

Subject: Recycled Water Program Timing and Tertiary Filtration Considerations

Date: December 19, 2018

The Issue

The timing of recycled water production is an important decision for the City of Nampa (City). The Facility Plan assumed recycled water production would begin in 2031, which is when the Nampa Wastewater Treatment Plant's (WWTP's) temperature limits become effective. The recycled water program will require tertiary filtration, which is a common process used in low-level nutrient removal and water reuse applications. The Preliminary Design Technical Team is working on a Business Case Evaluation (BCE) to identify the recommended technology for tertiary filtration. However, the timing of the recycled water program's implementation will have implications to what tertiary treatment technology is selected. The intent of this briefing is to provide the Design Review Committee (DRC) with additional background information to guide the presentation of the recommended tertiary filtration approach in a future DRC meeting.

Background and Analysis

The design criteria for the tertiary filtration technology is dependent on the timing of the recycled water production by the City. The City's Facility Plan assumes that recycled water discharge to the irrigation canal would occur in 2031 (consistent with when temperature limits are enforced in the City's NPDES permit). The challenge for this approach is that the summer effluent total phosphorus (TP) limit between 2026 and 2031, which would be 0.1 mg/L because the City would be discharging to Indian Creek. These limits would then increase to 0.35 mg/L year-round beginning in 2031 when the City implements the discharge to Phyllis Canal. (Figure 1). Alternatively, if this recycled water discharge was pulled forward to occur in 2026, the City may benefit from less stringent TP limits in 2026 (Figure 2).

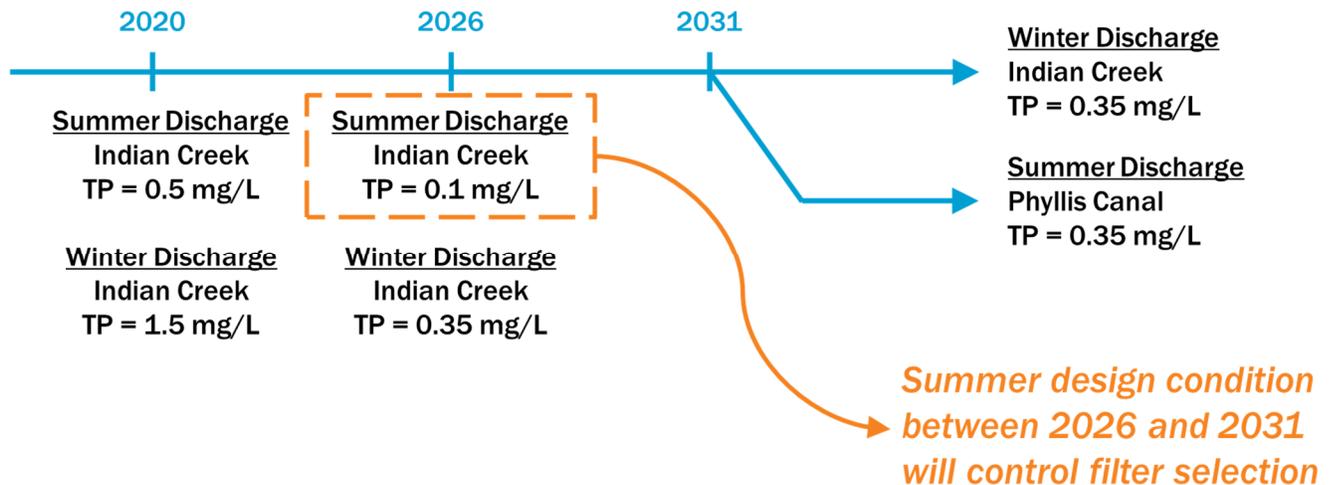


Figure 1. Current timeline for recycled water program.

