

COLLECTIONS DIVISION

The water discharged from your homes and businesses enters a maze of underground pipes, which direct the flow to the Wastewater Treatment Plant. This is called the collection system. The City has about 50 miles of sewer lines. The collection system works primarily as a gravity system in which the water flows down hill through the lines. There are four lift stations, which have to pump the wastewater from low points in the city to a higher level so it will flow to the WWTP.

Maintenance of the collections system consists of inspecting the lines visually and with video equipment, cleaning the lines to prevent build up of grease or other debris which could block the lines, removal of roots growing through joints or cracks in the pipes, and repair or replacement of degraded lines, manholes, or lift stations and lift station equipment.

Pretreatment: Pretreatment is done prior to discharge to the collection system. It prevents hazardous or other harmful chemicals from being discharged to the collection system and Wastewater Treatment Plant. Pretreatment can include grease traps, used by restaurants and other businesses for the removal of fats, oils and grease (FOG).

Storm System: The city storm system collects run-off from streets, parking lots and other impermeable surfaces through catch basins and allows it to flow to a number of discharge points along McKay Creek, Tutuilla Creek, and the Umatilla River. You will notice stamps in the concrete or painted messages stating “Do not Dump, Drains to River” around many of the catch basins in the streets.

WASTEWATER TREATMENT PLANT

The City of Pendleton has operated a Wastewater Treatment Plant in the same location since 1948. Currently the City of Pendleton operates a Class IV Conventional Activated Sludge Treatment Plant under regulations from the Department of Environmental Quality (DEQ) and the Environmental Protection Agency (EPA). The National Pollutant Discharge Elimination System (N.P.D.E.S.) permits the city to discharge up to 5.5 Million



Gallons per Day (MGD). Current average daily flows are approximately 2.5 MGD. The treatment plant serves approximately 17,700 residents in Pendleton and on the Umatilla Indian Reservation.

There are a number of steps to the treatment process. Treatment of the waste is done through both physical and biological means.

Preliminary - Preliminary treatment is the removal of large debris and inorganic matter like rags, sticks, coffee grounds, gravel etc. by physical means. The influent flows through a grinder and screen where rags and large debris is ground up and removed from the stream. The influent flows into the grit chamber where the velocity is dropped to about 1 cubic feet per second (cfs). This allows the heavier particles to

settle to the bottom of the chamber. The grit (coffee grounds, gravel, etc) is removed from the grit chamber and pumped into a cyclone separator and grit washer where the organic material is washed out and returned to the primary clarifier influent. The grit from the separator is collected in a large sand bag and put into a 2 cubic yard dumpster, along with the screenings from the screen. The Pendleton Sanitary Service empties the dumpster once a week and takes the grit to the Sanitary Transfer Station. The water from the grit chamber flows into the primary clarifier.

Primary - Primary treatment is the physical separation of the biodegradable (organic) solids from the water by physical methods. The velocity of the water is slowed down to less than 1 cfs so the solids will settle to the bottom of the Clarifier if they are



heavier than water or float on the surface if they are lighter. The effluent (flow out of a unit) from the primary clarifier contains quite a few things most of which bacteria call “food” and flows to the Aeration Basin through the plant pump station. The pump station and aeration basin are part of the secondary process. The raw sludge is collected in the bottom of the primary clarifier and pumped to the Primary Digester. The digester is a heated and mixed anaerobic bioreactor, which through digestion, reduces pathogens (bad bacteria) and organic solids so they will not attract vectors (stink and draw flies). The solids are retained in the digester for approximately 35 days at a temperature averaging 95 degrees F. The biosolids (digested or processed sludge) are transferred automatically from the primary digester to one of the secondary digesters. Byproducts from the digestion process include water, methane, hydrogen sulfide (rotten egg smell), ammonia, and carbon dioxide. The methane gas is utilized in the boiler to produce hot water to heat the digester. Water and solids are separated in the secondary digesters. The water (supernate) is removed and combined with the primary clarifier effluent for additional treatment. The biosolids are removed from the bottom of the secondary digesters and transferred to the Solids Storage Basin. The biosolids are pumped into the drying beds and are air dried prior to being land applied to DEQ approved sites where wheat or other crops are grown. The city treats and applies approximately 290 dry tons of biosolids per year.

Secondary - Water from the primary clarifier is sent to an aeration basin where it is mixed and aerated.



The aeration basin is a bacteria farm, where oxygen, bacteria and a food source come together, allowing the bacteria to grow.

The bacteria eat the waste. There are a few environmental factors that can be adjusted to select for bacteria that help the process perform. Most often this is balancing the food to mass of bacteria (f/m ratio) to select for bacteria that sink in the next phase of the process. The aeration basin flows into secondary clarifiers where the bacteria will settle out. This separated the bacteria from the “clean” water. The water goes on to disinfection and the bacteria go back to the aeration basin (return activated sludge, RAS) or are sent to the primary digester via the primary clarifier as waste activated sludge (WAS). This maintains a balance between organisms and incoming waste.

Disinfection and Discharge

The effluent from the secondary clarifiers is chlorinated at a junction box with chlorine gas. It then flows into the chlorine contact chamber. The final effluent discharges into McKay Creek and to the Umatilla River 52 miles from the confluence at the Columbia River.



