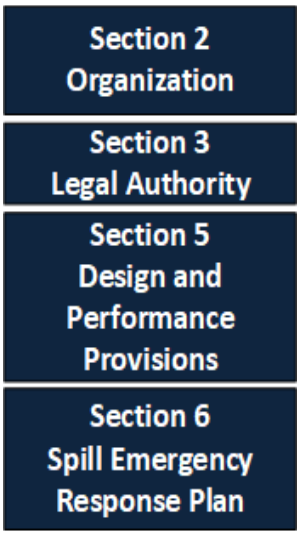
100.1 Purpose

This document is a reference for SacSewer's SSMP, providing greater detail in certain sections. For SacSewer's SSMP to be effective, strategies and procedures for managing, operating, and maintaining the sanitary sewer system must be developed, implemented, monitored, and improved. This document details the strategies and procedures that SacSewer employees follow in their daily work activities to ensure the success of the SSMP.

100.2 Background

Certain elements of **Attachment D** of the **General Order WQ 2022 – 0103 – DWQ** do not require further elaboration and are only addressed in SacSewer's SSMP. **Figure 100 – 1** lists the required elements solely addressed in SacSewer's SSMP.

Figure 100 – 1 Elements Only in SSMP



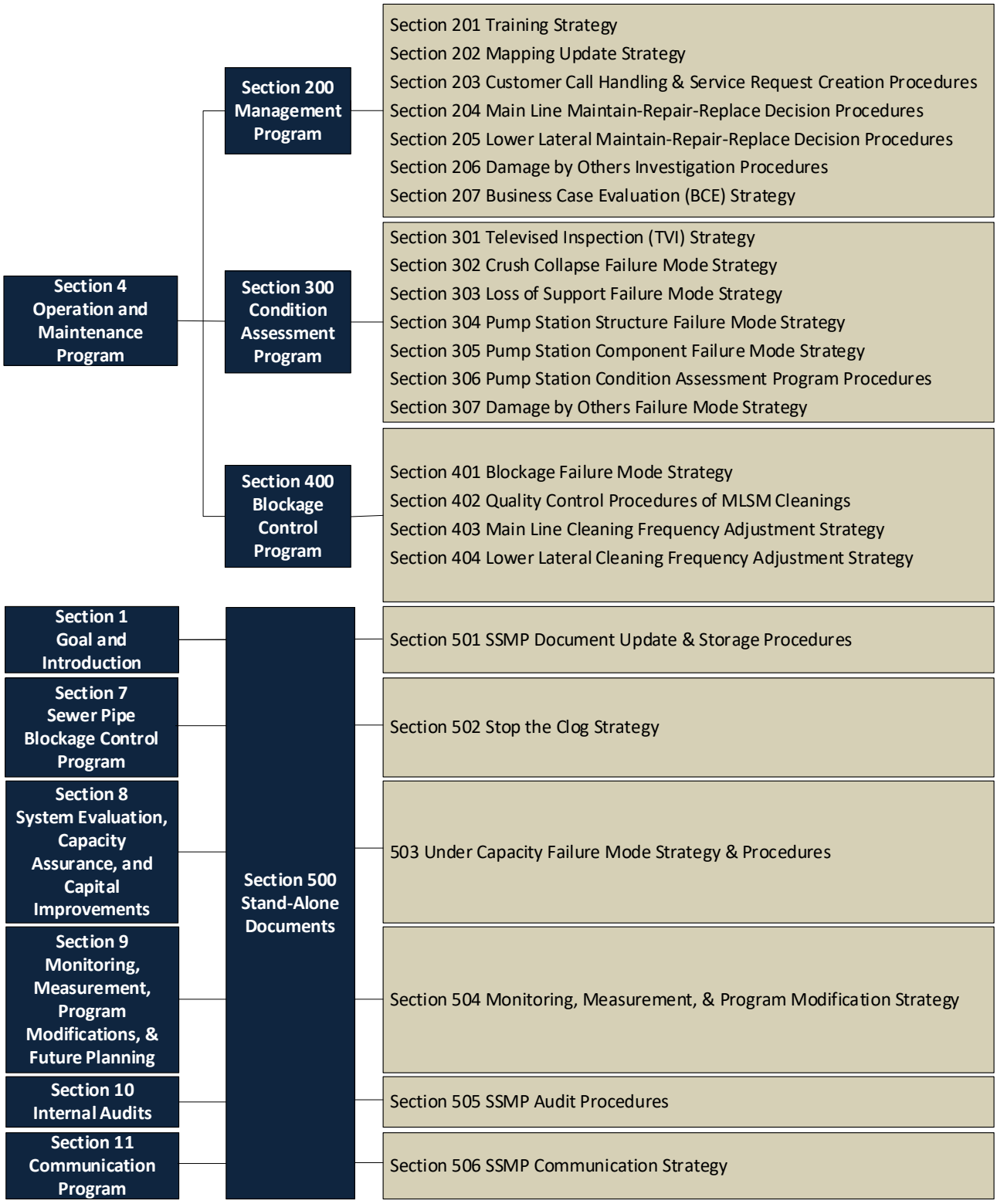
The remaining required elements of **Attachment D** of the **General Order WQ 2022-0103-DWQ** are briefly discussed in SacSewer's SSMP with further elaboration in SacSewer's SSMP Reference Document under four main sections: **Management Program, Condition Assessment Program, Blockage Control Program,** and Stand – Alone Documents**,** as shown in **Figure 100 – 2**. Each section contains strategies and procedures that describe how SacSewer operates and maintains the sanitary sewer collection system.

SacSewer strategies consist of proactive and reactive approaches. Proactive approaches involve anticipating future challenges and improvement opportunities through planning and foresight, allowing SacSewer to align resources with long-term goals while staying ahead of anticipated challenges to reduce spills. Conversely, reactive approaches focus on responding to unforeseen events and changes as they occur, ensuring agility and adaptability in SacSewer's responses. By integrating both approaches, SacSewer can effectively navigate uncertainties, mitigate risks, and create a resilient and strategic framework to manage its sanitary sewer system.

SacSewer's procedures ensure consistency and efficiency in tasks by providing detailed step-by-step instructions and visual workflows. The procedures outline specifics, such as a sequence of actions with decision-making criteria, necessary resources, responsible parties, and required conditions. SacSewer can

ensure that staff performs tasks accurately and consistently by integrating both step-by-step instructions and visual workflows.

Figure 100 – 2 Elements in SSMP & SSMP Reference Document



100.3 Roles and Responsibilities

SacSewer's Engineering Business Planning Section – Business Planning Group is responsible for updating the SSMP and coordinating the update of the SSMP Reference Document with document owners. Business Planning will liaise between the SSMP Reference Document strategies and procedures owners and the District Director of Operations to produce an updated document at least once every six years.

Table 100 – 1 lists the SSMP Reference Document strategies and procedures and their owners within SacSewer. The listed owner will be the primary contact for any questions. The owner will also be responsible for periodic reviews and updates to meet stated goals. Stakeholders are the units affected by each strategy and procedure. Updates made by owners should be made in coordination with the affected stakeholders, as both are responsible for training staff on the latest SSMP updates.

Table 100 – 1 Section Owners and Key Stakeholders

Section	Section Title	Owner	Key Stakeholders
200	**Management Program**	Mai-Tram Le, Engineering Business Planning – Business Planning	Training, M&O, Engineering Business Planning, Engineering Operations Support
201	**Training Strategy**	Jennifer Weitz, Internal Services – Training	Training, M&O, Engineering Business Planning, Engineering Operations Support
202	**Mapping Update Strategy**	Luisa Gomez, Engineering Business Planning – Information Management	M&O, Engineering Business Planning, Engineering Operations Support
203	**Customer Call Handling & Service Creation Request Procedures**	John Hough, Maintenance & Operations	M&O, Engineering Operations Support
204	**Main Line Maintain – Repair – Replace Decision Procedures**	Ryan Shewry, Engineering Operations Support – Pipeline Support	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pipeline Support
205	**Lower Lateral Maintain – Repair – Replace Decision Procedures**	Ryan Shewry, Engineering Operations Support – Pipeline Support	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pipeline Support
206	**Damage By Others Investigation Procedures**	Ryan Shewry, Engineering Operations Support – Pipeline Support	M&O, Engineering Operations Support
207	**Business Case Evaluation Strategy**	Ryan Shewry, Engineering Operations Support – Pipeline Support	M&O, Engineering Operations Support – Pipeline Support

Section	Section Title	Owner	Key Stakeholders
300	**Condition Assessment Program**	Mai-Tram Le, Engineering Business Planning – Business Planning	M&O, Engineering Business Planning, Engineering Operations Support
301	**Televised Inspection Strategy**	Ryan Shewry, Engineering Operations Support – Pipeline Support	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pipeline Support
302	**Crush Collapse Failure Mode Strategy**	Mai-Tram Le, Engineering Business Planning – Business Planning	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pipeline Support
303	**Loss of Support Failure Mode Strategy**	Ryan Shewry, Engineering Operations Support – Pipeline Support	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pipeline Support
304	**Pump Station Structure Failure Mode Strategy**	My Huynh, Engineering Operations Support – Pump Station & Interceptor Support	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pump Station & Interceptor Support
305	**Pump Station Component Failure Mode Strategy**	My Huynh, Engineering Operations Support – Pump Station & Interceptor Support	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pump Station & Interceptor Support
306	**Pump Station Condition Assessment Program Procedures**	My Huynh, Engineering Operations Support – Pump Station & Interceptor Support	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pump Station & Interceptor Support
307	**Damage By Others Failure Mode Strategy**	Ryan Shewry, Engineering Operations Support – Pipeline Support	M&O, Engineering Business Planning, Engineering Operations Support
400	**Blockage Control Program**	Mai-Tram Le, Engineering Business Planning – Business Planning	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pipeline Support
401	**Blockage Failure Mode Strategy**	Mai-Tram Le, Engineering Business Planning – Business Planning	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pipeline Support

Section	Section Title	Owner	Key Stakeholders
402	**Quality Control Procedures of MLSM Cleanings**	John Hough, Maintenance & Operations, and Ryan Shewry, Engineering Operations Support – Pipeline Support	M&O, Engineering Operations Support – Pipeline Support
403	**Main Line Cleaning Frequency Adjustment Strategy**	Ryan Shewry, Engineering Operations Support – Pipeline Support	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pipeline Support
404	**Lower Lateral Stoppage Failure Mode Strategy**	Ryan Shewry, Engineering Operations Support – Pipeline Support	M&O, Engineering Business Planning – Business Planning, Engineering Operations Support – Pipeline Support
500	**Stand Alone Documents**	Mai-Tram Le, Engineering Business Planning – Business Planning	M&O, Engineering Business Planning, Engineering Operations Support, Communication Department
501	**SSMP Document Update & Storage Procedure**	Mai-Tram Le, Engineering Business Planning – Business Planning	Engineering Business Planning – Business Planning
502	**Stop the Clog Strategy**	Mai-Tram Le, Engineering Business Planning – Business Planning	P&P – WSCS, Communication Department, M&O, Safety & Regulatory Compliance, Engineering Business Planning – Business Planning, Engineering Operations Support – Pipeline Support
503	**Under Capacity Failure Mode Strategy**	Agustin Lopez, Engineering Business Planning – Capacity Management	Engineering Business Planning – Capacity Management, Engineering Operations Support – Pump Station & Interceptor Support
504	**Monitoring, Measurement, & Program Modification Strategy**	Mai-Tram Le, Engineering Business Planning – Business Planning	Engineering Business Planning – Business Planning
505	**SSMP Audit Procedures**	Agustin Lopez, Engineering Business Planning – Capacity Management	Engineering Business Planning
506	**SSMP Communication Strategy**	Paige Bedegrew, Communication Department	Communication Department

Table 100 – 2 Lists the responsible units and their respective general SSMP-related roles. Specific roles can be found in the strategies and procedures of the SSMP Reference Document.

Table 100 – 2 General Roles Related to the SSMP

Responsible Unit	Roles
Engineering Business Planning – Business Planning	• Revise and update the SSMP and ensure SSMP Reference reflects current business practices. • Determine the effectiveness of the SSMP.
Engineering Business Planning – Information Management	• Provides data support to SacSewer for its daily operations. • Maintains sewer easement layer. • Maintains the record Drawings.
Engineering Business Planning – Development	• Review Improvement Plans according to SacSewer's Standards and Specifications.
Engineering Business Planning – Capacity Management	• Maintains and updates the hydraulic model of the SacSewer system. • Provides hydraulic modeling support. • Updates the System Capacity Plan. • Responsible for flow monitoring.
Engineering Operations Support – Design	• Responsible for planning, designing, and managing contracted Capital Improvement Projects.
Engineering Operations Support – Pump Station & Interceptor Support	• Assess the performance and condition of pump stations, pressurized assets, Interceptors, and components. • Sets PM, Renewal / Replacement plan, and recommended alternative approaches to minimize failures. • Plans, designs, and manages in-house and contracted repair or replacement projects.
Engineering Operations Support – Pipeline Support	• TVI Review, writing WOs, planning and scheduling work, and linear asset PM adjustments. • Responsible for managing on-call contracts to provide contractor support to M&O's workload using SacSewer's Standards and Specifications • Damage investigation.
Maintenance & Operations	• Writing WOs, planning and scheduling work, and completing work. • Performs the necessary maintenance and construction work. • Respond, clean up, and report spills.
Internal Services Department – Training	• Manage and coordinate training.

Department of Communication	• Maintaining SacSewer's website, including updating the SSMP web pages. • Advertising SacSewer's website on customer and stakeholder communication materials (i.e., design and construction newsletters, service commitment report cards, etc.) • Coordinating with the cities, SacSewer serves to promote awareness. • Providing support and co-managing the consultant contract for the Public Outreach and Education portion of the Stop the Clog Strategy.

The Reference Document Sections incorporate numerous activities taking place throughout SacSewer. As such, all units within SacSewer should be familiar with the basic nature and elements of the section correlated with their job responsibilities. Each business unit identified as a stakeholder in **Table 100 – 1** or identified in **Table 100 – 2** as having a role or responsibility for carrying out a section of this Reference Document is responsible for training staff, as needed, to implement the section successfully.

200 Management Program

200 Program Overview

200.1 Purpose

The purpose of the **Management Program** in the SSMP Reference Document is to provide additional information on the strategies and procedures that:

- Describes computer applications and training needed to perform daily tasks consistently and how they are updated.
- Documents procedures for handling customer calls.
- Documents decision-making procedures for short-term repair and long-term replacement of assets.
- Ensures consistency in the investigation and reporting of damages to any SacSewer asset during excavation by an external excavator.

200.2 Background

SacSewer owns and operates a variety of physical assets. In support of SacSewer's goals of reducing spills, meeting regulatory requirements, achieving identified service commitment targets, and operating in a cost-effective manner, SacSewer has documented several efforts designed to optimize the management of its assets. Some of those efforts are documented only in the **Management Program, Section 4.1** of the SSMP. The remaining efforts are further discussed in detail in the **Management Program, Section 200** of the SSMP Reference Document.

200.3 Program

The **Management Program** encompasses several separately documented but interrelated strategies and procedures. The strategies and procedures that are further discussed in the **Management Program** are listed below:

- Training Strategy
- **Mapping Update Strategy**
- **Customer Call Handling & Service Request Creation Procedures**
- **Main Line Maintain-Repair-Replace Decision Procedures**
- **Lower Lateral Maintain-Repair-Replace Decision Procedures**
- **Damage by Others Investigation Procedures**
- **Business Case Evaluation Strategy**

201 Training Strategy

201.1 Purpose

This document defines SacSewer's training strategy for meeting **General Order WQ 2022-0103-DWQ** to ensure that all staff (including employees, contractors, or other agents) working in sanitary sewer system operations and maintenance are adequately trained and possess adequate knowledge, skills, and abilities.

201.2. Background

Changes in regulatory requirements have increased the need for documented training programs for employees and contractors to ensure they possess the knowledge, skills, and abilities to perform work safely. **General Order WQ 2022-0103-DWQ, Attachment D Section 4.3**, requires in-house and external training to be provided on a regular basis for sanitary sewer system operations and maintenance staff and contractors. The training must cover:

- The requirements of **General Order WQ 2022-0103-DWQ**;
- The enrollee's Spill Emergency Response Plan procedures and practice drills;
- Skilled estimation of spill volume for field operators; and
- The electronic CIWQS reporting procedures for staff submitting data

201.3. Strategy Approach

SacSewer's Training Strategy establishes a centralized proactive training approach to address the training requirements included in the following:

- **General Order WQ 2022-0103-DWQ**,
- Hazardous Material Plan (HMP),
- Spill Prevention Control and Containment Program (SPCCP),
- Storm Water Pollution Prevention Program (SWPPP), and
- Illness and Injury Prevention Plan (IIPP)

SacSewer's Training and Organizational Development (Training) Section is responsible for overall planning, managing, coordinating, and monitoring the effectiveness of training implementation. This group is also responsible for overseeing training records such as attendance tracking for training courses and hours logged for each staff member and keeping records of certification/qualification fulfilled. The Training Section uses a centralized Training calendar in Outlook and SharePoint. The Training Section establishes and maintains annual training calendars for SacSewer. On a yearly basis, the Training Section will coordinate with subject matter experts (SMEs) and trainers to identify dates, times, trainees, and other logistics.

SacSewer's **Training Strategy** consists of several proactive approaches that have and continue to provide adequate training for employees and contractors. Specific training is developed through collaboration between the Training Section and SMEs with approval from the sponsoring Director within SacSewer. Training priorities are established based on the particular needs of each department or office. Upon request, the Training Section will create and develop training deliverables including, but not limited to, Training Manuals, Instructor Guides, PowerPoints, Videos, Written Exams, Practical Exams, Syllabi, and job aids. Staff are trained and possess knowledge, skills, and abilities applicable to job assignments to ensure adherence to all Federal, State, County, and SacSewer laws and regulations. The Training Section also helps ensure all duties are performed safely and according to Sacramento Area Sewer District's Standard Operating Procedures.

Proactive Approach:

1. Internal Training

- ***M&O Staff***

  M&O Staff – Consists of Underground Construction and Maintenance, Mechanical Maintenance, SacSewer Construction and Maintenance, Electrician, and Control Systems employees and contractors. M&O provides SMEs for creating materials for training and testing to ensure adequate training and possession of the knowledge, skills, and abilities for spill response, sewer collection system cleaning, maintenance, and repair activities.

  The M&O Section trains all appropriate staff on applicable sections of the Spill Emergency Response Plan Manual, job plans, and on-the-job training. Type of training includes:

  - Compliance/Regulatory
  - General Safety System/Equipment Related
  - Spill Emergency Response Plan, including spill volume estimation, as needed, for job assignment at minimum once a year.
  - Software needed for fieldwork

  Training Methods:

  - Onboarding Safety Training
  - Monthly safety tailgate meetings
  - Quarterly Spill Emergency Response Plan training for applicable staff
  - Job Plans (i.e., written steps necessary to complete a sewer system maintenance and operation task)
  - On-the-job for system/equipment-related training (i.e., pairing a new employee with an experienced journey-level craftsperson)
  - Competency-Based Training program

  Compliance/Regulatory Training is business-critical employee training that is mandatory for the organization to comply with regulations, legislation, or policies. It aims to ensure employees are familiar with and informed of any regulations applicable to SacSewer.

  Onboarding Training is a standardized program that ensures new employees are provided with safety and administrative information, with the intent to build a sense of safety culture. Staff become aware of safety standards and familiarize themselves with policies, procedures, and values.

  Monthly Safety tailgate meetings remind employees of work-related hazards, safe work practices, and reinforce SacSewer safety culture and values.

  To more comprehensively address the need to ensure adequate knowledge, skills, and abilities for Spill Emergency Response Plan training, system/equipment-related training, and software used in-house, SacSewer maintains a Competency-Based Training Program. Competency-based training is a methodology that confirms employee competency by testing knowledge retention and task performance through written and practical exams.

  Competency-based training tests operating district staff for understanding and practical training that ensures the employee can perform their job duties and provides a baseline of adequate training. Training standards tests are determined by SacSewer's directors or their appointed or delegated managers.

The Competency-Based Training Program objectives are to develop the following:

1. Job Competency Requirements - Written documentation that compiles the knowledge and skills required to master the basics for a given system/piece of equipment.
2. Standard Answers - These are standards against which the employee will be measured.
3. Standard Operating Procedures - Developed when an employee is required to follow specific steps each time they perform a task.
4. Competency Assessments – Examination forms and practical evaluations, as applicable, that assess whether the employee possesses the knowledge and skills to demonstrate competency in the work function(s).

The Competency-Based Training also includes:

- A Recertification process for follow-up/refresher training at standardized time intervals.
- The field/qualifying experience process certifies that the job is being performed (in the field) within acceptable performance standards.

This program recognizes the needs of the affected Sections and will leverage the knowledge, skills, and abilities of SMEs within SacSewer.

- ***Spill Responders***

SacSewer Engineering and Regulatory Compliance staff are responsible for responding to Category 1, Category 2, and any other spills with the potential of becoming Category 1 or 2 spill. Spill Responders document spill response activity, including spill volume estimation, in SacSewer's CMMS and the CIWQS database. Spill Responders are also responsible for notifying the Director of SacSewer Operations, M&O Superintendent, California Office of Emergency Services (Cal-OES), and the County of Sacramento Environmental Management Department (EMD) of Category 1 spills. Sewer's Spill Emergency Response Plan Managers are responsible for providing adequate training on the Spill Emergency Response Plan Manual and electronic reporting of spill data in the CIWQS database to all Spill Responders.

- ***Office Staff***

Office Staff – Consists of management, supervisors, administrative, and engineering employees who may perform spill response duties or fieldwork. Type of training includes:

- General Safety & Spill Awareness
- Spill Emergency Response Plan, as needed, for job assignment at minimum once a year.
- Software needed for fieldwork

Training Methods

- Monthly safety tailgate meetings, which cover a broad range of topics on general safety awareness and spills
- Quarterly Spill Emergency Response Plan training for applicable staff

2. External Training

- ***CWEA Certification Training***

  CWEA Certification Training is a type of Professional Certification Training supported by SacSewer's Training section. The Training section supports CWEA Certification Training. SacSewer employees are provided with information and study materials as needed.

- ***Professional Conferences***

  A Professional Conference is a meeting of professionals in each subject or profession, dealing with industry matters, matters concerning the status of the profession, and scientific or technical developments. Conference attendance is typically coordinated through travel coordinators, given that conferences often combine travel, conference payment, and registration support. The Training Section assists with determining when and how to use this process.

- ***Vendor Training***

  Vendor Training is training conducted or facilitated by someone other than a SacSewer employee or designated representative. This training can be on-site or off-site. On-site training with a vendor requires coordination with the ISD Procurement Section for insurance and liability. Off-site training typically involves coordination with the purchasing section, coordination with the travel coordinator, or the Training Seminar Request Form.

- ***Web-based Training***

  Web-based training or webinars are online training used by individuals or classrooms. When web-based training is needed for individuals (e.g., LinkedIn Learning training that a single individual will view), no coordination is required beyond the initial license setup. When web-based training is needed for classrooms or groups, the sponsor or manager is responsible for coordinating that with the Training and/or IT staff.

202 Mapping Update Strategy

202.1 Purpose

The document defines SacSewer's strategy for maintaining up-to-date maps of the sewer collection system and applicable stormwater conveyance facilities.

202.2. Background

General Order WQ 2022-0103-DWQ Attachment D, Section 4.1 requires enrollees to include in their SSMP "an up-to-date map(s) of the sanitary sewer system, and procedures for maintaining and providing the State and Regional Water Board staff with access to the map. The map(s) must show gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities within the sewer system service area boundaries."

202.3. Strategy Approach

SacSewer staff utilize an electronic map of the sewer collection system as a day-to-day tool. SacSewer utilizes a sewer-specific viewer that displays the sewer assets over the shared layers to provide functional electronic maps.

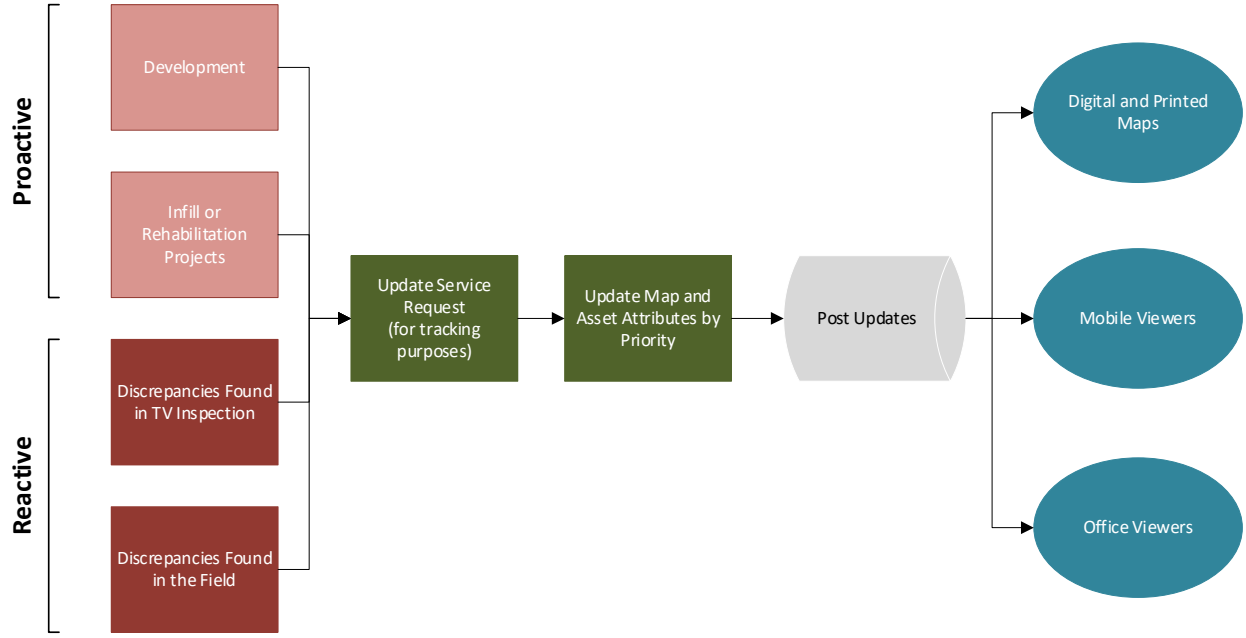
SacSewer's Engineering Business Planning Section – Information Management Group – GIS staff are responsible for creating the electronically mapped assets of the sewer collection system. Information from hard-copy civil plans and profile drawings are used by Information Management staff to create various mapped assets, including main lines, lower laterals, manholes, pump stations, force mains, and valves. The asset information in the electronic map links to a scanned version of the original hard copy drawings, so a more detailed engineering drawing is available to staff when needed.

In addition to the sewer-specific data, SacSewer utilizes the Sacramento County Department of Technology Geographic Information System (GIS) group's product to provide the shared layers, such as street centerlines, parcel boundaries, address information, and storm drain facilities. Different stormwater jurisdictions within SacSewer's service area, such as Sacramento County Department of Water Resources (DWR), City of Citrus Heights, City of Elk Grove, City of Folsom, City of Rancho Cordova, and City of West Sacramento, maintain and provide information on their stormwater facilities. SacSewer uses this information to complete the storm drain facilities map within SacSewer's service area.

SacSewer's Engineering Business Planning Section – Information Management Group is responsible for ensuring mapped information is accessible to SacSewer staff by providing data, map viewers, and maps (digital and printed). The electronic map is not available to the public; however, SacSewer is able to provide a hard copy of a specified area via a Public Records Request (**Public Records Request - Sacramento Area Sewer District**).

The Engineering Business Planning Section – Information Management Group – Data Maintenance staff are responsible for maintaining and making updates to the electronically mapped assets. The latest information about assets gathered in the office and/or field is used to update existing mapped assets and related records according to **Figure 202-1 Mapping Update Process**. The accuracy and completeness of SacSewer's asset data records and mapping continually improve through this iterative, documented, and tracked method of identifying, notifying, and updating SacSewer asset data and mapping system.

Figure 202-1 Mapping Update Process



Updates to the electronically mapped assets are initiated through Maximo service requests and processed based on the following priority and timeline listed, where complete means that the updates are reflected on the electronic map and the map viewers:

- Complete the Priority 2 update within two weeks of creating the service request.
- Complete the Priority 3 update within four weeks of creating the service request.
- Complete the Priority 4 update within six weeks of creating the service request.

SacSewer's **Mapping Update Strategy** describes the sources from which proactive and reactive mapping update notifications come. Each source has staff trained to create and update Maximo service requests and forward it with appropriate notations, plans, sketches, or details to the Data Maintenance Team for incorporation into the electronic mapping and asset data records.

Proactive Approach:

1. Development

SacSewer's Engineering Business Planning Section – Development Group is responsible for obtaining drawings of any additions and changes to the sewer collection system that originate from the development sector within SacSewer's service area. The Development Group is also responsible for providing Maximo service requests when new project plans are approved, go under construction, and when the projects become operational.

2. Infill or Rehabilitation Projects

SacSewer's Engineering Operations Support Section – Design Group is responsible for providing drawings of any additions and changes to the sewer collection system that originate from infill or rehabilitation projects managed by the Design Group and providing the associated Maximo service requests as the projects proceed from design through construction.

Reactive Approach:

1. Discrepancies Found in TV Inspections

SacSewer's Engineering Operations Support Section – Pipeline Support Group – Main Line & Lower Lateral TV Review Teams are responsible for providing update notifications to asset attributes when discrepancies are found between existing asset data records and the current TV inspections.

2. Discrepancies Found in the Field

Staff in the field and staff in charge of contracted fieldwork are responsible for providing update notifications when discrepancies between asset data records and actual field conditions are found.

203 Customer Call Handling & Service Request Creation Procedures

203.1. Purpose

The purpose of this document is to describe SacSewer's process for handling customer calls and creating/assigning Priority 1 and 2 (shown in **Table 203-1** and **Table 203-2**, respectively) Service Requests (SR).

203.2. Background

One of the six Service Commitments that SacSewer developed to measure the effectiveness of the SSMP is called Service Call Response Time. The Service Commitments demonstrate SacSewer's commitment to serving customers and protecting public health and the environment by measuring performance in areas that customers care about and align with regulatory requirements. See Monitoring, Measurement, & Program Modification Strategy, Section 504**,** for more information on SacSewer's Service Commitments.

The Service Call Response Time Service Commitment requires SacSewer to respond to 95% of all customer service calls (determined to be Priority 1) within two hours, as a monthly average. This time is measured from when the call is received by either Customer Service Dispatch during business hours or Sacramento County Central (County Central) staff during non-business hours to when M&O Pre-checkers arrive on site. Therefore, it is essential for SacSewer to answer and assign service requests quickly and efficiently to the appropriate group. The **Customer Call Handling and Service Request Creation Procedures** was created to ensure SacSewer staff consistently respond to customer calls and direct requests to the relevant group to address the situation.

203.3. Procedure Approach

The Customer Service Dispatch staff is responsible for handling calls that come into the SacSewer emergency phone number (916) 875-6730 between 7:00 AM and 3:30 PM, Monday through Friday, excluding Weekends and SacSewer observed Holidays. County Central is responsible for handling calls outside of the mentioned hours. County Central will ask customers to call back during regular SacSewer business hours for Priority 2 issues.

From Monday through Friday during normal business hours, M&O Managers inputs into the CMMS – no later than 7:00 AM – a list of available M&O Pre-checkers and correct phone numbers for the day, including any training, meetings, etc., that will cause an M&O Pre-checker to be unavailable between 7:00 AM and 3:30 PM (excluding normal lunch breaks.) M&O Managers notify Customer Service Dispatch via phone of any changes throughout the day. Customer Service Dispatch staff will notify M&O Managers by phone when all M&O Pre-checkers are unavailable to take a call and may assign the service request to the M&O Manager for further disposition.

Customer Service Dispatch staff needs to gather as much relevant information as possible from the caller and assign the service request as quickly and accurately as possible. Customer Service Dispatch and County Central will follow the following procedures to ensure timely response when a customer notifies SacSewer of a potential sewer-related issue.

203.4. Descriptive Procedural Steps

1.0 Answer Incoming Call

The Customer Service Dispatch and Country Central promptly and professionally answer all incoming calls according to the **Dispatch Guidelines**.

2.0 Is Call about a Sewer Issue?

If yes, continue to step 3.0.

If no, proceed to Document & End.

3.0 Is the Caller Reporting a Priority 1 or 2 Problem?

Review **Table 203-1 Priority 1 Calls** and **Table 203-2 Priority 2 Calls** for a list of reported problems with descriptions.

If Priority 1, continue to step 3.1 or 3.3 accordingly.

If Priority 2, continue to step 4.0.

Table 203-1 Priority 1 Calls

Reported Problem	Problem Description	Dispatch To
1. BIS	Backups-Into Structure (including burped toilets that splash onto the bathroom floor)	M&O Pre-Checker
2. DAMAGED	Damage done by others (not SacSewer) to a SacSewer Asset. This call should accompany a notification to SacSewer USA Group.	M&O Pre-Checker
3. ODOR	Any odor complaint	M&O Pre-Checker
4. OTHER	Any occasion that may require immediate attention but does not have a category (i.e., customers who have dug up their service lines for a cleanout installation and have an open excavation hole)	Typically, M&O Pre-Checker (possibly Customer Service Assistant (CSA)
5. SPILL	Sanitary Sewer Spills of any type, (e.g., out of a pipe, cleanout, manhole, etc.)	M&O Pre-Checker
6. SAFETY	Asset Safety Issue (e.g. trip hazard)	M&O Pre-Checker
7. SLOWDRN	A complaint of the sewer system draining slowly	M&O Pre-Checker
8. SUNKEN	Sunken areas	M&O Pre-Checker
9. WET	A wet area within the street, curb, gutter, sidewalk, back of walk, or yard that could be sewer-related	M&O Pre-Checker

Reported Problem	Problem Description	Dispatch To
ANY REPORTED PROBLEMS LISTED ABOVE RELATED TO **PUMP STATIONS** • water/sewage flowing from the site, odor complaint, audible alarm coming from the site, person in station, fire, open gate, open building, etc. (**M&O Facilities Manager**)		

Table 203-2 Priority 2 Calls

Reported Problem	Problem Description	Dispatch To
1. ADJUST	Asset (typically manhole or cleanout) too high or too low	M&O Pre-Checker
2. CFC	Noise from a loose manhole lid or missing cleanout lid that the caller does not identify to be a safety concern	M&O Pre-Checker
3. INSECTS	Insects (e.g., cockroaches)	M&O Pre-Checker
4. OTHER	Any occasion that may require urgent attention but not immediate	Typically, M&O Pre-Checker (possibly Customer Service Assistant (CSA)
5. PLUMBER	After restoring service, a Plumber feels SacSewer should review SacSewer Assets (e.g., plumber sees roots in SacSewer portion of lateral)	M&O Pre-Checker
6. PERSON	Compliments and complaints about past or current work or staff, etc.	M&O Manager
7. RESTORE	Site Restoration is being requested, or a question about restoration is being asked.	M&O Manager/Eng Project Manager
COMPLAINTS to **M&O Manager** (currently no "Complaint" Reported Problem in Maximo, so use Reported Problem above that best fits) ▪ Questions about work performed ▪ Questions about the work that is going to be performed ▪ Complaints about how SacSewer staff have been driving the crew trucks ▪ Complaints about employee behavior		
COMPLAINTS to **Customer Service Liaison** (currently no "Complaint" Reported Problem in Maximo, so use Reported Problem above that best fits) ▪ Second or more requests for Site Restoration ▪ Escalating situations with Customer communication, such as when a customer is notably upset, agitated, or frustrated in communicating (e.g., extreme emotion displayed, shouting, accusations, threats to call media or elected officials or take legal action, etc.) ▪ Exhausted talks with manager ▪ Claims related ▪ Dispute findings		

Reported Problem	Problem Description	Dispatch To
WORK PERFORMED BY CONTRACTORS (e.g., bundles, projects, etc.) ON SacSewer's BEHALF (Future and Past) to **Engineering Pipeline Support Project Manager**		
ANY REPORTED PROBLEMS LISTED ABOVE RELATED TO **PUMP STATIONS** • e.g., graffiti or vandalism, general questions, construction access requests, utility questions, complaints about personnel, cleanup, annoyances, station landscaping non-urgent issues, etc. (**M&O Facilities Manager**)		

3.1 Create Priority 1 SR Assigned to M&O Pre-Checker

Customer Service Dispatch and Country Central staff will create a Priority 1 SR and assign it to an M&O Pre-Checker before taking another call.

