



# South Bayside System Authority

Providing wastewater services to residents and businesses in Redwood City, San Carlos, Belmont, and West Bay Sanitary District

**SBSA BULLETIN**

**Winter 2010**

## SBSA Commission

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## *Manager's Corner*

**By Daniel Child, SBSA Manager**

### **A Story That Grabbed National Attention**



If you are like me, you give up wondering how the media covers news and, as they say, “how they play it.”

For example, for two years SBSA has been promoting its 10-year, \$339 million Capital Improvement Project, a major enterprise to modernize the SBSA facilities for more than 200,000 customers. Despite our best efforts, press coverage, at best, has been sporadic. (This is why we utilize this electronic mailing list and our website to tell our own stories).

But recently an article involving SBSA reached nationwide attention in newspapers, television, and blogs. The County of San Mateo agreed to pay \$2.3 million to settle a lawsuit for failing to stem a flow of debris from the Maguire Correctional Facility (county jail) that was clogging SBSA's wastewater treatment system.

I must admit, as an outsider it seems comical, that inmates could stuff clothes, hair gel containers, food containers, and other inappropriate items down the jail toilets and severely impact the area's wastewater treatment system.

But as an insider, it was anything but funny to our operations.

The \$2.3 million settlement takes into account \$1.2 million in extra maintenance costs that the SBSA incurred since 2005 as a result of the inappropriate items coming from the jail. The county reduced the flow of material since the lawsuit was filed in early 2008 by using tighter inventory control for clothing and removing some items that are commonly flushed. The rest of the \$2.3 million payment is intended to help cover future maintenance costs and capital improvements to help the authority better handle junk coming from the jail.

In addition to the cash payment, the settlement requires the county to keep its discharge of solid matter from the jail at the same level it is now. The county has also agreed to let SBSA review its plans for dealing with flushed solids in its new five-story jail, a project that is in the planning stages.

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## Motor Control Center Computer Update

Sometimes, a small project can pay large dividends. An example is the installation of our Motor Control Center PLC (programmable logic controller) and associated cabling and conduit.

A PLC or programmable controller is a digital computer used for automation of electromechanical processes, such as control of machines and even lighting fixtures. Unlike general-purpose computers, the PLC is designed for multiple inputs and output arrangements, extended temperature ranges, immunity to electrical noise, and resistance to vibration and impact. All of these are essential to SBSA's operations.

Programs to control machine operation are typically stored in battery-backed or non-volatile memory. A PLC is an example of a real time system since output results must be produced in response to input conditions within a bounded time, otherwise unintended operation will result.

Provisions were made for future connection to an upgraded fiber optic cable system, which is currently in design. After the fiber optic cable system is installed, PLC communications will be cutover to a new high-speed Ethernet network.

## Fixed Film Reactor Rehabilitation Design Report Update

The SBSA Commission has approved a 12-month, \$553,000 contract for engineering services to develop a preliminary design report for the fixed film reactor rehabilitation and upgrade project.

The fixed film reactors (FFR) are the first stage of SBSA's secondary biological treatment process. Wastewater is pumped to the top of the fixed film reactors where bacteria on the reactors consume most of the organic matter in the wastewater.

There are four FFRs, each of which is comprised of a steel "I" beam super structure frame, lined with corrugated fiberglass siding within which are stacked blocks of plastic media. Directly downstream of the FFR is the activated sludge biological process (aeration system). Together, these two secondary treatment processes are referred to as a "combined process" as there is no clarification between the two biological processes. This combined process has provided very reliable and effective treatment for lower-than-average energy usage.

The FFRs are original equipment and used continually. The plastic media, corrugated siding and other components of this process are deteriorating and have exceeded their life expectancy.

There are five projects specifically related to the FFR process:

- FFR Rehabilitation and Upgrade (\$14.4 million)
- FFR Feed Pump Suction Pipe Leak Repair & Valve Replacement (\$0.344 million)
- FFR Pump Motor Replacement (\$0.277 million)
- FFR Odor Control – Covers (\$3.35 million)
- FFR Odor Control – Treatment Systems (\$6.69 million)

The CIP project specific to rehabilitation of the superstructure, the media, and the distribution systems of all four FFRs is the most comprehensive of the projects related to the FFR system. The necessary work outlined in this project description includes addressing the physical condition of the FFRs as well as evaluating the secondary combined process.

The work also requires an evaluation of energy use and recommended improvements to conserve energy in the future. Though the current combined process energy use is lower than most other typical secondary treatment systems, it still represents nearly 40% of the total energy demand at SBSA.



“It is prudent to evaluate and identify possible process performance improvements prior to committing millions of dollars in capital investment,” SBSA staff told the Commission. “The industry’s knowledge of combined systems and fixed film systems has increased over the past 25 years and the expanded current knowledge can be used to evaluate SBSA’s secondary process train.”

The first step to initiate the FFR Rehabilitation and Upgrade project is to conduct a preliminary design study. This study consists of an in-depth investigation on the FFR’s role in the overall process to ensure the future capital plans reflect the best available technology. The objective of the preliminary design is to provide SBSA with the information needed to make decisions on how to rehabilitate and upgrade the FFRs and potentially, the activated sludge system.

The firm of CDM was selected for the work due to their familiarity of combined systems, specifically the SBSA system. The project manager is a nationally recognized expert in fixed film system design. He has authored several design manuals and manuals of practice on FFR systems and has personal knowledge of the SBSA system as he worked on SBSA’s original treatment process design.

CDM’s scope includes evaluation of the existing activated sludge process and various upgrades with suspended growth technologies. Solids developed from alternative processes will be evaluated to define the affects to the downstream solids processing systems.

## Numerous Changes Await Visitors to SBSA Facilities

Visitors approaching the SBSA facility at 1400 Radio Road are in store for several changes – now and upcoming.

