

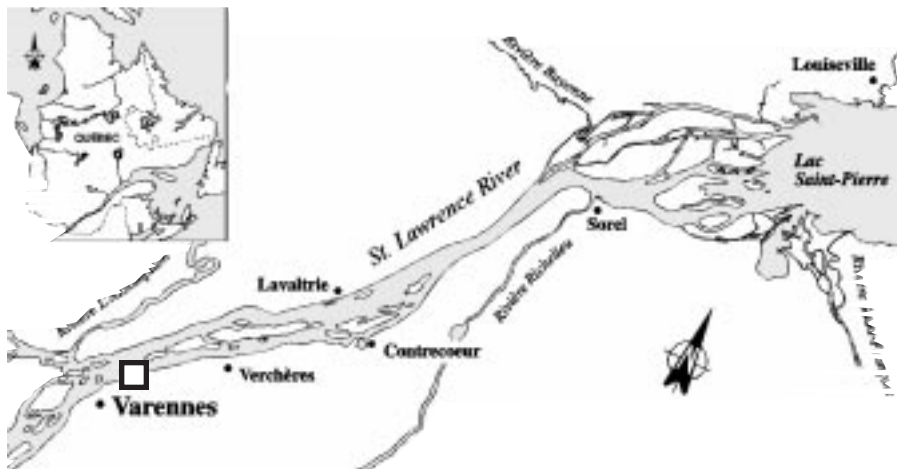
FACT SHEET No. 21

Nacan Products Ltd.

3656 Côte d'en bas

Varennnes, Quebec

J3X 1T6



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 liquid toxic waste and virtually eliminate discharges of persistent toxic substances.

The 106 industrial plants designated under SLV 2000 are divided into four groups, each of which has been given a specific objective. The NACAN PRODUCTS LTD. plant located in Varennes is part of Group 4, comprising the 50 plants targeted under the St. Lawrence Action Plan.

The objective set for Group 4 is to pursue cleanup efforts and perform environmental monitoring to achieve a 90% reduction in liquid toxic waste. Between 1988 and 1995, the 50 plants reduced their toxic effluent discharges by 96%.

INDUSTRIAL PLANT

Plant closed in August 1993

Until August 1993, the NACAN PRODUCTS LTD. plant in Varennes made polyvinyl acetate from vinyl acetate, polyvinyl alcohol and additives. Polymerization took place in an aqueous solution within an open cycle system. The finished product was transferred to intermediate tanks, then to storage tanks to await filtration and conditioning. In 1993, the company transferred those operations to its Boucherville plant. The Varennes facility had an annual production capacity of 8400 t at the time and employed a work force of 16. Effluent discharges stopped when the plant closed.

PRODUCTION

Before closing

PRINCIPAL RAW MATERIALS

- Vinyl acetate
- Polyvinyl alcohol
- Emulsifiers
- Plasticizers

FINISHED PRODUCT

- Polyvinyl acetate

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

ss and COD

Based on an extrapolation of the 1990 Action Plan characterization data, in 1988 the plant discharged 40 m³/d of process effluent, containing:

- 220 kg/d of chemical oxygen demand (COD)
- 54 kg/d of suspended solids (ss)
- 3.4 kg/d of biochemical oxygen demand (BOD₅)

RESOURCES AND USES TO PRESERVE

An abundance of wildlife

The NACAN PRODUCTS LTD. plant discharged its industrial effluent into the St. Lawrence about 700 m downstream from Cap Saint-Michel. The river section between Montreal and Lake Saint-Pierre provides favourable growing conditions for Lake sturgeon, a valuable species for the local commercial fishery. The Verchères islands lie about 4 km below the plant outfall, north of the shipping channel. The marshes and plant communities on the south riverbank between Montreal and Varennes are heavily used as waterfowl nesting and staging areas. The region includes large spawning grounds for several fish species and is also a vacation spot for nature lovers. Verchères draws its drinking water from the river, about 10 km downstream from Varennes' industrial zone.

WATER QUALITY BASED OBJECTIVES

Environmental protection

Water quality based 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.

EFFLUENT TREATMENT

Physicochemical treatment

Prior to closing, the NACAN PRODUCTS LTD. plant discharged 2400 m³/d of wastewater, including 40 m³/d of process effluent, into the St. Lawrence. Wash water from the reactors and tanks and drainage water from the floors was circulated to a clarifier, then pumped to flocculators. The clarified water flowed through two bag filters before its final discharge. The flocculator mud was concentrated by a filter press and the filtrate was released into the river; concentrated sludge from the flocculators and the clarifier was hauled to a dump. Rainwater and indirect cooling water were channelled directly to the river. Sanitary sewage emptied into an oxidation pond. Supernatants were discharged into the river; the residue was hauled to a dump.

