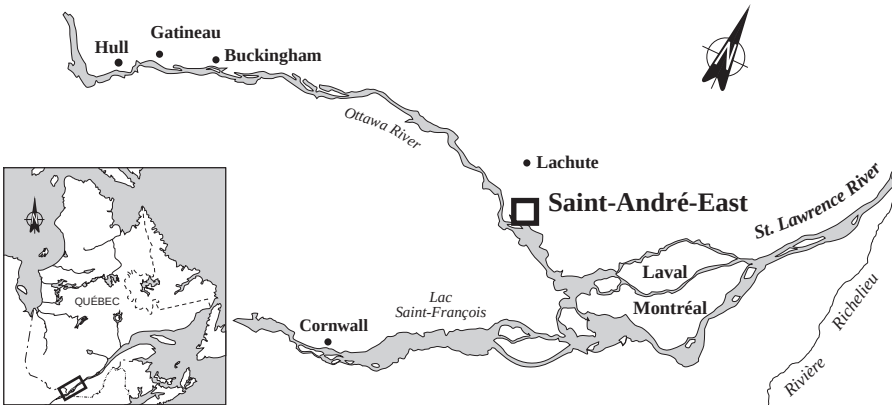
FACT SHEET 69

Goodfellow Inc.

4 du Moulin Street
Saint-André-East, Quebec
J0V 1X0



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 GOODFELLOW INC. plant in Saint-André-East is in Group 2, comprising plants that have already implemented treatment programs but whose effluent may contain toxic substances.

The objective for Group 2 is maximum reduction of toxic effluent of targeted plants.

INDUSTRIAL PLANT

Wood preservation

The GOODFELLOW INC. plant in Saint-André-East treats timber only. The pieces of wood are already sized and drilled when they arrive. Incisions are made in the wood to promote the penetration of solutions. The wood is then dried at 30° to 55° C. The ambient air is dehumidified with heat pumps then heated and reintroduced into the dryer. The wood achieves a humidity of 16 to 19% after two or three weeks of treatment. Next the preservative is applied - chromated copper arsenate or pentachlorophenol. In both cases, the wood is placed on carts and put in an autoclave. A vacuum is created for 20 to 60 minutes and then the autoclave is filled with preservatives and hydrostatic pressure is applied for anywhere from 30 minutes to 18 hours. The preservative is then removed and routed to tanks, and the wood is stored sloping on a drip frame. The plant also has a flame-retardant treatment process. Annual production capacity of the plant is 14 200 t. In 1997, the plant operated at 65% capacity and employed a work force of 26.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Resinous timber
- Chromated copper arsenate (CCA - 50%)
- Pentachlorophenol (PCP - 98%)
- PCP solvent
- Flame retardants

FINISHED PRODUCTS

- CCA-treated wood
- PCP-treated wood
- Fire retardant treated wood
- Untreated wood

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

No industrial effluent

According to company data, in 1993 the plant did not discharge any industrial effluent, only domestic sewage, rainwater and daily boiler blow down. However, rainwater was slightly contaminated by soil on the plant's grounds.

RESOURCES AND USES TO PRESERVE

Fishing and pleasure boating

The GOODFELLOW INC. plant in Saint-André-East is on the right bank of the du Nord River, about 5 km from its confluence with the St. Lawrence. Close to 38 species of fish inhabit the area. The wetlands of Fer à Cheval and Carillon bays offer favourable spawning and rearing areas for many species of fish. The area also provides nesting, feeding and brooding sites for waterfowl; 22 species of wild bird are found in the region. Certain spots are also suitable for the nesting of great blue heron and the survival of muskrat, river otter and mink. The du Nord River attracts sport fishermen and pleasure boaters. The first drinking water intake downstream of the plant is in Lac des Deux Montagnes and supplies the municipality of 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. There are no environmental discharge objectives for GOODFELLOW INC. as the plant does not discharge any process water.

EFFLUENT TREATMENT

Closed circuit

The industrial wastewater is filtered and recirculated in a closed circuit within the plant process. Water extracted from the wood together with the filtrate is stored and then reused in the chromated copper arsenate treatment. Domestic sewage empties into a septic tank with a tile field. Rainwater and water extracted daily from the boiler are discharged into the du Nord River.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

No major changes

No major changes to the plant process or the wastewater treatment system have been made at the GOODFELLOW INC. plant since 1993.

