FACT SHEET 79

SKW Canada Inc.

6500 Yvon Trudeau
Bécancour, Quebec
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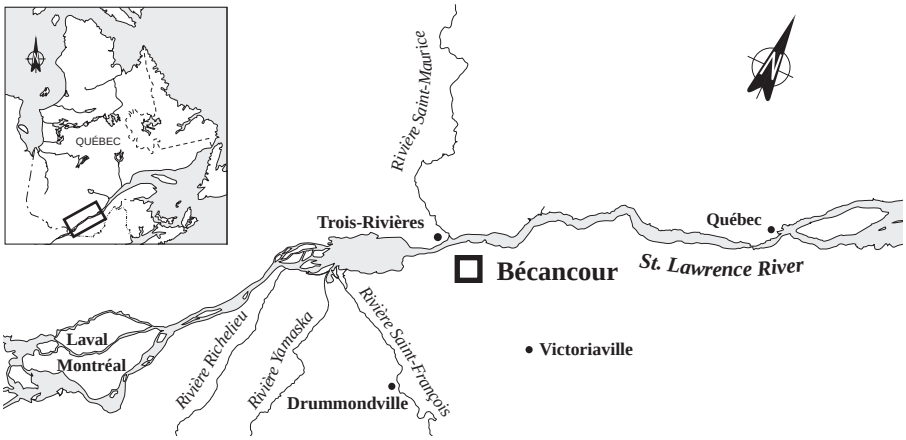

A list of 106 industrial plants has been established under St. Lawrence Vision 2000 (SLV 2000), the second phase of the St. Lawrence Action Plan, launched in 1988. The general objective is to reduce toxic effluent and virtually eliminate discharges of persistent toxic substances.

The 106 industrial plants designated under SLV 2000 are divided into four groups, each with a specific objective. The SKW CANADA INC. plant in Bécancour is in Group 2, comprising plants whose effluent may contain toxic substances even though treatment programs have already been implemented.

The objective for Group 2 is maximum reduction of toxic effluent of targeted plants.

A screening characterization has provided confirmation of contaminant absence in SKW CANADA INC. effluent.

INDUSTRIAL PLANT

Silicon alloy production

The SKW CANADA INC. plant produces silicon and ferrosilicon alloys by mixing quartz (SiO_2), coal and wood chips. Steel turnings are added to the mixture to produce ferrosilicon. The mixture is sent to electric-arc furnaces where the quartz is reduced. Two furnaces are used to produce metallic silicon and one to produce ferrosilicon. The molten metal is then refined. Various alloys are then produced and the metal poured into cooling moulds. Once hardened, the metal is unmoulded, crushed, sieved, and stored for shipment. The plant has a rated production capacity of 28 000 t/yr for ferrosilicon and 28 000 t/yr for metallic silicon. In 1995, the plant works at 100% capacity in both cases and employs a work force of 200.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Quartz
- Coal
- Wood chips
- Steel turnings

FINISHED PRODUCTS

- Ferrosilicon
- Metallic silicon
- Silica fume

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Indirect cooling water

According to company data, in 1993, the effluent contained only indirect cooling water from the furnaces. The average effluent discharge was 18 000 m^3/d.

RESOURCES AND USES TO PRESERVE

A large mud flat

The SKW CANADA INC. plant is located in the Bécancour Industrial Park along the banks of the St. Lawrence. The complex natural morphology of the river lends itself to a wide variety of wildlife habitats. The infralittoral zone facing the park contains water-plant communities. Immediately downstream from the Bécancour wharf, a large mud flat rises in the middle of the river. Water-plant communities are considered ideal spawning and nursery areas for northern pike, perch, brown bullhead and smallmouth bass. Over 70 species of fish and at least 26 species of waterfowl can be found in the area. Hunting and fishing enthusiasts frequent the Bécancour area, with sport fishing and muskrat trapping being particularly popular at the mouth of the Gentilly River. The nuclear power station draws its drinking and industrial water a little downstream from the Bécancour wharf.

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 to select treatment methods which best promote environmental protection. The environmental discharge objectives for SKW CANADA INC. will be available by 1997.

EFFLUENT TREATMENT

Only cooling waters

The process used at SKW CANADA INC. generates no effluent. Indirect cooling water from the furnaces is discharged into a ditch at the Bécancour industrial park. Domestic sewage is treated at the industrial park's voluntary aerobic lagoon.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Silicon cooling

In 1995, a commercial-scale pilot unit was installed to produce water-cooled rather than air-cooled silicon. The unit is still being tested.

REGULATORY COMPLIANCE - WATER COMPONENT

No specific regulations

The SKW CANADA INC. plant in Bécancour is subject to no specific regulations for effluent.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

No effluent

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 and determine the toxic contribution of each pollutant (Table 1).

Since the SKW CANADA INC. plant discharges no effluent, no exhaustive characterization will be carried out under SLV 2000. A screening characterization carried out in August 1995 has provided confirmation of contaminant absence in company effluent.

Table 1 ***Chimiotox Index - SKW Canada Inc.***

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
There will be no exhaustive effluent characterization for the SKW CANADA INC. plant in Bécancour since the company discharges no effluent. A screening characterization carried out in August 1995 has provided confirmation of contaminant absence in company effluent.			
CHIMIOTOX INDEX			**N/A**

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 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.

The SKW CANADA INC. plant in Bécancour produces no industrial effluent other than cooling waters.

PEEP TOXICITY REDUCTION

No PEEP

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 SKW CANADA INC. plant, only cooling waters are discharged and the PEEP value won't be calculated.

REDUCTION IN SUBSTANCES MONITORED

Cooling water only

According to company data for 1995, the plant produces no industrial effluent. Effluent is made up of indirect cooling water at an average flowrate of 18 000 m^3/d. A very small percentage of this flow will be re-used in the new direct silicon cooling process, and this water will be discharged with other indirect cooling water after treatment.

KEY POINTS

- **Industrial effluent consists exclusively of cooling waters**
- **Testing of direct water-cooling process**

Based on December 1995 inventory

ADDITIONAL INFORMATION

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