PREVENTION AND CLEANUP SYSTEMS IMPLEMENTED

Productive measures

When NACAN PRODUCTS LTD. bought the Varennes plant in August 1991, the facility was already subject to a wastewater treatment program (PAE) entered into with the Ministère de l'Environnement et de la Faune du Québec. In 1989, then-owner Hoechst Canada Inc. had introduced a physicochemical batch treatment system to handle process wastewater. Annual consumption of di-n-butylphthalate had dropped from 60 to 5 t/yr, meaning smaller discharges of that substance.

REGULATORY COMPLIANCE - WATER COMPONENT

Commendation

In 1993, Environment Canada and the Ministère de l'Environnement et de la Faune du Québec commended the NACAN PRODUCTS LTD. plant for the treatment measures carried out since 1988.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Phthalates

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

Table 1 gives the Action Plan characterization data gathered in 1990, as well as the Chimiotox values estimated from those figures, for an effluent flow of 2470 m³/d. In testing for more than 120 substances, 4 were found. The figures show the presence of phthalates in the treated wastewater. Total phthalates make up 94% of the Chimiotox index, followed by total oil and grease (5.6%).

Figure 1 is plotted from the 1990 characterization data, which were used to extrapolate the Chimiotox index for 1988 after adjustment for the lack of physicochemical treatment prior to 1989. The indices for the period 1989-1992 are also based on the 1990 characterization figures. The 1993 index was adjusted to reflect the plant shutdown at mid-year. The Chimiotox index had dropped 100% by the time the plant closed. The release of effluents ceased with the shutdown, and the Chimiotox index fell to zero.

*Table 1 Chimiotox Index (1990) - Nacan Products Ltd.**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total Phthalates	0.252	5000	1262
Total Oil and Grease	0.750	100	75
Iron	0.520	3	2
Nitrites-Nitrates	0.160	5	1
CHIMIOTOX INDEX			1340

* For effluent discharge of 2470 m³/d (4 substances detected in testing for more than 120).

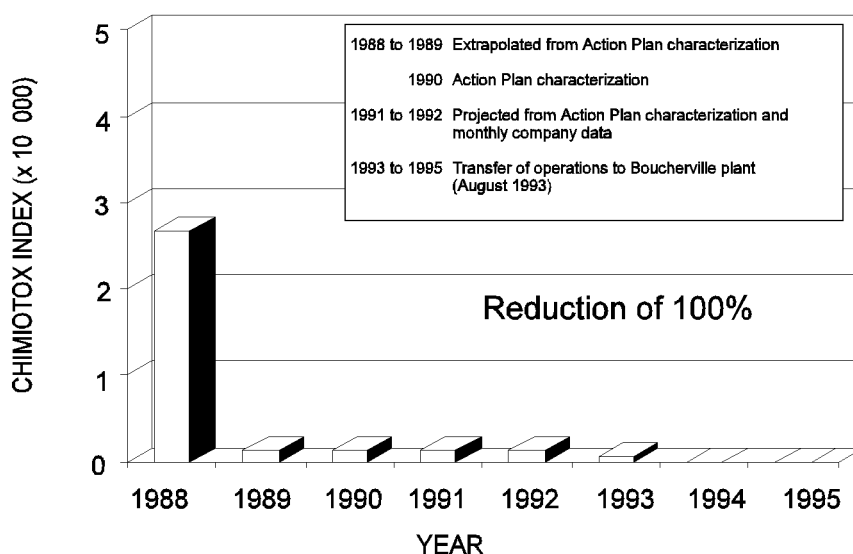


Figure 1 Changes in toxic effluent discharges, 1988-1995 - Nacan Products Ltd.

VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

No persistent toxic substances

One long-range objective of SLV 2000 is the virtual elimination of 11 persistent bioaccumulative toxic substances from 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 alkyl, benzo(a)pyrene and hexachlorobenzene.

No persistent toxic substance was detected during the 1990 Action Plan characterization study.

PEEP TOXICITY REDUCTION

Zero toxicity

The Potential Ecotoxic Effects Probe, or PEEP, combines results from 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. One series of bioassays was conducted for the NACAN PRODUCTS LTD. plant. The 1990 PEEP was zero.

REDUCTION IN SUBSTANCES MONITORED

Plant closed

The plant has discharged no effluent since it closed in August 1993. By that time, treatment measures had significantly lowered the concentrations of pollutants in the effluent.

KEY POINTS

- **Introduction of a physicochemical treatment system in 1989**
- **In 1993, Environment Canada and the Ministère de l'Environnement et de la Faune du Québec commended the plant for the treatment measures carried out since 1988**
- **Plant closing in August 1993**

Based on December 1995 inventory.
Information reviewed by Gilles Legault, SLV 2000.

ADDITIONAL INFORMATION

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