

FACT SHEET 57

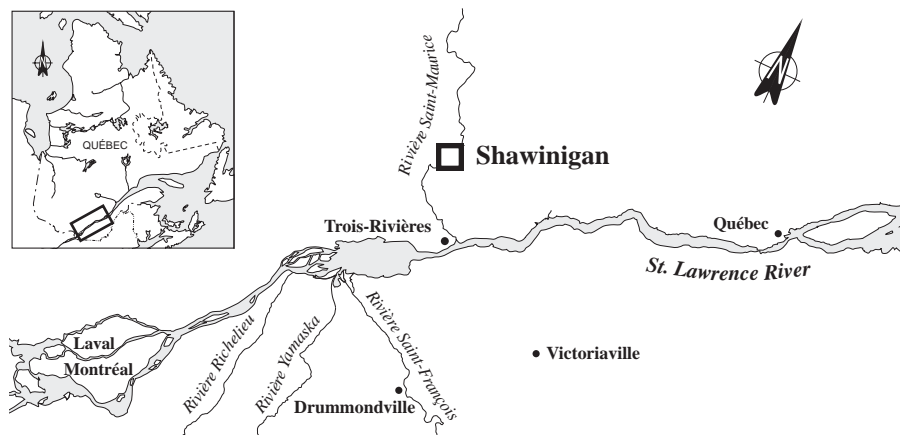
Norton Céramiques avancées du Canada inc.

D. R. Wilson Street
Shawinigan, Quebec
G9N 6W2

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 NORTON CÉRAMIQUES AVANCÉES DU CANADA INC. plant in Shawinigan is in Group 1, comprising industrial plants whose effluent may contain toxic substances even though it is treated.

The objective for Group 1 is to reduce toxic effluent of targeted plants by 90%.



INDUSTRIAL PLANT

Manufactures silicon carbide

The NORTON CÉRAMIQUES AVANCÉES DU CANADA INC. plant in Shawinigan manufactures silicon carbide (SiC) from petroleum coke and silica sand in Acheson-type furnaces. The process water is drawn directly from the river and used only for cooling. Annual production capacity of the plant is 39 600 t. In 1995, the plant operates at 100% capacity and employs a work force of 131.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Silica sand
- Petroleum coke

FINISHED PRODUCT

- Silicon carbide

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Mainly ss

Based on the 1995 SLV 2000 characterization, in 1993 the plant discharged 6472 m³/d of effluent containing notably:

- 348 kg/d of suspended solids (ss)
- 135 kg/d of chemical oxygen demand (COD)
- 63 kg/d of sulphates
- 36.7 kg/d of total organic carbon (TOC)
- 17.3 kg/d of chlorides
- 5.4 kg/d of metals (iron, aluminum, copper, and manganese)
- 4.4 kg/d of total kjeldahl nitrogen

RESOURCES AND USES TO PRESERVE

Cottaging area

The NORTON CÉRAMIQUES AVANCÉES DU CANADA INC. plant discharges effluent into the Saint-Maurice River, not far from a marina, a federal wharf and a cottaging area. This stretch of the Saint-Maurice River attracts sport fishermen and pleasure boaters. Parc des Chutes offers a panoramic view of the Shawinigan Falls and the Saint-Maurice River. In the city of Shawinigan, a park and a walkway run along the banks of the river just over a kilometre from the plant's effluent discharge point. Some 20 fish species inhabit this part of the river, including yellow walleye, northern pike and smallmouth bass. This river stretch also offers sites favourable for spawning and even a spot used for swimming. Trois-Rivières draws its drinking water from the Saint-Maurice River, about 7 km from its mouth.

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 NORTON CÉRAMIQUES AVANCÉES DU CANADA INC. are available on request.

EFFLUENT TREATMENT

Cooling water and sanitary sewage

Effluent is made of cooling water and sanitary sewage. It is channeled to the public sewerage system, which empties into the Saint-Maurice River.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Septic tank to be installed

The company is planning to separate its rinse water (of which there is a substantial amount) from its sanitary sewage, and to channel the sanitary sewage into a septic tank.

REGULATORY COMPLIANCE - WATER COMPONENT

No regulations

The NORTON CÉRAMIQUES AVANCÉES DU CANADA INC. plant is not subject to any specific regulations.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Mainly total copper

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 1995 along with the Chimiotox values estimated from them assuming an effluent flowrate of 6472 m³/d. In testing for more than 120 substances, 12 were selected. According to these data, total copper accounts for 29% of the Chimiotox index, total sulphides for 25% and total oil and grease for another 25%.

