

SSO Reduction Action Plan 2012

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City of Santa Barbara
Santa Barbara, California
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Section 1

Introduction and Background

1.1 Requirement to Prepare Report

On April 27, 2011, Santa Barbara Channelkeeper filed a lawsuit against the City of Santa Barbara in the United States District Court for alleged violations of the Clean Water Act. The parties engaged in extensive Court-ordered and supervised mediation that resulted in the Court's entry of a Consent Decree on May 14, 2012. The Consent Decree sets forth as one of its primary objectives, Sanitary Sewer Overflow (SSO) Reduction Performance Standards. In the event that the City does not achieve those performance standards, the City must prepare an SSO Reduction Action Plan setting forth the additional measures that the City will take during the coming year and thereafter to achieve the SSO Reduction Performance Standards (Performance Standards).

The Consent Decree provides that, "if the City does not comply with SSO Performance Standards because of one or more SSOs for which the City had no feasible alternatives, based on reasonable engineering judgment, that it could have implemented to avoid the SSO(s), then the City's SSO Reduction Action Plan shall include an explanation to that effect and need not propose additional actions."

In 2012, the City experienced 20 SSOs from the publicly owned sewer system. This is two more than the maximum allowable number in the Performance Standards. However, two of these SSOs were caused by circumstances that could not feasibly be prevented through actions on the part of the City. Both were caused by the actions of private contractors working on private systems which resulted in SSOs from the City's sewer system. They are discussed in detail in the body of the report.

Because two of the SSOs were beyond the control of the City, under the terms of the Consent Decree the City is not required to propose any additional actions or modifications to its programs. Nonetheless, the City has identified additional measures that it can implement to better control SSOs as set forth in Section 3 of this report.

1.1.1 Report Organization

Section 2 –Compliance with SSO Reduction Performance Standards for 2012: Discusses current and completed activities and actions that were designed to achieve compliance with the SSO Reduction Performance Plan.

Section 3 –Additional Measures to Achieve SSO Reduction Plan Compliance: Discusses additional measures, activities and actions to be undertaken in 2013 and beyond that are designed to achieve compliance with the SSO Reduction Performance Plan.

Section 2

Compliance with SSO Reduction Performance Standards For 2012

2.1 2012 SSO History

In 2012, the City of Santa Barbara had 20 SSOs from the wastewater collection system. This number exceeds the Performance Standards by two SSOs. A detailed explanation of these SSO events and a summary of related Wastewater Collection System performance matters are provided in the following subsection. A listing of the date and primary cause for 2012 SSOs appears in Table 2-1.

Table 2-1. 2012 SSO Event Listing			
SSO Event	Location	SSO Date	Cause
1	1303 DE LA GUERRA RD.	01/15/12	OTHER
2	123 ALAMEDA PADRE SERRA	01/25/12	DEBRIS
3	300 WEST PUEBLO STREET	03/07/12	OTHER (Private Construction)
4	327 WEST PADRE STREET	03/10/12	ROOTS
5	2119 STATE (20 AMERICAN AVENUE)	04/07/12	OTHER (City Contractor)
6	1919 GARDEN STREET	05/10/12	ROOTS
7	870 PASEO FERRELO	05/17/12	ROOTS
8	1210 CACIQUE STREET	05/20/12	GREASE
9	2906 LAS POSITAS ROAD	05/30/12	ROOTS
10	1210 ALAMEDA PADRE SERRA	05/30/12	ROOTS
11	1244 WEST MICHELTORENA ST.	06/04/12	ROOTS
12	11 LAS ALTURAS ROAD	06/06/12	ROOTS

SSO Event	Location	SSO Date	Cause
13	1524 EUCALYPTUS HILL ROAD	06/25/12	ROOTS
14	600 N. MILPAS ST.	07/13/12	GREASE
15	INTERSECTION MORENO AT APS	09/28/12	OTHER (Private construction)
16	1830 CLEVELAND	10/05/12	ROOTS
17	1225 N. SALSIPUEDES ST	11/09/12	ROOTS
18	462 CONEJO ROAD	11/10/12	OTHER (City Contractor)
19	1102 LUNETTA PLAZA	12/02/12	ROOTS
20	416 N. ONTARE	12/22/12	ROOTS

2.1.1 2012 Overflows By Cause

Table 2-2 summarizes the 20 SSOs by cause. In this past year, the cause category of “Roots” accounted for more than half of all total SSO events (60%). In one such event, roots entered the City’s wastewater collection system from a private sewer lateral, causing the largest volume SSO event (6,600 gallons) of the year. The next most common condition finding was “Other” which had a variety of causes (resulting in 25% of the total SSO events). The cause categories of “Grease” and “Debris” constituted the remaining causes of SSO events in the past year, accounting for a combined three of the total SSO events (15%).

Table 2-2. 2012 SSO Event Summary by Primary Cause	
SSO Cause	Number of SSO Events
Roots	12
Other	5
Grease	2
Debris	1

The data in Table 2-2 illustrates that the most effective and efficient way to reduce SSOs is to continue to develop a comprehensive cleaning program that results in cleaning pipe segments in a manner that is timely to each segment’s need based on maintenance condition findings from CCTV and cleaning events. The City has devoted substantial resources and time into the development of a comprehensive cleaning program. Because this program was developed in the second half of 2012, the results of program implementation are not demonstrated by the data in the table above. The City is continuing to implement and refine the cleaning program and expects continued improvement. The two events that were beyond the control of the City are discussed in detail below:

SSO Event 3

Address: 300 W. PUEBLO ST

Date: 3-7-12

Pipe ID: E7-161 (8" PVC, 69 ft)

Structure ID: PRIVATE LATERAL

Incident

A sewer overflow was reported to the City on Wednesday, March 7, 2012 at 0815 hours from a private lateral into a fountain. Wastewater Collection field staff responded and initiated control, containment and recovery procedures. The overflow was contained within the fountain structure. The entire overflow, 50 gallons, was recovered and returned back to the public sewer. Staff cleaned the pipe to clear the blockage and observed a mechanical pipe plug (debris). There is no upstream pipe section; this is the beginning of the line. It was a new 8" PVC installed as part of a private construction project and accepted by the City.

Incident Analysis

A CCTV investigation was conducted on the subject pipe. Because this is a new segment of pipe, installed 4-2-12, there is no applicable cleaning data. CCTV results indicated a mechanical pipe plug was observed to be the cause of the SSO event. Pipe E7-161 was replaced (8" PVC) as part of Cottage Hospital area improvements, a private project. The plug was apparently accidentally left in the pipe by the contractor who made the improvements to the main for Cottage Hospital. City maintenance and repair activities cannot feasibly be designed to prevent SSOs such as this that results from the accident or mistake of a private contractor working for another private entity.

Follow Up Actions

This sewer main frequency has been changed from a 60-month frequency to a 24-month frequency. This increased frequency was taken purely as a precautionary step and was not a function of pipe condition, was to ensure that no repeat SSO occurs from this location. Condition findings from future cleanings will result in the establishment of a cleaning frequency at an appropriate interval for this pipe segment.

