

## **Filtration and Disinfection**

Any microorganism leaving the Wastewater Treatment Plant with a plan to cause havoc in the environment, doesn't have a chance. The final steps of filtration and disinfection in the wastewater treatment process are designed to prevent that from happening.

There are numerous technologies available to filter and disinfect wastewater. Filters can use a media such as sand or granular activated carbon, or use membrane technologies such as cloth or reverse osmosis membranes. Disinfection methods include gaseous chlorine, sodium hypochlorite, or Ultraviolet (UV) radiation. The end result is to make sure no pathogenic micro-organisms leave the facility and go downstream.

In general, filters are designed to remove very small particulate or "suspended" solids in the water. The current Plant uses a sand filtration process which does not have adequate future capacity, and is expensive to operate and maintain. The Upgrade will install cloth media disk filters that will improve efficiency.

The disinfection step is designed to inactivate and destroy pathogenic organisms to prevent the spread of waterborne diseases to downstream users and the environment. Currently, the Treatment Plant uses two banks of UV lamps, 12 lamps in each bank. As water passes through the channel containing the lamps, the UV lights zap the organisms with ultraviolet energy, effectively destroying the cell's ability to reproduce.

There are several advantages to using UV disinfection. It is a physical process rather than a chemical disinfectant, there is no residual chemicals that can be harmful to humans or aquatic life. It is also operator-friendly, has shorter contact time when compared with other disinfectants and the equipment requires less space than other methods. In addition, the energy usage of UV systems can be adjusted based on flows and the clarity of the water thereby conserving energy. The Upgrades will include and an additional UV channel to increase overall plant capacity.

After filtration and disinfection, water is released back into the Willamette River, having met DEQ requirements outlined in the facility's National Pollutant Discharge Elimination System (NPDES) Permit.