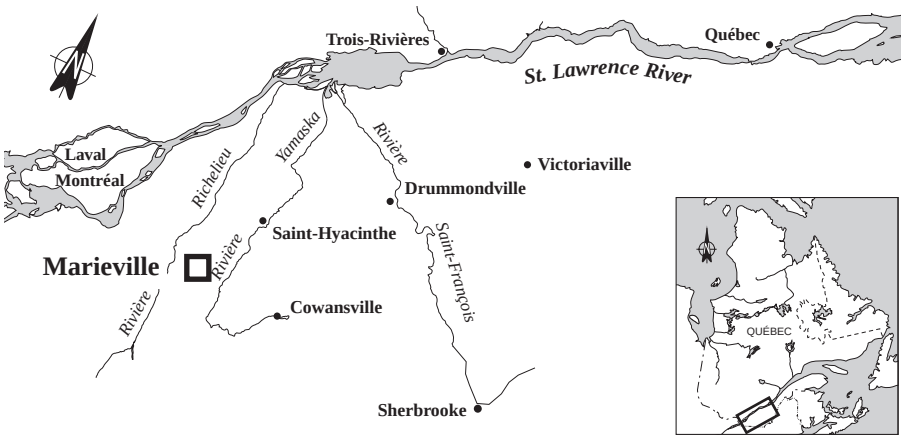
FACT SHEET 78

Sivaco Quebec, division of Ivaco Inc.

800 Ouellette Street

Marieville, Quebec

J3M 1P5



***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 SIVACO QUEBEC, DIVISION OF IVACO INC. works in Marieville 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

Metal works

The SIVACO QUEBEC, DIVISION OF IVACO INC. works produces steel wire, nails (galvanized and ungalvanized) and wire mesh. The drawing stock is first cleaned mechanically or in an acid bath (sulphuric or hydrochloric acid) to remove surface oxide. Once cleaned, the wire coils are coated with lubricating film (lubricating soap, lime, phosphate or borax). The wire is rough drawn through dies to obtain the desired diameter, following which it can be sold as is or galvanized, made into nails or wire mesh or heat treated. Annual production capacity of the plant is about 180 000 t. In 1997, the plant employed a work force of 459.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Various grades of steel (wire coils)
- Lead and zinc ingots
- Powdered zinc
- Chemicals

FINISHED PRODUCTS

- Steel wire
- Galvanized wire
- Nails
- Galvanized nails
- Wire mesh

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Low loads

Based on company data, in 1993 the wastewater treatment system discharged 327 m^3/d of effluent, containing notably:

- 5.25 kg/d of suspended solids (ss)
- 0.77 kg/d of iron
- 0.1 kg/d of zinc
- 0.02 kg/d of total lead

RESOURCES AND USES TO PRESERVE

Farming area

Wastewater from SIVACO QUEBEC, DIVISION OF IVACO INC. flows into Barré creek, which is in turn a tributary of Saint-Louis creek, which flows into the des Hurons River. This river joins the Richelieu on its right bank at Chambly Basin. Herds of livestock drink from the Saint-Louis and Barré creeks. These two small streams probably contain minnows. There is also a promising habitat for northern pike and perch at the mouth of the des Hurons River. The drainage basin of the des Hurons River drains an area of intensive farming. There is a campground on the right bank of the river. Near the Chambly basin, the Richelieu is used for fishing, windsurfing and other water activities. The first drinking water intake is in the Chambly basin near the left bank of the Richelieu. The nearby filtration plant serves Goyer, Lièvres and Demers islands.

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 SIVACO QUEBEC, DIVISION OF IVACO INC. have been calculated and are available on request.

EFFLUENT TREATMENT

Physico-chemical treatment

Some of the industrial wastewater undergoes physico- chemical treatment. The system includes a pre-neutralization tank, a primary neutralization tank, a coagulation and flocculation tank, and a settling tank. Sludge is thickened before going through two filter presses. Domestic sewage is discharged into the Marieville sanitary sewer system and treated with activated sludge at the municipal sewage treatment plant.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Many measures implemented

Since 1993, 9 mechanical decokers have been operating. This has resulted in a decrease of the effluent treatment loads and of the amount of sludge generated.

Since July 1997, a part of the acid discharged to the wastewater treatment system is recovered thanks to a modification of the cleaning system for the preparation of steel

Since January 1998, effluent of the lime tank is treated by the wastewater treatment system.

REGULATORY COMPLIANCE - WATER COMPONENT

Standards met

The SIVACO QUEBEC, DIVISION OF IVACO INC. works in Marieville is subject to discharge standards set by the certificate of authorization issued on January 27, 1987 for the installation of a wastewater treatment system. The company meets the standards to which it is subject.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Mostly 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 SLV 2000 characterization data collected in March 1996 along with the Chimiotox values calculated from them, assuming an effluent flowrate of 327.2 m^3/d. Fifteen substances were selected in testing for more than 120. According to these data, oil and grease accounted for 80% of the total.

Figure 1 is plotted from 1996 SLV 2000 characterization data and on company data for 1998. The Chimiotox index calculated from SLV 2000 data was reported unchanged for 1993 to 1997 and was based on company data for 1998. Reduction in the Chimiotox index for 1998 results from implementations measures made by the company.