3.2 Respond to Priority 1 SR

An M&O Pre-Checker will review, address, and respond to the Priority 1 SR within 2 hours of SacSewer receiving the call.

Proceed to Document & End.

3.3 Create Priority 1 SR Assigned to M&O Facilities Manager

Customer Service Dispatch and Country Central staff will create a Priority 1 SR and assign it to the M&O Facilities Manager before taking another call.

3.4 Respond to Priority 1 SR

The M&O Facilities Manager will review, address, and respond to the Priority 1 SR within 2 hours of SacSewer receiving the call.

Proceed to Document & End.

4.0 Is Caller Reporting a Priority 2 Problem?

Review **Table 203-2 Priority 2 Calls** for a list of reported problems with descriptions.

If yes, continue through steps 4.1, 4.3, 4.5, 4.7, or 4.9 accordingly.

If no, proceed to Document & End.

4.1 Create Priority 2 SR Assigned to M&O Pre-Checker

Customer Service Dispatch and Country Central staff will create a Priority 2 SR and assign it to an M&O Pre-Checker before taking another call.

4.2 Respond to Priority 2 SR

A M&O Pre-Checker will review, address, and respond to the Priority 2 SR within 5 days of receiving the call.

Proceed to Document & End.

4.3 Create Priority 2 SR Assigned to M&O Facilities Manager

Customer Service Dispatch and Country Central staff will create a Priority 2 SR and assign it to the M&O Facilities Manager before taking another call.

4.4 Respond to Priority 2 SR

The M&O Facilities Manager will review, address, and respond to the Priority 2 SR within 5 days of receiving the call.

Document & End.

4.5 Create Priority 2 SR Assigned to M&O Manager

Customer Service Dispatch and Country Central staff will create a Priority 2 SR and assign it to an M&O Manager before taking another call.

4.6 Create Priority 2 SR Assigned to Pipeline Support Project Manager

Customer Service Dispatch and Country Central staff will create a Priority 2 service request and assign it to the Pipeline Support Project Manager before taking another call.

4.7 Create Priority 2 SR Assigned to Customer Service Liaison

Customer Service Dispatch and Country Central staff will create a Priority 2 SR and assign it to the Customer Service Liaison before taking another call.

4.8 Assign Pre-Checker & Respond to Priority 2 SR

Customer Service Dispatch and Country Central staff will assign a Pre-Checker to review and address Plumber Referrals and Insect Mitigation, responding to the Priority 2 SR within 5 days of receiving the call.

If a customer has a complaint or compliment during this step, the M&O Manager will address the customer accordingly.

Proceed to Document & End.

4.9 Respond to Priority 2 SR

The Pipeline Support Project Manager will review, address, and respond to the Priority 2 SR within 5 days of receiving the call.

Proceed to Document & End.

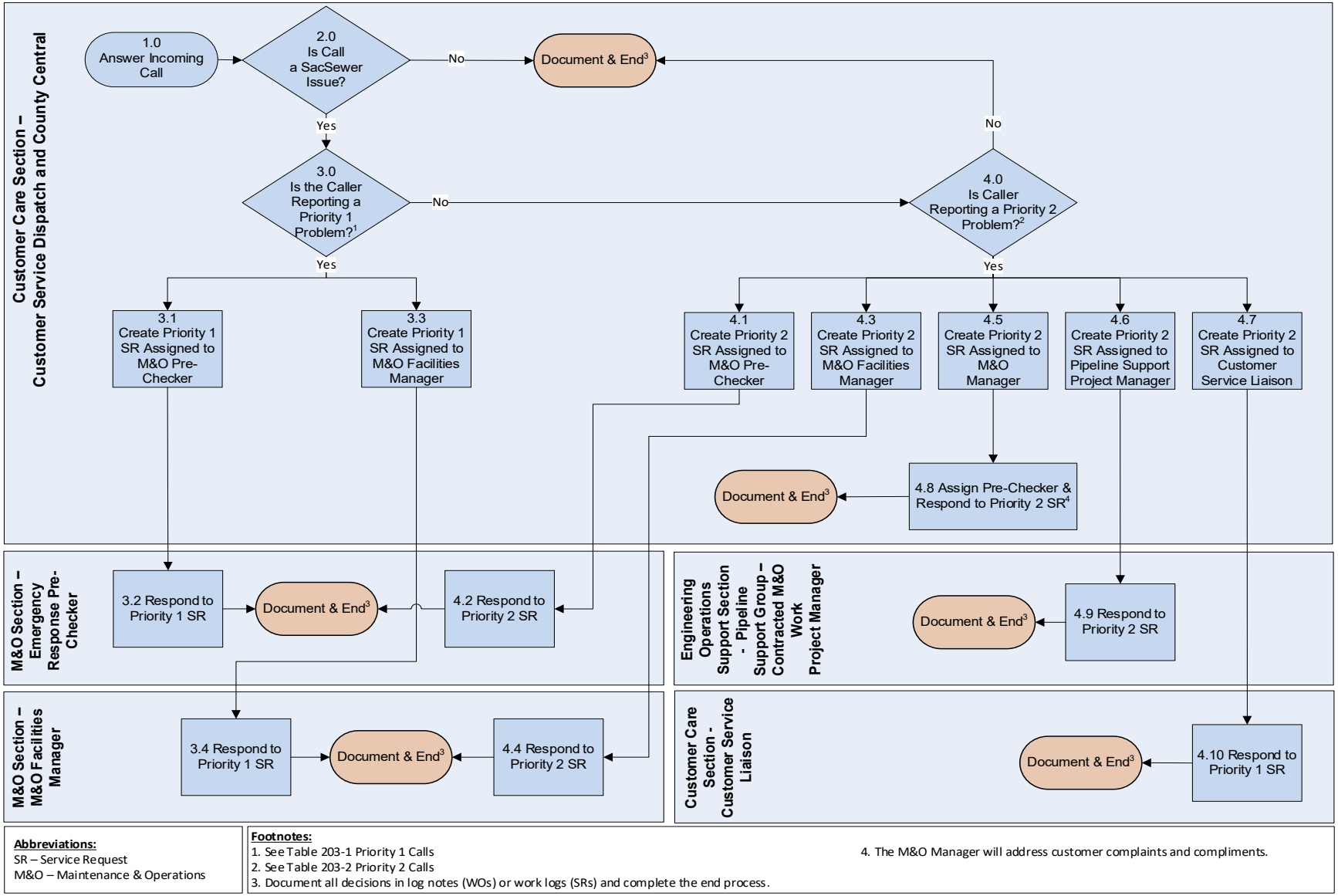
4.10 Respond to Priority 2 SR

The Customer Service Liaison will review, address, and respond to the Priority 2 SR within 5 days of receiving the call.

Proceed to Document & End.

203.5 Flowchart

Customer Call Handling and Service Request Creation Procedures Flowchart



Abbreviations:
SR – Service Request
M&O – Maintenance & Operations

Footnotes:
1. See Table 203-1 Priority 1 Calls
2. See Table 203-2 Priority 2 Calls
3. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
4. The M&O Manager will address customer complaints and compliments.

204 Main Line Maintain-Repair-Replace Decision Procedures

204.1. Purpose

The purpose of the **Main Line Maintain- Repair-Replace Decision Procedures** is to document and ensure consistent decision-making in determining the best preventive or corrective maintenance action for when issues are observed in main lines from a televised inspection.

204.2. Background

To reduce the frequency of spills caused by crush collapse, blockage, faulty repair, and inadequate cleaning failures, SacSewer utilizes CCTV equipment to perform TV inspections on pipe assets such as main lines as stated in SacSewer's **Televised Inspection Strategy, Section 301**. The Engineering Operations Support Section – Pipeline Support Group staff reviews TVIs to determine the appropriate corrective action. To ensure consistency in how SacSewer makes decisions for addressing defects in main line pipes, a procedure with detailed steps and a flowchart for staff to follow is needed.

204.3. Procedure Approach

SacSewer developed the **Main Line Maintain-Repair-Replace Decision Procedures** to identify and implement cost-effective solutions for maintaining its assets. In August of 2005, SacSewer's Asset Management Section began performing business case evaluations (BCEs) to address issues with SacSewer's assets, including main lines. The BCEs provided a cost-based comparison between various alternatives proposed for resolving identified main line issues. These alternatives typically include:

- Status quo,
- Re-evaluate at a future date,
- Add or change a preventive maintenance schedule, and
- Perform a repair or replacement

The analysis conducted in numerous main line BCEs has provided cost and solution efficacy data that was used to develop the **Main Line Maintain-Repair-Replace Decision Procedures**. SacSewer's Engineering Operations Support Section – Pipeline Support Group utilizes the following procedures when reviewing a lower lateral TV inspection and is responsible for providing suggestions if revisions are needed.

204.4. Descriptive Procedural Steps

Part 1 – Initial Assessment

1.0 ML TVI Review

Review TVI and assess observations.

2.0 Is there a ML Issue?

If yes, continue to step 4.0.

If no, continue to 3.0.

3.0 Is there a LL Issue?

Is there a LL issue that can be seen from the ML TVI? A LL issue could potentially cause an issue in the ML.

If yes, continue to step 3.1.

If no, proceed to Document and End.

3.1 Multiple Laterals with Issues?

If yes, continue to step 3.2.

If no, proceed to step 3.3.

3.2 Create a BCE

Create a BCE Service Request. No other TVI WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The **BCE Strategy, Section 207** describes when SacSewer performs a BCE.

Proceed to Document & End.

3.3 Follow LL Maintain-Repair-Replace Decision Procedures Part-2a.

4.0 Does the ML have Structural Issues?

ML structural issues include cracked, broken, missing, collapsed, or corroded pipe found through the ML TVI.

If yes, continue to Flowchart Part-2a.

If no, continue to step 5.0.

5.0 Is there Grease?

Steps 5.0 through 5.3 describe the process when grease is found through the ML TVI.

If yes, continue to 5.1.

If no, continue to 6.0.

5.1 Severity?

Grease severity can be described in the **TVI Manual, Section 204.7 – Grease in Pipe.**

If Light, proceed to Document & End.

If Moderate, continue to step 5.3.

If Severe, proceed to step 5.2.

5.2 Initiate FOG Advisory

Create an SR that is assigned to the appropriate workgroup. See the **Enforcement Response Plan** for more information.

5.3 Is this the 1st Assessment TVI?

If yes, continue to step 7.0.

If no, continue to Flowchart Part-3.

6.0 Are there Solids/Debris or Roots?

Steps 6.0 through 6.2 describe the process when solids/debris, or roots, are found through the ML TVI.

If yes, continue to 6.1.

If no, proceed to Document & End.

6.1 Severity?

Solids/Debris severity can be described in the **TVI Manual, Section 205.1 – Solids or Sediment**.

If Light, proceed to Document & End.

If Moderate or Severe, continue to step 6.2.

6.2 Is this the 1st Assessment TVI?

If yes, continue to step 7.0.

If no, continue to Flowchart Part-3.

7.0 Create Cleaning WO and TVI WO

Create a priority 2 cleaning work order and a priority 4 TVI work order to be completed in 12 months.

Proceed to Document & End.

Part 2a – Structural & Maintenance Assessment

1.0 Are there Multiple Structural Issues?

If yes, continue to step 2.0.

If no, continue to step 3.0.

2.0 Create a BCE

Create a BCE Service Request. No other TVI WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The **BCE Strategy, Section 207** describes when SacSewer performs a BCE.

Proceed to Document & End.

3.0 Is CPL, CRM, or CRS?

Is the pipe lightly cracked, moderately corroded, or severely corroded, as described in **TVI Manual, Section 204 – Pipe Observations?**

If yes, continue to step 3.1.

If no, continue to step 4.0.

3.1 Does a Previous TVI Exist?

If yes, continue to step 3.2.

If no, continue to step 3.3.

3.2 Has the Condition of the Crack Changed?

If yes, continue to step 3.3.

If no, proceed to Document & End.

3.3 Create TVI WO

Create a TVI work order to be conducted in 5 years after the most current TVI.

Proceed to Document & End.

4.0 Is CPM?

Is the pipe moderately cracked, as described in **TVI Manual, Section 205.2 – Cracked Pipe Observations?**

If yes, continue to 4.1.

If no, continue to 5.0.

4.1 Is Crack Below Spring Line?

If yes, continue to 4.2.

If no, continue to 4.4.

4.2 Is Repair an Emergency?

If yes, continue to 4.3.

If no, continue to 9.0.

4.3 Contact M&O Pipelines Manager

M&O Maintenance & Repair Group will proceed to step 8.0.

4.4 Is there Infiltration?

If yes, continue to step 9.0.

If no, continue to step 4.5.

4.5 Are there ≥ #4 Roots at Crack?

If yes, continue to step 9.0.

If no, continue to 4.6.

4.6 Create TVI WO

Create a TVI work order to be conducted in 5 years after the most current TVI.

Proceed to Document & End.

5.0 Is CPS?

Is the pipe severely cracked, as described in **TVI Manual, Section 205.2 – Cracked Pipe Observations?**

If yes, continue to Flowchart Part-2b.

If no, continue to step 6.0.

6.0 Is BPX, OJS, or XPX?

Is the pipe broken, severely offset, or collapsed, as described in **TVI Manual, Section 204 – Pipe Observations?**

If yes, continue to Flowchart Part-2c.

If no, continue to step 7.0.

7.0 Create a BCE

Create a BCE Service Request. No TVI WOs shall be written. Please see step 2.0 for more information.

Proceed to Document & End.

8.0 Perform Emergency Repair

M&O Maintenance & Repair Group will perform the emergency repair.

9.0 BCE or Repair?

This decision is decided upon by considering all variables.

If BCE is the decision, continue to step 10.0.

If Repair is the decision, continue to Flowchart Part-4.

10.0 Create a BCE

Create a BCE Service Request. No TVI WOs shall be written. Please see step 2.0 for more information.

Proceed to Document & End.

Part 2b – Structural & Maintenance Assessment

1.0 Is Crack >1" Wide?

If yes, continue to step 1.1.

If no, continue to step 1.2.

1.1 Is the ML Diameter <12"?

If yes, continue to step 3.0.

If no, continue to step 10.0.

1.2 Is there Visible Broken Pipe (BPX)?

If yes, continue to step 1.3.

If no, continue to step 2.0.

1.3 Is there Evidence of Soil Intrusion?

If yes, continue to step 3.0.

If no, continue to step 1.4.

1.4 Would Cleaning PM Activity Cause Soil Intrusion?

If yes, continue to step 3.0.

If no, continue to step 2.0.

2.0 Is Crack Below the Spring Line?

If yes, continue to step 3.0.

If no, continue to step 6.0.

3.0 Is Repair an Emergency?

If yes, continue to step 4.0.

If no, continue to step 9.0.

4.0 Contact M&O Pipelines Manager

ML TVI Review Group will notify the M&O Pipelines Manager that emergency repair work is needed.

Proceed to step 5.0.

5.0. Perform Emergency Repair

The M&O Maintenance & Repair Group will perform the emergency repair.

6.0 Is there Infiltration?

If yes, continue to step 9.0.

If no, continue to step 7.0.

7.0 Are there ≥ #4 Roots at the Crack?

If yes, continue to step 9.0.

If no, continue to step 8.0.

8.0 Create TVI WO

Create TVI WO to be conducted in 5 years after the most current TVI.

Proceed to Document & End.

9.0 BCE or Repair?

If BCE is the decision, continue to step 10.0.

If Repair is the decision, continue to Flowchart Part-4.

10.0 Create a BCE

Create a BCE Service Request. No other TVI WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The **BCE Strategy, Section 207** describes when SacSewer performs a BCE.

Proceed to Document & End.

Part 2c – Structural & Maintenance Assessment

1.0 Is BPX?

Is there a broken pipe, as described in the **TVI Manual**, **Section 204.3 – Broken Pipe?**

If yes, continue to step 1.1.

If no, continue to step 2.0.

1.1 Missing Pipe?

Missing pipe is an additional condition of a broken pipe, where a piece of broken pipe is missing, leaving a hole in the main line.

If yes, continue to step 1.4.

If no, continue to step 1.2.

1.2 BPX Stable?

Stable BPX has uninterrupted flow, no infiltration, and no evidence of soil intrusion.

If yes, continue to step 1.3.

If no, proceed to step 10.0.

1.3 Create TVI WO

Create a TVI work order to be conducted 5 years after the most current TVI.

Proceed to Document & End.

1.4 Is Largest Hole Dimension ≥¼ Pipe Diameter?

If yes, continue to step 1.5.

If no, continue to step 1.6.

1.5 Is ML Diameter <12"?

If yes, continue to step 8.0.

If no, continue to step 12.0.

1.6 Is there Visible Broken Pipe (BPX)?

If yes, continue to step 1.7.

If no, continue to step 1.9.

1.7 Is there Evidence of Soil Intrusion?

If yes, continue to step 8.0.

If no, continue to step 1.8.

1.8 Would Cleaning PM Activity Cause Soil Intrusion?

If yes, continue to step 8.0.

If no, continue to step 1.9.

1.9 Missing Pipe Below the Spring Line?

If yes, continue to step 8.0.

If no, continue to step 5.0.

2.0 Is OJS?

Is the severely offset, as described in **TVI Manual Section 204.6 – Offset Joint Pipe Observations?**

If yes, continue to step 2.1.

If no, continue to step 3.0.

2.1 > Than Thickness of the Pipe Wall?

If yes, continue to step 2.2

If no, continue to step 2.5.

2.2 Disrupting Flow?

If yes, continue to step 2.4.

If no, continue to step 2.3.

2.3 Create TVI WO

Create TVI WO to be conducted in 5 years after the most current TVI.

Proceed to Document & End.

2.4 > 16 ft Deep?

If yes, continue to step 4.0.

If no, continue to step 11.0.

2.5 Against Flow?

If yes, continue to step 4.0.

If no, continue to step 2.6.

2.6 Create TVI WO

Create a TVI work order to be conducted in 5 years after the most current TVI.

Proceed to Document & End.

3.0 Is XPX?

Is the pipe collapsed, as described in **TVI Manual, Section 204.4 – Loss of Structural Integrity?**

If no, continue to step 4.0.

If yes, continue to step 5.0.

4.0 Create a BCE

Create a BCE Service Request. No other TVI WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The **BCE Strategy, Section 207** describes when SacSewer performs a BCE.

Proceed to Document & End.

5.0 Is there Infiltration?

If yes, continue to step 11.0.

If no, continue to step 6.0.

6.0 Roots ≥ #4 Roots at Area of Concern?

If yes, continue to step 11.0.

If no, continue to step 7.0.

7.0 Create TVI WO

Create a TVI work order to be conducted in 5 years after the most current TVI.

Proceed to Document & End.

8.0 Is Repair an Emergency?

If yes, continue to step 9.0.

If no, continue to step 11.0.

9.0 Contact M&O Pipelines Manager

Pipeline Support Main Line TVI Review will contact the M&O Pipelines Manager to notify of work created to perform an emergency repair.

Proceed to step 10.0.

10.0 Perform Emergency Repair

The M&O Maintenance & Repair Group will perform the emergency repair.

11.0 BCE or Repair?

If BCE is the decision, continue to step 12.0.

If Repair is the decision, continue to Flowchart Part-4

12.0 Create a BCE

Create a BCE Service Request (SR). No TVI WOs shall be written. Please see step 4.0 for more information.

Proceed to Document & End.

Part 3 - Preventive Maintenance Decision

SacSewer uses 3, 6, 12, 18, 24, 36, 48, or 60-month cleaning PM frequencies for main lines. PM frequencies outside this approved list would require supervisor approval.

1.0 Is the ML on MLSM Program?

If yes, continue to step 1.1.

If no, continue to step 2.0.

1.1 Is ML on Correct Job Plan?

If the ML is on a cleaning PM, verify that the PM is on the correct job plan.

If yes, continue to step 1.4.

If no, continue to step 1.2.

1.2 Change Job Plan

Change the Job Plan to alleviate the maintenance defect found.

Continue to step 1.3.

1.3 Create a TV for Condition and PM Eval WO

Create a TV for Condition and PM Eval work order one year out from cleaning with the new job plan.

Proceed to Document & End.

1.4 Is ML on the Correct Cleaning PM Frequency?

If yes, proceed to Document & End.

If no, continue to step 1.5.

1.5 Increase Frequency

Increase the frequency to the next highest frequency.

Proceed to Document & End.

2.0 Prior Stoppages?

If yes, continue to step 3.0.

If no, continue to step 2.1.

2.1 Put ML on MLSM Program

Proceed to Document & End.

3.0 Evaluate ML History for Stoppage Intervals

If ≥ 12 months, continue to step 5.0.

If < 12 months, continue to step 4.0.

4.0 Create a BCE

Create a BCE Service Request. No other TVI WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The **BCE Strategy, Section 207** describes when SacSewer performs a BCE.

Proceed to Document & End.

5.0 Put ML on the MLSM Program

Proceed to Document & End.

Part 4 – Corrective Maintenance Decision

1.0 Is Pipe Flagged for Rehab/Infill Project?

The ML TVI Reviewer will evaluate the asset history to confirm if any work has been created and or is pending for rehabilitation or infill projects.

If yes, continue to step 1.1.

If no, continue to step 2.0.

1.1 Create a BCE

Create a BCE Service Request. No other TVI WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The **BCE Strategy, Section 207** describes when SacSewer performs a BCE.

Proceed to Document & End.

2.0 Is Pipe Too Uneven for CIPP Patch?

The defective area of the main line may have cracked or broken pipe edges or pieces that may be oriented such that it may be too severe and uneven for a CIPP patch repair. The preferred alternative is a dig and replace method of repairing the defective main line.

If yes, continue to step 2.1.

If no, continue to step 3.0.

2.1 Create WO for Dig & Replace

The Engineering Pipeline Support Group – ML TVI Review Unit will create a WO for Dig & Replace. The Operations & Engineering Support Unit can directly assign this work to the Contracted M&O Work unit.

Continue to step 6.0.

3.0 Is there Visible Broken Pipe?

If Broken Pipe, as described in **TVI Manual, Section 204.3 – Broken Pipe or Hole in Pipe,** is detected from the TVI around the pipe, it would need to be grouted if possible to minimize the risk of loss of support around the main line and other possible structural damage.

If yes, continue to step 3.1.

If no, continue to step 4.0.

3.1 Is Grout & CIPP Patch Repair Cost 15% Less Than Dig and Replace Cost?

Since there is visible broken pipe and the pipe is still smooth enough for a CIPP repair, a Grout & CIPP Patch repair may be used, depending on the cost comparison to a Dig & Replace repair.

The Engineering Pipeline Support Group prepares cost estimates to compare and decide on the most economical alternative to repair the defective main line. The Grout & CIPP cost criteria of less than 15% of the dig and replace repair method is to account for additional risks associated with CIPP, future maintenance, and potential unseen outside voids due to soil erosion. The Operations & Engineering Support Unit consults with the Contracted M&O Work Unit for the latest costs to use for the BCE. Two cost estimates typically used are:

- Grout & CIPP Patch Repair
- Dig & Replace

These estimates allow the Engineering Pipelines Support Group to make the most cost-effective decision by comparing the costs of the common methods of repairing the defective main line.

If yes, continue to step 3.2.

If no, continue to step 4.1.

3.2 Create WO for Grout & CIPP Patch Repair

The Engineering Pipeline Support Group – ML TVI Review Unit will create the WO for Grout & CIPP Repair and the TVI after Grout & CIPP Repair.

Continue to step 5.1.

4.0 Is CIPP Patch Cost 15% Less Than Dig and Replace Cost?

Since there is visible broken pipe and the pipe is still smooth enough for a CIPP repair, a CIPP Patch repair may be used, depending on the cost comparison to a D&R repair.

The Engineering Pipeline Support Group prepares cost estimates to compare and decide on the most economical alternative to repair the defective main line. The CIPP cost criteria of less than 15% of the dig and replace repair method is to account for additional risks associated with CIPP, future maintenance, and potential unseen outside voids due to soil erosion. The Operations and Engineering Support Unit consults with the Contracted M&O Work unit for the latest costs to use for the BCE. Two cost estimates typically used are:

- CIPP Patch Repair
- Dig & Replace

These estimates allow the Engineering Pipelines Support Group to make the most cost-effective decision by comparing the costs of the common methods of repairing the defective main line.

If yes, continue to step 5.0.

If no, continue to step 4.1.

4.1 Create WO for Dig & Replace and TVI After Replace

The Engineering Pipeline Support Group will create a WO for Dig & Replace repair and the TVI after Repair

Continue to step 6.0.

5.0 Create WO For CIPP Patch and TVI After CIPP Patch Repair

The Engineering Pipeline Support Group will create a WO for the CIPP patch repair. The Operations & Engineering Support Unit can directly assign this work to the Contracted M&O Work unit.

Continue to step 5.1.

5.1 Assign WO to Contracted M&O Work Group

The Engineering Pipeline Support Group will assign the work order to the Contracted M&O Work Unit. The Operations & Engineering Unit will arrange a meeting with the Contracted M&O Work Unit to discuss the issue found and the recommended repair.

Proceed to step 8.0.

6.0 Can M&O Perform the Work?

The M&O Workload Planning & Scheduling Group will confirm if M&O can perform the work written for the Dig & Replace.

If yes, proceed to step 7.0.

If no, go back to step 5.1.

7.0 Perform the Dig & Replace Repair

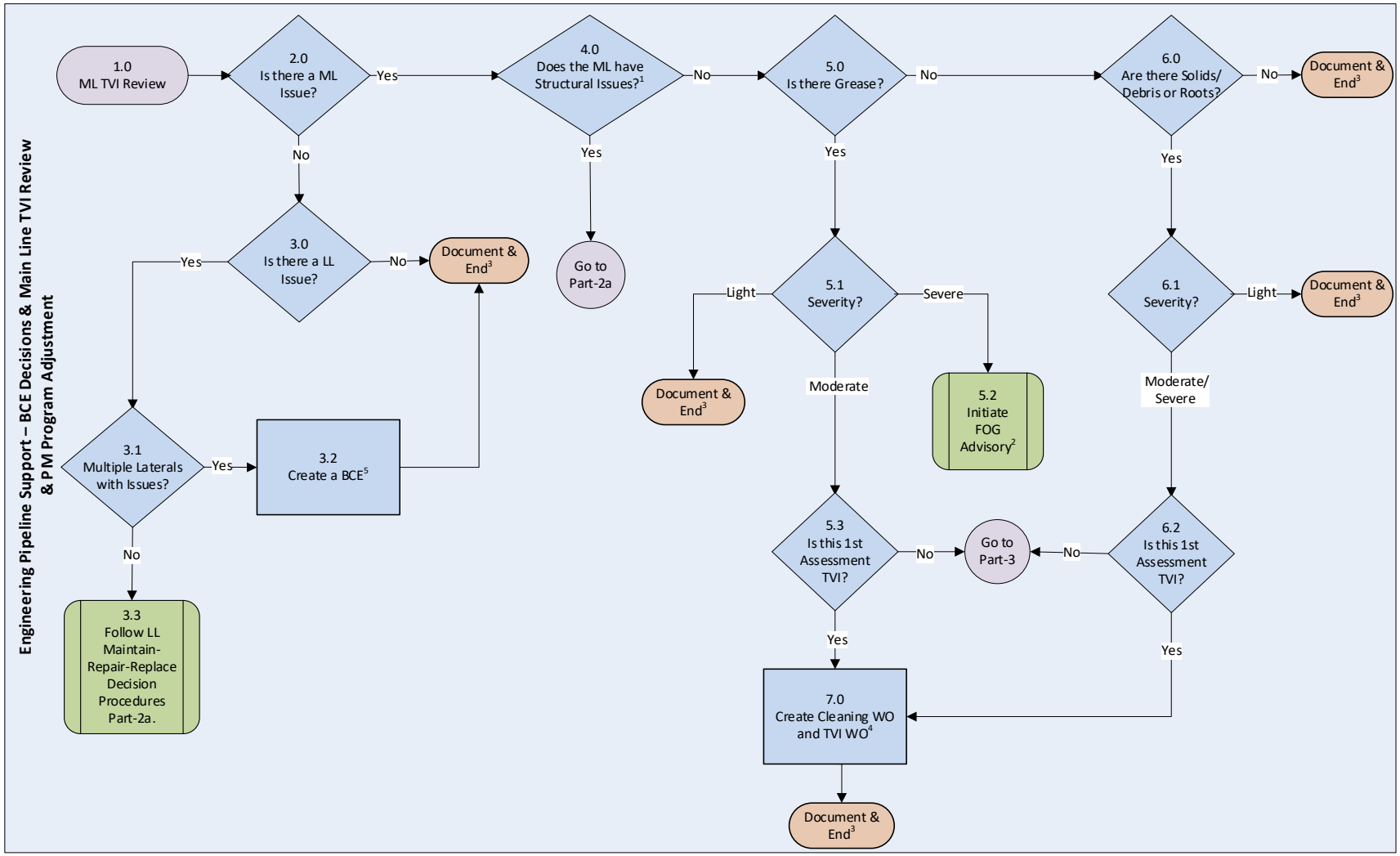
The M&O Workload Planning & Scheduling Group will schedule the work for the M&O Repair and Maintenance Group to perform the work.

8.0 Perform Repair through Contractor

The Engineering Pipeline Support Group will coordinate the recommended repair through the use of contractors. The Contracted M&O Work unit will be responsible for completing any necessary documentation.

204.6 Flowcharts

Main Line Maintain-Repair-Replace Decision Procedures
Part 1 - Initial Assessment Flowchart



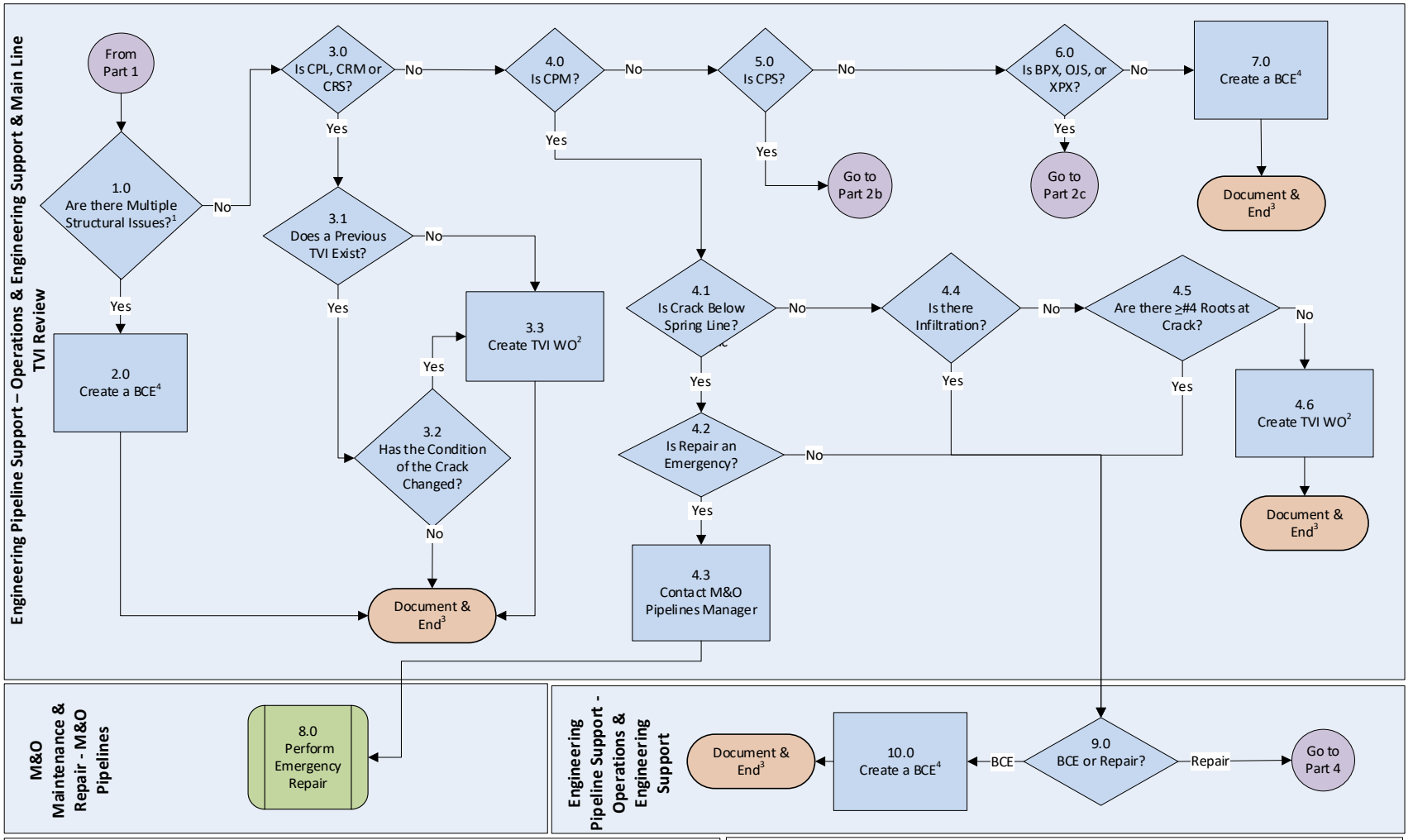
Abbreviations and Defect Codes:

BCE – Business Case Evaluation
FOG – Fats, Oils, & Grease
LL – Lower Lateral
ML – Main Line
TVI – Television Inspection
WO – Work Order
SR – Service Request

Footnotes:

1 Structural issues include cracked, broken, missing, collapsed, or moderate/severe corrosion.
2. See the Enforcement Response Process.
3. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
4. Write a priority 2 cleaning work order and a priority 4 TVI work order to be completed in 12-months.
5. Create a BCE SR. When a BCE SR is created no other TVI WO's should be created. The **BCE Strategy** will remedy if a TVI is necessary.

Main Line Maintain-Repair-Replace Decision Procedures
Part 2a - Structural & Maintenance Assessment Flowchart



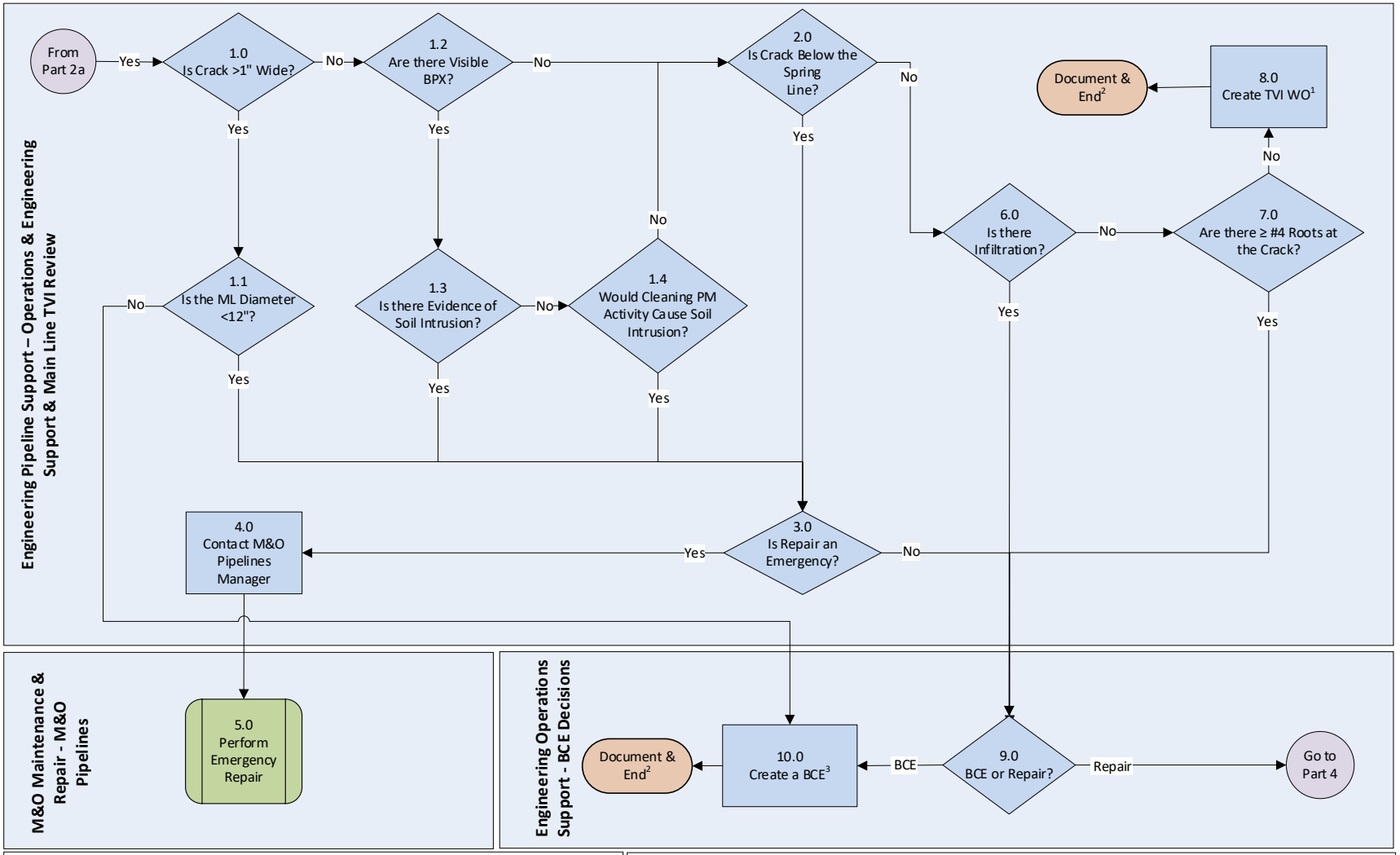
Abbreviations and Defect Codes:

BCE – Business Case Evaluation
CPL – Lightly Cracked Pipe
CPM – Moderately Cracked Pipe
CPS – Severely Cracked Pipe
TVI – Television Inspection
WO – Work Order
BPX – Broken Pipe
CRM – Moderately Corroded Pipe
CRS – Severely Corroded Pipe
OJS – Offset Joint Severe
XPX – Collapsed Pipe

Footnotes:

1. Structural issues include cracked, broken, missing, collapsed, or moderate/severe corrosion.
2. Create TVI work order to generate 5 years after previous TVI.
3. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
4. Create a BCE SR. When a BCE SR is created no other TVI WO's should be created. The **BCE Strategy** will remedy if a TVI is necessary.

