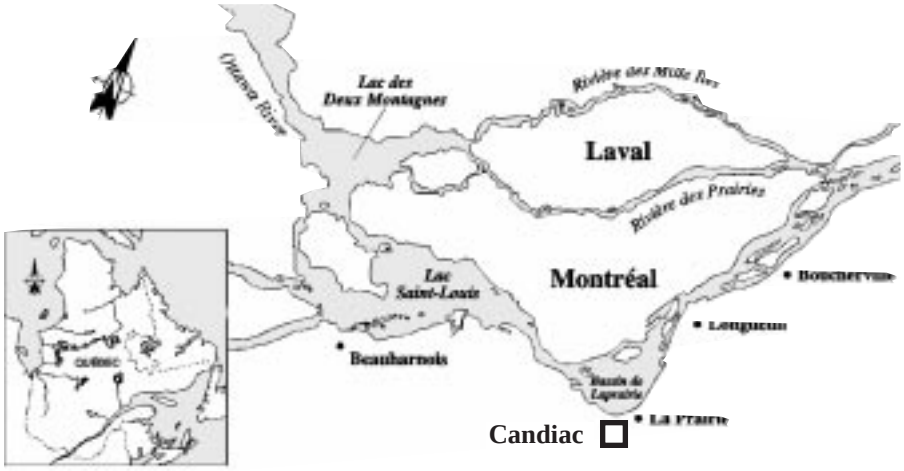
FACT SHEET No. 14

Perkins Papers Ltd.

75 Marie Victorin

Candiac, Quebec

J5R 1C2



***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 liquid toxic waste and virtually eliminate discharges of persistent toxic substances.*

The 106 industrial plants designated under SLV 2000 are divided into four groups, each of which has been given a specific objective. The PERKINS PAPERS LTD. mill, located in Candiac, is part of Group 4, comprising the 50 plants targeted under the St. Lawrence Action Plan.

The objective set for Group 4 is to pursue cleanup efforts and perform environmental monitoring to achieve a 90% reduction in liquid toxic waste. Between 1988 and 1995, the 50 plants reduced their toxic effluent discharges by 96%.

INDUSTRIAL PLANT

Products from recycled papers

PERKINS PAPERS LTD. manufactures recycled-paper products. The Candiac mill uses two papermaking machines and has had an annual production capacity of 89 280 mt since the fall of 1991, when the second machine went on stream. Both machines employ the same process, which consists of grinding and pulping used paper, deinking and cleaning the pulp, bleaching the pulp with sodium hypochlorite and making the paper. Given that the pulp is derived from used stock, the forms for the new paper often become clogged with debris and require frequent jetcleaning with solvents. The use of xylene as a cleaning agent was discontinued in 1995. The company has since banned the use of aromatic solvents.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Used paper
- Additives and dyes
- Sodium hypochlorite

FINISHED PRODUCTS

- Toilet paper
- Paper towels
- Table napkins

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

BOD_5 and SS

Based on company data, in 1988 the mill had an effluent discharge of 3948 m^3/d, containing:

- 1275 kg/d of biochemical oxygen demand (BOD_5)
- 356 kg/d of suspended solids (SS)

RESOURCES AND USES TO PRESERVE

Diverse uses of the environment

PERKINS PAPERS LTD. discharges its effluent into the Candiac municipal sewer system, which is connected to the plant operated by the La Prairie Basin wastewater treatment board located in Sainte Catherine. The treatment plant effluent empties north of the Seaway embankment into the La Prairie Basin, opposite the town of Sainte-Catherine. The La Prairie Basin is home to large numbers of animal and plant species and is heavily used by migrating and nesting waterfowl. There are several spawning grounds along the embankment and around the islands. Recreational activities such as boating, windsurfing and sport fishing are concentrated south of the embankment, a sector also known as the lesser La Prairie Basin. The first drinking water intakes below the municipal outfall are the La Prairie and Candiac municipal intakes, located north of the embankment at about 2000 and 4000 m, respectively, from the outfall.

