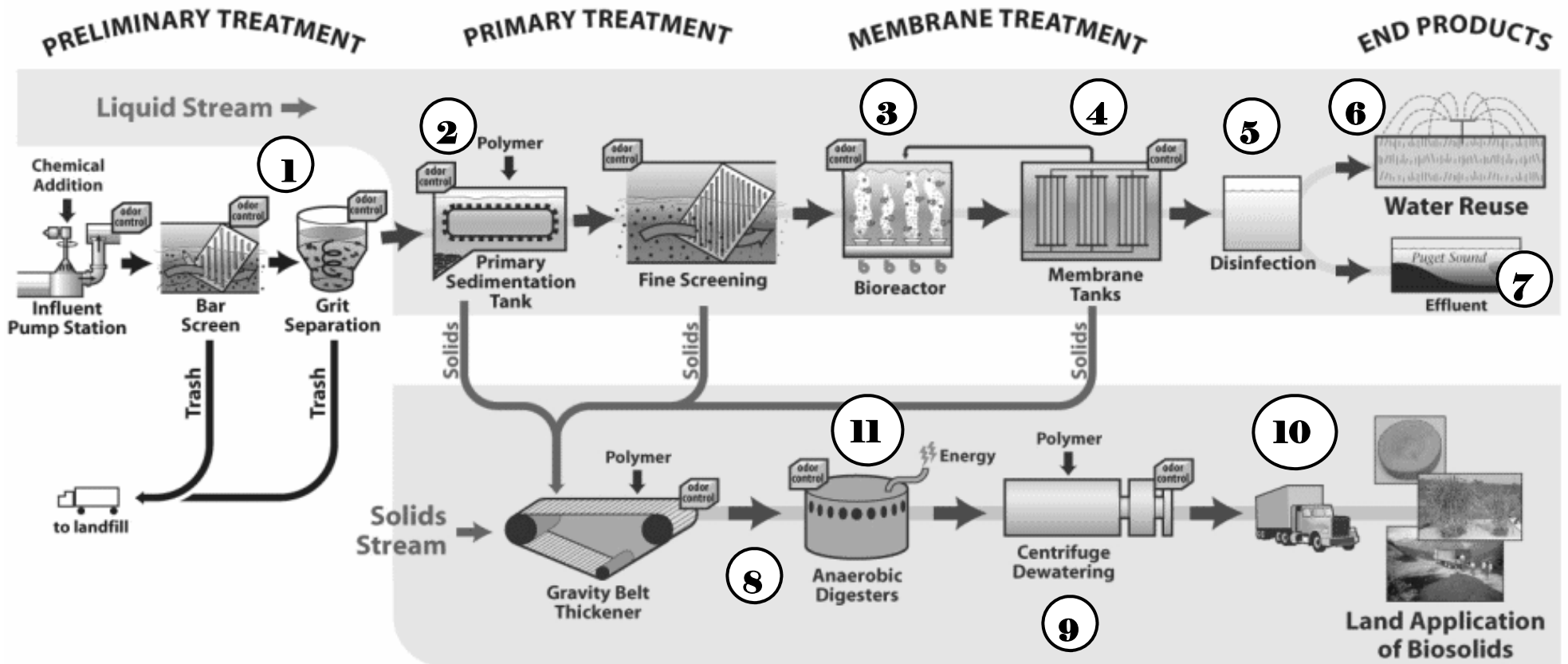


# Brightwater Treatment Processes





## **Brightwater Treatment Facility Processes**

**1. Head Works**–Screens remove trash; settling tanks remove dirt, or grit. Trash and dirt are sent to a landfill.

**2. Primary Treatment**–Settling tanks allow gravity to separate settleable solids from water. Heavy solids sink and light oils and grease float. Scrapers on the top and bottom of the tanks remove the solids which are sent to steps 8, 9, 10 to be recycled as nutrient-rich biosolids.

**3. and 4. Secondary Treatment using Membrane Bioreactor**–First, air, bacteria and water from primary treatment are mixed. The bacteria multiply using oxygen from the aeration blowers and the primary effluent as a food source. The organic waste remaining after primary treatment breaks down suspended organic solids. Membrane technology uses ultra-fine filters to remove the bacteria and solids remaining in the water. Membranes clean the water to a standard that can be reclaimed, or recycled, and used for many non-drinking purposes.

**5. Disinfection–Sodium Hypochlorite** (strong bleach) kills remaining pathogens before the water is either reclaimed and reused or sent to Puget Sound for discharge.

**6. Reclaimed Water**–Water that passes through the membrane bioreactors meets Class A Reclaimed Water standards and is used for non-potable water reuse such as irrigation, washing, and industrial uses.

**7. Outfall**–Clean water is sent to the Puget Sound or recycled. The effluent pipe that carries the water to the outfall in Puget Sound is 13 miles long. The outfall ranges between 200 and 500 feet deep with a 500 ft. long diffuser at the end.

**8. Blending and Thickening**–Solids removed in primary settling and secondary aeration are blended and sent through a gravity belt thickener to concentrate the solids by removing excess water before digestion.

**9. Digesters**–Solids are digested and decomposed using anaerobic bacteria and heat for approximately one month. The bacteria stabilize the solids making it usable for recycling. During the process the bacteria also produce methane-rich digester gas which can be recycled.

**10. Dewatering**–Solids are sent through a centrifuge for final removal of water before they are trucked to farms, forests or composting facilities to be recycled as nutrient-rich soil amendment.

**11. Energy Recovery**–During digestion, the bacteria produce a methane-rich gas which is sent through a boiler system that is used to heat the digesters, the treatment plant and buildings on-site.

**Odor Control**–Biological, chemical and carbon scrubbers are used to remove odorous contaminants from the air coming from the process areas to ensure there are no noticeable odors beyond the property boundary of the treatment plant.