Frequently Asked Questions

Why are we doing this project?

The City of Klamath Falls is working to upgrade the Spring Street Sewage Treatment Plant (STP) due to its aging infrastructure and the need to meet new, stricter treatment standards. The project is an important, long-term investment for the community. The City has operated the Spring Street STP since 1958, serving Klamath Falls for over 60 years. Many of the plant's parts are original since their installation in the 1950s. As repairs are becoming necessary due to age, it is more cost-efficient to replace them entirely them than to repair them. A comprehensive upgrade is a smart investment in the plant, avoiding short-term, quick-fix solutions that add up in the long run.

What benefits will this project provide to the City of Klamath Falls?

The City's Wastewater Division provides services to approximately 21,000 city residents and Klamath Basin area customers, cleaning an average 2.2 million gallons of wastewater per day from over 7,400 service connections. These upgrades will provide the following benefits to this process and to the community:

- Improved health, safety, and welfare of the public.
- Reliable, robust treatment with sufficient process and equipment redundancy (allowing the plant to stay operational while routine maintenance and repairs occur), and operator-friendly facilities.
- Energy efficiency, which will result in additional funding from the Energy Trust of Oregon and reduced power bills.
- Reduction in operation and maintenance costs due to the elimination of two existing processes: primary clarification and digestion.

Along with being a smart long-term investment, the upgrades will help keep the City in compliance with Department of Environmental Quality (DEQ) regulations and protect the area's natural resources such as Lake Ewauna, the headwaters of the Klamath River where the treated wastewater is discharged. DEQ administers the City's National Pollutant Discharge Permit (NPDES) permit on behalf of the Environmental Protection Agency. The permit program addresses water pollution by regulating point sources that discharge pollutants to waters of the United States and also is tied to endangered fish protection.

When will construction start and how long will it last?

Construction may begin as early as the first half of 2020. The project is now fully designed and awaiting approvals from the Department of Environmental Quality (DEQ) before beginning construction. Construction is anticipated to last 12-18 months.

During construction there will be little to no impacts to the public. Water service will work as normal. Because the plant is in an industrial area away from neighborhoods and public gathering places, people should not experience disruptions outside of some increased truck traffic in the vicinity of the plant.

How long has this project been in the works?

The City has planned for this project for over a decade. The City's current National Pollutant Discharge Permit (NPDES) was issued in 1990 and last modified in 1997. Renewal of the NPDES permit is currently pending, and stricter treatment requirements are expected.

In 2009, the City completed a Facility Plan for the Spring Street STP. At that time, the City began working to fund the plant upgrades by initiating incremental rate increases that are still being implemented today. Knowing that saving funds and obtaining an updated NPDES permit would take time, the City started early. In 2016, the City hired an Owner's Representative team to support the management and technical development of the project, which included hiring a Design Build team. In January 2018, a Preliminary Design report updated portions of the 2009 Facility Plan related to influent flows and loads, anticipated permit requirements, and upgrades required to meet future demands and ongoing condition issues - ultimately leading to a recommended project alternative to move forward. Designs for the upgraded plant are now complete, and the City is awaiting approvals from the Department of Environmental Quality (DEQ) before beginning construction.

What types of improvements are included in the plant upgrade?

The project to upgrade the plant includes these key features:

- **A new influent pump station**. This pump station lifts flows from the sewer system deep underground up to the surface where the treatment takes place. The current pump station was built in the 1950s.
- **An improved headworks facility with fine screening and grit removal**. Headworks remove large debris from the wastewater such as rags, sticks and rocks. The current headworks was built in the 1950s.
- **An additional aeration basin**. An aerated tank holds billions to trillions of microorganisms which consume pollutants in the wastewater and is one of the most essential parts of the treatment process. Those microorganisms then sink to the bottom allowing for easier removal of the pollutants. Adding the additional basin will help meet stricter permit requirements.
- **A new BioMag® system**. This cutting edge technology is the most cost-efficient way to settle out solids and shrink the overall footprint of the treatment plant.
- **A new screw press for solids dewatering**. The screw press processes and squeezes solid particles after they are removed from the wastewater to remove excess water.
- **Conversion of one digester to W.A.S. (Waste Activated Sludge) storage tank**. This conversion will efficiently reuse existing infrastructure.
- **Hydraulic improvements to existing facilities**. Modifications will allow higher flows to pass through the facility.

How much will the project cost and how is it being funded?

The project cost is estimated in the $50 million range. The project is being funded by incremental ratepayer increases, low-interest loans from the State of Oregon, City funds, and additional funding from the Energy Trust of Oregon.

Why does the plant upgrade cost $50 million?

This cost is typical of a comprehensive plant upgrade with aging infrastructure designed to meet stringent permitting requirements. The City's plant incorporates mechanical, biological, and chemical treatment processes to meet stringent wastewater treatment requirements. The new plant will incorporate more advanced technologies and processes to help meet more stringent water quality limits in the upcoming permit.

Lake Ewauna, where the City's wastewater is discharged, suffers from water quality that is not protective of resident fish and aquatic life. The City is required to treat its water to a high standard to avoid further negative impacts to this resource.

What other alternatives were considered?

