FACT SHEET No. 45

Abitibi-Price Inc., Alma Business Unit

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Alma, Quebec
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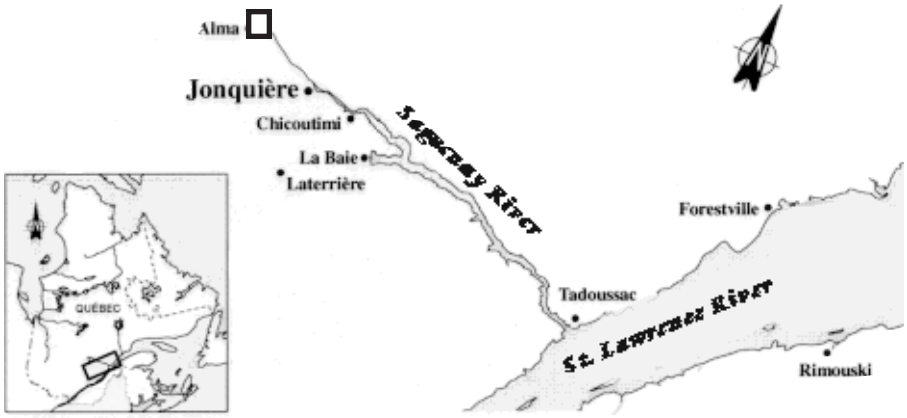

A list of 106 industrial plants has been established under St. Lawrence Vision 2000 (SLV 2000), the second phase of the St. Lawrence Action Plan, launched in 1988. The overall objective is to reduce liquid toxic waste and virtually eliminate discharges of persistent toxic substances.

The 106 industrial plants designated under SLV 2000 are divided into four groups, each of which has been given a specific objective. The ABITIBI-PRICE INC. mill, located in Alma, 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

Specialty papers

The ABITIBI-PRICE INC. pulp and paper mill in Alma has an average daily production of 310 t of directory paper and 400 t of newsprint. It makes those papers from mechanical pulp (62%), sulphite pulp (14%), minor fibres (12%) and kraft and thermomechanical pulps (12%). The debarked wood billets are defibrated with grinding wheels; the resulting mechanical pulp is screened to remove any knots and stray chunks of wood. To make sulphite pulp, wood chips are cooked in digesters containing sodium bisulphite. The cooked chips are removed from the digesters and washed in a blow tank, drained and put through two refining-washing stages. The resulting pulp is screened and thickened on a disk filter, then stored in a tank. The pulps are bleached with sodium hydrosulphites. Kraft pulp is purchased from other pulp mills; de-inked pulp is made at the plant from waste newspapers (75%) and magazines (25%). Pulp mixtures are fed to three paper machines producing sheet paper that is then pressed, dried and calendered. The wood billets are floated to the mill on the Petite Décharge river. Part of the supply of wood chips is trucked in. The mill has an annual production capacity of 110 000 t of directory paper and 145 000 t of newsprint. In 1995, it operated at 98% and 97% capacity for directory paper and newsprint, respectively, and employed a work force of 800.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Wood chips and billets (81% spruce, 16% fir, 3% jack pine)
- Minor fibres (tailings, waste newspapers and magazines)
- Kraft pulp

FINISHED PRODUCTS

- Mechanical-pulp specialty paper
- Directory paper
- Newsprint

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

BOD_5 and SS

According to company data, in 1988 the mill had an average effluent discharge of 75 679 m^3/d, containing:

- 28 503 kg/d of biochemical oxygen demand (BOD_5)
- 6122 kg/d of suspended solids (SS)

RESOURCES AND USES TO PRESERVE

A recreation area

The ABITIBI-PRICE INC. mill in Alma is located on the south shore of Alma island, about 4 km from Pointe des Américains. Wood billets are floated on about two-thirds of the Petite Décharge, between the river mouth and Saint-Georges Bridge. Papermaking effluent is discharged into the branch of the river between Alma and Sainte-Anne island and is largely to blame for the unpleasant odour and unsightliness of the local waters. The Petite Décharge is a scenic waterway featuring wharves, jetties and footpaths along the shore, recreation areas and dwellings. The Péninsule campground, a hydroplane base, a yacht club, wharves and boat-launching ramps are located nearby in Shipshaw. However, the poor condition of the river rules out any sports involving the possibility of contact with the water. The deep, calm expanse of water downriver from the confluence of the Petite Décharge and the Grande Décharge, between Alma and Shipshaw, lends itself to aquatic activities (canoeing, windsurfing, swimming). Anglers fish the Petite Décharge and the entire Saguenay. The main species caught are yellow walleye and northern pike. Dam construction and log floating in the area have wiped out the former hospitable conditions for lake trout.

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. Water quality based objectives for ABITIBI-PRICE INC. will be available on request by 1997.

EFFLUENT TREATMENT

Primary and secondary treatment

Industrial wastewater from the wood preparation room, pulping shops and paper machines (surplus white water) is circulated to a 44 m diameter primary clarifier. Lime is added at the clarifier inlet to regulate pH. The wastewater then goes to a secondary system comprising a selector, aeration lagoon and secondary clarifier 27, 84 and 57 m, respectively, in diameter. Uncontaminated water is separated from water to be treated; the old 69 m diameter clarifier has been made into an emergency pond.

Sludged formed at he bottom of the clarifiers is recovered to be thickened to more than 25% consistency and routed to the plant's landfill located close by. The leachate recovered from the landfill is treated in the clarifier. Approximately 5% of the plant site is drained by pipes that route the water directly to the Petite Décharge river. Runoff from the rest of the site follows the natural slant of the land shile water from roof drains are directed to an industrial wastewater treatment system. Sanitary wastewater is processed through a biological disk and then discharged whi the effluent to the secondary clarifier.

