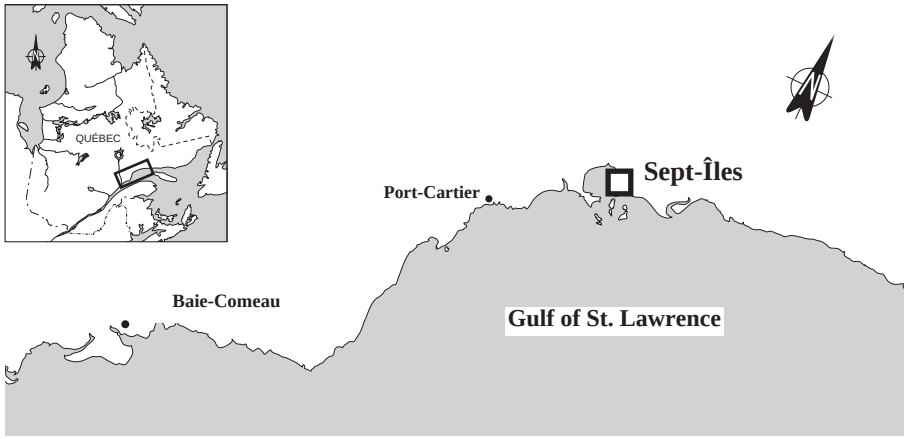
FACT SHEET 62

Aluminerie Alouette Inc.

400 de la Pointe-Noire
Sept-Îles, Quebec
G4R 5M9



***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 ALOUETTE INC. plant in Sept-Îles 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

Aluminum casting

Since June 1992, the ALUMINERIE ALOUETTE INC. plant in Sept-Îles has been casting aluminum ingots and pigs. The plant includes an anode facility as well as electrolysis and casting units. In the anode facility, a vibrating compactor operating in a vacuum forms green anodes of coke and pitch which are then baked in a high-temperature furnace. The annual production capacity is 117 000 t of prebaked anodes. The aluminum is produced by electrolysis of alumina in electrolysis tanks using the Hall-Héroult process. The liquid metal settles on the bottom of the tanks and is then conveyed to the holding furnace in the casting unit. Two ingot moulds and a carousel are used to cast the finished product. The annual production capacity of the plant is 215 000 t of aluminum. In 1997, the plant operated at 101% design capacity and employed a work force of 549.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Alumina
- Aluminum fluoride
- Calcium fluoride
- Coke
- Pitch

FINISHED PRODUCTS

- Aluminum
- Prebaked anodes

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Fluorides

Based on 1994 company data, in 1993 the plant discharged an average of 2252 m^3/d of effluent (rainwater only), containing notably:

- 759 kg/d of dissolved solids (DS)
- 55.9 kg/d of chemical oxygen demand (COD)
- 13 kg/d of suspended solids (SS)
- 7.39 kg/d of fluorides
- 1.95 kg/d of aluminum
- 0.13 kg/d of zinc

RESOURCES AND USES TO PRESERVE

Diversified fishing resources

The ALUMINERIE ALOUETTE INC. plant is located on the Marconi peninsula, on the southwest side of Sept Îles bay about 6 km from the city of Sept-Îles. The plant's rainwater outfall ends at the bay entrance off Pointe à la Marmite. Sept Îles bay is an expanse of water covering about 100 km^2. Current circulation patterns show net water transport counterclockwise into the bay on the Sept-Îles side and out of the bay on the Pointe à la Marmite side.

A number of fish species are found in Sept Îles bay and in the waters around Pointe à la Marmite, among them herring, capelin and smelt. However, commercial fishing takes place only in the northern part of the bay and around the Sept Îles islands. Lobster is found in Anse aux Rats and around the islands. Of the sea mammals inhabiting the region, only minke whale and harbour porpoise regularly come into the bay. Minke whales are often sighted close to Pointe à la Marmite; harbour porpoises seem to prefer nearby deeper waters. These mammals thrive mainly on capelin, which is abundant in Sainte-Marguerite bay. A small colony of harbour seals used to frequent the Pointe Noire and Pointe à la Marmite area, but is now dispersed and only three or four individual seals are observed in summer.

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 ALUMINERIE ALOUETTE INC. have been calculated and are available on request.

