

## FACT SHEET No. 39

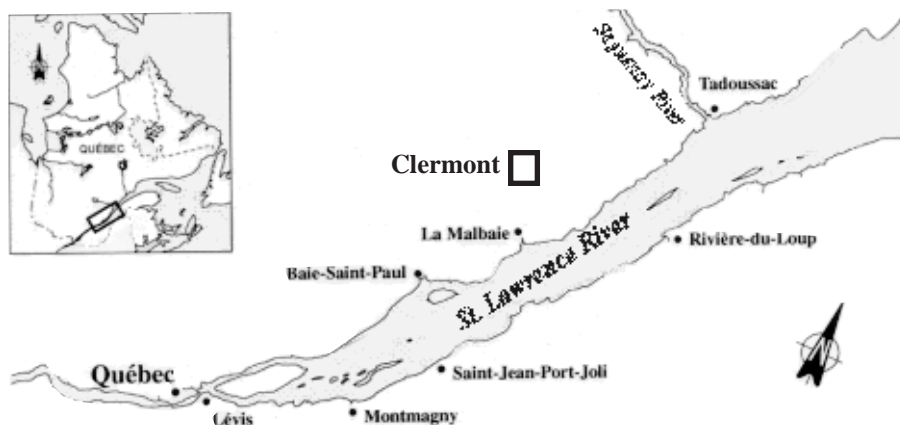
# Donohue Forest Products Inc.

100 Donohue Street  
Clermont, Quebec  
G4A 1A7

*A list of 106 industrial plants has been established under St. Lawrence Vision 2000 (SLV 2000), the second phase of the St. Lawrence Action Plan, launched in 1988. The overall objective is to reduce liquid toxic waste and virtually eliminate discharges of persistent toxic substances.*

*The 106 industrial plants designated under SLV 2000 are divided into four groups, each of which has been given a specific objective. The DONOHUE FOREST PRODUCTS INC. mill, located in Clermont, is part of Group 4, comprising the 50 plants targeted under the St. Lawrence Action Plan.*

*The objective set for Group 4 is to pursue cleanup efforts and perform environmental monitoring to achieve a 90% reduction in liquid toxic waste. Between 1988 and 1995, the 50 plants reduced their toxic effluent discharges by 96%.*



## INDUSTRIAL PLANT

### Newsprint

The DONOHUE FOREST PRODUCTS INC. mill in Clermont makes newsprint by a process using only thermomechanical pulp. The screened wood chips are stored in two stacks of 3000 t each, then moved by conveyor to the silo of the pulping section. Four pressurized refiners (primary and secondary) reduce the prewashed chips. The resulting stock passes through pressurized screens and centrifugal cleaners, then is thickened and placed in four storage tanks. The steam from the pulping process is used in drying the paper. The pulp is bleached with sodium hydrosulphite. Since January 1993, the mill has used some de-inked pulp (0-25%), which it buys from suppliers and treats on site by diluting the bales in white water.

The finished product is made by two late-model paper machines. That newsprint is packaged and stored or else shipped directly to customers by truck, train or boat.

## PRODUCTION

### PRINCIPAL RAW MATERIALS

- Wood chips (spruce, fir, jack pine)
- De-inked pulp (outside suppliers)

### FINISHED PRODUCT

- Newsprint

# TREATMENT MEASURES

## INITIAL EFFLUENT VALUES

*BOD<sub>5</sub> and ss*

According to company data, in 1988 the mill had an average effluent discharge of 56 793 m<sup>3</sup>/d, containing:

- 24 574 kg/d of biochemical oxygen demand (BOD<sub>5</sub>)
- 9112 kg/d of suspended solids (ss)

## RESOURCES AND USES TO PRESERVE

*Sensitive environment*

The DONOHUE FOREST PRODUCTS INC. paper mill in Clermont is located on the Malbaie river, about 10 km from the mouth of the St. Lawrence. The company had a dam built at the confluence of the two rivers in order to float logs, but discontinued that practice in 1985. Wastewater from the mill is discharged into the river through an outfall downstream from the dam. The three commercial fisheries in the area harvest American eel, Atlantic sturgeon, capelin, rainbow smelt, Atlantic tomcod and Atlantic herring. That fishery takes place mostly at the confluence of the Malbaie and St. Lawrence rivers. Migratory birds (Black Duck, Common Goldeneye, Common Eider and diving ducks) frequent the riverbanks in spring and fall.