WATER QUALITY BASED OBJECTIVES

Environmental protection

Water quality based 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. In the case of the PERKINS PAPERS LTD. company, there are no water quality based objectives, as the company's effluents are discharged into the municipal sewer.

EFFLUENT TREATMENT

Primary physicochemical treatment

Each of the two papermaking machines is equipped with a primary physicochemical treatment system. Both of the systems comprise a primary clarifier and a sludge pressing system. Part of the treated wastewater is returned to the paper machines; the remaining effluents are combined for measurement and sampling. They are then released into the Candiac sewer system and undergo secondary treatment at the plant operated by the La Prairie Basin wastewater treatment board. Sanitary sewage empties directly into the municipal sewer system.

PREVENTION AND CLEANUP SYSTEMS IMPLEMENTED

Equipment optimization

As of fall 1993, the mill optimized its water recirculation and fibre recovery equipment. The modifications cut back discharges and SS loads to the levels posted before the second papermaking machine entered into operation in 1991. The BOD_5 load in the effluent has been reduced through secondary treatment at the La Prairie Basin wastewater treatment plant.

REGULATORY COMPLIANCE - WATER COMPONENT

BOD_5 treatment

The PERKINS PAPERS LTD. mill in Candiac is partly subject to federal and provincial regulations for pulp and paper mills. Those regulations are not fully applicable because the mill effluent is released into a municipal sewer system. The plant is also subject to the municipal by-law for wastewater discharges into sewers. In 1993, the Ministère de l'Environnement et de la Faune commended PERKINS PAPERS LTD. for its treatment measures.

At present, the effluent BOD_5 is treated at the plant operated by the La Prairie Basin wastewater treatment board. PERKINS PAPERS LTD. must strike a final agreement with the board in order to fulfil the commitment made when it sought approval from the Ministère de l'Environnement et de la Faune to build and operate the second papermaking machine. That commitment will ensure treatment of effluent BOD_5 at the La Prairie Basin treatment facility.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Mostly non-halogenated VOCs

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

Table 1 gives the data supplied by the company, in accordance with the provincial regulations on pulp and paper mills, for the months of October to December 1995, as well as the Chimiotox values calculated therefrom, for an effluent flow of 5172 m^3/d. Testing showed that copper was predominant in the treated wastewater, making up 51% of the Chimiotox index, followed by lead (27%) and mineral oil and grease (20%).

Figure 1 is plotted from the 1991 characterization data, which were adjusted to account for the efficiency of the municipal secondary treatment system. Those 1991 figures were also adjusted on the basis of monthly company data to establish Chimiotox indices for 1988-1990 and 1992-1995. The 86% drop in the index between 1988 and 1993 resulted from connection of the mill to the municipal treatment plant (1991) and the reduction in dioxins and furans (1993). The elimination of xylene in 1995 brings the reduction to 90%.

Table 1 ***Chimiotox Index (1995) - Perkins Papers Ltd.****

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total Copper	0.930	451	419
Total Lead	0.698	314	219
Mineral Oil and Grease	1.628	100	163
Total Aluminum	0.488	11	5
T_4CDD-2,3,7,8 equivalent	5.17×10^{-11}	71 428 571 429	4
Tetrachlorocatechol	0.002	1 000	2
Trichlorophenols	0.034	56	2
Total Nickel	0.140	10	1
CHIMIOTOX INDEX(before municipal wastewater treatment)**			**815**
CHIMIOTOX INDEX(after municipal wastewater treatment)**			**125**

* For effluent discharge of 5172 m^3/d.
** October to December 1995.

