



Waste Water Treatment

Oil & Gas Client

403.295.8054

clearbakk@alsys-group.com

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BACKGROUND:

ClearBakk was approached by a major oil and gas client in Alberta to help in treating their wastewater collected from 1700 people camp to meet unrestricted reuse standards (California Title 22) which is more stringent than Alberta Environment discharge standards.



MAIN FEATURES:

- Membrane bioreactor system is used to meet stringent discharge standards.
- Use of membranes allows for a faster startup time and more reliable effluent quality than traditional extended aeration plants.
- The membrane removal is provided within a heated enclosure, membranes can be serviced at any time of the year.
- Modular Sewage Treatment Plant (STP). Minimum on-site setup time. Stack design facilities no piping, heat trace or electrical connections are required on-site between the STP buildings.
- All tanks and screens are closed and vented outside with access hatches allowing visual observation of the process, allowing the top building to be classified as general purpose, and preventing build up of moisture.

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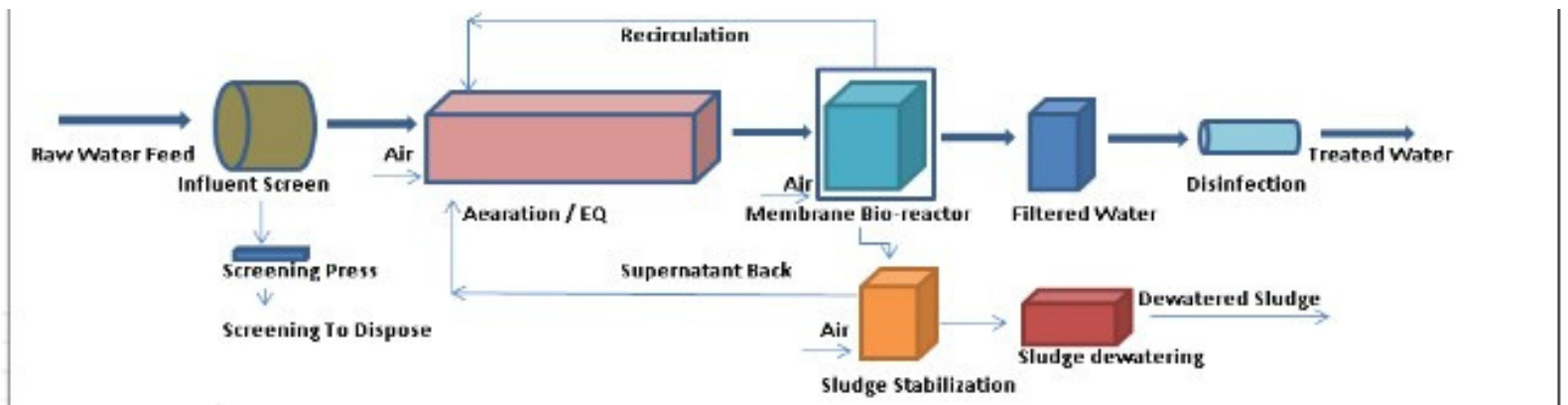
ADVANTAGES:

- **Two loads:** easy to install, minimal inter-module connection between two containers, does not require multiple containers to be connected.
- **Safety:** numerous safety and operator friendly features, including overhead crane, process tanks are sealed and vented outside, lockable hand-off-auto switches for easy equipment LOTO on Control Panel, gas detectors, smoke detector and mounted fire extinguishers.
- **Smallest footprint:** 76 feet long and 14' wide.
- **Modular:** easy for expansion; additional plant module can be installed in parallel for future camp increases.
- **Highest Quality:** all tanks, structural members and flooring are aluminum alloy for longevity and avoids rusting of components, ensuring the asset life is maximized.