SSO Event 15

Address: INTERSECTION OF MORENO RD. AT APS RD.

Date: 9-28-12

Pipe ID: G5-2 (6" HDPE, 286 ft)

Structure ID: MH-G5-019

Incident

A sewer overflow was reported to the City on September 28, 2012, at 1335 hours, from a manhole. City staff responded and initiated control, containment and recovery procedures. The spill volume was estimated at 50 gallons; 40 gallons were recovered; 10 gallons were not recovered. Staff cleaned the pipe and findings were clear. The upstream pipe G5-5 and the downstream pipe F6-164 were cleaned and both had clear findings.

Incident Analysis

CCTV observations included yellow sand debris. The debris came from a broken private water mainline which was located upstream on a private construction site. Potable water and sand discharged into the public sewer system and overwhelmed a downstream manhole. This is what caused the SSO event. Cleaning history documented in Cartegraph indicated the pipe was previously cleaned on 10-18-2011 (clear findings). The City could not reasonably have prevented this SSO. City maintenance and repair activities cannot feasibly be designed to prevent SSOs such as this that result from inundation of the system due to a broken private water line entering the system through private infrastructure on private property.

Follow Up Actions

- The next scheduled cleaning date is on 9-27-13. This is currently listed as a 24-month pipe.
- No further actions beyond currently, scheduled, routine maintenance activities are recommended.

Table 2-3 provides a detailed summary of each of the 2012 SSO events.

Table 2-3. SSO Event Condition Finding Details						
SSO Event	Pipe ID	Grease	Roots	Debris	Other	Overall Finding
1	H6-142	Clear	Clear	Medium	Heavy	Heavy
2	K7-51	Clear	Clear	Heavy	Clear	Heavy
3	E7-161	Clear	Clear	Clear	Heavy	Heavy
4	E7-111	Clear	Heavy	Clear	Medium	Heavy
5	E7-52	Clear	Clear	Light	Heavy	Heavy
6	F6-135	Clear	Heavy	Clear	Heavy	Heavy
7	H6-108	Clear	Heavy	Clear	Clear	Heavy
8	K8-27	Heavy	Clear	Clear	Clear	Heavy
9	D6-132	Clear	Heavy	Clear	Clear	Heavy
10	H5-33	Clear	Medium	Clear	Clear	Medium
11	E10-9	Clear	Medium	Medium	Clear	Medium
12	J6-91	Clear	Light	Light	Clear	Light
13	K8-83	Clear	Heavy	Clear	Clear	Heavy
14	H7-44	Heavy	Clear	Clear	Heavy	Heavy
15	G5-2	Clear	Clear	Clear	Heavy	Heavy
16	F6-165	Clear	Light	Clear	Clear	Light
17	G7-83	Clear	Medium	Clear	Clear	Medium
18	New	Light	Light	Light	Heavy	Heavy
19	F12-46	Light	Heavy	Light	Clear	Heavy
20	C4-93	Clear	Light	Light	Clear	Light

A summary description of each of the 2012 SSOs is included in Appendix C of this report.

2.1.2 2012 Overflows By Volume

Table 2-4 summarizes the SSO events by volumes, showing total event volume, volume recovered, and net volume released.

Table 2-4. 2012 SSO Event Summary by Volume			
SSO Event	Total Volume	Volume Recovered	Volume Not Recovered
1	100	100	0
2	90	90	0
3	50	50	0
4	2	0	2
5	3	0	3
6	250	20	230
7	2	0	2
8	400	250	150
9	15	10	5
10	75	45	30
11	25	0	25
12	10	10	0
13	10	10	0
14	25	25	0
15	50	40	10
16	25	25	0
17	25	25	0
18	50	50	0
19	6,600	100	6,500
20	325	300	25
Totals:	8,132	1,150	6,982

Table 2-4 data shows that 14% of the total SSO volume was recovered during emergency response events. Because the notification to the City for SSO Event Number 19 was significantly delayed (see subsection 2.1.3), this event is considered an outlier. Excluding data from SSO Event Number 19, the total volume of SSOs in 2012 was 1,532 gallons, with 482 gallons unable to be recaptured and cleaned up, which is a 69% recovery.

2.1.3 2012 Public Water Overflow Impacts

In 2012, two City SSOs reached public waters: SSO Event Number 8 and SSO Event Number 19. SSO Event Number 8 was caused by “Grease” and occurred in a City sewer main immediately

downstream from a mobile home park's sewer lateral discharge point, located on Cacique Street. As a result of Event Number 8, City Fats, Oil, and Grease (FOG) Program door hangers were distributed on all the mobile home residences located in that trailer park complex. The cleaning frequency of the blocked sewer main also was increased.

SSO Event Number 19 was caused by a private property sewer lateral's roots entering a City sewer main and causing a root-related blockage at the location of the sewer lateral's connection with the City sewer main. It was noted by City staff that the citizen calling in the SSO complaint was the owner of this private property, and that the citizen informed City staff that the SSO event had been taking place for approximately one day prior to calling in the SSO complaint.

The citizen did not notify the City of the SSO when first noticed. Had that communication been done in a timely manner, the volume of the SSO would have been significantly smaller and may not have reached public waters. The City subsequently has increased its public outreach through City email publications and utility bill inserts to encourage residents to immediately notify the City when they suspect an SSO may be occurring in the City of Santa Barbara.

2.2 Business Process and Documentation Development

Utilizing consultant contract support throughout the years 2011 and 2012, the City produced the following Work Plan documents in 2012:

- Fats, Oils and Grease Program Plan
- SSO Response Improvement Plan
- Lift Station SSO Response Plan
- Cleaning and Inspection Plan
- CCTV, Rehabilitation, and Replacement Plan
- Wastewater Master Plan
- Lift Station Maintenance, Inspection, and Condition Assessment Plan
- IT Governance Plan
- Flow Monitoring Plan
- Exfiltration Abatement Program Plan
- Updated Sewer System Management Plan

These important Work Plan documents serve as a principal guidance for planning and implementing industry best practices and standards related to wastewater collection business processes within the City of Santa Barbara. These plans also serve as the basis for operating the collections system in a manner that will meet the Consent Decree Performance Standards. It is important to note that because these Work Plans were developed in 2011 and 2012, staff is now in the preliminary stages of implementation of the changes to work practices. As a result we expect to see the outcomes from these changes in the coming years. Updates to the Work Plan documents will be made as-needed due to system performance and other information learned during their implementation.

Modifications being made to existing business processes and practices are substantial and not expected to be perfected all at once. Implementation of core principles and practices of these Work Plans within the city workforce will be a priority. This implementation will take place on an on-going basis.

2.3 Program Modifications in 2012

Towards the end of 2012, the City began implementation of its first year of operation for all Work Plan activities. The same year was the first year of the City's efforts to clean its entire Wastewater

Collection System in a five-year time period. Much has been learned during this first year and major user-based modifications are being made to the Cartegraph CMMS: modifications to sewer main cleaning schedules, addition of data into Cartegraph related to CCTV activity schedules, addition of SSO event information, and addition of Sewer Lateral Inspection Program scheduling and tracking activities.