PREVENTION AND CLEANUP SYSTEMS IMPLEMENTED

$23 million invested

In 1988-1989, the gradual replacement of sulphite pulp with kraft pulp purchased to make directory paper brought about a large reduction in effluent SS and BOD_5.

In 1995, the company brought on stream a $20 million de-inking shop with a daily capacity of 125 t, thus reducing raw wood requirements.

In summer 1994, the company undertook construction of an activated-sludge secondary treatment system. The set-up of that system required modification of the former treatment system and measures for the separation of uncontaminated water. The new system, which cost an estimated $23 million, was commissioned in the summer of 1995.

The company has begun construction of a thermomechanical pulping shop to come on stream in the summer of 1996. This project will end the need to float logs on the river, and the wood preparation shops and chemical sulphite and mechanical pulping shops will be closed.

REGULATORY COMPLIANCE - WATER COMPONENT

New standards met

The ABITIBI-PRICE INC. mill in Alma is subject to the Quebec Regulations respecting Pulp and Paper Mills and the federal Pulp and Paper Effluent Regulations. Start-up of the new secondary treatment system has enabled the company to meet the new standards that came into effect September 30, 1995.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

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 provincial regulations governing pulp and paper mills, for the months of October to December 1995, as well as the Chimiotox values estimated from those figures, for an effluent flow of 47 336 m^3/d. The figures show a predominance of lead in the treated wastewater, at 35% of the Chimiotox index, followed by mineral oils and grease (25%) and aluminum (23%).

Figure 1 is plotted from the 1990 Action Plan characterization data, which were used to extrapolate Chimiotox indices for the period 1988-1994. For 1995, the values of Chimiotox index are based on the data supplied by the company for the months of October to December 1995. The Chimiotox index fell by 98% from 1988-1995 as a result of the treatment measures implemented.

Table 1 ***Chimiotox Index (1995) - Abitibi Price Inc., Alma Business Unit****

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total Lead	1.385	314	435
Mineral Oil and Grease	3.077	100	308
Total Aluminium	25.695	11	283
Total Zinc	2.616	9.4	25
Dehydroabeitic Acid	0.278	77	21
Abietic Acid	0.611	19	12
Total Nickel	0.462	10	5
Oleic Acid	0145	19	3
Stearic Acid	0.141	19	3
Linoleic Acid	0.043	19	1
Isopimaric Acid	0.075	19	1
Palustric Acid	0.029	19	1
CHIMIOTOX INDEX**			**1098**

* For effluent discharge of 47 366 m^3/d.
** October to December 1995.

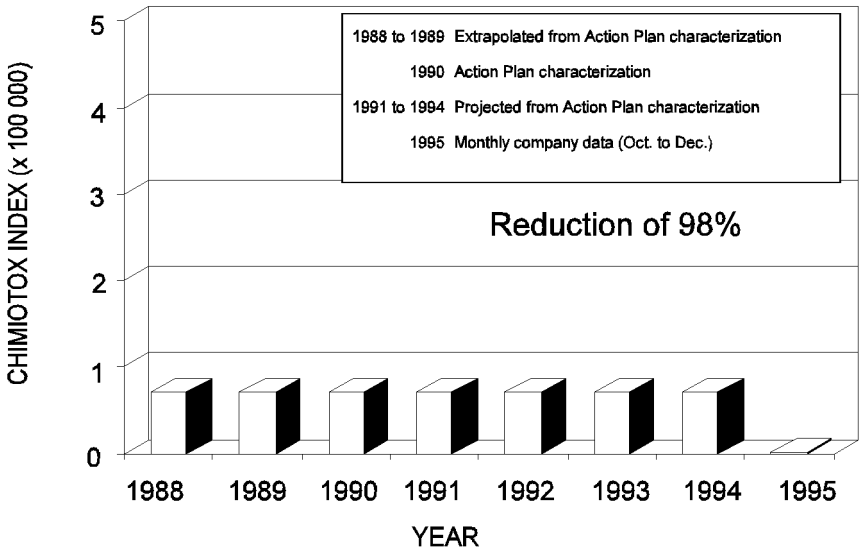

FIgure 1 ***Changes in toxic effluent discharges, 1988-1995 - Abitibi Price Inc., Alma Business Unit***

VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

No persistent toxic substances

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 figures for October to December 1995, none of the targeted substances 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. One series of bioassays was conducted for the ABITIBI-PRICE INC. mill in Alma. The 1990 PEEP index was estimated at 5.4.

Since September 30, 1995, the provincial Regulations respecting Pulp and Paper Mills prohibit the discharge of 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. Introduction of the new treatment measures at the ABITIBI-PRICE INC. mill has helped reduce effluent toxicity. According to the monthly data for October to December 1995, the effluent is non-toxic.

REDUCTION IN SUBSTANCES MONITORED

Reduction in SS, BOD_5 and effluent flow

According to company data on October, November and December 1995, the mill had an average effluent discharge of 50 368 m^3/d, containing:

- 1413 kg/d of biochemical oxygen demand (BOD_5
- 2009 kg/d of suspended solids (SS)

For 1988-1995, company data show a 67% reduction in SS, a 95% reduction in BOD_5 and a 23% reduction in effluent flow. These are largely attributable to sulphite pulp production cuts in 1988 and 1989, when the company began buying kraft pulp instead, and to the startup of the new treatment system.

KEY POINTS

- **98% reduction in the Chimiotox index**
- **Start-up of an activated-sludge secondary treatment system in the summer of 1995 ($23 million investment)**

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

ADDITIONAL INFORMATION

Chimiotox index and PEEP:
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Water quality based objectives:
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