Main Line Maintain-Repair-Replace Decision Procedures
Part 2b - Structural & Maintenance Assessment Flowchart



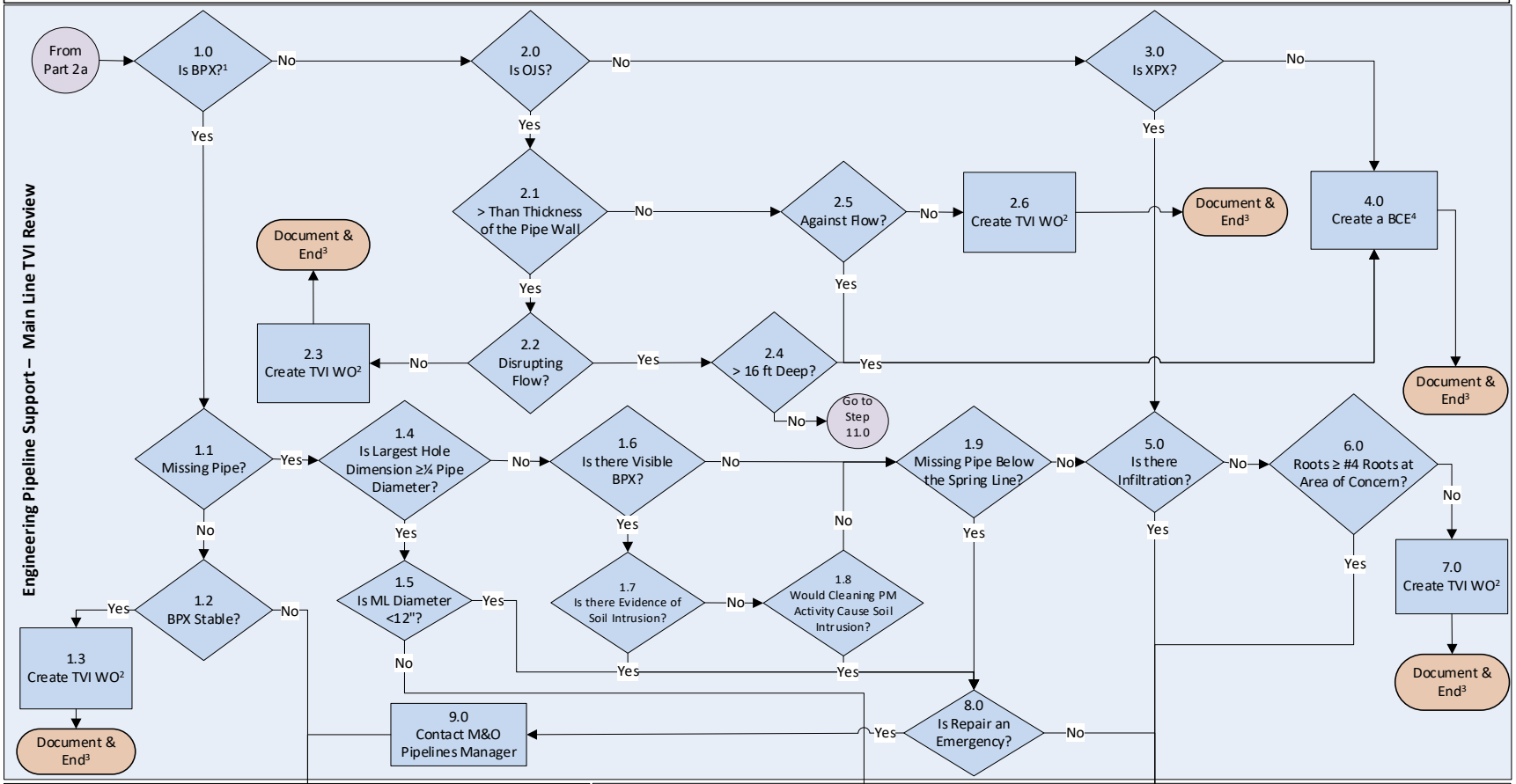
Abbreviations and Defect Codes:

BPX – Broken Pipe
ML – Main line
M&O – Maintenance & Operations
BCE – Business Case Evaluation
TVI – Television Inspection
WO – Work Order
PM – Preventative Maintenance

Footnotes:

1. Create TVI Work Order to generate 5 years after previous TVI.
2. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
3. Create a BCE SR. When a BCE SR is created no other TVI WO's should be created. The **BCE Strategy** will remedy if a TVI is necessary.

Main Line Maintain-Repair-Replace Decision Procedures
Part 2c - Structural & Maintenance Assessment Flowchart



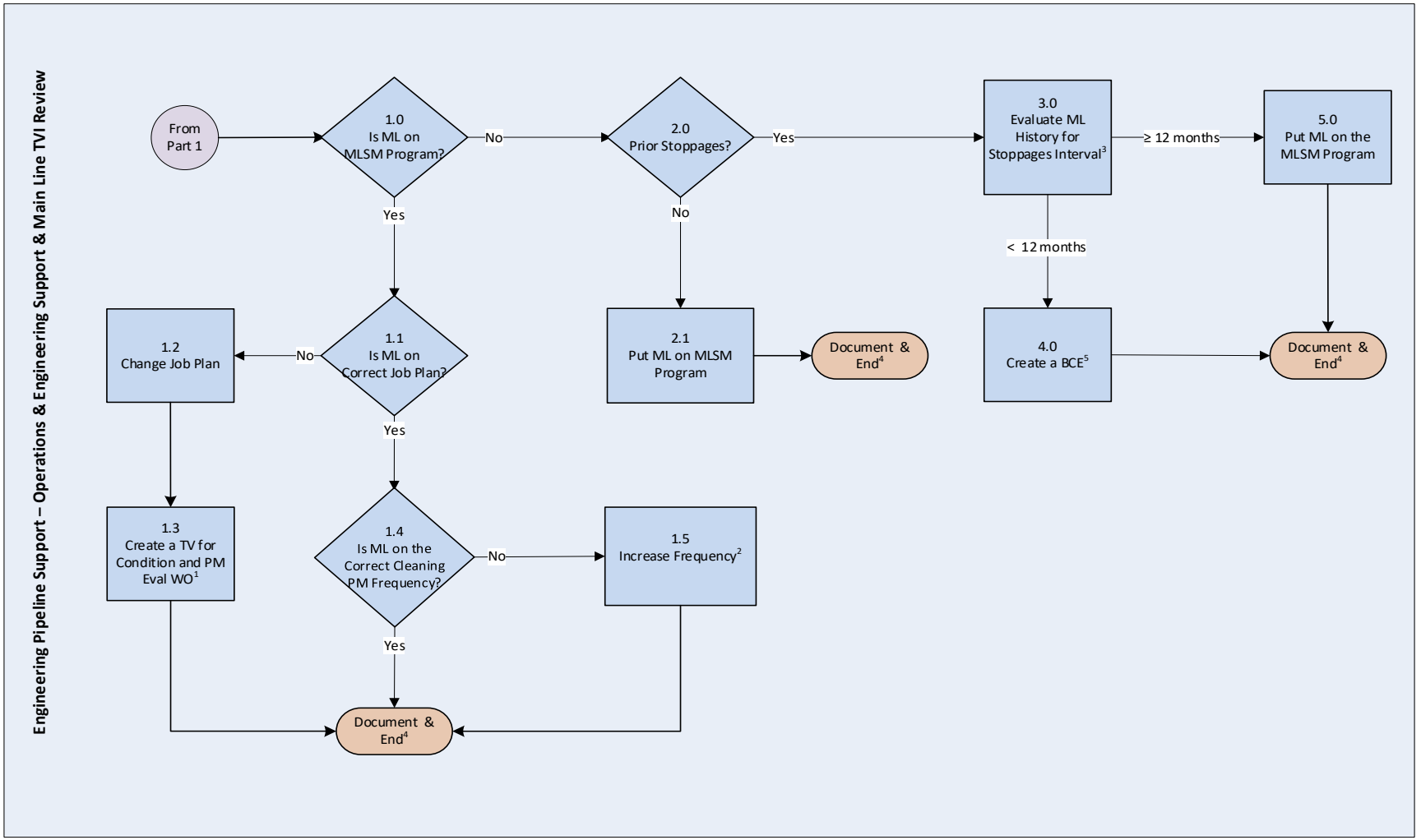
Abbreviations and Defect Codes:

OJS – Offset Joint Severe	BPX – Broken Pipe
ML – Main Line	XPX – Collapsed Pipe
M&O – Maintenance & Operations	BCE – Business Case Evaluation
TVI – Television Inspection	
PM – Preventative Maintenance	
WO – Work Order	

Footnotes:

1. Cracked, broken, missing, or collapsed pipe with multiple defects are not covered under this procedure. They will require a BCE.
2. Create TVI Work Order to be conducted 5 years after the most current TVI.
3. Document & End Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
4. Create a BCE SR. When a BCE SR is created no other TVI WO's should be created. The **BCE Strategy** will remedy if a TVI is necessary.

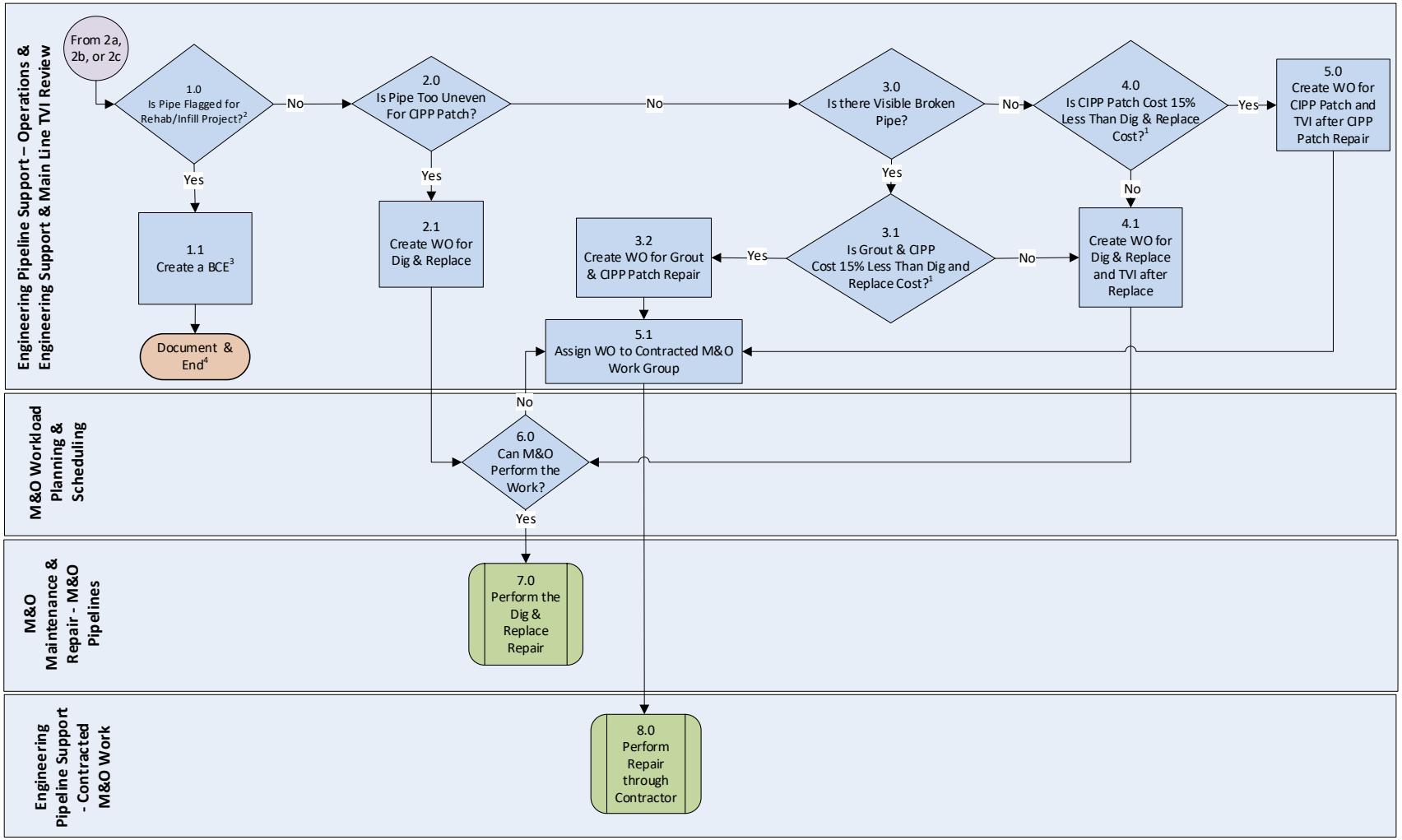
Main Line Maintain-Repair-Replace Decision Procedures
Part 3 - Preventive Maintenance Decision Flowchart



Abbreviations and Defect Codes:
BCE – Business Case Evaluation
ML – Main Line
MLSM – Main Line Schedule Maintenance Program
PM – Preventive Maintenance
TVI – Television Inspection
WO – Work Order

Footnotes:
1. Create a TV for Condition and PM Evaluation one year out from latest cleaning that utilizes the new job plan
2. Create a BCE when the next higher frequency is less than 3 months
3. Always select the shortest stoppage interval when choosing a cleaning PM frequency
4. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
5. Create a BCE SR. When a BCE SR is created no other TVI WO's should be created. The **BCE Strategy** will remedy if a TVI is necessary.

Main Line Maintain-Repair-Replace Decision Procedures
Part 4 - Corrective Maintenance Decision Flowchart



Abbreviations and Defect Codes:
CIPP – Cured in Place Pipe
PM – Project Manager
WO – Work Order

Footnotes:
1. CIPP patch, full CIPP, and Grout costs must be 15% less than dig and replace to account for additional risk with the method. Risks for CIPP patch include future maintenance and unseen outside void due to broken pipe.
2. Use the asset history to determine if there is any pending rehab/infill work for a project.
3. Create a BCE SR. When a BCE SR is created no other TVI WO's should be created. The **BCE Strategy** will remedy if a TVI is necessary.
4. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.

205 Lower Lateral Maintain-Repair-Replace Decision Procedures

205.1 Purpose

The purpose of the **Lower Lateral Maintain-Repair-Replace Decision Procedures** is to document and ensure consistent decision-making when determining the best preventive or corrective maintenance action for when issues are observed in lower laterals from a televised inspection.

205.2 Background

To reduce the frequency of spills caused by crush collapse, blockage, faulty repair, and inadequate cleaning failures, SacSewer utilizes CCTV equipment to perform TV inspections on pipe assets such as lower laterals as stated in SacSewer's **Televised Inspection Strategy, Section 301**. The Engineering Operations Support Section – Pipeline Support Group staff reviews TVIs to determine the appropriate corrective action. To ensure consistency in how SacSewer makes decisions for addressing defects in lower laterals pipes, a procedure with detailed steps for staff to follow is needed.

205.3 Procedure Approach

SacSewer developed the **Lower Lateral Maintain-Repair-Replace Decision Procedures** to identify and implement cost-effective solutions for maintaining its assets. In August of 2005, SacSewer's Asset Management Section began performing business case evaluations (BCEs) to address issues with SacSewer's assets, including lower laterals. The BCEs provided a cost-based comparison between various alternatives proposed for resolving identified lower lateral issues. These alternatives typically include:

- Status quo,
- Re-evaluate at a future date,
- Add or change a preventive maintenance schedule, and
- Perform a repair or replacement

The analysis conducted in numerous lower lateral BCEs has provided cost and solution efficacy data that was used as the foundation for developing the **Lower Lateral Maintain-Repair-Replace Decision Procedures**. SacSewer's Engineering Operations Support Section – Pipeline Support Group utilizes the following procedures when reviewing a lower lateral TV inspection and is responsible for providing suggestions if revisions are needed.

205.4 Descriptive Procedural Steps

Part 1 – Initial Assessment

1.0 LL TVI Review

Review TVI and assess observations.

2.0 Is there a Connection Downstream of the Cleanout (CO)/Easement?

If yes, continue to step 9.0.

If no, continue to step 3.0.

3.0 Is the TVI Complete?

If yes, continue to step 5.0.

If no, continue to step 4.0.

4.0 Incomplete due to Method?

An alternate method, such as using a string to guide the camera past an offset, or using a reverse set up from a node may be required to complete an inspection. In some cases, cleaning is needed to enable a complete TVI to be recorded.

If yes, continue to step 4.1.

If no, continue to step 4.2.

4.1 Create a WO to Rework TVI

Create a work order to have the TVI reworked due to the prior incomplete inspection.

Proceed to Document & End.

4.2 Cause of Incomplete TVI

If Maintenance, continue to step 4.3.

If Structural, continue to Flowchart Part-2a.

4.3 Create WO to Clean & TVI

Create a work order to clean the LL, and then create a TVI to be completed within the next 30 days.

Proceed to Document & End.

5.0 Sunken Area or Broken Pipe (BPX)?

This question usually stems from a service request (SR) via a service call, where M&O staff will verify if there is a sunken area or broken pipe and its location.

If yes, continue to step 5.1

If no, continue to step 6.0

5.1 LL Issue Causing Sunken Area or Broken Pipe (BPX)?

Such issues are generally structural defects, which can lead to broken pipe that can result in missing pipe causing soil above the pipe to cave in, thus creating a sunken area at ground level. These types of defects will generally require a dig and repair.

If yes, continue to Flowchart Part-2a.

If no, continue to step 5.2.

5.2 LL Location?

If Street, continue to step 9.0.

If Easement, continue to step 5.3.

5.3 Was there a WO to Repair LL in the Last Year?

Reference the asset history to evaluate whether a repair was completed or not in the last year.

If yes, continue to step 5.4.

If no, continue to step 6.0.

5.4 Create a Repair/Restoration WO

Create a repair or restoration WO to repair the LL, and thus the sunken area. Depending on the length and location of the sunken area, a full LL replacement may be the cost-effective solution. Discuss this decision with your supervisor, and if necessary, create a BCE.

Continue to step 6.0.

6.0 SacSewer CO Present?

A SacSewer CO is a single-direction cleanout located within the SacSewer easement or Right of Way.

If yes, continue to step 8.0.

If no, continue to step 6.1.

6.1 LL Location?

If Street, continue to step 7.0.

If Easement, continue to step 6.2.

6.2 Depth ≥16 ft or Horizontal Length >10 ft?

Horizontal length is measured from the bottom of the wye to the bend of the main line.

If yes, continue to step 6.3.

If no, continue to step 6.4.

6.3 Create a BCE

Create a BCE Service Request. No other WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The **BCE Strategy, Section 207** describes when SacSewer performs a BCE.

Proceed to Document & End.

6.4 Create WOs to Replace LL and TVI After

Create a work order to replace the LL and TVI the LL after the replace.

Proceed to Document & End.

7.0 Are there Any Other Issues in the LL?

If yes, continue to Flowchart Part-2a.

If no, continue to step 7.1.

7.1 Is the LL Connected to a MH?

If yes, Proceed to Document & End.

If no, continue to step 7.2.

7.2 Create WOs to Install SacSewer CO and TVI After

Create a WO to install a SacSewer CO if no other issue exists in the LL more than 8 feet from the bottom of the wye. Follow the **Televised Inspection Strategy, Section 301** and

create a quality control TVI WO to TVI LL after repair work is completed to verify that the quality of work performed is acceptable.

Proceed to Document & End.

8.0 CO or Riser Issue?

Is there a Issue with the CO or riser (i.e., poor grade, broken pipe, CO high or CO low, broken or missing Sewer Relief Valve (SRV) or Carson box, etc.)?

If yes, continue to step 8.1.

If no, continue to Flowchart Part-2a.

8.1 Are there Any Other Issues in the LL?

If yes, continue to Flowchart Part-2a.

If no, continue to step 8.2.

8.2 Create a WO to Fix CO and TVI After or Fix Riser

Create a WO to repair CO or Riser only if no other structural issues exist in the LL. A structural issue is considered to be any of the following: broken pipe, collapsed pipe, Orangeburg pipe, moderate or severe cracked pipe, severe offset joint, severe swale, and moderate or severe oval pipe.

Proceed to Document & End.

9.0 Create a BCE

Create a BCE Service Request. No other WO's shall be written. Please see step 6.3 for more information.

Proceed to Document & End.

Part 2a – Structural & Maintenance Assessment

2.0 LL Issues?

If yes, continue to step 2.2.

If no, continue to step 2.1.

2.1 Is there a Non-Tap or MH Issue?

If yes, continue to step 2.1.1.

If no, continue to step 2.1.2.

2.1.1. Send Communication Log to ML TVI Supervisor

Send communication log to ML TVI Supervisor stating the identified issues.

Proceed to Document & End.

2.1.2. Is there a Structural Issue at the ML Tap?

If yes, continue to step 2.1.3.

If no, continue to step 2.1.5.

2.1.3. Depth of LL ≥ 8 ft?

If yes, continue to step 2.1.4.

If no, continue to step 2.1.6.

2.1.4. Is the Location in the Street (ST), a Cul-de-sac (CDS) or Intersection (INT)?

If yes, continue to step 2.1.9.

If no, continue to step 2.1.8.

2.1.5. Is there a Maintenance Issue at the ML Tap?

If yes, continue to Flowchart Part-2c.

If no, Proceed to Document & End.

2.1.6. LL Location in the Easement?

If yes, continue to step 2.1.8.

If no, continue to step 2.1.7.

2.1.7. Create Tap Replace WO and TVI LL After Tap Replace

Create Tap Replace work order and TVI LL After Tap Replace work order.

Proceed to Document and End.

2.1.8. Create WOs to Dig & Replace LL, Replace ML Tap, and TVI After

Create Dig & Replace, Replace Mainline Tap, and TVI after Replace work orders.

Proceed to Document & End.

2.1.9. Create a BCE

Create a BCE Service Request. No other WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The BCE Strategy, Section 207 describes when SacSewer performs a BCE.

Proceed to Document & End.

2.2. Is there a CO?

If yes, continue to step 2.3.

If no, continue to step 2.2.1.

2.2.1 Are there Structural Issues?

If yes, continue to step 2.3.

If no, continue to step 2.2.2.

2.2.2 Create COI and TV After COI WOs

Create a Clean Out Install work order and TV after Clean Out Install work order.

Proceed to Document & End.

2.3. Issues at Multiple Footages

If yes, continue to step 2.3.1.

If no, continue to Flowchart Part 2b.

2.3.1. Two Structural Issues More Than Eight Feet Apart?

A structural issue is considered any of the following: broken pipe, collapsed pipe, Orangeburg pipe, moderate or severe cracked pipe, moderate or severe offset joint, severe swale, and moderate or severe oval pipe.

If yes, continue to Flowchart Part-4.

If no, continue to step 2.3.2.

2.3.2. Two Structural Issues Less Than Eight Feet Apart?

When there are two structural issues less than eight feet apart, they are considered one issue.

If yes, continue to step 2.3.4.

If no, continue to step 2.3.3.

2.3.3. At Least One Structural Issue?

Is there at least one structural issue?

If yes, continue to step 2.3.4.

If no, continue Flowchart Part-2b.

2.3.4. Is there a Need for Maintenance?

In addition to one structural issue, is there also a need to maintain the issue through scheduled preventive maintenance? A maintenance issue is considered any of the following: roots, grease, solids, and debris.

If yes, continue to Flowchart Part-3.

If no, continue to Flowchart Part-2b.

Part 2b – Structural & Maintenance Assessment

2.4. Offset Joint Severe (OJS), Moderate Oval Pipe (OVM), or Several Oval Pipe (OVS)?

Does the pipe have an offset joint severe as described in **TVI Manual, Section 204.6 – Offset Joint**, or a moderate/severe out-of-round pipe as described in **TVI Manual, Section 204.10 – Out of Round?**

If yes, continue to step 2.4.1.

If no, continue to step 2.5.

2.4.1. Can the Cleaning Equipment Pass?

Can maintenance equipment get past the OJS, OVM, or OVS?

If yes, continue to step 2.4.2.

If no, continue to Flowchart Part-3.

2.4.2. Did OJS, OVM, or OVS Cause a Stoppage or a Maintenance Issue?

A maintenance issue includes solids as described in **TVI Manual, Section 205.1 – Solids or Sediments**, grease as described in **TVI Manual, Section 204.7 – Grease in Pipe**, or roots as described in **TVI Manual, Section 204.9 – Roots in Pipe.**

If yes, continue to Flowchart Part-3.

If no, continue to step 2.4.3.

2.4.3. Create SR for Asset Alert noting OJS, OVM, or OVS

Create a service request for an Asset Alert noting the OJS, OVM, or OVS and its footage. If an Asset Alert for that issue already exists, do not create another Asset Alert SR.

Proceed to Document & End.

2.5. Broken (BPX), Collapsed (XP), Moderate or Severe Cracked (CPM or CPS), Severe Corrosion (CRS), or Orangeburg Pipe (ORG)?

Is the pipe broken as described in **TVI Manual, Section 204.3 – Broken Pipe or Hole in Pipe**, collapsed as described in **TVI Manual, Section 204.4 – Loss of Structural Integrity**, showing moderate or severe cracked pipe as described in **TVI Manual, Section 205.2 – Cracked Pipe**, severe corrosion as described in **TVI Manual, Section 204.5 – Corrosion**, or is Orangeburg Pipe material?

If yes, continue to Flowchart Part-3.

If no, continue to step 2.6.

2.6. Grease?

If yes, continue to step 2.6.1.

If no, continue to Flowchart-2c.

2.6.1. Severity?

Is the grease severity Light, Moderate, or Severe as described in **TVI Manual, Section 204.7 – Grease in Pipe?**

If Light, proceed to Document & End.

If Moderate, continue to step 2.6.2.

If Severe, continue to step 2.6.4.

2.6.2. Has the LL been Cleaned?

If yes, continue to Flowchart Part-3.

If no, continue to step 2.6.3.

2.6.3. Create WOs to Clean and TVI after Cleaning

Create work orders to clean the LL using a priority based upon the severity and TVI the LL 12 months after the cleaning to evaluate the build-up of grease.

Proceed to Document & End.

2.6.4. Create SR to Initiate FOG Process & Create a TVI

Create SR to initiate FOG Process and create a TVI work order as a Priority 2 to be completed in 12 months from the current TVI.

Refer to the **Enforcement Response Process** for FOG advisory and enforcement process.

Part 2c – Structural & Maintenance Assessment

2.7. Swales, Reverse Grade, Solids, or Debris?

If yes, continue to step 2.7.1.

If no, continue to step 2.8.

2.7.1. Is the Camera Underwater?

Is the camera underwater, as described in **TVI Manual, Section 201.5 – Water Level**, preventing a complete review of the LL's condition?

If yes, continue to step 2.7.2.

If no, continue to step 2.8.5.

2.7.2. Is the Tap Location MH and LL Diameter ≥6 inches?

If yes, continue to step 2.7.4.

If no, continue to step 2.7.3.

2.7.3. Create a BCE

Create a BCE Service Request. No other WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The BCE Strategy, Section 207 describes when SacSewer performs a BCE.

Proceed to Document & End.

2.7.4. Create WO to TVI LL from MH with ML camera.

Proceed to Document & End.

2.8. Roots?

Are there roots present in the pipe as described in the **TVI Manual, Section 204.9 – Roots in Pipe?**

If yes, continue to step 2.8.1.

If no, continue to step 2.8.4.

2.8.1. Roots in the UL?

If yes, continue to step 2.8.2.

If no, continue to step 2.8.3.

2.8.2. Initiate UL Root Process

Refer to the **Enforcement Response Process** and the **Upper Lateral Root Process.**

Continue to step 2.8.7.

2.8.3. Roots at ML Tap Inside the LL?

Roots at the ML Tap can be described in **TVI Manual, Section 206.1 – Roots in Lower Laterals Tap.**

If yes, continue to step 2.8.7.

If no, continue to step 2.8.4.

2.8.4. Create a BCE

Create a BCE Service Request. No other WO's shall be written. Please see step 2.7.3 for more information.

Proceed to Document & End.

2.8.5. Cleaned in the Last 6 Months?

If yes, continue to step 2.8.6.

If no, continue to step 2.8.7.

2.8.6. Create a TVI WO

Create a work order to TVI the LL in 1 year from the cleaning work order.

Proceed to Document & End.

2.8.7. Cleaned in the Last 5 Years?

Review the asset history to evaluate if the LL has been cleaned within the last 5 years.

If yes, continue to Flowchart Part-3.

If no, continue to step 2.8.8.

2.8.8. Severity?

Is the grease severity Light, Moderate, or Severe as described in **TVI Manual, Section 204.7 – Grease in Pipe**?

If Light or Moderate, continue to step 2.8.9.

If Severe, continue to step 2.8.10.

2.8.9. Create WOs to Clean and TVI the LL

Create a cleaning work order to clean the LL and then create a work order to TVI the LL in 12 months from that cleaning.

Proceed to Document & End.

2.8.10. Cleaned Before, During, or After Current TVI?

Was the LL cleaned before, during, or after the current LL TVI?

If yes, continue to step 2.8.12.

If no, continue to step 2.8.11.

2.8.11. Create WO to Clean LL Before Projected Failure Date

Create a work order to clean the LL. Projecting the failure date and deciding on a the priority on the cleaning work order is dependent on the TVI Review discretion upon results of the LL TVI and asset history.

Proceed to step 2.8.12.

2.8.12. Create a TVI WO

Create a work order to TVI the LL in 1 year from the cleaning work order.

Proceed to Document & End.

Part 3 – Preventive Maintenance Decision

3.1. Determine a Cleaning PM Frequency

Determine the cleaning preventive maintenance (PM) frequency (with the frequency less than the stoppage interval or estimated interval) or decide if the LL cannot be maintained.

SacSewer uses 12, 18, 24, 36, 48, or 60 month PM frequencies. PM frequencies greater than 48 months would need supervisor approval.

The highest frequency for LLs located in easements is 36 months.

The highest frequency for LLs located in the street is 12 months.

PM frequencies higher than 36 or 12 months for LLs located in easements or streets, respectively, are considered on a case-by-case basis through a BCE by the Engineering Operations Support group.

A LL cannot be maintained if it has one of the following structural defects: broken pipe, collapsed pipe, Orangeburg pipe, moderate or severe cracked pipe, severe offset joint, and moderate or severe oval pipe.

If putting the LL on a 24, 18, or 12-month frequency or the LL cannot be maintained by a cleaning PM frequency, continue to step 3.2.

If putting the LL on a 48 or 36-month frequency, continue to step 3.1.

3.2. Schedule or Adjust Cleaning PM

Schedule or adjust the cleaning PM that was determined in step 3.0 of this procedure. Create an SR to request that the LL be put on the appropriate cleaning PM schedule or to request to adjust the existing cleaning PM schedule to a different, more appropriate frequency.

Proceed to Document & End.

3.3. LL Location?

Is the LL located in the street or the easement?

If Street, continue to step 3.3.

If Easement, continue to Flowchart Part-4.

3.4. Are All Defects Located Between CO and Edge of Asphalt?

If yes, continue to step 3.4.

If no, continue to step 3.5.

3.5. Create WOs to Repair Defects to Edge of Asphalt and TVI after

Follow the **Televised Inspection Strategy, Section 301**, and create a quality control TVI WO to TVI LL after work is completed to verify that the quality of repair work performed is acceptable.

Proceed to Document & End.

3.6. Determine Cleaning PM Frequency

Determine the cleaning PM frequency (with the frequency less than the stoppage interval or estimated interval) or decide if the LL cannot be maintained.

The frequency limit for LLs located in the street is 12 months. The decision to put a LL on a PM frequency higher than 12 months can only be made by the Engineering Operations Support Group, after evaluating the LL issue through a BCE.

A LL cannot be maintained if it has one of the following structural defects: broken pipe, collapsed pipe, Orangeburg pipe, moderate or severe cracked pipe, severe offset joint, and moderate or severe oval pipe.

If putting the LL on a 24, 18, or 12-month frequency, continue to step 3.6.

If putting the LL on a 6, 4, or 3-month frequency or the LL cannot be maintained by a cleaning PM frequency, continue to step 3.5.1.

3.5.1 Are All Defects < 8 ft Apart?

If yes, continue to step 3.5.2.

If no, continue to Flowchart Part-4.

3.5.2 Is Horizontal Length of LL < 10 ft?

If yes, continue to Flowchart Part-4.

If no, continue to step 3.7.

3.7. Horizontal Length Required to Repair LL?

Determine the horizontal length required to repair the LL that would eliminate the defects, and thus the need for a cleaning PM. Assume that the horizontal length of pipe to repair one defect is four feet.

Example 1. There are two joints that have roots, one at 15 ft. and the other at 30 ft. from the CO. The roots are growing at a rate that requires either a 12, 18 or 24 months PM. The total horizontal length required to repair both joints would be 8 feet because each defect requires 4 ft. of pipe removal. Thus, the decision would be to schedule a PM.

Example 2. There are two joints that have roots, one at 17 ft. and the other at 22 ft. from the CO. The roots are growing at a rate that requires either a 12, 18, or 24 months PM. The total horizontal length required to repair both joints would be 5 feet, then go to step 3.8 to further evaluate for location of LL.

If < 8 ft, continue to step 3.7.

If ≥ 8 ft, continue to step 3.11.

3.8. Is LL Location CDS or INT?

Is the lower lateral location in the cul-de-sac or intersection?

If yes, continue to step 3.9.

If no, continue to step 3.8.

3.9. Depth Required to Repair LL?

If < 16 ft, continue to step 3.10.

If ≥ 16 ft, continue to step 3.9.

3.10. Create a BCE

Create a BCE Service Request. No other WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The **BCE Strategy, Section 207** describes when SacSewer performs a BCE.

Proceed to Document & End.

3.11. Create WOs to Spot Repair LL & TVI After Repair

Only create this WO if all structural and/or maintenance issues in the LL will be resolved with this repair. Once the WO to spot repair is written, create another WO for TVI After Repair.

Proceed to Document & End.

3.12. Schedule or Adjust Cleaning PM

Schedule or adjust the cleaning PM that was determined in step 3.0 of this Process.

Create an SR to request that the LL be put on the appropriate cleaning PM schedule or to request an adjustment to the cleaning PM schedule to a different, more appropriate frequency.

Proceed to Document & End.

Part 4 – Corrective Maintenance Decision

4.1 LL Location?

If the location is Street, continue to step 4.2.

