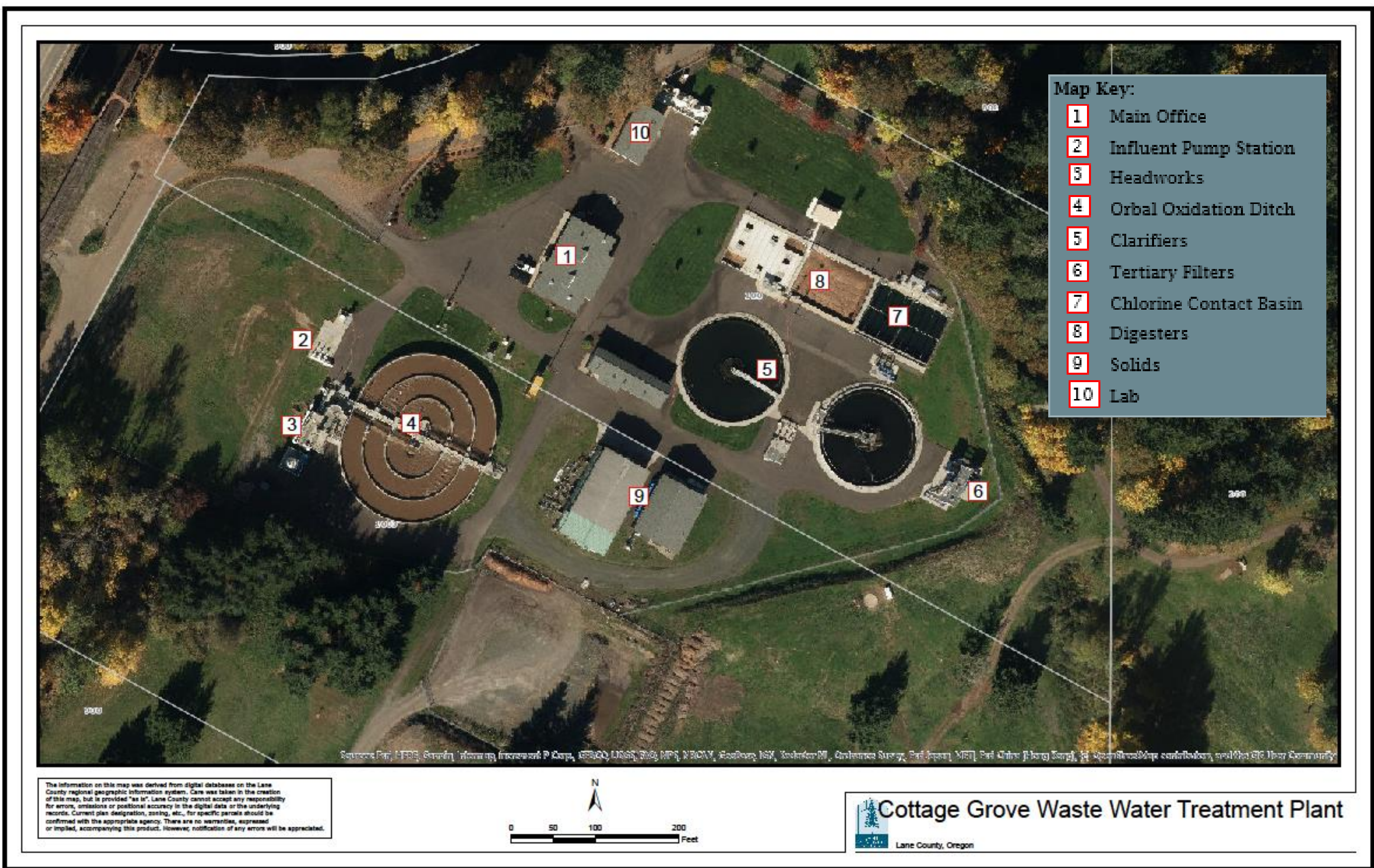


City of Cottage Grove Wastewater Treatment Plant



The Cottage Grove Treatment Plant cleans and treats around 800 million gallons of wastewater per year. That is, anything that is flushed or goes down your household drains. The plant operates 24 hours a day, 365 days a year.

What happens to water after you *flush*?

