Your Guide to the Budd Inlet Treatment Plant







What does the Budd Inlet Treatment Plant do?

The treatment plant cleans wastewater, which is all the water that runs down the drain in our homes and businesses. Water from sinks, dishwashing, laundry,

showers, toilets, industrial processes, and countless other uses becomes wastewater. Millions of gallons of wastewater are produced every day in our communities. After wastewater goes down the drain, it travels through underground sewer

pipes to the treatment plant. LOTT treats an average of 12 million gallons of wastewater every day.

Wastewater contains many pollutants that must be removed before it can be safely returned to the environment. The Budd Inlet Treatment Plant cleans water to a very high standard, which includes additional nutrient removal. This treatment process mimics nature's system of cleaning and recycling water, but it happens much quicker – in about one day.



How does the treatment process work?

LOTT's Budd Inlet Treatment Plant offers the highest level of wastewater treatment on Puget Sound. Treatment involves both physical and biological processes. For example, settling is a physical process; by



slowing the flow of the wastewater, lighter particles float to the top and heavier particles sink to the bottom, leaving the water in between cleaner. In contrast, biological treatment processes rely on bacteria to clean the wastewater.

Their environment is controlled so that they break down or consume pollutants in the water that are not removed by the physical processes.

As wastewater moves through the steps in the treatment process, some of the bacteria and flow are recycled to sustain the physical and biological processes involved in treatment.



The Budd Inlet Treatment Plant produces a number of useful products. Methane produced in the digesters during solids handling is used to generate heat and electricity, which is put to use on-site. Biosolids are hauled to farmlands for use as a soil amendment and fertilizer. Highly treated **Class A Reclaimed Water** is used in plant processes and throughout our local communities for irrigation and other non-drinking uses.



How does LOTT know the plant is working correctly?

All activity within the treatment plant is monitored 24 hours a day, 7 days a week. A highly trained team of operations, maintenance, laboratory, control systems, and administrative staff keeps the utility running efficiently.

State certified operators are responsible for running and monitoring the treatment processes. This is done via computer control systems and on-the-ground observations of equipment and processes many times each day.

The treatment plant houses a state certified laboratory. Daily tests are run on samples from each step in the treatment process, including the final stages as cleaned water is released to Budd Inlet, or diverted for further treatment and use as Class A Reclaimed Water. Biosolids are also tested during treatment and prior to leaving the plant. LOTT monitors its processes and finished products carefully to ensure compliance with the strict standards required by its National Pollutant Discharge Elimination System (NPDES) permit issued and enforced by the Washington Department of Ecology, and the state reclaimed water permit, also enforced by the Department of Health. Highly skilled staff members check, maintain, and repair LOTT's state-of-the-art equipment and facilities.

Is my wastewater treated at the Budd Inlet Treatment Plant?

For most people who live, work, or go to school in Lacey, Olympia, or Tumwater, or the associated urban growth areas, the answer is yes! Check your utility bill for city and LOTT sewer charges. Those fees mean your wastewater is treated through the LOTT wastewater system.

If your city bill does not include sewer charges, you likely have an on-site septic system to treat your wastewater. Septic systems store solid waste in underground tanks. Liquid waste from the septic system travels to an

underground drainfield in your yard and is filtered by the soil before returning to the groundwater. Some properties are served by STEP systems, a combination of septic systems and sewer service. They have a septic tank for solid



waste, but liquid waste is pumped into the sewer system and treated at LOTT. In either case, septic tanks must be emptied every few years to ensure they continue to work properly. Septic haulers pump the tanks and bring the solids to the plant for treatment. So, even if you have a septic system, a portion of your wastewater may be

treated at the Budd Inlet Treatment Plant.







Steps in the Treatment Process



Headworks

Wastewater enters the treatment plant and flows through escalator screens, which remove trash, and grit channels, where sand, gravel, and grit are removed. This area has storage tanks to manage flow from heavy rains.



Primary Clarifiers

The flow of the wastewater is slowed so that lighter solids float to the top and heavier solids sink to the bottom. Cleaner water in the middle continues through the treatment process. The solids are removed and sent to Solids Handling (Step 10).

