



MEMORANDUM

To: Doug Monn, Public Works Director
Jim App, City Manager

From: Matt Thompson, Wastewater Resources Manager

Date: January 24, 2011

Subject: **Audit of 2010 Wastewater Collection Performance**

City sewer maintenance activities are documented in our Sewer System Management Plan (SSMP). The SSMP requires me to annually audit our wastewater collection performance and SSMP effectiveness and report the results to you. Here are the results for 2010.

Background – The City collects three million gallons of sewage each day through 140 miles of sewer lines and 14 pump stations. The sewer system requires regular maintenance with specialized tools to function properly. Grit, grease, and debris must be cleaned out of sewer lines and pump stations, tree roots must be controlled in old sewer lines, submerged pumps must be pulled out for maintenance, and sewer lines must be inspected to inform sewer rehabilitation and replacement decisions. These actions prevent sewage spills and backups, protect public health and the environment, and reduce the City's exposure to fines when sewage spills occur.

In 2008, the City acquired a combination sewer cleaner/vacuum truck (Vac-Con, see photo at right), a root foaming machine to chemically treat roots intruding into sewer lines, and a video inspection system (Video Van). In 2010, the City acquired a new Vac-Con that is large enough to clean both sanitary sewers and storm drains, a replacement crane truck, a new trailer-mounted rodder machine (for mechanical root removal), a new easement sewer cleaner, and a mobile GIS system to better track collection system maintenance information.

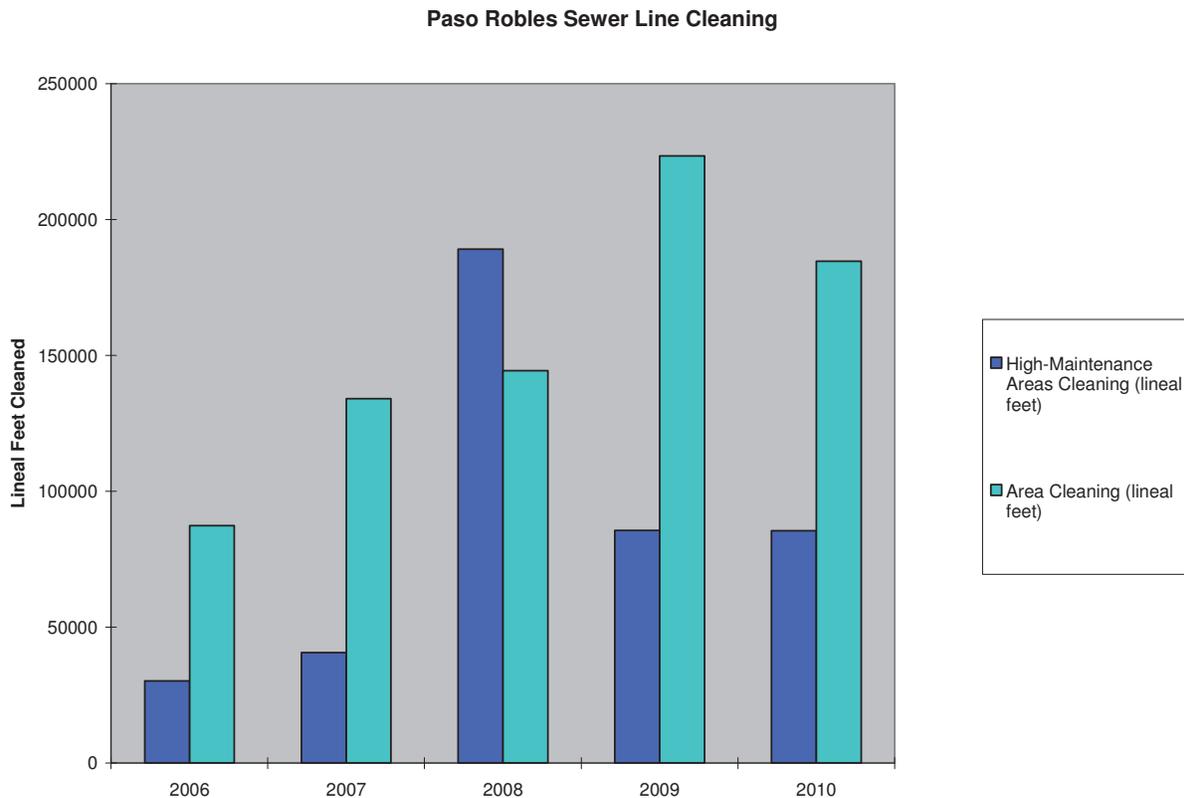


Six Maintenance Specialists work in Collections. They generally work in teams of two and perform all of the above functions and operate all of the above equipment. Each team rotates to a different function every three months. Each Maintenance Specialist is required to maintain certification from the California Water Environment Association. Collections and Treatment Operations are managed by Chris Slater. Patti Gwathmey works with the City's industries to control discharges of pollutants that may harm the collection system, pass through the wastewater treatment plant, or interfere with the treatment process. In 2010, Michael Hendry

became a Wastewater Division inspector. He's been working with food establishments to reduce grease discharges into the City sewer system.