Every time you flush a toilet, take a shower, wash your dishes, or do your laundry, wastewater is created. This wastewater travels through the city collection system sewers, entering the treatment plant through the *influent pump station*.

The treatment process begins at the *headworks*, where inorganic materials, such as rags, grit, and plastic are removed from the waste stream. A **fine mesh screen conveyor belt** captures these materials, which are then transported to a receptacle and buried in a landfill. After passing through the headworks, the waste stream continues to the *oxidation ditch*.



Mesh screen filter.

What is *grit*?

Grit includes sand, gravel, cinder, or other heavy solid materials that are “heavier” than the organic biodegradable solids in the wastewater. Grit also includes eggshells, bone chips, seeds, coffee grounds, and large organic particles, such as food waste.


Protect the Pipes!

Please refrain from flushing ‘flushable’ wipes, Swiffer cleaning pads, plastics, grease, and feminine hygiene products, as these items plug pipes and cause costly equipment damage.











Reduce your impact.

- Use biodegradable detergents and soaps.
- Flush **ONLY** toilet paper.

DO FLUSH
The following can be flushed down the toilet.


 Toilet paper

DO NOT FLUSH
The following cannot go in the toilet as they can clog pipes and septic systems.

 Paper towels	 Cigarette butts	 Disposable diapers	 Wipes (Baby or flushable)	 Feminine hygiene products
 Plastics	 Medications	 Cotton (Cotton swabs or balls)	 Dental floss	 Toxic Substances

Dispose these items in the trash.

