CITY COMMITTEE

Overview: The City Committee *investigated the City of Redding's wastewater treatment and disposal plants and the expenditure of approximately $100 million to upgrade and expand both facilities. Based on a citizen's complaint, the committee reviewed procedures followed by the City of Redding in establishing Business Improvement Districts (BID) asking the question "are assessments imposed by a BID considered a tax as defined by the State of California?" Finally, the committee reviewed the status of Redding Electric Utility loans to the City of Redding and the general fund as it relates to the purchase and subsequent sale of the Stratte property.*

City of Redding Wastewater Treatment

777 Cypress Ave. Redding, CA. 96001 – (530) 224-6069

The Choice is Clear

Before **After**

Reason for Inquiry

The City of Redding (City) has embarked on an approximately $100 million improvement and expansion project at its two wastewater treatment plants. The City's wastewater system has not been the subject of a comprehensive examination in at least a decade. For these reasons, the Grand Jury decided to investigate.

Background

Wastewater Utility is one of the divisions under the Municipal Utilities Department of the City of Redding. The wastewater department consists of a collection system, two wastewater treatment plants (Clear Creek and Stillwater), an industrial wastewater component, and a compliance unit. A director heads the department, a manager oversees the daily operations, and each component (i.e., collection, plants, compliance and industrial waste) has a supervisor and staff. Staffing at the plants includes certified laboratory technicians.

The Clear Creek plant is undergoing a multi-year, multi-phase, $80 million modification and expansion. This project is expected to be completed in 2012. Financing is through a series of low interest loans from the California State Revolving Fund to be repaid over 20 years.

One engineering firm completed a facilities plan (initial design), and another completed the final design. A branch of that second firm was hired to manage construction.

The Stillwater expansion is being designed and is expected to be ready to go out to bid in the spring of 2010. The first two phases are expected to cost about $8 million each.

The City maintains two water collection systems. Sewer water goes to either of the two treatment plants. Storm drain water flows directly into our creeks and streams, and at times into the sewer system. Because storm drain water is not treated, it is very important for the community to be careful what it puts into the system. For example, washing cars in a driveway or on the street allows detergents and other chemicals to flow into the storm drains.

Four hundred and twenty miles of sewer lines and 17 pumping stations make up the collection system. Because the collection piping is gravity flow, deteriorated pipes enable groundwater to leak into (infiltrate) the system. Influent to the plants is composed of sewage plus inflow and infiltration. Inflow is storm water, which enters the system through openings, such as sewer manholes and roof gutters plumbed directly into collection piping. Infiltration is ground water leaking into the system through faulty piping.

Fixed flow meters measure flow rates at various locations in the system in order to detect leaks. The City has recently acquired portable flow meters to augment these measurements during rain events. When infiltration is suspected, the pipes are checked by the use of TV cameras and smoke testing in order to find and repair defective pipes.

Property owners are responsible for maintaining their connection (lateral) to the sewer system. Currently many homes still have rain gutters plumbed directly into their lateral. This and infiltration (leaks) into faulty laterals contribute approximately three fourths of the total influent, causing an undue burden on the treatment plants. Inflow and infiltration are common problems in most communities. Some communities have attempted to solve this issue through ordinances that require property owners to inspect and repair faulty laterals prior to property sale or transfer.

The Clear Creek Treatment Plant is located on Metz Road south of Redding. In dry weather the treatment, plant processes about 8 million gallons per day (mgd) and two to two and one-half times as much in rainy weather. Flows, greater than this, are diverted to storage ponds. However, the pond storage capacity is scheduled for reduction, from 126 million gallons to 96 million gallons, because some of the ponds are being converted to solids processing and handling basins as part of the upgrade. Inflows during a heavy rain event can go as high as 50 mgd. When that occurs, the excess over 16 mgd must be stored; but because of storage reduction, it is conceivable the plant could be overwhelmed during a heavy 3-4 day storm.

The Clear Creek Treatment Plant operates under a permit issued by the California Regional Water Quality Control Board (Board); that permit has expired, but the state is allowing continued operation, pending renewal.

The City expects to treat more sewage daily to compensate for the decreased storage and future growth. Clear Creek could process 40 mgd of raw sewage daily, except the tertiary filters (final filtering stage) limit the processing capability to 16 mgd. In order to compensate for this limitation the City proposed to blend unfiltered effluent with the filtered by bypassing the filters (blending) during periods of heavy rain. Without filtering all the effluent (water discharged into the river), the water would contain more suspended solids than when properly filtered. Resolution 68-16 of the State Water Resources Control Board (SWRCB) states that once an approved level of quality of discharged water is achieved, plant modifications that would degrade (downgrade) performance to a lower level are not permitted. The Board has stated that blending will not be allowed in the new permit; and if it occurs under other than emergency circumstances, the City will be fined.

Recently, the City of Redding received a $19 million low interest loan ($2 million may be forgiven) from Federal Stimulus Money. These monies along with savings realized by not modifying additional storage ponds could pay for tertiary filtration improvements, which could resolve the issue of blending.

