

## FACT SHEET No. 38

### Abitibi-Price Inc., papeterie Beupré

1 du Moulin Street

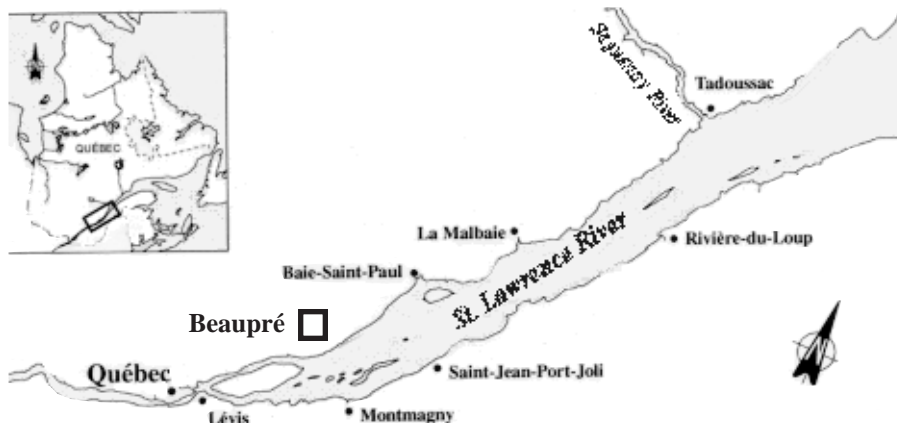
Beupré, Quebec

G0A 1E0

*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. ABITIBI-PRICE INC., PAPETERIE DE BEAUPRÉ 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

### *Manufacturing of specialty paper*

The Beupré mill of ABITIBI-PRICE INC., PAPETERIE DE BEAUPRÉ manufactures specialty paper from thermomechanical pulp. Pre-washed wood chips are steamed in tanks and then defibred in refiners. The resulting thermomechanical pulp is passed through four centrifugal sieves before it is washed in five steps by centrifugal cleaners. Next, the pulp is washed in three pressurized washers and thickened before being poured into two tanks with a combined storage capacity of approximately 200 tonnes. Lastly, the pulp is bleached in two steps. It is mixed into a solution of sodium silicate, hydrogen peroxide, caustic soda and water, prior to being poured into two bleaching towers. When it leaves the towers, the pulp is bleached with sodium hydrosulphite. The plant's annual production capacity is 175 000 tonnes of specialty paper. In 1995, the plant operated at 100% of rated capacity and employed a work force of 450.

## PRODUCTION

### PRINCIPAL RAW MATERIALS

- Wood chips
- Sodium silicate
- 50% hydrogen peroxide
- Caustic soda
- Sulphur dioxide
- DTPA (diethylenetriamine pentaacetic acid)
- Sodium hydrosulphite

### FINISHED PRODUCTS

- Specialty papers

# TREATMENT MEASURES

## INITIAL EFFLUENT VALUES

### *BOD<sub>5</sub> and SS*

According to company data, in 1988 there was an effluent discharge of 34 431 m<sup>3</sup>/d, containing:

- 11 900 kg/d of biochemical oxygen demand (BOD<sub>5</sub>)
- 9691 kg/d of suspended solids (SS)

## RESOURCES AND USES TO PRESERVE

### *A wildlife reserve*

The Beauré mill of ABITIBI-PRICE INC., PAPETERIE DE BEAUPRÉ is located on the north shore of the St. Lawrence River, opposite the downstream tip of Orléans Island. It empties its wastewater into the St. Lawrence. The Beauré Shore, which has many wharves and boat-launching ramps, is one of the most popular recreation areas along the St. Lawrence. Over 100 000 vacationers, including 1000 hunters who particularly prize the area, go there every year. The nearby Montmagny islands have bulrush marshes that are the most beautiful of their kind anywhere along the river, and the Cap Tourmente National Wildlife Area is approximately 5 km downstream from Beauré. At the time of their fall migration, Snow Geese, thousands of dabbling ducks, hundreds of Canada Geese and sea ducks gather there. The intertidal zone between Beauré and Cap Tourmente is a spawning ground for northern pike, while Canards Cove, at the northeastern tip of Orléans Island, harbours spawning grounds for shad and sucker.