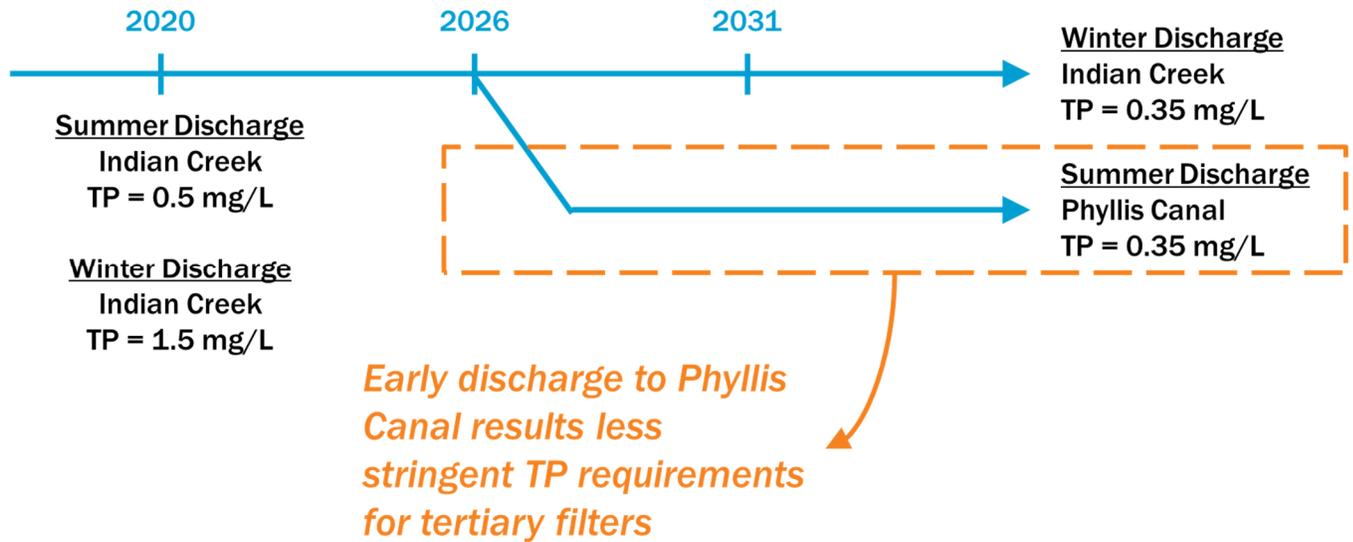


Figure 2. Alternative timeline for recycled water program.

The Preliminary Design Technical Team has analyzed the tertiary filtration technologies based on both potential effluent TP limits, 0.1 and 0.35 mg/L. There are several technologies capable of achieving the 0.1 mg/L limit with capital costs ranging from \$40M - \$45M. There are also several technologies capable of achieving the 0.35 mg/L limit with capital costs ranging from \$16M - \$40M.

Potential Consequences

The timing of the recycled water program’s implementation is closely tied to the tertiary filtration technology selection. Considerations pertaining to both decisions are described below.

- **Tertiary Filtration Design Criteria and Potential Capital Cost Savings:** Designing to a higher effluent TP limit of 0.35 mg/L could reduce the capital cost of the tertiary filtration system by approximately \$16 M - \$18M depending on the technology selected.
- **Shift of Recycled Water Program Costs to Phase II:** Producing and distributing Class A recycled water will require the inclusion of several projects in the Phase II Upgrades (completed by 2026) that were originally planned to be completed as part of the Phase III Upgrades (completed by 2031). This would include the recycled water pump station and distribution pipeline as well as the internal mixed liquor recycle (IMLR) pumps. Using the Facility Plan cost estimates, these projects have an estimated capital cost of \$11.9M. While this reduces the overall cost of the City’s Wastewater Program, it does offset a portion of the potential cost savings from the tertiary filtration system.
- **Future Risk of More Stringent TP Limits:** The tertiary filtration decision is sensitive to the risk of more stringent total phosphorus limits in the future. If the City elects to install a tertiary filtration system that is only capable of meeting a higher effluent TP (i.e. 0.35 mg/L) limit, additional capital investment may be needed in the future. This capital investment would be driven by more stringent effluent TP limits. Should this risk be realized, the total capital investment in tertiary filtration systems would be approximately equivalent (i.e. \$40 M - \$44M) without considering the time-value of money.

Recommendation

The Preliminary Design Technical Team is seeking feedback from the DRC on the potential to accelerate the timeline for the City’s recycled water program. If the DRC is amenable to the potential for this, the options for tertiary filtration technologies that meet an effluent TP limit of 0.35 mg/L will be presented at DRC Meeting #5. Conversely, if the DRC prefers to maintain the schedule described in the Facility Plan only tertiary filtration options that meet an effluent TP limit of 0.1 mg/L will be presented.