After studying a number of alternatives, a comprehensive plant upgrade was determined to be the preferred option. The new plant will incorporate more advanced technologies and processes to help meet more stringent water quality limits in the upcoming permit. The team explored a number of other treatment options that were ultimately not recommended:

Constructed Wetlands

Constructed wetlands treat wastewater using natural processes. These wetlands can provide community benefits such as creation and preservation of wildlife habitat, environmental education, and recreation opportunities including hiking and bird watching.

It is anticipated that the City's new permit will require year-round nutrient requirements. Wetlands do not provide winter ammonia removal as the vegetation will be dormant during winter months. This would require process upgrades at the STP in addition to the constructed wetlands, significantly increasing the project costs. Additionally, phosphorous removal through wetlands can be inconsistent, which poses a problem for meeting the more stringent upcoming permit requirements. Wetland projects in other areas of Oregon have proven to be successful since they have less strict requirements and aren't required to provide winter nitrification.

Nitrification describes the biological process where ammonia is converted to nitrate. Nitrification in wastewater treatment is needed to mitigate water quality concerns from discharging water with high ammonia concentrations since it can have detrimental effects on the receiving water body.

Water Quality Trading

Water quality trading is an innovative program that allows facilities that discharge wastewater to a water body to meet regulatory obligations by implementing equivalent or larger pollution reductions from another source feeding that same water body, or by protecting or restoring the water body to offset the impact of discharged pollutants. This program is typically used to meet temperature limits ("temperature trading"). It is most common to use "shading" as the temperature reduction technique, which is effective when trees are planted that shade an entire width of a water body, such as a narrow river. Using the program for Lake Ewauna would

be difficult due to the size and width of the lake. This program also does not address standards for meeting nutrient limits ("nutrient trading"). There are no known examples for nutrient trading, and there are no clear cost effective alternatives to reduce nutrient loads from other sources, making upgrades to the plant necessary.

Ground Water Injection into Geothermal Wells

Within the City, there is a geothermal aquifer which is used as a heating source. The groundwater in the aquifer is not drinkable due in part to high concentrations of arsenic. The team analyzed the potential to inject treated wastewater into this aquifer instead of discharging to the lake.

Groundwater injection into geothermal wells is relatively new to the region and has not been done in Oregon, and it's unclear whether or not it would be allowed under current regulations. Assuming is it permissible, treatment requirements for this type of injection are typically very strict to ensure the protection of the groundwater source. In the City's case, stricter treatment standards would likely apply, requiring substantial investment in injection equipment and infrastructure, resulting in overall higher project cost.

Recycle Water

The team looked at three main opportunities for reusing treated wastewater that may eliminate the costs associated with nitrification at the treatment plant:

1. Irrigation of crops, Christmas trees, animal pastures, fodder, golf courses, parks and playgrounds, orchards, and vineyards;
2. Other industrial and commercial uses such as rock crushing, street sweeping, commercial car washing, and dust control and;
3. Cultivation and maintenance of tree farms such as the fast-growing hybrid poplars that can be harvested into a wood product.

For any of these options, there is an additional cost for infrastructure for irrigation (pump station and pipelines) and coordination with the local farmers, communities, and DEQ permitting. While all three are viable options for the City for summer flows, there is no demand for reuse water during the winter months when the plant is required to meet nitrification and temperature limits. This will require the City to complete the nitrification process upgrades at the plant or to build significant infrastructure for storage of the treated wastewater during the winter, before it could be put to use in the summer months.

It was estimated that 2,700 acre-feet of storage would be needed to store treated wastewater in the winter months, requiring a parcel of land at least 270 acres in size, excavated to a depth of 10 feet. It is likely that the City would be required to completely line the storage area to protect against any ground water contamination. The City would also have to secure 2000 acres of land to dispose of the water during irrigation season. The Bureau of Reclamation does not consider disposal into the A-Canal an option.

What water quality requirements do the treatment plant have to meet and what new or more stringent requirements will the treatment plant upgrade address?

In Oregon, all sources of discharged wastewater must have processes in place to clean the water to meet limits that are protective of the water bodies receiving the treated wastewater. The City's current wastewater discharge permit sets limits for the amount of organic material and suspended solids discharged to Lake Ewauna and requires the wastewater to be effectively disinfected prior to discharge.

New DEQ regulations will require the plant to also limit the amount of nitrogen and phosphorus (called "nutrient loads") discharged to the river as well as meet more stringent limits for the pollutants currently permitted. Plant upgrades will more effectively remove nitrogen, phosphorus, organic matter, and suspended solids from the wastewater to ensure the City can meet these key current and future permit requirements. There may be other wastewater pollutants that DEQ requires to be reduced in the future, but those unknowns are not specifically addressed in the planned upgrades. This is because the pollutants either have not been identified or their limits are unknown, making the required level of treatment uncertain. One expected regulation will require sources discharging wastewater to the Klamath River basin to meet strict temperature thresholds, called "thermal loads."

Permits to discharge wastewater can surpass these minimum nutrient loads (and soon thermal loads as well) and require higher treatment standards. This is because DEQ considers the specific watershed being discharged into - including its quality, how it is used, and how many discharge sources there are.

Lake Ewauna, where the City's wastewater is discharged, suffers from water quality that is not protective of resident fish and aquatic life. The City is currently required to treat its water to a high standard to avoid further negative impacts to this resource. Renewal of the City's discharge permit is currently pending, and stricter treatment requirements are expected to meet nutrient load limits. New thermal load limits are also expected within the next year.