

# Swan Hills Treatment Centre

## Waste Water Reclamation System

Swan Hills, AB, January, 2016

The Swan Hills Treatment Centre is the only facility of its kind in Canada and one of few in the world. It has played a principal role in ridding the province of hazardous waste such as fungicides, insecticides, PCBs, dioxins and other chemicals. The Centre is located 200 km NW of Edmonton.



*The primary and secondary filtration featuring Dow ultrafiltration membranes*

The Swan Hills Treatment Centre is operated by SENA, a global engineering and contracting firm, under contract with the Alberta government. SENA provides a variety of services to meet environmental and infrastructure needs for industry and government.

BI Pure Water was selected by SENA Waste Services to provide a treatment system to reclaim waste water for reuse for the main plant's processes. The goal was to provide additional process makeup water and to improve the quality of the waste water that is injected into the deepwell.

The system was delivered on a skid and installed inside the existing waste treatment facility. The system is designed to treat wastewater flows of 397 L/min (105 USGPM) after treatment from the Clarifier, with total estimated daily volume of 577,364 L (152,540 USG). Up to 132 L/min water will be reclaimed and 201 L/min (53 USGPM) will be rejected to the Deep Well holding tanks.

Influent is made up of the blowdown from a rotary kiln incinerator, leachate from a hazardous waste landfill process and effluent from an inorganic treatment facility. The process treated waste water has an average temperature before treatment of 47°C. The minimum temperature of the wastewater is 22°C and the maximum temperature is 66°C. The average total dissolved solids (TDS) is estimated to be 32,000 mg/L.

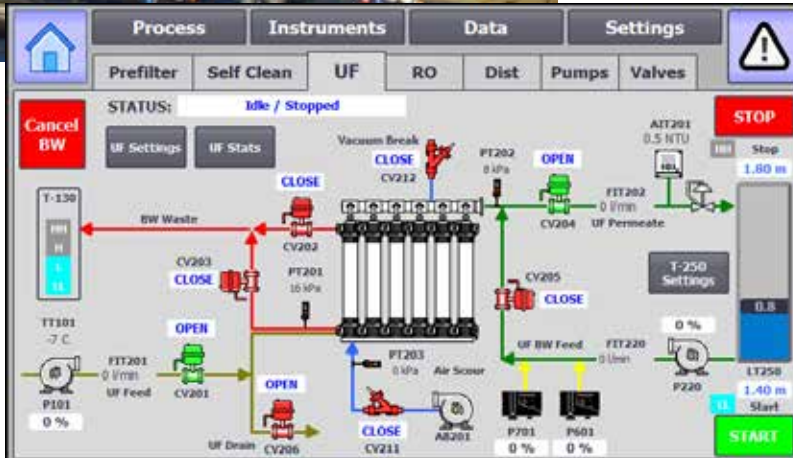
The system contains the following treatment processes, in order:

- a) Primary filtration system: Self-cleaning disk or spin filters for pre filtration
- b) Secondary fine filtration system: \*\* highly efficient Dow IntegraFlux UF filters for pre-filtration
- c) Tertiary very fine filtration system: Reverse Osmosis unit with Dow membranes, booster pump and Energy Recovery Device (ERD)
- d) Five chemical dosing systems: anti-scalant, sodium metabisulphite, pH correction, sodium hypochlorite and acid.



Above: The RO system uses energy recovery to save significant power costs.

Right: A typical HMI screen with the ultrafiltration system selected



- e) Separate Clean-in-Place systems are provided for the UF and RO system. A filter vessel with a 20 or 5 micron filter cartridge filters the cleaning solution during the CIP process.
- f) Backwash and waste handling system: backwash tank and pump
- g) Treated water storage and distribution system: two tanks and pumps

BI Pure Water engineers utilized “Design for Resilience” when conducting the detailed design. This is the strategic design of infrastructure and other systems to sustain required operations during and after the impact of severe disturbances, plus adapt to longer term influences.

Challenges to the process design included the varying inlet TDS levels and wastewater quality, plus the relatively high temperature of the wastewater. Energy recovery was important as it represents a 30 to 40 percent reduction in power costs.

Al Wakelin, SENA's project consultant stated: “Let me say we are very happy with the way the system has operated to date and our operating staff are impressed with the control system and how the units starts up. The system has been operated at design throughput with no hydraulic issues. The inlet wastewater TDS is less than design right now and, as expected, recovery percent is somewhat above design. I have enjoyed working with you and the field staff and from our side, budget and schedule constraints have been satisfied.”

BI Pure Water (BIPW) specializes in reviewing water quality test results, analyzing customer needs and then prescribing the most cost-effective solution. BIPW engineers pilot, design, manufacture, install, start-up and commission package water treatment plants.



BC & North American award winning design & manufacture

[bipurewater.com](http://bipurewater.com)



#2 - 9790 190th Street  
 Surrey, BC  
 Tel: (604) 882-6650  
 Toll-free: 1 (888) 901-3111