Oxidation Ditch

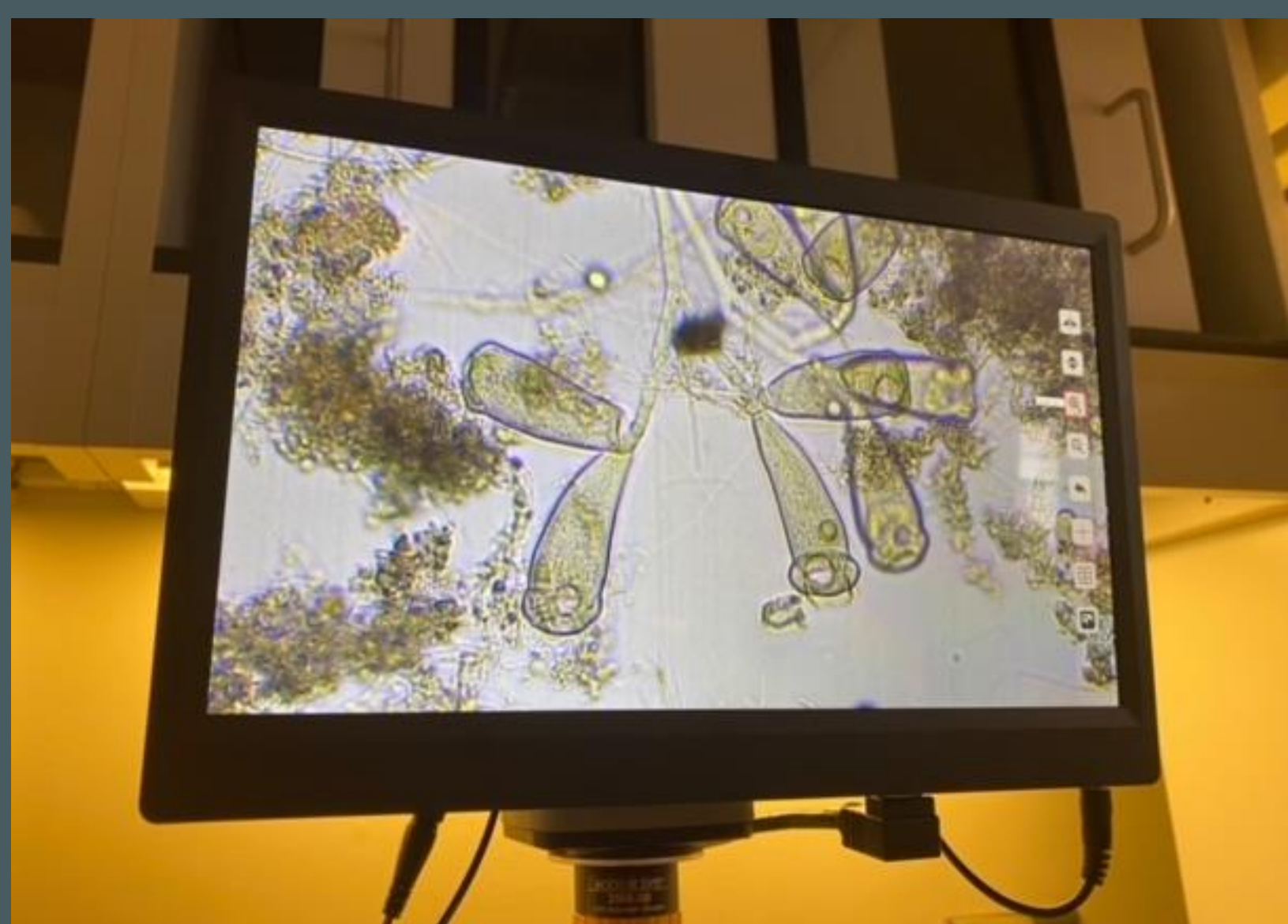


Once the heavy solids and waste are filtered from the wastewater stream, the water moves from the headworks to the *oxidation ditch*. The purpose of the oxidation ditch is to receive the waste stream and introduce it to oxygen and other microorganisms.

The water travels through three channels as it is aerated. Rotating cylinders, called paddles, oxygenate the stream by disrupting the surface of the water. The cylinder speed can be increased or slowed to adjust the oxygen levels being introduced. As the water travels from the outer to inner channels, it transforms from an anoxic (oxygen deficient) to an aerobic (oxygen rich) state.

