



CITY OF SANTA CRUZ WASTEWATER TREATMENT FACILITY



Mark Dettle, Director of Public Works
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History



- 1928 – Original plant built
- 1965 – Primary upgrade
- 1985 – Current outfall completed
- 1988 – Advanced primary upgrade
- 1998 – Full secondary with UV disinfection

Service Area

- Regional facility serves approx. 130,000 residents
- Service Area includes:
 - All City of Santa Cruz
 - County Sanitation District includes Live Oak, Capitola, Soquel and parts of Aptos, which is approximately 50% of total plant flow

Facility Flow Data

Design:

17 MGD Average Dry Weather Flow

81 MGD Peak Wet Weather Flow

Actual:

2012

- 9.00 MGD Average Daily Flow
- 3.3 billion gallons total treated

2013

- 8.43 MGD Average Daily Flow
- 3.1 billion gallons total treated

The Process

PRIMARY TREATMENT

1 Raw sewage comes into the plant from three City lines and from a forced main from the county. The raw sewage then passes through mechanically operated bar screens, which remove debris that is large enough to cause problems with downstream equipment.

2 After screening, the City of Santa Cruz wastewater is lifted by up to six centrifugal pumps and mixes with the county wastewater. The combined wastewater then passes through aerated grit chambers where air is added to create a rolling action. The rolling action allows the heavy grit to settle. Grit includes rocks, coffee grounds and other large size organic or inorganic substances.

3 The degritted wastewater is then sent to primary settling tanks. These tanks slow the wastewater down to allow dense solids to settle and lighter solids to float. These solids are removed from the tanks and pumped for further treatment.

SECONDARY TREATMENT

4 Primary treated wastewater is pumped to a maximum of six trickling filters where it is distributed evenly over plastic media. The media supplies a surface for bacteria to grow and consume the organic material in the primary effluent.

5 After the trickling filters, the wastewater gravity feeds to solids contact tanks. Air is introduced to allow for *floculation* of particles and for a minor amount of secondary treatment to occur. Floculation converts the organic solids into heavier clumps that settle more easily. Secondary clarifiers can then remove these clumps downstream.

6 In the secondary clarifiers, the water is slowed so that the heavier solids can settle out. The majority of the settled solids are returned to the aeration basin for reuse in the biological process. The excess solids are sent for thickening and further treatment.

ULTRAVIOLET DISINFECTION SYSTEM

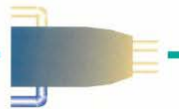
7 During the disinfection process, the secondary effluent is passed through ultraviolet lights to kill harmful bacteria. The final effluent flows by gravity through our 12,250-foot long outfall line.

By discharging one mile off shore through a diffuser that is 110 feet below the ocean surface, Santa Cruz beaches remain clean and safe.

SOLIDS HANDLING



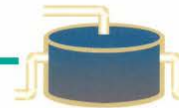
The solids are then used as soil amendment for nonfood crops in the Central Valley, composting, and/or top cover for valley landfills.



11 The stabilized solids are sent to be dewatered by centrifuges. We generate approximately 220 wet tons of solids per week.



10 The Cogen system can generate up to 1.3 megawatts of electricity for use at the facility. This equates to approximately 10 million KWH per year. Excess heat is used to warm digesters and buildings.



9 The thickened solids are sent to the anaerobic digesters for stabilization of the biodegradable portion of the solids. As a by-product of this stabilization, methane gas is produced, which is used with natural gas to co-generate electricity for use in the plant.



8 Excess solids from the secondary and primary processes are thickened in preparation to be sent to the anaerobic digesters.



These environmentally-friendly features of our process are specifically designed to enhance the air, water and quality of life in Santa Cruz.