2.3.1 Business and Technology-Driven Modifications

In 2012, the City made significant investment in information technology hardware and software, including the following milestone activities:

- Updating the City's GIS and CMMS software databases to address critical data gaps necessary for City staff to provide best practice business activities.
- Implementing an updated CMMS, linked to GIS, to record and track pertinent asset management, operations, and maintenance activities.
- Developing a database of pipe invert elevations which allow the City to evaluate the relative depths of the sewer pipes in the City Collection System and separate storm sewer pipes in the City's MS4.
- Developing and implementing an inspection database to be incorporated into the City's CMMS system that documents the condition assessment rating for all Sewer Line Segments inspected pursuant to the City's CCTV and Condition Assessment Work Plan.

Both the Cartegraph and ESRI GIS databases have changed substantially in the past year with much new data being entered into them and modifications made to their table structures. In the coming year, these databases should become more mature both in terms of structure and in terms of content.

The business process development activities have been instrumental in preparing the City to continue its implementation of Consent Decree activities in 2013 and beyond, and in complying with Consent Decree requirements by providing these plans as Consent Decree deliverables for ChannelKeeper's review and comment. These activities have formed the very foundation upon which key Consent Decree milestone activities will be achieved and may be accurately measured in the future. Many of these activities were "one-time" tasks and will not be required to be undertaken in following years.

2.4 CCTV Activities in 2012

In early 2012, the City contracted with National Plant Services to televise many large diameter sewer mains. This work was completed in July 2012. In mid-2012, the City initiated activities to develop a CCTV Inspection contract for the 2013 time period. CCTV inspection plans and specifications were developed and requests for proposals were solicited in September 2012. The contractor Advanced Sewer Technologies (AST) was selected as a result of this process. AST was purchased by ProPipe, and a contract with the City was executed in November 2012. The CCTV Inspection work completed in 2012 produced the information which appears in Table 2-5 below. Sewer segment locations are shown in Figure 2-1. Data from CCTV inspection is used in determining pipe cleaning frequencies and prioritizing CIP work.

Table 2-5. 2012 CCTV Events			
CCTV Source	HR Candidate Pipe Mileage	Regular Pipe Mileage	Total Mileage
City	4.42	11.51	15.93
Contract	2.02	4.05	6.07
Total	6.44	15.56	22.00

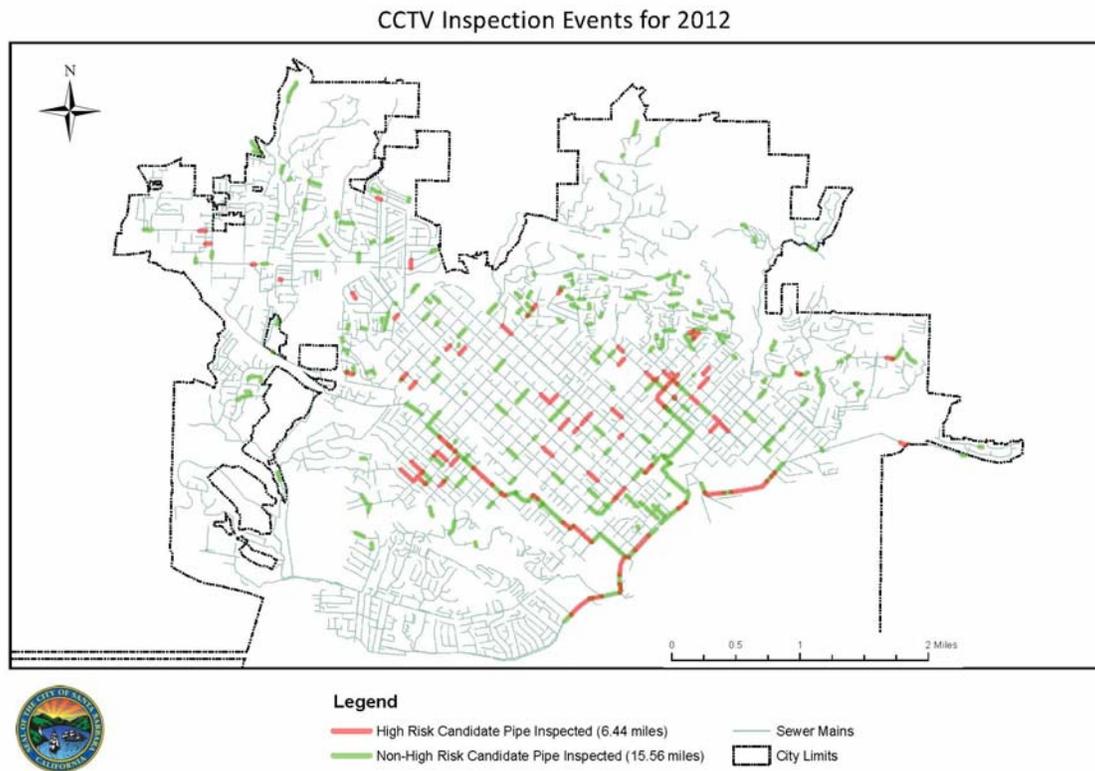


Figure 2-1. CCTV Inspection Events for 2012

2.5 Condition Assessment and CIP Work in 2012

In 2012, the City made significant progress in development and implementation of its Condition Assessment Work Plan activities. Notable developments were the acquisition and implementation of new Condition Assessment Program software. This software product is called POSM (which stands for Pipeline Observation System Management). The new POSM software serves as a repository and condition assessment tool by which City staff can analyze and prioritize sewer mains which have been televised, PACP code-graded, and uploaded into the software system. The existing CCTV and assessment data that has been placed into the new POSM software is being reviewed by City staff at this time.

The City developed a contract for CCTV Inspection work in the latter part of 2012, which now is in progress in early 2013. PACP Grading System results for this contract work are anticipated in mid-2013.

The City completed CIP construction project pipe mileage totaling 5.12 miles in 2012. This information is presented in Table 2-6. A map depicting these sewer main segments is shown in Figure 2-2.

Table 2-6. Project pipe Mileage Completed in 2012							
Project Type	Type of Work	HRP		Non-HRP		Total	
		Segment ¹ Count	Miles	Pipe Count	Miles	Segments	Miles
Sewer Main Rehabilitation Project	Rehab	11	0.48	42	1.98	53	2.46
Sewer Main Replacement Project	Replace	0	0.00	5	0.08	5	0.08
Sewer Main Repairs Project	Repair	11	0.54	52	2.04	63	2.58
Total		22	1.02	99	4.10	121	5.12

¹ A segment of pipe is the distance from manhole to manhole or manhole to clean-out.

