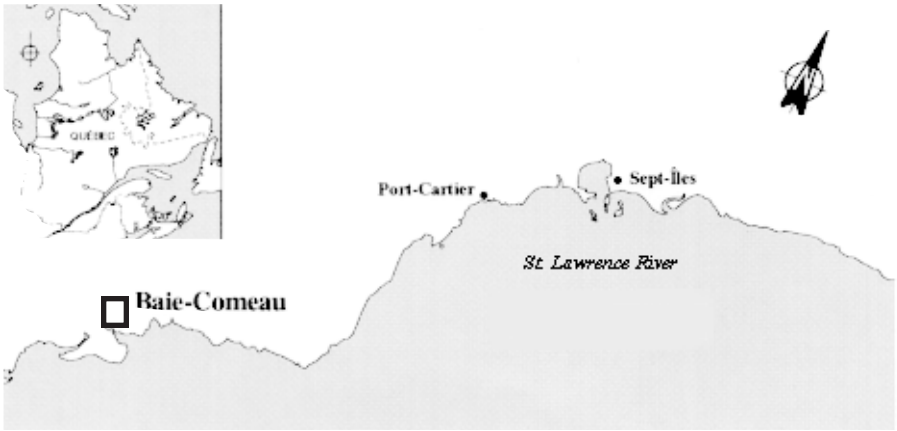
FACT SHEET No. 41

DONOHUE QUNO INC.

20 Marquette Street
Baie Comeau, Quebec
G4Z 1K6



A list of 106 industrial plants has been established under Saint 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 QUNO INC. mill, located in Baie Comeau, 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

A large North Shore paper company

DONOHUE QUNO INC. pulp and paper mill at Baie Comeau (formerly known, variously, as the QUNO CORPORATION and the Quebec and Ontario Paper Company Ltd.) produces 566 477 t of newsprint per year from thermomechanical, OPCO and recycled pulps. Since late 1994, it has manufactured pulps from wood chips and printing waste only; logs are no longer used. In 1995, the mill operated at 83% capacity and employed a work force of about 1000.

PRODUCTION

PRINCIPAL RAW MATERIALS	FINISHED PRODUCT
• Wood chips • Packing board	• Newsprint

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

BOD_5 and SS

According to company data, in 1988 the mill had an effluent discharge of 128 537 m^3/d, containing:

- 65 247 kg/d of biochemical oxygen demand (BOD_5)
- 15 560 kg/d of suspended solids (SS)

The chemical pulping process used at the time was discontinued in June 1990.

RESOURCES AND USES TO PRESERVE

A diverse natural environment

DONOHUE QUNO INC. discharges its process wastewater into the St. Lawrence at Baie Comeau. In 1994, it relocated the final outfall to a permanently submerged point. The heavily used area includes a cottage community, a riverfront park, beaches, a marina, boating and fisherman's wharves, boat-launching ramps and boat service points. Diving is another activity in the area, but poor water quality has ruled out swimming at Pointe Saint-Gilles. Flats provide habitat for game birds, and eiders and brants are hunted. Colonies of nesting birds occupy the riverbanks below the outfall. Marine mammals (belugas, seals, minke and finback whales, porpoises) regularly frequent the area. Though there is little commercial or sport fishing in the Baie Comeau region several species of fish and other marine organisms (cod, halibut, flounder, turbot, herring, whelk, shrimp, snow crab) generate some activity. A shellfish bed between the commercial port and the Reynolds wharf was closed to commercial harvesting.

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. DONOHUE QUNO INC.'s water quality based objectives will be available on request by 1997.

EFFLUENT TREATMENT

Secondary treatment system

The DONOHUE QUNO INC. mill discharges all process wastewater through one outfall. Wastewater from the wood preparation unit is treated in a primary settling pond and then mixed with the other process wastewater in a second primary settler before being sent to a secondary treatment system. Water low in suspended solids content (less than 100 mg/L) is discharges untreated. Sanitary wastewater empties into the municipal sewerage system.

PREVENTION AND CLEANUP SYSTEMS IMPLEMENTED

An investment of close to $52 million

In June 1994, the company undertook the construction of an activated-sludge secondary treatment system. The project involved the addition of a pumping station, aeration lagoons and secondary settling ponds, as well as modifications to the existing primary settlers and the relocation of the final outfall. It also called for facilities to collect wood chip and biomass leachate and separate uncontaminated process wastewater. These measures, completed in June 1995, improve effluent quality enough to meet the standards prescribed in the new pulp and paper mill regulations. The overall project cost is estimated at $52 million.

