*FACT SHEET 57*

# Norton Céramiques avancées du Canada inc.

*D. R. Wilson Street*

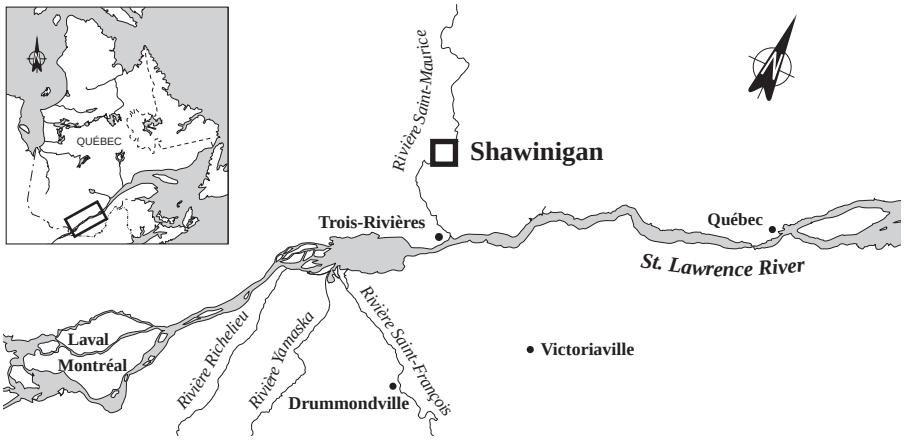
*Shawinigan, Quebec*

*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.***

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




## INDUSTRIAL PLANT

*Silicon carbide manufacturing*

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 1997, the plant operated at 100% capacity and employed a work force of 120.

## PRODUCTION

### PRINCIPAL RAW MATERIALS

- Silica sand
- Petroleum coke

### FINISHED PRODUCT

- Silicon carbide

# TREATMENT MEASURES

## INITIAL EFFLUENT VALUES

*Mainly total solids*

Based on the 1995 SLV 2000 characterization, in 1993 the plant discharged 6472 $m^3$/d of effluent, containing notably:

- 196 kg/d of total solids
- 19 kg/d of chemical oxygen demand (COD)
- 20 kg/d of sulphates
- 0.62 kg/d of copper

## RESOURCES AND USES TO PRESERVE

*Vacation 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 vacation 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 stretch of the river 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 domestic sewage*

Effluent consists of cooling water and domestic sewage. It is channelled to the public sewer 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 shower water in the spring of 1998. Domestic sewage will go through independent treatment systems. This work will also be carried out in the spring of 1998.

## REGULATORY COMPLIANCE - WATER COMPONENT

*No regulations*

Effluent from 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 $m^3$/d. Nine substances were selected in testing for more than 120. According to these data, total copper accounts for 31% of the Chimiotox index, total sulphides and total oil and grease each acounted for 26%.

Figure 1 was plotted from the SLV 2000 characterization data collected in 1995. The Chimiotox index estimated from the 1995 data was reported unchanged for 1993 to 1998. No major changes have been made to 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 |
| Nitrites-nitrates | 0.335 | 5 | 2 |
| Ammonia nitrogen | 2.141 | 0.8 | 2 |
| Total manganese | 0.186 | 10 | 2 |
| Total iron | 0.187 | 3.3 | 1 |
| **CHIMIOTOX INDEX** | | | **915** |

* Assuming an effluent flowrate of 6472 $m^3$/d (9 substances selected in testing for more than 120).

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

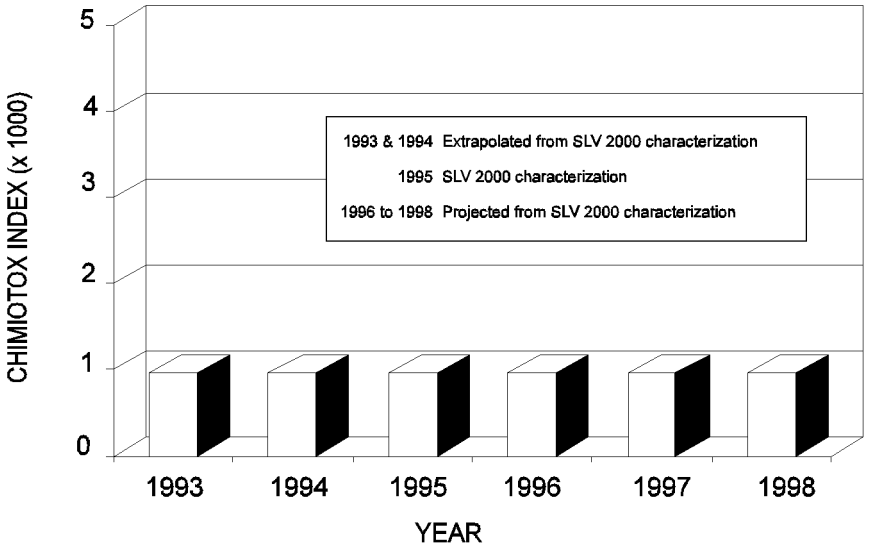



*Figure 1* ***Chimiotox Index Trends (1993 to 1998) Norton Céramiques avancées du Canada inc.***

## 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 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.

Benzo(*a*)pyrene was detected during the 1995 SLV 2000 characterization; theconcentration 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 of increasing toxicity ranging from 1 to 10 and are used to monitor discharge trends over the years. In the case of the NORTON CÉRAMIQUES AVANCÉES DU CANADA INC. plant, a series of bioassays was conducted in 1995; yielding a PEEP of 3.6, and showing moderate toxicity for the organisms tested.

## REDUCTION IN SUBSTANCES MONITORED

*Stable loads*

The 1995 SLV 2000 characterization data are the most recent available. No major changes have been made to the process or the treatment system since the beginning of the SLV 2000 program in 1993.

## KEY POINTS

- **Effluent consists of cooling water and domestic sewage**
- **Domestic sewage will be treated beginning in spring 1998**

Information revised 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):**
Louise Trudel (819) 371-6581 # 2065

**Environment officer at NORTON CÉRAMIQUES AVANCÉES DU CANADA INC.:**
Élaine Vachon (819) 536-2537

**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/**

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