

FACT SHEET 98

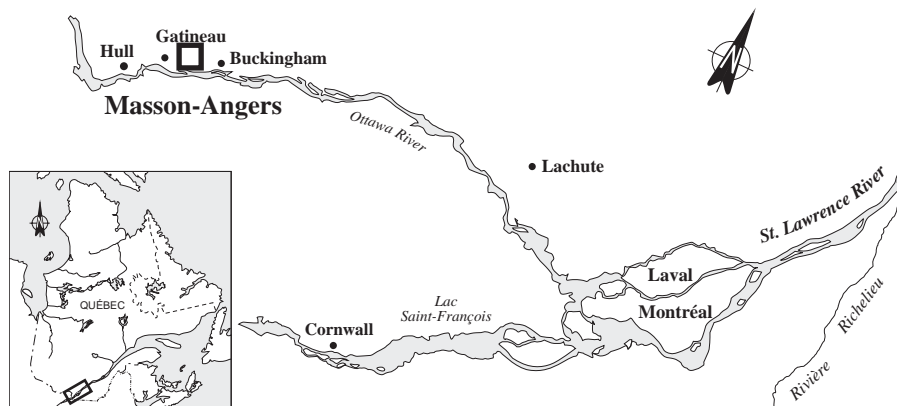
James MacLaren Industries Inc., Newsprint Division

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Masson-Angers, Quebec
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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 toxic effluent and virtually eliminate discharges of persistent toxic substances.

The 106 industrial plants designated under SLV 2000 are divided into four groups, each with a specific objective. The JAMES MACLAREN INDUSTRIES INC., NEWSPRINT DIVISION mill in Masson-Angers is in Group 3, which comprises regulated industrial plants.

The objective for Group 3 is to check toxic discharges of regulated plants against environmental objectives and to establish corrective measures for maximum reduction of deleterious effects on the receiving environment.



INDUSTRIAL PLANT

Newsprint mill

The JAMES MACLAREN INDUSTRIES INC., NEWSPRINT DIVISION mill manufactures newsprint from chemical and mechanical pulp prepared on site and from purchased Kraft pulp and de-inked recycled paper. The wood chips used to make the chemical pulp are cooked in a sodium bisulphite liquor, washed and refined before pulping. The pulp produced is screened before it is mixed with other pulps and fed to the paper machine. Mechanical pulp is produced from defibred ground logs. The pulp is refined, screened, mixed, and fed to the paper machine, where the paper web is formed. Production capacity of the mill is about 620 t/d. In 1995, the mill operates at 93% design capacity and employs a work force of 450.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Logs (softwood and aspen)
- Softwood chips
- Pulp from de-inked recycled paper
- Kraft pulp

FINISHED PRODUCT

- Newsprint

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Mainly BOD₅

According to company data, in 1993 the mill discharged 41 258 m³/d of effluent containing notably:

- 20 740 kg/d of biochemical oxygen demand (BOD₅)
- 2700 kg/d of suspended solids (ss)

RESOURCES AND USES TO PRESERVE

Abundant and diversified wildlife

The JAMES MACLAREN INDUSTRIES INC., NEWSPRINT DIVISION mill in Masson-Angers empties its effluent off the right bank of du Lièvre River, 2 km from its mouth in the Ottawa River. Regional wildlife is abundant and diversified downstream of the plant. Some twenty fish species feed, spawn and rear their young in the waters of Baie Clément, north of the plant. Every year, hundreds of thousands of Canada geese use the region as a staging area, tens of thousands stopping in Baie Clément alone. Eleven duck species nest in the area, which is protected for waterfowl. Every year, the region attracts some 400 hunters as well as sport fishermen. The area is also used for other recreational activities and has vacation cottages. The first water intake downstream of the discharge point is in Lac des Deux Montagnes and supplies the towns of Vaudreuil and Deux-Montagnes.

ENVIRONMENTAL DISCHARGE OBJECTIVES

Environmental protection

Environmental discharge 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. Environmental discharge objectives for JAMES MACLAREN INDUSTRIES INC., NEWSPRINT DIVISION, will be available by 1997.

EFFLUENT TREATMENT

Activated sludge treatment

Mill effluent undergoes primary treatment mainly to reduce ss concentration. Since 1995, mill effluent has also been subjected to an activated sludge secondary treatment process before release into the du Lièvre River.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Secondary treatment

The mill is no longer supplied by log running, as it was until 1994. Instead, a dry debarking and cross-cutting unit was built, at a cost of \$4.5 million. During the log-running era, the wood lost its bark and much of its resin in the river. An increase in biochemical oxygen demand in mill effluent was accordingly noted after the new method of supply was introduced. In April 1994, when authorization was obtained, the company began building a secondary activated sludge treatment system. Because of this system, together with the primary treatment, biochemical oxygen demand level has dropped and the effluent is no longer toxic. About \$31 million was invested in these improvements.

