



## Water Treatment Plant Glossary of Terms

**Direct filtration** – the treatment system which the previous plant used. Direct filtration uses a chemical coagulant, such as iron or aluminum that is added to the water. It is then passed through filters. Direct filtration does not perform as well as conventional filtration in the purification of highly turbid water.

**Conventional filtration** – the upgraded plant uses this water treatment system, with the addition of ozone. Conventional filtration uses two new steps – flocculation and sedimentation, which removes more material from the water before filtration.

**Ballasted flocculation** – the major step in the water treatment process. Aluminum sulfate (Alum) is added to the water along with micro-sand. The alum acts like a ‘dirt magnet’ to attract tiny particles in the water to stick together which forms “floc”. The sand helps the floc to form and settle to the bottom of the settling tank. Sediment is then transferred to the gravity thickener and clarified water is then treated with ozone.

**Ozone treatment** – ozone gas is created by adding a third oxygen atom to oxygen gas ( $O_2$ ) to form ( $O_3$ ). Ozone disinfects the water to drinking water standards and removes any unpleasant taste and odor. Ozone provides an additional treatment barrier to protect public health and removes more impurities from the water supply.

**LOX** – liquid oxygen gas, used to produce the ozone. Ozone is created by combining oxygen gas with electricity in an ozone generator.

**Filters or filtration** – once the larger particles are removed in the settling basins and the water has been treated with ozone, water is filtered through a bed of granular activated carbon and silica sand to remove the remaining small particles, before flowing to the clearwell. With the addition of the ballasted flocculation process, the new filters will operate for longer periods between cleanings and better remove any remaining particles and contaminants, especially during winter months when water from the river contains more sediment.

**Clearwell** – an underground water storage reservoir. Once the water has been clarified in the ballasted flocculation and filtered, a small amount of chlorine is added to disinfect the water. The required chlorine contact time is obtained in a clearwell chlorine contact chamber, before the water is pumped through the finished water pump station into a large transmission pipeline that delivers water to Lake Oswego and Tigard.

**Finished water pump station** – a pumping system which is connected to the clearwell. It pumps water to the transmission network of finished water pipelines.

**Gravity thickener** – thickens river sediments removed during the treatment process. The thickened “solids” are then transferred to the solids storage tank.

**Solids** – consist of soil or sediments from the river, and the alum that was used to remove the soil from the water.

**Solids storage tank** – holds thickened river sediments or solids removed during the treatment process and keeps them mixed before sending it to the mechanical dewatering system.

**Mechanical dewatering** – screw presses remove the remaining water from the solids and the dry soil that results is trucked off site for disposal or beneficial reuse.

**Wastewater lagoons** – previously, four lagoons stored solids that were removed during the treatment process. Solids were dried in the lagoons, then hauled off site. Now, the two remaining wastewater lagoons operate as overflow basins that may hold excess water in case of an overflow from a different process.

**Washwater recovery basins** - water and sediment cleaned from the filters during the filter backwash process flows into the washwater recovery basins. This water is then recycled back into the treatment process.

**Chemical building** – stores chemicals including aluminum sulfate, sodium hypochlorite, sodium hydroxide, and polymer used in the water treatment process. It also houses the ozone generators that turn oxygen ( $O_2$ ) into ozone gas ( $O_3$ ).

**Electrical building** – houses electrical gear including the pump drives and also serves as an equipment storage and maintenance area.

**Shoring** – the process of supporting or “propping up” a building, structure, trench or large excavation so it does not collapse while work is underway nearby.

**Sheet piling** – a form of “shoring.” Steel plates (sheets) are inserted into the ground to support existing structures or secure an area by creating a wall. Sheets are often installed using an impact hammer or vibratory hammer.

**Auger cast piling** – piles, or large columns, that are installed using a hollow auger attached to a drill rig. The auger drills a hole in the soil and dirt until it reaches the gravel layer. Grout, a mixture of cement and sand, is pumped through the hollow stem of the auger and the auger is slowly removed from the hole bringing out the soil. Once the hole is filled with grout a cage of long, reinforcing steel is then lowered into the hole. The auger cast piles support the building foundations, to make structures seismically resistant.