Table 1 ***Chimiotox Index (1996) - Sivaco Quebec, division of Ivaco Inc.****

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total oil and grease	7.219	100	722
Total arsenic	0.002	57 143	91
Total mercury	0.0002	166 667	36
Total lead	0.065	314	20
Total thallium	0.059	125	7
Total aluminum	0.671	11	7
Total lead	1.595	3.3	5
Total manganese	0.339	10	3
Total cadmium	0.003	909	3
Nitrites-nitrates	0.414	5	2
Total chromium	0.003	500	1
Total zinc	0.118	9.4	1
Ammonia nitrogen	0.462	0.8	<1
Cyanures totaux	0.003	200	<1
Total molybdenum	0.060	1	<1
CHIMIOTOX INDEX			**899**

* Assuming an effluent flowrate of 327.2 m^3/d. (15 substances selected in testing for more than 120).

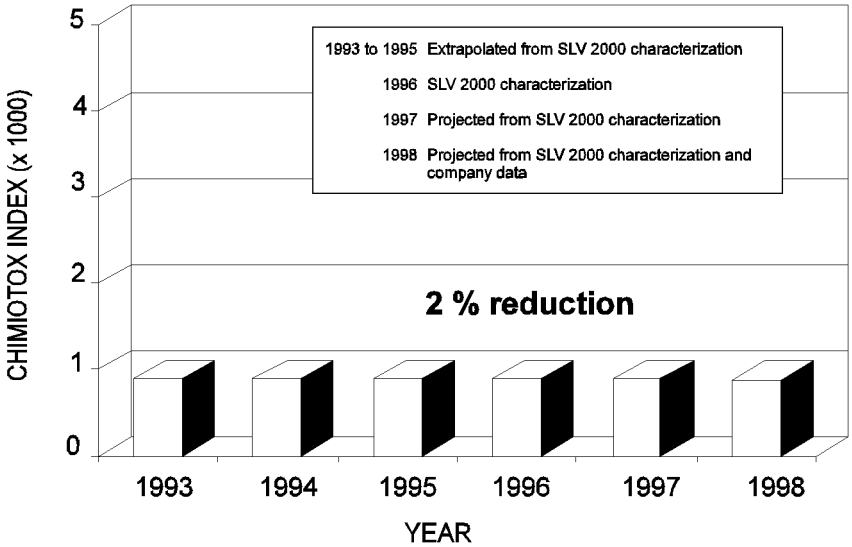


Figure 1 ***Chimiotox Index Trends (1993 to 1998)***
Sivaco Quebec, division of Ivaco Inc.

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 showed the presence of one of the eleven persistent toxic substances, mercury. Its concentration (0.95 µg/L) was above the temporary environmental discharge objective for this substance (0.1 µg/L).

PEEP TOXICITY REDUCTION

Moderate toxicity

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 ranging from 1 to 10 of increasing toxicity and are used to monitor discharge trends over the years. In the case of the SIVACO QUEBEC, DIVISION OF IVACO INC. works, a series of bioassays was conducted in 1996, yielding a PEEP of 3.8, and showing moderate toxicity for the organisms tested.

REDUCTION IN SUBSTANCES MONITORED

Major load reductions

According to the SLV 2000 characterization, in 1996 the plant discharged 327.2 m^3/d of effluent, containing notably:

- 257.2 kg/d of suspended solids (SS)
- 1.6 kg/d of iron
- 0.13 kg/d of zinc
- 0.065 kg/d of total lead

From 1993 to 1996, the loads of all substances monitored increased in the treated effluent. In 1998 one untreated effluent remains with a low flowrate but a not inconsiderable iron and oil and grease loads. Otherwise, the improvements made by the company in 1998 to its wastewater treatment have reduce the treated effluent loads by:

- 92% for suspended solids (SS)
- 25% for chromium
- 19% for copper
- 7% for mercury
- 48% for lead
- 72% for aluminum
- 29% for iron.

KEY POINTS

- **The plant meets discharge standards in the certificate of authorization for installation of a wastewater treatment system**
- **Since 1993, implementation of many measures which have improved treated effluent quality**
- **A 2% decrease in the Chimiotox Index**

Information updated January 1998

ADDITIONAL INFORMATION

Chimiotox Index and PEEP:
Gilles Legault, Environment Canada
(514) 283-3452

Environmental discharge objectives:
Francine Richard, MEF (418) 521-3820 #4767

Records officer at the Ministère de l'Environnement et de la Faune du Québec (MEF):
Lyne Longpré (514) 928-7607 #279

Environment officer at SIVACO QUEBEC, DIVISION OF IVACO INC.:
Denis Charbonneau (514) 658-8741

Production team:
Environment Canada
Isabelle Bouchard Thérèse Drapeau
Gilles Legault Lucie Olivier
Sylvie Roberge Marc Villeneuve

Ministère de l'Environnement et de la Faune du Québec
Francine Richard
François Rocheleau

Internet address:
http://www.slv2000.qc.ec.gc.ca

Published by authority of the Minister of the Environment
 Catalogue No. En153-6/78-1998E
ISBN 0-662-26546-7
(Aussi disponible en français sous le titre *Établissements industriels : faits saillants*)