

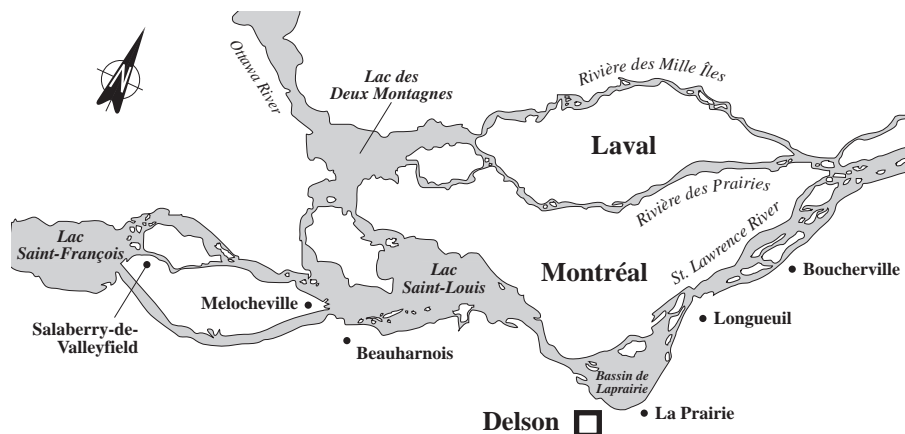
## FACT SHEET 61

### Stella-Jones Inc.

41 Rodier St.

Delson, 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 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 of with a specific objective. The STELLA-JONES INC. plant in Delson, is in Group 1, comprising plants that discharge inadequately treated effluent.*

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

## INDUSTRIAL PLANT

### Wood processing plant

STELLA-JONES INC. acquired the former DOMTAR plant in Delson in December 1993, although DOMTAR still owns the land on which the facility is located. The preservation process in use at the plant involves oil-based products such as creosote, creosote solution, pentachlorophenol (PCP) solution and water-soluble salts in aqueous solutions, namely chromated copper arsenate (CCA). The wood is first dried naturally or in a kiln, then perforated and cut before being treated. Wood that has not been air-seasoned is vacuum processed by steam or boiling. One of two impregnation techniques is used in the steel autoclaves, depending on how much preservative should be retained by the wood. The company plans to install a new CCA autoclave in 1998. The annual capacity of the plant is 26 280 hours for oil-based treatments and 8760 hours for CCA. In 1997, the plant employed a work force of 79.

## PRODUCTION

### PRINCIPAL RAW MATERIALS

- Wood
- Creosote
- Pentachlorophenol (PCP)
- Heavy oil (solvent for creosote)
- Oil for pole treatment (solvent for PCP)
- Chromated copper arsenate (CCA)

### FINISHED PRODUCTS

- Railway ties
- Pilings
- Framing timber
- Structural timber
- Power and telephone poles

# TREATMENT MEASURES

## INITIAL EFFLUENT VALUES

### *Low flow*

Based on company data, in 1993 the plant discharged 96 m<sup>3</sup>/d of effluent, containing notably:

- 16.7 kg/d of chemical oxygen demand (COD)
- 11.3 kg/d of biochemical oxygen demand (BOD<sub>5</sub>)
- 3.7 kg/d of suspended solids (SS)
- 0.5 kg/d of oil and grease (O&G)

## RESOURCES AND USES TO PRESERVE

### *Diversity of birds and fish*

Effluent from the STELLA-JONES INC. plant is discharged into the Saint-Pierre and Tortue rivers. Both join the south shore of the St. Lawrence River, in the Little La Prairie Basin. This area contains fish spawning sites. At least 14 species of aquatic birds have been recorded between Sainte-Catherine and Brossard. The mouth of the Tortue river is a water bird area also used by waterfowl during nesting and migration. It is also used for sport fishing and pleasure boating. The area between the mouths of the Saint-Régis and Saint-Jacques rivers is part of a commercial fishing zone for carp and yellow sturgeon.

## 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 STELLA-JONES INC.

## EFFLUENT TREATMENT

### *Oil separation*

Wastewater from processes using creosote and PCPs is treated in a number of stages. Oil is first separated from water in three primary settling tanks. The oil thus recovered is dehydrated and reused. The water is channelled to the separator, which removes floating oils, and then to the flocculation system, which removes emulsified oils. The water next flows through a sand filter and two columns of activated charcoal before being discharged into the Saint-Pierre river. Wastewater from CCA processing is recirculated within the process.

Domestic sewage, boiler purge water and water softener regeneration water is discharged into the public sewer system and treated at the Sainte-Catherine sewage treatment plant.

Runoff from the land on which the STELLA-JONES INC. plant is located and treated wood leachate currently flow untreated into the Tortue and Saint-Pierre rivers.

## PREVENTION AND CLEANUP MEASURES IMPLEMENTED

### *Containment of contaminated soil and recycling of oils*

Since the plant was sold to STELLA-JONES INC., DOMTAR has removed some of the contaminated soil from the drainage areas by the autoclave outlets and stored some of this soil in a watertight cell. A certificate of authorization was issued on July 22, 1997 for the temporary storage of contaminated soil.