SYSTEM INTRODUCTION:

| Constituent | Average 5-day carbonaceous Biological Oxygen Demand (cBOD ₅), mg/L | Peak 5-day carbonaceous Biological Oxygen Demand (cBOD ₅), mg/L | Total Suspended Solids (TSS), mg/L | Ammonia-Nitrogen (NH ₃ -N), mg/L | Alkalinity (as CaCO ₃), mg/L | PH | oil and grease, mg/L | influent Temperature, °C | Total Coliform, MPN / 100ml |
|-------------|--|---|------------------------------------|---|--|----------|----------------------|--------------------------|-----------------------------|
| Influent | 400 | 600 | 400 | <40 | >350 | >7; <8.5 | <80 | >15; <25 | |
| Effluent | 5* | - | 5* | - | - | 6.5-8.5 | - | - | 2.2** |

Total coliform bacteria 2.2 MPN per 100 mL, based on a seven sample median and does not exceed 23 MPN per 100 mL in more than one sample in a 30 day period.

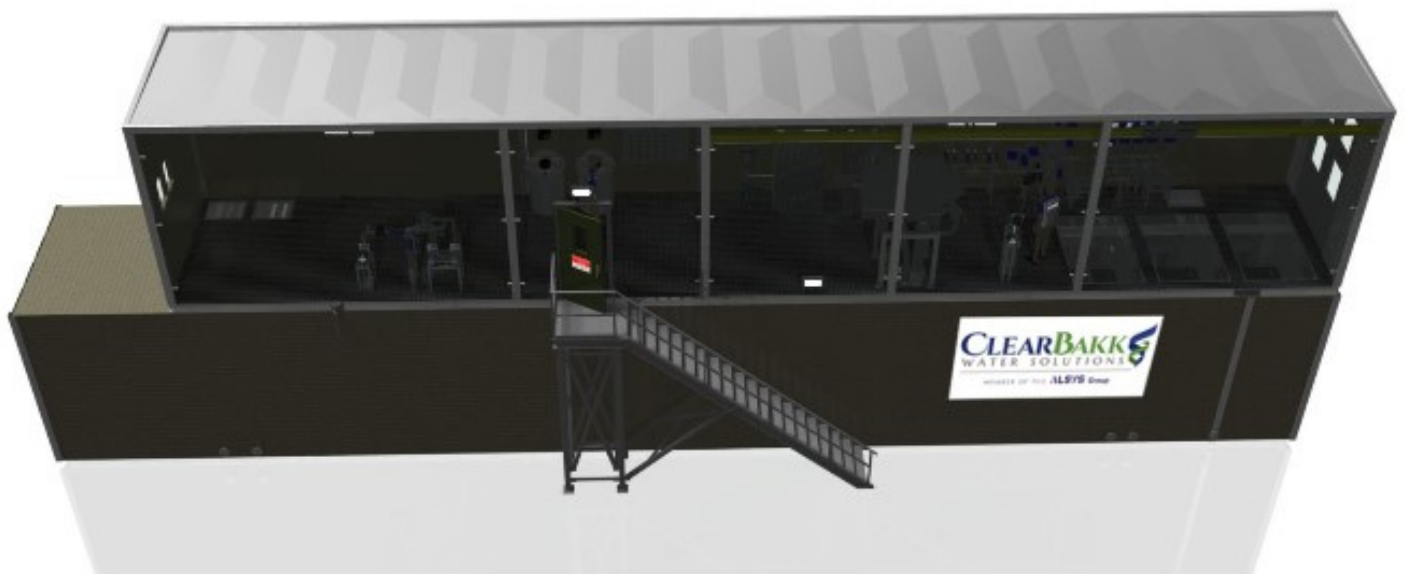


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SYSTEM OVERVIEW:

- Design population: **1660**
- Design average day flow (DAF): **375 m3/day**
- Peak hourly influent flow: **1468 L/min**
- Expansion room was left for future capacity.
 - **Easy expansion to 2,000 population with flow rate of 440 m3/day**
- **Effluent to meet discharge and unrestricted reuse standards (California Title 22)**
- Harsh climate in the winter: **ambient air temperature (minimum) -42°C**
- Building Size: **14' W x 80'-10" L x 12'-11" H + 14' W x 63'-8" L x 13'-2" H**



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SUMMARY:

Plant Profile:

- Modularized package; easy to install, easy for expansion; minimize the site work.
- Two-story building, minimize the footprint. Easy to move if needed.
- One tank structure contains all the treatment retention time for aeration, equalization, membranes and sludge storage.
- Spacious top building provides adequate room and access to all equipment, storage for spare parts.

TREATMENT ACHIEVED:

Treated water quality met or exceeded quality guidelines.