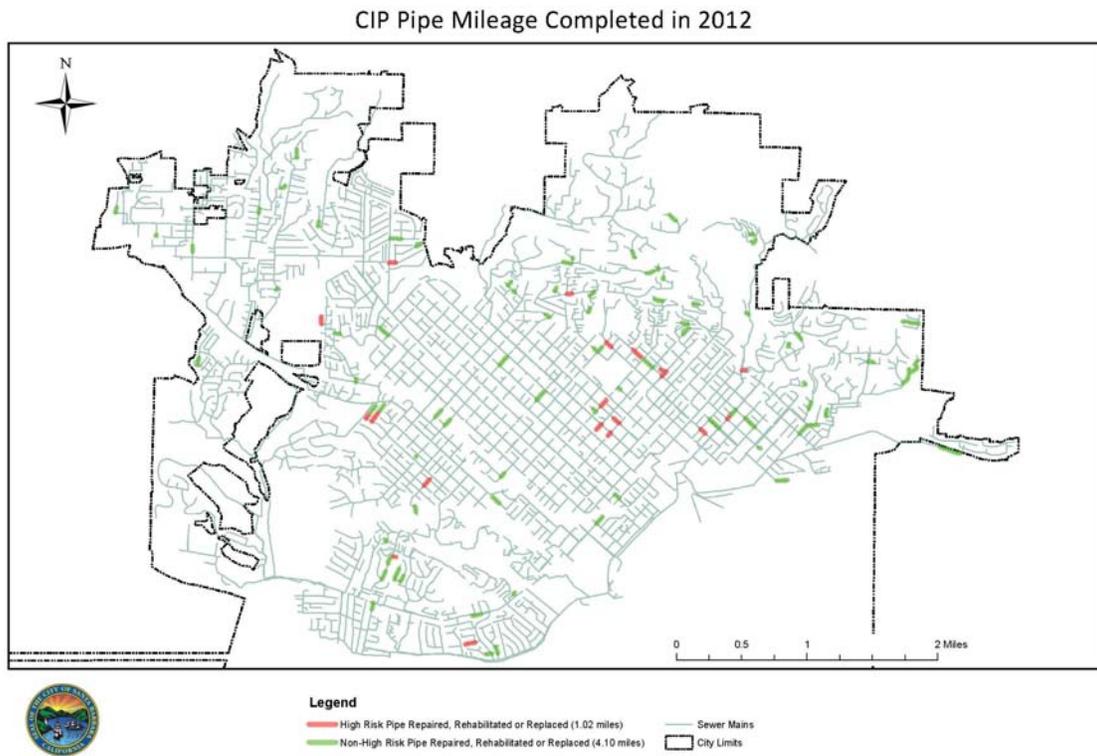


Figure 2-2. CIP Pipe Mileage Completed in 2012

2.6 Sewer Segments Cleaned in 2012

2.6.1 Cleaning Activity Summaries

Staff have identified that maintenance is the most immediate and effective way to prevent SSOs. In 2012, the City cleaned approximately 186.5 miles of sewer segments (mains).

Key analyses contained in this report have produced the following results:

- 4,482 sewer main cleaning events were completed in 2012. These cleaning events represent 186.5 miles of sewer mains.
- 3,539 individual sewer mains were cleaned, many of them several times, in 2012.
 - These cleaned sewer main segments represent 144 geographic miles of the Wastewater Collection System (which is 257.4 geographic miles). Thus in 2012, the City cleaned 56% of its entire Wastewater Collection System.
- Of all sewer main segments cleaned in 2012, some experienced cleaning schedule frequency changes.
 - Six percent of all sewer mains cleaned had their cleaning frequencies reduced (from 1- through 6-month frequencies to less frequent cleaning schedules).
 - Five percent of all sewer mains cleaned had their cleaning frequencies increased from a 60-month frequency schedule to more frequent cleaning schedules.

Key strategies designed to improve overall performance of the Wastewater Collection System as a result of analyses contained in this report:

- A new mechanical root control program will be designed and implemented in 2013 to change cleaning schedules of sewer segments found to have heavy or medium root condition findings to a new 6-month cleaning frequency.
- A new debris control program will be designed and implemented in 2013 to change cleaning schedules of small-diameter sewer segments found to have heavy or medium debris condition findings to a new 12-month cleaning frequency.

Table 2-7 lists the monthly sewer main cleaning events and related cleaning mileages this past year. In summary, the City performed an average of 374 cleaning events monthly with a resulting average of 15.5 miles of sewer main being cleaned each month.

Table 2-7. Sewer Main Cleaning Monthly Summaries		
Month	Monthly Cleaning Events	Monthly Cleaning Mileage
January	381	17.39
February	292	12.01
March	442	17.79
April	337	14.70
May	436	19.38
June	357	14.63
July	298	12.15
August	391	16.77
September	369	14.07
October	456	19.53
November	343	13.70
December	380	14.41
Totals:	4482	186.53
Monthly Averages:	373.5	15.54

Table 2-8 lists the number of times that individual sewer mains were cleaned in 2012. Sewer mains being cleaned only one time in the past year represent 63.6% of all the cleaning events performed. Sewer mains being cleaned more than one time represent the remaining 36.4% of these cleaning events.

Table 2-8. 2012 Sewer Main Cleaning Event History			
Cleaning Event Category	Number of Mains Cleaned	Cleaning Mileage	Geographic Mileage
One Time	2744	108.34	108.34
Two Times	659	58.85	29.43
Three Times	124	17.27	5.76
Four Times	12	2.07	0.52
Totals:	3539	186.53	144.05

2.6.2 Condition Findings

Table 2-9 provides information related to the density of materials that were found when cleaning events were performed in 2012. In summary, 94% of the sewer main cleaning events resulted in “Clear” or “Light” condition findings, which indicate that the cleaning schedules for these sewer mains are adequate and that they do not require more frequent cleaning. The condition findings for the remaining 6% of the cleaning events performed have resulted in the sewer main cleaning

frequencies being adjusted so that these pipes are cleaned more frequently in the future. Sewer segments representing these Overall condition findings are shown in Figure 2-3.

Table 2-9. 2012 Sewer Main Cleaning Condition Findings Summary			
Overall Condition Finding	Number of Mains	Number of Events	Cleaning Mileage
Heavy	35	78	3.29
Medium	131	200	8.50
Light	688	1001	42.57
Clear	2488	3203	132.17
Other	197	NA	
Total	3539	4482	186.53