The Stillwater Treatment Plant, located off Airport Road, processes about 2.5 mgd and has storage capacity for rainy periods. Part of the rework plan is to run a 6-inch pipe from the Stillwater plant to the Clear Creek plant (six to seven miles) to move suspended solids for processing at a single location resulting in cost reduction.

Once sewage reaches either plant, it goes through the headwork's where large solids are screened out. At Clear Creek, solids larger than six millimeters are processed through macerators, which are similar to very large garbage disposers. The macerated solid material is dewatered and compacted. The liquid sewage is clarified by letting it sit in large basins where the solids settle and floating material is skimmed off. Both types of removed material are pumped through the solids treatment processing equipment, added to the macerated solids and then sent to a landfill or used for commercial applications. Interviewees indicated that the recently installed macerators require an excessive amount of maintenance.

The liquid sewage goes through aeration, further clarification, and then tertiary filtration prior to being disinfected with chlorine. The final steps are to neutralize the chlorine with sulfur dioxide and discharge the effluent into the Sacramento River. The discharged water is cleaner than required by federal, state and county regulations. The Stillwater plant process is slightly different but produces the same desired results.

The entire process is monitored by an electronic system which checks inflows and outflows, temperatures, biochemical oxygen demand and total suspended solids. Laboratory technicians measure pH and biological, bacteriological, and heavy metals content. The quality of the river water is tested above and below the point of discharge. All data are logged and reported to the state, county and Environmental Protection Agency (EPA). Both plants are staffed ten hours a day with an operator on call after hours. When a problem occurs, the monitoring system alerts an operator who responds to correct the problem. The division manager has the ability to access the monitoring system remotely.

There are numerous rules and regulations that cover training, safety, and operating procedures. Compliance must be documented to the EPA, state, and county. Within the last year, the city hired a compliance officer whose job is to ensure that appropriate records are kept and reported. The Grand Jury found that some forms in the procedure manual were not being used; however, locally generated forms were being utilized. Still, other forms were not completed in a timely manner. The compliance officer is working to clear up the deficiencies.

The Industrial Waste Division identifies new and existing businesses which have the potential for discharging hazardous waste, i.e. heavy metals. This division works with these businesses to ensure that maximum allowable levels of discharged materials are not exceeded. Restaurants are included because of grease and food particulates. Results of routine testing are reported to federal and state agencies.

Findings

1. The City of Redding Wastewater Treatment facilities are financially self-supporting.

2. Both plants were clean and relatively odor free.

3. Staff was friendly, cooperative and knowledgeable.

4. In accordance with Resolution 68-16 the State Water Resource Control Board will cite the City if it uses blending under non-emergency conditions.

5. Several engineers stated that if it came down to blending effluent or dumping raw sewage during high inflow, both of which could result in a fine, the City would elect to blend.

6. Employees stated that additional filtration capacity would alleviate the need for blending; however, additional filtration was removed from the original facility plan due to cost.

7. At this writing, the project plan is being modified to include additional filtration which should eliminate the need to blend.

8. The City failed to secure the Board's written approval for the blending process in the initial design.

9. The City has no staff engineers that are expert in wastewater treatment technology. Consequently, it has no in-house capability to fully evaluate the merits of engineering designs.

10. Construction oversight was assigned to a division of the company that performed the engineering design. This created at least an appearance of a conflict of interest.

11. The City has a program to repair collection mains to reduce inflow and infiltration, but none to address faulty or improperly plumbed laterals. Implementing a program would reduce the problem caused by rain and groundwater.

12. The macerators (grinders) installed within the last two years require excessive maintenance. The manufacturer's warranty has expired; however, the firm is re-engineering the unit at no cost to the City, at least this time.

13. There is a comprehensive procedures manual which includes operational data forms that are not being utilized. However, required information is gathered and recorded, utilizing locally generated forms.

14. The Clear Creek plant emits a significant amount of methane gas which is flared (burned) on site.

Recommendations

1. The City should insure that major proposed changes to the treatment plants or the collection system are approved in writing by the Board prior to implementation.

2. The City should try not to hire one division of a company to oversee the work of another division within that same firm.

3. The Grand Jury recommends the procedures manual be updated so only the forms that are currently used are in the manual.

4. The Grand Jury recommends the City enforce an ordinance requiring property owners with rain gutters connected directly to their lateral to disconnect them.

5. The City should adopt an ordinance requiring property owners to inspect and repair laterals prior to sale or change of ownership.

6. The City should explore methods for using locally generated methane gas more profitably.

Responses Required

- The Redding City Manager as to findings 4, 7, and 11.
- The Redding City Council as to recommendations 1 through 6

Method of Inquiry

The Grand Jury interviewed the following:

- Municipal Utilities Director, City of Redding
- Municipal Utilities Manager, City of Redding
- Three representatives of the Regional Water Quality Board
- Five civil engineers
- Five wastewater treatment plant operators
- Five Municipal Utilities Division supervisors

The Grand Jury toured both City of Redding wastewater treatment plants.

The Grand Jury reviewed approximately 1,200 pages of manuals, reports, meeting minutes and information on several web sites.

Settling Basin