The Malbaie region is known for its beautiful landscapes, and tourism is among the main local activities. However, two campgrounds and a park are the only recreational facilities downstream from the dam. One of those spots gives bathers and rowers access to the river. In summer, the waters are used for windsurfing and boating. Water sports are concentrated in the vicinity of two marinas, at Pointe-au-Pic and Cap-à-l'Aigle.

## WATER QUALITY BASED OBJECTIVES

*Environmental protection*

Water quality based objectives are established to preserve local resources and uses. These guidelines, expressed as maximum permissible loads and concentrations for effluent released into the environment, are used in choosing treatment methods which best promote environmental protection. The water quality based objectives for DONOHUE FOREST PRODUCTS INC. will be available on request by 1997.

## EFFLUENT TREATMENT

*Primary treatment*

The process wastewater from the mill flows by gravity into a main sewer, from which two pumps (one in continuous operation, the other on standby) circulate the effluent to a 150 foot diameter primary clarifier for the removal of suspended solids. The clarified water is pumped to a secondary treatment system. The sludge is pumped, dewatered under pressure and burned in a bark digester. Uncontaminated water from the paper machines is mixed with the clarified water at the clarifier outlet. A pumping station discharges the sanitary wastewater into the Clermont public sewerage system.

## PREVENTION AND CLEANUP SYSTEMS IMPLEMENTED

*\$37 million invested*

Treatment measures begun in 1990 included a reduction in freshwater withdrawal, white-water recycling and the separation of uncontaminated water. These measures have cut down on wastewater volume and contamination.

Since September 1993, the DONOHUE FOREST PRODUCTS INC. mill in Clermont has used wood chips as its sole raw material; it no longer debarks logs. Discontinuation of the debarking process has reduced effluent volume and content.

In the summer of 1994, the company undertook the construction of an activated-sludge secondary treatment system and the installation of a fluidized-bed boiler for burning primary and secondary sludge. A pumping station was built to circulate water from the primary clarifier to the secondary treatment system, consisting of an aeration tank, a secondary clarifier and a reserve tank. A generator has been installed to keep part of the treatment setup running in case of power outage. These projects have been completed since August 1995; the total cost of the work is estimated at \$37 million.

## REGULATORY COMPLIANCE - WATER COMPONENT

*Compliance with new standards*

The DONOHUE FOREST PRODUCTS INC. mill in Clermont is subject to the Quebec Regulations Respecting Pulp and Paper Mills and the federal Pulp and Paper Effluent Regulations. The treatment measures and new secondary treatment system (September 1995) enable the facility to meet the new standards that have been in effect since September 30, 1995.

# POLLUTION ABATEMENT

## CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

### *Oil and grease*

The Chimiotox index gauges the load of all toxic substances present in industrial effluent, using the toxicity factor assigned to each one. It is used, among other things, to monitor discharge trends over the years (see Figure 1) and determine the proportion of each pollutant (see Table 1).

Table 1 gives the data supplied by the company, in accordance with provincial regulations governing pulp and paper mills, for the months of October to December 1995, as well as the Chimiotox values calculated from those figures, for an effluent flow of 29 438 m<sup>3</sup>/d. The figures show a predominance of oil and grease in the treated wastewater; these make up 82% of the Chimiotox index.

Figure 1 is plotted from the 1990 Action Plan characterization data, which were used to extrapolate Chimiotox indices for 1988-1994. The projections for 1995 are based on the efficiency of the activated-sludge secondary treatment system. The 1995 treatment measures lowered the Chimiotox index by 95% relative to the 1988 level.

Table 1 *Chimiotox Index (1995) - Donohue Forest Products Inc., Clermont mill\**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Mineral Oil and Grease	18.297	100	1830
Total Lead	0.674	314	212
Total Aluminium	5.778	11	64
Dehydroabietic Acid	0.786	77	60
Total Zinc	2.408	9.4	23
Abietic Acid	0.835	19	16
Stearic Acid	0.188	19	4
Isopimaric Acid	0.196	19	4
Total Nickel	0.193	10	2
Linoleic Acid	0.097	19	2
Sandaracopimaric Acid	0.098	19	2
Oleic Acid	0.066	19	1
Levopimaric Acid	0.073	19	1
Palustic Acid	0.029	19	1
Pimaric Acid	0.077	19	1
<b>CHIMIOTOX INDEX **</b>			<b>2223</b>

\* For effluent discharge of 29 438 m<sup>3</sup>/d.