REGULATORY COMPLIANCE - WATER COMPONENT

No specific regulations

The GOODFELLOW INC. plant is not subject to any specific regulations governing effluents.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Mainly total arsenic

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 SLV 2000 characterization data collected in October 1996 along with Chimiotox values estimated from them, assuming an effluent flowrate of 13.9 m^3/d. Twelve substances were selected in testing for more than 120. Based on these data, total arsenic accounts for 78% of the Chimiotox index.

Figure 1 is plotted from SLV 2000 characterization data colected in 1996. The Chimiotox index calculated from these data was reported unchanged for 1993 to 1998. No major changes were made to the company's processes between 1993 and 1998.

Table 1 ***Chimiotox Index (1996)- Goodfellow Inc.****

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total arsenic	0,006	57 143	349
2,3,7,8-T_4CDD equivalent	6,3 X 10^{-10}	7 X10^{10}	45
Total oil and grease	0,019	100	2
Total chromium	0,003	500	2
Total phosphorus	0,010	50	1
Total sulphides	0,002	500	1
Total aluminium	0,052	11	1
Total copper	0,002	451	1
Ammonia nitrogen	0,070	0,8	<1
Total iron	0,064	3,3	<1
Total manganese	0,002	10	<1
Total zinc	0,004	9,4	<1
CHIMIOTOX INDEX			**449**

*Assuming an effluent flowrate of 13.9 m^3/d (12 substances selected in testing for more than 120).

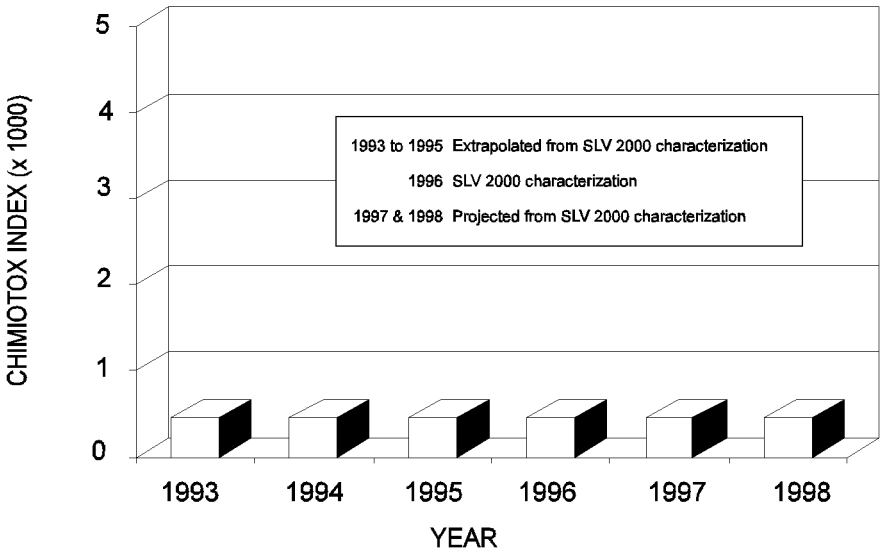


Figure 1 ***Chimiotox Index Trends (1993 - 1998) Goodfellow Inc.***

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 priority 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.

The 1996 characterization detected dioxins and furans in the company's rainwater. The concentration measured was 16.15 pg/L 2,3,7,8-T_4CDD toxic equivalent. There are no environmental discharge objectives for this plant.

PEEP TOXICITY REDUCTION

Low toxicity

The Potential Ecotoxic Effects Probe (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. In the case of the GOODFELLOW INC. plant in Saint-André-East, a series of bioassays was carried out during the 1996 characterization, yielding a PEEP of 0.5, and showing low toxicity for the organisms tested.

REDUCTION IN SUBSTANCES MONITORED

No industrial effluent discharged

According to company data, in 1998 the plant does not discharge any process water; all industrial wastewater is recirculated. The plant discharges only domestic sewage, rainwater and water boiler extraction. However, rainwater is slightly contaminated by soil on the plant's grounds.

KEY POINTS

- **No process wastewater discharged**
- **Low toxicity**

Information updated January 1998

ADDITIONAL INFORMATION

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