REGULATORY COMPLIANCE - WATER COMPONENT

Compliance with new standards

The DONOHUE QUNO INC. mill in Baie Comeau is subject to the Quebec Regulations respecting Pulp and Paper Mills and the federal Pulp and Paper Effluent Regulations. The treatment systems completed in 1994 and 1995 bring the company into compliance with Quebec's new regulatory standards, which took effect September 30, 1995.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

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 therefrom, for an effluent flow of 86 814 m^3/d. The figures show a predominance of aluminum, stearic acid and zinc in the treated wastewater, their respective shares in the Chimiotox index being 44%, 22% and 19%.

Figure 1 is plotted from the 1990 characterization data, which were also used to extrapolate Chimiotox indices for 1988-1994. For 1995, company data for the months of October to December 1995 were used to calculate the Chimiotox index, which shows a 99% reduction between 1988 and 1995.

Table 1 ***Chimiotox Index (1995) - DONOHUE QUNO INC.****

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total Aluminum	26.147	11	288
Stearic Acid	7.457	19	142
Total Zinc	13.073	9.4	123
Dehydroabietic Acid	0.778	77	60
Abietic Acid	1.591	19	30
Oleic Acid	0.601	19	11
Total Nickel	0.327	10	3
CHIMIOTOX INDEX**			**657**

* For effluent discharge of 86 814 m^3/d.
** October to December 1995.

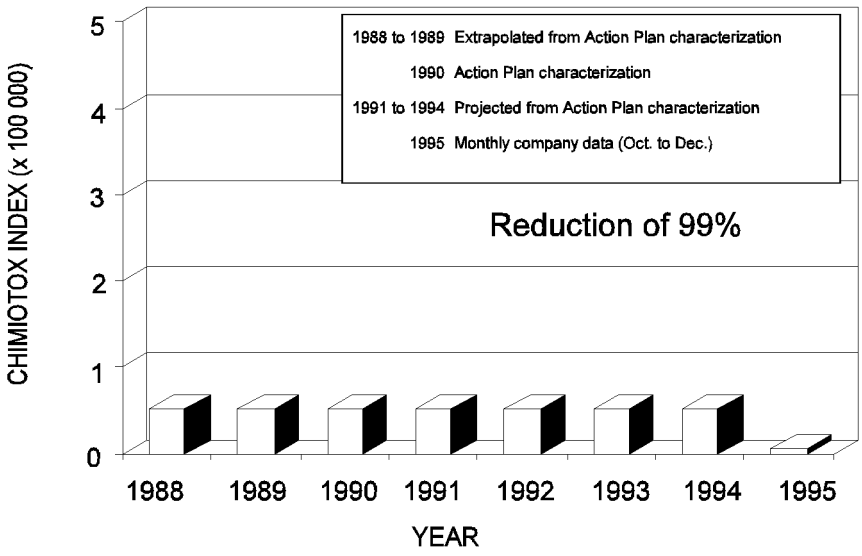


Figure 1 ***Changes in toxic discharges, 1988-1995 DONOHUE QUNO INC.***

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.

Monthly figures for October to December 1995 show that no persistent toxic substances were detected.

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 QUNO INC. mill in Baie Comeau. The 1990 PEEP index was estimated at 7.2.

Since September 30, 1995, the provincial Regulations Respecting Pulp and Paper Mills have prohibited discharge of 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. Compliance with the new standards should lower the PEEP value by the next evaluation. According to the monthly data for October to December 1995, the final effluent is non-toxic.

REDUCTION IN SUBSTANCES MONITORED

BOD_5 and SS reduced

According to company data for October to December 1995 the mill had an effluent discharge of 94 287 m^3/d, containing:

- 2075 kg/d of suspended solids (SS)
- 1677 kg/d of biochemical oxygen demand (BOD_5)

Company data for 1988-1995 show effluent BOD_5 reduced by 97% and SS by 87%. This performance was progressively achieved through the June 1990 shutdown of the chemical pulping process, the 1991-1992 modifications to plant processes under the suspended solids reduction program, and the recent startup of the new secondary treatment system.

KEY POINTS

- **99% reduction in the Chimiotox index**
- **Relocation of the final outfall to a permanently submerged point**
- **New wastewater treatment system ($52 million investment)**

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

ADDITIONAL INFORMATION

Chimiotox index and PEEP: Gilles Legault, Environment Canada (514) 283-3452.

Water quality based objectives: Francine Richard, MEF (418) 644-3574.

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