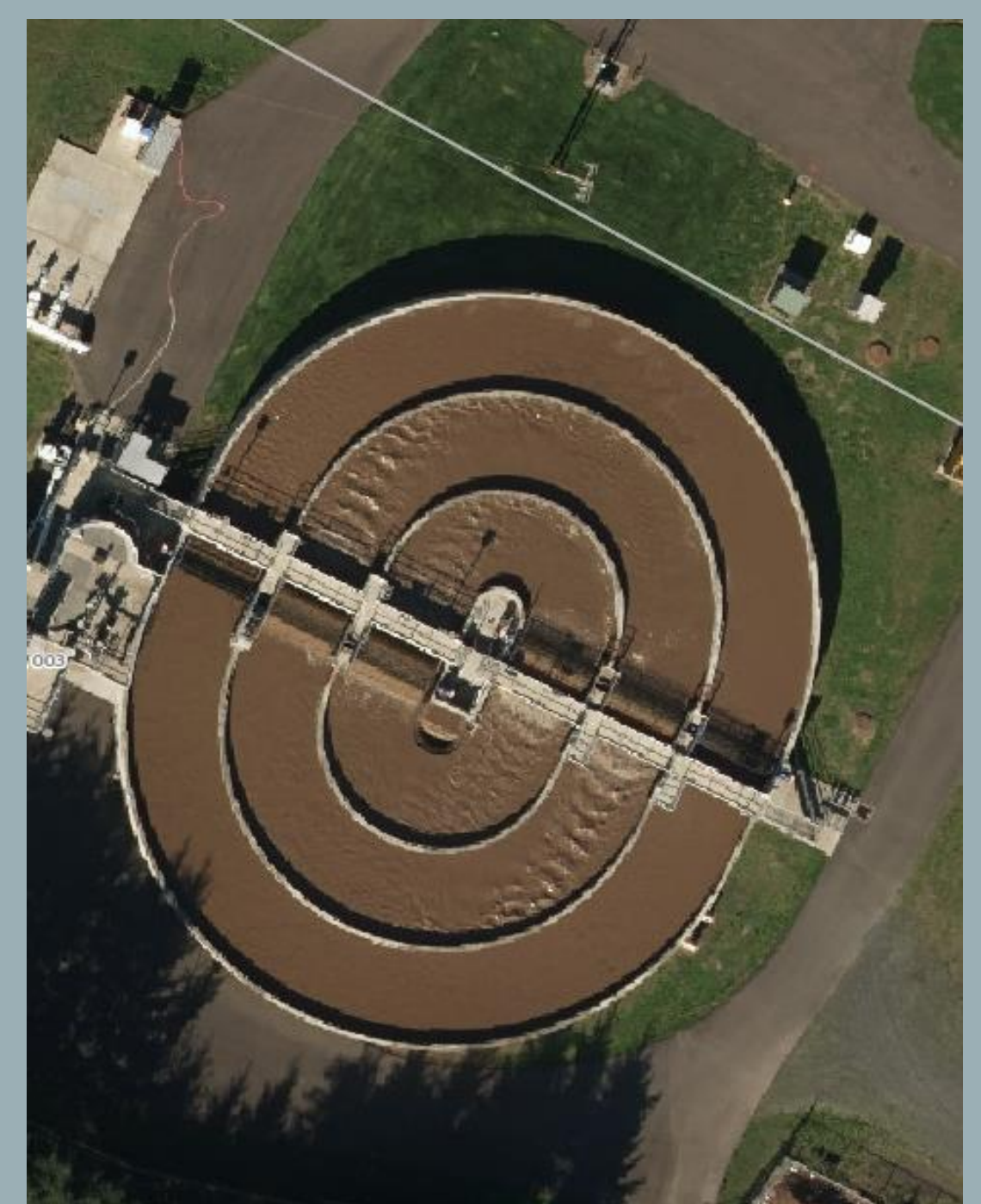


Rotating paddles with aerated disks.



The Role of Bacteria

Microbes, introduced to the basin through activated sludge, need oxygen in order to live. The microorganisms begin to break down (eat) waste and targeted pollutants. Pollutants that are removed in the oxidation basin include ammonia, phosphate, nitrate, and nitrite.



Did you know?

The average Oregon resident uses 113 gallons of water per day in and around their home.

Source - NEEF USA

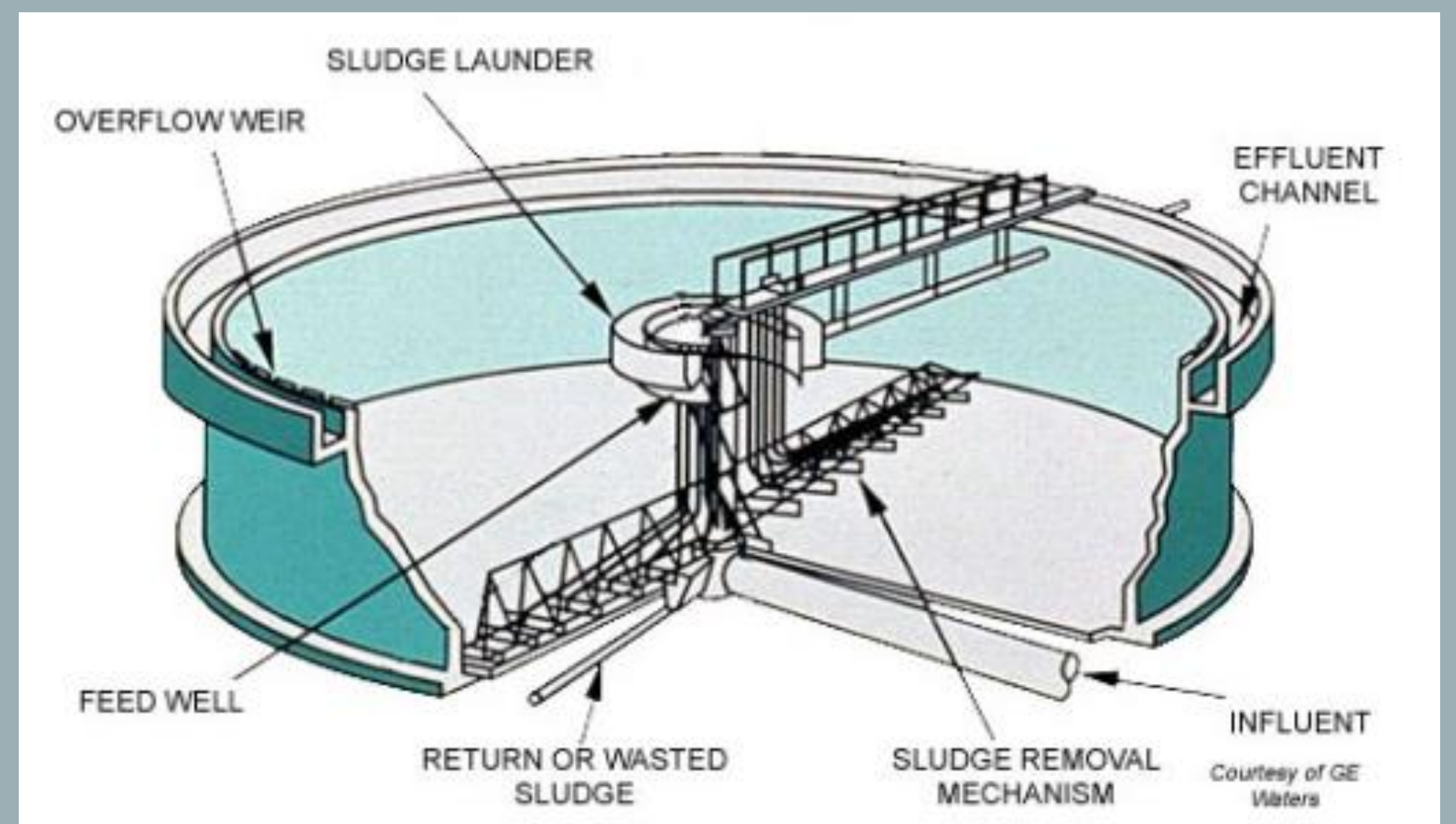
Once the water has been aerated, it is ready to move into the *clarifier*.