In order to better serve the community during the coming decades, SBSA has begun construction for repair of the SBSA wastewater treatment facilities. As a result, a temporary parking area for SBSA employees is required along Radio Road. This lot WILL NOT block access to the Shore Dog Park or the small parking area southeast of the dog park.

Parking will be restricted along the southern edge of the reclaimed water storage lagoon by placing a gate across the road. However, pedestrian access along the south side of the lagoon is provided for your continued use in observing the water fowl in the area.

The shoulders have been paved, providing parking for staff during the new administration building construction. A new trailer for our construction management team has been placed on the entrance road, near our front gate. Another trailer will be placed there in late January.

The area is being fenced to keep non-SBSA automobile traffic out of this area for safety and security purposes, but pedestrian access will be maintained.

We will also be putting up signs in the next few months (maybe in February or March) at the T-intersection of Radio Road where it intersects our reclaimed water storage lagoon. The signs will direct contractor-related traffic left to a new entrance north of our lagoon and will direct SBSA-related traffic to the right towards our existing entrance.

**The area is being fenced to keep non-SBSA automobile traffic out of this area for safety and security purposes, but pedestrian access will be maintained.**

## Redwood Shores Exterior Levee Project Update

On March 1, 2010, the Federal Emergency Management Agency (FEMA) is scheduled to implement new 100-year flood certification requirements. To meet those federal requirements, the City of Redwood City is working to raise and fortify approximately five miles of levees around Redwood Shores.

One of the segments of perimeter levee adjoins SBSA's property and, under an agreement with the City, SBSA adopted the responsibility to design and will oversee construction of the perimeter levee upgrade.

The SBSA portion of the project consists of installing 20-foot long plastic interlocking sheets along a 1,538-foot long segment of the existing levee bordering SBSA's property to a top elevation of 12.0 above mean sea level. The sheets to be used will be 20-foot long and approximately five feet of the sheet piles will extend above the levee's earthen surface, forming a low retaining wall. After the sheet pile work is complete, six-inches of base rock will be installed to facilitate maintenance access

**One of the segments of the perimeter levee adjoins SBSA's property...SBSA is responsible for this portion of the project**

This wall eliminates the need for a significant amount of solid fill on the levee top to offset settlement that would occur over time. Additionally, if solid fill were placed on the levee, marsh habitat within the jurisdiction of the San Francisco Bay Conservation and Development Commission could be impacted, SBSA's existing 66-inch outfall pipe would most likely fail due to the additional weight of the material, and the SBSA storm water detention pond to the south of the levee would be filled and about half its capacity would be lost, thereby impacting its capacity to treat stormwater during storm events.

The construction period is limited to September 1 through January 31 due to the presence of threatened species—clapper rail and salt harvest mouse. The City was expecting to receive a BCDC permit Christmas week and begin work immediately.

## Commission OKs More CIP Projects, Bringing the Total to 67

Since our last newsletter, the SBSA Commission has approved four more projects in SBSA's 10-year, \$331 million Capital Improvement Program (CIP), bringing the total to 67 since May 2008.

Two are related to automation projects: one for the thickener PLC/SCADA and one for 3W system remote monitoring. The third project will bring natural gas into the plant for use in the new administration building and the cogeneration engine. There are many activities related to automation of the treatment plant process tanks and equipment that are initiated and ongoing. The tasks can easily be accomplished concurrently with other automation projects, creating efficiencies and reductions in overall costs.

The CIP includes a project to bring natural gas from the front gate entrance into the treatment plant. This project was included in the CIP with the intent that the natural gas would be used to enhance the cogeneration process. Preliminary investigation of available gas service pressure at the property line indicates that there is enough pressure to also serve the administration/control building needs for water heater use. The administration/control building currently utilizes propane for water heating needs. Using natural gas will reduce the costs associated with the showers and sinks in the building.

The fourth project—the force main rehabilitation—is the single largest and most complex project within the CIP. It involves the replacement of the influent force main that conveys sewage from the member agency service areas to the plant. The pipeline has discrete sections between pump stations at different pipe diameters. The entire length of force main is bell-and-spigot concrete pipe and the majority of the

force main lies in young bay mud, which is extremely unstable and allows for easy movement of the pipe.

The pipe was originally designed as a gravity pipe to convey treated wastewater and its use as a pressure pipe, while it has performed adequately thus far, is not recommended to continue due to the pressure levels in the pipe. Replacing or rehabilitating the entire force main was included in the CIP and is recognized as the highest priority to SBSA.

There are five projects included in the SBSA CIP related to the force main repair and replacement. Three of the projects have already begun. The projects are:

- 1. Bair Island Force Main – in progress**
- 2. Conveyance System Master Plan Force Main Study – in progress**
- 3. Influent Force Main Repair and Replacement – in progress; as needed**
- 4. PWWF Conveyance and Storage Improvements – not yet initiated**
- 5. Influent Force Main – Rehabilitation or Parallel – seeking approval to initiate**

The Bair Island Force Main project encompasses a section of the 48-inch diameter pipeline that crosses Bair Island. Engineering planning and design on this section of pipe has been ongoing for more than a year and replacement is dependent upon U.S. Fish and Wildlife Service rehabilitation activities on the island. SBSA cannot take action to replace the pipe until such time as USFWS indicates they are ready for SBSA to do so.

In the meantime, while engineering work has been ongoing, it was determined that moving off-island to replace the 48-inch diameter portion of the pipeline would greatly facilitate the overall construction of the pipe as well as reducing SBSA's exposure to sewer breaks in this section of pipe. In order to expend funds related to planning and design of the off-island pipeline work, the CIP project related to Influent Force Main Rehabilitation was authorized by the Commission.