



# protecting our health, Bay, and economy

SAN JOSE/  
SANTA CLARA  
WATER POLLUTION  
CONTROL PLANT

about our plant



By cleaning  
wastewater,  
**the Plant**  
protects our  
health, Bay  
and economy



# about our plant

## The San Jose/Santa Clara Water Pollution Control Plant

The San Jose/Santa Clara Water Pollution Control Plant (Plant) cleans our wastewater before it flows into the South San Francisco Bay. Wastewater is the water that goes down drains inside our homes and businesses from washing dishes and clothes, showering, flushing toilets, and industrial processes.

Built in 1956, the Plant is a round-the-clock operation that cleans an average of 110 million gallons of wastewater per day, and has the capacity to clean up to 167 million gallons per day.

The Plant serves eight cities with 1.4 million residents and a business sector with more than 17,000 main sewer connections. Our Plant is the largest advanced wastewater treatment facility in the western United States.

Our wastewater undergoes a sophisticated 10-hour treatment process that simulates the way nature cleans water. The Plant

removes 99 percent of the impurities before the cleaned water is discharged into the South San Francisco Bay or recycled for other uses such as irrigation, industrial processes, cooling towers, and flushing toilets. Our Plant includes an advanced (tertiary) level of treatment that is necessary to meet our region's strict regulations for the shallow waters and sensitive ecosystem of the southern Bay.

Our Plant is located on 2,600 acres at the South Bay shoreline, covering more area than twice the size of San Francisco's Golden Gate Park. The site includes a 175-acre wastewater processing area, a 750-acre sludge-drying area, and an 850-acre former salt production pond. The remaining acreage is open land that buffers adjacent communities from odors and hazardous operations.

# how does the Plant clean our wastewater?

indoor water



Flows from homes and businesses through the sanitary sewer system to the Plant for treatment, where solids are separated from the liquids.

outdoor water



storm water

Flows untreated through the storm sewer system directly to the Bay

creeks



san francisco bay

**influent**  
Incoming wastewater

waste water



**1**  
Upon arrival, wastewater passes through headworks, where **large screens** remove debris such as sticks, rocks, trash, and rags including baby wipes.



**2**  
Wastewater then flows to **grit chambers** that remove heavier objects like sand and gravel. Debris and objects removed at this stage are taken to a landfill.



**primary**  
Physical Stage (1 hr)  
Water is 50% cleaner

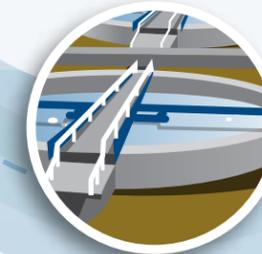


**3**  
In large **primary tanks**, gravity settles the solids in the wastewater. **Flights**, or fiberglass bars, rotate to skim off floating fats, oils, and grease from the surface of the water and to scrape out solids that sink to the bottom.

**secondary**  
Biological Stage (6 hrs)  
Water is 95% cleaner

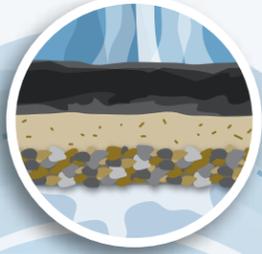


**4**  
**Aeration tanks** pump air into the wastewater to nurture the growth of naturally occurring aerobic bacteria that remove organic pollutants in the water.



**5**  
The wastewater is then piped into **clarifiers**, where the aerobic bacteria settle. Mechanical arms scrape away the settled material to transfer to the digester tanks or reuse again in the aeration tanks.

**tertiary**  
Filtration Stage (8 hrs)  
Water is 99% cleaner



**6**  
Wastewater flows through **filter beds** composed of gravel, sand, and anthracite coal to remove small suspended solids.



**7**  
The water flows through serpentine tanks where **chlorine** is used to kill any remaining viruses or bacteria. The chlorine is then neutralized to protect aquatic life.

