



FilterBoxx™
Water & Environmental Corp.

FilterBoxx Packaged Water Solutions Customer: Canadian Gold Producer

Sanitary Wastewater Treatment Plant for Mining Installation

YOUR WATER
OUR SOLUTIONS

FilterBoxx Water and
Environmental Corporate
Headquarters
5716 Burbank Road S.E.
Calgary, Alberta
Canada T2H 1Z4
Tel: +1.403.203.4747
Fax: +1.403.203.4774
Toll Free: +1.877.868.4747
Email: info@filterboxx.com

FilterBoxx Packaged Water
Eastern Canada/USA
2829 Sherwood Heights Dr.
Suite 101, Oakville, Ontario
Canada L6J 7R7
Tel: +1.289.881.0200
Fax: +1.289.881.0201

FilterBoxx Energy Services
Operations Headquarters
364 Saskatchewan Avenue
Spruce Grove, Alberta
Canada T7X 3B4
Tel: +1.780.960.0999
Fax: +1.780.960.0744

FilterBoxx Energy Services
Grande Prairie & N.E. British
Columbia
21 County Industrial Park
Grande Prairie, Alberta
Canada T8V 5N3
Tel: +1.780.532.0543
Fax: +1.780.532.1784

The customer's camp is part of a largely unexplored land package of over 103,000 hectares (over 254,518 acres) located approximately 65 kilometers north of Stewart in northwestern British Columbia. The Knipple Glacier is located 5,000 feet above sea level and is noted as having the second highest snowfall rating in Canada. With ice-roads as the primary method of travel in and out of this temporary workforce housing installation, access to and from the site was very limited. In addition to the challenges with a remote site, the plant was required to produce treated water effluent that meets and exceeds the Ministry of Environment's discharge water quality requirements as it was destined to be discharged in a nearby body of water.

FilterBoxx became involved with the project in mid-2014 with the supply and plant operations of a temporary & mobile sanitary WWTP. The plant supported the existing on-site work camp and treated 75m³/day of wastewater. The Membrane Bioreactor (MBR) plant was supplied completely pre-assembled and tested/commissioned prior to shipping. This unit was designed to withstand the harsh Canadian climate that would be expected atop the glacier. FilterBoxx was responsible for complete plant operations and performed routine plant maintenance during this time period.



WWTP being transported to the top of the glacier.

During mid-2015, following regulatory and finance approvals, FilterBoxx initiated pre-design on a plant expansion for a permanent installation. The permanent plant was awarded to FilterBoxx based on our standard pre-engineered design in September 2015, ready for delivery in Q1 2016.

The permanent treatment system will continue to utilize MBR technology to meet the strict discharge regulations for surface water. The system capacity was expanded to 150 m³/d and now includes a sludge dewatering and drying system as part of the expanded supply. The sludge dewatering and drying system is an integral step in the overall solids handling and disposal system for the camp site. Solids from the MBR at 1.0 - 2.0% will be further dewatered to >25% prior to incineration at site. These systems will be supplied by FilterBoxx completely pre-assembled and tested/commissioned prior to shipping. Overall foot print of the permanent plant, including sludge dewatering and drying equipment, will be 3 modular buildings: 3 x [10' x 50'].

Remote Systems and Data Acquisition

The operations & technical support team can remotely access and operate the WWTP from anywhere in the world. This operating data is automatically transmitted to a local server that stores, trends and displays data which is reviewed and assessed by our experienced process technical support team. This fully automated system requires very little operator intervention.

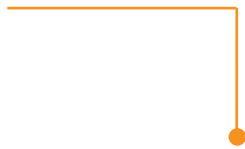
General Process Design and Overview

This WWTP includes Membrane Bioreactor (MBR) technology, which combines the proven activated sludge process with the absolute barrier characteristic of ultrafiltration (UF) membranes, producing treated effluent of the highest quality. The simplified system is becoming the method of choice for WWTP installations, by requiring very minimal operation and maintenance, and the ability to fit into a very small footprint. This type of facility also has the unique ability to operate at various flux rates (i.e. flow throughput), depending on the season and influent variability. The temporary WWTP operated for approximately 12 months and consistently achieved average effluent qualities as illustrated in the table below.

Final Treated Water Quality		
BOD5	mg/l	< 5.0
TSS	mg/l	< 5.0
TP	mg/l	< 0.15

The selected hollow fibre UF membranes are referred to as “outside-in” filters; the solids that are filtered out of the waste water are retained in the process tanks, and are pumped to the onboard Aerobic Digester for further processing. waste activated sludge (WAS) is periodically pumped from the membrane process tanks to maintain optimal concentrations of bacteria.

The UF membranes are designed for industrial applications (i.e. high solids and chemical environments), and are very robust, durable, low maintenance and operator friendly.



The FilterBoxx equipment endured some of the harshest climates on top of the frigid glacier. During the winter, it was completely submerged in heavy cold snow and it operated consistently.