## WATER QUALITY BASED OBJECTIVES

### *Environmental protection*

In order to protect resources and uses, environmental objectives for toxic effluent are calculated in terms of concentrations and loads that must not be exceeded. These values are guidelines in seeking the most appropriate treatment solutions for protecting the environment. The water quality based objectives for ABITIBI-PRICE INC. will be available on request by 1997.

## EFFLUENT TREATMENT

### *A secondary treatment system*

Industrial wastewater from the wood preparation workshop, the pulp workshop and the paper machines is treated in a settling tank then sent to a biological treatment system. Domestic wastewater is collected and discharged into the Beauré municipal sewerage system. Wastewater from the water supply treatment system and run-off are emptied into the river without treatment.

## PREVENTION AND CLEANUP SYSTEMS IMPLEMENTED

### *Major investment*

Since October 1989, industrial wastewater has been purified in a settling tank. The installation of this piece of equipment for primary treatment resulted in a marked reduction of SS in the effluent. In July 1993, the chemi-thermomechanical pulp workshop was transformed into a thermo-mechanical pulp workshop. The changes completely eliminated the use of sodium sulphite and reduced the effluent discharge sent to the clarifier. Between March 1993 and August 1994, further improvements made it possible to reduce the amount of water withdrawn; effluent discharge was subsequently reduced from 36 000 m<sup>3</sup>/d to 19 000 m<sup>3</sup>/d. In November 1994, after the production of sulphurous water was stopped, the pH level of the water entering the clarifier improved. On

the other hand, during the same period, the upgrading of one of the two paper machines provoked an increased flow of wastewater to the clarifier.

Connection of the plant's domestic sewerage system to the Beauré municipal treatment plant was completed in the summer of 1995, as were the activated-sludge secondary treatment facilities the company had started building the previous summer in order to further reduce effluent pollution. The total construction cost for the secondary treatment facilities was \$ 15 million.

## REGULATORY COMPLIANCE - WATER COMPONENT

### *Compliance with new standards*

The ABITIBI-PRICE INC. mill in Beauré is subject to the Quebec Regulations Respecting Pulp and Paper Mills and the federal Pulp and Paper Effluent Regulations. Since the new secondary treatment system came on stream in the summer of 1995, the ABITIBI-PRICE INC. mill has been able to meet the new standards, which came into effect on September 30, 1995.

# POLLUTION ABATEMENT

## CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

### *Mineral oil and grease*

The Chimiotox index gauges the load of all the toxic substances 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 monthly data supplied by the company under the provincial regulations on pulp and paper mills for the months of October to December 1995, as well as the Chimiotox values calculated from them, for an effluent discharge of 19 692 m<sup>3</sup>/d. The data show that mineral oil and grease were preponderant in the treated water. The mineral oil and grease accounted for 76% of the Chimiotox index.

Figure 1 is plotted from the 1990 characterization data and the monthly company data (Oct. to Dec. 1995). The Chimiotox indices for 1988 and 1989 were obtained from the 1990 characterization, taking into account company figures for the period before the installation of the settling tank. The Chimiotox indices for 1991 to 1994 were extrapolated from the 1990 characterization data. The reduction of 85% of the Chimiotox index, between 1988 and 1995, was obtained by the installation of a primary settling tank in 1989 and the installation of the activated-sludge secondary treatment system in 1995.

Table 1 *Chimiotox Index (1995) - Abitibi-Price Inc., papeterie Beupré \**

| Substance                | Load (kg/d) | Toxic Weighting Factor | Chimiotox Units (CU) |
|--------------------------|-------------|------------------------|----------------------|
| Mineral Oil and Grease   | 24.046      | 100                    | 2405                 |
| Total Aluminium          | 32.927      | 11                     | 362                  |
| Total Lead               | 0.467       | 314                    | 147                  |
| Total Copper             | 0.280       | 451                    | 126                  |
| Dehydroabietic Acid      | 0.588       | 77                     | 45                   |
| Total Zinc               | 2.800       | 9.4                    | 26                   |
| Oleic Acid               | 0.831       | 19                     | 16                   |
| Abietic Acid             | 0.635       | 19                     | 12                   |
| Palustric Acid           | 0.252       | 19                     | 5                    |
| Total Nickel             | 0.280       | 10                     | 3                    |
| Isopimaric Acid          | 0.149       | 19                     | 3                    |
| Levopimaric Acid         | 0.159       | 19                     | 3                    |
| Neoabietic Acid          | 0.103       | 19                     | 2                    |
| <b>CHIMIOTOX INDEX**</b> |             |                        | <b>3155</b>          |

\* For effluent discharge of 19 692 m<sup>3</sup>/d.