The following results suggest this equipment and staff has greatly improved maintenance efficiency and reduced the number and volume of sewage spills.

Sewer Cleaning – Prior to obtaining the first Vac-Con in 2008, staff primarily used a jetter, which cleans the sewer line or clears a blockage, but does not remove the sewage debris that causes blockages. The Vac-Con has a powerful vacuum and waste tank to remove sewage debris. Through regular use of the Vac-Con, staff has greatly improved the quality of cleaning and the length of sewer lines cleaned. This is evidenced by a steady increase in lineal footage of sewer line cleaned, as shown below.



Continued rehabilitation and replacement of high-maintenance areas (e.g., old sewers with structural problems, excessive grease and/or tree roots) has allowed staff to steadily increase “area cleaning,” which is proactive cleaning to maintain sewer capacity and prevent sewage spills. Staff completed 35 miles of area cleaning in 2010, which amounts to 25% of the entire collection system. The slight decrease in area cleaning in 2010 is attributed to Collections staff spending a lot of time in 2010 on special projects such as upgrade of Lift Station No. 10 (24th Street and Riverside Avenue) and relocating their storage yard in preparation for the pending wastewater treatment plant upgrade. Despite the slight decrease in area cleaning, by March 2011, the City will meet its SSMP goal of cleaning 100% of the collection system in three years.

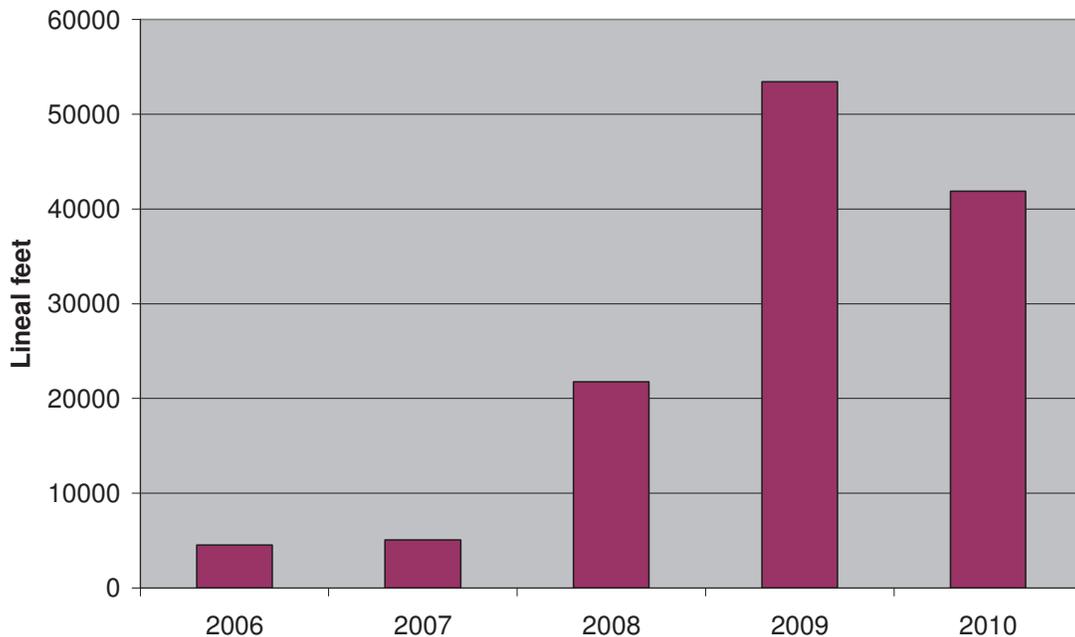
The new larger Vac-Con allows staff to efficiently clean large diameter collector sewerds and interceptors. In 2010, staff cleaned out the 27 inches diameter Riverside Interceptor, between the wastewater treatment and 24th Street. This line is very flat and had never been cleaned before, thus was full of grit and debris. Cleaning has restored the Riverside Interceptor to original capacity.

Root Control – Roots enter sewer lines through cracks or joints in old sewer lines and cause debris and grease to accumulate and block the line. After the 2009 audit in which staff found roots to be the primary cause of sewage spills that year, staff continued to focus on root control. In 2009, staff chemically treated 3.45 miles of sewers. In 2010, staff chemically treated 3.68 miles, a 7% increase. Staff acquired the new rodder machine in October and mechanically treated 4,124 feet of sewer before the end of the year. Regular root control has contributed to a steady reduction in blockages since 2007. No spills occurred as a result of roots in 2010.