Clarifier



A mechanical arm skims the surface of the water to capture particles and surface scum.

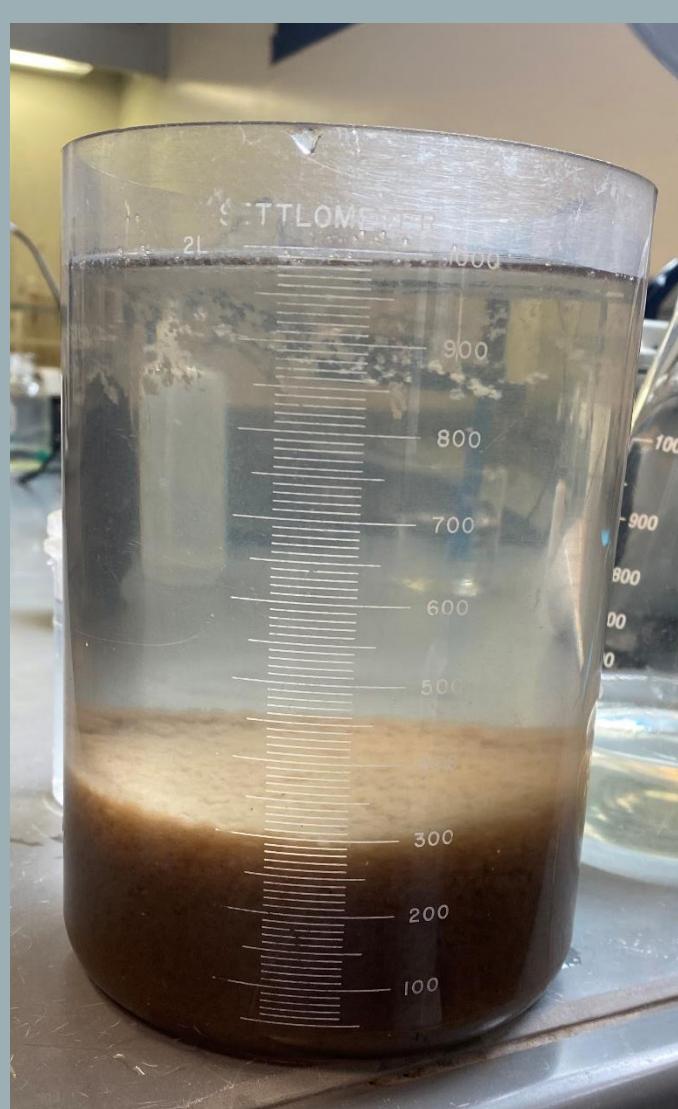
From the oxidation ditch, the waste stream flows to the *clarifier*. The secondary clarifiers perform several functions simultaneously: Clarification, settling, thickening, and solids removal.