If the location is Easement, continue to step 4.1.2.

4.1.2. Are there Defects that would Prevent CIPP Lining?

Refer to the **Lining Training Guide** for defects and other criteria that would prevent lining.

If yes, continue to step 4.1.4.

If no, continue to step 4.1.3.

4.1.3. Depth of LL?

If < 8 ft, then continue to step 4.1.4.

If ≥ 8ft, then continue to step 4.2.1.

4.1.4. Create a BCE

Create a BCE Service Request. No other WOs shall be written - the BCE will remedy whatever work is necessary.

A BCE is applied to issues requiring more detailed analysis to determine the most economical solution while considering risk. The **BCE Strategy, Section 207** describes when SacSewer performs a BCE.

Proceed to Document & End.

4.2 Are there Defects that would Prevent CIPP Lining?

Refer to the **Lining Training Guide** for defects and other criteria that would prevent lining.

If yes, continue to step 4.3.

If no, continue to step 4.2.1.

4.2.1 Create WO to CIPP Line LL

Proceed to Document & End.

4.3 Is LL Location in CDS or INT?

If yes, continue to step 4.4.

If no, continue to step 4.3.1.

4.3.1. Is LL Connected to MH?

If yes, continue to step 4.4.

If no, continue to step 4.3.2.

4.3.2. Depth of LL?

If < 16 ft, continue to step 4.3.3.

If ≥ 16 ft, continue to step 4.4.

4.3.3. Is the ML Tap Defective?

Is the ML tap defective? ML tap defects include but are not limited to hammer, core, tee, severely cracked, broken, and missing.

If yes, continue to step 4.3.4.

If no, continue to step 4.3.5.

4.3.4. Create WO to Replace ML Tap

Create work order to replace the ML Tap.

Continue to step 4.3.5.

4.3.5. Create Dig & Replace LL WO and TVI After

Create work orders to Dig & Replace LL, and TVI after LL Replace. If the decision is to also replace the ML Tap, ensure the dates of the replace ML Tap work order match the Dig & Replace LL work order.

Proceed to Document & End.

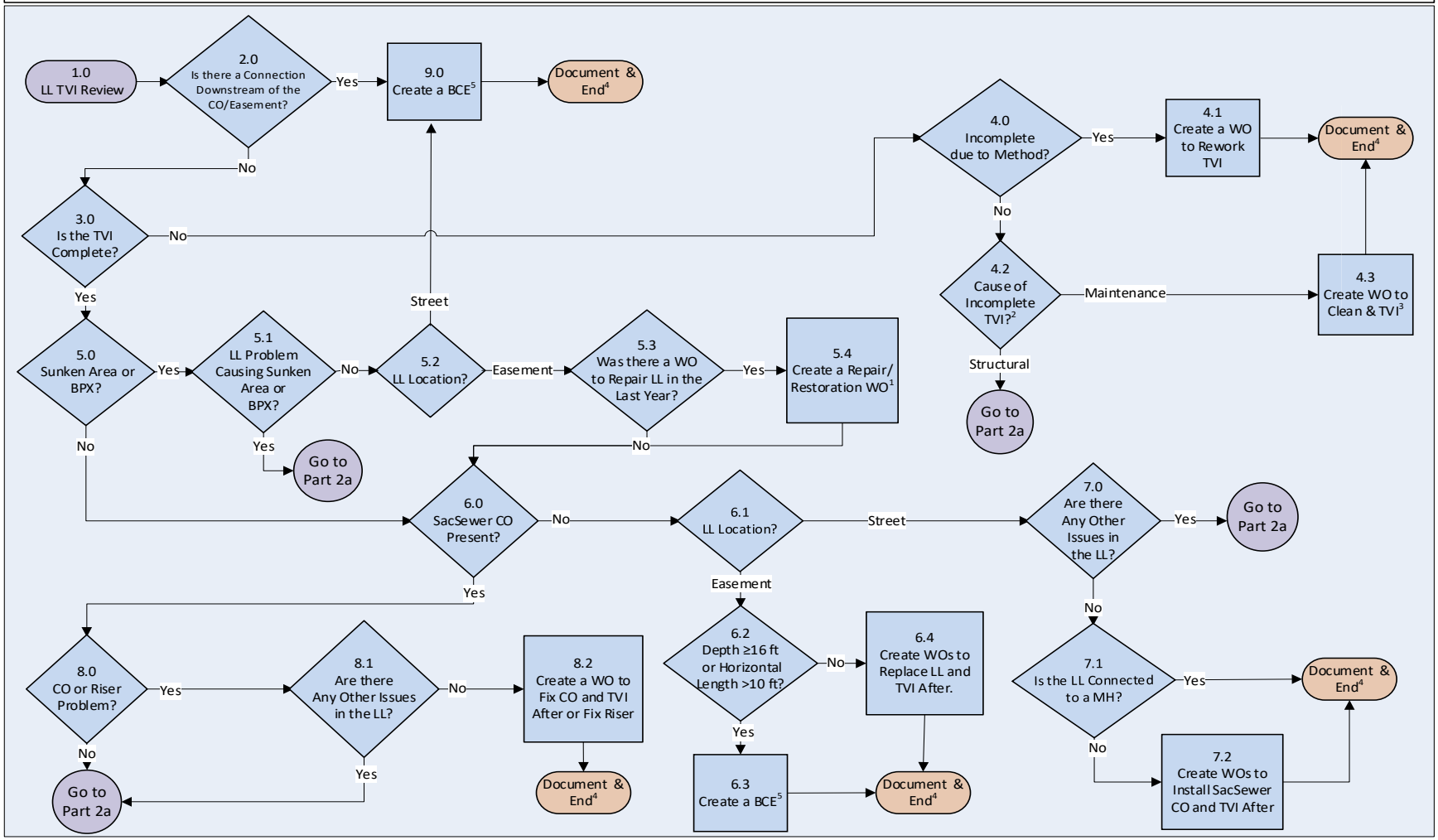
4.4 Create a BCE

Create a BCE Service Request. No other WOs shall be written. Please see step 4.1.4 for more information.

Proceed to Document & End.

205.5 *Flowcharts*

Lower Lateral Maintain-Repair-Replace Decision Procedures
Part 1 – Initial Assessment Flowchart



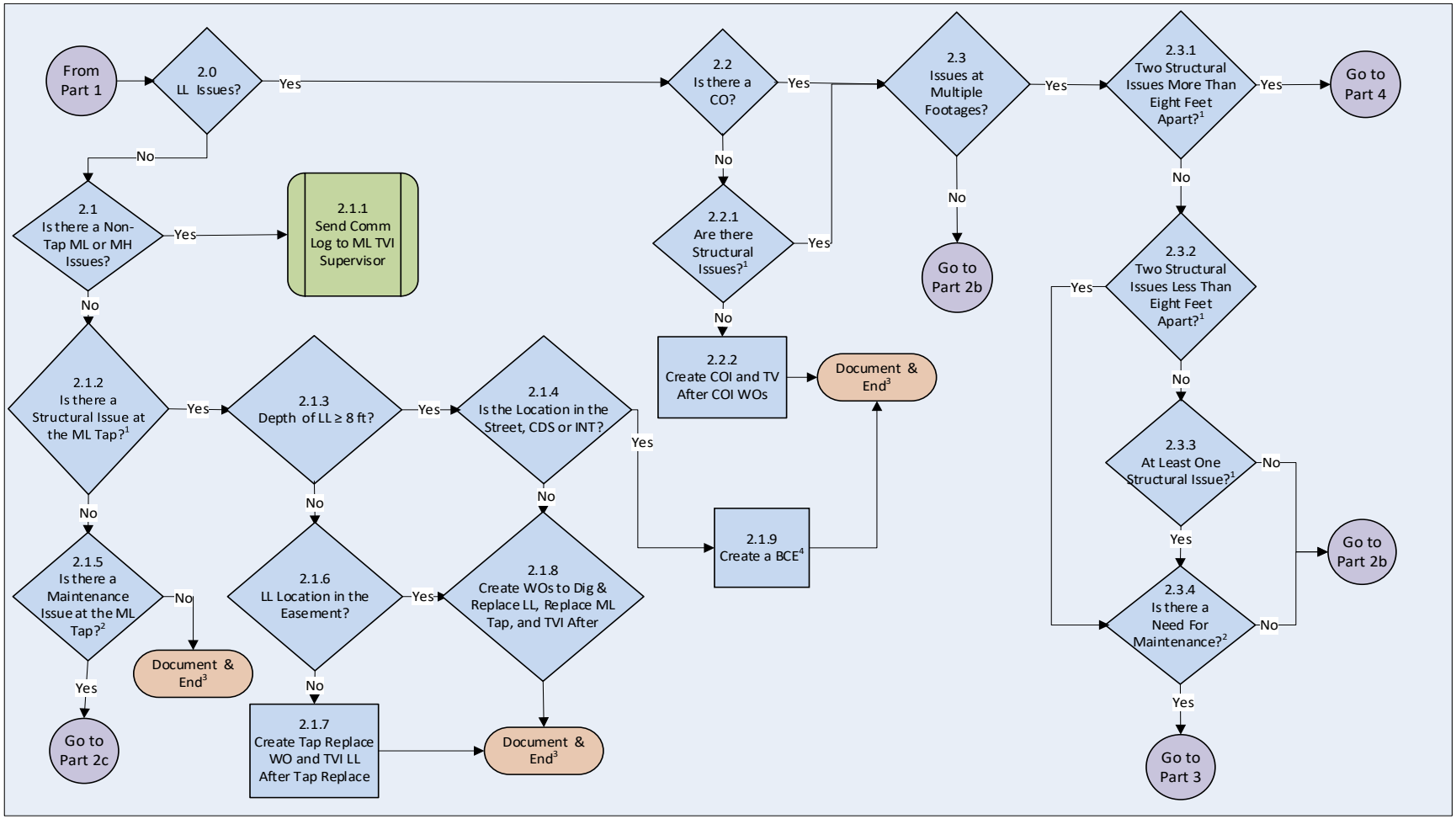
Abbreviations and Defect Codes:

BCE – Business Case Evaluation
BPX – Broken Pipe
CO – Cleanout
LL – Lower Lateral
MH – Manhole
TVI – Televised Inspection
WO – Work Order

Footnotes:

1. WO Priority depends on the urgency of the repair.
2. A structural problem is considered any of the following: broken pipe, collapsed pipe, orangeburg pipe, moderate or severe cracked pipe, severe offset joint, severe swale, and moderate or severe oval pipe. Structural problems cannot be maintained. A maintenance problem is considered any of the following: roots, grease, solids, and debris.
3. Create a cleaning and TVI WOs to be completed within the next 30 days.
4. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
5. Create a BCE SR. When a BCE SR is created no other WO's should be created.

Lower Lateral Maintain-Repair-Replace Decision Procedures
Part 2a – Structural & Maintenance Assessment Flowchart



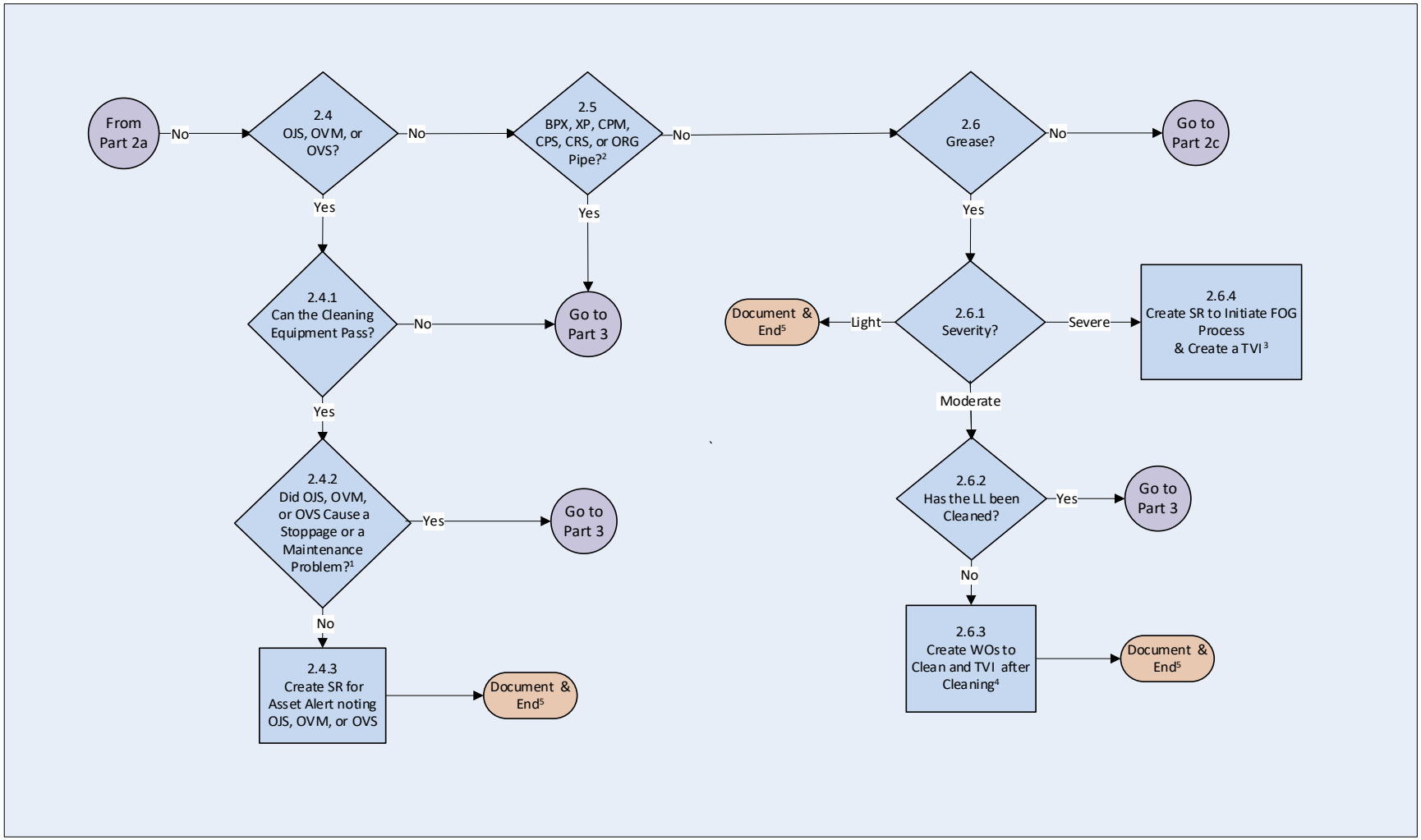
Abbreviations and Defect Codes:

CDS – Cul-De-Sac
CO – Cleanout
COI – Cleanout Install
INT – Intersection
LL – Lower Lateral
ML – Mainline
MH – Manhole
TVI – Televised Inspection
WO – Work Order

Footnotes:

1. A structural issue is considered any of the following: broken pipe, collapsed pipe, orangeburg pipe, moderate or severe cracked pipe, severe offset joint, severe swale, severe corrosion and moderate or severe oval pipe. Structural problems cannot be maintained.
2. A maintenance problem is considered any of the following: roots, grease, solids, and debris.
3. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
4. Create a BCE SR. When a BCE SR is created no other WO's should be created.

Lower Lateral Maintain-Repair-Replace Decision Procedures
Part 2b – Structural & Maintenance Assessment Flowchart



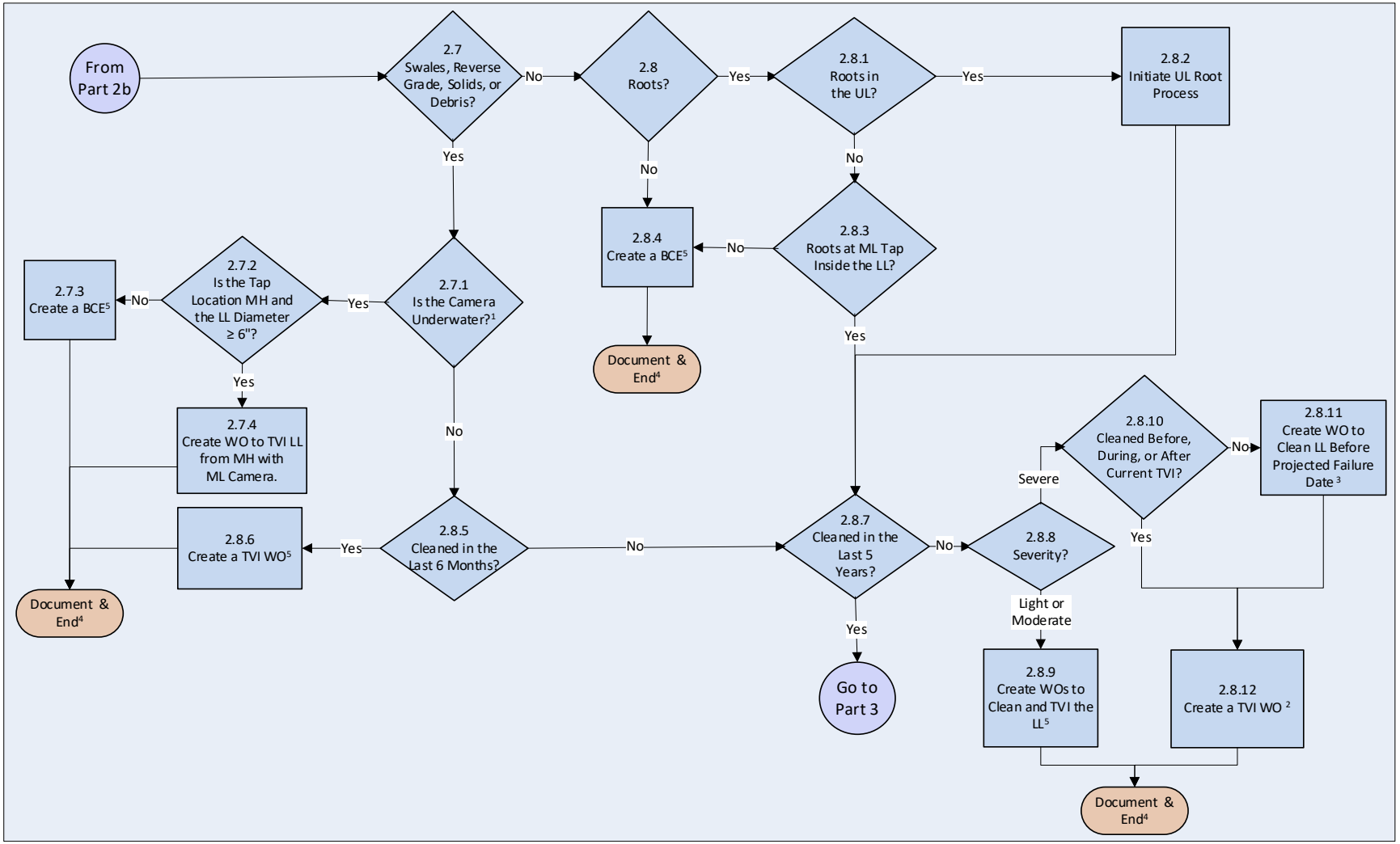
Abbreviations and Defect Codes:

BPX – Broken Pipe
CPS – Cracked Pipe Severe
CRS – Severe Corrosion
LL – Lower Lateral
OJS – Offset Joint Severe
ORG – Orangeburg Pipe
OVM – Out of Round Moderate
OVS – Out of Round Severe
TVI – Televised Inspection
WO – Work Order
XPX – Loss of Structural Integrity

Footnotes:

1. A maintenance problem is considered any of the following: roots, grease, solids, and debris.
2. BPX refers to a broken pipe, visibly displaced pipe material, or missing pipe. Adding X to the BP indicates an increase in severity.
3. Create the TVI WO as a priority 2 to be completed in 12 months from the current TVI.
4. Create WOs to clean based with priority based upon severity and create the TVI to be completed 12 months after the cleaning.
5. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.

Lower Lateral Maintain-Repair-Replace Decision Procedures
Part 2c – Structural & Maintenance Assessment Flowchart



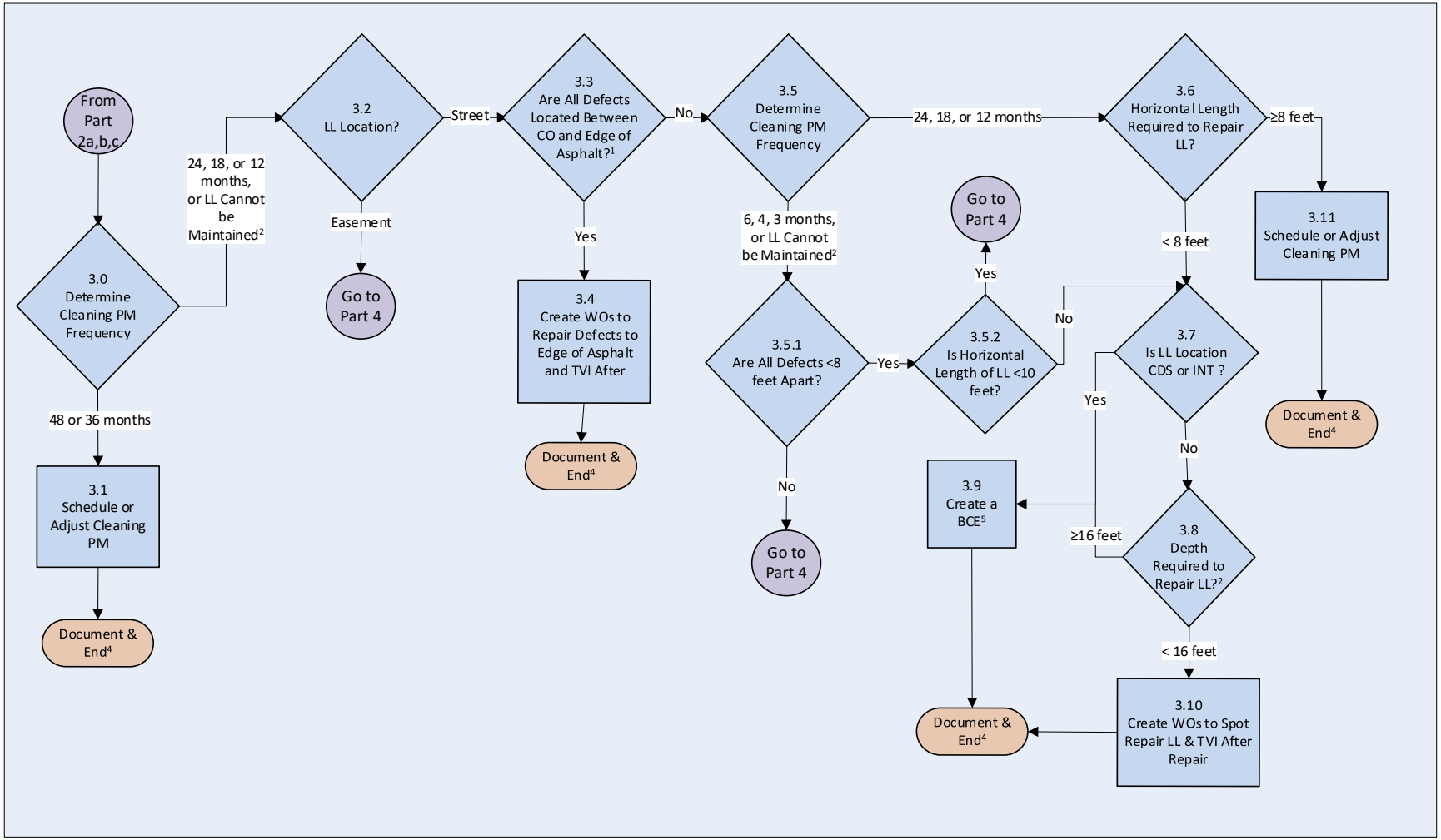
Abbreviations and Defect Codes:

BCE – Business Case Evaluation
LL – Lower Lateral
MH – Manhole
ML – Mainline
TVI – Televised Inspection
UL – Upper Lateral
WO – Work Order

Footnotes:

1. Camera underwater is a camera submerged to a degree that prohibits assessment of LL condition.
2. Create a TVI WO 1 year after hydro-cleaning.
3. Projected failure date and priority on the cleaning WO is dependent on TVI Reviewer discretion upon results of the LL TVI.
4. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
5. Create a BCE SR. When a BCE SR is created no other WO's should be created.

Lower Lateral Maintain-Repair-Replace Decision Procedures
Part 3 – Preventive Maintenance Decision Flowchart



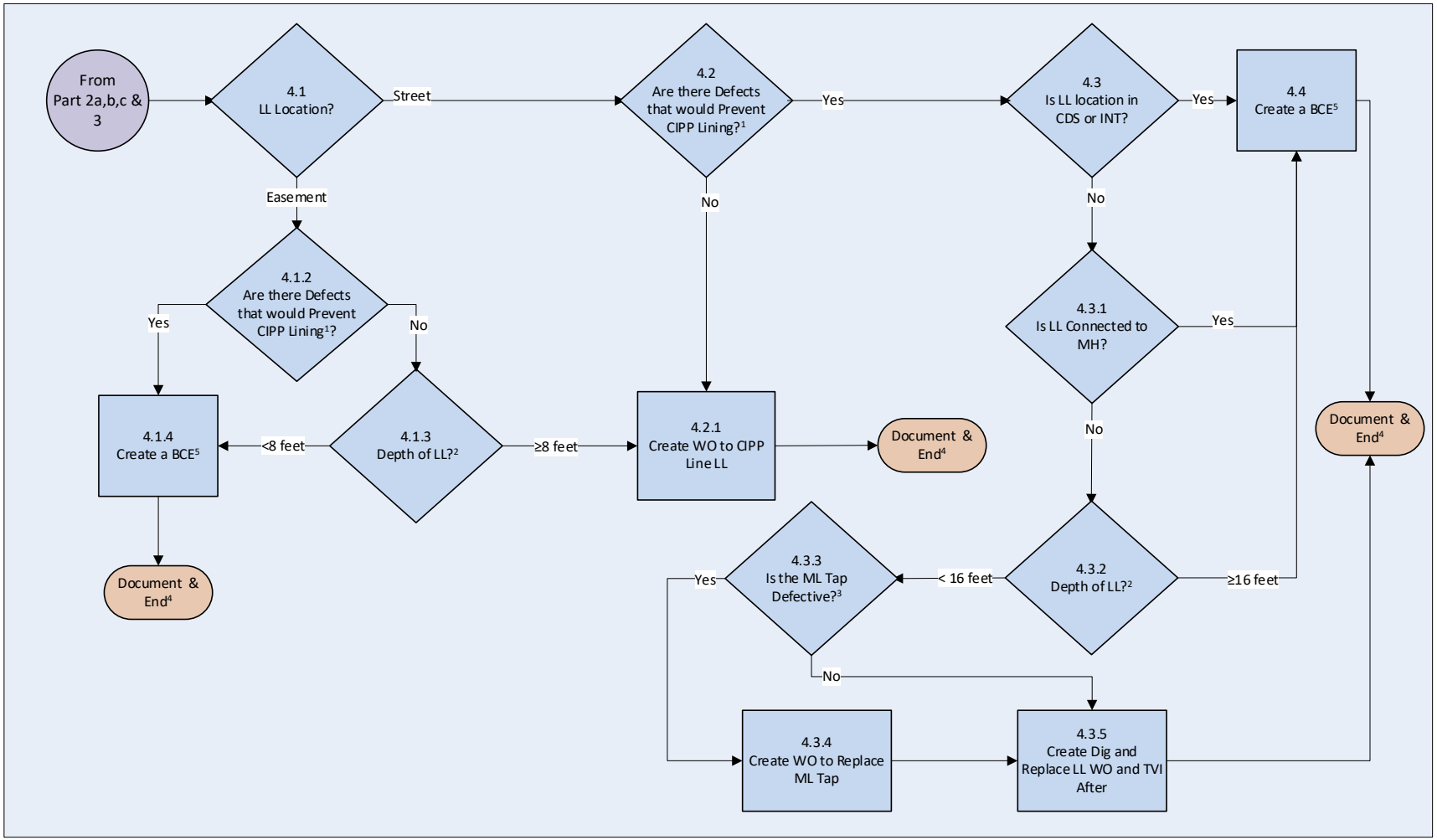
Abbreviations and Defect Codes:

BCE – Business Case Evaluation
CDS – Cul-De-Sac
CO – Cleanout
INT – Intersection
LL – Lower Lateral
PM – Preventive Maintenance
TVI – Television Inspection
WO – Work Order

Footnotes:

1. The following defects cannot be maintained: broken pipe, collapsed pipe, orangeburg pipe, moderate or severe cracked pipe, severe offset joint, and moderate or severe oval pipe.
2. Depth refers to the deepest portion of the lateral required for repair.
3. If any problem results in launching a BCE investigation, then no other work order or service request shall be written.
4. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
5. Create a BCE SR. When a BCE SR is created no other WO's should be created.

Lower Lateral Maintain-Repair-Replace Decision Procedures
Part 4 – Corrective Maintenance Decision Flowchart



Abbreviations and Defect Codes:

CDS – Cul-De-Sac
CIPP – Cured-in-Place-Pipe
INT – Intersection
LL – Lower Lateral
ML – Mainline
SR – Service Request
TVI – Televised Inspection
WO – Work Order

Footnotes:

1. Refer to Lining Training Guide for restrictions.
2. Depth of LL for a replace or liner equals the main line tap depth.
3. ML tap defects: hammer, core, tee, severely cracked, broken, missing.
4. Document all decisions in log notes (WOs) or work logs (SRs) and complete the end process.
5. Create a BCE SR. When a BCE SR is created no other WO's should be created.

206 Damage by Others Investigation Procedures

206.1 Purpose

The purpose of the **Damage by Others Investigation Procedures** is to ensure consistency in the investigation and reporting of damages to SacSewer assets caused by external excavators (e.g., other agencies, utilities, organizations, etc.)

206.2 Background

The **Damage by Others Investigation Procedures** describes SacSewer's process for investigating underground facility damage to identify the root cause and the person/utility/etc. responsible. This information assists SacSewer in determining who is financially accountable for the damage and assists in the recovery of all associated costs. The collection of underground facility damage data is analyzed to learn why events occur and how actions by industry can prevent them in the future, thereby ensuring the safety and protection of people and SacSewer's infrastructure. Over time, SacSewer can reduce future damages through effective practices and procedures, such as collecting failure data that allows SacSewer to identify root causes, perform trend analysis, and help educate contractors, employees, and the public.

206.3 Procedure Approach

SacSewer investigates and reports all excavation damage to any SacSewer-owned underground asset caused by external excavators. SacSewer's Engineering Operations Support Section – Pipeline Support Group – Operations & Engineering Support Team performs the investigation and documents all relevant information. SacSewer developed the following procedures to ensure consistency in investigating and reporting damages.

206.4 Descriptive Procedural Steps

1.0 SacSewer Made Aware of Damage

SacSewer staff typically becomes aware of damage to its collection system assets in one of three ways:

1. An Engineering Operations Support – Pipeline Support Group TV inspection reviewers find a hole, broken piece, or obstruction protruding in or through a sewer pipe.
2. An M&O field crew or contractor finds damaged assets while performing work.
3. An external excavator notifies SacSewer via phone call or email.

Once SacSewer is aware of damage caused by an external excavator, the Operations & Engineering Support Team is notified.

2.0 SacSewer Repairs Damage

The Operations & Engineering Support Team will direct the M&O field staff to repair the damage, or M&O management will arrange for a contractor to perform the work.

3.0 SacSewer Investigates and Prepares Claim

M&O field staff completes a site investigation and creates a Damage Claim Service Request assigned to the Engineering Operations Support Section – Engineering Pipeline Support Group. The Operations & Engineering Support Team researches the findings, determines who is at fault, and

prepares a claims package containing a summary of the damage, investigation, repair work order details, USA ticket (if available), and costs associated with labor, tools, materials, and services.

If SacSewer is at fault, continue to step 3.1.

If the Other Party is at fault, continue to step 3.2.

3.1 End

If SacSewer is found to be at fault, then the investigation procedure should be ended.

3.2 Claim Submitted to Responsible Party

When another party is at fault, the Operations & Engineering Support Team will forward the claim to SacSewer's Internal Services Department (ISD), who will deliver the claim to the party responsible and ensure a timely response.

4.0 Responsible Party Receives Claim

If the claim is accepted, continue to step 4.1.

If the claim is rejected, continue to step 5.0.

4.1 SacSewer Receives Payment

If the responsible party accepts the claim as presented, payment remittance is delivered to ISD staff for deposit. ISD staff will update the spreadsheet with the deposit number.

Proceed to step 4.2.

4.2 Claim is Closed

Operations & Engineering Support Team will close the claim; no further action will be taken.

5.0 Close Claim or refer to Risk Management

If the claim is $5,000 or less and is rejected by the responsible party, SacSewer's Engineering Operations Support Section Manager will review the claim and either:

- Refers the claim to SacSewer's ISD - Risk Management Group to negotiate a settlement or
- Instruct the Operations & Engineering Support Team to close the claim.

If the claim is between $5,001 and $50,000, the Director of SacSewer Collection System Operations or EchoWater Operations reviews the claim and either:

- Refers the claim to the Risk Management Group to negotiate a settlement or
- Instruct the Operations & Engineering Support Team to close the claim.

Any claim over $50,000 the responsible party rejects is referred to the Risk Management Group to pursue.

Settlements between $50,001 and $100,000 will be made by the District Engineer in consultation with the Risk Management Group Manager.

For settlements over $100,000, County Counsel will meet with the Risk Management Group and the Director of SacSewer Collection System Operations or EchoWater Operations and/or their delegate to review the Board package with SacSewer's District Engineer. The Board package will include a description of the claim, attempts to settle, a recommendation to either settle or dismiss the claim

and a request to authorize the District Engineer to sign the Release of Liability if required by the party responsible.

If the claim is not pursued, continue to step 5.1.

If the claim meets the criteria to refer to the Risk Management Group, continue to step 5.2.

5.1 Claim Closed

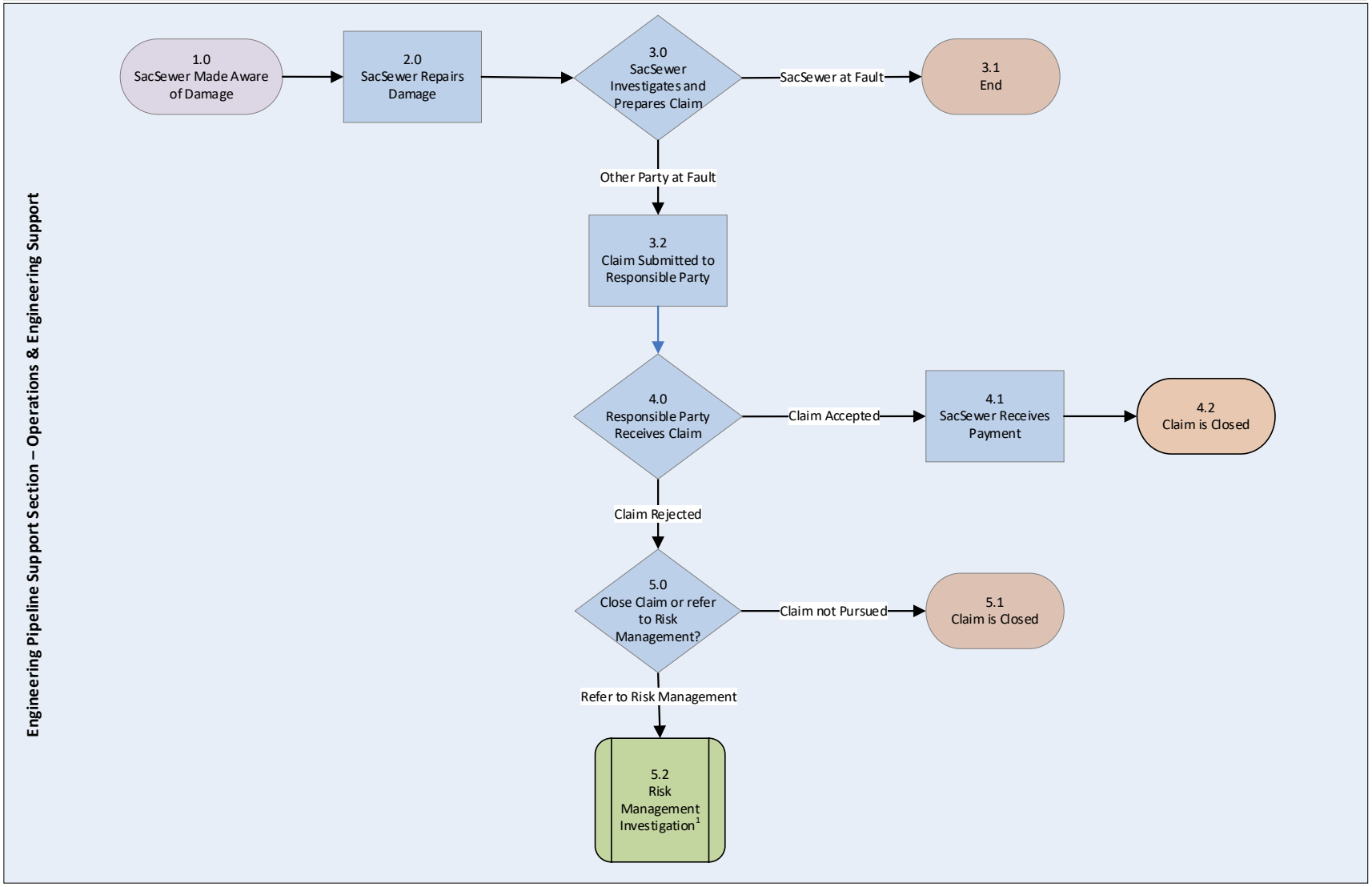
If the Board instructs staff to cease pursuing cost recovery, the claim will be closed.

