

## FACT SHEET 74

### Montupet Ltd

500 Léger Street

Rivière-Beaudette, Quebec

J0P 1R0



*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 MONTUPET LTD plant in Rivière-Beaudette 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

### Aluminum engine parts production

The MONTUPET LTD plant in Rivière-Beaudette produces aluminum engine parts. Aluminum alloys received in ingot form are melted in natural gas furnaces. The molten metal is then transferred to a casting ladle and sent to holding furnaces. In the moulding operation, metal cores are placed in two metal half-moulds. The moulds are closed and the metal is poured. The part is then removed and placed in a cooling tunnel. Finishing includes decorating, removal of risers, deburring and machining. Quality is monitored at the end of the process. Since the SLV 2000 characterization in 1995, the plant has gradually increased its annual production capacity from 7000 to 14 500 t. In 1997, the plant operated at 75% capacity and employed a work force of 400.

## PRODUCTION

### PRINCIPAL RAW MATERIALS

- Aluminum
- Silica sand
- Cutting oil
- Hydraulic oil
- Triethylamine
- Liquid nitrogen
- Sulphuric acid
- Phosphoric acid
- Isocure resin
- Phenolic resin
- Metal treatment products
- Zyglopenetrating agent

### FINISHED PRODUCTS

- Aluminum cylinder heads
- Aluminum cylinder blocks
- Aluminum crancases

# TREATMENT MEASURES

## INITIAL EFFLUENT VALUES

### *Presence of phosphorus*

According to 1995 SLV 2000 characterization data, in 1993 the plant discharged an average of 1237 m<sup>3</sup>/d of effluent, containing notably:

- 7.6 kg/d of suspended solids (ss)
- 6.9 kg/d of total hydrocarbons
- 4.6 kg/d of total organic carbon (TOC)
- 3.9 kg/d of total phosphorus
- 0.5 kg/d of iron

## RESOURCES AND USES TO PRESERVE

### *A priority area*

Effluent from the MONTUPET LTD plant in Rivière-Beaudette is discharged into the storm sewer system of the municipal industrial park. The storm sewer system flows into an infiltration pond near the Beaudette River, a tributary of Lake Saint-François. Spawning grounds for walleye and smallmouth bass are located about 3 km upstream from the mouth of the Beaudette River. Fishing season regulations apply to the area. Apart from walleye and bass, a dozen other fish species are found in the river. A dense bird population lives on the lake near the mouth of the Beaudette River, and a number of duck species also use the area during migration and breeding. This wetland environment is a priority protection area.

The Beaudette River and Lake Saint-François are used for many recreational activities. The north shore of the lake contains campgrounds, boat ramps and beaches, while sport fishing, commercial fishing and water sports are practised on the lake. Saint-Zotique draws its drinking water from Lake Saint-François about 6.5 km downstream from the mouth of the Beaudette River.

## 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. There are no environmental discharge objectives for MONTUPET LTD.

## EFFLUENT TREATMENT

### *Primary treatment*

Effluent passes through a sediment, oil and grease interceptor containing a quicklime contact acid neutralizer. The treated effluent is discharged into the storm sewer system of the municipal industrial park. A small amount (about 20%) of industrial wastewater is discharged untreated into the storm sewer system of the new section of the plant. This effluent is carried to the industrial park's storm sewer system.

Domestic sewage is carried by the domestic sewer system to the wastewater treatment plant of the Rivière-Beaudette municipal industrial park. This facility consists of a septic tank equipped with a tile bed.

## PREVENTION AND CLEANUP MEASURES IMPLEMENTED

### *Recovery and regeneration*

Phosphorus discharges were eliminated in 1996 following a stop in the production of an engine manifold that used phosphoric acid for quality control to prevent corrosion of manifolds.

In addition, MONTUPET LTD introduced measures to increase its capacity without increasing its water consumption and wastewater discharges. For example, the exchange of heat to cool hydraulic power units was optimized.

MONTUPET LTD also identified sources of effluent contamination by oil and grease. The majority of the oil comes from quality control processes for its parts. Prevention measures, such as a review of methods to apply chemical products and clean parts, have been put in place. The quantities of water and products used per production unit have thus been reduced. This has resulted in a decrease of 2 to 3 kg/d in the oil and grease load.

## REGULATORY COMPLIANCE - WATER COMPONENT

### *No specific regulations*

Effluents from the MONTUPET LTD plant in Rivière-Beaudette is not subject to any specific regulations.