REGULATORY COMPLIANCE - WATER COMPONENT

Standards met

JAMES MACLAREN INDUSTRIES INC., NEWSPRINT DIVISION, is subject to the provincial and federal pulp and paper regulations. The introduction of a secondary treatment system has made it possible for the company to meet the latest provincial standards, which came into force on September 30, 1995.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Mainly mineral oil and grease

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

Table 1 gives company monthly data for the last quarter of 1995 along with the Chimiotox values calculated from them assuming an effluent flowrate of 38 523 m³/d (exceptionally, fatty and resin acid loads are based on company data for March and April 1996). According to these data (supplied by the company in compliance with the provincial pulp and paper regulation), mineral oil and grease account for 43% of the Chimiotox index, total lead account for 27% and total copper for 22%.

Figure 1 is plotted from characterization data collected in 1991 for the industrial effluent abatement program (PRRI) and from company monthly data for the last quarter of 1995. The Chimiotox index calculated from the PRRI characterization data was applied to 1993 and 1994. Projections for 1996 to 1998 are based on company monthly data for the last quarter of 1995. The drop in Chimiotox index is due to the introduction of an activated sludge secondary treatment system.

Table 1 *Chimiotox Index (1995) - James MacLaren Industries Inc., Newsprint Division**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Mineral oil and grease	13.110	100	1311
Total lead	2.622	314	823
Total copper	1.482	451	668
Total aluminum	11.483	11	126
Total zinc	13.090	9.4	123
Dehydroabietic acid	0.193	77	15
Total nickel	0.384	10	4
Stearic acid	0.154	19	3
Linoleic acid	0.038	19	1
Oleic acid	0.077	19	1
Isopimaric acid	0.038	19	1
CHIMIOTOX INDEX			3076

* Assuming a effluent flowrate of 38 523 m³/d

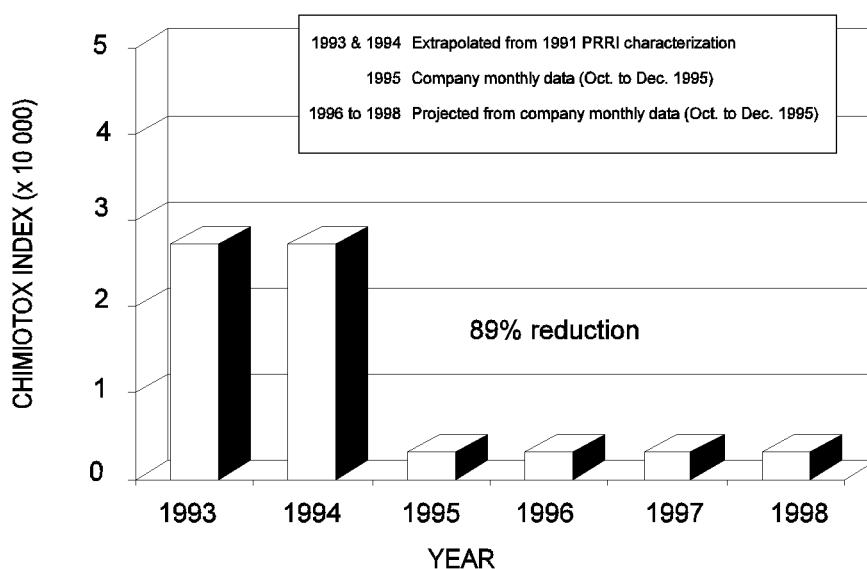


Figure 1 *Chimiotox Index trends (1993 to 1998)*
James MacLaren Industries Inc., Newsprint Division

VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

One long-range objective of SLV 2000 is the virtual elimination of eleven persistent bioaccumulative toxic substances from the effluent of 106 priority plants located on 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 alkyls, benzo(a)pyrene and hexachlorobenzene. To reach this objective, Protection has fixed the environmental discharge objectives set for applicable substances as its target by the end of SLV 2000 in 1998, thereby ensuring that all uses of the receiving environment are protected.

None of these eleven persistent bioaccumulative toxic substances appears in mill effluent according to company monthly data for the last quarter of 1995.

EFFLUENT TOXICITY

Non-toxic effluent

Since September 30, 1996, it has been illegal under the Quebec pulp and paper regulation to release into the environment or a storm sewer a final effluent that is acutely lethal to rainbow trout, as demonstrated by bioassays. The new secondary treatment system at the JAMES MACLAREN INDUSTRIES INC., NEWSPRINT DIVISION plant has helped to reduce effluent toxicity. Data for the last quarter of 1995 indicate that final effluent is not toxic.

REDUCTION IN SUBSTANCES MONITORED

Reduced loads

According to company data, in 1995 the mill discharged 37 465 m³/d of effluent containing notably:

- 2097 kg/d of suspended solids (ss)
- 927 kg/d of biochemical oxygen demand (BOD₅)

Despite cessation of log running, biochemical oxygen demand dropped 96% and suspended solids load dropped 22% between 1993 and 1995. The decrease in loads is due mainly to the secondary treatment system introduced in 1995.

KEY POINTS

- **89% reduction in Chimiotox index**
- **Introduction of a secondary treatment system in 1995 at a cost of \$31 million**
- **Construction of a dry debarking unit in 1994 at a cost of \$4.5 million**
- **Non-toxic effluent**

Based on December 1995 inventory

ADDITIONAL INFORMATION

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