

FACT SHEET 95

Domtar Papers Windsor Business Center

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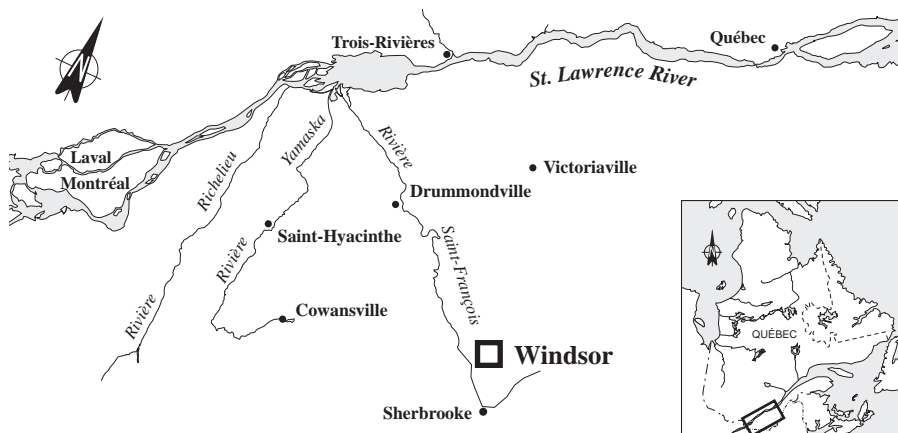
Windsor, Quebec

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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 with a specific objective. The DOMTAR PAPERS WINDSOR BUSINESS CENTER mill in Windsor is part of Group 3, comprising regulated industrial plants.

The objectives for Group 3 are to assess the toxic waste of regulated plants in terms of environmental objectives and establish corrective measures for optimum reduction of any harmful impact on the receiving environment.



INDUSTRIAL PLANT

Fine paper production

DOMTAR PAPERS WINDSOR BUSINESS CENTER makes fine papers using a traditional Kraft process. Bleached hardwood pulp is produced for the mill's own requirements. The bleaching process uses chlorine in the form of chlorine dioxide (ClO_2) and gaseous chlorine (Cl_2); at the end of 1996, only ClO_2 will be used for this purpose. Quicklime used to causticize the green liquor is recalcined from a lime kiln. The hardwood logs are dry debarked. The production capacity of the plant is 615 051 t/yr. In 1995, the mill works at 100% capacity and employs 1011 workers.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Hardwood
- Hardwood chips
- Bark
- Softwood pulp
- Chemicals for pulp bleaching
- Calcium carbonate (CaCO_3)
- Lime (CaO)

FINISHED PRODUCTS

- Fine paper (photocopy paper, offset paper, paper for business forms and envelopes)
- Bleached hardwood pulp

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Suspended solids and biochemical oxygen demand

Based on company data, in 1993 the mill had an effluent discharge of 66 811 m³/d, containing notably:

- 9655 kg/d of suspended solids (ss)
- 1045 kg/d of biochemical oxygen demand (BOD₅)

RESOURCES AND USES TO PRESERVE

Fishing area

Effluent from the DOMTAR PAPERS WINDSOR BUSINESS CENTER mill is discharged onto the right bank of the Saint-François river. The stretch between Richmond and the plant dam is used by waterfowl and a number of fish species, along with stocking areas for brown trout and rainbow trout. The stretch also contains areas with a specific fishing season for smallmouth bass, pike, yellow walleye and trout. The river is bordered by parks and picnic areas, and attracts kayak, canoe, rowboat and sport fishing enthusiasts. The major water intake for Drummondville is also located in the area. Commercial fishing for bait is practised from Windsor to Drummondville. In addition, Celanese has an industrial water intake at Drummondville.

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. The water quality based objectives for DOMTAR PAPERS WINDSOR BUSINESS CENTER have been calculated and are available on request.

EFFLUENT TREATMENT

Many stages

Effluent from the mill is first treated in a primary clarifier. The supernatant obtained goes to a tank where it is neutralized by effluent from the bleaching plant and the addition of neutralizers. This water then flows into a sedimentation tank, a cooling tower, then through an aeration tank where it undergoes secondary biological treatment (aerated lagoons). It then goes to a secondary clarifier; the solids are pressed and land-filled. Effluent from the aeration tank is mixed with cooling water and then discharged into the river. Domestic sewage will be sent to the Windsor sewage treatment plant beginning in November 1996.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Modernizing the treatment system

The mill modified its bleaching sequence in October 1994. This operation reduced consumption of fresh water, made for better re-use of clear white water and reduced the volume of effluent to be treated as well as the dioxin and furan loads.

The DOMTAR PAPERS WINDSOR BUSINESS CENTER mill obtained authorization to modify its secondary treatment system. Work began in October 1994 and lasted until September 1995. The main changes were the addition of: one cooling tower at the exit end of the sedimentation tank, mixers in the aeration tank to prevent sedimentation, four flotation cells to remove suspended solids and a filter press to dry sludge. This work, carried out at a cost of \$18 million, improved effluent quality, mainly as regards pollution by ss, dioxins and furans. The company obtained a certificate of authorization to increase the production capacity of the chlorine dioxide generator.

