FACT SHEET 85

St. Laurent Paperboard Inc., Matane Mill

90 Industrial Park

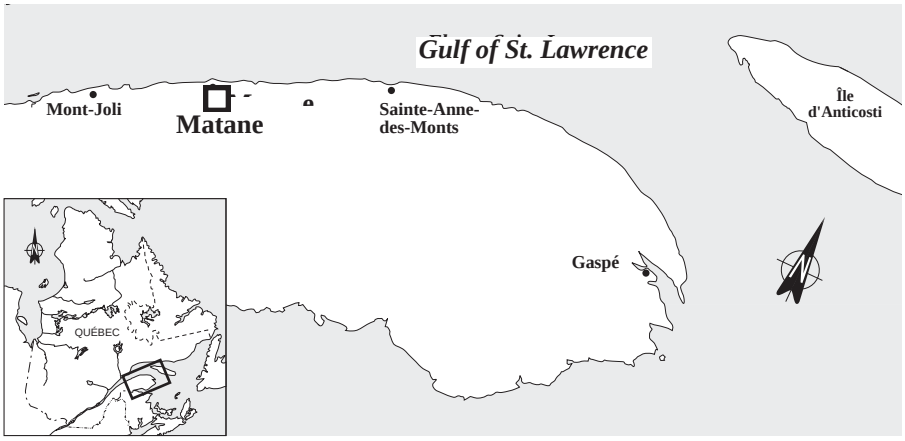
Matane, Quebec

G4W 3M9

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 general 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 ST. LAURENT PAPERBOARD INC., MATANE MILL is part of Group 3, which comprises regulated industrial plants.

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



INDUSTRIAL PLANT

Produces recycled paperboard

The ST. LAURENT PAPERBOARD INC., MATANE MILL makes corrugated board from bundles of old paperboard. The bundles are pulverized and the pulp obtained run through a variety of refining and screening operations before stocking. The unbleached pulp is then conveyed to a fourdrinier-type paper machine for manufacture of the finished product. Annual production capacity of the mill is 112 200 t of corrugated paperboard. In 1995, the plant operates at 102% design capacity and employs a work force of 142.

PRODUCTION

PRINCIPAL RAW MATERIAL	FINISHED PRODUCT
• Old paperboard	• Corrugated paperboard

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Mainly BOD_5

According to company data, in 1993 the mill discharged an average 7980 m^3/d of effluent containing notably:

- 25 570 kg/d of biochemical oxygen demand (BOD_5)
- 2432 kg/d of suspended solids (SS)

RESOURCES AND USES TO PRESERVE

Fishing, a major source of income

The ST. LAURENT PAPERBOARD INC., MATANE MILL empties its effluent into the St. Lawrence estuary at the Matane harbour. Neighbouring waters are used mainly for fishing (commercial and sport) and recreation. Fishing is a major source of income in the Matane area. The main species harvested are herring, mackerel, cod and whelk. Ocean sport fishing takes place mainly at the mouth of the Matane, where rainbow smelt stop every year on their way to tributaries further upstream. The Matane River is famous for its Atlantic salmon; sport fishing here generates economic spin-offs valued at $1 million a year. The most popular area is downstream of the Mathieu-d'Amours dam, not far from the fishway. Parc des Îles, which is near the dam, has a rest area with a beach and is suitable for a variety of recreational activities.

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 to select treatment methods which best promote environmental protection. There are no environmental discharge objectives for the ST. LAURENT PAPERBOARD INC., MATANE MILL because it operates in closed circuit.

EFFLUENT TREATMENT

Recirculation and separation

Since 1995, effluent from both pulping facilities and from the paperboard machine is completely recirculated and the cooling water is separated. Domestic sewage is separated, channeled to the municipal sewerage system and then treated in aerated ponds in the Matane wastewater treatment plant.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

$18 million invested

The company introduced a water cleanup plan in October 1988. This plan was modified in 1992 when a pulping facility for recycled paperboard was built. In December 1993, the semichemical pulp facility was shut down, resulting in a decline in SS loads and BOD. In 1995, the company modified its process so that cooling waters could be separated and industrial wastewater completely recirculated. At the same time, the company also built a facility for evaporation of spent cooking liquor, so the chip cooking facility, which uses a semichemical neutral sulphite process, could be started up again in 1996. Certificates of authorization were requested from the Ministère de l'Environnement et de la Faune du Québec (MEF). These improvements cost a total of $18 million.

REGULATORY COMPLIANCE - WATER COMPONENT

Standards met

The ST. LAURENT PAPERBOARD INC., MATANE MILL is subject to the provincial pulp and paper regulation as well as the federal regulation governing pulp and paper mill effluent. With the implementation of environmental measures, the company has complied with the latest provincial standards, which came into force on Septembre 30, 1995.

VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

One long-range objective of SLV 2000 is the virtual elimination of eleven persistent and bioaccumulative toxic substances from the effluent of the 106 targeted plants along 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 the eleven targeted persistent and bioaccumulative toxic substances were detected during the effluent self-monitoring program activities of the last quarter of 1995.