Source - Wisconsin Department of Natural Resources
Basic General Wastewater Study Guide August 2015 Edition

Clarification and Settling:

Microorganisms attach to solid materials and water pollutants to form *floc*. The process where microorganisms and sediment combine to form larger, heavier aggregate flakes is called flocculation. The floc settles to the bottom of the clarifier as sludge. Some of the sludge is scraped from the bottom and returned to the oxidation ditch to help treat incoming waste. The remaining sludge is thickened and sent to the *digester*.



Flocculation demonstration.

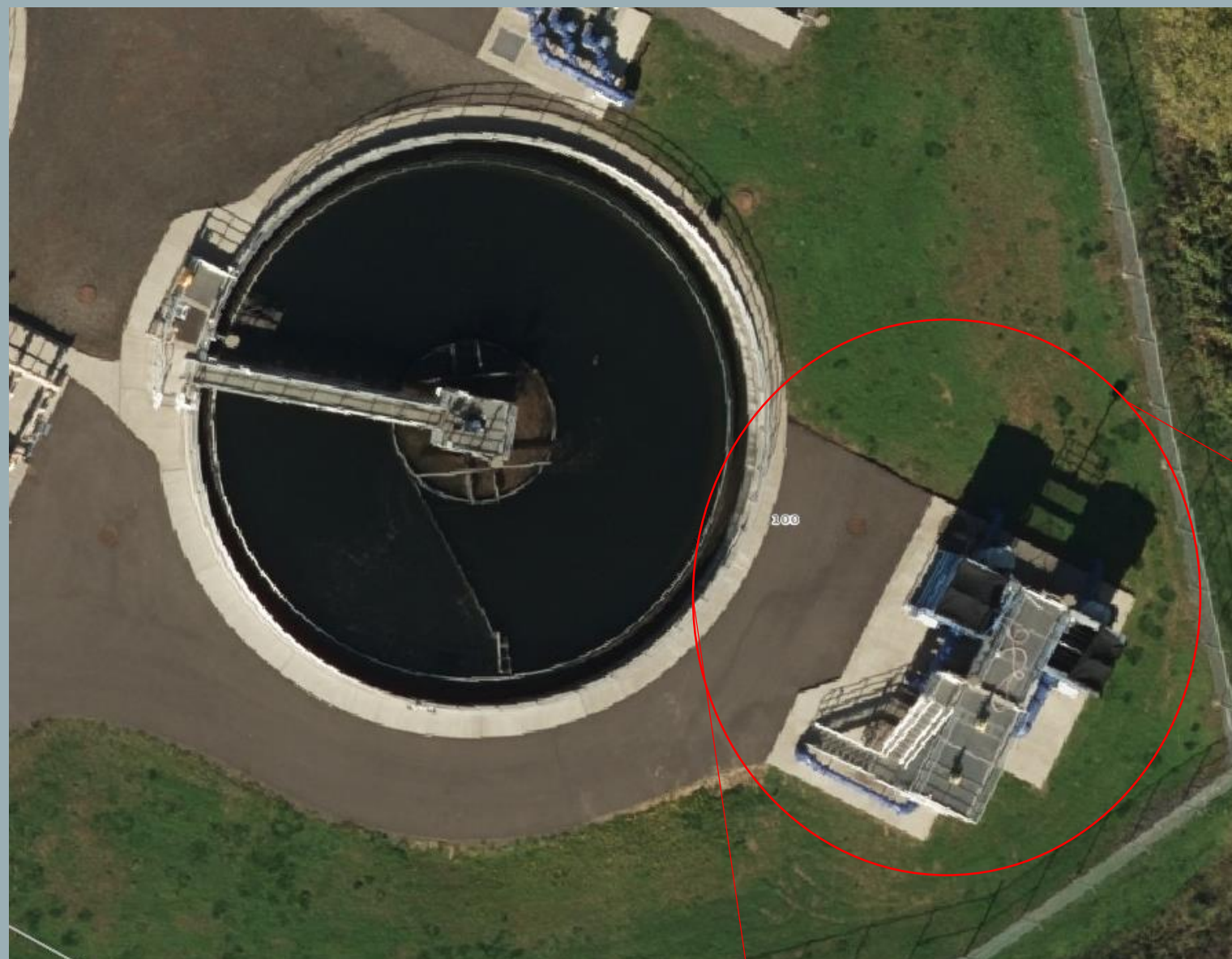
What is a weir?

A barrier designed with tooth-like edges to control the flow of water.



