FACT SHEET 63

Aluminerie Lauralco Inc.

1 Sources Blvd.
Deschambault, Quebec
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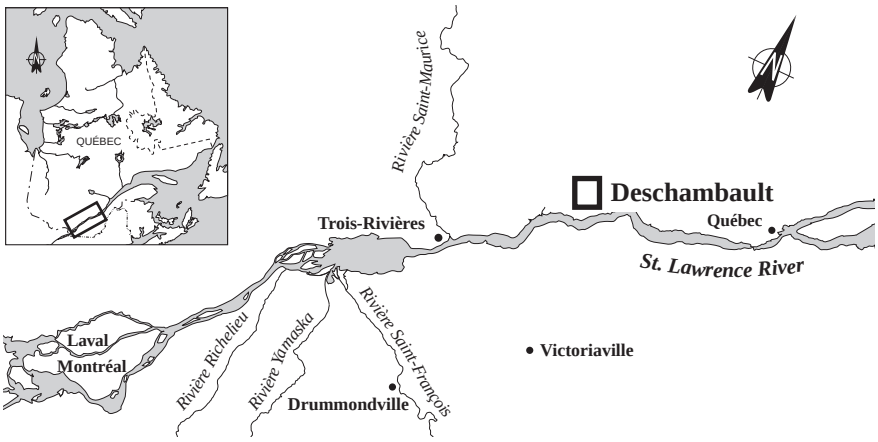

A list of 106 industrial plants has been established under St. Lawrence Vision 2000 (SLV 2000), the second phase of the St. Lawrence Action Plan, launched in 1988. The overall objective is to reduce toxic effluent and virtually eliminate discharges of persistent toxic substances.

The 106 industrial plants designated under SLV 2000 are divided into four groups, each with a specific objective. The ALUMINERIE LAURALCO INC. plant, in Deschambault, 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

A modern aluminum smelter

The ALUMINERIE LAURALCO INC. smelter in Deschambault produces aluminum ingots. The facility includes carbon and electrolysis shops and a foundry. In the carbon shop, coke and pitch anodes are shaped on a paste lathe, then baked in an oven. A steel bar is attached to the anode to conduct electricity. Cell linings are replaced in the carbon shop. Alumina is transformed into aluminum in 264 cells with Pechiney prebaked anodes in the electrolysis shop. Molten aluminum is then channelled into three holding furnaces near the foundry. Two pits are used to form the aluminum into T-shaped ingots. The rated production capacity of the plant is 270 000 t/yr. In 1997, the plant operated at 87% capacity.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Alumina
- Coke
- Pitch
- Aluminum fluoride
- Cast iron

FINISHED PRODUCT

- Aluminum in T-ingots

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Presence of fluorides

In 1993, there were 29 rainwater discharge days at ALUMINERIE LAURALCO INC. Based on company data, the plant discharged an average effluent of 2413 m^3/d, containing notably:

- 522 kg/d of dissolved solids (DS)
- 19.2 kg/d of chemical oxygen demand (COD)
- 16.9 kg/d of fluorides
- 3.6 kg/d of suspended solids (ss)
- 0.56 kg/d of aluminum

RESOURCES AND USES TO PRESERVE

Farming area

The ALUMINERIE LAURALCO INC. storm sewer drains into Pinière Brook. The 2.5 km brook flows into the Bélisle River, halfway between the river source and the St. Lawrence. The Bélisle River encircles much of the plant site before joining the St. Lawrence at Deschambault. The main fish species found are walleye and brook trout. A walleye spawning ground lies at the junction of the river and the St. Lawrence. No drinking water intakes are located along the river. The Bélisle River drainage basin in contains forests interspersed with farmlands. Several gravel pits are also found in the region.

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. The environmental discharge objectives for ALUMINERIE LAURALCO INC. have been calculated and are available on request.

EFFLUENT TREATMENT

No industrial sewage disposal

Under normal circumstances, no industrial wastewater is discharged from ALUMINERIE LAURALCO INC. in Deschambault. Cooling water for anodes and aluminum ingots is recirculated. Anode cooling line purge water is completely evaporated. Water used to purge ingot cooling lines is evaporated, condensed and recirculated. Process water lines are designed to recirculate water from blind drains, service station rainwater and runoff from the washing of motor vehicles.

The only water discharged from the ALUMINERIE LAURALCO INC. plant is rainwater runoff. It is first cleaned in sand and in coalescing filters. If there is much rainfall, runoff may exceed the amount needed for the plant's processes and overflow into the environment. The water then settles and, if necessary, undergoes reverse osmosis or ion exchange before being discharged. Domestic sewage is discharged to the Deschambault sewage treatment plant.