\*\* October to December 1995.

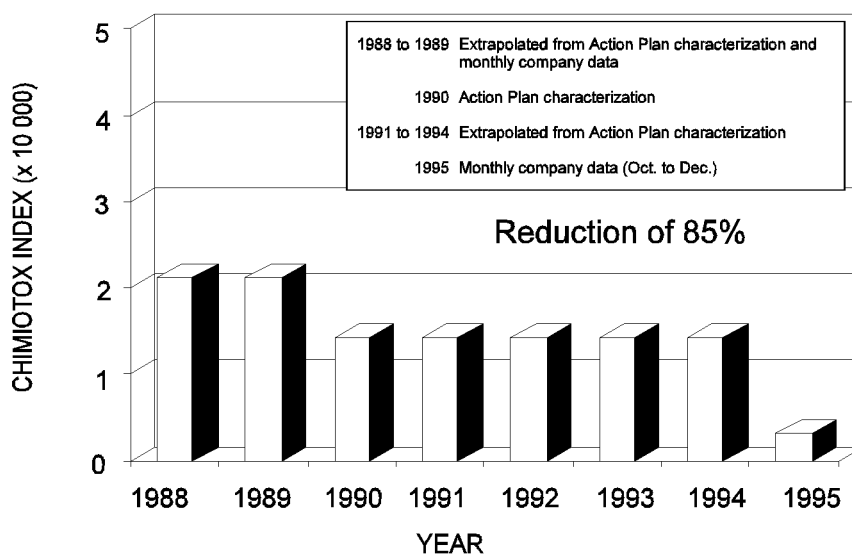


Figure1 *Changes in toxic effluent discharges, 1988-1995 - Abitibi-Price Inc., papeterie Beupré*

## VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

### *No persistent toxic substance*

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

According to the monthly data for October to December 1995, no persistent toxic substance was detected.

## PEEP TOXICITY REDUCTION

### *Non-toxic effluent*

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 ABITIBI-PRICE mill in Beupré, one series of bioassays was carried out. The PEEP value was 6.0 in 1990.

Since September 30, 1995, it is prohibited under the provincial Regulations Respecting Pulp and Paper Mills to discharge a final effluent whose toxicity has reached an acute lethality level (as demonstrated by bioassays with rainbow trout) into a storm sewer or elsewhere in the environment. The implementation of new cleanup measures in the ABITIBI-PRICE INC. mill has helped reduce the toxicity of the effluent, which has been non-toxic since the secondary treatment system came on stream.

## REDUCTION IN SUBSTANCES MONITORED

### *A significant reduction of BOD<sub>5</sub> and ss*

Based on company data for the months of October, November and December 1995, the average effluent flow was 21 607 m<sup>3</sup>/d, containing:

- 1595 kg/d of biochemical oxygen demand (BOD<sub>5</sub>)
- 6031 kg/d of suspended solids (ss)

Between 1988 and 1995, company data show, there was a 38% decrease in ss, an 87% decrease in BOD<sub>5</sub>, and a 43% decrease in effluent flow. The reduction in ss, BOD<sub>5</sub> and the effluent flow is due to the implementation of several cleanup measures and to the discontinuation of chemi-thermomechanical pulp production. Optimization of the new biological treatment facilities during 1996 should reduce ss values by 85% from 1988.

## KEY POINTS

- **85% reduction in the Chimiotox index**
- **38% reduction in ss and 87% reduction in BOD<sub>5</sub> between 1988 and 1995**
- **Installation of an activated-sludge treatment system (an investment of \$15 million) in September 1995**

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.

**Records officer at the Ministère de l'Environnement et de la Faune du Québec (MEF):** Vital Gauvin, (418) 622-5151.

**Environment officer at ABITIBI-PRICE INC., PAPETERIE DE BEAUPRÉ:**  
Lyne Tremblay, (418) 827-6476.

Published by authority of the Minister of the Environment  
© Minister of Supply and Services Canada, 1996  
Catalogue No. En153-6/38-1996E  
ISBN 0-662-23361-1

(Aussi disponible en français sous le titre *Établissements industriels - faits saillants*).