The clear water flows out of the top of the clarifiers through a *weir*.

Tertiary Filters



The *tertiary filters* receive water from the secondary clarifiers. The function of the filters is to make the water into class A effluent, which can be used to irrigate the golf course and parks.



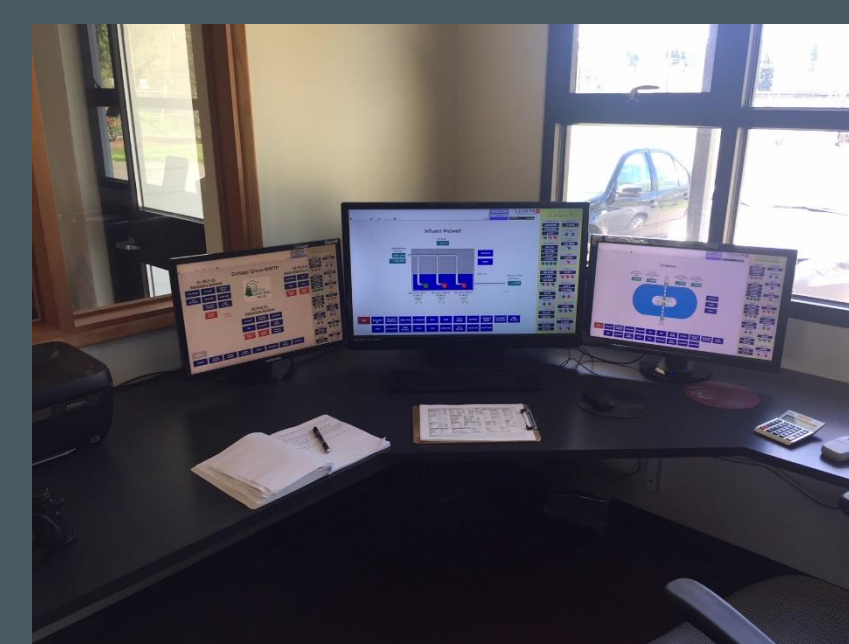
How it works...

Cloth filter disks remove fine particles from the water. The filter backwashes automatically at regular intervals to clear out the filters. The filtered water is then pumped to the chlorine contact basin for disinfection before being returned to the water supply or stored for irrigation purposes.

Explore a Career in Water & Wastewater Treatment!