Industrial water is obtained from rainwater collected on the plant's land to reduce drinking water consumption.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

A $20 million investment

Some modifications have been made to the original design of the water treatment system. Work since 1993 has been aimed at improving the raw paste shop and reducing the risk of contamination from runoff. In August 1994, changes were made to the plant's air compressor cooling systems to reduce the use of cooling water. The entire water management system, including adjustments and modifications during construction and after the system was commissioned, represent an investment of about $20 million.

REGULATORY COMPLIANCE - WATER COMPONENT

Compliance with discharge criteria

ALUMINERIE LAURALCO INC. in Deschambault meets the discharge criteria in the agreement between the plant and the Ministère de l'Environnement et de la Faune du Québec (MEF) drafted in December 1991. The agreement is part of the certificate of authorization for operations of the plant issued by the MEF in February 1992.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Very low Chimiotox Index

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

Table 1 shows June 1995 SLV 2000 characterization data along with the Chimiotox values estimated from them, assuming an effluent flowrate of 2532 m^3/d. Four substances were selected in testing for more than 120. Based on these data, total iron accounts for 38% of the Chimiotox index.

Figure 1 is plotted from 1995 SLV 2000 characterization data. The Chimiotox index calculated from the SLV 2000 characterization data was reported unchanged for 1993 to 1998. It is one of the lowest in SLV 2000, despite the fact that some discharge comes from the natural environment.

Table 1 ***Chimiotox Index (1995) - Aluminerie Lauralco Inc.****

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total iron	3.901	3.3	13
Nitrites-nitrates	1.908	5	10
Total manganese	0.665	10	7
Total phosphorus	0.082**	50	4
CHIMIOTOX INDEX			**34**

***** Assuming an effluent flowrate of 2532 m^3/d (4 substances selected in testing for more than 120).

******Load calculation based on analytical data which are near methodological detection limits.

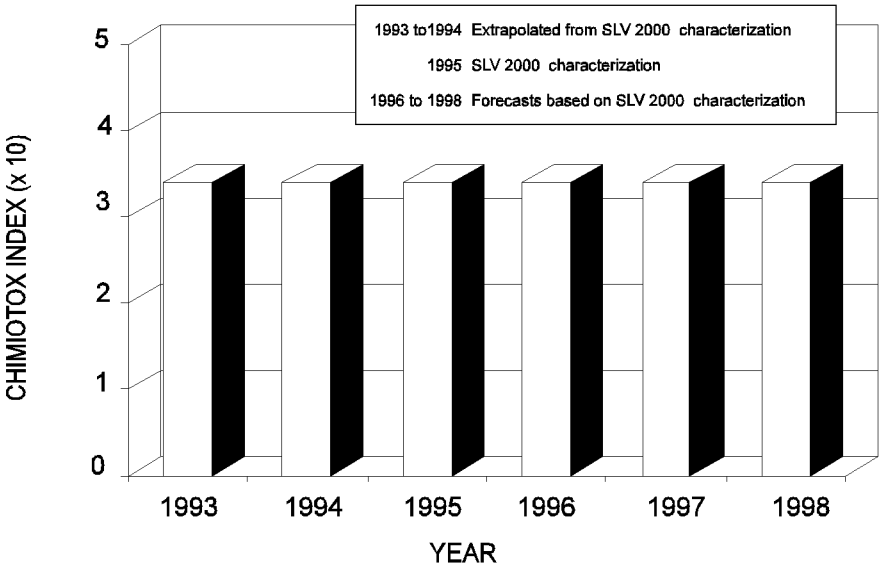

Figure 1 ***Chimiotox Index Trends 1993 to 1998 Aluminerie Lauralco Inc.***

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 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.

Based on 1995 SLV 2000 characterization data, none of the eleven persistent and bioaccumulative toxins were detected in effluent from ALUMINERIE LAURALCO INC.

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. In the case of ALUMINERIE LAURALCO INC. in Deschambault, a series of bioassays was carried out in 1995, yielding a PEEP of less than 1.2, and showing no toxicity for the organisms tested.

REDUCTION IN SUBSTANCES MONITORED

Reduction in loads

There were 66 rainwater discharge days at ALUMINERIE LAURALCO INC. in 1997. Based on company data, in 1997 the plant discharged an average of 1636 m^3/d of effluent, containing notably:

- 9.0 kg/d of fluorides
- 0.18 kg/d of aluminum

From 1993 to 1997 during periods of rainwater discharge, the fluoride load decreased by 47% while the aluminum load dropped by 68%.

KEY POINTS

- **Chimiotox index one of the lowest in SLV 2000**
- **No industrial wastewater discharge (surplus rainwater only)**
- **Water management system: a $20 million investment**
- **Non-toxic effluent**

Information revised January 1998

ADDITIONAL INFORMATION

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Published by authority of the Minister of the Environment
 Catalogue No. En153-6/63-1998E
ISBN 0-662-26531-9
(Aussi disponible en français sous le titre *Établissements industriels : faits saillants*)