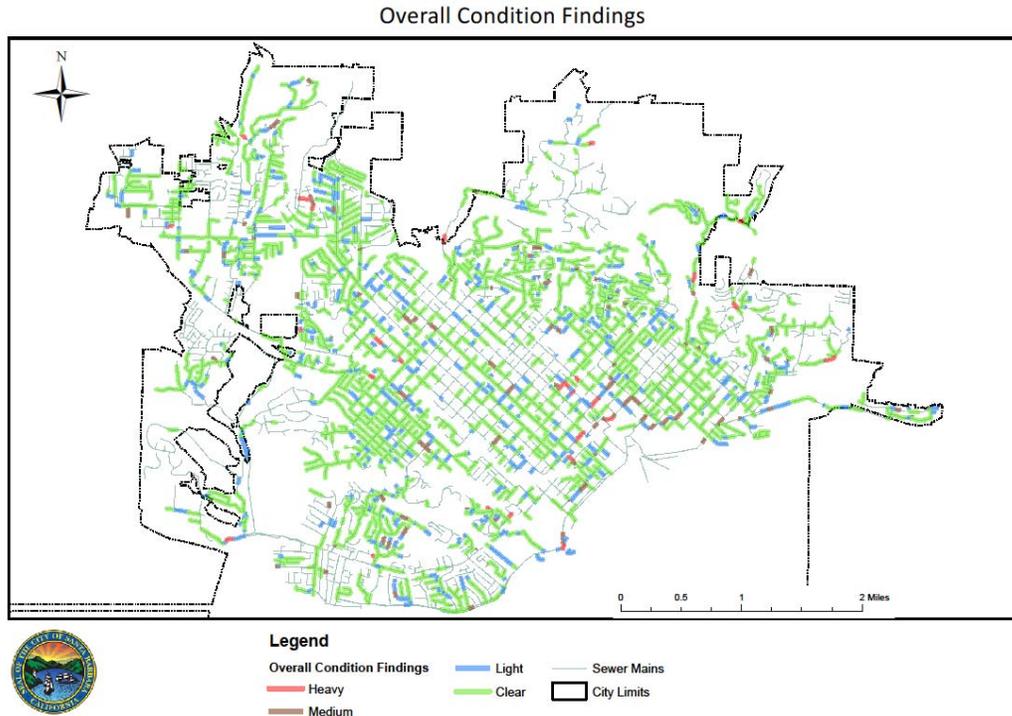


Figure 2-3. Overall Condition Findings

A more detailed examination of these condition findings can be made through a review of Table 2-10. Detailed cleaning event results for the sewer mains which have been found to have “heavy” or “medium” condition findings are shown below.

Table 2-10. Cleaning Event Condition Finding Summary				
Category	Grease Events	Root Events	Debris Events	Other Events
Heavy	11	20	27	24
Medium	31	86	94	2
Light	125	521	482	11
Clear	4310	3851	3874	4437
Other	5	4	5	8
Totals:	4482	4482	4482	4482

Individual analyses of major three condition finding categories are presented in the tables and figures below. Root condition finding data are presented in Table 2-11 and Figure 2-4 below.

Table 2-11. Root Condition Finding Data		
Category	Number of Sewer Mains	Number of Root Finding Events
Heavy	18	20
Medium	69	86
Light	396	521
Clear	3053	3851
Other	3	4
Totals:	3539	4482

Table 2-11 shows that there were 106 “heavy” or “medium” root finding events occurring in 87 sewer mains in 2012. These events will be more fully examined in the following Section.

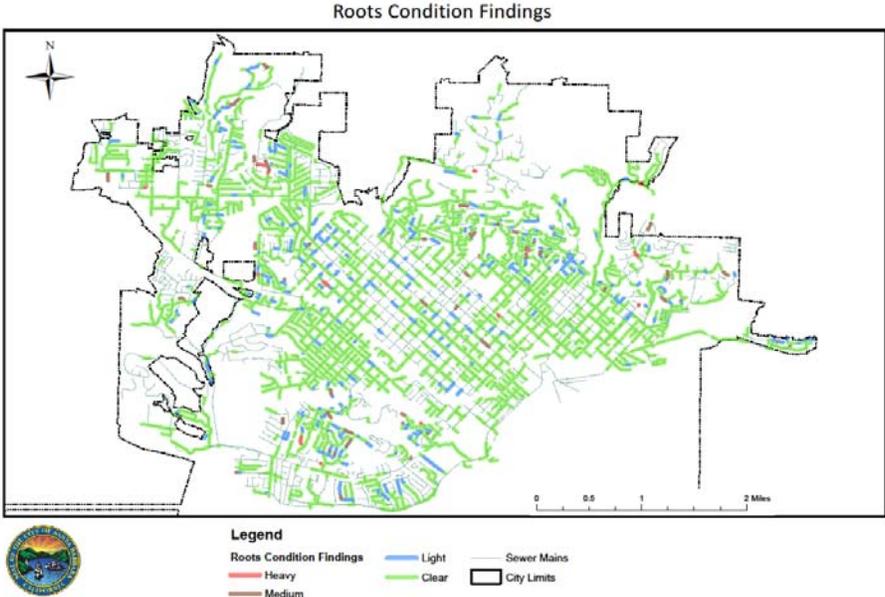


Figure 2-4. Roots Condition Findings

Grease condition finding data are presented in Table 2-12 and Figure 2-5 below.

Table 2-12. Grease Condition Finding Data		
Category	Number of Sewer Mains	Number of Grease Finding Events
Heavy	9	11
Medium	15	31
Light	72	125
Clear	3440	4310
Other	3	5
Totals:	3539	4482

Table 2-12 shows that there were 42 “heavy” or “medium” grease finding events occurring in 24 sewer mains in 2012. These events will be more fully examined in the next Section.

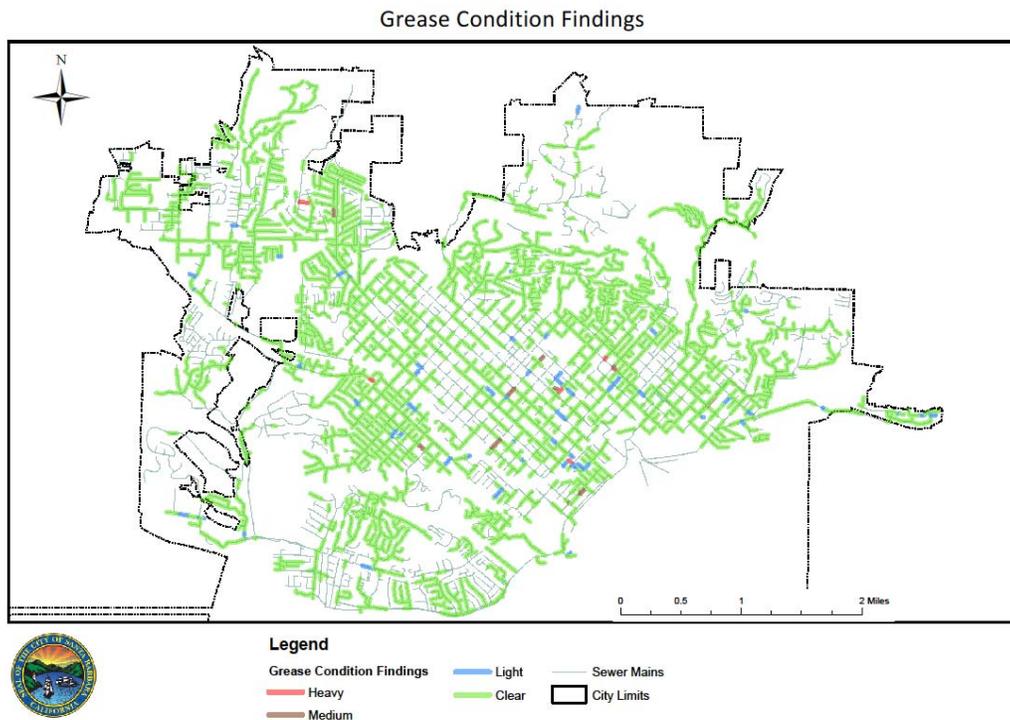


Figure 2-5. Grease Condition Findings

Debris condition finding data are presented in Table 2-13 and Figure 2-6 below.