Living Wages • Serve Your Community



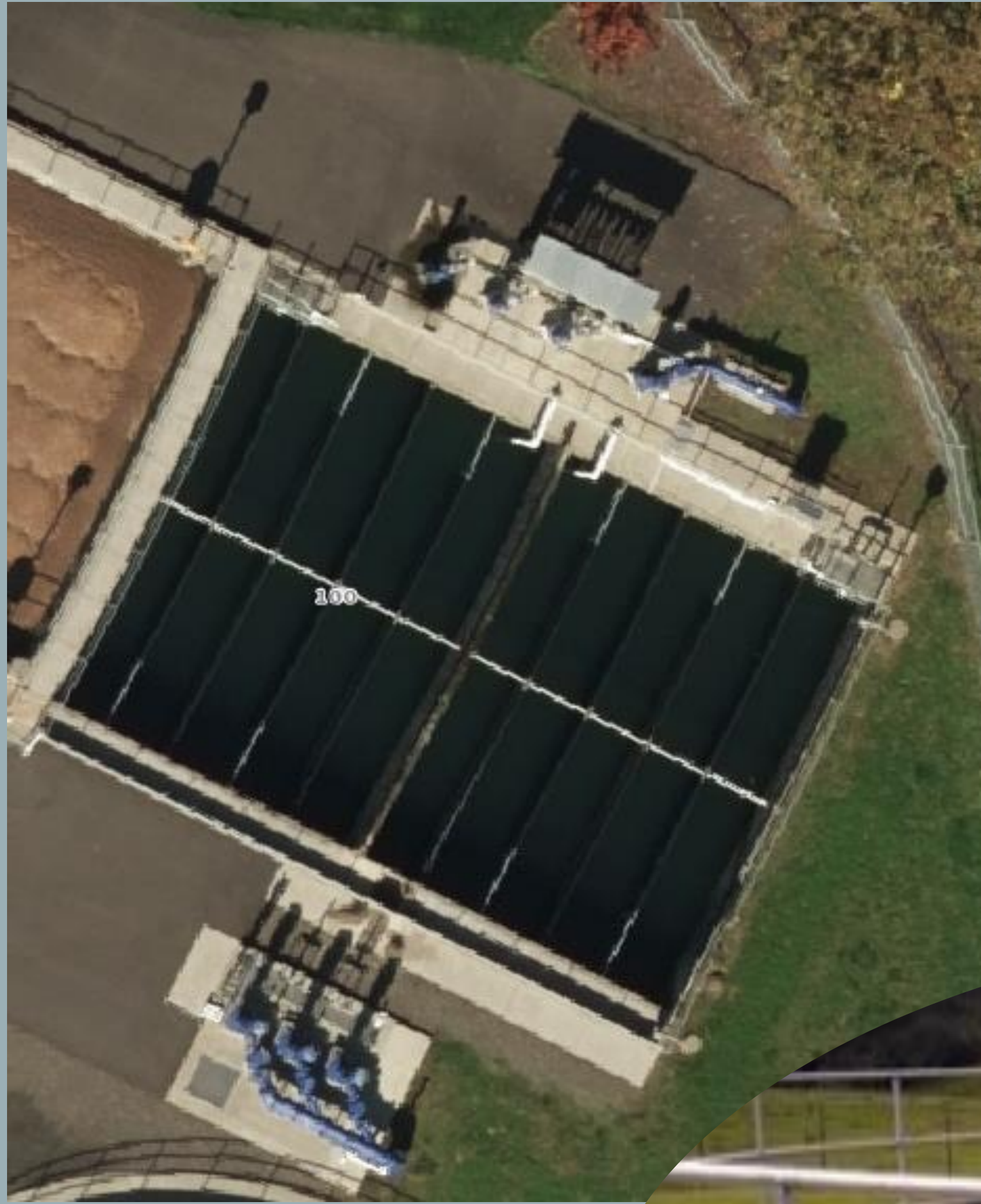
Go to the State of Oregon Department of Environmental Quality (DEQ) website to:

- Find DEQ approved courses in Water Treatment and Technology
- Become an Operator in Training (OIT)
- Earn your Provisional Grade I Certificate
- And more!

<https://www.oregon.gov/deq/wq/wqpermits/Pages/Wastewater-Operator-Certification.aspx>

Department of Environmental Quality / Water Quality / Water Quality Permits / Wastewater Operator Certification Program

Chlorine Contact Basin



The function of the *chlorine contact basin* is to add chlorine to the finished water for disinfection. The water is then pumped to the storage pond for irrigation or neutralized with *sodium bisulfite* and returned to the river.



The serpentine-style design of the basin ensures enough contact time between the chlorine and water to kill remaining bacteria before it is returned to the river or used to irrigate the golf course and parks.

Source - Wisconsin Department of Natural Resources
Basic General Wastewater Study Guide August 2015 Edition

Recycled Water Storage Pond



Finished, fully treated water is stored in the new, 10 million gallon capacity pond installed on the site. The water is piped to the golf course for irrigation.



Currently, work is being done to expand irrigation to the interchange along Oregon Interstate 5 at Exit 174 and Bohemia Park.

Aerobic Digesters



The sludge removed from the clarifier ends up at the *digester*. Aerobic digesters utilize microorganisms and oxygen to digest the remaining organic material in wasted sludge from the primary and secondary treatment processes. Heat, air, and time break down this byproduct causing it to become inert. The byproduct from this process can be used as fertilizer.

Did you know?

“Before 1950, most communities in the United States discharged their wastewater, or sewage, into streams and rivers with little if any treatment”

Stehouwer, R. (2021, June 24). What is sewage sludge and what can be done with it? Penn State Extension.

What is sludge?

Sludge refers to the solids that result from the treatment process. **Biosolids** refers to treated sludge that is suitable for land application.

Solids



The solids room has two functions. First, polymer is added to dewater the sludge. The dried product then goes to the digester. The purpose of *dewatering* is to concentrate the solids while reducing the liquid content of the sludge. Dewatering reduces the volume of the sludge for storage and transportation.

Second, the belt filter press takes sludge from the digester and mechanically presses the water out. The dried sludge is then hauled off to be used as fertilizer.

