

NAPIER - REID

Package Water Treatment Plants



Napier-Reid's Package Water Treatment Plants are designed to provide potable water for municipal applications from varying raw water sources.



NR – Package WTP - Process Description

Napier-Reid designs and fabricates package water treatment plants to produce potable water for municipal applications or quality water for industrial applications. They can remove suspended solids, turbidity, colour, odour and TOC from the raw feed water.

Purification is accomplished in several stages such as chemical mixing, coagulation, flocculation, clarification, filtration and disinfection. The main plant components include rapid mixer, flocculator, clarifier with tube settlers or dissolved air flotation system and a high rate gravity filter.



COAGULATION

In the first stage of the package water treatment plant, the raw water is fed into a rapid mixing zone where neutralizing and coagulating chemicals are added. Coagulants neutralize the charge and promote collisions between the small suspended particulates, called colloids, enabling them to form flocs.

FLOCCULATION

The coagulated water enters the flocculation tank. A coagulant aid or polymer is usually added to strengthen the floc bonding. Slow stirring motion in the flocculation chamber promotes collision between the forming precipitates and the remaining contaminant particles to form larger flocs.

CLARIFICATION

The coagulated and flocculated water is evenly distributed across the clarifier using well designed distribution laterals under the tube settlers. Tube settlers are used to promote rapid clarification. The tube settler consist of square tubes, usually inclined at 60 degrees, which causes the “captured” floc particles to settle by gravity to the bottom of the clarifier and form sludge.

The sludge accumulates in the bottom of the clarifier’s hopper and is withdrawn through a desludge valve at regular intervals. A collection system on the over the surface collects and directs the clarified water to the filters.

Dissolved air flotation clarifiers can also be provided for high rate clarification.



FILTRATION

Clarified water enters the high rate gravity filter for removal of the remaining finer solid particles. Based on the application, the filter media can be dual media, multi-media, GAC, greensand or MD-80. The water passes through the layers of the media and is collected by the under drain system. This filtered water is then sent for disinfection or further processing.

Salient Features of NR – Package Water Treatment Plants

• **PROCESS**

- Package WTP is based on proven technologies, and designed to provide safe drinking water for municipal applications or industrial applications from varying raw water sources.
- The three-stage treatment process: coagulation/flocculation, clarification and filtration, produces highly pure water that meets or exceeds Canadian Drinking Water Standards.
- Highly stable process produces potable water even during peak flow conditions, very low influent water temperature or fluctuations in raw water qualities like turbidity and temperature.
- Effectively removes turbidity, suspended solids, color, odor and TOC.

• **DESIGN & EQUIPMENT**

- Custom designed and fabricated to suit the process and layout requirements.
- Highly efficient and robust rapid mixers, flocculators and clarifiers.
- No moving or rotating parts in clarifier with tube-settlers.
- Depending upon application, the filter cell is provided with dual media, multi-media, GAC, greensand or MD-80 (for Fe, Mn and H₂S removal).
- High rate gravity filtration cells with an efficient underdrain system that evenly collects the filtered water and distributes the backwash water.
- Air scour system included to enhance backwash efficiency.
- Easy to install and start-up.
- High degree of automation provided for least operator attention. Plant comes with PLC / SCADA control system and operator interface.
- The package plant can be easily transported to site.
- High quality workmanship and aesthetic finish.
- Material of construction: Marine grade aluminum, stainless steel or epoxy coated carbon steel.

• **SPACE and O & M Cost**

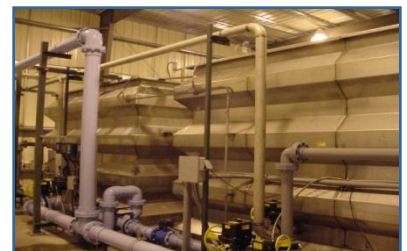
- Compact design with high rate clarifiers and filters results in smaller footprint.
- Simple and practical design for ease in operation and maintenance.
- No addition of costly chemicals or special microsands in clarifier, resulting in reduced operating cost.
- No recirculation and washing of special microsands, resulting in lower power consumption.
- Highly efficient backwash system in filters results in cleaner media, hence longer filter run time, leading to lower power consumption.
- Robust system design and quality components results in minimal maintenance.



▲ **Town of Marmora, Ontario**
Design Flow: 4008 m³ per day



▲ **Town of Port Carling, ON**
Design Flow: 1584 m³ per day



▲ **Monteith, Ontario**
Design Flow: 1816 m³ per day



▲ **Village of South River, ON**
Design Flow: 1680 m³ per day

NR – Package WTP Applications

Municipal Water

Industrial Water



Town of Limoges, Ontario
Design Flow: 1680 m³ per day



Vermillion Bay, Ontario
Design Flow: 1344 m³ per day

About Napier - Reid

Over 60 years of excellence in water & wastewater treatment

Napier-Reid is located in the greater Toronto area in the Province of Ontario, Canada. We supply engineering services and process equipment for water and wastewater treatment.

We have the technology, resources and experience to design, manufacture and implement innovative water and wastewater treatment solutions worldwide. We have completed over 3000 projects since our inception in 1950. This stands as a testament of our ongoing commitment of providing the highest quality service, products and after sales support in the industry. Our capabilities include engineering, manufacturing, installation and field support. We have in-house personnel for complete mechanical, electrical and instrumentation process and control system design. As a manufacturer, our designs focus on cost-effective solutions, simplicity of installation and ease of maintenance.

Napier-Reid has developed an excellent team with many years of experience. We have a well-deserved reputation for innovation, service and integrity. A significant portion of Napier-Reid's business is now exported to regions such as the Caribbean, Central America, South America, Middle East, Eastern Europe, Africa, and Asia. Some of these projects are financed by Canadian government or International financing institutes. As a Canadian manufacturer, we are eligible for Canadian governmental funding and EDC export credit. We have the capability to handle a large range of projects, from engineering, equipment supply, installation, start-up, to turnkey projects. Let Napier-Reid be your single solution for water and wastewater purification.



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