# POLLUTION ABATEMENT

## CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

*Mainly total oil and grease*

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 data from the SLV 2000 characterization carried out in September 1995 along with Chimiotox values calculated from them, assuming an effluent flowrate of 1237 m<sup>3</sup>/d. Seven substances were selected in testing for more than 120. Based on these data, total oil and grease dominates in the treated water, accounting for 76% of the Chimiotox index, followed by total phosphorus with 22%.

Figure 1 is plotted from 1995 SLV 2000 characterization data and company data collected in 1997. The Chimiotox index calculated from these data was reported unchanged for 1993 to 1996. For 1997 and 1998, the Chimiotox index is based on data provided by the company for 1997. Reductions are attributable to prevention measures and changes in production introduced by the company.

Table 1 *Chimiotox Index (1995) - Montupet Ltd\**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total oil and grease	6.880	100	688
Total phosphorus	3.895	50	195
Total copper	0.017	451	8
Total sulphides	0.014**	500	7
Total iron	0.749	3.3	2
Total manganese	0.173	10	2
Nitrites-Nitrates	0.075**	5	<1

### CHIMIOTOX INDEX

902

\* Assuming an effluent flowrate of 1237 m<sup>3</sup>/d (7 substances selected in testing for more than 120).

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

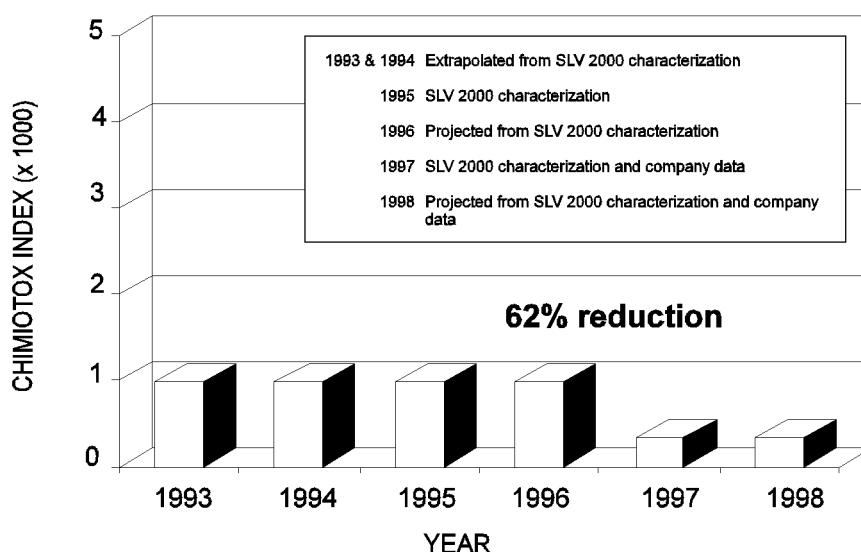


Figure 1 *Chimiotox Index Trends (1993 to 1998)*  
*Montupet Ltd*

## 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 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.

Based on 1995 SLV 2000 characterization data, none of the eleven targeted persistent and bioaccumulative toxic substances was detected in the company's effluent.

## PEEP TOXICITY REDUCTION

### *Low toxicity*

The Potential Ecotoxic Effects Probe (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 MONTUPET LTD plant, a series of bioassays was conducted in 1995, yielding a PEEP of 2.4, and showing only low toxicity.

## REDUCTION IN SUBSTANCES MONITORED

### *Reduction in hydrocarbons and phosphorus*

According to 1995 SLV 2000 characterization data and company data for 1997, the plant discharged 1237 m<sup>3</sup>/d of effluent, containing notably:

- 7.6 kg/d of suspended solids (ss)
- 3.2 kg/d of hydrocarbons C<sub>10</sub> to C<sub>50</sub>
- 4.6 kg/d of total organic carbon (TOC)
- 0.5 kg/d of iron

Effluent remained stable from 1993 to 1997 with the exception of hydrocarbons and phosphorus, whose loads decreased by 54% and 100% respectively.

## KEY POINTS

- **Elimination of phosphorus discharges in 1996**
- **Increase in production without an increase in water consumption or wastewater discharges**
- **A number of prevention measures introduced**
- **62% decrease in Chimiotox index**

Information updated 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):**

Yvon Goulet (514) 370-3085

### **Environment officer at MONTUPET LTD:**

Annie Hince (514) 269-2022

### **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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