Effluent Filtration System

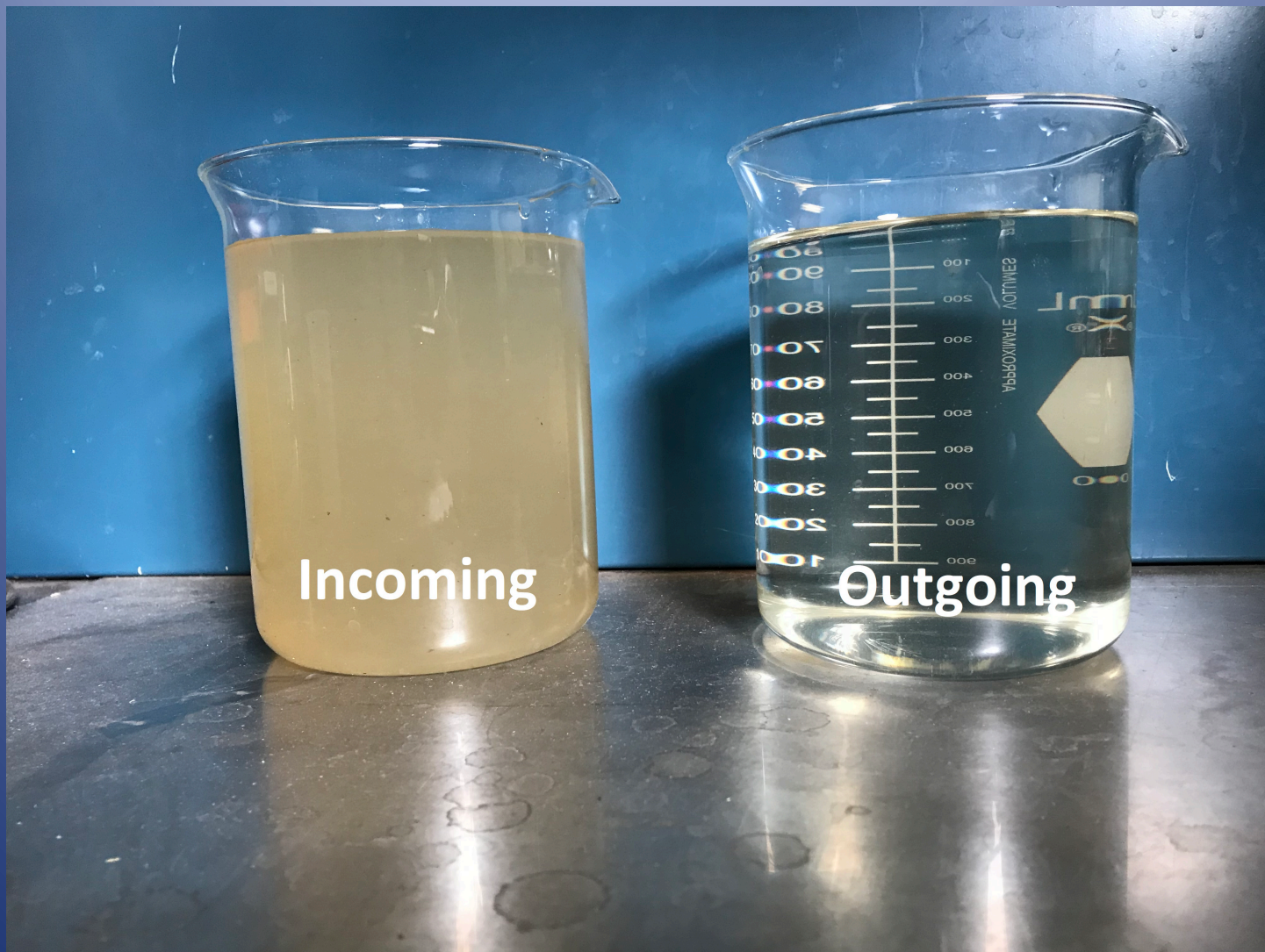


- Currently recycle an average of 135,000 gallons per day for on-site use: process wash-down, equipment clean-out, chemical make-up and pump seals.
- In 2013 – 47 MG were recycled.

Outfall Location



Any water that is not re-used on site
(approximately 8.3 MGD)
is released to this outfall location.



Incoming

Outgoing

California Water Environment Association Monterey Bay Section 2012 Overall Plant of the Year



- Acknowledges outstanding achievement in more than 20 categories.
- Combines results of review of infrastructure, management practices and compliance records.
- City of Santa Cruz Wastewater Treatment Facility is recognized for being a well-run facility that meets all discharge permit requirements.
- Received 3rd place for CWEA state-wide overall mid-size plant of the year.