REGULATORY COMPLIANCE - WATER COMPONENT

Compliance with standards

The DOMTAR PAPERS WINDSOR BUSINESS CENTER mill is subject to the regulation on pulp and paper mills and the guidelines of the federal regulation. Cleanup measures have enabled the company to meet the standards under the new Quebec regulation that came into force on September 30, 1995.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Significant reduction in Chimiotox Index

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

Table 1 shows monthly data for the last three months of 1995, provided by the company under the provincial regulation governing pulp and paper mills, along with the Chimiotox values estimated from these data, assuming an effluent flowrate of 60 969 m³/d. Based on these data, oil and grease predominate in the treated water, representing 57% of the value of the Chimiotox index, followed by dioxins and furans with 23%, and total aluminum with 17%.

Figure 1 is based on September 1992 industrial effluent abatement program (PRRI) characterization data, along with monthly company data for October to December 1995. The Chimiotox index calculated from the PRRI characterization data was used as is for 1993 and 1994. Forecasts for 1996 to 1998 are based on company data for October to December 1995. The 83% reduction in the Chimiotox index is mainly due to the efficiency of the new secondary treatment system.

Table 1 *Chimiotox Index (1995) - Domtar Papers Windsor Business Center**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Mineral oil and grease	28.890	100	2 889
2,3,7,8-T ₄ CDD equivalent	1.67x10 ⁻⁸	71 428 571 429	1 191
Total aluminum	77.040	11	847
Stearic acid	5.363	19	102
Total zinc	5.136	9.4	48
Oleic acid	0.458	19	9
Déhydroabietic acid	0.100	77	8
Linoleic acid	0.141	19	3
CHIMIOTOX INDEX			5 097

* For an effluent flowrate of 60 969 m³/d.

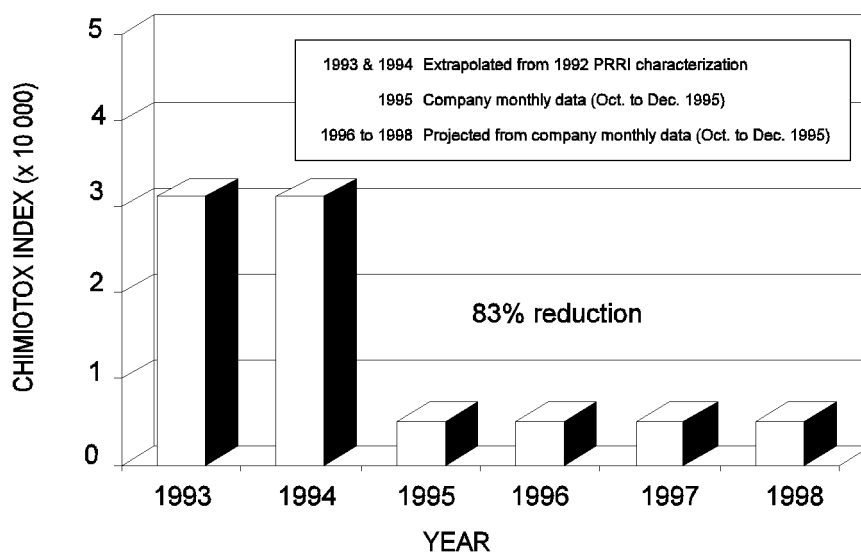


Figure 1 *Chimiotox Index Trends, 1993 to 1998
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VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

One long-range objective of SLV 2000 is the virtual elimination of eleven persistent and bioaccumulative toxic substances from the effluent of the 106 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.

Based on data from the self-regulating effluent monitoring program for the last three months of 1995, two of eleven persistent toxins were detected: dioxins and furans. The mean concentration measured was 0.27 pg/l 2,3,7,8-T₄CDD equivalent. The environmental discharge objective is 0.15 pg/l 2,3,7,8-T₄CDD equivalent.

EFFLUENT TOXICITY

Non-toxic effluent

Since September 30, 1995, it has been illegal under the Quebec pulp and paper regulation to release into the environment or a storm sewer a final effluent that is acutely lethal to rainbow trout, as demonstrated by bioassays. For DOMTAR PAPERS WINDSOR BUSINESS CENTER, implementation of new cleanup measures has reduced effluent toxicity. Company data for October to December 1995 indicate that final effluent is not toxic.

REDUCTION IN SUBSTANCES MONITORED

Reduction in suspended solids

Based on company data for the last three months of 1995, the mill had a mean effluent discharge of 58 953 m³/d, containing notably:

- 5043 kg/d of suspended solids (ss)
- 1474 kg/d of biochemical oxygen demand (BOD₅)

From 1993 to 1995, the suspended solid loads decreased by 48%, mainly as a result of changes to the water treatment system. biochemical oxygen demand increase is essentially due to plant production growth.

KEY POINTS

- **Chimiotox index down 83%**
- **Modernization of secondary biological treatment system at a cost of \$18 million**
- **Non-toxic effluent**

Based on December 1995 inventory

ADDITIONAL INFORMATION

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