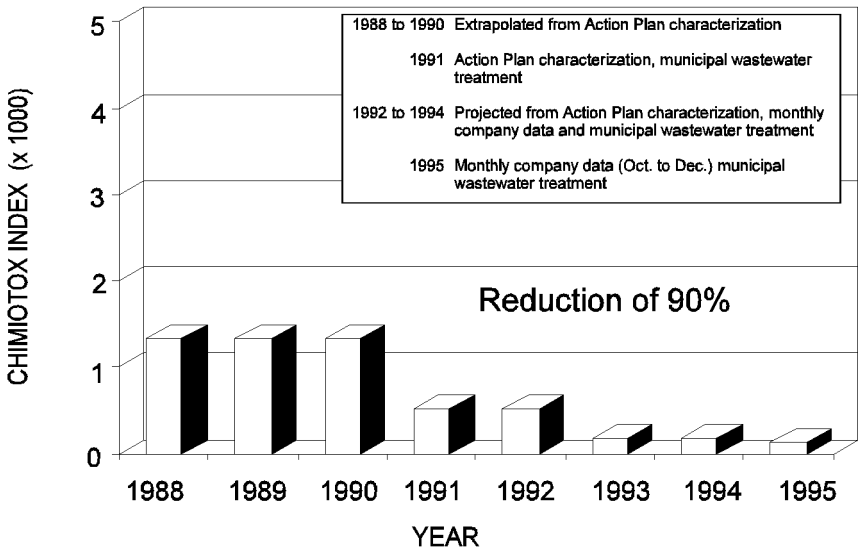


Figure 1 ***Changes in toxic effluent discharges, 1988-1994 - Perkins Papers Ltd.***

VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

Dioxins and furans

One long-range objective of SLV 2000 is the virtual elimination of 11 persistent 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 alkyl, benzo(*a*)pyrene and hexachlorobenzene.

According to the monthly data for October to December 1995, two of the 11 targeted substances, dioxins and furans, were detected. The average measured concentration was 10 pg/L, which corresponds to a load of 5.17×10^{-11} kg/d (1.1×10^{-3}). For the period covered by the new action plan the industry should be able to meet the standards laid down by the new pulp and paper mill regulations, which call for concentrations of 15 pg/L; federal regulations refer to a measurable concentration of dioxins and furans.

PEEP TOXICITY REDUCTION

Average toxicity

The Potential Ecotoxic Effects Probe, or PEEP, combines results from 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. One series of bioassays was conducted in 1991 for the PERKINS PAPERS LTD. mill. The PEEP index was estimated at 4.8, in the middle range of the PEEP indices found for the 50 plants.

Since September 30, 1995, the Quebec regulations respecting pulp and paper mills have prohibited the release into the environment or storm drains of any final effluent of acutely lethal toxicity (as demonstrated by bioassays with Rainbow trout). This does not apply to the PERKINS PAPERS LTD. MILL, however, which discharges its final effluent to the municipal sewer system.

REDUCTION IN SUBSTANCES MONITORED

Production boosted

Based on monthly company data for the month of October, November and December 1995, the mill had an effluent discharge of 5040 m^3/d, containing:

- 2429 kg/d of biochemical oxygen demand (BOD_5)
- 338 kg/d of suspended solids (SS)

During the period 1988-1995, SS loads decreased by 5% and BOD_5 loads increased by 90%. This increase was due to the startup of a second papermaking machine, which doubled production.

KEY POINTS

- **90% reduction in the Chimiotox index**
- **In 1991, connection to the treatment plant of the La Prairie Basin wastewater treatment board**
- **Reduction in dioxins and furans**
- **In 1993, Environment Canada and the Ministère de l'Environnement et de la Faune commended PERKINS PAPERS LTD. for the treatment measures implemented.**

Based on December 1995 inventory.
Information reviewed by Gilles Legault, SLV 2000.

ADDITIONAL INFORMATION

Chimiotox index and PEEP: Gilles Legault, Environment Canada (514) 283-3452.

Water quality based objectives: Francine Richard, MEF (418) 644-3574.

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