

Mobile Water Services Case Studies



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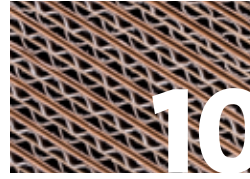
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Mobile Water Services Capabilities

Keeping Industry Flowing

Veolia offers reliable, secure, 24/7 services to suit all requirements. Pre-packaged on a trailer, skid, or container for maximum mobility and responsiveness, a portable water treatment plant will instantly enhance your facility by providing consistent and reliable water treatment.

We provide a full-service offering with flow rates ranging from 20 gpm to 5,000 gpm. Our solutions include high-quality assets to rent, consumables, spare parts, chemicals, and services. All pre-engineered with 'plug-and-play' connections for ease of use.

Three Flexible Service Offerings

- **Planned:** Maintain the provision of treated water during scheduled maintenance, upgrade, or commissioning.
- **Multi-Year:** Standard water treatment solutions for up to seven years.
- **Emergency:** Short-term, immediate response to cover and ensure business continuity in the case of an unexpected event.

Applications

- Clarification
- Discfiltration
- Ultrafiltration
- Chemical Softening
- Polishing Demineralization
- Reverse Osmosis
- Specialty Ion Exchange

For More Information

water.info@veolia.com

+1 800.337.0777

www.veoliawatertech.com



Confidential Power Producer

Location: Québec, Canada

Client Needs

- Raw water treatment of river water for boiler water
- Maintenance involving a steam blow procedure which included the need for highly deionized water
- Treatment capacity: 150 gpm



Solution

- 1 filtration skid (MOFI 3x60)
- 1 mobile reverse osmosis trailer (MORO 4x25T) in double-pass mode
- Ion Exchange vessels (MOFI 1200) to achieve $<1.0 \mu\text{S}/\text{cm}$

Benefits

- Ensure continuity during a planned maintenance
- Guaranteed quantity and quality water for production needs





Confidential Chemical Producer

Location: Texas, USA

Client Needs

- Refurbishment of current RO membranes
- Continuous supply of low conductivity demineralized water during the refurbishment
- Some unforeseen weather conditions (winter storm) had created emergency conditions



Solution

- 1 mobile reverse osmosis trailer (MORO 4X25T) to ensure treated water of up to 100 m³/hr (440 gpm) and <10 µS/cm
- 1 mobile filtration skid (MOFI 3x60)

Benefits

- Ensure continuous operation of production
- Emergency deployment to minimize risk during weather event





Pretium Resources Brucejack Mine

Location: British Columbia, Canada

Client Needs

- The client requested service to provide a temporary mine water treatment solutions while the permanent plant was being designed
- Contract duration: 2.5 years



Solution

- 1 mobile Actiflo® clarification unit
- The 1,100 gpm (250 m³/h) temporary mobile plant was designed for TSS, metals and toxicity removal



Benefits

- Environmental compliance for low level metals
- Temporary plant allowed for design and installation of permanent plant



Confidential Chemical Producer

Location: Louisiana, USA

Client Needs

- 50-100 gpm of demineralized water at $<10 \mu\text{S}$
- Feed water source: clarified river water
- Application: maintenance, tank cleaning
- The client struggled with inlet flow and wanted some flexibility to keep the plant running



Solution

- 1 filtration skid consisting of 5 micron bags followed by 1 micron filters
- 4 mobilizations of ten million grain capacity mobile demineralization trailers (MODI)

Benefits

- Rapid response to meet client's project deadlines
- Continuous production of demineralized water
- Flexible and full service





Teck Resources

Location: British Columbia, Canada

Client Needs

- The client urgently needed to remove 200,000 – 300,000 m³ of water from their tailings pit in three months.
- The client needed to dewater the mine pit in order to meet blasting target date so the production schedule was critical and needed rapid mobilization of a mobile water treatment system.



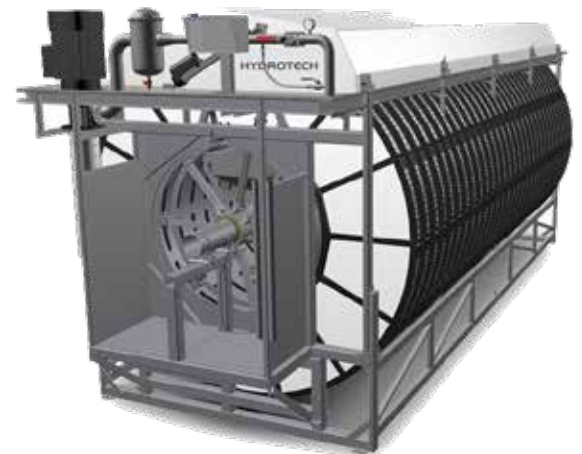
Mobile Actiflo Unit

Solution

- 1 Actiflo[®] High-Rate Clarification unit for metals precipitation at 10,000 m³ / day capacity
- 1 Hydrotech Discfilter unit for tertiary polishing
- Hydrex water treatment chemicals