Figure 1 was plotted from the SLV 2000 characterization data collected in 1995. The Chimiotox index estimated from the 1995 data was applied for the entire period between 1993 and 1998. No major changes were made in the process or the treatment system since 1993.

Table 1 *Chimiotox Index (1995) - Norton Céramiques avancées du Canada inc.**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total copper	0.625	451	282
Total sulphides	0.474	500	237
Total oil and grease	2.360	100	236
Total lead	0.292	314	92
Benzo(a)pyrene	0.0004**	100 000	40
Benzo(a)anthracene	0.001**	32 154	24
Total aluminum	1.903	11	21
Total phosphorous	0.300**	50	15
Total iron	2.647	3.3	9
Nitrites-nitrates	0.659	5	3
Ammoniacal nitrogen	2.141	0.8	2
Total manganese	0.186	10	2
CHIMIOTOX INDEX			963

* For an effluent flowrate of 6472 m³/d (12 substances selected in testing for more than 120)

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

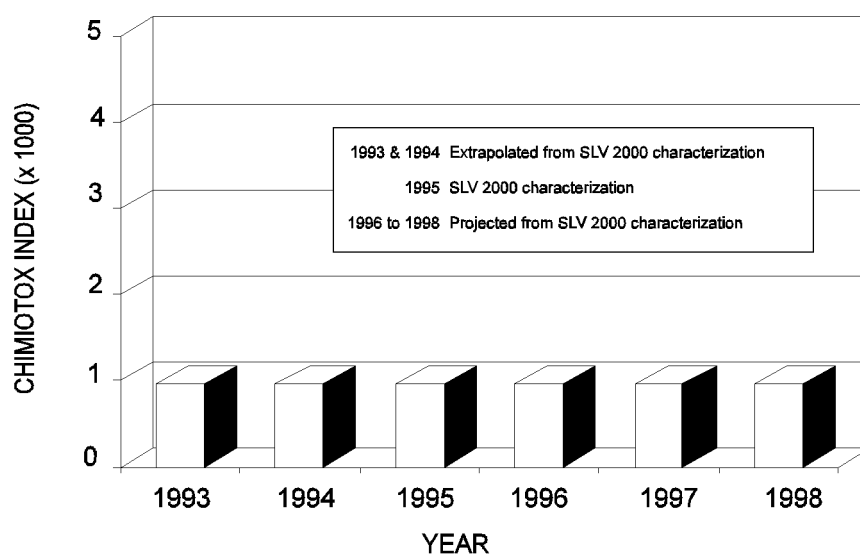


Figure 1 *Chimiotox Index Trends (1993 to 1998)
Norton Céramiques avancées du Canada inc.*

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 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.

Benzo(*a*)pyrene was detected during the 1995 SLV 2000 characterization; concentration was 0.08 µg/L. The company meets the environmental discharge objective for polycyclic aromatic hydrocarbons (including benzo(*a*)pyrene), which is 3.1 µg/L.

PEEP TOXICITY REDUCTION

Moderate toxicity

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 (1 to 10) of increasing toxicity and are used to monitor discharge trends over the years. A series of bioassays of effluent from the NORTON CÉRAMIQUES AVANCÉES DU CANADA INC. plant was conducted in 1995; a PEEP index of 3.6 was obtained, and the effluent is moderately toxic to the organisms tested.

REDUCTION IN SUBSTANCES MONITORED

Stable loads

According to the SLV 2000 characterization, in 1995 the plant discharged 6472 m³/d of effluent containing notably:

- 348 kg/d of suspended solids (ss)
- 135 kg/d of chemical oxygen demand (COD)
- 63 kg/d of sulphates
- 36.7 kg/d of total organic carbon (TOC)
- 17.3 kg/d of chlorides
- 5.4 kg/d of metals (iron, aluminum, copper, and manganese)
- 4.4 kg/d of total kjeldahl nitrogen

No major changes have been made in the process or the treatment system since 1993.

KEY POINTS

- Effluent consists of cooling water and sanitary sewage

Based on December 1995 inventory

ADDITIONAL INFORMATION

Chimiotox Index and PEEP:

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