STELLA-JONES INC. installed two containment tanks in the spring of 1994 to be used in the event of an accidental spill and a drainage area at the outlets of the oil-based treatment autoclaves. Since August 1994, oil-based process condensates have been stored in two reservoirs, then reused in the boiler.

## REGULATORY COMPLIANCE - WATER COMPONENT

### *Municipal bylaw*

The STELLA-JONES INC. plant in Delson is subject to Delson municipal bylaws on discharge into the local sewer system. After treatment, its process water is channelled to the Saint-Louis river.

# POLLUTION ABATEMENT

## CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

*Mainly dioxins and furans*

The Chimiotox index gauges the load of all toxic substances present 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 October 1997, assuming an effluent flowrate of 625 m<sup>3</sup>/d originating from process water and indirect cooling water from the air purification system. Six substances were selected in testing for more than 120. According to these data, dioxins and furans, expressed as 2,3,7,8-T<sub>4</sub>CDD equivalents, account for 73% of the Chimiotox index.

Figure 1 is plotted from 1997 SLV 2000 characterization data. The Chimiotox index calculated from these data was reported unchanged for 1993 to 1998. No major changes were made to the wastewater treatment process during that period.

Table 1 *Chimiotox Index (1997)- Stella-Jones Inc.\**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
2,3,7,8-T <sub>4</sub> CDD equivalent	8.874X10 <sup>-10</sup>	71 428 571 429	63
Total oil and grease	0.100	100	10
Acrolein	0.021	333	7
Total arsenic	6.2X10 <sup>-5</sup>	57 143	4
Nitrites-nitrates	0.182	5	1
Total aluminum	0.111	11	1

### INDICE CHIMIOTOX

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\*Assuming an effluent flowrate of 625 m<sup>3</sup>/d (6 substances selected in testing for more than 120).

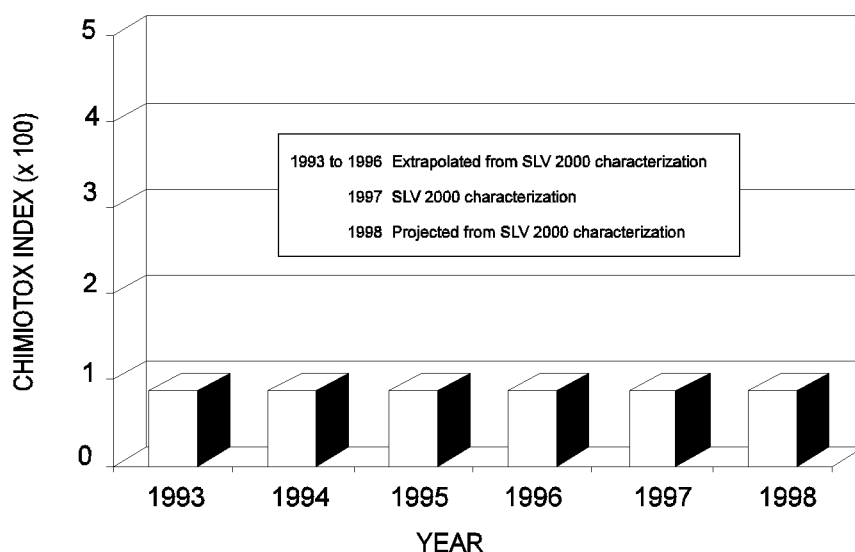


Figure 1 *Chimiotox Index Trends (1993 to 1998)  
Stella-Jones Inc.*

## 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 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 SLV2000 in 1998, thereby ensuring that all uses of the receiving environment are protected.

The 1997 SLV 2000 characterization detected the presence of dioxins and furans, expressed as 2,3,7,8-T<sub>4</sub>CDD equivalents. There are no environmental discharge objectives for STELLA-JONES INC.

## PEEP TOXICITY REDUCTION

*No toxicity observed*

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 STELLA-JONES INC. plant in Delson, a series of bioassays was conducted in 1997, yielding a PEEP of less than 0.6, and showing no toxicity for the organisms tested.

## REDUCTION IN SUBSTANCES MONITORED

*Reduction in flowrate and charges*

According to SLV 2000 characterization data, in 1997 effluent consisting of process wastewater had a flowrate of 18.1 m<sup>3</sup>/d, containing notably:

- 6.8 kg/d of chemical oxygen demand (COD)
- 4.4 kg/d of biochemical oxygen demand (BOD<sub>5</sub>)
- 0.2 kg/d of suspended solids (ss)
- 0.1 kg/d of oil and grease (o&g)

Between 1993 and 1997, the effluent flowrate decreased by 81%, the COD by 59%, the BOD<sub>5</sub> by 61%, and ss and o&g loads by 95% and 80% respectively.

## KEY POINTS

- No toxicity for the organisms tested

## ADDITIONAL INFORMATION

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