**effluent**  
Outgoing clean water



**8**  
About 90 percent of the treated water is piped to the **outfall channel**. This flows to Coyote Creek and into the South San Francisco Bay. The remaining 10 percent flows to the South Bay Water Recycling system for further treatment and use for irrigation, industrial processes, building cooling, and toilets and urinals.

solids



**flotation thickeners**  
(5-6 hours)  
Solids from secondary clarifiers (step 5) are taken to **flotation thickeners**, where air is pumped into the sludge to break it down further into solids and water. Water is returned to the primary tanks for further processing.



**digesters**  
(up to 30 days)  
In the **digester tanks**, naturally occurring **anaerobic bacteria** digest sludge and produce the methane gas that helps meet the Plant's energy needs.



**lagoons**  
(3 years)  
Sludge is pumped into **lagoons** to stabilize, and covered with water to control the odors.



**drying beds**  
(up to 6 months)  
Sludge moves to the **drying beds** to be dried by the sun. This step produces high-quality Class A biosolids.



**landfill**  
Biosolids are then used as daily cover at **Newby Island Landfill** to prevent wind-blown debris and discourage animal scavengers.

# our environment

## Recovering Renewable Resources

### Clean water

Currently about 10 million gallons of the Plant's treated water is recycled daily for landscape irrigation, industrial processes, cooling towers, and flushing toilets in San José, Santa Clara, and Milpitas. Every gallon of water that is recycled conserves a gallon of precious drinking water. Recycled water costs less than drinking water, saving businesses money while protecting the environment and creating a drought-proof water supply. On average, the Plant's recycled water system saves more than 2.2 billion gallons of water per year.

### Clean biosolids

The solids removed from the wastewater treatment process are treated to produce high-quality Class A biosolids. Currently our biosolids are used by the adjacent landfill to meet regulations for daily covering of incoming garbage. Although our biosolids are not used as fertilizer or processed as compost, they qualify for such use. The City of San José seeks out partnerships with innovative firms to convert solid waste and biosolids—such as those produced by the Plant's treatment process—into biodiesel, methanol, biogas, and electricity that will someday power municipal operations as well as be available to other users. The Plant is researching how to capture energy from fats, oils, grease, and other food streams.

### Clean energy

The Plant uses 11 megawatts of energy each day, which is enough to power 9,000 homes year round. Roughly 60 percent of the Plant's energy needs are met by methane gas (biogas) generated by the Plant's digesters and purchased from the nearby landfill. Using methane gas supports the Plant's goal of 100 percent energy self-sufficiency by 2022. Biogas is produced from treating settled wastewater solids in the digester tanks. New feedstocks, such as fats, oils, grease, and other organic wastes, along with more efficient digester technologies, can also help us achieve the goal of energy self-sufficiency.

our history

**1880s:** The City of San José constructs a simple sewage system that takes untreated wastewater directly into the Bay.



**1940s:** Indoor plumbing grows among Americans, generating more wastewater.

**1948:** The federal Water Pollution Control Act passes in response to the increase in wastewater contaminating the nation's waters. It is the first federal law to regulate water pollution.

**1950:** Santa Clara County recommends two separate collection systems for stormwater and wastewater to reduce the amount of water requiring treatment.



**1954:** The City of San José annexes land at the southern Bay and purchases bufferlands for the Plant site.

**1956:** The City of San José constructs the Plant with only primary treatment facilities designed to treat the organic waste from canneries.

**1959:** The City of Santa Clara helps fund upgrades, gaining an approximate 20 percent ownership stake.

1800

1940

1950

# our future

## The Plant Master Plan

Aging equipment and facilities, a growing population, and evolving state and federal wastewater and air regulations have created the need for the Plant to look at how best to continue its critical functions of protecting our health, Bay, and economy.

In 2008, the Plant launched a three-year master planning project, engaging stakeholders and the community on how to address aging infrastructure, incorporate new technologies, be a good neighbor, and use the Plant's 2,600-acre site.

The Plant Master Plan will guide decisions on how to upgrade and improve the Plant so that it functions well through 2040

and beyond. Some urgent projects are underway—including replacing electrical cables, rebuilding the digesters, and replacing damaged concrete.

Adopting technologies that address odors and operational hazards creates the opportunity to consider new uses for the Plant lands. The master plan is exciting as it invites the public to consider how to best reshape our shoreline to provide economic, environmental, and social benefits for the entire South Bay region.