\*\* October to December 1995.

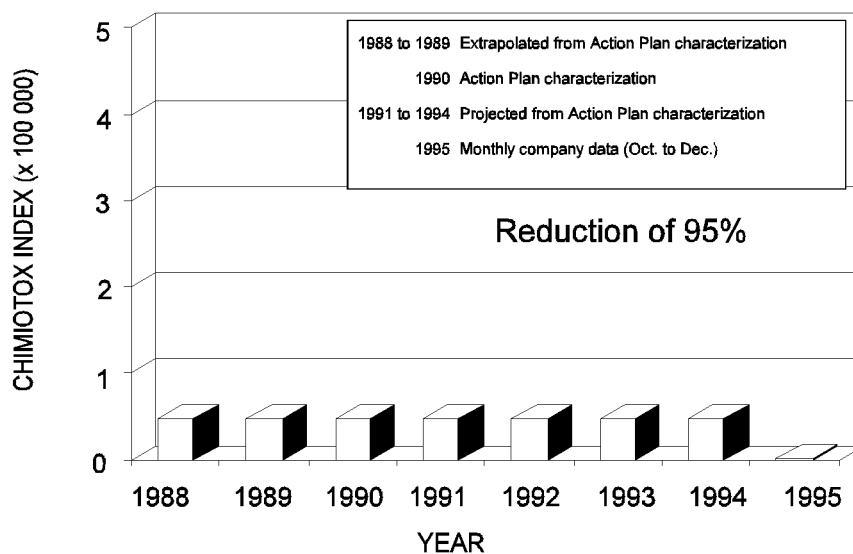


Figure 1 *Changes in toxic effluent discharges, 1988-1995 - Donohue Forest Products Inc., Clermont mill*

## VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

### *No persistent toxic substances*

One long-range objective of SLV 2000 is the virtual elimination of 11 persistent bioaccumulative toxic substances from the St. Lawrence and its tributaries. The targeted substances are those designated by the International Joint Commission in August 1993: PCBs, DDT, dieldrin, toxaphene, dioxins, furans, mirex, mercury, lead alkyl, benzo(a)pyrene and hexachlorobenzene.

No persistent toxic substances were detected according to the monthly data for October to December 1995.

## PEEP TOXICITY REDUCTION

### *Non-toxic effluent*

The Potential Ecotoxic Effects Probe, or PEEP, combines the results of six standardized bioassays measuring the toxic effects of effluent. The results are expressed on a logarithmic scale of increasing toxicity ranging from 1 to 10 and are used to monitor discharge trends over the years. One series of bioassays was conducted for the DONOHUE FOREST PRODUCTS INC. mill in Clermont. The 1990 PEEP index was estimated at 6.0.

Since September 30, 1995, the provincial Regulations Respecting Pulp and Paper Mills have prohibited discharging a final effluent whose toxicity has reached an acute lethality level (as demonstrated by bioassays with rainbow trout) into a storm sewer or elsewhere in the environment. The implementation of new cleanup measures at the DONOHUE FOREST PRODUCTS INC. mill in Clermont has helped reduce the toxicity of the effluent. Since the new secondary treatment system came on stream the effluent has been non-toxic.

## REDUCTION IN SUBSTANCES MONITORED

### *Reduction in ss, BOD<sub>5</sub> and effluent flow*

According to company, data for October to December 1995, the mill had an average effluent discharge of 33 665 m<sup>3</sup>/d, containing:

- 2104 kg/d of suspended solids (ss)
- 982 kg/d of biochemical oxygen demand (BOD<sub>5</sub>)

Company data for 1988-1995 show ss reduced by 77%, BOD<sub>5</sub> by 96% and effluent flow by 41%. That performance is explained by the treatment measures implemented since 1988, the shutdown of the debarking process in September 1993, and the August 1995, startup of a new secondary treatment system.

## KEY POINTS

- **Startup in August 1995 of an activated-sludge secondary treatment system and a fluidized-bed biomass boiler (an investment of more than \$37 million)**
- **95% reduction in the Chimiotox index**
- **Shutdown of the debarking process in September 1993**

Based on December 1995 inventory.  
Information reviewed by Gilles Legault, SLV 2000.

## ADDITIONAL INFORMATION

### **Chimiotox index and PEEP:**

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