

## WWTP Strategy Executive Summary

In 2012, the City of Saskatoon (City) procured Stantec Consulting Ltd. (Stantec) to complete a Long-Term Capital Development Expansion Plan (2012 LTCDEP) for the H.M. Weir Wastewater Treatment Plant (WWTP). The goal of the project in 2012 was to provide the City with a forecast of expected upgrades and expansions required to meet the expected treatment objectives for a 30-year period. Since the completion of the 2012 LTCDEP, wastewater influent flow and loading has not progressed in the manner originally predicted due to water conservation, annual precipitation, and sewer use bylaws. As a result, the 2012 LTCDEP forecast requires updating to better align the forecast of required expansions and upgrades to the year 2050.

In order to update the forecast of required expansions and upgrades to the year 2050, influent wastewater flow and loading projections were developed based on historical operating data and populations. Potential future effluent limits were determined in 2012 during conversations between Stantec and the Ministry of Environment (MOE). Future effluent requirements were assumed to remain the same as those predicted in the 2012 LTCDEP. Lastly, a decision matrix was developed to evaluate each option. The decision matrix accounted for non-economic values, including the City's strategic goals and corporate values, and economic values, including net present value and impact to the Saskatoon Water Rate.

Once the necessary data was acquired and the decision matrix was developed, process evaluations were performed for the liquids and solids trains. The process evaluations included review of construction to date, review of existing process and design criteria, and the sizing and timing for required upgrades. From the results of the process evaluations, six alternatives, all of which were based on conventional BNR systems, were developed and evaluated using the decision matrix previously described.

Based on the evaluation, it is recommended that the City implement capital and expansion planning based on *Option 4 – Combined Treatment Expansions and Nitrification Immediate*. In this option, the WWTP would proceed with a Nitrification Expansion immediately following the technology review study and the Bioreactors, Secondary Clarifiers, and Ostara System would be expanded as one project. The main advantage of this option is identifying the technology direction of the WWTP during the Nitrification Expansion project. This will allow capital expansion planning to remain consistent going forward. The disadvantage of this option is that the hydraulic capacity of the WWTP would not be increased from its current state until 2029.

In addition to the process upgrades and expansions that were included in Option 4, expansion of the Administration, Maintenance, and Laboratory Buildings were considered. Staffing levels were cross-referenced with planned treatment capacity expansions to develop a staffing projection plan to 2050. Rather than expand the Administration Building to accommodate the additional staff members, a renovation can be completed given that certain existing spaces are underutilized or oversized. It was

determined that there are no expected major expansions to the Maintenance Building or Laboratory in the next 30 years.

It is recommended that a technical memorandum be produced every two years, prior to the budget cycle, to update the flow and population projections and revise the capital expansion forecast accordingly. As well, technology studies should be considered prior to executing any capital expansions. Figure E.1 depicts the WWTP layout in 2050 based on the recommended upgrades and expansions. Tables E.2, E.3, and E.4 show the final WWTP LTCDP 30-year budget forecast.

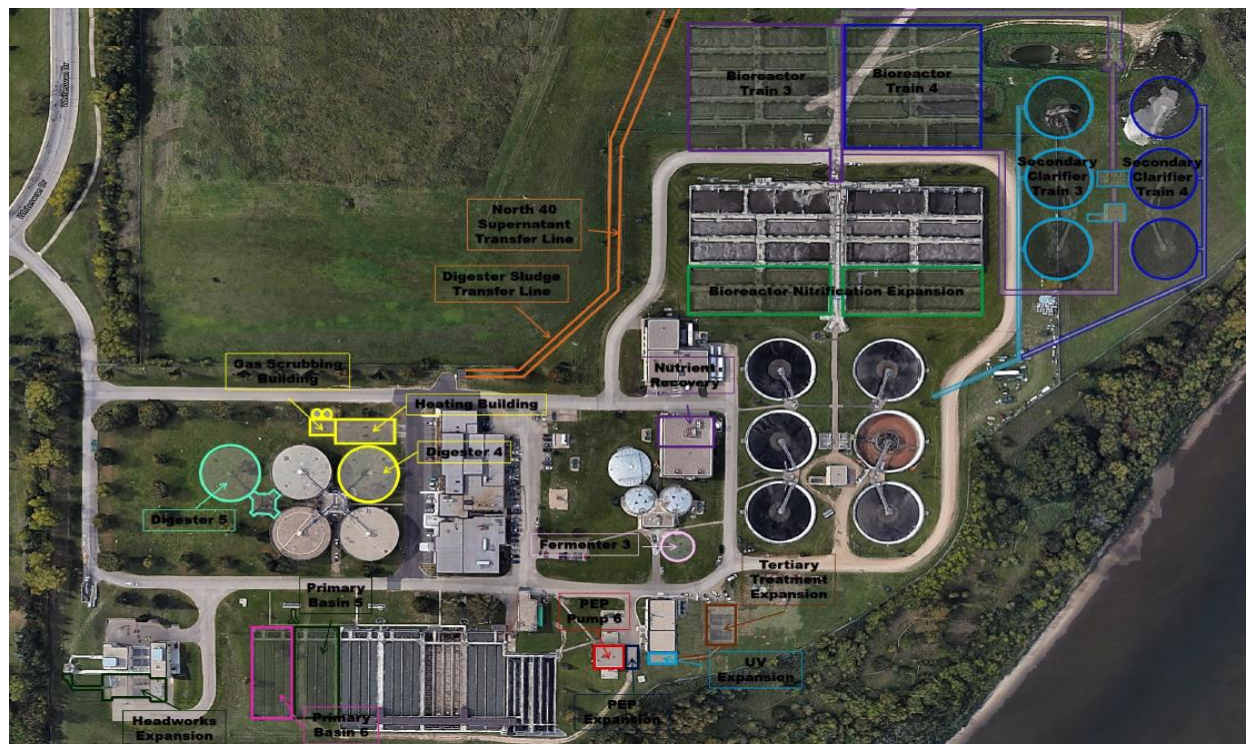


Figure E.1: WWTP – 2050 Conceptual Layout