EFFLUENT TOXICITY

Non-toxic effluent

Since September 30, 1995, 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. New cleanup measures implemented at the ST. LAURENT PAPERBOARD INC., MATANE MILL have helped to reduce effluent toxicity. Data from the last quarter of 1995 indicate that the final effluent is non-toxic.

REDUCTION IN SUBSTANCES MONITORED

Significant reductions

According to company data, in the last quarter of 1995 the mill discharged an average 2511 m^3/d of effluent, containing notably:

- 977 kg/d of biochemical oxygen demand (BOD_5)
- 75 kg/d of suspended solids (SS)

According to company data, between 1993 and 1995 biochemical oxygen demand dropped 96%, suspended solids dropped 97%, and effluent flowrate diminished by 69%. These decreases are due to the shutdown of the semichemical pulping facility in December 1993 and the measures taken in 1995 to separate and recirculate water.

TECHNOLOGICAL DEVELOPMENT

Water recirculation

The ST. LAURENT PAPERBOARD INC., MATANE MILL has taken measures to recirculate industrial wastewater generated by the mill. An industrial wastewater treatment system was introduced and the process water cycle closed. More than 3 t of dissolved and suspended solids are recovered every day thanks to these changes that is more than 1% of mill production. The ST. LAURENT PAPERBOARD INC., MATANE MILL is possibly the first corrugated paperboard plant in Canada to operate closed circuit. The project cost a total of $4.5 million.

KEY POINTS

- **100% reduction in Chimiotox index and non-toxic effluent**
- **Semichemical pulp facility closed in December 1993**
- **Cleanup measures taken in 1995: separation of cooling water, complete recirculation of industrial wastewater and construction of a chip cooking-liquor evaporation facility; $18 million invested**
- **Restart of chip cooking facility planned for 1996**

Based on December 1995 inventory

ADDITIONAL INFORMATION

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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 shows company monthly data for the last quarter of 1995 along with Chimiotox values estimated from them assuming an effluent flowrate of 2511 m^3/d. According to these data (supplied by the company as required by the provincial pulp and paper regulation), mineral oil and grease dominate the wastewater, accounting for 89% of the Chimiotox index.

Figure 1 is based on characterization data collected for the industrial effluent abatement program (PRRI) in 1991 and company data for the last quarter of 1995. The Chimiotox index calculated from the 1991 PRRI characterization data was applied for 1993. For 1994, the index was adjusted to reflect the closing of the semichemical pulp facility. Projections for 1996 to 1998 assume recirculation of industrial wastewater.

Table 1 ***Chimiotox Index (1995) - St. Laurent Paperboard Inc., Matane Mill****

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Mineral oil and grease	0.991	100	99
Total aluminum	0.663	11	7
Dehydroabietic acid	0.031	77	2
Total zinc	0.144	9.4	1
Total nickel	0.005	10	<1
Linoleic acid	0.003	19	<1
Oleic acid	0.012	19	<1
Stearic acid	0.006	19	<1
Abietic acid	0.024	19	<1
Chlorodehydroabietic acid	0.016	19	<1
Isopimaric acid	0.005	19	<1
Pimaric acid	0.003	19	<1
CHIMIOTOX INDEX			**111**

* Assuming an effluent flowrate of 2511m^3/d

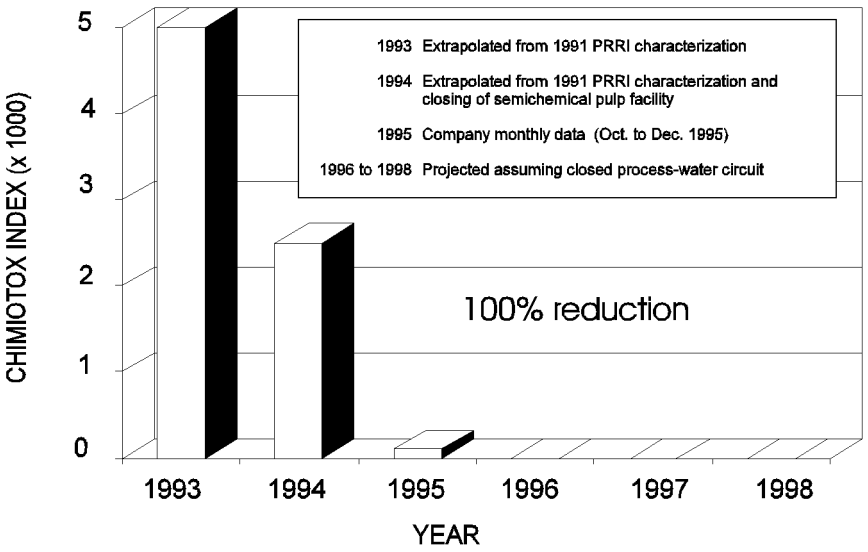

Figure 1 ***Chimiotox Index trends (1993 to 1998) St. Laurent Paperboard Inc., Matane Mill***