5.2 Risk Management Investigation

If settlement is approved, the Risk Management Group will pursue payment from the responsible party, which will be delivered to ISD for deposit. ISD staff will update the Damage Claim Service Request with the deposit number, at which point the claim is considered closed.

206.5 Flowchart

Damage by Others Investigation Decision Procedures Flowchart



Footnote:
1. If the settlement is approved, the Risk Management Group will pursue payment from the responsible party.

207 Business Case Evaluation Strategy

207.1. Purpose

This document defines SacSewer's strategy for when business case evaluations are performed to determine the best preventive or corrective maintenance action for when problems are observed with SacSewer assets.

207.2. Background

A Business Case Evaluation (BCE) is an evaluation of alternatives to a problem while considering the risks involved, if any. A BCE is used to economically compare alternatives against each other to provide a basis for selecting a preferable, cost-effective solution. Typically, a 40-year net present value (NPV) is used to compare alternatives but may be adjusted if a different NPV time span is more appropriate. BCE alternatives include:

- Status quo,
- Re-evaluate at a future date,
- Add or change a preventive maintenance schedule,
- Perform a repair or replacement, or
- Other alternatives that may be appropriate

BCEs also help optimize operational efficiency and prevent spills within the SacSewer service area by incorporating M&O feedback and accessing existing decision-making processes (i.e., the **Main Line Maintain-Repair-Replace Decision Procedures, Section 204** and the **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205)**, workflows, resource allocations, and asset performance history to help identify areas of improvements. SacSewer's Engineering Operations Support Section – Pipeline Support Group – Operations & Engineering Support Team is responsible for performing BCEs when a service request is generated by SacSewer staff.

207.3. Strategy Approach

SacSewer's **BCE Strategy** focuses on when BCE service requests are generated by SacSewer staff and includes both proactive and reactive approaches.

Proactive Approach

1. **MLSM Monthly Frequency Adjustment Report:**

   The **MLSM Monthly Frequency Adjustment Report** is part of the **Main Line Cleaning Frequency Adjustment Strategy, Section 403**. The **MLSM Monthly Frequency Adjustment Report** is an automatically generated report that compares data on main line assets from the last three prior cleaning PM work orders. A BCE SR is generated by the Engineering Operations Support Section – Engineering Pipeline Support Group – Main Line TVI Review staff when the proposed PM frequency adjustment is:

   - 6 to 3 months
   - 3 to 1 months, or
   - 1-month frequency

   If a previous BCE SR had been concluded for a 3 to 1-month frequency or a 1-month frequency increase, then that same 1-month frequency increase recommendation may go for 36 report cycles

(or 3 years) with no changes given the asset history shows no events. Once the 1-month frequency increase reaches a 36-report cycle, a new BCE SR is created to renew the investigation process again.

The BCE SR will launch research to determine whether the report's recommendation is valid or whether the asset's cleaning frequency should remain the status quo, given comparable asset history data.

Reactive Approach

1. **Televised Inspection Strategy:**

   The **TVI Strategy** provides proactive and reactive approaches for when a TVI of a main line, lower lateral, and manhole is required. The reactive approach includes:

   - Stoppage Follow-Up TVIs
   - Project or BCE Investigation
   - Service Requests assigned to M&O

   For more information, see **TVI Strategy, Section 301.**

2. **Responding to Work Orders Created by TVI Reviewer Staff and M&O Field Staff**

   SacSewer's Engineering Operations Support Section – Pipeline Support Group staff utilize the **Main Line Maintain-Repair-Replace Decision Procedures, Section 204,** and the **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205** to determine the preventive and corrective action of main line and lower lateral assets. In some situations, these procedures may result in the creation of a BCE SR.

   A BCE SR may also be created during fieldwork when M&O Field Staff or a project manager of contracted fieldwork encounters situations that may warrant more investigation or decisive needs. These needs may include but are not limited to, incorrect mapping data, additional information from the field that may change the nature of the work order created, and discrepancies with asset attributes.

300 Condition Assessment Program

300 Program Overview

300.1. Purpose

The purpose of the **Condition Assessment Program** in the SSMP Reference Document is to provide additional information on the strategies that:

- Describes when televised inspections of main lines, lower laterals, and manholes are required.
- Define how SacSewer cost-effectively reduces the frequency of loss of support, crush collapse, and damage by other failures.
- Identify methodologies to assess the pump station structures and components.
- Define how SacSewer cost-effectively reduces the frequency of pump station structural and non-structural component failures.

300.2. Background

SacSewer owns and operates a variety of physical assets. In support of SacSewer's goals of reducing spills, meeting regulatory requirements, achieving identified service commitment targets, and operating in a cost-effective manner, SacSewer has documented several efforts designed to assess the condition of its assets. The **Condition Assessment Program, Section 300** of the SSMP Reference Document, provides additional information on the strategies described in the **Condition Assessment Program, Section 4.2** of the SSMP.

300.3. Program

The **Condition Assessment Program** encompasses several separately documented but sometimes interrelated strategies and procedures. The strategies and procedures that are further discussed in the **Condition Assessment Program** are listed below:

- **Televised Inspection Strategy**
- **Crush Collapse Failure Mode Strategy**
- **Loss of Support Failure Mode Strategy**
- **Pump Station Structure Failure Mode Strategy**
- **Pump Station Component Failure Mode Strategy**
- **Pump Station Condition Assessment Program Procedures**
- **Damage by Others Failure Mode Strategy**

301 Televised Inspection Strategy

301.1. Purpose

The purpose of this document is to provide direction for when Televised Inspections (TVIs) of main lines, lower laterals, and manholes are required.

301.2. Background

SacSewer's **Crush Collapse Failure Mode Strategy, Section 302** and **Blockage Failure Mode Strategy, Section 401**, details SacSewer's strategies for reducing the frequency of spills caused by crush collapse and blockage failures in gravity assets. SacSewer predominantly uses CCTV equipment to perform TV inspections on pipe assets such as lower laterals, main lines, and manholes to reduce the risks associated with failures due to structural defects, spills, stoppages, faulty repairs, and inadequate cleanings. SacSewer's **TVI Strategy** describes both proactive and reactive approaches to when and how TVI work is generated to assess the condition of gravity sewer pipes.

301.3. Strategy Approach

Detailed instructions for conducting TVIs can be found in SacSewer's **Television Inspection Manual**. The **TVI Manual** contains the defect codes for TVIs. TVI defect codes are used by Maintenance and Operations (M&O) staff and Contractors to provide consistent inspection results. TVI defects are also used in the decision-making process when evaluating the condition of the sewer pipe and determining the best preventive or corrective action. Per the **TVI Manual,** Granite is the repository of all completed TVIs and includes defect code information.

The results from TVIs conducted per this strategy will be reviewed by the Engineering Operations Support Section – Pipeline Support Group and may be subject to further analysis if defects are found. Further analysis will follow the **Main Line Maintain-Repair-Replace Decision Procedures, Section 204**, **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205**, or the **Business Case Evaluation Strategy, Section 207.**

The following proactive and reactive approaches have been implemented to inspect the condition of SacSewer assets.

Proactive Approach:

1. **TVI Based Programs**

   SacSewer has developed and currently implements several inspection programs to proactively inspect the condition of gravity assets, such as the **Lower Lateral Scheduled Inspection (LLSI) Program**, **Main Line Schedule Inspection (MLSI) Program**, and **Main Line Critical Assets (MLCA) Program**. Assets on these programs have been selected for proactive inspection because they meet specific criteria that SacSewer has identified through spill data that could lead to a blockage or collapsed pipe causing a spill, service interruption, and environmental consequences. See the **Crush Collapse Failure Mode Strategy, Section 302,** for more information.

2. **Quality Control – Preventive Maintenance Evaluations**

   SacSewer proactively reviews the quality of main line cleaning PM work performed as part of the **Main Line Scheduled Maintenance (MLSM) Program** in an effort to reduce the number of future main line caused spills attributed to incorrect cleaning activity assigned and insufficient cleaning techniques. TV inspections are generated by the Engineering Operations Support Section – Pipeline Support Group monthly for a representative sample of cleaning PM work orders to verify that main lines are being

adequately cleaned. For more information, see the **Quality Control Procedures for MLSM Cleanings, Section 402.**

3. Quality Control – After Repairs & Replacements

Per Section 331 Television Inspection of SacSewer's **Standards and Specifications,** following the repair or replacement of a lower lateral or main line, a TVI shall be performed for quality control of the repair or replacement.

Target Completion Date: Within 2 weeks of the repair or replacement.

For more information on SacSewer's **Standards and Specifications**, see the **Design and Performance Provisions, Section 5** of the **SSMP.**

4. Preventive Maintenance Schedule Changes and Removal

SacSewer's Engineering Pipeline Support Group staff may generate TV inspection work orders to potentially adjust the PM cleaning schedule or activity of assets on LLSM or MLSM programs. The **Main Line Maintain-Repair-Replace Decision Procedures, Section 204**, **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205**, and the **BCE Strategy, Section 207** are used to change or remove PM schedules based on the findings of a TVI when there is not enough data to follow the **Main Line Cleaning Frequency Adjustment Strategy, Section 403** and the **Lower Lateral Cleaning Frequency Adjustment Strategy, Section 404.**

Reactive Approach:

5. Stoppage Follow-up (Failure Analysis)

Follow-up TVIs are required for failure analysis of all spills and stoppages in the SacSewer's collection system. TVI work is typically generated by M&O field staff when responding to emergency events such as a spill per the **Spill Emergency Response Plan**. For more information, see **Spill Emergency Response Plan, Section 6** of the **SSMP**.

6. Project or BCE Investigation

SacSewer's Engineering Pipeline Support Group staff may generate TV inspection work orders for project or BCE investigations to gather information that will help in deciding the appropriate corrective action for a defective sewer pipe.

7. Service Requests (SRs) Assigned to M&O

SacSewer's M&O staff generate TV inspection work orders when responding to a spill or customer call/request. Service requests assigned to M&O are generated according to the **Customer Call Handling and Service Request Creation Procedures, Section 203.** M&O Pre-checker are assigned service requests and respond within a timely manner based on priority. To determine the condition of a SacSewer asset, the M&O Pre-checker may generate a TVI work order.

302 Crush Collapse Failure Mode Strategy

302.1. Purpose

This document defines SacSewer's strategy for cost-effectively reducing the frequency of and responding to failures caused by a crush collapse of gravity assets, such as lower laterals, main lines, and manholes.

302.2. Background

Crush collapse failures in lower laterals, main lines, and manholes occur when the assets are degraded or excessive forces have occurred, causing cracking and breaking of the pipe or manhole, potentially leading to the asset collapsing. Collapsed assets can cause spills, service interruptions, and environmental consequences. The consequence of failure is the cost associated with a spill (i.e., initial response, cleanup activities, reporting, etc.) and environmental and social risk costs.

302.3 Strategy Approach

The **Crush Collapse Failure Mode Strategy** focuses on assessing the structural integrity of the gravity assets within the collection system. SacSewer's main method to assess gravity assets is through Televised Visual Inspections (TVIs). Detailed instructions for conducting TVIs can be found in SacSewer's TVI Manual. The TVI Manual also contains the defect codes M&O staff and contractors use to provide consistent inspection results. It is also used by TVI Review staff to determine the appropriate corrective action for a defective sewer pipe per the **Main Line Maintain-Repair-Replace Decision Procedures, Section 204, Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205**, and the **BCE Strategy, Section 207**. SacSewer's **Crush Collapse Failure Mode Strategy** for utilizing TVIs to reduce the frequency of and respond to failures caused by a crush collapse consists of several proactive and reactive approaches.

Proactive Approach

The following maintenance programs and procedures have been developed and implemented to reduce the risk of spills caused by crush collapse failures in lower laterals, main lines, and manholes. All program details and schedules were determined by considering the spill data, available resources, and annual workload. These program details are subject to change (if needed) to achieve optimal performance. For more information on how work orders are generated, tracked, and completed in Maximo, please see **Maintenance Management System (CMMS), Section 4.1.1 of the SSMP.**

3. Lower Lateral Scheduled Inspection (LLSI) Program:

The LLSI Program was implemented in July 2021 and focuses on preventing future failures due to a stoppage or structural collapse by TV inspecting lower laterals over the age of 40 on an interval to identify any defects that may cause an issue and lead to a spill.

Program Details:

- The lower lateral assets on the LLSI program meet the following criteria:
  - Assets over 40 years of age.
  - Assets are not part of the Lower Lateral Scheduled Maintenance Program (LLSM).
  - Assets have an existing Cleanout per SacSewer's CMMS.
- The TV inspection interval is determined based on the pipe material type as follows:
  - MULTI material type: 8-year frequency
  - Not MULTI and Not ABS material type: 10-year frequency

- ABS material type: 12-year frequency

- Lower lateral assets that cannot be TV'd due to a blockage will be cleaned as defined in SacSewer's Standards and then re-TV'd.

4. Main Line Scheduled Inspection (MLSI) Program:

The MLSI Program was implemented in July 2020 and focuses on preventing future failures due to a stoppage or structural collapse by TV inspecting main lines over the age of 40 on an interval to identify any defects that may cause an issue and lead to a spill.

Program Details:

- The main line assets on the MLSI program meet the following criteria:
  - Assets over 40 years of age.
  - Assets that are not part of the MLCA Program or the MLSM Program.
- The TV inspection interval is determined based on the pipe diameter as follows:
  - 6-inch diameter and less: 10-year frequency
  - 8-12 inch diameter: 12-year frequency
  - Greater than 12-inch diameter: 15-year frequency
- Main line assets that cannot be TV'd due to a blockage will be cleaned as defined in SacSewer's Standards and then re-TV'd.

5. Main Line Critical Assets (MLCA) Program:

The MLCA Program was implemented in July 2020 and focuses on preventing future failures due to a stoppage or structural collapse by TV inspecting main lines that are in geographic proximity to critical features (such as waterways, railways, highways, and levees) on an interval to identify any defects that may cause an issue and lead to a spill.

Program Details:

- The main line assets on the MLCA program meet the following criteria:
  - Assets within 125 feet of a waterway.
  - Assets within 15 feet of a railway.
  - Assets that intersect with a highway or levee.
- Assets will be inspected on a 5-year frequency.
- Main line assets that cannot be TV'd due to a blockage will be cleaned as defined in SacSewer's Standards and then re-TV'd.

6. Main Line Easement Rehabilitation (MLESRH) Program:

The MLESRH Program was implemented in July 2020 and is the revised version of the main line lining for root mitigation efforts. It is a proactive program focused on cured-in-place-pipe (CIPP) lining main

line assets on the MLSM Program in easement locations to prevent future stoppages or structural collapses from occurring. This program will also reduce customer impact, risk to employees, and maintenance and operations costs.

Program Details:

Easement areas will be selected each year for rehabilitation based on ranking. Several risk factors, including age, spill history, and the quantity of PMs in the area, determine the ranking. Main lines within the selected area will then be evaluated for rehabilitation needs. The program takes a two-year phase approach to rehabilitating each easement area chosen.

- **Phase 1 – Investigation & Planning (Year 1):**
  - A rehabilitation area is identified.
  - The area is evaluated for rehabilitation needs.
  - Evaluation and estimated costs will be determined and budgeted for the next fiscal year.
- **Assets selection criteria**:
  - Easement main line assets in the selected area on a 12-month PM frequency or less will be evaluated for CIPP lining.
  - Main lines qualified for CIPP lining will have lower laterals tapped into them evaluated.
    - Lower laterals without a cleanout will be replaced.
    - Lower laterals with a cleanout will have their condition evaluated for potential replacement.
  - Main line assets that cannot be lined will be assessed individually through the **BCE Strategy, Section 207**.
- **Phase 2 – Construction (Year 2):**
  - The project will be bid out to contractors.
  - Construction work (i.e., LL replacements and ML CIPP lining) will be performed for the evaluated area within the fiscal year.

7. Televised Inspection Strategy:

The **TVI Strategy** provides proactive and reactive approaches for when a TVI of a main line, lower lateral, and manhole is required. The proactive approach includes:

- TVI Based Programs
- Quality Control – Preventive Maintenance Evaluations
- Quality Control After Repairs & Replacements
- PM Schedule Changes and Removal

For more information, see **TVI Strategy, Section 301.**

<u>Reactive Approach</u>

The reactive approach includes performing corrective work after a stoppage or defect has occurred. The **Spill Emergency Response Plan, Section 6** of the **SSMP** lays out the initial spill response and cross-references the policies below:

1. **Televised Inspection Strategy:**

   The **TVI Strategy** provides proactive and reactive approaches for when a TVI of a main line, lower lateral, and manhole is required. The reactive approach includes:

   - Stoppage Follow-Up TVIs
   - Project or BCE Investigation
   - Service Requests assigned to M&O

   For more information, see **TVI Strategy, Section 301.**

2. **Business Case Evaluation Strategy:**

   If a problem is not covered by separate procedures such as the **Main Line Maintain-Repair-Replace Decision Procedures, Section 204,** and the **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205**, then a business case evaluation is conducted as described in the **BCE Strategy, Section 207.**

303 Loss of Support Failure Mode Strategy

303.1. Purpose

This document defines SacSewer's strategy for cost-effectively reducing the frequency of and responding to failures caused by loss of support for assets such as for lower laterals, main lines, manholes, and force mains that cross or are adjacent to a creek.

303.2. Background

Loss of support failures are caused by a pipeline's loss of contact with bedding material or loss of other support structures. Examples of bedding materials are crushed rock and soil. Examples of support structures are piers and hangers. Erosion of bedding or corrosion of support structures may cause loss of support for a SacSewer asset in or near a creek. In addition, creek characteristics frequently change with storm events and debris build-up on obstructions within the creek, causing velocity changes that can alter the width and depth of the creek. The loss of supporting structures can cause a pipe to separate, fall, or break, resulting in a spill that reaches a waterway.

303.4. Strategy Approach

SacSewer has numerous pipelines that cross or run parallel, adjacent to, or within creeks. SacSewer's **Loss of Support Failure Mode Strategy** covers proactive and reactive approaches to loss of support failures for lower laterals, main lines, manholes, and force mains in aerial, covered, or exposed creek crossings and parallel pipelines within creeks.

Force mains are also inspected for loss of support failures under the **Pump Station Condition Assessment Strategy, Section 304**. The loss of support failures caused by construction activities of another agency, utility, or organization is covered under the **Damage by Others Failure Mode Strategy, Section 307.**

Proactive Approach:

1. **Creek Inspection Program:**

   This proactive program is focused on reducing the risk of failure in pipes that cross or run parallel, adjacent to, or within creeks, by identifying defects before they become an issue.

   Program Details:

   - **Assessment of Sewer Pipelines along Waterways**
     This assessment is performed every 10 years. The next assessment will occur in 2029.
     - Pipelines included in assessment:
       - **Aerial crossings** – A sewage pipe that is above the creek floor and may or may not have support structures in the creek. The material of the crossing is typically some type of ductile iron or steel pipe.
       - **Covered crossings** – A sewage pipe that is buried as it crosses the creek.
       - **Exposed crossings** – A sewage pipe that is exposed on the floor of the creek. The crossing may or may not be in a carrier pipe or encased in concrete that protects the pipe and provides support.
       - **Parallel pipeline** – A pipeline within a creek that extends in the same direction as the creek.
     - Desktop Assessment

All pipelines within 25 feet of the waterway centerline as determined by GIS mapping receive desktop assessment. Assessment includes:

- Review of aerial photo to determine waterway characteristics along with pipeline and waterway relationship
- Review of as-builts (if available)
- Review of Computerized Maintenance Management System (CMMS) records

Pipelines found to have potential erosion or structural issues are inspected.

- Field Assessment (Inspection)

  Pipelines determined by desktop assessment to have the potential for issues will be visually inspected.

  Results of Field Assessment may result in a business case evaluation or adding the asset to the Annual Visual Inspections list.

- **Annual Visual Inspections**
  - Visual inspection is performed on a recurring frequency determined by the condition and location of the crossing.
  - Crossings are visually inspected for corrosion, erosion, and structural issues.
  - Depending on the likelihood and consequence of failure, the frequency of visual site inspection may be adjusted.

Table 303-1 Minimum Inspection Frequencies

Minimum Inspection Frequency (Years)	Crossing Type
1	• Aerial not attached to bridge structure • Exposed without encasement • Exposed with degrading encasement
2	• Exposed with encasement
3	• Aerial attached to bridge structure
5	• Covered by 1' or less

- **Post Storm Visual Inspections**

  Aerial crossings not attached to a bridge structure and exposed crossings without encasements will be inspected within five business days following a storm greater than the 2-year return period (6 or 24-hour duration) storm as determined following the **Hydrology Standards of the Sacramento County/City Drainage Manual (December 1996).** Using this methodology, the following rain events will trigger inspections:

Table 303-2 Rainfall Event Triggers

Inspection Criteria	Storm Return Period	Storm Duration	Total Volume

• Aerial Crossings not attached to bridge structure	2-Year	6 Hour	1.06 in
• Exposed crossings without encasements	2-Year	24 Hour	1.90 in

- **Failure Analysis and Follow-up Work:**

  As a follow-up to any of the Annual Visual Inspections or Post-Storm Visual Inspections, a business case evaluation will be employed to analyze any problem found and determine the appropriate corrective action if needed.

Reactive Approach:

The reactive approach is performing corrective work after a stoppage or defect has occurred. The **Spill Emergency Response Plan, Section 6** of the **SSMP** lays out the initial spill response and cross-references the policies below:

3. Televised Inspection Strategy:

The **TVI Strategy, Section 301** provides proactive and reactive approaches for when a TVI of a main line, lower lateral, and manhole is required. The reactive approach includes:

- Stoppage Follow-Up TVIs
- Project or BCE Investigation
- Service Requests assigned to M&O

For more information, see **TVI Strategy, Section 301.**

2. Business Case Evaluation Strategy:

If a problem is not covered by separate procedures such as the **Main Line Maintain-Repair-Replace Decision Procedures, Section 204** or the **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205**, then a business case evaluation is conducted as described in the **BCE Strategy, Section 207.**

304 Pump Station Structure Failure Mode Strategy

304.1. Purpose

This document defines SacSewer's strategy for cost-effectively reducing the risk and responding to pump station structure failures.

304.2. Background

Pump station structure failures may result in spills. Even though the number of SacSewer spills from pump stations is low, the consequence may be severe due to the sewage flow rate and pressure. For that reason, it is vital to maintain the pump station structures, which include:

- Wet wells
- Force mains
- Combination air release valves (CARV)
- Dry pits
- Valve vaults
- Buildings

For clarity, the term pump station can refer to sewer pump stations or sewer lift stations and all their associated appurtenances. Possible failure modes for pump station structures include, but are not limited to, corrosion, erosion, crush/collapse, and damage.

304.3. Strategy Approach

SacSewer's **Pump Station Structure Failure Mode Strategy** incorporates both proactive and reactive approaches to minimize and respond to pump station structure failures.

Proactive Approach:

1. Facilities Scheduled Maintenance (FCSM) Program

FCSM Program aims to prevent failures through regularly scheduled maintenance. Preventive Maintenance (PM) activities and frequencies vary by pump station depending on need. There are several PM activities that relate to structural items at a pump station. Below are the most common PMs, but the list does not include all PM work performed at pump stations. SacSewer documents damages found during the PM in corrective maintenance or business case evaluation work orders. SacSewer performs BCEs to provide additional evaluation and determine the most cost-effective alternatives to mitigate the structural defect.

Program details:

- **Pump Station Monthly and Annual Inspections** – The monthly and annual PM includes a visually inspecting viewable components and evaluating any indication of structural deterioration. A brief description of the tasks performed during each type of pump station inspection is listed below.
    - Safety inspection: Complete the confined space entry form. Wear all required Personal Protective Equipment (PPE) such as hard hats, rubber gloves, safety glasses, goggles, face shields, etc.
    - General maintenance inspection: Check building condition. Observe the area for vandalism.
    - Spill Inspection: look for possible signs of a spill at the wet well.

- Force Main inspections: visually inspect by walking or driving the force main length and checking for sinkholes, leaky CARV, or leakage along the force main.
  - CARV inspections: test, clean, and flush the CARV assets on the force mains.
- Pump and valve inspection: open the inspection access hole and check for plugged pump and worn wear rings.
- Sealed water lines and filter inspection: check water lines and filter.
- Sump pump inspection: remove and inspect the sump pump and float for corrosion and damage. Clean the sump pump area.
- Compressor or wet well transducer inspection: If a bubbler system is installed, test compressor for proper operation. Clean air filters as needed. If a wet well transducer is installed, check transducer and clean as needed (ensure no rags or debris on transducer or drop cable)
- Wet well inspection: Visually inspect all hardware such as pump rails, brackets, clamps and piping for corrosion.
- Blower/fan operational check: Check for proper airflow. Check for loud noises and excessive vibrations

- **Ultrasonic wall thickness testing** – SacSewer owns and operates 9 metal-walled pump stations. Due to sewer gases and the electrical potential in the soil, the metal walls may corrode. The test checks the thickness of metal walled pump stations and force mains in order to estimate the rate of corrosion. A sample of the procedures performed at each ultrasonic wall thickness test is listed below.
  - Safety inspection: Complete the confined space entry form. Wear all required PPE, such as hard hats, rubber gloves, safety glasses, goggles, face shields, etc.
  - General maintenance inspection: Check building condition. Observe the area for vandalism.
  - Spill Inspection: Look for possible signs of a spill at the wet well.
  - Calibrate the unit: Turn the unit on by pressing ON/OFF button. Plug the transducer into the unit. Wipe the surface of the transducer to remove any debris.
  - Taking measurements: Apply approximately two drops or more of coupling gel to the transducer surface. Press the transducer with the gel side flat against the surface that is being measured. Repeat the steps until all desired data points are collected.
- **Aerial Force Main Crossings** – The following three force mains listed in **Table 304-1** have been identified as having an aerial crossing over a waterway. They are assessed using the following PM schedule listed in **Table 304-2**.

Table 304-1 Arial Force Main Crossings

Station	FM Length (ft)	Diameter at crossing	Material	Crossing Length (ft)	Location of Crossing
S132	35,933	22"	HDPE	200	NW Intersection of Sunrise Blvd and Kiefer Blvd (over utility bridge, contained within 36" steel casing)
S102	1,350	4"	Aluminum	60	1000 feet east of pump station (supported by piers)
S070 (Dual Force Mains)	2,891	8" & 10"	Ductile Iron*	150	Sunrise Blvd crossing over the Folsom South Canal north of White Rock Rd (attached to the west side of bridge)

* Aerial crossing is ductile iron pipe; underground portion of pipe on both sides of the crossing is PVC

Table 304-2 Aerial Force Main Preventive Maintenance Schedule

Station	Aerial Force Main Preventive Maintenance	Frequency
S132	1. Visually inspect the visible containment pipe for possible failures at joints and supports from the ground.	Monthly
	2. Inspect slope for erosion and stability.	Annually
	3. Collect and record a pressure reading at each CARV.	Quarterly
S102	1. Visually inspect pipe joints and supports without removing wrap.	Monthly
	2. Inspect polyvinyl protective tape and re-wrap as necessary.	Annually
	3. Inspect concrete pipe supports.	Annually
	4. Inspect slope for erosion and stability.	Annually
S070 (Dual Force Mains)	1. Ultrasonic wall thickness testing.	10 years
	2. Visually inspect visible pipe joints, pipe supports, and sewer crossing warning sign for damage	Monthly
	3. Inspect slope for erosion and stability.	Annually

The force mains for S132, S102, and S070 are visually inspected after rainfall events based on the triggers outlined in the **Loss of Support Failure Mode Strategy, Section 303**. SacSewer's Engineering Operations Support – Pipeline Support Group is responsible for performing post-rainfall visual inspections.

2. Pump Station Condition Assessment Program

The **Pump Station Condition Assessment Program** is a proactive effort to identify the condition of pump station structures and components at a particular point in time. The information gathered enables SacSewer to minimize the risk of failure while making cost-effective maintenance and replacement decisions. SacSewer's Engineering Operation Support – Pump Station & Interceptor Support Group (Pump Station Support) is responsible for performing pump station condition assessments. For more information, see **Pump Station Condition Assessment Program Procedures, Section 306.**

3. Pump Station and Force Mains Inventory and Expenditures

SacSewer maintains and updates an inventory and expenditure list for each pump station. The list consists of major pump station structures, such as wet wells. It also includes the structure installation year, estimated life cycle costs, and estimated remaining useful life. The **Pump Station and Force Mains Inventory and Expenditures** is used to determine future financial needs as part of the Asset Management Plan.

Reactive Approach:

The reactive approach includes responding to pump station alerts and performing failure analysis. The **Spill Emergency Response Plan, Section 6** of the **SSMP** lays out the initial spill response and cross-references the approaches below:

1. Supervisory Control and Data Acquisition (SCADA)

The **SCADA** system alerts SacSewer of unusual operating patterns at a pump station. Component alarms can be an indirect indicator of a structural problem. For example, if a pump runs longer than usual, a pump cycle duration alarm alerts SacSewer staff, who will then respond and determine the issue.

2. Failure Analysis

When structural failures occur, SacSewer inspects and tests the pump station structural assets to determine the cause of the failure. The outcome of the failure analysis may result in further investigation of the structural problem through a business case evaluation. The business case evaluation recommendations may include one or a combination of the following:

- Add or modify the Preventive Maintenance (PM) schedule
- Repair
- Replace applicable components
- Change operating practices

SacSewer's Pump Station Support Group is responsible for creating business case evaluations for significant repairs, replacement, or operation changes. Pump Station Support also assists M&O with engineering review of process changes and additions or modifications of pump station structures.

305 Pump Station Component Failure Mode Strategy

305.1. Purpose

This document defines SacSewer's strategy for cost-effectively reducing the risk and responding to pump station component failures.

305.2. Background

Pump station component failures may result in spills. Even though the number of SacSewer spills from the pump station is low, the consequence may be severe due to the sewage flow rate and pressure. For that reason, it is vital to maintain the pump station components. Pump station components are any items that are not structural to the pressurized sewer system. For clarity, the term pump station can refer to sewer pump stations or sewer lift stations and all their associated appurtenances.

305.3. Strategy Approach

SacSewer's **Pump Station Component Failure Mode Strategy** incorporates both proactive and reactive approaches to minimizing and responding to pump station component failures.

Proactive Approach:

2. Facilities Scheduled Maintenance (FCSM) Program

The FCSM Program places pump station components on scheduled maintenance frequencies to prevent failures.

Program details:

- A preventive maintenance (PM) frequency may be determined by considering:
  - Manufacturers recommendation.
  - Component history (i.e., recurring issues).
  - Business case evaluations.
- A PM activity is chosen by considering:
  - Manufacturers recommendation.
  - Component history (i.e., recurring issues).

1. Pump Station Condition Assessment Program

The **Pump Station Condition Assessment Program** is a proactive effort to identify the condition of pump station structures and components at a particular point in time. The information gathered enables SacSewer to minimize the risk of failure while making cost-effective maintenance and replacement decisions. SacSewer's Engineering Operation Support – Pump Station & Interceptor Support Group (Pump Station Support) is responsible for performing pump station condition assessments. For more information, see **Pump Station Condition Assessment Program Procedures, Section 306.**

2. Pump Station and Force Mains Inventory and Expenditures

SacSewer maintains and updates an inventory and expenditure list for each pump station. This list consists of major pump station components and includes the component installation year, estimated life cycle costs, and estimated remaining useful life. The inventory and expenditures list

provides maintenance costs for each major component. The list is shared with SacSewer's M&O Section – Facility Maintenance and Operations Group and Engineering Business Planning Section – Business Planning Group. The **Pump Station and Force Mains Inventory and Expenditures** is used to determine future financial needs as part of the Asset Management Plan.

Reactive Approach:

The reactive approach includes responding to pump station alerts and electrical power outages and performing failure analysis. The **Spill Emergency Response Plan, Section 6** of the **SSMP** lays out the initial spill response and cross-references the approaches below:

1. Supervisory Control and Data Acquisition (SCADA)

The **SCADA** system alerts SacSewer of unusual operating patterns at a pump station. For example, an alert is sent if a pump fails to start, allowing SacSewer staff to respond and determine the issue.

2. **Electrical Power Outages**

SacSewer relies on electrical power to operate pump stations. Electrical power is supplied by different utility companies in the area of SacSewer's pump stations. Since SacSewer does not have control over electrical power, SacSewer has four approaches to handling electrical power outages. The following options are used depending on the downtime and cost-effectiveness of each option:

- Install stationary generators.
- Install bypass pumping capabilities at the station.
- Deliver a portable generator to the stations as needed.
- Install additional storage capacity.

3. Failure Analysis

When a pump station component fails, SacSewer inspects the component, evaluates the operating condition, and performs tests to determine the cause of failure. Depending on the cause of failure, SacSewer may alter maintenance activities, frequencies, or system design and operating practices or repair or replace the pump station component. The outcome of the failure analysis may result in further investigation of the component problem through a business case evaluation. The business case evaluation recommendations may include any one or a combination of the following:

- Add or change a Preventive Maintenance (PM) schedule.
- Perform a repair on the component
- Replace the component
- Change operating practices.

SacSewer's Pump Station Support Group is responsible for preparing business case evaluations for significant repairs, replacement, or operation changes. Pump Station Support also assists M&O with engineering review of process changes and additions or modifications of pump station components.

306 Pump Station Condition Assessment Program Procedures

306.1. Purpose

The purpose of the **Pump Station Condition Assessment Program Procedures** is to establish and document a consistent process for performing a comprehensive assessment of pump station components and facilities. The findings will help SacSewer develop recommendations for necessary repair, rehabilitation, or replacement of the pump station structure and/or components.

306.2. Background

Condition assessment is a proactive measure meant to identify the condition of an asset at a particular point in time. The information gathered enables SacSewer to minimize the risk of failure while making cost-effective maintenance and replacement decisions. Condition assessments are not intended to replace failure analysis, although information gathered during condition assessments is invaluable during the failure analysis process.

306.3 Procedure Approach

SacSewer Maintenance & Operations (M&O) Section regularly performs pump station condition assessments during monthly, quarterly, semi-annual, and annual preventive maintenance inspections as part of the Facilities Scheduled Maintenance (FCSM) Program. These condition assessments include using both qualitative and quantitative measurements. Qualitative measurements consist of visual, sound, and touch assessments. Examples include visual assessments of all pump station components and collecting equipment information, photographs, and general observations. Quantitative measurements consist of physical measurements such as the ultrasonic test, which inspects the metal wall thickness of wet wells. After measurement, SacSewer's M&O staff interpret the results and determine whether additional actions or further evaluation are needed. Any failure found by M&O during the condition assessment will be handled through a business case evaluation through a service request in SacSewer's Computerized Maintenance Management System (CMMS).

In addition to preventive maintenance inspections performed by M&O, SacSewer has implemented a Pump Station Condition Assessment Program. SacSewer's Engineering Operations Support – Pump Station & Interceptor Support Group (Pump Station Support) is responsible for performing a more detailed condition assessment for pump stations that require a higher degree of evaluation as part of the Pump Station Condition Assessment Program. The results and outcomes from this assessment provide SacSewer with the information needed for management to make projections for long-range renewal and replacement revenue needs.