For more information, visit [rebuildtheplant.org](http://rebuildtheplant.org)



**1964:** The Plant expands to include secondary treatment to meet state regulations and accommodate a growing population.

### 1960's & 1970's:

The City of Milpitas, Cupertino Sanitary District, and the West Valley Sanitation District join the Plant's service area.

**1972:** The Clean Water Act is enacted to eliminate all discharged pollutants by 1985. The focus is to limit pollution levels in the water and regulate pollution at the source.

**1979:** The Plant expands to include tertiary treatment to meet Clean Water Act regulations.



**1998:** The South Bay Water Recycling facility and pipeline is constructed.

**2006:** The Plant celebrates 50 years of service.

**2008:** The Plant Master Plan launches to plan the next 30 years.

**2010:** Construction begins on an advanced water treatment facility to improve recycled water quality.

1960

1970

1990

2000

# our lab and computer network

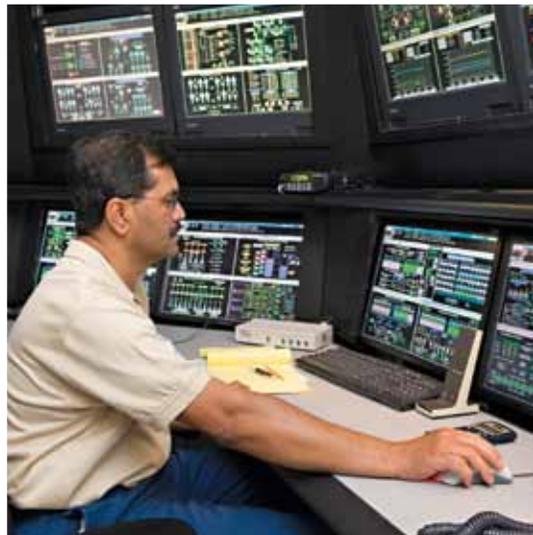
## Laboratory

The San Jose/Santa Clara Water Pollution Control Plant's laboratory is one of the highest performing labs in the nation. Operating 365 days a year since its inception in 1996, the 12,000 square foot lab analyzes about 70,000 samples annually.

Employing technicians, chemists, biologists, microbiologists, and chemical engineers, the lab's primary job is to test Plant performance, saving operational costs and protecting public health and the environment. The lab analyzes wastewater and biosolids samples before, during, and after treatment, and checks for compliance with state and federal standards. The Plant also monitors industrial discharge and Bay water quality, and participates in local, state, and national research projects.

## Computer Network

All of the Plant's treatment processes are monitored and controlled using a state-of-the-art computer network. At control terminals located throughout the Plant, operators can make instantaneous adjustments to the treatment process as needed.



# plant-at-a-glance

- The Plant cleans about **110 million gallons of wastewater per day**, which is enough to fill the HP Pavilion in downtown San José.
- The Plant has the capacity to clean **167 million gallons of wastewater per day**.
- **Ten percent of treated wastewater** is recycled through South Bay Water Recycling each day.
- **The Plant treats to tertiary level (99 percent clean)** to protect the sensitive ecosystem of the southern Bay, where treated wastewater is discharged. The Plant is unlike many other U.S. wastewater treatment facilities, which treat wastewater to secondary level (95 percent clean). **All three South Bay plants treat to a tertiary level.**
- The Environmental Protection Agency named the Plant **National Plant of the Year in 2000** based on its operations and maintenance excellence.
- The Plant's annual budget is approximately **\$75 million**.





SAN JOSE/  
SANTA CLARA  
WATER POLLUTION  
CONTROL PLANT

Milpitas

Santa Clara  
San Jose

Cupertino  
Campbell

SERVICE AREA

Saratoga

Monte Sereno

Los Gatos

tributary agencies

- City of San José, co-owner and operator
- City of Santa Clara, co-owner
- City of Milpitas
- Cupertino Sanitary District (City of Cupertino)
- West Valley Sanitation District (cities of Campbell, Los Gatos, Monte Sereno, and Saratoga)
- County Sanitation District 2-3 (unincorporated)
- Burbank Sanitary District (unincorporated)

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1210/Q10000/MIG/ImageX/KY



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