Table 2-13. Debris Condition Finding Data		
Category	Number of Sewer Mains	Number of Debris Finding Events
Heavy	24	27
Medium	73	94
Light	348	482
Clear	3091	3874
Other	3	5
Totals:	3539	4482

Table 2-13 shows that there were 121 “heavy” or “medium” debris finding events occurring in 97 sewer mains in 2012. These events will be more fully examined in the next Section.

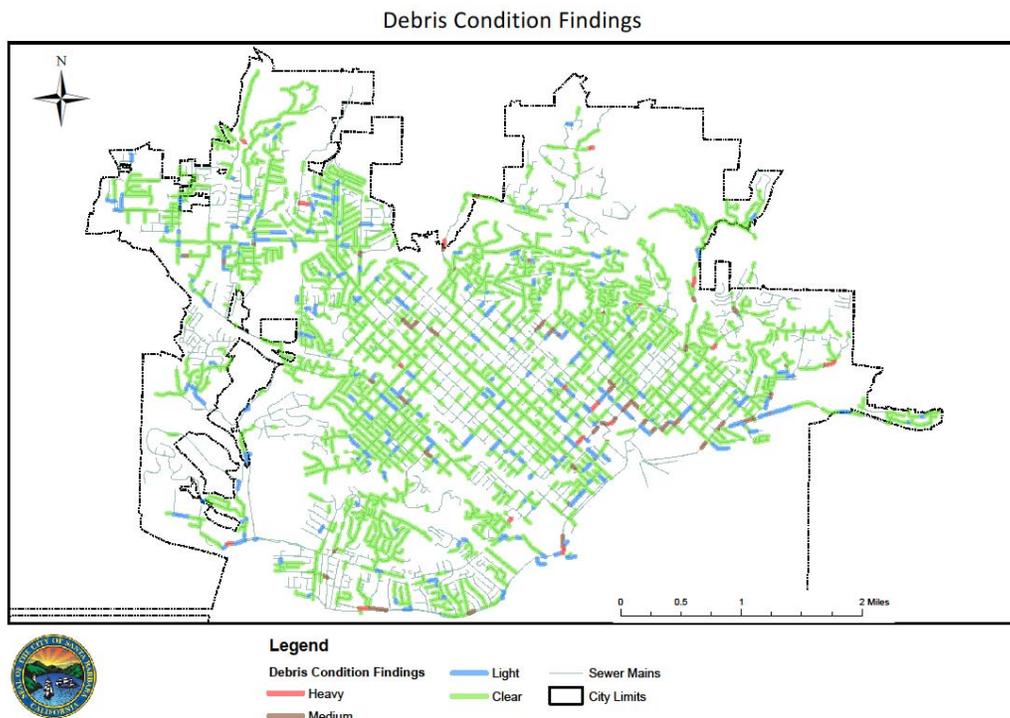


Figure 2-6. Debris Condition Findings

2.6.3 Cleaning Frequency Adjustments

Table 2-14 summarizes the sewer main cleaning frequency adjustments that have been made in 2012. It shows that 578 sewer mains have had their cleaning frequency adjusted this past year. In general sewer mains with cleaning frequency changes have had their frequencies either reduced (1-

to-6-month frequency pipes being changed to new 12-month cleaning intervals) or have had their frequencies increased (60-month frequency pipes being changed to 24-month cleaning frequency). Now the 12-month and 24-month frequency pipe constitute the largest population of changed frequency pipe in 2013.

Table 2-14. Calendar Year 2012 Sewer Main Cleaning Frequency Change Summary		
Frequency Range (month)	Previous Sewer Main Frequency Count	Current Sewer Main Frequency Count
1 to 6	327	122
12	51	280
24	13	176
60	187	0
Totals:	578	578

The following Section describes additional measures to be undertaken in 2013 and beyond that are designed to achieve compliance with SSO Reduction Performance Standards. It will provide a more detailed look at the results of sewer main cleaning activities that took place in 2012. Specifically a review of “heavy” and “medium” condition finding cleaning events have shown there is an opportunity to fine-tune the current cleaning schedules of specific sewer mains now, so that they are cleaned at time intervals more appropriate for the materials that are apt to collect within these pipes in the coming years.

Section 3

Additional Measures to Achieve SSO Reduction Plan Compliance

This section of the report discusses planned activities to reduce SSOs in 2013. Section 3.1 discusses implementation of planned activities and section 3.2 discusses modifications to the Work Plan that reflect adjustments designed to ensure that the City meets SSO Performance Standards in 2013 and future years.

3.1 CCTV Activities in 2013

As discussed above, the City has awarded a contract for CCTV inspection to ProPipe. The scope of work for the ProPipe contract involves the cleaning and subsequent CCTV inspection of 24.5 miles of 6" and 8" diameter City sewer mains, and inspection of the sewer manholes that are associated with these sewer mains. Ancillary contract work involves traffic control, Caltrans and other agency permitting, resident and merchant notifications, and production of a final inspection report.

The contractor will clean City sewer mains in conformance with applicable Work Plan policies and related Wastewater Section Standard Operating Procedures. The contractor will report its sewer main cleaning condition findings in a format that allows for the City to enter the results into its CMMS software for determination of next cleaning frequency schedules and required future cleaning events for all sewer mains cleaned by this contract in 2013.

All City sewer mains televised will be assessed by the Contractor according to PACP Code standards. The resulting CCTV data and related reporting information will be transmitted to the City and uploaded into the City's CCTV software, POSM. City certified inspectors will spot-check the Contractor's PACP coded-video to ensure that the video is of appropriate quality and that the PACP code results are accurate and representative of the City sewer mains being assessed.

The City plans to award a second CCTV contract in 2013. This contract will be for approximately 12 miles of high risk candidate pipe. The contract will include pipe cleaning and sewer manhole inspection of manholes associated with the sewer mains being televised.

The City owns one CCTV truck with televising hardware that functions with POSM software. In 2013, City staff will continue its televising work of City sewer mains needed for response to: SSO events, system blockages, customer complaints, quality control review of sewer main cleaning, and ad-hoc organizational needs.

City staff also will participate in planned annual system-wide CCTV scheduled work as needed to assist in successful completion of the City's annual CCTV goal. It is estimated that this City televising work will result in approximately 15 miles of City sewer main being assessed in 2013. Table 3-1 summarizes the planned CCTV work for 2013. A graphical representation of City sewer segments planned to be televised is shown in Figure 3.1 below. A listing of these individual sewer segments is provided in the Appendices' ESRI GIS Shapefile.