306.4. Descriptive Procedural Steps

SacSewer's **Pump Station Condition Assessment Program Procedures** is a proactive approach to identifying and ranking the condition of SacSewer's pump stations through a comprehensive condition assessment process. More information and details can be found in SacSewer's **Pump Station Condition Assessment Strategy**, which describes the proper responses to specific conditions and performance ratings.

1.0 Selection Process

The selection process determines which SacSewer pump stations and components will be evaluated. SacSewer's Pump Station Support Group is responsible for selecting the pump stations and components to be further evaluated. The selection process involves data analysis and a

workshop with SacSewer personnel. The selected pump stations will undergo condition assessments as outlined in SacSewer's **Pump Station Condition Assessment Strategy.**

2.0 Condition Assessment

A condition assessment is performed after selecting the pump stations with the highest ranking. The condition assessment at each pump station may consist of, but is not limited to, the following activities:

- Visual Condition Assessment – Visiting each station and conducting visual assessments of all components of the stations, collecting equipment information, photographs, and general observations.
- Corrosion Field Survey – A corrosion specialist will inspect and collect field measurements of major structural components at each pumping station subject to corrosion.
- Pump Performance Testing – Collect pressure readings on the discharge piping for each pump and the corresponding pump start and stop times from the Supervisory Control And Data Acquisition (SCADA) system to calculate flows. Using this information, measure the actual performance against the manufacturer's pump curve.
- Camera Inspections – To safely provide inspections within wet wells, a pole-mounted camera is used to collect video of the interior of the wet wells to conduct a detailed, non-destructive assessment of any defects that can be identified.

Condition Assessment activities are performed by a combination of in-house SacSewer staff, consultants, and specialists, depending on the capabilities and availability of in-house staff. SacSewer may also sometimes use other condition and performance testing methods. Appendix B of the **Pump Station Condition Assessment Strategy** provides a more detailed list of condition assessment activities performed on pump stations and components**.**

3.0 Condition and Performance Scoring

Major components found in each pump station will undergo condition and performance scoring during the condition assessment. The results of the visual observations, testing, and analysis activities will be used to score the major components of each pump station.

4.0 Levels of Service (LOS) Standards

LOS standards were established through a series of workshops, and the minimum acceptable thresholds were defined in five categories: safety, reliability, cost of maintenance, good neighbor, and efficiency (cost of operations). The LOS standards define the minimum performance for an entire pump station and individual components. Additional details can be found in the **Pump Station Condition Assessment Strategy.**

5.0 Recommendations

The condition and performance scores help Pump Station Support staff establish recommendations for each component based on the severity of the scores. These recommendations are defined by the region where the performance and condition ranking scores intersect. A graphic of the recommendations associated with each combination of condition and performance scores is provided in the **Pump Station Condition Assessment Strategy.**

6.0 Review Levels of Service

After recommendations for each component have been made, Pump Station Support staff will review the level of service for updates or changes. The review will ensure that the LOS-based recommendations are cost-effective and appropriate. The review may result in the deletion or addition of a LOS to address a recommendation that was not previously identified.

7.0 Develop and evaluate alternatives (PDP-1)

After updating the LOS standards, Pump Station Support staff can develop and evaluate alternatives using the **Project Authorization Process: PAC/PDP Guidelines.** During PDP-1, staff will consider all the recommendations and develop alternatives addressing the pump station as a whole. Staff may coordinate with consultant engineers to provide preliminary investigations into these alternatives.

8.0 PDP-2

The chosen alternatives for each station will be further evaluated in PDP-2 by SacSewer's Engineering Operation Support – Design Group.

9.0 Present PDP-2 Alternatives to the Organizational Planning Team (OPT)

Alternatives are then presented to SacSewer's OPT for approval before presenting the alternatives to the Project Authorization Committee.

10.0 PDP-2 Alternatives Approved?

If yes, continue to step 11.0

If no, go back to step 8.0.

11.0 Present PDP-2 Alternatives to Project Authorization Committee (PAC)

Alternatives are then presented to SacSewer's PAC for approval.

12.0 PDP-2 Alternative Approved?

If yes, proceed to step 13.0

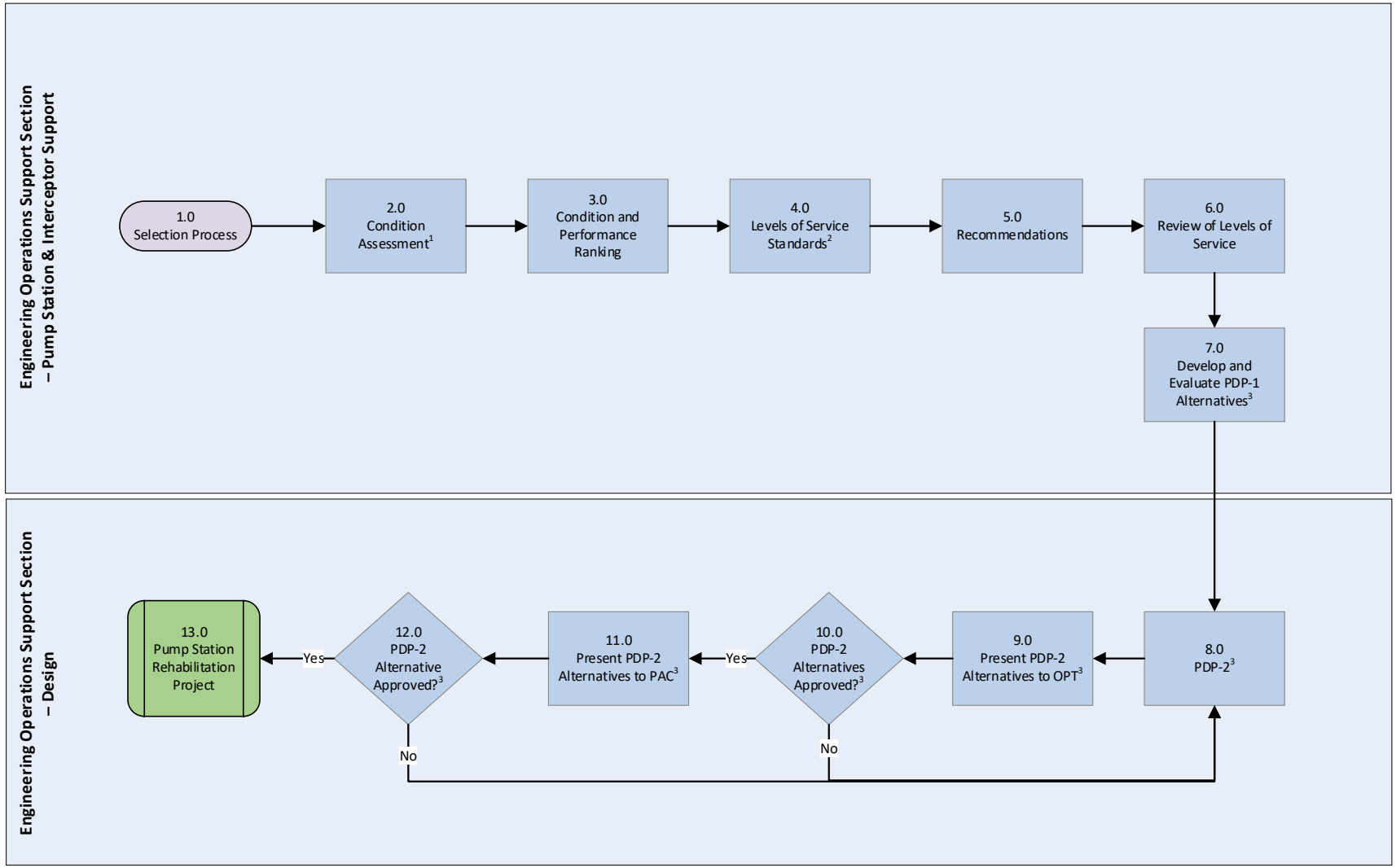
If no, go back to step 8.0.

13.0 Pump Station Rehabilitation Project

The approved alternative is turned into a Pump Station Rehabilitation Project. SacSewer's Engineering Operations Support – Design Group will bid out the project and work with the selected consultant to perform rehabilitation work on the pump station.

306.5. Flowchart

Pump Station Condition Assessment Program Procedures Flowchart



Abbreviations:
PDP – Project Development Plan
OPT – Organizational Planning Team

Footnote:
1. Condition assessments may consist of, but is not limited to the following: Visual Condition Assessments, Corrosion Field Surveys, Pump Performance Testing, and Camera Inspections
2. Levels of Service define the minimum acceptable threshold in five categories: safety, reliability, cost of maintenance, good neighbor, and efficiency (cost of operations)
3. For more information, please see the **Project Authorization Process: PAC/PDP Guidelines**

307 Damage by Others Failure Mode Strategy

307.1. Purpose

This document defines SacSewer's strategy for reducing and mitigating damage to SacSewer assets caused by external excavators (e.g., other agencies, utilities, organizations, etc.)

307.2. Background

Damage by other failures are caused when public and/or private excavators damage a SacSewer asset while performing digs or other construction work for their projects. Damage to a SacSewer asset could lead to a spill if it causes a blockage or structural collapse. Damage caused by others includes:

- Accidental damage - such as pipeline breaks caused by contractors and/or other utilities striking a SacSewer asset.
- Unintentional damage (e.g., a vehicle striking a perimeter fence).
- Intentional damage (e.g., vandalism and/or the dumping of debris into SacSewer manholes).

307.3. Strategy Approach

SacSewer's **Damage by Others Failure Mode Strategy** for reducing and mitigating damage caused by others in the most cost-effective way incorporates both proactive and reactive approaches.

Proactive Approach

SacSewer attempts to reduce the chance of damage occurring through the use of the following:

1. **Underground Service Alert (USA) of Northern California and Nevada**

   SacSewer participates in the **USA of Northern California and Nevada,** a facility damage prevention service implemented to reduce the chances of causing damage by public and private excavators. **USA's** purpose is to receive and transmit planned excavation reports from public and private excavators to all participating members of the **USA** who may have underground facilities at the planned excavation location. The **USA** Members will mark or stake their facility, provide information, or give clearance to dig.

Reactive Approach

After damage to an asset has occurred, SacSewer investigates to mitigate the damage and reduce the risk of future damage to the asset through the use of the following:

1. **Damage by Others Investigation Procedures**

   The **Damage by Others Investigation Procedures** specifies the process for investigating underground facility damage incidents, determining their causes, and identifying the persons or groups responsible for the damage. See the **Damage by Others Investigation Procedures, Section 206**, for more information.

2. **Business Case Evaluation Strategy**

   The **BCE Strategy** uses an internal process to analyze the cost of repairing or reducing the risk of future damage. In some situations, an asset may be modified to prevent repeat incidents of vandalism or other intentional damage. For more information, see the **BCE Strategy, Section 207.**

400 Blockage Control Program

400 Program Overview

400.1. Purpose

The purpose of the **Blockage Control Program** in the SSMP Reference Document is to provide additional information on the strategies and procedures that:

- Routinely clean or inspect sewer pipes to prevent spills caused by FOG, roots, debris, and other pipe-blocking substances.
- Describe the procedures to verify main lines are cleaned adequately.
- Define how preventive maintenance schedules are adjusted.

400.2. Background

SacSewer owns and operates a variety of physical assets. In support of SacSewer's goals of reducing spills, meeting regulatory requirements, achieving identified service commitment targets, and operating in a cost-effective manner, SacSewer has documented several efforts designed to clean assets. The **Blockage Control Program, Section 400** of the SSMP Reference Document, provides additional information on the strategies and procedures described in the **Blockage Control Program, Section 4.3** of the SSMP.

400.3. Program

The **Blockage Control Program** encompasses several separately documented but sometimes interrelated strategies, policies, and programs. These strategies and procedures that are further discussed in the **Blockage Control Program** are listed below:

- **Blockage Failure Mode Strategy**
- **Quality Control Procedures of MLSM Cleanings**
- **Main Line Cleaning Frequency Adjustment Strategy**
- **Lower Lateral Cleaning Frequency Adjustment Strategy**

401 Blockage Failure Mode Strategy

401.1. Purpose

This document defines SacSewer's strategy for cost-effectively reducing the frequency of and responding to failures caused by stoppages or blockages in gravity assets such as lower laterals, main lines, and manholes.

401.2. Background

Stoppages in lower laterals, main lines, and manholes are blockages in a pipe or channel that impede the movement of sewage through the collection system and can result in spills, service interruptions, and environmental consequences. Blockages can be composed of one or a combination of pipe-blocking substances such as roots, grease, and debris. Historical stoppage and spill data show that roots is the cause for a large number of the stoppages and spills for SacSewer's collection system.

401.3. Strategy Approach

The **Blockage Failure Mode Strategy** focuses on clearing blockages in gravity assets within the collection system. SacSewer's main tools to combat blockages in gravity assets are mechanical cleanings and TVIs. Gravity assets can be cleaned by the following:

- Rodding: spinning steel rods through a pipe
- Balling: pushing a ball through a pipe
- Jetting: using a hydraulically pressurized nozzle
- Flailing: using a hydraulically pressurized nozzle with chains attached

SacSewer has tried other techniques to control root intrusion, such as root foaming. However, after several studies and pilot projects, SacSewer management decided to discontinue the use of chemical root foaming. It was determined that sewer pipes that had grease and debris in addition to roots had to be cleaned with mechanical cleaning after the root foaming was performed. The root foaming was only effective in preventing root growth, while the mechanical cleaning effectively removed roots, grease, and debris simultaneously. Since most of the sewer pipes that were foamed also required mechanical cleanings, it was determined that mechanical cleaning is a more effective method than root foaming.

Detailed instructions for conducting TVIs can be found in SacSewer's TVI Manual. The TVI Manual contains the defect codes M&O staff and contractors use to provide consistent inspection results. It is also used by TVI Review staff to determine the appropriate corrective action for a defective sewer pipe. SacSewer's **Blockage Failure Mode StrategyJ** of utilizing mechanical cleanings and TVIs to reduce the frequency of and responding to failures caused by blockages consists of several proactive and reactive approaches.

Proactive Approach:

The following maintenance programs and procedures have been developed and implemented to reduce the risk of spills caused by blockages in lower laterals, main lines, and manholes. All program details were determined by considering the spill data, available resources, and annual workload. These program details are subject to change (if needed) to achieve optimal performance. For more information on how work orders are generated, tracked, and completed in Maximo, please see **Maintenance Management System (CMMS), Section 4.1.1 of the SSMP.**

1. Lower Lateral Scheduled Maintenance (LLSM) Program:

The LLSM Program focuses on preventing future failures due to stoppages by regularly cleaning lower laterals with known but maintainable sewer issues such as roots, grease, and debris. Lower laterals are placed on the LLSM Program from the **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205, BCE Strategy, Section 207,** or **TVI Strategy, Section 301.** Best judgment and previous history are used to determine the maintenance interval and the job plan.

Program details:

- A PM interval is determined by several factors listed as follows:
    - The history of the lower lateral is reviewed to see if there are recurring issues (roots, grease, or debris).
    - If there was a stoppage at 50% of the PM interval, if applicable, that duration would be used as the minimum PM interval.
    - A first stoppage on a lower lateral is followed by a TVI in 12 months to determine if it needs to be put on the LLSM Program and at what PM interval.
    - All lower lateral PM schedules can be adjusted per the **Lower Lateral Cleaning Frequency Adjustment Strategy, Section 404,** or, if not applicable, adjustments can be accessed based on the findings (i.e., roots, grease, or debris rating) from a TVI performed according to the **TVI Strategy, Section 301.**
- A PM Job plan is determined:
    - Depending on the asset location (street or easement).

2. Lower Lateral Cleaning Frequency Adjustment Procedures:

This strategy focuses on reducing the number of spills experienced by lower laterals on the LLSM Program that may have incorrect cleaning frequencies assigned or require adjustments over time. Frequencies are adjusted based on their latest PM observations. For more information, see **Lower Lateral Cleaning Frequency Adjustment Strategy, Section 404.**

3. Lower Lateral Scheduled Inspection (LLSI) Program:

The LLSI Program was implemented in July 2021 and focuses on preventing future failures due to a stoppage or structural collapse by TV inspecting lower laterals over the age of 40 on an interval to identify any defects that may cause an issue and lead to a spill. Refer to the **Crush Collapse Failure Mode Strategy, Section 302,** for more program details**.**

4. Lower Lateral Area Inspection Program (LLAIP) – Cleanout Installs:

The LLAIP – CO Installs Program is focused on reducing lower lateral spills by concentrating cleanout install efforts (for lower laterals without a cleanout) in geographical locations prioritized according to spill ratio (BIS ratio and spill ratio overlap). The locations with the highest spill ratio will be completed first unless directed elsewhere by SacSewer management. This process assumes that areas with past spills have a higher risk of future re-occurrences. By installing a cleanout, SacSewer will have an access point to maintain a lower lateral through cleanings and TV inspections.

Program details:

- Annually, SacSewer selects a pre-determined number of lower laterals to write cleanout install work orders based on budget, staff resources, and location.
- If a cleanout is found buried, the cleanout is to be raised to grade, a functioning SRV added, and a Carson box is to be installed.
- The new cleanout location will be recorded, added, or updated in SacSewer's CMMS.

5. Main Line Scheduled Maintenance (MLSM) Program:

The MLSM Program focuses on preventing future failures due to stoppages by regularly cleaning main lines with known but maintainable sewer issues such as roots, grease, and debris. Main lines are placed on the MLSM Program from the **Main Line Maintain-Repair-Replace Decision Procedures, Section 204, BCE Strategy, Section 207,** or **TVI Strategy, Section 301**. Best judgment and previous history are used to determine the maintenance interval and the job plan.

Program Details:

- A PM interval is determined by several factors listed below:
    - The history of the main line is reviewed to see if there are recurring issues (roots, grease, or debris).
    - If there is a prior stoppage, the shortest stoppage interval will be used as the minimum PM interval if applicable.
    - A first stoppage on a main line is followed by a TVI in 12 months to determine if it needs to be put on the MLSM Program and at what PM interval.
    - All main line PM schedules can be adjusted per the **Main Line Cleaning Frequency Adjustment Strategy, Section 403**, or if not applicable, adjustments can be assessed based on the findings (i.e., roots, grease, or debris) from a TVI performed according to the **TVI Strategy, Section 301.**
- A PM Job plan is determined or changed:
    - Depending on the asset location and findings (i.e., roots, grease, or debris rating) from a TVI performed according to the **TVI Strategy, Section 301.**

6. Main Line Cleaning Frequency Adjustment Procedures:

This strategy focuses on reducing the number of spills experienced by main lines on the MLSM Program that may have incorrect cleaning frequencies assigned or require adjustments over time. Frequencies are adjusted based on their latest PM observations. For more information, see **Main Line Cleaning Frequency Adjustment Procedures, Section 403.**

7. Quality Control for Sewer Pipe Cleaning Procedures:

The **Quality Control for Sewer Pipe Cleaning Procedures** details SacSewer's procedures for evaluating the cleaning techniques and activity of main line assets cleaned as part of SacSewer's

MLSM Program. For more information, see **Quality Control for Sewer Pipe Cleaning Procedures, Section 402.**

8. Main Line Scheduled Inspection (MLSI) Program:

The MLSI Program was implemented in July 2020 and focuses on preventing future failures due to a stoppage or structural collapse by TV inspecting main lines over the age of 40 on an interval to identify any defects that may cause an issue and lead to a spill. Refer to the **Crush Collapse Failure Mode Strategy, Section 302**, for more program details**.**

9. Main Line Critical Assets (MLCA) Program:

The MLCA Program was implemented in July 2020 and focuses on preventing future failures due to a stoppage or structural collapse by TV inspecting main lines that are in geographic proximity to critical features such as waterways, railways, highways, or levees, on an interval to identify any defects that may cause an issue and lead to a spill. Refer to the **Crush Collapse Failure Mode Strategy, Section 302**, for more program details.

10. Main Line Visual Flow Inspection (VFI) Program:

The Main Line VFI Program is focused on reducing main line spills by visually inspecting the flow through main lines at downstream manholes. The program requires at least 90% of the main lines not scheduled to be cleaned or inspected in a calendar year to have their flow visually inspected per the Main Line VFI Program.

Program Details:

- M&O Field staff will compare the flow through a main line with the VFI Normal Flow Depth chart.
- If the flow is determined to be stagnant or surcharged:
  - The main line should be cleaned within 4 hours.
  - A follow-up TVI WO is written.
  - The TVI will be reviewed. A review of the TVI may create future actions that may include a Business Case Evaluation (BCE), future TVI work, or adding the main line to the MLSM Program.
- If the flow is determined to be slow flow:
  - The main line should be cleaned within the next 5 days.
  - A follow-up TVI WO is written.
  - The TVI will be reviewed. The review may lead to future actions, including a Business Case Evaluation (BCE), future TVI work, or adding the main line to the MLSM Program.
- If a main line experiences a second slow drain within 10 years of the first cleaning, the main line will be assigned to the MLSM Program.

11. Main Line Easement Rehabilitation (MLESRH) Program:

The MLESRH Program was implemented in July 2020 and is the revised version of the main line lining for root mitigation efforts. It is a proactive program focused on cured-in-place-pipe (CIPP) lining main line assets on the MLSM Program in easement locations to prevent future stoppages or structural collapses from occurring. This program will also reduce customer impact, risk to employees, and maintenance and operations costs. Refer to the **Crush Collapse Failure Mode Strategy, Section 302**, for more program details.

12. Manhole Scheduled Maintenance (MHSM) Program:

The MHSM Program is focused on preventing future stoppages by cleaning manholes regularly that have known but maintainable sewer issues such as roots, grease, and debris. The MHSM Program also includes replacing odor control media annually to mitigate manholes with odor issues. Manholes can be placed on the MHSM Program from the **BCE Strategy, Section 207,** or **TVI Strategy, Section 301**. Best judgment, cost analysis, and previous history are used to determine the PM interval and job plan.

13. Televised Inspection Strategy:

The **TVI Strategy** provides proactive and reactive approaches for when a TVI of a main line, lower lateral, and manhole is required. The proactive approach includes:

- TVI Based Programs
- Quality Control – Preventive Maintenance Evaluations
- Quality Control After Repairs & Replacements
- PM Schedule Changes and Removal

For more information, see **TVI Strategy, Section 301.**

<u>Reactive Approach:</u>

The reactive approach includes performing corrective work after a stoppage or defect. The **Spill Emergency Response Plan, Section 6** of the **SSMP** lays out the initial spill response and cross-references the policies below:

2. Televised Inspection Strategy:

The **TVI Strategy** provides proactive and reactive approaches for when a TVI of a main line, lower lateral, and manhole is required. The reactive approach includes:

- Stoppage Follow-Up TVIs
- Project or BCE Investigation
- Service Requests assigned to M&O

For more information, see **TVI Strategy, Section 301.**

3. Business Case Evaluation Strategy:

If a problem is not covered by other procedures such as the **Main Line Maintain-Repair-Replace Decision Procedures, Section 204**, or **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205**, then a business case evaluation is conducted as described in the **BCE Strategy, Section 207.**

3. Legal Authority to Enforce Compliance

The **Collection System Ordinance** and the Treatment and Resource Recovery Ordinance provide SacSewer with the legal authority to impose penalties and take enforcement actions against violators of the ordinances. Specifically, the "Authority to monitor discharge and take enforcement action for inadequate control of fats, oil, and grease and ineffective facility maintenance practices." The **Collection System Ordinance** states the owner has the sole responsibility for clearing stoppages and inspecting, maintaining, and repairing the upper lateral, including backflow prevention devices.

SacSewer developed an **Enforcement Response Process (ERP)**, which provides procedures for addressing non-compliance, including fines, mandatory corrective actions, and potential service termination. The ERP describes SacSewer's process of initiation, research, enforcement, follow-up, and closure of violations when users do not comply with the provisions of the **Collection System Ordinance**. The process can generally be applied to all users of the sewer collection system in conformance with the ordinances, including those subject to the requirements of the Federal pre-treatment program (typically referred to as industrial users) and those discharging under a Wastewater Discharge Permit (WDP). The ERP does not expand the authority described in the ordinances. It is used by SacSewer staff to identify, document, track, and respond to non-compliance and to select the appropriate enforcement action for a given violation. The ERP ensures that consistent, timely, fair, and equitable enforcement procedures are implemented for instances of non-compliance.

SacSewer's Safety & Regulatory Compliance (S&RC) and Wastewater Source Control Section (WSCS) staff inspect and enforce the provisions of the ordinances and Enforcement Response Plan. S&RC or WSCS staff is notified by SacSewer when the cause of an FOG or upper lateral root-related spill or impact can be traced to a resident or FSE. S&RC or WSCS staff follow its Enforcement Response Process. Generally, the Enforcement Response Process for upper lateral root intrusion and FOG includes the following elements:

- Advisory letters are sent to give the owner knowledge of roots or FOG entering the lower lateral from their upper lateral.
- Follow-up evaluations occur to confirm that the owner has taken corrective action.
- Notice of violation letters are sent if the owner has not performed corrective action or if roots or FOG from the upper lateral caused a stoppage in SacSewer's lower lateral.

SacSewer and WSCS staff periodically review the status of open upper lateral root and FOG incident cases and discuss necessary enforcement actions to ensure compliance.

402 Quality Control Procedures for MLSM Cleanings

402.1. Purpose

This document defines SacSewer's procedures for evaluating the cleaning techniques and activity of main line assets cleaned as part of SacSewer's Main Line Scheduled Maintenance (MLSM) Program.

402.2. Background

SacSewer identifies maintenance defects (i.e., FOG, roots, debris) in main lines through CCTV inspection or spill analysis. When a maintenance defect is found, SacSewer can cost-effectively extend an asset's life through routine scheduled cleanings as part of the MLSM Program instead of replacing the main line. The assets on the MLSM Program are assigned a cleaning frequency and job plan activity to prevent future spills caused by blockages from occurring.

Although the MLSM Program intends to prevent blockage-caused spills, there are still instances where a spill occurs. The four primary causes of failure for main lines currently on the MLSM Program are the following:

- Incorrect PM cleaning frequency assigned
- Incorrect PM job plan activity assigned
- Insufficient PM cleaning technique during MLSM PM cleaning
- Incorrect maintenance solution (i.e., choosing a cleaning activity instead of a repair/renewal solution)

This document outlines specific guidelines and procedures for reviewing main line cleaning PM work.

402.3. Procedure Approach

The **Quality Control Procedures for MLSM Cleaning** focuses on reducing future main line spills attributed to *incorrect cleaning activity assigned* and *insufficient cleaning techniques* by verifying that main lines on MLSM are cleaned adequately by SacSewer M&O field staff.

Three major evaluation factors include:

- The specified activity (i.e., jetting, rodding, and balling)
- The equipment used to perform the cleaning
- The operator of the equipment

402.4. Descriptive Procedural Step

1.0 MLQC Report Automatically Generates

The MLQC Report is automatically generated through a subprocess created by the ML TVI Review Team.

1.1 Accesses the MLQC Report

The ML TVI Review Team accesses and retrieves the data that was automatically generated.

1.2 Create Work Orders from the MLQC Report

The ML TVI Review Team determines the appropriate percentage of each PM activity to be evaluated, and ensures the equal review of the various operators who perform the work and/or equipment. Then the ML TVI Review team utilizes a mass work order batching tool to create the work orders identified from the MLQC report.

2.0 Schedule MLQC TVI WOs

The Workload Planning and Scheduling Group assigns the MLQC TVI work orders to be performed no more than 10 calendar days from the completion date of the initial MLSM PM cleaning work order.

3.0 Perform MLQC TVI WOs

The Maintenance & Repair Group TV inspects the main lines following the procedures in the **TVI Manual**.

4.0 Review MLQC TVI or RE-TVI WOs

The Main line TVI Review Team receives the completed TVI recordings and reviews them within 14 calendar days of receiving the work order.

4.1 Is Roots ≥4, or Moderate/Heavy Grease or Solids/Debris Found?

Roots greater or equal to #4 or Moderate/Heavy Grease or Solids in a main line have the potential to cause a blockage and lead to a spill.

If yes, continue to step 4.3

If no, continue to step 4.2

4.2 Pass

Document & End

4.3 Is Job Plan Assigned to PM Correct?

If yes, continue to step 4.5

If no, continue to step 4.4

4.4 Activity Fail

The Job Plan activity assigned to the MLSM PM is incorrect. Main Line TVI Review Unit revises the asset's PM Cleaning Job Plan to the appropriate Job Plan activity to address the observed or reported maintenance defects.

4.5 Technique Fail

The M&O field staff that performed the MLSM PM needs to go back and reclean the main line.

4.6 Create RECLEAN and RE-TVI WOs

The Main Line TVI Review Team creates RE-CLEAN and Re-TVI WOs.

4.7 Send Failure Email to M&O Supervisory & Management Group

The Main Line TVI Review Team sends a Failure Email to the M&O Supervisory & Management group to notify them of the Activity or Technique Fail.

5.0 Schedule RECLEAN and RE-TVI WOs

The Workload Planning and Scheduling Group assigns the RECLEAN and RE-TVI work orders to be performed no more than 10 calendar days from the completion date of the initial MLSM PM cleaning work order. The RE-CLEAN WO will be assigned to the M&O field crew that performed the initial MLSM PM cleaning that failed QC inspection.

6.0 Perform RECLEAN and RE-TVI WOs

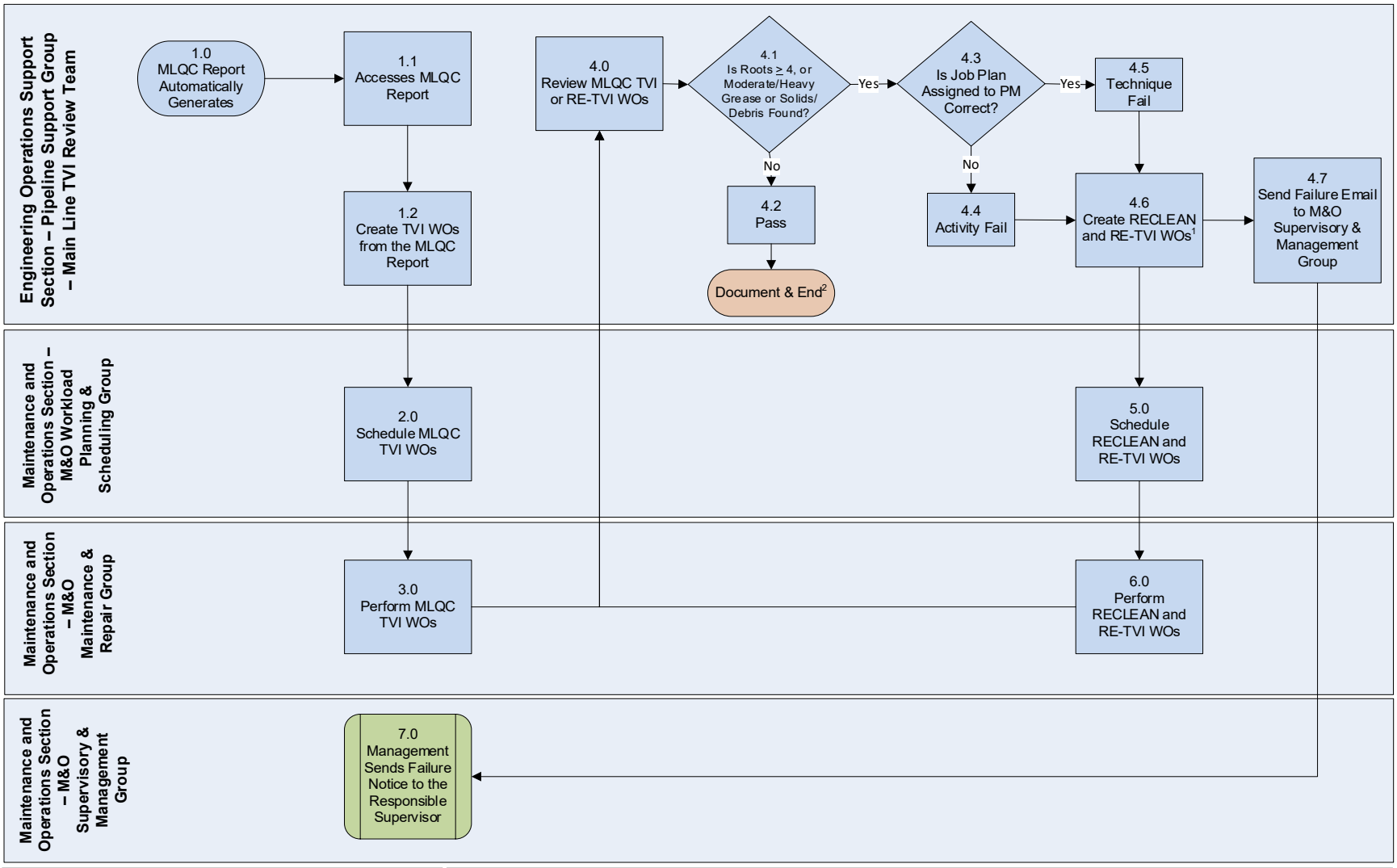
The Maintenance & Repair Group RE-TVI the main lines following the procedures in the **TVI Manual**.

7.0 Management Sends Failure Notice to the Responsible Supervisor

M&O Management sends the Failure Notice to the Response supervisor for staff notification of the failure.

402.5 Flowchart

Quality Control Procedures for MLSM Cleanings Flowchart



Abbreviations:

MLQC – Main Line Quality Control
PM – Preventive Maintenance
TVI – Television Inspection
WOs – Work Orders

Footnotes:

1. Add Rework Mainline Sched Maint QC "RWMLWMQC" to the classification field in Maximo.
2. Document all decisions in log notes and complete the end process.

403 Main Line Cleaning Frequency Adjustment Strategy

403.1. Purpose

This document defines SacSewer's strategy for reducing the number of spills for main lines on the Main Line Scheduled Maintenance Program (MLSM Program) that may have incorrect PM cleaning frequencies assigned or require adjustment over time.

403.2. Background

SacSewer identifies maintenance defects (i.e., FOG, roots, solids/debris) in main lines through CCTV inspections or spill analysis. When a maintenance defect is found, in many cases, SacSewer can cost-effectively extend an asset's life through routine scheduled cleanings as part of the MLSM Program instead of replacing or rehabilitating the main line. Assets on the MLSM Program are assigned a cleaning frequency and activity to prevent future spills caused by blockages from occurring.

However, as time passes, conditions may change, which may cause these assets to fail before their next scheduled cleaning. The four primary causes of failure for main lines currently on the MLSM Program are the following:

- Incorrect PM cleaning frequency assigned
- Incorrect PM cleaning activity assigned
- Insufficient PM cleaning technique during MLSM PM cleaning
- Incorrect maintenance solution selected (i.e., choosing a cleaning activity instead of a repair/renewal solution)

403.3. Strategy Approach

The **Main Line Cleaning Frequency Adjustment Strategy** focuses on reducing the frequency of spills due to blockages caused by assets on the MLSM Program with an incorrect PM cleaning frequency and consists of proactive and reactive approaches.

Proactive Approach:

An asset on the MLSM Program may proactively have its cleaning PM frequency adjusted if a cleaning or TVI finds maintenance defects that could lead to a stoppage. SacSewer created the following monthly report and strategy to identify which assets need proactive PM cleaning adjustments.

1. **MLSM Monthly Frequency Adjustment Report:**

   MLSM Program work orders consist of M&O field staff utilizing high-velocity/vacuum cleaning equipment, such as jetters, easement carts, and Minuteman trucks. M&O field staff document cleaning observations for grease, roots, and solids/debris in the Failure Reporting tab of the cleaning PM work order in SacSewer's CMMS. **Section 7: Standard Measure of Observed Results** of **SacSewer's Intro to HVVC Training Manual** outlines standard measures for recording field observations of sewer pipes at the time of cleaning. Documented severities include None, Light, Moderate, or Heavy for grease, roots, and solids/debris. These observations are then evaluated for potential PM frequency adjustment.

   The Engineering Business Planning Group created a **MLSM Monthly Frequency Adjustment Report** that identifies the main line assets on the MLSM Program that were cleaned the previous month with cleanliness ratings according to **Table 403-1 Frequency Adjustment Criteria.** The Engineering Pipeline Support Group – Main Line TVI Review staff is responsible for running the **MLSM Monthly**

Frequency Adjustment Report at the beginning of every month and making the necessary adjustments according to **Table 403-1 Frequency Adjustment Criteria** within 30 days. If ML TVI Review staff determines that no adjustment in PM frequency is needed based on asset history, the main line will be excluded from a cleaning PM frequency adjustment.

