

SOURCE OF SUPPLY (SS)

Project Identifier: SS-1c

CIP Budget: \$28,450,000

Project Name: Retrofit Existing WTP with Membrane Filtration (10-12 MGD)

Funding Source: Debt

PROJECT DESCRIPTION: This project is to retrofit the existing 15-MGD conventional filtration WTP with pressurized membrane filtration and reduce the design capacity of the existing WTP to approximately 10-12 MGD. Some existing infrastructure, like the sedimentation basins, clearwell and finished water pump station, will remain in-service with this alternative.

PROJECT ELEMENTS:

The conceptual plan for installing pressurized membranes includes:

- Continuing to use the plant's raw water line and rapid mix system or coagulant addition and sodium hypochlorite addition.
- Routing the flow through the existing flocculation and sedimentation basins to achieve some pre-treatment and necessary chlorine contact time.
- Pumping through new pumps installed at the end of the sedimentation basins to the new pressurized membrane system.
- Installing a new membrane filtration system in the existing filter area, on new concrete floors built over the converted filter basins. The membrane system would filter out turbidity and provide the balance of disinfection credits not achieved with chlorine disinfection.
- The plant's existing clearwell would then receive the membrane permeate and provide additional chlorine contact time upstream of the existing new clearwell and finished water pump station.
- A new building would be required for this alternative, to house membrane cleaning chemical systems and electrical and control equipment. It appears that the new building could be located on the site of the existing old administration residence building, between the existing filters and the river.

Additional existing components of the WTP would continue to be used, including:

- The chlorine building and its sodium hypochlorite generation and feed equipment;
- Portions of the existing main process building;
- The wash water holding basin and residuals lagoon; and
- The control/lab building and the maintenance building.

NEED OR JUSTIFICATION: Retrofitting the existing WTP with aboveground pressurized membranes address the following existing facility concerns or deficiencies:

- 1. Aging Infrastructure:** Limited reinvestment in the plant facilities, approaching 100 years in age, has caused limitations in both treatment efficiency and the ability to supply water to City customers 24/7/365. Approximately 75% of the critical plant components are beyond their useful life.
- 2. Lack of Subsystem Redundancy:** The filter backwash system and the power supply components of the finished water pump station are “single points of failure”, i.e. critical systems lacking backup or spare equipment. Currently, failure in one of these systems will require a plant shutdown until repairs are made.
- 3. Operational Limitations:** Currently the WTP is not operated at night, which reduces its production capacity. When the plant is not running, the majority of system demand is met by using stored water. Intermittent WTP operation causes excessive drawdown in the High Reservoir water level to as little as 8.5 feet during the summer peak demand period. The rehabilitated WTP will be capable of operating at night with advanced “state of the art” automation and require minimal staffing, which would in turn eliminate reliance on stored water to meet off peak demand.