Table 3-1. Calendar Year 2013 Planned CCTV Assessment Schedule				
CCTV Source	Manholes Inspected	HR Candidate Pipe Mileage	Regular Pipe Mileage	Total Mileage
City	TBD	0	15.0	15.0
Contractor	1200	36.4	0	36.4
Total	1200+	36.4	15.0	51.4

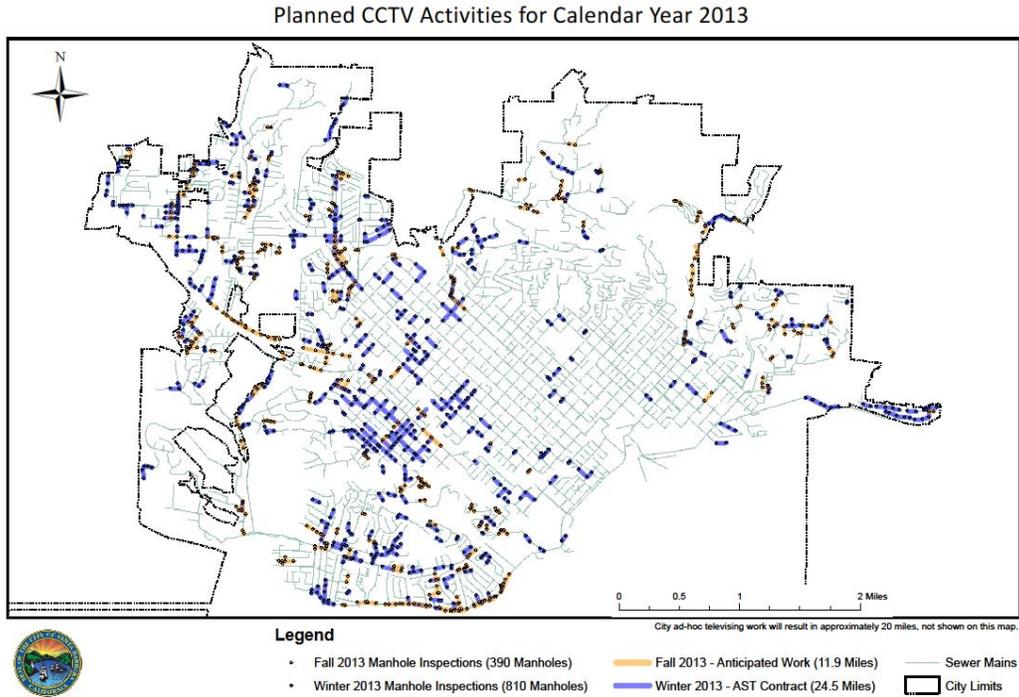


Figure 3-1. Planned CCTV Activities for 2013

For long-term CIP-related condition assessment purposes, the City has developed a basic schedule to televise the entire Wastewater Collection System in a ten-year time period. A summary schedule of this system-wide CCTV program is listed below in Table 3-2 and in Figure 3.2.

Table 3-2. Multi-Year Contract CCTV Inspection Schedule Summary		
Year	Count of Pipes	Mileage*
2013	862	36.4
2014	581	25.8
2015	541	25.8
2016	600	26
2017	741	26
2018	659	26
2019	699	26
2020	671	26
2021	728	26
2022	645	26

* Televising PACP Codes 4 & 5 sewer mains may increase televised mileage quantities in 2014 and 2015.

Planned CCTV Activities for Calendar Years 2013 through 2017

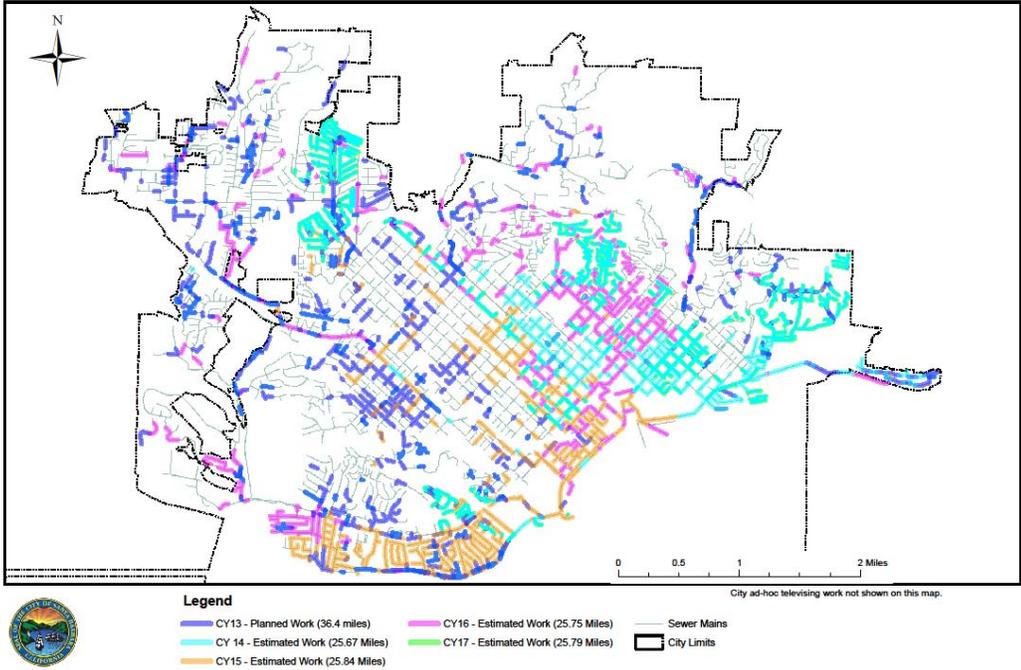


Figure 3-2. Planned CCTV Activities for 2013 through 2017

3.2 Cleaning Plan Modifications in 2013

3.2.1 Need for Maintenance Control Programs

From analyses conducted both on SSO events and on sewer main cleaning events in 2012, it was found that a major contributor to SSOs are “heavy” and “medium” root condition findings. From review of existing cleaning frequency data, 87 sewer mains were found to have overall “heavy” or “medium” root findings. Of these, 56 sewer mains now have cleaning frequencies greater than six-month time intervals.

To provide better focus on root-related SSO reduction, a new Mechanical Root Control Program is being implemented in 2013. Sewer mains that have been identified with “heavy” or “medium” root condition findings will have their cleaning frequencies manually adjusted to a 6-month interval in 2013. These sewer mains will be cleaned initially at a 6-month frequency to ensure that root growth in sewer mains is controlled until such time that CIP project rehabilitation or repair can be made on these sewer mains.

Analyses made for grease and debris-related “heavy” or “medium” condition findings have resulted in a similar determination for pipe cleaning frequencies to be increased in 2013. Grease condition finding pipes also will result in individual tributary area studies made to determine if upstream commercial food establishments are contributing to these grease condition findings. Special outreach and inspection activities will continue to be conducted at these area food service establishments. For “heavy” or “medium” debris condition findings on smaller diameter sewer mains, cleaning frequencies will be increased if they are at less than 12-month intervals. Cleaning frequency adjustments for larger diameter pipes will be reviewed on a case-by-case basis.

