



AQUA-AEROBIC SYSTEMS, INC.
A Metawater Company

SUCCESS STORIES

PLANT NAME AND LOCATION

MACLAREN INDUSTRIES - THURSO, QUEBEC

AVERAGE DAILY FLOW

22.6 MGD (85,551 m³/day)

AQUA-AEROBIC SOLUTION

(41) 75 HP Aqua-Jet[®] AERATORS, (6) 75 HP ThermoFlo[®] SPRAY COOLERS

MACLAREN'S PULP MILL UPGRADED TO MEET NEW REQUIREMENTS AND AID IN PROTECTING THE ENVIRONMENT

MacLaren Industries' kraft pulp mill, located in Thurso, Quebec was built in 1958 and used only a primary treatment process for treatment of its pulp waste until the mid 1990s. It was at this time that more stringent effluent requirements for BOD₅ were defined for discharge into the nearby Ottawa River. To meet the new requirements and to make a commitment to protecting the environment, MacLaren decided to employ a secondary treatment process.

In 1995, MacLaren installed (41) 75 HP Aqua-Jet[®] surface aerators in an aeration basin to biologically treat its pulp waste. Six 75 HP ThermoFlo[®] surface spray coolers were also installed at this time in an adjacent basin to cool the pulp wastewater prior to biological treatment.

Aqua-Aerobic Systems equipment was chosen by MacLaren because of its reputation for efficiency and economical operation. It also was highly recommended by other pulp mills already employing Aqua-Aerobic equipment. MacLaren's new treatment process has enabled the plant to consistently meet effluent requirements and reduce pollution into the Ottawa River.

MacLaren's kraft pulp mill currently produces 238, 000 metric tons of pulp annually. This includes hardwood pulp and four specialty pulps, which are used to produce high quality papers such as parchment and photographic.



A number of MacLaren's Aqua-Jet[®] aerators in operation. The ThermoFlo[®] spray coolers can be seen in the background.

Aqua-Jet® AERATOR PROCESS

The Aqua-Jet aerator is a mechanical direct-drive unit designed to provide optimum oxygen transfer in a variety of municipal and industrial wastewater applications. The performance of the Aqua-Jet also provides the mixing necessary to uniformly disperse oxygen and organic matter within the microbial population.

Basin water is pumped up into the intake cone and through the volute, and is dispersed through the diffusion head in a spray pattern. Oxygenation occurs at two critical points, when the water exits the diffusion head and when the spray enters the water surface.



Illustration of the Aqua-Jet® Spray Pattern

ThermoFlo® SPRAY COOLER PROCESS

The operation of the ThermoFlo spray cooler is fairly simple. Process water is pumped through a heavy-duty cast manifold and is divided between each of the unit's spray arms. Discharge of the process water occurs at the end of each arm through a cast anti-clog nozzle.



ThermoFlo® Spray Coolers in operation.

DESIGN CHARACTERISTICS

MacLaren typically utilizes 22 to 24 of its (41) 75 HP Aqua-Jet aerators at any one time for biological treatment of its pulp waste and to reduce BOD₅ and TSS to required levels.

Because the temperature of the pulp waste is so high, it is necessary to cool it prior to biological treatment during the summer months. MacLaren chose to employ (6) Aqua-Aerobic ThermoFlo® spray coolers as an alternative to cooling towers and cooling ponds, to efficiently dissipate the heat of the waste.

AVERAGE OPERATING DATA

LOADING	DESIGN INFLUENT	AVG INFLUENT	PERMIT EFFLUENT	AVG EFFLUENT
AVG Flow mgd	22.6	17.2	----	----
BOD ₅ mg/l	438	330	52	8
TSS mg/l	478	275	84	15

Aqua-Jet® AERATOR ADVANTAGES

- Available in 1-150 HP
- Vibration controlled design
- Superior oxygen transfer
- Low maintenance
- Propeller design provides non-clog operation and greater efficiency
- One-piece shaft design means no couplings and no submerged bearings
- Lower initial cost, and less expensive to install than gear reduced (slow speed) units
- Endura® Series motor available - 5 year no maintenance