Benefits

- All discharge permit requirements and the mine pit was dewatered in advance of the deadline such that blasting could be completed as scheduled
- Water quality met the Federal Water Quality Objectives



Hydrotech Discfilter

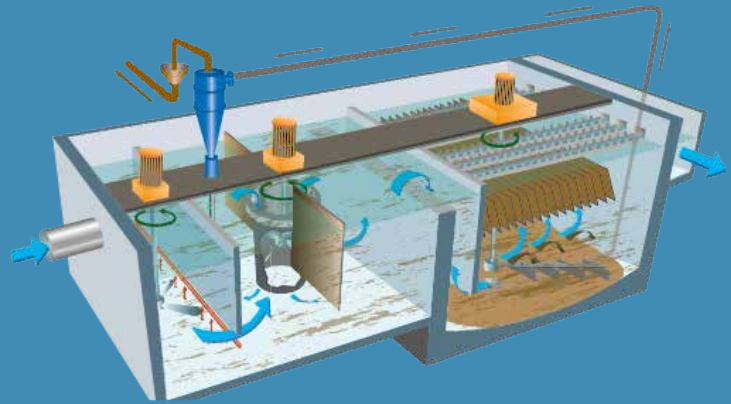


Confidential Chemical Producer

Location: Ohio, USA

Client Needs

The site had scheduled maintenance work to be carried out on one of their two secondary clarifiers, but did not want to throttle production which would occur if a shutdown was needed



Solution

1 Actiflo® clarification mobile unit

Benefits

- Small footprint of Actiflo® clarification unit
- Ability to handle the influent feed of 3,000 – 4,000 mg/l mixed liquor suspended solids (MLSS)
- Reliable solution for the client with no disruption to production





Nunavik Nickel Mine

Location: Québec, Canada

Client Needs

- The client needed to dewater a tailings pond to remove toxicity from the permeate
- The site had a very high concentration of thiosalts that required treatment
- The site is located in a very remote area of Canada



Solution

- Mobile reverse osmosis mobile units fitted with nanofiltration membranes treating 4,800 m³/d of permeate

Benefits

- Thiosalts removal is over 99.9%
- Multi-year rental lowered mine site's CAPEX budget by utilizing OPEX expenditures instead



Confidential Oil Refinery

Location: Alberta, Canada

Client Needs

- Existing clarifier was scheduled for maintenance then suddenly broke down which demanded an urgent response
- Raw water treatment of river water for demineralizer feed



Solution

- 2 mobile ultrafiltration trailers (MOUF 4x80T) producing >1200 GPM of less than 0.25 NTU filtered water each
- 2 storage tanks (MOTK 30C)
- 4 duplex pump skids (MOPS I170)

Benefits

- Ensured consistent water quality required to prevent demineralizer fouling and maintain boiler production
- Refinery production was not interrupted
- Veolia's operational team provided support throughout the entire critical emergency repair time frame





Confidential Chemical Producer

Location: Tamaulipas, Mexico

Client Needs

- Feed water source was having high salinity increases due to lack of rain and intrusion of saline water
- The period of operation of the RO was undefined as it was depending on the coming of the rainy season



Solution

- Mobile reverse osmosis trailer (MORO 4x25T) supplying 440 GPM capacity to produce 10-20 $\mu\text{S}/\text{cm}$ water quality
- The mobile RO provided the most optimal solution due to large changes in conductivity in the feedwater

Benefits

- Speed of the response to bring an RO unit was key to restore the client's production
- Salinity in the raw water was subject to spikes of high conductivity but the RO permeate was continually producing a low permeate conductivity (less than 20 μS) at same production level
- Full service from Veolia to operate the plant and solve all the interfaces and issues to bring product water to its center of production



Confidential Pulp & Paper Mill

Location: Ontario, Canada

Client Needs

- The client was in need of urgent maintenance of their existing demin units so temporary demin trailers were utilized to maintain production continuity
- A solution needed to be customized to the plant's need for line connection and pressurization



Solution

- 2 mobile reverse osmosis trailers (MORO 4x25T) to ensure 900 GPM of treated water at 10 μ S/cm
- 1 Break Tank (MOTK 30)
- 2 Pumping Skids (MOPS I170)

Benefits

- Rapid response to meet client's needs to maintain continuous production
- Veolia's operational team provided instrumental support during throughout the emergency repairs