Main lines on the MLSM Program with a stoppage between PM cleaning frequencies, will not be evaluated for cleaning PM frequency adjustment according to the **MLSM Monthly Frequency Adjustment Report**. Their cleaning frequency will be adjusted according to the **Main Line Maintain-Repair-Replace Decision Procedures, Section 204**.

Table 403-1 Frequency Adjustment Criteria

If cleanliness rating occurs with…	2 consecutive **None** results in all three categories (i.e., Grease, Roots, Solids/Debris)	3 consecutive **Light or None** results in all three categories	2 consecutive **Heavy** results in any one category	Any other results
Then adjust the frequency as follows…	Adjust frequency to longer PM interval.	Adjust frequency to longer PM interval.	Adjust frequency to shorter PM interval. Create a BCE SR when the next higher frequency is less than 3 months.[1]	Continue current maintenance frequency.

[1] If a previous BCE SR had been concluded for a 3 to 1 month frequency, or a 1-month increase, then that same 1-month increase recommendation may go for 36 report cycles (or 3 years) with no changes given the asset history data allows with no events. Once the 1-month increase reaches a 36-report cycle, then a new BCE SR will need to be created to begin the investigation process once again.

SacSewer uses 6, 12, 18, 24, 36, or 48-month PM cleaning frequencies when adjusting to a longer cleaning PM interval and 3, 6, 12, 24, or 36 when adjusting to a shorter PM cleaning interval.

2. Televised Inspection Strategy:

The **TVI Strategy** provides proactive and reactive approaches for when a TVI of a main line, lower lateral, and manhole is required. The proactive approach includes:

- TVI Based Programs
- Quality Control – Preventive Maintenance Evaluations
- Quality Control – After Repairs & Replacements
- PM Schedule Changes and Removal

For more information, see **TVI Strategy, Section 301.**

Reactive Approach:

An asset on the MLSM Program that experiences a spill before reaching its next scheduled PM cleaning will be evaluated through the following strategies and procedures that may lead to adjusting the PM cleaning frequency**.**

4. Televised Inspection Strategy:

The **TVI Strategy** provides proactive and reactive approaches for when a TVI of a main line, lower lateral, and manhole is required. Observations from a TVI are evaluated through the **Main Line Main-Repair-Replace Decision Procedures, Section 204,** and could result in a PM frequency adjustment if the asset is currently on the MLSM Program. The reactive approach includes:

- Stoppage Follow-Up TVIs
- Project or BCE Investigation
- Service Requests assigned to M&O

For more information, see **TVI Strategy, Section 301.**

5. Main Line Repair-Maintain-Replace Decision Procedures

Observations from an ML TVI are evaluated through the **Main Line Maintain-Repair-Replace Decision Procedures** and could result in a PM frequency adjustment if the asset is currently on the MLSM Program. For more information, see **Main Line Maintain-Repair-Replace Decision Procedures, Section 204.**

404 Lower Lateral Cleaning Frequency Adjustment Strategy

404.1. Purpose

This document defines SacSewer's strategy for reducing the number of spills for lower laterals on the Lower Lateral Scheduled Maintenance Program (LLSM Program) that may have incorrect cleaning PM frequencies assigned or require adjustments over time.

404.2. Background

SacSewer identifies maintenance defects (i.e., FOG, roots, solids/debris) in lower laterals through CCTV inspection or spill analysis. When a maintenance defect is found, in many cases, SacSewer can cost-effectively extend an asset's life through routine scheduled cleanings as part of the LLSM Program instead of replacing the lower lateral. Assets on the LLSM Program are assigned a cleaning frequency and activity to prevent future spills caused by blockages from occurring.

However, as time passes, conditions may change, which may cause these assets to fail before their next scheduled cleaning. The four primary causes of failure for lower laterals currently on the LLSM Program are the following:

- Incorrect PM cleaning frequency assigned
- Incorrect PM cleaning activity assigned
- Insufficient PM cleaning technique during LLSM PM cleaning
- Incorrect maintenance solution selected (i.e., choosing a cleaning activity instead of a repair/renewal solution)

404.2. Strategy Approach

The **Lower Lateral Cleaning Frequency Adjustment strategy** focuses on reducing the frequency of spills due to blockages caused by assets on the LLSM Program with an *incorrect PM cleaning frequency* and consists of proactive and reactive approaches.

Proactive Approach:

An asset on the LLSM Program may proactively have its cleaning PM frequency adjusted if a cleaning or TVI finds maintenance defects that could lead to a stoppage. SacSewer created the following monthly report and strategy to identify which assets need proactive PM cleaning adjustments.

3. LLSM Monthly Frequency Adjustment Report:

LLSM Program work orders consist of performing a dry-run TVI according to the **TVI Manual** before hydro cleaning. If Light to Moderate grease, roots, or solids are found, M&O field staff hydro the lateral according to the **Minuteman Training Manual** and TV after without recording a TV inspection to verify the asset is clear. M&O staff only record the dry-run TVI when the following is found:

- Heavy Grease, Solids, or Roots
- Roots found in the Upper Lateral
- Severe offset joint, cracked pipe, broken pipe, or Orangeburg pipe
- If an issue is found that could lead to a blockage or structural failure
- If nothing is found – Roots none, Grease none, and Solids/Debris none

M&O field staff documents the dry-run TVI observations for Grease, Roots, and Solids/Debris in the failure Reporting tab of the PM cleaning work order in SacSewer's CMMS. **Section 12: Standard Measures of Cleaning Observations** of SacSewer's **Minuteman Truck Training Manual** outlines the

standard measures for recording observations based on cleaning work. The same method for recording cleaning observations is followed by M&O field staff to document lower lateral TVI observations for LLSM work orders in the Failure Reporting tab in SacSewer CMMS. Documented severities include None, Light, Moderate, or Heavy for grease, roots, and solid/debris. All recorded TVIs are submitted and reviewed by Engineering Pipeline Support Group – Lower Lateral TVI Review staff, and corrective action are determined according to the **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205.**

Lower laterals that are hydro-cleaned with no TVI submitted are evaluated for potential PM frequency adjustment based on cleaning observations. The Engineering Business Planning Group created an **LLSM Monthly Frequency Adjustment Repor**t that identifies the lower lateral assets on the LLSM Program that were cleaned the previous month with cleanliness ratings according to **Table 404-1 Frequency Adjustment Criteria.** The Engineering Pipeline Support – Lower Lateral TVI Review staff is responsible for running the **LLSM Monthly Frequency Adjustment Report** at the beginning of every month and making the necessary adjustments according to **Table 404-1 Frequency Adjustment Criteria** within 30 days.

Lower laterals on the LLSM Program with a stoppage between cleaning PM frequencies will not be evaluated for PM frequency adjustment according to the **LLSM Monthly Frequency Adjustment Report**. Their cleaning frequency will be adjusted according to the **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205.**

Table 404-1 Frequency Adjustment Criteria

If cleanliness rating occurs with…	2 consecutive PMs at the same frequency with **None** results in **all three categories** (i.e., Grease, Roots, Solids/Debris)	1 PM with **Heavy Roots**	1 PM with **Heavy Grease**	Any other results
Then ….	Adjust PM frequency to longer interval[1]	Adjust PM frequency to shorter interval[2]	Verify the Grease rating from TVI submitted and add a log note to document the discrepancy.	Continue current maintenance PM frequency.

1 If the asset is already at the longest frequency interval, then evaluate whether to remove or keep the asset on the **LLSM Program**. PM frequency interval greater than 48 months will need supervisor approval.

2 If the asset is already on the shortest frequency, create a Priority 2 TVI WO.

SacSewer uses 12, 18, 24, 36, or 48-month PM frequencies when adjusting to a longer PM Interval and 12, 24, and 36 months when adjusting to a shorter PM Interval. The shortest frequency interval for LLs in the easement is 36 months, and the shortest frequency interval for LLs in the street, including a cul-de-sac and an intersection, is 12 months.

4. Televised Inspection Strategy:

The **TVI Strategy** provides proactive and reactive approaches for when a TVI of a main line, lower lateral, and manhole is required. The proactive approach includes:

- TVI Based Programs
- Quality Control – Preventive Maintenance Evaluations
- Quality Control – After Repairs & Replacements
- PM Schedule Changes and Removal

For more information, see **TVI Strategy, Section 301.**

Reactive Approach

An asset on the LLSM Program that experiences a spill before reaching its next scheduled cleaning PM will be evaluated through the following strategy and procedures that may lead to having the cleaning PM frequency adjusted**.**

6. Televised Inspection Strategy:

The **TVI Strategy** provides proactive and reactive approaches for when a TVI of a main line, lower lateral, and manhole is required. The reactive approach includes:

- Stoppage Follow-Up TVIs
- Project or BCE Investigation
- Service Requests assigned to M&O

For more information, see **TVI Strategy, Section 301.**

7. Lower Lateral Maintain-Repair-Replace Decision Procedures

Observations from an LL TVI are evaluated through the **Lower Lateral Maintain-Repair-Replace Decision Procedures** and could result in a PM frequency adjustment if the asset is currently on the LLSM Program. For more information, see **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205.**

500 Stand-Alone Documents

500 Section Overview

500.1 Purpose

The purpose of the **Stand-Alone Documents** section in the SSMP Reference Document is to provide additional information on the strategies and procedures that:

- Describes how SacSewer updates and stores the SSMP document to ensure consistency and accessibility.
- Documents the type of data, efforts, and achievements related to preventing sewer pipe blockages in the collection system.
- Describes the process for evaluating the collection system for potential capacity deficiencies.
- Documents how SacSewer monitors and measures the effectiveness of the SSMP.
- Describes SacSewer's internal evaluation process for auditing the SSMP.
- Defines how SacSewer communicates to the public regarding the SSMP.

500.2 Background

SacSewer owns and operates a variety of physical assets. In support of SacSewer's goals of reducing spills, meeting regulatory requirements, achieving identified service commitment targets, and operating in a cost-effective manner, SacSewer has documented most strategies and procedures in the **Operations and Maintenance Program, Section 4** of the SSMP and provides more details in **Section 200, 300, and 400** of the SSMP Reference Document.

The strategies and procedures described in **Sections 1 through 3** and **5 through 11** of the SSMP are documented in more detail in the **Stand-Alone Documents, Section 500** of the SSMP Reference Document.

500.3 Strategies & Procedures

The **Stand-Alone Documents** section encompasses several separately documented but interrelated strategies and procedures. The strategies and procedures that are further discussed in the **Stand-Alone Documents** section are listed below:

- **SSMP Document Update & Storage Procedures**
- **Stop the Clog Strategy**
- **Under Capacity Failure Mode Strategy & Procedures**
- **Monitoring, Measurement, & Program Modification Strategy**
- **SSMP Audit Procedures**
- **SSMP Communication Strategy**

501 SSMP Document Update & Storage Procedures

501.1 Purpose

The purpose of the SSMP Update and Storage Procedures is to describe SacSewer's process for updating and posting the current version of its SSMP, along with storing historical versions of the document.

501.2 Background

The General Order WQ 2022-0103-DWQ Sections 5.3, 5.5, and 6.3 and Attachment E1 Section 3.11 and 4.6 requires:

- At a minimum, enrollees shall update the SSMP and get it approved by its governing entity every six years after the due date of its last SSMP update.
- The LRO is to certify and upload the enrollee's approved updated SSMP to the online CIWQS Database. If the electronic document format or size capacity prevents the electronic upload, the LRO shall provide an electronic link to the approved SSMP update.
- During the period between updates, the enrollee shall continuously document changes to the SSMP in a change log attached to the SSMP.
- The enrollee's updated SSMP must be maintained for public inspection at the enrollee's offices and facilities. SSMP hard copies must be available upon request and must be available to the public through CIWQS and/or the enrollee's website.

The SSMP Update and Storage Procedures address the WDR requirements listed above and provide additional details on how SacSewer updates and stores its SSMP.

501.3 Procedure Approach

To aid in spill reduction, SacSewer updates the SSMP when maintenance programs, strategies, and procedures change, in addition to what the WDR requires. All proposed maintenance program and strategy changes occur through the **Monitoring, Measurement, & Program Modification Strategy, Section 504**. SacSewer's Change Log is located in front of SacSewer's SMMP, which tracks changes in a table that is initialed and dated by the District Engineer and Director of Operations. To comply with **General Order WQ 2022-0103-DWQ,** SacSewer will update their SSMP and have it certified by the Board by May 2, 2025. After which, future board-approved updates will occur every six years. In between the six-year board-approved updates, the District Engineer can sign off on non-consequential changes to the SSMP as authorized by SacSewer's Board of Directors.

SacSewer's SSMP is too large to upload onto the State Water Board's CIWQS database. Thus, a link to SacSewer's website, where the latest version of SacSewer's SSMP resides, is provided in CIWQS. The newest version of SacSewer's SSMP is available to the public on SacSewer's website at **Sewer System Management Plan - Sacramento Area Sewer District (sacsewer.com)**. A link is provided for the public to submit comments to SacSewer regarding the SSMP. SacSewer stores historical versions of its SSMP internally on SacSewer's Record Center Sharepoint Site. The public may access historical versions of SacSewer's SSMP through a **Public Records Request** found on SacSewer's website at **Public Records Request - Sacramento Area Sewer District (sacsewer.com)**.

Updating SacSewer's SSMP involves key staff members and consists of several steps. See the following Descriptive Procedural Steps and Flow Chart for more details.

501.4 Descriptive Procedural Steps

1.0 Identify Changes and Coordinate with Business Planning

Each document owner (refer to **Table 100-1**) is responsible for ensuring that their strategy and procedure are up-to-date. Once an update is necessary, the document owner will identify the changes that need to be made and coordinate with the Engineering Business Planning Group.

2.0 Check Out SSMP from SharePoint

Business Planning is responsible for SacSewer's SSMP. To revise the SSMP, Business Planning will check out the Master SSMP Word document from the Business Planning SharePoint.

3.0 Review and Make Changes in SSMP

Business Planning will review all proposed changes and combine the changes provided by the document owner into the Master SSMP Word Document.

4.0 Update Change Log

To note significant changes, Business Planning will check out the Master SSMP Change Log Word document from the Business Planning SharePoint.

5.0 Forward SSMP to Management for Review

Business Planning will forward the Draft SSMP to Management for review.

6.0 Review SSMP Updates

Management will review the Draft SSMP and determine if any additional changes need to be made.

7.0 Are Changes Needed?

If yes, proceed to step 8.0.

If no, proceed to step 9.0.

8.0 Facilitate Changes with Document Owner

Business Planning will help facilitate necessary changes with the Document owner.

9.0 Forward to Director of CS Operations

Business Planning will forward the Draft SSMP to the Director of CS Operations for review.

10.0 Review SSMP Updates

The Director of CS Operations will review the Draft SSMP and determine if any additional changes need to be made.

11.0 Are Changes Needed?

If yes, return to step 8.0.

If no, proceed to step 12.0.

12.0 Sign Change Log, SSMP, and SSMP Reference Document Cover Pages

The Director of CS Operations will initial the change log and sign and date the draft SSMP and SSMP draft cover pages.

13.0 Forward to General Manager for Review

Business Planning will forward the draft SSMP to the General Manager for review.

14.0 Review SSMP Updates

The General Manager will review the Draft SSMP and determine if additional changes are needed.

15.0 Are Changes Needed?

If yes, return to step 8.0.

If no, proceed to step 16.

16.0 Initial Change Log and SSMP Cover Page

The General Manager will initial the Change Log and sign and date the SSMP cover page.

17.0 Does SSMP Require Board Approval?

If yes, proceed to step 18.0.

If no, proceed to step 19.0.

18.0 Take to Upcoming Board Meeting and Request Approval

The General Manager will take the draft SSMP to the upcoming board meeting to request approval.

19.0 Upload Final SSMP Document to Records Center

Business Planning will upload the final SSMP document to the Records Center Sharepoint site located on SacSewer's intranet site.

20.0 Contact Communications and IT Regarding Update

Business Planning will email the Department of Communications (Communications) and Information Technology (IT) Department to request the update of the SSMP on SacSewer's Internet and Intranet websites.

21.0 Update Latest SSMP Version to Intranet

IT will update the link to the SSMP on SacSewer's intranet site

22.0 Update Latest SSMP Version to Public Website

Communications will update the SacSewer website with the updated SSMP following the **Communication Strategy, Section 506**.

23.0 Email SacSewer Management Regarding SSMP Update

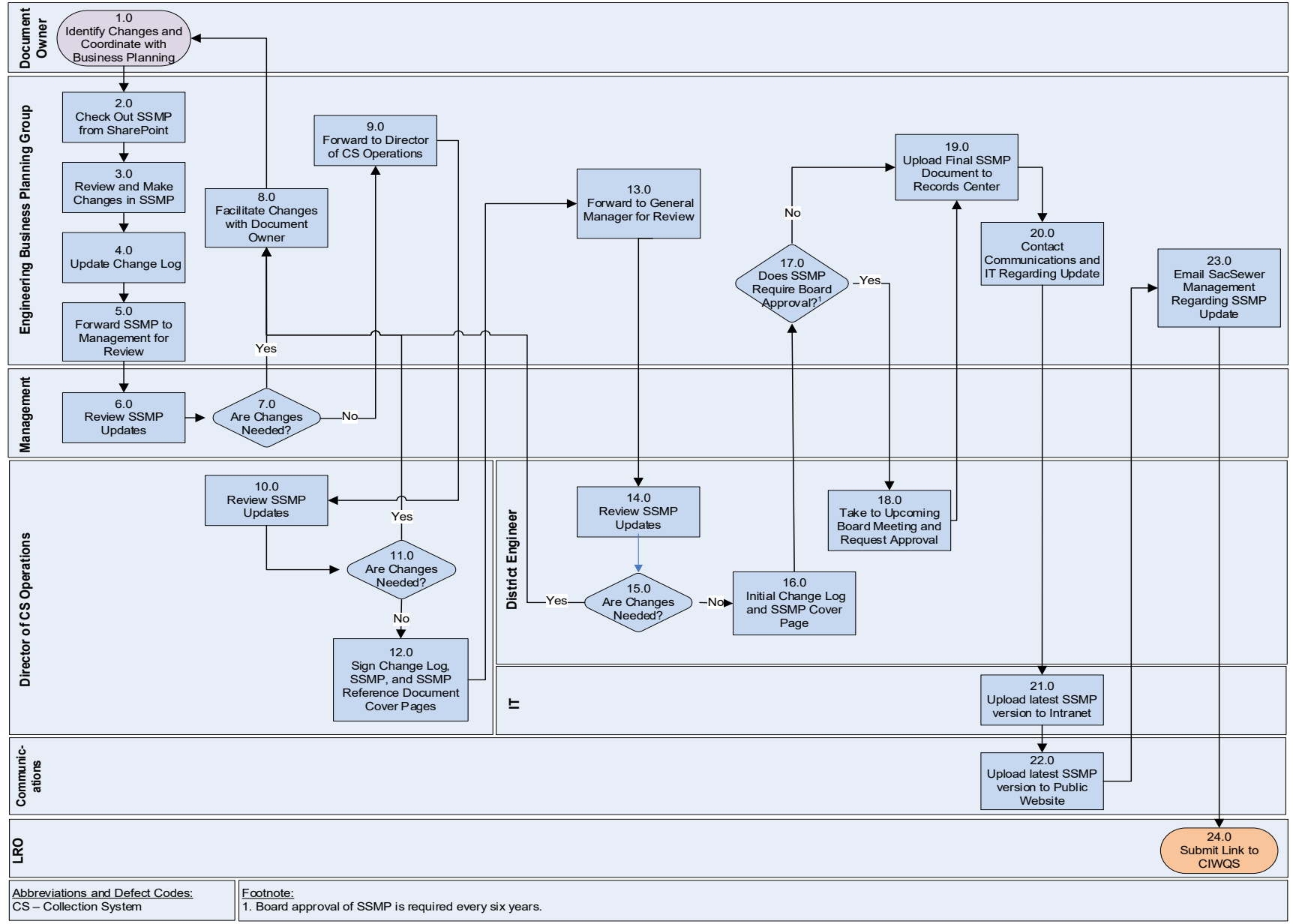
Business Planning will inform SacSewer's management that the SSMP has been updated and owners and stakeholders of the strategies and procedures are responsible for training staff on the latest SSMP.

24.0 Submit Link to CIWQS

A specified Legally Responsible Official (LRO) will update the link to SacSewer's SSMP in the CIWQS website.

501.5 ***Flowchart***

SSMP Update Procedures Flowchart



502 Stop the Clog Strategy

502.1 Purpose

This document defines SacSewer's strategy for cost-effectively preventing and mitigating sewer pipe-blocking substances in the collection system.

502.2 Background

General Order WQ 2022-0103-DWQ, Attachment D Section 7 requires enrollees to include in their SSMP "procedures for the evaluation of their service area to determine whether or not a sewer pipe blockage control program is needed to control fats oils, grease, rags, and debris. The procedures must include:

- An implementation plan and schedule for a public education and outreach program that promotes proper disposal of pipe-blocking substances.
- A plan and schedule for disposing of pipe-blocking substances 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 substances generated within a sanitary sewer system service area.
- The legal authority prohibits discharges to the system and identifies measures to prevent spills and blockages.
- Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, best management practices requirements, recordkeeping, and reporting requirements.
- Authority to inspect grease-producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the fat, oils, and grease ordinance.
- An identification of sanitary sewer system sections subject to fats, oils, and grease blockages and establishment of a cleaning schedule for each section.
- Implementation of source control measures for all sources of fats, oils, and grease, reaching the sanitary sewer system for each section identified above.

SacSewer utilizes the **Monitoring, Measurement, and Program Modifications Strategy, Section 504,** to monitor and measure the performance of the collection system. SacSewer recognizes the need for a strategy to cost-effectively prevent and mitigate sewer pipe-blocking substances in the collection system due to the causes of spills SacSewer experiences annually.

502.3 Strategy Approach

Spills caused by pipe-blocking substances occur throughout SacSewer's service area, mostly in single-family residential areas per previous data analysis performed in 2001, 2004, 2011, 2017, and 2024 by SacSewer. Because most of SacSewer's stoppages occur in residential areas, reducing pipe-blocking substances loading by increasing source control efforts is difficult.

SacSewer's **Stop The Clog Strategy** is an overarching strategy that integrates multiple efforts to comply with the requirements of the **General Order WQ 2022-0103-DWQ, Attachment D Section 7,** using proactive and reactive approaches to reduce or eliminate the occurrence of pipe blockages that could lead to spills and other operational failures.

Proactive Approach:

1. Legal Authority to Prohibit Discharges and Measures to Prevent Blockages

The **Collection System Ordinance** provides SacSewer's with the legal authority to:

- **Prohibit Discharges:**
    - Define and enforce permissible and prohibited discharges under Sections 2.2 and 2.4.
    - Prohibit illicit discharges, including fats, oils, and grease (FOG); debris; roots; and other pipe-blocking substances, as outlined in Section 2.4.
    - Implement regulations under section 2.5 of the **Treatment and Resource Recovery Ordinance (TRRO)** to prevent harmful substances from entering the system.
- **Inspect Facilities**
    - Authorize the inspection of grease-producing facilities and other blockage contributors under Sections 2.6, 2.9, and 9 of the **Collection System Ordinance** and Section 2.8 of the **TRRO**.
    - Permit access for inspections to verify compliance with ordinances, including grease management practices under Section 2.7.
- **Mandate Use of Pretreatment Devices**
    - Require installation of grease removal devices (e.g., grease interceptors) per Sections 2.8 and 2.9.
    - Set design standards, maintenance requirements, and recordkeeping protocols for these devices to ensure their effectiveness as per Section 2.7.
    - In addition to the ordinances, the following are codes, procedures, and protocols that contribute to the adherence of requirements to install grease removal devices, design standards for the removal devices, maintenance requirements, Best Management Practices requirements, record keeping, and reporting requirements:
        - SacSewer Standards and Specifications
        - Uniform Plumbing Code
        - CA Plumbing Code
        - Health & Safety Code
        - County Building Code
        - County Environmental Health Department requirements
        - FOG Control Program Information Kits
        - SacSewer's Enforcement Response Process and Standard Operating Procedures
        - Wastewater Source Control Section (WSCS) Incident Response Working files and Maximo Service Request records
- **Control and Mitigate Blockages**
    - Establish Procedures to address and mitigate common causes of blockages, including roots, debris, and non-flushable items such as wipes and rags, as detailed in section 2.3.

SacSewer is currently updating both the Collection System and Treatment and Resource Recovery Ordinances to include among other updates, expansion of legal authority to monitor discharge and take enforcement action for inadequate control of pipe blocking substances per **General Order WQ 2022-0103-DWQ, Attachment D Section 7.** The updating effort is scheduled for completion by the end of Fiscal Year 2024-25. For more information about the current **Collection System Ordinance**, please see **Legal Authority, Section 3** of SacSewer's SSMP.

2. Public Education and Outreach Efforts

SacSewer's public education and outreach efforts associated with the **Stop the Clog Strategy** includes:

- **Website**

  SacSewer regularly updates its Stop the Clog Program (Program) website, **www.stoptheclog.com**. The website contains educational information on preventing and disposing of FOG and other common un-flushable items—like wipes—and links to resources for residents, educators, rental owners, and kids' corner. Additionally, rental owners and property managers in SacSewer's service area can request various Program materials via a web form. The website also allows the public to comment and contact SacSewer.

  SacSewer updated the appearance of the Program, incorporating a set of characters known as the SacTown Clog Squad and SacTown Unflushables to personify common items that are improperly disposed of. These new characters help visually convey our key messages to continue fostering behavior change at home.

- **Social Media**

  SacSewer continues to increase and evolve its use of social media as a strategic communications tool. Utilizing the SacSewer Facebook and Instagram accounts, content is regularly shared to educate customers on Program-related issues, proper disposal methods, and available resources.

- **Satellite Collaboration**

  SacSewer collaborates with contributing agencies of the City of Folsom, the City of Sacramento, and the City of West Sacramento to create a regional outreach and education campaign with consistent key messages, instructions, and requirements for residents, Food Service Establishments (FSE), and Grease Generating Facilities (GGF).

- **Bill Inserts**

  SacSewer delivers its Program messages to area residents through bill inserts and articles in local print media, such as Citrus Heights and Rancho Cordova neighborhood newsletters. Additionally, Sacramento County includes Program reminders in their monthly updates to constituents during the holidays (Oct, Nov, and Dec.)

- **Site Visits**

  SacSewer conducts site visits and delivers printed grease handling best management practices to FSEs that are identified as needing outreach or control through maintenance programs. Wipes outreach and FOG outreach mailers are sent to targeted neighborhoods based on specific high-impact areas identified by maintenance programs or spill response.

- **Elementary School Outreach**

  SacSewer continues to provide to the Elementary Schools Outreach Campaign targeting future sewer stewards in grades K-6. The Campaign is designed to educate young children on responsible sewer practices and promote environmental stewardship. The performance-style presentation features key messages on Program topics and incorporates interactive lessons to further highlight the importance of proper Program disposal techniques. Additionally, students receive a copy of an activity book created by SacSewer that includes sections on FOG and wipes, providing readers with key messages and engaging activities to complete at home.

- **Outreach Events**

  Throughout the year, SacSewer staff regularly attend scheduled public outreach events within the SacSewer service area where staff discuss the importance of proper disposal methods. Educational Program materials are distributed to attendees. Program materials are also provided to participants who attend one of SacSewer's public tours of the EchoWater Resource Recovery Facility.

- **Community Outreach**

  Multilingual employees also engage with local committees and community organizations to educate independent grocers, restaurant operators, and store owners. SacSewer shares Best Management Practices, answers grease interceptor questions, and discusses FOG's impact on the local area.

- **Enforcement Education**

  On a case-by-case basis, SacSewer staff provide sewer users with direct messaging and fliers on proper disposal and best management practices for FOG, wipes, or other solids to address the potential impact from debris as part of the enforcement response process.

3. Plan for Disposal of Pipe-Blocking Substances

SacSewer's community outreach efforts also encompass the proper disposal of pipe-blocking substances. SacSewer works with local haulers to permit the transportation and disposal of FOG and liquid waste, accept and record their manifests, and receive hauled inedible kitchen grease. SacSewer's EchoWater Resource Recovery Facility accepts kitchen grease directly into the digesters, producing biogas, a renewable energy.

SacSewer also provides FOG disposal links to multiple area waste management and recycling entities on the Stop The Clog website. For cooking oil and residential recycling locations, links are provided for options in the local community. For inedible kitchen grease from FSEs, links are provided for a list of haulers and best management practices for FSE grease devices.

4. Identifying Areas Subject to Pipe Blocking Substances & Preventive Maintenance Programs

SacSewer's **TVI Strategy, Section 301** describes SacSewer efforts in performing condition assessments for gravity assets such as lower laterals, main lines, and manholes. TV inspections are reviewed by SacSewer's Engineering Operations Support Section – Pipeline Support Group staff using the **Main Line Maintain-Repair-Replace Decision Procedures, Section 204**, **Lower Lateral Maintain-Repair-Replace Decision Procedures, Section 205**, or the **Business Case Evaluation Strategy, Section 207.**

Assets found with maintenance defects, such as FOG, roots, or solids/debris, are added to one of SacSewer's preventive maintenance programs such as the **Lower Lateral Schedule Maintenance Program**, **Main Line Scheduled Maintenance Program**, or **Manhole Scheduled Maintenance Program** to mitigate repeat FOG or sewer pipe blocking related spills. For more information on these maintenance programs, please see **Blockage Failure Mode Strategy, Section 401.**

Reactive Approach:

1. Legal Authority to Enforce Compliance

The **Collection System Ordinance** and the **TRRO** provide SacSewer with the legal authority to impose penalties and take enforcement actions against violators of the ordinances. Specifically, the "Authority to monitor discharge and take enforcement action for inadequate control of FOG and ineffective facility maintenance practices." The **Collection System Ordinance** states the property owner has the sole responsibility for clearing stoppages and inspecting, maintaining, and repairing the upper lateral, including backflow prevention devices.

SacSewer has an **Enforcement Response Process (ERP)** for addressing non-compliance, including fines, mandatory corrective actions, and potential service termination. The ERP describes SacSewer's process for initiation, research, enforcement, follow-up, and closure of violations when users do not comply with the provisions of the **Collection System Ordinance**. The process can generally be applied to all users of the sewer collection system in conformance with the ordinances, including those subject to the requirements of the Federal pre-treatment program (typically referred to as industrial users) and those discharging under a Wastewater Discharge Permit (WDP). The ERP does not expand the authority described in the ordinances. It is used by SacSewer staff to identify, document, track, and respond to non-compliance and to select the appropriate enforcement action for a given violation. The ERP ensures that consistent, timely, fair, and equitable enforcement procedures are implemented for instances of non-compliance.

SacSewer's Safety & Regulatory Compliance (S&RC) and WSCS staff inspect and enforce the provisions of the ordinances and ERP upon being notified when the cause of FOG or upper lateral root-related spill or impact can be traced to a resident or FSE. Generally, the ERP for upper lateral root intrusion and FOG includes the following elements:

- Advisory letters are sent to provide the owner knowledge of roots or FOG entering the lower lateral from their upper lateral.
- Follow-up evaluations to confirm that the owner has taken corrective action.
- Notice of violation letters are sent if the owner has not performed corrective action or if roots or FOG from the upper lateral caused a stoppage in SacSewer's lower lateral.

WSCS staff track the status of upper lateral root and FOG incident cases for escalation of necessary enforcement actions to ensure compliance.

2. Identifying Areas Subject to Pipe Blocking Substances

An investigation is conducted after each blockage in a SacSewer asset that leads to a spill or slow drain to determine the underlying cause before deciding on corrective measures. The investigation process allows SacSewer to make smart, proactive preventive maintenance decisions to reduce the risk of repeated stoppages and identify any potential systematic weaknesses that need addressing.

For more information, see SacSewer's **TVI Strategy, Section 301**.

503 Under Capacity Failure Mode Strategy & Procedures

503.1 Purpose

The purpose of the **Under Capacity Failure Mode Strategy & Procedures (UCFMS)** is to ensure consistency in the evaluation of potential capacity deficient areas in SacSewer's collection system.

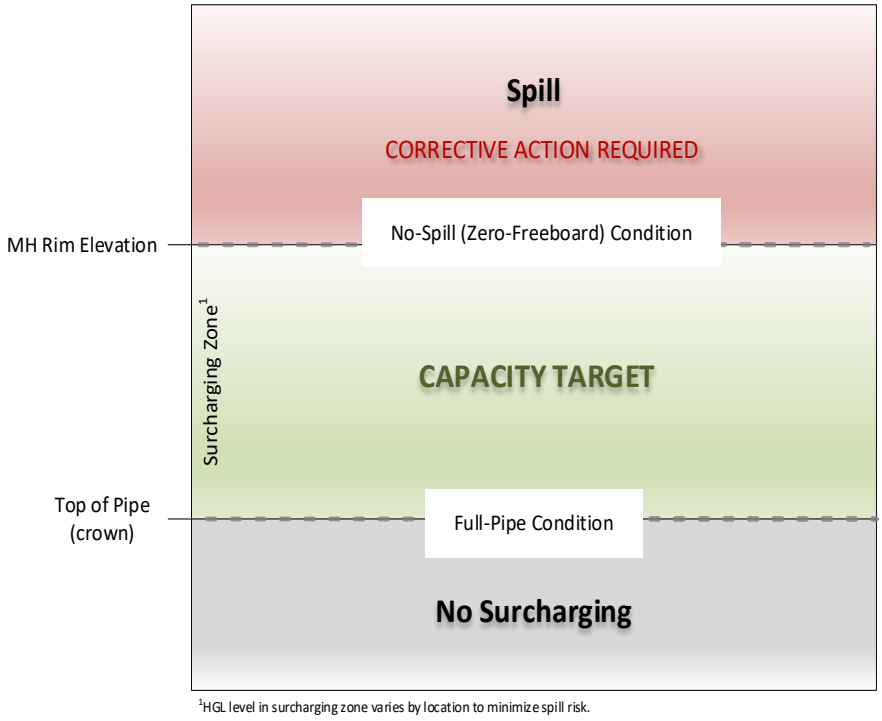
503.2 Background

The **General Order WQ 2022-0103-DWQ, Attachment D Section 8.2,** requires enrollees to include procedures in the SSMP that identify system components experiencing or contributing to spills caused by hydraulic deficiency and/or limited capacity, including procedures to identify the appropriate hydraulic capacity of key system elements. Some of the requirements listed in **Attachment D Section 8.2** are addressed in SacSewer's **System Capacity Plan, Section 8.1** of the **SSMP,** and in the **Condition Assessment Program, Section 300** of the SSMP Reference Document. The remaining requirements are addressed in SacSewer's **UCFMS** document. The **UCFMS** is the second phase of the **System Evaluation, Capacity Assurance, and Capital Improvements Process** mentioned in **Section 8** of SacSewer's **SSMP**.

503.3 Strategy Approach

One of the objectives of SacSewer's **System Capacity Plan** is to identify areas within the collection system that have potential capacity deficiencies. Once identified, these areas undergo further investigation through the **UCFMS**. The **UCFMS** introduces the concept of a "capacity target." As shown in **Figure 503-1 Capacity Target**, the "capacity target" is bounded by the no-spill, zero freeboard condition, and the full-pipe condition.

Figure 506-1 Capacity Target



[1]HGL level in surcharging zone varies by location to minimize spill risk.

When a capacity-related spill occurs in the collection system, the "do nothing" alternative is unacceptable. Corrective action may be necessary to return the collection system performance to within the "capacity target" range. A future sewer infill project could increase pipe capacity and/or decrease system flow to return the collection system performance to within the "capacity target" range.

The **UCFMS** documents how SacSewer proactively and reactively investigates the capacity-deficient areas identified in the **System Capacity Plan** or from spills within the collection system and determines which areas meet the criteria requiring a **Project Development Plan (PDP)** that could lead to a potential future sewer infill project (capital improvement project).