Video Inspection – Prior to 2008, the City had a “push-camera,” which was too large and heavy to inspect an entire sewer line segment. Staff would periodically hire a contractor to televise portions of the sewer system, but the inspections were not necessarily targeted on problematic areas discovered while cleaning. The Video Van acquired in 2008 includes a remotely operated camera vehicle capable of inspecting long sewer line segments and a computerized video management system. This has enabled staff to examine, at any time, portions of sewer line it suspects may require repair or replacement. In many cases, staff learn the line simply requires more frequent cleaning or root treatment, or may only require a point repair (versus full replacement). The Video Van stores all inspection data, which will inform future rehabilitation and replacement decisions. In this way, the Video Van should save the City hundreds of thousands of dollars in rehabilitation and replacement costs over its useful life.

Length of sewer line inspected has improved greatly since acquiring the video van, as shown here.

Video Inspection of Paso Robles Sewer Lines



The decrease in lineal feet inspected in 2010 is attributed mostly to equipment problems. The remotely operated camera vehicle failed several times in 2010 and had to be shipped to the supplier for repair.

Lift Stations – The City has 14 sewage lift stations to keep sewage flowing towards the wastewater treatment plant. Failure of a lift station could cause a very large sewage spill and threaten public health. All lift stations are continuously monitored by a telemetry system (SCADA). The telemetry system communicates by radio with a data concentrator at the wastewater treatment plant. If a lift station is having problems such as a power failure or high water level, the data concentrator will notify staff through an auto dialer system. In this way, staff may quickly respond to lift station problems. Staff regularly check all large lift stations twice per week and smaller stations once per week.

Five of the City's fourteen lift stations are equipped with onsite standby generators in case of a power outage. The other stations may be powered with a portable generator. Lift Station No. 10, at 24th Street and Riverside Avenue, transports sewage from most of west Paso Robles and is the second largest station in the City. It has recently undergone a major electrical system and pump upgrade, but is not presently equipped with an onsite generator. Staff is prepared to install an onsite generator at Lift Station No. 10 in early 2011.

In 2010, all lift stations operated reliably. Staff discovered and addressed problems before they could escalate to a major failure. For example, at Lift Station No. 1 on North River Road, staff replaced old variable frequency drives (energy-saving motor controllers) before the pumps could fail.

Sewage Spills – The first goal of the City's SSMP is to reduce the occurrence of sewage spills by one-third from pre-SSMP levels. Sewage spills have decreased from 11 in 2008, to 7 in 2009, to 1 in 2010. The City has met its SSMP goal. The one spill in 2010 amounts to less than one spill per 100 miles of sewer, which is well below the current statewide average of 7.4 spills per 100 miles of sewer.¹ Staff is pleased with these results and has renewed its goal of zero sewage spills for 2011.

The one spill which occurred was caused by accumulation of debris and rags in a flat sewer line in an alley between 18th and 19th Streets, between Spring and Oak Streets. Staff used a Vac-Con to clear the blockage, then vacuumed up the 400 gallons of sewage which surfaced. Staff then rinsed the affected area with fresh water and vacuumed up the rinse water. Finally, staff sprayed down the affected area with a mild bleach solution. The spill did not reach surface waters or threaten public health. The spill was timely reported to appropriate agencies.

One spill of 400 gallons is remarkable when considering the City safely collected and treated 1,074,000,000 gallons of sewage in 2010. Also remarkable is that on December 19 and 20, Paso Robles received five inches of rain in one storm, yet did not experience a sewage spill. This same storm caused large sewage spills in Cayucos, San Luis Obispo, at Cuesta College, Avila Beach, and Oceano. This success may be attributed to:

1. Paso Robles does not have a major problem with stormwater inflow and groundwater infiltration to its sewer lines;

¹ Per State Water Resources Control Board's May 2010 Statewide Sanitary Sewer Overflow Reduction Program, Annual Compliance Report

2. The City is in the midst of upsizing sewer system segments identified as undersized by its Collection System Master Plan; and,
3. In 2010, staff began a new practice of cleaning all sewers where past spills have occurred (in addition to high-maintenance areas) prior to the rainy season.

In 2007, the primary cause of sewage spills was grease accumulated in City sewers. No spills were caused by grease in 2010.

These results suggest the City's SSMP is effective and no changes are necessary at this time.

Recommendations – I recommend the City continue to:

1. Repair and replace high maintenance sewers. This will eliminate potential sources of sewage spills and allow staff to spend more time on area cleaning and root control;
2. Clean out sewer segments where past spills have occurred prior to each rainy season;
3. Upsize sewer system segments identified as undersized by the Collection System Master Plan;
4. Improve older sewage lift stations;
5. Work with food service establishments and educate the public to reduce grease discharges to the sewer system; and
6. Rotate Collections staff teams on a quarterly basis, so they gain and retain knowledge of all functions and equipment, and remain interested in their work.