

Treatment Plant History

1952 - Portland begins treating its sewage for the first time when the Columbia Boulevard Wastewater Treatment Plant opens. Before the city built the plant, Portland's untreated sewage flowed into the Columbia Slough and Willamette River.

1969 - The treatment plant doubles primary treatment capacity and replaces outdated equipment.

1974 - The plant adds a secondary treatment process and doubles in size.

1983 - The plant adds anaerobic digesters to triple its sludge processing capacity.

1996 - The treatment plant gets a new Headworks building. This is where wastewater, or influent, first enters the plant.

2000 - The plant builds new covered primary clarifiers with the latest odor control technology.

2001 - A new pump station starts pumping sewage from the Columbia Slough Big Pipe to the treatment plant.

2006 - The plant expands wet weather treatment capacity and the Swan Island Pump Station begins pumping sewage from the West Side Big Pipe to the treatment plant.

2011 - The Swan Island Pump Station begins pumping sewage from the East Side Big Pipe to the treatment plant.

The Bureau of Environmental Services provides city residents with programs to protect water quality and public health, including wastewater collection and treatment, sewer construction and maintenance, stormwater management, and stream and watershed restoration.



It goes to the wastewater treatment plant where it is cleaned and then returned to the river.

after the flush

When it comes to the environment, there is no "away."

The Portland Bureau of Environmental Services helps protect public health, water quality and our environment. We clean dirty water to keep people and the environment healthy.

Wastewater is water from the toilet, sink, shower, bathtub and washing machine in your home. In some parts of Portland, it's also the stormwater that runs off your driveway and roof when it rains. It all goes into the sewer for a trip to the wastewater treatment plant.

It's quite a trip.

Sewage and stormwater go through sewer pipes and pump stations on the way to the Columbia Boulevard Wastewater Treatment Plant. The treatment plant cleans the water and sends it into the Columbia River.

Treatment Plant Facts

- ✓ When it's not raining, the Columbia Boulevard Wastewater Treatment Plant cleans about 65 million gallons of water every day.
- ✓ On rainy days, the plant can clean up to 400 million gallons a day.
- ✓ More than 10 trillion microscopic creatures help clean wastewater in the plant's aeration tanks.
- ✓ The plant's bar screens and grit basins remove about four tons of debris from wastewater every day.
- ✓ It takes between eight and ten hours for wastewater to move through the treatment plant.
- ✓ Clean water from the treatment plant flows into the Columbia River at an average rate of 125,000 gallons per minute.



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How we clean wastewater is pretty important. Take a look inside to see how it's done.

Here's where it goes - and what happens when it gets there



1 Wastewater is sewage, sometimes combined with stormwater runoff. Wastewater that enters the treatment plant is known as influent. Influent flows through metal bar screens inside the Headworks building. The space between each bar is 5/8 of an inch wide. That lets water pass through but screens out sticks, rocks and litter. The bar screens collect about four tons of litter a day and trucks haul it to a landfill for disposal. Special filters remove sewer odor before the air leaves the Headworks.

called microorganisms. While they eat, huge blowers pump oxygen into the water to create the ideal habitat for microorganisms.

4 Next, the wastewater flows into settling tanks where those well-fed microorganisms sink to the bottom of the tanks. Mechanical scrapers remove sludge from the bottom of the tanks and skim scum off the top. These tanks are called final clarifiers. The sludge and scum move to digesters to continue the solids treatment process.

5 The water is now 95% cleaner than it was when it arrived at the plant. As the water flows through pipes that carry it to the Columbia River, machines add a disinfectant to kill any remaining bacteria. The raw sewage that entered the treatment plant is now treated effluent.

Portland has more than 2,300 miles of sewer pipe that lead to the treatment plant.

2 When wastewater leaves the Headworks, it flows to primary clarifier tanks where it slows down to let solids sink to the bottom and oil and grease float to the top. Mechanical scrapers remove sludge from the bottom of the tanks and skim scum off the top. These solid materials go to a digester to be processed (see A). This process is called primary treatment and it reduces solids in the wastewater by more than 50%.

3 Secondary treatment begins when the wastewater moves on to aeration tanks where the small, solid particles that remain in the water become food for tiny creatures

The journey through the treatment plant is different for sludge.

A Sludge and scum collected from settling tanks go inside an anaerobic digester. Anaerobic means there is no oxygen. Unlike the microorganisms in aeration tanks, microorganisms in the digesters need a warm, oxygen-free environment. The temperature inside the digesters stays at nearly 100 degrees Fahrenheit, which is very close to normal human body temperature. Sludge stays in the digesters for 15 to 20 days as microorganisms break it down and decompose.

B The decomposing sludge creates methane gas. The plant uses some of the gas as fuel for engines that generate electricity to help operate the treatment plant and heat the plant's digesters. The plant sells some of the gas to a local manufacturer.

C The digesters kill bacteria, reduce odors and change sludge into biosolids. The biosolids go through belt presses that squeeze out more water and make the biosolids easier to transport and be recycled as fertilizer.

D Trucks haul biosolids from Portland to farms and ranches in eastern Oregon where biosolids spread on the land help prevent wind erosion, grow grass that feeds cattle, and grow canola for biodiesel production.