Proactive Approach:

Model-Predicted Capacity Related Spills

SacSewer initiates the **UCFMS** evaluation based on model-predicted spills from either the **System Capacity Plan** under existing land use conditions or from new proposed development(s) under existing conditions. The potentially deficient systems are monitored using flow meters and undergo a preventive maintenance review. If the systems identified have an actual capacity-related spill during a storm event that has a similar or less impact on the collection system compared to the SacSewer's Performance Storm, the asset data of the shed is verified, and a new hydraulic model is constructed and calibrated for the localized sewershed from the latest system data. SacSewer's Performance Storm characteristics are defined in SacSewer's **System Capacity Plan**. If the newly calibrated model predicts a spill using the Performance Storm under existing land use conditions, an infill project will be initiated through the **PDP** process.

Reactive Approach:

Actual Capacity-Related Spills

SacSewer can also initiate the UCFMS process based on actual capacity-related spills that occurred during storm events that had a similar or less impact on the collection system compared to SacSewer's Performance Storm. Systems identified are monitored using flow meters and undergo a preventive maintenance review. Then, the asset data of the shed is verified, and a new hydraulic model is constructed from the latest system data. If the newly calibrated model predicts a spill using SacSewer's Performance Storm under existing land use conditions, an infill project will be initiated through the **PDP** process.

503.4 Descriptive Procedural Steps

1.0 Monitoring Trigger Met

The evaluation of potential capacity-deficient sheds through the **UCFMS** begins with the monitoring trigger. The three monitoring triggers are listed below.

- Model predicted spill caused by new development under existing conditions
- Model predicted spill from the **System Capacity Plan** under existing land use conditions
- Actual capacity-related spill during a storm event that has similar or less impacts on the SacSewer system compared to the SacSewer's Performance Storm

If one of these monitoring triggers is met, flow monitoring is initiated in the shed along with a Preventive Maintenance program review.

Continue to step 1.1.

1.1 Flow Monitoring Implementation and Preventive Maintenance (PM) Program Review

Flow meters are installed in the potentially capacity-deficient system to characterize flow throughout the project area. Flow monitoring and rain data are used to develop flow parameters (e.g., domestic flow factors, unit flow hydrographs, rainfall-dependent inflow and infiltration (RD I&I) percentages, etc.) for model calibration.

Concurrently, the maintenance histories of the potentially capacity-deficient pipes identified through modeling will be reviewed, and their cleaning PM schedules may be developed or adjusted based on the pipe conditions. The goal of this procedure is to ensure that capacity-constrained main lines can operate at full capacity during storm events.

Continue to step 1.2.

1.2 Actual or Predicted?

Predicted Capacity-related spills are spills predicted in the System Capacity Plan under Existing Land Use Conditions or from New Proposed Development. Actual Capacity-related spills are spills that occur during a storm event that have less impact on the collection system compared to the SacSewer Performance Storm.

If Predicted, continue to step 2.0.

If Actual, continue to step 2.2.

2.0 Investigative Trigger Met?

The investigative trigger is met when an actual capacity-related spill occurs during a storm event that has similar or less impacts on the system compared to the SacSewer's Performance Storm. The SacSewer's Performance Storm is a real storm event that occurred on January 21, 1997. This storm event was selected through continuous simulation modeling and statistical analysis of the SacSewer system's response to actual storms (refer to the report titled "**Summary of Findings from Continuous Simulation Modeling for SacSewer Performance Storm Development,**" dated January 18, 2008).

If yes, continue to step 2.2.

If no, continue to step 2.1.

2.1 Close out UCFMS

Proceed to Document & End. The area identified is put on hold until the Investigative Trigger is met.

2.2 Asset Data Verification and Model Construction

When the investigative trigger is met, asset data verification for the shed will be implemented, including surveying if needed. A ***newly calibrated hydraulic model*** for the shed will be constructed from the latest system data.

The model will then be calibrated using the flow monitoring data that was collected previously. Model calibration is a process of adjusting the model parameters to match the model predictions with the observed data. The calibrated model is used to evaluate the true hydraulic performance of the collection system under various flow scenarios.

Continue to step 3.0.

3.0 Corrective Action Trigger Met?

The corrective action trigger is met when the ***newly calibrated hydraulic model*** predicts a spill using SacSewer's Performance Storm for existing land use conditions. An infill project is needed to bring the system performance within the acceptable capacity target range.

If yes, proceed to step 3.2.

If no, continue to step 3.1.

3.1 Close out UCFMS

Proceed to Document & End. The area identified is put on hold until the Corrective Action Trigger is met.

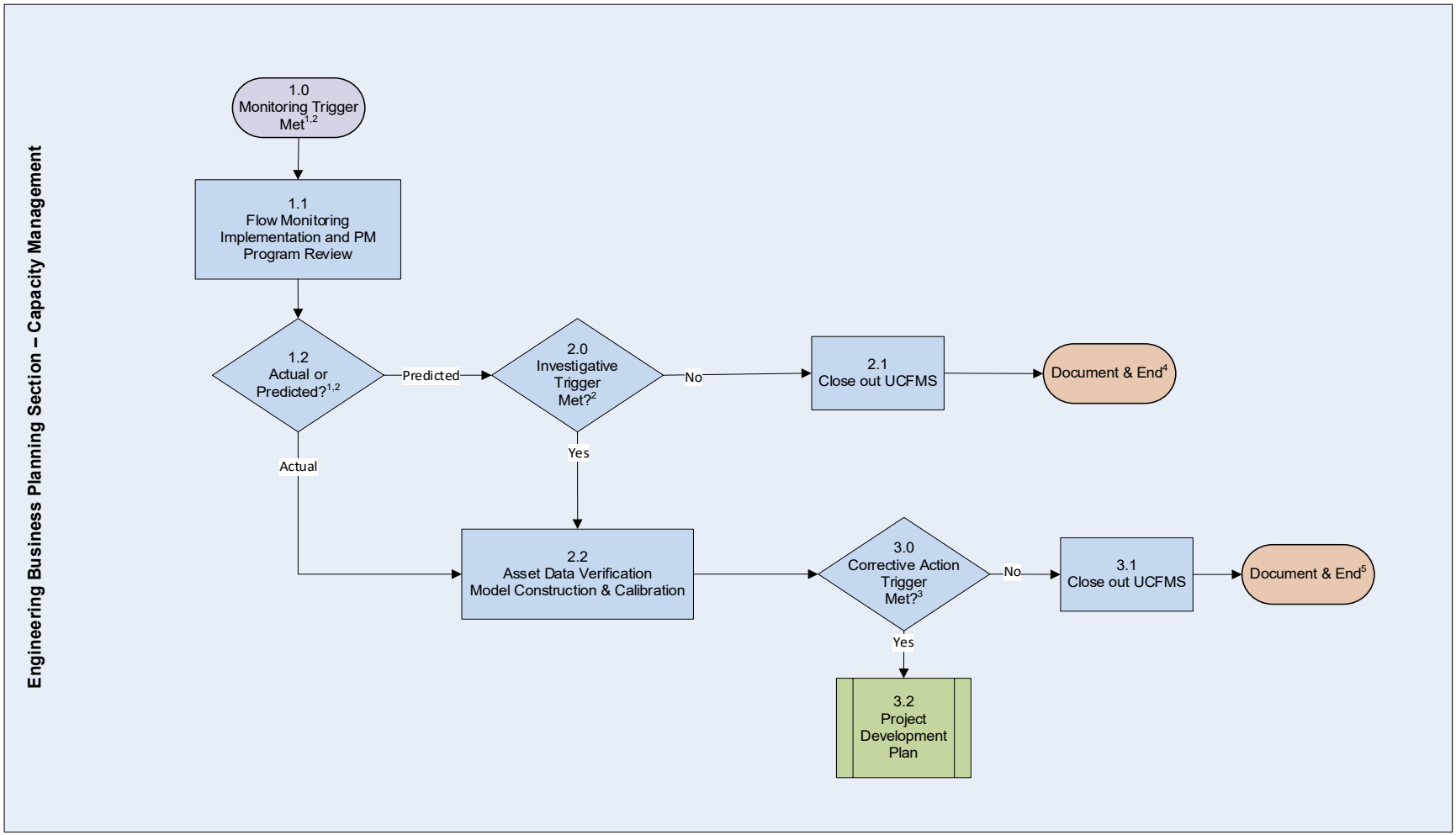
3.2 Project Development Plan

Infill projects for systems that meet the **UCFMS** corrective action trigger will be further developed through the **Project Development Plan** process.

Refer to the **Project Authorization Process: PAC/PDP Guidelines** document for the next steps in project development.

503.5. Flowchart

Under Capacity Failure Mode Strategy & Procedures Flowchart



Abbreviations and Defect Codes:
PM – Preventive Maintenance
UCFMC – Under Capacity Failure Mode Strategy

Footnotes:
1. Predicted Capacity-related spill is a spill predicted in the System Capacity Plan under Existing Land Use Conditions or from New Proposed Development.
2. Actual Capacity-related spill is a spill during a storm event that has less impact on the collection system compared to the SacSewer Performance Storm.
3. The newly constructed and calibrated model predicted spill using the SacSewer's Performance Storm under Existing Land Use Conditions.
4. The area identified is put on hold until the Investigative Trigger is met.
5. The area identified is put on hold until the Corrective Action Trigger is met.

504 Monitoring, Measurement, & Program Modification Strategy

504.1 Purpose

The **Monitoring, Measuring, & Program Modification Strategy** documents how SacSewer monitors and measures the effectiveness of the SSMP for the collection system. It also describes SacSewer's processes for changing maintenance programs, strategies, and procedures based on the latest performance trends.

504.2 Background

SacSewer owns and operates a variety of physical assets. It is important to monitor the most common causes of failure, recognize the consequences of failure, and identify the best practices to prevent failures. By doing this, SacSewer can focus efforts and financial resources on projects and programs that will prevent failures and sustain asset life.

The **General Order WQ 2022-0103-DWQ, Section 9**, requires SacSewer's SSMP to include an Adaptive Management Strategy that addresses the SSMP implementation effectiveness and the steps for improvement. The strategy must include:

- Monitoring the implementation and measuring the effectiveness of each SSMP element
- Assessing the success of the preventive operations and maintenance activities
- Updating the SSMP procedures and activities, as appropriate, based on results of monitoring and performing evaluations
- Identifying and illustrating spill trends, including frequency, locations, and estimated volumes

504.3 Strategy Approach

This **Monitoring, Measuring, & Program Modification Strategy** guides the efforts of SacSewer as a whole to monitor the overall effectiveness of SacSewer's SSMP. Overall effectiveness can be monitored through SacSewer's ability to reduce spills in the collection system, achieve Service Commitment targets, meet the requirements of the **Monitoring, Measurement, & Program Modification** element of the **General Order WQ 2022-0103-DWQ**, and sustain asset life. By reviewing system-wide spill-reducing performance trends, SacSewer can focus efforts and financial resources on maintenance programs, projects, strategies, and procedures that will efficiently and effectively prevent future spills.

The strategy consists of two components:

- Proactive Approach - Monitoring and Measuring Performance
- Reactive Approach - Program Modifications

Proactive Approach

The following methods have been developed and implemented to monitor and measure SacSewer's performance in implementing the SSMP.

1. Service Commitments

One method SacSewer uses to measure the SSMP's effectiveness is Service Commitments. Service Commitments demonstrate the quality of service our customers receive as a result of their monthly sewer rate. SacSewer has six Service Commitments, each with an established target to set a minimum level of performance for SacSewer. SacSewer's current Service Commitments were developed and approved by the Board on December 11, 2024. Below is a list of SacSewer's six Service Commitments:

- **Service Call Response Time** – Measures the percentage of on-time arrivals to a customer service request call. SacSewer staff will respond onsite within two hours of a customer service request for 95% of all priority 1 service calls occurring within any calendar month.
- **Service Restoration Time** – Measures the percentage of customers whose sewer service is restored within the on-time window with no sewer use limitation for the customer. SacSewer staff will restore service within four hours of receipt of the customer call for 90% of all service interruptions occurring within any calendar month. The on-time window extends to six hours when excavation of the lower lateral is needed.
- **Development Submittal Review Time** – Measures the customer service provided to the development community. This service commitment refers to the percentage of development entitlement applications, improvement plans, and sewer study submittals that are reviewed and returned to the developer within the time standards established. The submittals may include reviews of lower lateral, collector, trunk, and interceptor-sized facilities. SacSewer staff is committed to returning comments within the review time standards of a minimum of 90% of all complete developer submittals within any calendar month. The review time standards are: development entitlement applications within 15 working days, review of first submittal improvement plans within 20 working days, review or resubmittal improvement plans within 10 working days, review of improvement plans revisions within 5 working days, and review of sewer studies/design reports (submittals and resubmittals) with 25 working days.
- **Customer Satisfaction –** Indicates the percentage of positive responses from customers via an anonymous survey. After a service call, SacSewer contacts each customer, asking them to rate the overall quality of the service provided. SacSewer's goal is to achieve 90% of customers responding within any calendar month and rating the service they received as good or excellent.
- **Non-lateral Spill Rate** – Measures non-lateral spills originating within both of SacSewer's collection systems (WDID# 5SSO10912 & 5SSO11045) per 100 miles of non-lateral sewer lines and assets (e.g., ARVs, BOVs, pump stations, etc.) in any calendar month, regardless of the volume or whether the sewage enters a waterway. It considers the fact that a larger system, similarly managed, will experience more spills than a smaller one. This service commitment has a target of 0.43 non-lateral sewer spills or lower per 100 miles of non-lateral sewer lines for 2025. This target will be lowered annually by 0.02 spills per 100 miles until 2028, when the target is at 0.37 non-lateral sewer spills per 100 miles of non-lateral sewer lines.
- **Lateral Spill Rate** – Measures lower-lateral sewer spills originating within SacSewer's collection system per 100 miles of lower lateral sewer lines in any calendar month, regardless of the volume or whether the sewage enters a waterway. It takes into consideration the fact that a larger system, similarly managed, will experience more spills than a smaller one. This service commitment has a target of 6.6 lower lateral sewer spills or lower per 100 miles of lower lateral sewer lines for 2025. This target will be lowered annually by 0.7 spills per 100 miles until 2028, when the target is at 4.5 lateral sewer spills per 100 miles of lateral sewer lines.

Table 504-1 shows the Service Commitments and the associated SSMP elements that may require modification if SacSewer does not meet a performance target.

Figure 504-1 Service Commitments vs SSMP Elements

SacSewer Service Commitment	Section 1. Sewer System Management Plan Goal and Introduction	Section 2. Organization	Section 3. Legal Authority	Section 4. Operation and Maintenance Program	Section 5. Design and Performance Provisions	Section 6. Spill Emergency Response Plan	Section 7. Sewer Pipe Blockage Control Program	Section 8. System Evaluation, Capacity Assurance, and Capital Improvements	Section 9. Monitoring, Measurement, and Program Modifications	Section 10. Internal Audits	Section 11. Communication Program
Service Call Response Time						X			X		
Service Restoration Time						X			X		
Development Submittal Review Time					X				X		
Customer Satisfaction									X		X
Non-Lateral Spill Rate				X		X	X	X	X		
Lateral Spill Rate				X		X	X		X		

SacSewer monitors and measures its Service Commitments performance monthly and annually. Spill and work performance trends are reviewed and presented to management. SacSewer's Service Commitment Bands Policy considers the latest year's data, examines how SacSewer's performance is trending, and recommends whether to adjust emphasis or implement changes for each Service Commitment. Through decision-making processes, a determination is made to:

- Investigate an issue or concern
- Revise existing operational maintenance activities, procedures, frequencies, and practices and/or
- Develop new operational maintenance activities, procedures, frequencies, or practices.

The Service Commitments can be found on SacSewer's public website at https://www.sacsewer.com/service-commitments/**.** The Service Commitment Bands Policy is an internal document. It is updated annually and is available to the public upon request.

2. Monthly Spill Reports

Another method SacSewer uses to measure the SSMP's effectiveness is through Monthly Spill Reports. These spill reports provide detailed information on SacSewer's spills within the past year and are emailed to management staff by mid-month. They provide additional details such as spill counts by:

- Asset type (i.e., main line, manhole, force main, pump station, interceptor, or lower lateral)
- Cause (i.e., grease, roots, debris, operator error, pipe structural problem/failure, vandalism, or other)
- Category (i.e., Category 1, 2, 3, or 4)

Spill counts reported in the Monthly Spill Reports and Service Commitments should match spills in the CIWQS database by WDID. Trends from the latest spill counts could lead to further investigation or discussion, such as lessons learned or potential strategies to gain positive improvement. The Monthly Spill Reports are internal documents available to the public upon request.

3. Internal Audit

SacSewer also uses internal audits to measure the effectiveness of the SSMP. The Internal Audit is designed to:

- Evaluate the implementation and effectiveness of SacSewer's SSMP in preventing spills
- Evaluate SacSewer's compliance with the **General Order WQ 2022-0103-DWQ**
- Identify SSMP deficiencies in addressing ongoing spills and discharges to waters of the State
- Identify necessary modifications to the SSMP to correct deficiencies

Results from each Internal Audit identify gaps in SacSewer's SSMP, including an action plan/schedule to address each gap. For more information, please see **Internal Audit, Section 10** of the SSMP and **SSMP Audit Procedures, Section 505.**

4. Staff Feedback

Every staff member at SacSewer is vital in helping SacSewer deliver its mission. Management encourages staff to bring new ideas, processes, or equipment that could help maintain the collection system more efficiently and effectively to their direct supervisors for further discussion and potential implementation if approved.

Reactive Approach

When the latest spill trends show that a maintenance program, strategy, or procedural change is needed, SacSewer management assigns a group to evaluate and develop recommendations for better performance. SacSewer's reactive approach utilizes the following decision-making teams to review and approve the proposed recommendations.

1. Organizational Planning Team (OPT)

The OPT establishes a decision-making forum supporting SacSewer's goals of meeting **General Order WQ 2022-0103-DWQ**, achieving identified Board-approved Service Commitment targets, and operating cost-effectively. The OPT provides approval and direction on the following:

- How to comply with **General Order WQ 2022-0103-DWQ**
- Asset management elements including the development of long-term asset plans, staffing plans, and associated cost projections, including desired levels of asset management
- Service Commitment target attainment
- Revenue need projections
- Appropriate risk levels
- Projects below PAC thresholds
- Projects that will be presented to PAC

Items to be discussed may include the following:

- Budget needs and forecasts
- Trends and correlations
- Staffing plans
- New or existing maintenance programs and strategies
- Workload projections

This collaborative forum includes SacSewer Section Managers providing input with the final decision making by the SacSewer Director of Operations. Meetings are held regularly to facilitate the above activities. In addition, the OPT meetings may provide a forum for other business decisions as directed by the SacSewer Director of Operations.

2. Purchasing Authorization Levels

Two documents detail the purchasing authorization levels and form the Project Authorization Committee (PAC): the **Procurement Policy and Process Procedures and Purchasing Authority Limits** and the **Project Authorization Process.**

- **Procurement Policy and Process Procedures and Purchasing Authority Limits**
  For goods and services below the PAC threshold, this document aims to establish a purchasing authority policy and update purchasing limits for goods and services SacSewer needs to conduct business cost-effectively.
  - **Project Authorization Process (PAP)**
    The purpose of the **PAP** is to lay out the process to obtain management approval to proceed with capital and non-capital projects or programs that meet established criteria and financial thresholds.

The **Procurement Policy and Process Procedures and Purchasing Authority Limits** and the **Project Authorization Process** are internal documents available to the public upon request.

3. Change Advisory Team (CAT)

The CAT represents the interests of the customers, users, and SacSewer by providing a structured process for evaluating, approving, and prioritizing Requests for Change (RFC) to applications, systems, processes, and documentation utilized by SacSewer.

The CAT is a key component of the Change Management Process. It provides a forum for various business operational areas to suggest and evaluate enhancements to existing applications, functionality, and processes.

The team within the change management process acts as a review and decision-making body for RFCs within the scope of authority. The team falls under the oversight of the Asset Data Application Steering Committee (SC), and decisions outside the scope of authority require consultation with the SC.

CAT members include at least one member from each SacSewer operational area. Members may be adjusted as needed to provide the necessary experience and knowledge.

4. Collaboration and Innovation Team (CIT)

The CIT was established to support SacSewer's Five-year Strategic Plan by promoting the following:

- Exploring and, as appropriate, implementing new and innovative technologies for sewer system operations and sewer maintenance, repair, and rehabilitation
- Empowering employees, commensurate with their level of responsibility, to make necessary business decisions
- Fostering cross-organizational coordination opportunities to improve efficiency and production further

The CIT meets monthly and includes:

- Steering Committee – Director of SacSewer Operations and direct reports, including managers of Customer Care, Engineering, M&O, Safety and Regulatory Compliance, and Communications Department.
- Team Leader
- Secretary
- Up to 14 SacSewer staff members from various sections or departments (i.e., Customer Care, Engineering, M&O, Safety and Regulatory Compliance, and Department of Communications)

5. Collection System Operations Management Team

The intention of the meeting is to have a management discussion forum. The SacSewer Collection System Operations Management Team meets bi-weekly and includes the Director of CS Operations and her direct reports:

- M&O Superintendent
- Senior Safety Specialist
- Engineering Operations Support Principal Engineer
- Engineering Business Planning Principal Engineer
- Senior Public Information Officer

505 SSMP Audit Procedures

505.1. Purpose

The purpose of the **SSMP Audit Procedures** is to describe SacSewer's internal evaluation process that will be applied to assist with meeting the SSMP Audit requirements.

505.2. Background

The **General Order WQ 2022-0103-DWQ, Section 5.4** and **Attachment D Section 11,** requires enrollees to conduct an internal audit of its SSMP and implementation of its plan at a minimum frequency of once every three years. The audit must be conducted for the period after the end of the enrollee's last audit period. The LRO must submit an audit report to the online CIWQS Sanitary Sewer System Database within six months after the required 3-year audit period ends. The internal audit will be scaled to the size of the system and the number of spills. The sewer system operators must be involved in completing the audit.

The SSMP audit must:

- Evaluate the implementation and effectiveness of the SSMP in preventing spills
- Evaluate compliance with the General Order
- Identify deficiencies in the SSMP in addressing ongoing spills and discharges to the waters of the State
- Identify necessary modifications to the SSMP to correct deficiencies

The SSMP Audit Report submitted should include:

- Audit findings and recommended corrective actions
- A statement that sewer system operators' input on the audit findings has been considered
- A proposed schedule to address identified deficiencies

505.3. Procedure Approach

SacSewer's SSMP Audits focus on evaluating the effectiveness of the SSMP and compliance with the WDR requirements. SacSewer's approach is to ask specific questions relating to the eleven sections of the SSMP. The structure includes documenting the questions and responses to them in writing. Participation from key SacSewer staff, such as sewer system operators, will be required to complete the audit.

SacSewer's written audit report will consist of three parts:

- The SSMP Compliance Review - Evaluation of the SSMP mandatory elements to determine compliance with the WDR requirements.
- The Effectiveness Review - Evaluation of SacSewer's data, processes, and practices used to determine the effectiveness of the SSMP in meeting the goals of the WDR.
- An action plan identifying deficiencies or improvement opportunities in SacSewer's SSMP Although many possible deficiencies may be identified, the plan only includes those actions expected to result in the most progress toward meeting the goals of the WDR prior to SacSewer's next internal audit.

Completed SSMP Audit Reports will be uploaded to the online CIWQS Sanitary Sewer System Database by SacSewer's LRO within six months after the required 3-year audit period ends. SacSewer maintains an SSMP Internal Audit SharePoint site containing past SSMP audit reports with findings and action items. These past SSMP Audit Reports are available to the public for review by appointment only; review requests can be made through the SacSewer website.

505.4. Descriptive Procedural Steps

2.0 Establish Audit Team

The Principal Engineer will appoint the Audit Lead. The Audit Lead will appoint the Audit Evaluator. The Director of CS Operations will approve the Audit Lead and Audit Evaluator. The Audit Lead is responsible for leading all efforts during the SSMP audit process, which includes:

- Identifying the list of subject matter experts (SMEs) that will be asked to respond to audit questions
- Drafting audit schedule
- Developing audit questions
- Gathering audit responses
- Drafting Audit Report for the Audit Evaluator, Director of CS Operations, and General Manager review

The Audit Evaluator is responsible for reviewing the SSMP Audit Report and identifying deficiencies or improvement opportunities that could be implemented to improve the SSMP before the end of the next audit period.

2.0 Identify SMEs & Draft Audit Schedule

The Audit Lead is responsible for identifying the SMEs that will be asked to respond to audit questions and drafting the audit schedule. The list of SMEs should include, but not limited to managers and seniors from various groups with SacSewer (i.e., M&O, Engineering, Safety & Regulatory Compliance, and Communications). Before proceeding, the Director of CS Operations must review and approve both the list of SMEs and the audit schedule.

3.0 Inform Audit Evaluator & LRO of Audit Schedule

Once the audit schedule is approved by the Director of CS Operations, the Audit Lead informs the Audit Evaluator and LRO of the audit schedule.

4.0 Schedule a Pre-Meeting with SMEs

The Audit Lead facilitates a pre-meeting with the SMEs to inform them of the audit plan, schedule, and expectations during the audit process and answer questions they may have.

5.0 Develop Questions for Effectiveness Review

The Audit Lead develO questions for the Effectiveness Review. The Effectiveness Review includes two parts:

- Data Review: consists of gathering spill data, creating a 10-year graph, and determining SacSewer's performance in effectively reducing and mitigating spills.
- Practice Review: consists of developing questions based on the work of the M&O SMEs selected, interviewing the M&O SMEs to evaluate the effectiveness of the procedures and training provided as part of SacSewer's Maintenance & Operations Program, and recording the responses.

5.1 Provide Responses for Effectiveness Review

The SMEs provide their assistance in gathering spill data and M&O field staff provide responses for the Effectiveness Review portion of the SSMP Audit.

6.0 Develop Questions for Compliance Review

The Audit Lead develops questions for the Compliance Review. The Compliance Review consists of questions relating to the mandatory elements of an SSMP as defined in the WDR. Questions may vary from audit to audit. As SacSewer's business practices and performance evolve, the Audit Lead may modify the questions to stimulate continuous improvement and ensure WDR compliance.

6.1 Provide Responses for Compliance Review

The SMEs provide their assistance and responses for the Compliance Review portion of the SSMP Audit. The Audit Lead assists the SMEs on an as-needed basis during this step by scheduling meetings to re-group, answer, and clarify any additional questions or concerns the SMEs may have.

7.0 Draft & Prepare Audit Report

The Audit Lead begins drafting the different components of the Audit Report including the executive summary, audit form, data analysis, practices review, and action plan.

The Audit Lead gathers the responses from the SMEs and prepares a Draft Audit Report. This step may require additional meetings with the SMEs to finalize the Draft Audit Report.

8.0 Review Audit Report

The Audit Evaluator reviews the Draft Audit Report.

9.0 Notify Audit Lead of Audit Review Findings

The Audit Evaluator will collaborate with the Audit Lead (if necessary) to address questions or to identify SSMP deficiencies or opportunities for improvement.

10.0 Review Audit Findings

The Audit Lead will review the audit findings identified by the Audit Evaluator.

11.0 Collaborate with SMEs & Revise Responses if Needed

If responses in the Data Review, Practice Review, or Compliance Review need revision to address the Audit Evaluator's concerns, then the Audit Lead will collaborate with the appropriate SMEs to revise the specific responses.

The Audit Lead follows up as necessary with the Audit Evaluator.

12.0 Draft Action Items & Schedule

Any deficiencies or opportunities for improvement identified by the Audit Evaluator will become an action item. The Audit Lead will draft a schedule for when the action item must be completed by. Once the Final Audit Report is approved, each action item will be assigned to a manager for completion, will have progress tracked regularly at the OPT, and will be recorded on the SSMP Internal Audit SharePoint site.

The Audit Lead will also inform the Director of CS Operations and General Manager (District Engineer) about the status of the audit and their upcoming review.

13.0 Review Audit Report

The Director of CS Operations will review the Final Audit Report.

14.0 Audit Report Approved?

If yes, proceed to step 15.0

If no, another round of collaboration efforts between the Audit Lead and the SMEs to revise responses to address the Director of CS Operations' concerns is necessary (return to step 11.0)

15.0 Review Audit Report

The General Manager (District Engineer) will review the Final Audit Report.

16.0 Audit Report Approved?

If yes, proceed to step 17.0

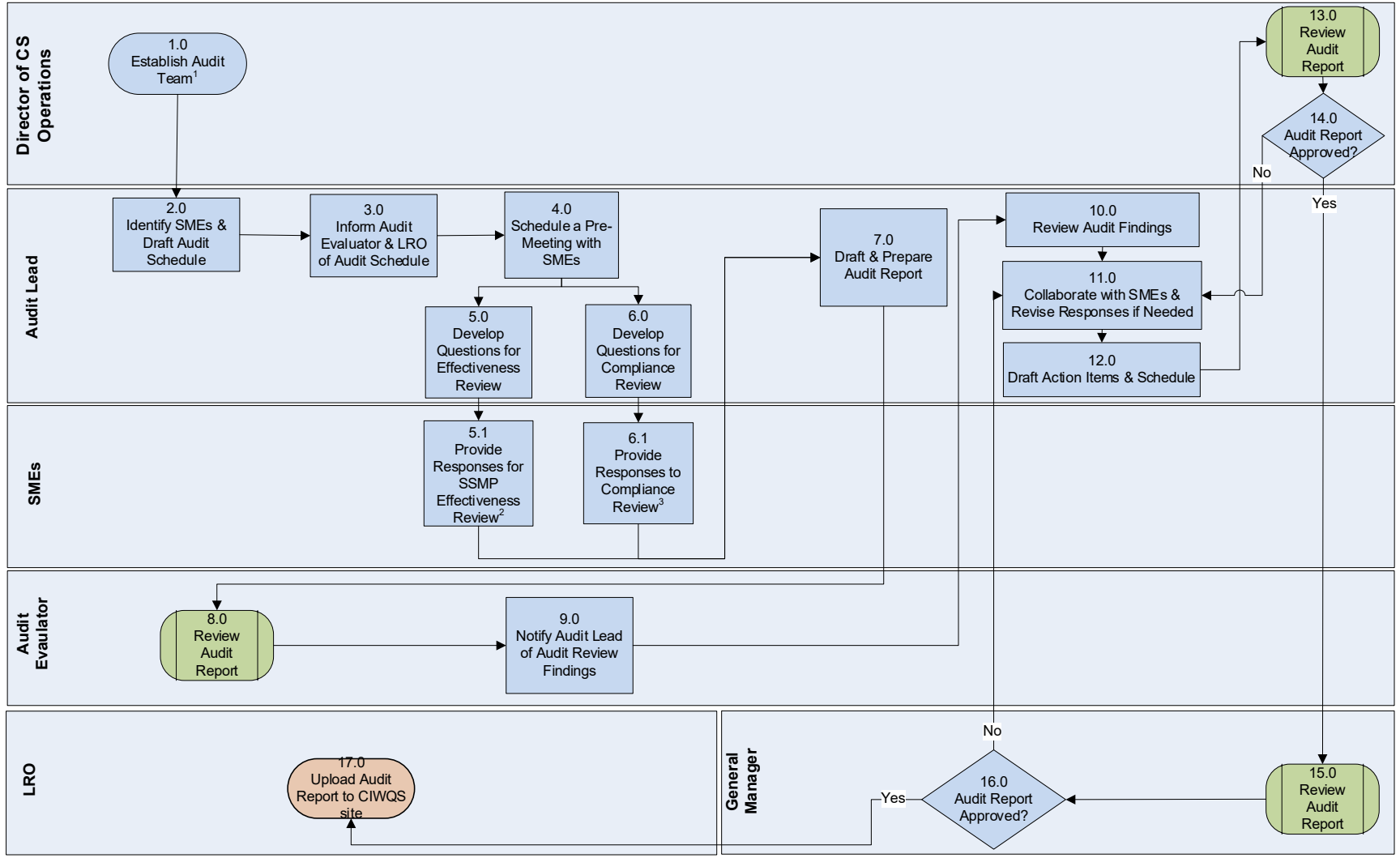
If no, another round of collaboration efforts between the Audit Lead and the SMEs to revise responses to address the General Manager's concerns is necessary (return to step 11.0)

17.0 Upload Audit Report to CIWQS Site

After the audit has been signed, an LRO will upload the completed and approved Audit Report to the CIWQS site within six months of the end of the audit period. Typically, SacSewer's Director of CS Operations or M&O Superintendent (both are LROs) will upload the Audit Report to the CIWQS site.

505.5. Flowchart

SSMP Audit Procedures Flowchart



Abbreviations and Defect Codes:
SME – Subject Matter Experts
LRO – Legally Responsible Official
CS – Collection System

Footnotes:
1. The Director of CS Operations will approve the audit team after the Principal Engineer has appointed the Audit Lead.
2. The SMMP Effectiveness Review includes Data Review and Practice Review.
3. The SSMP Compliance Review includes the Audit Form.

506 SSMP Communication Strategy

506.1. Purpose

The **SSMP Communication Strategy** aims to define SacSewer's strategy for communicating to the public and comply with the **General Order WQ 2022-0103-DWQ**.

506.2. Background

The **General Order WQ 2022-0103-DWQ, Attachment D Section 11,** requires enrollees to include procedures for communicating with:

- The public for:
  - Spills and discharges resulting in closures of public areas or that enter a source of drinking water, and
  - The development, implementation, and update of its SSMP, including opportunities for public input to SSMP implementation and updates.
- Owners/operators of systems that connect to the enrollee's system, including satellite systems for operation, maintenance, and capital improvement-related activities.

506.3. Strategy Approach

SacSewer implements robust communications and outreach within its service area using proactive and reactive methods.

Proactive Approach:

SacSewer's proactive approach to communication includes tactics focused on public awareness of the SSMP, service commitments, and other general methods that help support and achieve performance measures.

4. SacSewer Website:

To foster public awareness, SacSewer's Communications Department utilizes its website, **www.SacSewer.com,** as the primary source for public information. The website is advertised on nearly all customer and stakeholder communication materials (i.e., design and construction newsletters, Service Commitment Report Cards, etc.). SacSewer's Communication Department also coordinates with the cities it serves to promote SacSewer on their websites and newsletters. The website features user-friendly navigation, including the Residential, Business, Community, and Sustainability drop-down menus. The SacSewer website also has an "About Us" section where the public can learn more about SacSewer, review Service Commitments, and access several informative Reports and Plans such as:

- State of the District Reports
- Financial Reports
- Strategic Plans
- Sewer System Management Plan (SSMP)
- System Capacity Plans
- Spill Emergency Response Plan
- Asset Management Plan (executive summary)
- Catalog of Enterprise Systems

The SSMP web pages allow the public to view and download the most current, approved version of SacSewer's SSMP. The SSMP web pages also provide the public with a convenient way to give input and propose revisions to the SSMP. The public may comment by clicking the "comment" button, where their comments can be written and immediately submitted to SacSewer staff for review and consideration. SacSewer's Engineering Business Planning Group is responsible for updating SacSewer's SSMP, ensuring the latest version is posted, and archiving past PDF versions internally. For more information, see **SSMP Audit Procedures, Section 505.**

SacSewer's Service Commitments can also be found on SacSewer's website. Service Commitments demonstrate the quality of service SacSewer customers receive as a result of their monthly sewer rate. Service Commitments also indicate how successful SacSewer is in implementing the SSMP. SacSewer's Engineering Business Planning Group is responsible for reporting Service Commitments to SacSewer management and the Communications Department. See **Monitoring, Measurement, and Program Modification Strategy, Section 504,** for more information**.**

5. Other Communication and Outreach Activities:

Other general communication and outreach activities that help SacSewer achieve the performance of its SSMP may vary from year to year but generally include:

- A comprehensive Stop the Clog education program
- Educational presentations to community groups, local Boards, and Councils
- Attendance at local community fairs and festivals
- Dissemination of brochures, fact sheets, promotional items
- Public outreach about rehabilitation, repair, or other collection system improvement projects tailored to project needs
- Proactive and reactive media relations
- Website updates
- Specialized outreach to property owners for efforts such as backflow prevention devices
- Advertising annual and seasonal educational campaigns for public awareness
- Social media content via Facebook, Instagram, LinkedIn, and Nextdoor

Reactive Approach:

SacSewer's reactive approach to communication includes notifying the public about spills and discharges resulting in closures of public areas or that enter a source of drinking water

1. Spill Emergency Response Plan:

The **Spill Emergency Response Plan** can be found on SacSewer's public website at **https//www.sacsewer.com/spill-emergency-response-plan/**