EFFLUENT TREATMENT

No industrial effluent discharges

The ALUMINERIE ALOUETTE INC. plant does not discharge industrial effluent; all process water is recirculated or evaporated. Rainwater is channelled to a 40 000-m^3 settling basin before being discharged into the Gulf of St. Lawrence. Domestic sewage is channelled to a wastewater treatment plant (aerated ponds) built by the city of Sept-Îles for the aluminum works.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

No modifications

Ten certificates of authorization were issued for construction of the plant. Work began in September 1989 and ended in December 1992. The cleanup measures introduced when the plant was built have made it possible to comply with the requirements of the certificate of authorization issued for operation of the plant. No major changes were made between 1993 and 1998.

REGULATORY COMPLIANCE - WATER COMPONENT

Discharge criteria met

The ALUMINERIE ALOUETTE INC. plant in Sept-Îles meets discharge criteria in the certificate of authorization to operate the plant issued by the Ministère de l'Environnement du Québec (MENVIQ) in May 1992. The standards of the certificate of authorization are comparable to the environmental discharge objectives calculated.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Low Chimiotox index

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 November 1995 along with the Chimiotox values calculated from them, assuming an effluent flowrate of 1706 m^3/d. Six substances were selected in testing for more than 120. The Chimiotox index obtained is among the lowest of those of the 106 SLV 2000 plants.

Figure 1 is plotted from the 1995 SLV 2000 characterization data. The Chimiotox index calculated from these data was reported unchanged for 1993 to 1998. No major modifications to the process or the wastewater cleanup system were made during this period.

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

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total oil and grease	0.708	100	71
Total phosphorus	0.289	50	14
Total aluminum	0.604	11	7
Total iron	1.198	3.3	4
Nitrites-nitrates	0.509	5	3
Total zinc	0.043	9.4	<1
CHIMIOTOX INDEX			**100**

* Assuming an effluent flowrate of 1706 m^3/d (6 substances selected in testing for more than 120).

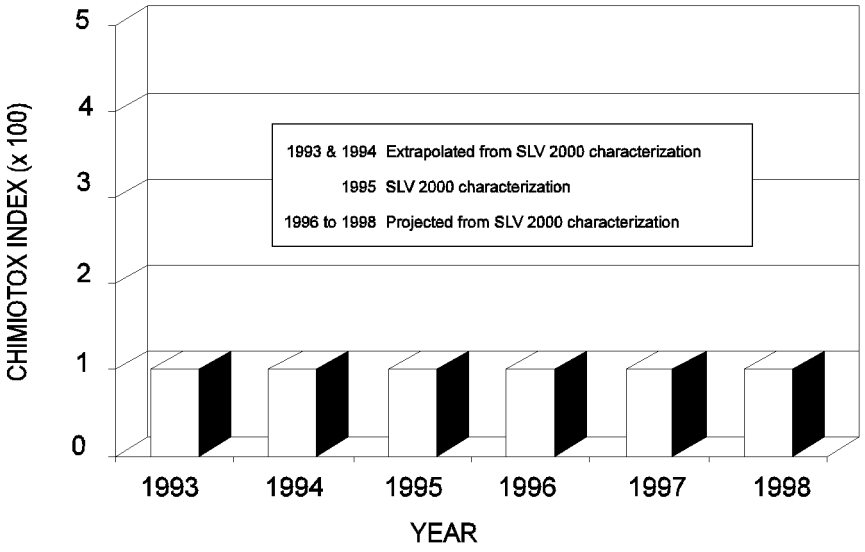


Figure 1 ***Chimiotox Index Trends (1993 to 1998) Aluminerie Alouette Inc.***

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.

None of the eleven persistent and bioaccumulative toxic substances were detected in plant effluent during the 1995 SLV 2000 characterization.

PEEP TOXICITY REDUCTION

Non-toxic effluent

The Potential Ecotoxic Effects Probe (PEEP) combines the results of six standardized bioassays measuring the toxic effects of effluent. 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 ALUMINERIE ALOUETTE INC. plant, 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

Stable loads

According to company data, in 1997 the plant discharged an average of 1717 m^3/d of effluent (rainwater only), containing notably:

- 629 kg/d of dissolved solids (DS)
- 53.4 kg/d of chemical oxygen demand (COD)
- 8.3 kg/d of suspended solids (SS)
- 7.9 kg/d of fluorides
- 0.6 kg/d of aluminum
- 0.04 kg/d of zinc

Effluent flowrate and loads of compounds present in the rainwater remained relatively stable between 1993 and 1997.

KEY POINTS

- **One of the lowest Chimiotox index of SLV 2000 plants**
- **No industrial effluent discharged (only excess rainwater)**
- **Non-toxic effluent**

Information updated January 1998

ADDITIONAL INFORMATION

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