

## FACT SHEET 80

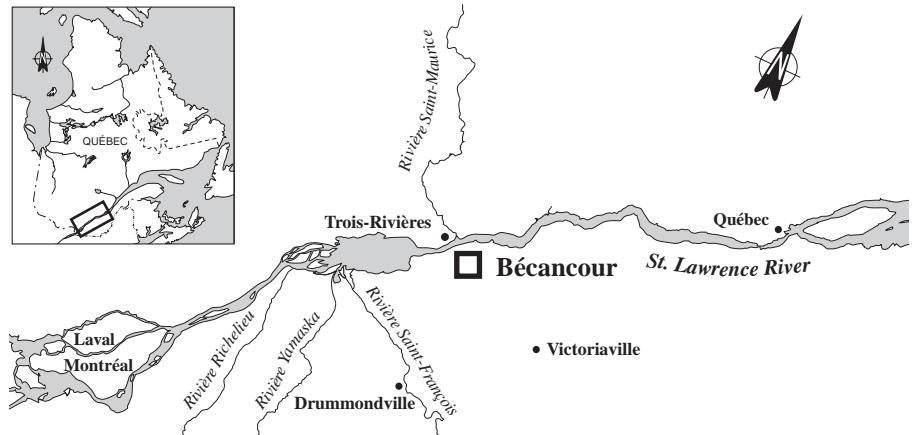
# Société Canadienne de Métaux Reynolds, div. Usine de tige Reynolds

6900 Raoul-Duchesne Blvd.  
Bécancour, Quebec  
G0X 1B0

*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 SOCIÉTÉ CANADIENNE DE MÉTAUX REYNOLDS, DIV. USINE DE TIGE REYNOLDS plant in Bécancour 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

### *Manufactures aluminum rods*

The SOCIÉTÉ CANADIENNE DE MÉTAUX REYNOLDS, DIV. USINE DE TIGE REYNOLDS plant in Bécancour manufactures aluminum rods. Aluminum is smelted in natural gas furnaces, continuously cast and then water cooled. The bars obtained are then crushed in a series of rollers to produce round rods 3/8 to 11/16 in. in diameter. The rods are then reeled and sold for manufacture of electric wire or for steel stripping. Aluminum is also sold in remelt ingots. Annual production capacity of the plant is 82 000 t. In 1997, the plant operated at 80% capacity and employed a work force of 50.

## PRODUCTION

### PRINCIPAL RAW MATERIALS

- Aluminum
- Magnesium
- Iron
- Titanium
- Boron
- Chromium
- Silicon
- Copper

### FINISHED PRODUCTS

- Aluminum rods
- Remelt ingots

# TREATMENT MEASURES

## INITIAL EFFLUENT VALUES

### *Low flowrate, small loads*

According to company data, in 1993 the plant discharged 24.0 m<sup>3</sup>/d of effluent, containing notably:

- 2.76 kg/d of suspended solids (ss)
- 0.87 kg/d of total oil and grease (O&G)
- 0.126 kg/d of aluminum
- 0.06 kg/d of iron

## RESOURCES AND USES TO PRESERVE

### *A wide variety of habitats*

The SOCIÉTÉ CANADIENNE DE MÉTAUX REYNOLDS, DIV. USINE DE TIGE REYNOLDS plant is located in the Bécancour industrial park along the banks of the St. Lawrence River. The plant discharges industrial waste to a ditch (considered an industrial sewer under municipal bylaw) more than 1.7 km from the river. The complex, natural morphology of the river in the area promotes a wide diversity of wildlife habitats. Water plant communities grow in the infralittoral area facing the park. A large mud flat rises in the middle of the St. Lawrence immediately downstream from the Bécancour wharf. The water plant communities in the area are considered attractive spawning and nursery areas for northern pike, perch, brown bullhead and smallmouth bass. Over 70 species of fish and at least 26 bird species may be found in the vicinity. Hunting and fishing enthusiasts visit the Bécancour area, and sport fishing and muskrat trapping are particularly popular at the mouth of the Gentilly River. The nuclear power station draws drinking water and industrial water a short distance 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 in choosing treatment methods which best promote environmental protection. Environmental discharge objectives for the SOCIÉTÉ CANADIENNE DE MÉTAUX REYNOLDS, DIV. USINE DE TIGE REYNOLDS plant have been calculated and are available on request.

## EFFLUENT TREATMENT

### *Two ultrafiltration units*

Since March 1997, industrial wastewater has been treated by two ultrafiltration units installed in series and then aerated in cooling towers to lower oxygen demand. The treated water is then discharged to the industrial ditch that empties into the St. Lawrence. Domestic sewage will be channelled to the industrial park's sewer system.

## PREVENTION AND CLEANUP MEASURES IMPLEMENTED

### *Reduction in wastewater*

A major effort has been made to reduce the amount of industrial water used in the process. As well, effluent from the mechanical broom is now stored in a tank and then shipped to an authorized site for treatment. This last measure has reduced the amount of wastewater discharged to the sewer system by 0.6 to 0.8 m<sup>3</sup>/d.