Pretreatment Program - The treatment plant has no current major industrial users on its system according to an Industrial Pretreatment Survey conducted in 2006 by the city W.W.T.P. This information was forwarded to DEQ. There have not been any additional industrial users added to the system.

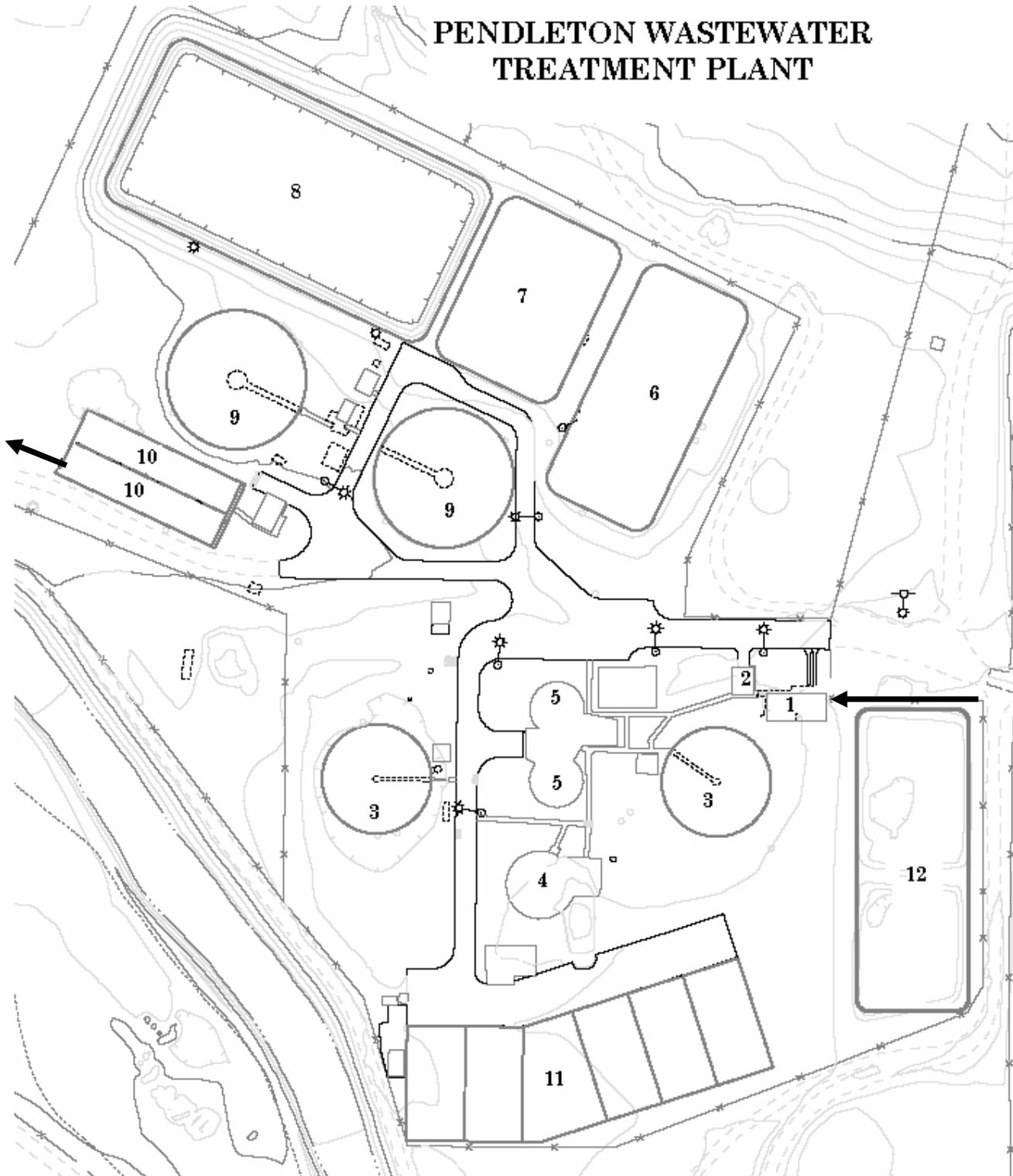
SAMPLING AND LABORATORY ANALYSIS



Sampling is the most critical part of water testing. If the sample does not represent the system being tested or if it is contaminated by outside sources the test is worthless. No matter how accurately the test is done, it will be meaningless if it does not represent the source from which it is taken.

The city operates a laboratory onsite. We run analysis required by our permit as well as process control testing as necessary. The city also contracts with other municipalities in our area to provide analysis and technical assistance. We have the ability to run a minimum of 14 different analyses. We analyze between 15 and 30 samples a day.

PENDLETON WASTEWATER TREATMENT PLANT



- 1 - Grit Chamber
- 2 - Grit Building
- 3 - Primary Clarifier - 429,000 gallons each
- 4 - Primary Digester - 525,000 gallons
- 5 - Secondary Digester - 225,000 gallons each
- 6 - Solids Storage Basin - 1.25 million gallons

- 7 - Aeration Basin #1 - 1.04 million gallons
- 8 - Aeration Basin #2 - 3.12 million gallons
- 9 - Secondary Clarifier - 856,500 gallons each
- 10 - Chlorine Contact Chamber - 261,000 gallons each
- 11 - Drying Beds - 56,000 gallons each
- 12 - Drying Lagoon - 200,000 gallons