Confidential Sugar Refinery

Location: Louisiana, USA

Client Needs

- The refinery was losing its DI plant to produce water for their boiler. Their production was jeopardized if a rapid solution was not implemented.
- The challenge was to find an adequate response to:
 - the needed quantity of water (60 GPM)
 - reach the right quality with safety (less than $0.5 \mu\text{S}/\text{cm}$)
 - pump the water in the client's high pressure line



Solution

- 1 Filtration Skid (MOFI 3x60)
- 1 Reverse Osmosis Skid
- 2 Mixed Bed Polishing Filters (MOFI 1200)
- 1 Break Tank (MOTK 30C)
- 1 Pumping Skid (MOPS I170)

Benefits

- A full line of treatment line adapted to the flow of the client (100 GPM) was implemented quickly to ensure production continuity



Confidential Oil Refinery

Location: Ohio, USA

Client Needs

- The client was in need of water production in several locations throughout the refinery in order to produce the necessary cleaning water quality and quantity during its planned outage period
- In order to increase the lifetime of the refining units, the client needed water with a very low chloride content for the cleaning of these units



Solution

- 4 Filtration Skids (MOFI 3x60)
- 4 mobile Reverse Osmosis trailers (MORO 4x25T) to supply 1,800 GPM of treated water to ensure effluent quality of less than 10 μ S/cm and less than 5ppm of chloride

Benefits

- Veolia was on-site for the duration of the outage in order to adapt and respond in a timely manner to all the needs and issues that client was experiencing during the outage
- Veolia was also very present during the preparation of the outage to make sure all expectations of client were handled the best way





Confidential Pulp & Paper Mill

Location: New Brunswick, Canada

Client Needs

- The client has been struggling with its demin system due to poor quality of the feed water. Operation cost needed to be optimized (resin replacement, chemical cleaning and labor involved).
- A new boiler in the plant was also installed and increased the need for a larger volume of pretreated water.
- Space in the plant was an issue as layout offered little space for an UF unit and its ancillary equipment.

Solution

- 1 Mobile Ultrafiltration Trailer (MOUF 4x80T)
- 1 Break Tank (MOTK 30C)
- 2 Pumping Skids (MOPS I170)

Benefits

- Due to the limited space at the plant, Veolia was able to offer a complete solution with enough capacity inside one UF trailer
- Final treated water included 1,400 GPM capacity with a final effluent quality of less than 0.25 NTU



Confidential Chemical Company

Location: Louisiana and Texas, USA

Client Needs

The client needed to ensure a continuous supply of demin water at all times at their plants in Texas and Louisiana in order to maintain production during the cold winter months



Solution

1 mobile Reverse Osmosis trailer (MORO 4x25T) was added to the water production at each site in order to secure a more autonomous water production

Benefits

- The mobile reverse osmosis trailer was able to produce a total capacity of 440 GPM while ensuring effluent quality of 10 to 15 $\mu\text{S}/\text{cm}$
- The plants were able to maintain continuous production during the winter
- By utilizing the mobile reverse osmosis unit, the client was able to limit the use of DI trailers thus optimizing operational costs





Confidential Food & Beverage Producer

Location: Ohio, USA

Client Needs

The client needed to optimize its operational cost by using well water for its process water. This involved a reverse osmosis unit with a high capacity of 600 GPM and the need to adapt the pretreatment ahead of the RO with a multimedia filter.



Solution

- After benchtop, and onsite piloting, Hydrex 6783 (Filter Aid Coagulant) and Multimedia Filter was found to provide value to the RO performance via enhanced particle removal as well as specialized in-situ RO membrane cleaning.
- 2 Filtration Skids (MOFI 2700)
- 1 Mobile Reverse Osmosis trailer (MORO 600)
- Hydrex water treatment chemicals



Benefits

- Water savings
- Improved demineralizer performance
- Increased time between ion exchange resin regeneration cycles
- Reduced chemical consumption



Confidential Pulp & Paper Mills

Location: Arkansas & Mississippi, USA

Client Needs

The clients were having issues with their demin production and needed to quickly implement a solution to ensure adequate supply for their production facilities.



Solution

1 Mobile Demineralization trailer (MODI) offering 10 million capacity producing less than 1 $\mu\text{S}/\text{cm}$ of effluent water at each of the paper mill facilities

Benefits

- Provided a high-quality water source to ensure production wast not interrupted
- Due to the close proximity of Veolia's regeneration center to each of the paper mills, the clients have ease-of-mind in case another emergency need arises



Resourcing the world

Veolia Water Technologies

Phone +1 800.337.0777

water.info@veolia.com • www.veoliawatertech.com