## REGULATORY COMPLIANCE - WATER COMPONENT

### *Standards met*

The SOCIÉTÉ CANADIENNE DE MÉTAUX REYNOLDS, DIV. USINE DE TIGE REYNOLDS plant in Bécancour complies with standards stipulated in its certificate of authorization for effluent discharge. These standards are stricter than those for discharges to municipal systems.

# POLLUTION ABATEMENT

## CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

*Very low Chimiotox index*

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 May 1995 and the Chimiotox values estimated from them, assuming an effluent flowrate of 48 m<sup>3</sup>/d. Three substances were detected in testing for more than 120. The Chimiotox index for the three substances detected is very low.

Figure 1 is plotted from company monthly data for 1993 and 1995, adjusted for the 1995 SLV 2000 copper characterization. The extrapolations for 1994 are based on company monthly data for 1993, adjusted for the 1995 SLV 2000 copper characterization. The projections for 1996 to 1998 are based on company monthly data for 1995, adjusted for the 1995 SLV 2000 copper characterization. The Chimiotox index of the SOCIÉTÉ CANADIENNE DE MÉTAUX REYNOLDS, DIV. USINE DE TIGE REYNOLDS plant is among the lowest of those of the SLV 2000 plants.

Table 1 *Chimiotox Index (1995) - Société Canadienne de Métaux Reynolds, div. Usine de tige Reynolds\**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total oil and grease	0.038	100	4
Total copper	0.006	451	3
Total phosphorous	0.015	50	1
<b>CHIMIOTOX INDEX</b>			<b>8</b>

\* Assuming an effluent flowrate of 48 m<sup>3</sup>/d (3 substances detected in testing for more than 120)

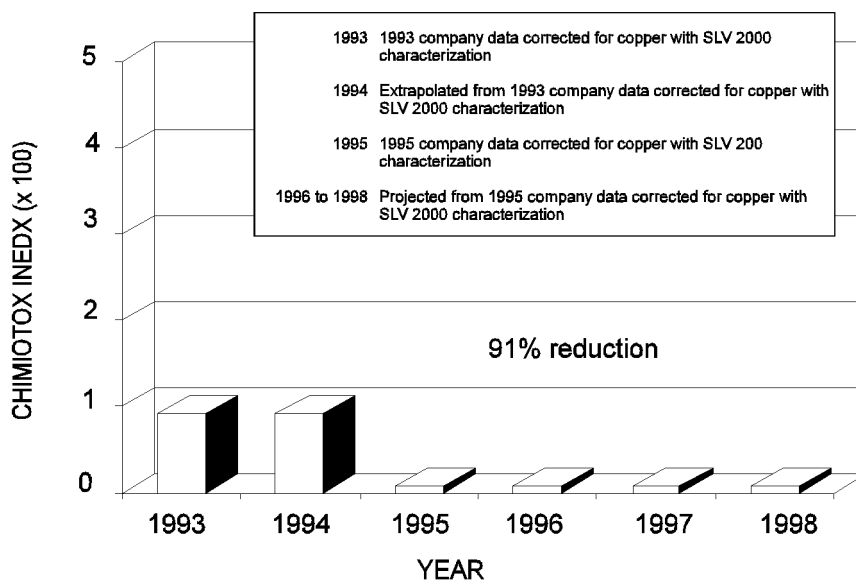


Figure 1 *Chimiotox Index Trends (1993 to 1998) Société Canadienne de Métaux Reynolds, div. Usine de tige Reynolds*

## 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 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.

None of the eleven targeted persistent and bioaccumulative toxic substances were detected in effluent from the SOCIÉTÉ CANADIENNE DE MÉTAUX REYNOLDS, DIV. USINE DE TIGE REYNOLDS plant during the May 1995 SLV 2000 characterization.

## PEEP TOXICITY REDUCTION

### *Low 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 SOCIÉTÉ CANADIENNE DE MÉTAUX REYNOLDS, DIV. USINE DE TIGE REYNOLDS plant, a series of bioassays of effluent was conducted in 1995 on a small percentage of effluent (2.4 m<sup>3</sup>/d), yielding a PEEP of 1.9, which is low.

## REDUCTION IN SUBSTANCES MONITORED

### *Load variations*

According to company data, in 1997 the plant discharged 63.1 m<sup>3</sup>/d of effluent, containing notably:

- 1.58 kg/d of suspended solid (ss)
- 0.152 kg/d of total oil and grease (o&g)
- 0.39 kg/d of aluminum
- 0.042 kg/d of iron

Between 1993 and 1997, oil and grease loads dropped 83%, suspended solids loads dropped 43%, and aluminum and iron loads increased 209% and 70% respectively. The decline in loads is due to cutbacks in chemical use and the installation of two ultrafiltration units.

## KEY POINTS

- One of the lowest Chimiotox indexes among SLV 2000 plants
- A more than 90% drop in the Chimiotox index

Information updated January 1998

## ADDITIONAL INFORMATION

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