The results for these overall condition finding analyses are presented in Table 3-3.

Table 3-3. Overall “Heavy” / “Medium” Condition Findings Pipe Count				
Category	Grease	Roots	Debris	Other
<= 6 Months	18	31	35	4
> 6 Months	6	56	62	14
Totals	24	87	97	18

A large number of SSO-related sewer main events have been recorded as “heavy” in the “Other” category in addition to specific category condition findings. For this reason the “Other” category has not been independently analyzed here. It also has been discovered that non-scheduled cleaning events were not getting automatic frequency adjustments made in the Cartegraph software through programming algorithms as were the scheduled cleaning events. The impacted cleaning frequency adjustments for these sewer segments and this Cartegraph programming algorithm error all will be corrected in 2013.

3.2.2 Root Control Program

Table 3-4 presents information related to sewer main mileage changes for sewer mains found to have “medium” or “heavy” root condition findings. Changing these pipes’ cleaning frequencies to a 6-month time interval creates a need to clean an additional 3.12 miles of sewer mains annually.

Table 3-4. Root Control Program Proposed Cleaning Schedule Modifications					
Existing Frequency (Month)	Pipe Count	Geographic Mileage	Existing Annual Cleaning Mileage	Proposed Annual Cleaning Mileage	Annual Cleaning Mileage Increase
12	15	0.61	0.61	1.22	0.61
24	40	1.64	0.82	3.28	2.46
60	1	0.03	.006	0.06	0.05
Totals:	56	2.28	1.44	4.56	3.12

3.2.3 Grease Control Program

Table 3-5 presents information related to sewer main mileage changes for sewer mains found to have “medium” or “heavy” grease condition findings. Changing these pipes’ cleaning frequencies to a 6-month time interval creates a need to clean an additional 0.41 miles of sewer mains annually.

Table 3-5. Grease Control Program Proposed Cleaning Schedule Modifications					
Existing Frequency (Month)	Pipe Count	Geographic Mileage	Existing Annual Cleaning Mileage	Proposed Annual Cleaning Mileage	Annual Cleaning Mileage Increase
12	1	0.07	0.07	0.14	0.07
24	4	0.21	0.11	0.44	0.33
60	1	0.06	0.01	0.02	0.01
Totals:	6	0.34	0.19	0.60	0.41

3.2.4 Debris Control Program

Table 3-6 presents information related to sewer main mileage for sewer mains found to have “medium” or “heavy” debris condition findings.

Table 3-6. Debris Condition Findings’ Existing Cleaning Schedules	
Existing Frequency (Month)	Pipe Count
12	4
24	49
60	9
Total:	62

Sewer mains with diameters greater than 12 inches may not require an accelerated cleaning schedule shorter than twenty four months due to the capacity of these sewer mains to convey sewage flow effectively even though a steady-state debris level exists in the pipe invert. Therefore, Table 3-7 provides a clear focus for near-term changes needed to sewer main cleaning frequencies for sewer mains of

diameters that are 12 inches in diameter or less. Changing these pipes' cleaning frequencies to a 12-month time interval creates a need to clean an additional 0.75 miles of sewer mains annually.

Table 3-7. Small Diameter Pipe Debris Findings Cleaning Mileage Modifications							
Existing Frequency (month)	Pipe Diameter (inches)	Pipe Count		Geographic Mileage	Existing Annual Cleaning Mileage	Proposed Annual Cleaning Mileage	Annual Cleaning Mileage Change
12	6	0	4	0.48	0.48	0.48	0
	8	3					
	12	1					
24	6	11	31	1.38	0.69	1.38	0.69
	8	14					
	10 to 12	6					
60	6	0	1	0.08	0.016	0.08	0.06
	8	0					
	12	1					
Totals:		36		1.94	1.19	1.94	0.75

3.2.5 New Mechanical Control Cleaning Program Schedule Summary

These condition finding-based analyses demonstrate that by increasing annual cleaning mileage requirements by a total of 4.28 additional miles, the City can initiate an effective mechanical cleaning program in 2013. This additional measure will provide for cleaning the City's most susceptible sewer mains in event frequencies better suited to prevent excessive materials from collecting in these sewer mains and causing sewer overflows and stoppages. By so doing, the City is implementing an important new measure which is designed to achieve SSO Reduction Goal compliance.

Section 4

Summary and Implementation Schedule

The plans, activities and actions provided in this SSO Reduction Action Plan demonstrate the City of Santa Barbara's commitment to providing the highest level of environmental service to its citizens at a budgetary cost consistent with provisions of the Consent Decree. By so doing, the City now is undertaking important new programmatic additional measures which are designed to achieve compliance with SSO Reduction Goals outlined in the Consent Decree.

A schedule which summarizes the City's commitment to continued progress in this regard is provided below in Table 4-1.

Table 4-1. Summary Schedule for Proposed Actions.		
Proposed Action	Start Date	Completion Date
CCTV Contract Work	January 2013	On-going
CCTV City Staff Work	January 2013	On-going
CIP Condition Assessment Work	January 2013	On-going
CIP Pipeline Construction Work	January 2013	On-going
Cleaning City Staff Work	January 2013	On-going
Cleaning Contract Work	As-needed	As-needed
City Management and Planning	January 2013	On-going

Appendices

Appendix A: ESRI GIS Shapefile Documentation

ESRI GIS Shapefile documentation associated with the 2012 SSO Reduction Action Plan Report has been appended electronically here (in CD-ROM format). Each Shapefile's component files are located in individual folders bearing the respective Shapefile name.

The files listed below are found on the accompanying CD-ROM disc:

- Storm sewer pipes the City considered to determine which sanitary sewer pipes are High Risk Pipes:
 - Stormdrainpipes.shp (GIS Data folder)
 - Stormdrainnodes.shp (GIS Data folder)
 - SDataHRPLocations.shp

- Sanitary sewer pipes the City considered to determine which sanitary sewer pipes are High Risk Pipes:
 - Sewermains.shp (GIS Data folder)
 - Sewerstructures.shp (GIS Data folder)
 - KnownHRPAugust2012.shp

- High Risk Pipes the City considered for repair, rehabilitation, and replacement:
 - KnownHRPAugust2012.shp
 - CIP Mileage Completed CY 2012 (folder)

- High Risk Pipes the City intends to repair, rehabilitate, or replace during the current Year:
 - Planned CY 2013 Rehabilitation Pipes (folder)

- List of Planned 2013 CCTV Pipes
 - PlannedCCTVEventsfor2013.shp

Appendix B: Cartegraph Database Documentation

Cartegraph database documentation associated with the 2012 SSO Reduction Action Plan Report has been appended electronically here (in CD-ROM format). Two database tables have been used for analysis work found in the Annual Report: the sewer main asset data table and the event data table. A MS Access database file provided in the CD-ROM contains these two data base tables.

Appendix C: Summary Description of 2012 SSOs

PDF documentation associated with the 2012 SSO Reduction Action Plan Report has been appended electronically here (in CD-ROM format). This file provides a narrative of each SSO event in 2012.