First Anoxic Basins

Flow from the Primary Clarifiers is mixed with flow from the Splitter Box (Step 5). This mixture, called "mixed liquor," provides food for hungry bacteria provided from the Secondary Clarifiers (Step 7). Anoxic means "no air." During this step, bacteria remove oxygen from nitrogen compounds in the flow, converting nitrates to harmless nitrogen gas.

First Aeration Basins

Air is pumped into the flow, creating an oxygenrich environment to help bacteria consume pollutants and convert ammonia to nitrate for anoxic treatment.



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Splitter Box

The flow is split, with 80% returning to the First Anoxic Basins (Step 3). Only 20% continues to the next step in the treatment process.

Second Anoxic and Final Aeration Basins

In Second Anoxic, oxygen-deprived bacteria convert nitrates to harmless nitrogen gas. In Final Aeration, air is pumped into the flow to help bacteria remove pollutants and ensure dissolved oxygen is present in the flow at the end of the treatment process.



Secondary Clarifiers

The flow is slowed dramatically so that solids and bacteria can settle. Most of the settled bacteria are pumped back to the First Anoxic or Aeration Basins (Step 3 and 4) to consume pollutants. The remaining solids are sent to Solids Handling (Step 10). The treated flow continues on to Ultraviolet Disinfection.

UV Disinfection

The flow is exposed to ultraviolet (UV) light to prevent bacteria from reproducing. Disinfected flow is called "final effluent." The treatment process has now removed over 95% of the pollutants.

Final Effluent Pumping

Most of the final effluent is pumped to the north end of the port peninsula where it is discharged to Budd Inlet. Some of the final effluent is diverted to the Reclaimed Water Plant (Step 12) for further treatment.

Solids Handling

Solids are thickened and pumped to the digesters. Over half the organic material is converted to methane gas by anaerobic bacteria. The methane gas is converted to provide heat and power for plant processes and buildings. The remaining sludge is dewatered in a centrifuge. The resulting "biosolids" are hauled off-site to farmlands and used as a soil amendment and fertilizer.

Odor Scrubbers

Odors generated during the treatment process are funneled through Odor Scrubbers that use carbon or a chlorine solution to remove odors. The cleaned air is released to the environment.

Reclaimed Water Plant

Each day, up to a million gallons of final effluent is diverted here, cleaned through sand filters, and chlorinated to meet strict Class A Reclaimed Water standards. Class A Reclaimed Water is used on-site for treatment processes and distributed through a purple pipe network for community use as irrigation and for other non-drinking purposes.















What is LOTT?

The LOTT Clean Water Alliance is a non-profit corporation formed by the cities of Lacey, Olympia, and Tumwater, and Thurston County. LOTT's mission is to preserve and protect public health and the environment by cleaning and restoring water resources for our communities. As the local population within the LOTT service area grows, so too must LOTT's ability to manage wastewater through treatment, flow reduction programs, and production of reclaimed water.

LOTT is governed by a Board of Directors made up of four elected officials – one from each of the partner governments. The Board oversees planning, construction, financing, and operations of LOTT programs and facilities.

For more information about the LOTT Clean Water Alliance, visit our website at www.lottcleanwater.org.

Visit the WET Science Center!

LOTT's WET Science Center is a fun, hands-on place to learn all about water – one of our most precious resources. Featuring interactive exhibits, weekend family activities, environmental presentations, education programs for school and community groups, and tours of the wastewater treatment plant and LEED Platinum certified building.

The WET Science Center has a variety of games and activities for all ages - most are designed for children ages 10

and up, as well as adults. Exhibits and interactive video games include information about:

- The natural and built water cycle, water use, and water conservation.
- Wastewater treatment, including the role of bacteria in the nitrogen removal process.
- What not to flush or put down the drain.
- Production and use of Class A Reclaimed Water.
- Career opportunities at the LOTT Clean Water Alliance.
- Stewardship of Puget Sound.

To inquire about a tour or education program, please call (360) 664-2333.

It's always free to visit! Open Monday-Saturday 10 a.m. to 4 p.m. 500 Adams Street NE in downtown Olympia

www.wetsciencecenter.org





