THE CITY OF Red Deer

CAPITAL BUDGET BRIEFING NOTE

WATER TREATMENT PLANT UPGRADE

Highlights

- The City supplies water to approximately 110,000 residents in Central Alberta. This includes residents in Red Deer, Red Deer County (South Hills) and the North Red Deer River Water Service Commission, which includes Blackfalds, Lacombe, Ponoka, Lacombe County and Ponoka County.
- The maximum day water demand is currently approximately 90 ML/d (million litres per day) and is projected to grow to 120 ML/d by 2020 based on historical consumption rates. With aggressive water conservation measures, we project that this demand can be kept down to 100 ML/d in 2020, based on our current customer base. Expansion of the water supply region would increase demand requirements.
- Water Treatment Plant (WTP) improvements required to meet our capacity needs as well as our license requirements include:
    - Water Intake and screen building
    - Disinfection, chemical feed and storage systems
    - Plant and raw water heating systems
    - Control systems
    - Standby power
    - Residuals Management

Project Overview

Construction of a new water intake and screening building was completed early in 2011. This facility not only increased intake capacity from 90 ML/d to 188 ML/d, but improved fish screening and bypass capability. It also screens out debris before the water enters the clarifiers.

The WTP currently uses gaseous chlorine as a disinfectant in the water production process. Chlorine is a poisonous, pressurized gas and carries significant risks for workers and the public in the case of a product leak. A Sodium Hypochlorite delivery system will therefore be installed to mitigate this risk. Sodium Hypochlorite (similar to household bleach) will then be delivered to the plant and used to disinfect the water.

The WTP currently has a small standby power generator to support a portion of the discharge pumping. A new generator will be installed to support approximately half of the plant production capacity as well as half of the discharge pumping. This will provide continuous water supply during extended power outages.

The WTP currently discharges filter backwash and clarifier blowdown materials back to the river. While most of this residual material originates in the river (e.g. silt, sand, debris), some process materials (e.g. alum, sand, chlorine) are added to the discharge. A major process addition to the WTP will be a residuals management system that cleans the discharge before releasing it to the river. The current contract includes de-chlorination of the discharge, but the remaining residuals management's processes will be included in a future contract.

Other improvements identified in the WTP Upgrade project include:

- Replace chemical feed systems and improve containment for chemical storage tanks to renew aged equipment, increase capacity and improve safety.
- Replace raw water and plant heating systems to renew aged systems and improve operational efficiency.
- Replace control systems to renew aged systems and improve functionality and reliability.
- Improve security systems to control access to WTP and protect against potential threats to water system.
- Retrofit Actiflo clarifiers with new lamella and air scour systems to address solid deposition issues.
- Provide additional work and laboratory space (construction completed in 2013).

These plant improvements are approximately 50% constructed and will be completed by the end of 2015. The residuals management facility will commence construction in 2016 for completion in 2017.

Budget Requirement and Council Decision Points

The Water Treatment Plant upgrade has an approved budget of approximately $54 million for the most recent phase of the project. This project does not have an effect on the 2015-2024 capital plan since funding was previously approved.

Funding Sources

Funding for the Water Treatment Plant upgrade will come from a variety of sources including utility reserves, federal and provincial grants and debt.