

History of Lake Oswego's Significant Water System Investments and Upgrades

Lake Oswego's water system has served residents and wholesale customers high quality drinking water for over 40 years. Key facilities were built in the late 1960s and funded entirely with federal grants from the Department of Housing and Urban Development ("DHUD"). Accounting records appear to suggest the cost to build these facilities was about \$4M dollars. In 1980 the capacity of the City's water treatment plant was expanded from 10 million gallons per day (mgd) to its present day capacity of 16 mgd.

Over the years the City of Lake Oswego has continued to invest in its water supply system with upgrades, replacements, and maintenance to maximize the return on these early investments and extend system life. This has allowed the City to keep water rates low. Below are but a few examples of how the City has continued to invest in its water system:

Clackamas River Intake

In addition to periodic refurbishment of pumping and electrical equipment, two major projects were completed at this facility:

1. In 2000 the City partnered with PGE and the NW Energy Trust to replace a 1967 vintage 350 horsepower pump with a modern premium efficiency pump and motor. Based on energy savings calculated by the Trust over the life of the new pump, the City received a grant of over \$52,000 dollars;
2. In response to new rules regarding the protection of endangered salmon in the Clackamas River, the City installed new fish-friendly screens at the intake. The City also took advantage of a grant program offered by the Oregon Department of Fish and Wildlife and received a grant of \$75,000 to install these screens.
3. In conjunction with the fish screen project, the City also took the opportunity to harden the facility against earthquakes and address other deficiencies including replacing old electrical wiring. During this work it was discovered that the concrete in the floor slab is decaying due to poor quality concrete used during construction. Remediation options are not feasible without significant additional expenditures or accepting a reduced level of capacity.

Untreated Water Transmission Main

This approximately 14,000 foot-long, 27-inch diameter steel pipeline is the lifeline of Lake Oswego's water supply. It conveys water from the river intake to the City's water treatment plant located in West Linn. Two major projects have been completed on this facility since its construction:

1. In 1992 the interior of the pipe was cleaned out to remove river sand and silts that had accumulated in the "belly" of the pipe as it crossed under the Willamette River over the prior 25-years of service. This effort improved the hydraulic efficiency of the pipe reducing pumping energy requirements;
2. In 1999 after an investigation resulting from reported leakage, the City determined portions of the pipeline were slowly corroding and without protection from corrosion, pipeline longevity would be shortened. In 2000 the City completed Phase 1 of a corrosion protection system that slows the rate of corrosion of this important facility. Unfortunately, there was no feasible method to provide equivalent protection to that portion of the pipeline crossing the Willamette River.

Water Treatment Plant

If the transmission mains can be thought of as arteries, the City's Water Treatment Plant is the heart of the water supply system. Constructed in 1967 with a capacity of 10 mgd and later expanded to its present day capacity of 16 mgd in 1980, this facility is the key to producing high quality, safe and pleasant tasting water for Lake Oswegan's and several wholesale customers including the City of Tigard. Several major upgrades at this facility has assured continued compliance with ever changing EPA Safe Drinking Water Act (SDWA) regulations, building codes, seismic and fire/life safety requirements as well as improvements that improve plant efficiency and safety for operating personnel. These upgrades include:

1. In 1999 new treatment technology was introduced at the plant to address new regulations relating to lead and copper leaching from home plumbing in contact with drinking water and to eliminate the use of gaseous chlorine as a disinfectant in a residential neighborhood. These changes improved water quality, reduced public health risks and addressed concerns of neighbors living adjacent to the plant.
2. In 2000 two earthen ponds used to collect river sands and silts removed from the river water during treatment were replaced with four, modern concrete solids handling lagoons. These improvements improved plant efficiency and eliminated the labor intensive and hazardous process of removing accumulated river silts and clays from the earthen pits.
3. In 1995 the City conducted a seismic vulnerability assessment of its critical water and wastewater infrastructure including the water treatment plant. This assessment determined the plant facility would not be operable if subjected to seismic forces from the design earthquake. In response to the findings of the study, the City programmed seismic upgrades to the water plant. Early in 2001 these improvements were completed. Now the plant will remain operable even when subjected to large seismic forces. Other improvements were made to address the Americans with Disabilities Act and fire/life safety building requirements.
4. Further improvements were made to the plant toward the end of 2001 to increase water quality, improve reliability and reduce operating and maintenance costs. Old filter media was replaced with new media and a different design. New piping, pumps and valves were installed to improve plant performance and reduce water waste.
5. Between 2000 and 2007 additional improvements were implemented to improve site security and technologically advanced systems were installed to improve the ability of plant operators to remotely monitor and control the operation of reservoirs and pump stations located throughout the City's water supply system from the plant.

Treated Water Transmission Main

In 2003 the City implemented Phase 2 of its corrosion protection system for the treated water transmission main between the water treatment plant and George Rogers Park. This 20,000 foot-long segment of 24-inch diameter, steel pipe benefits from a corrosion protection system similar to that constructed in 2000 to protect the untreated water pipeline. These systems slow, but do not eliminate, the corrosive effects of the soils surrounding the pipelines extending their life beyond that of similar, but unprotected, pipelines.