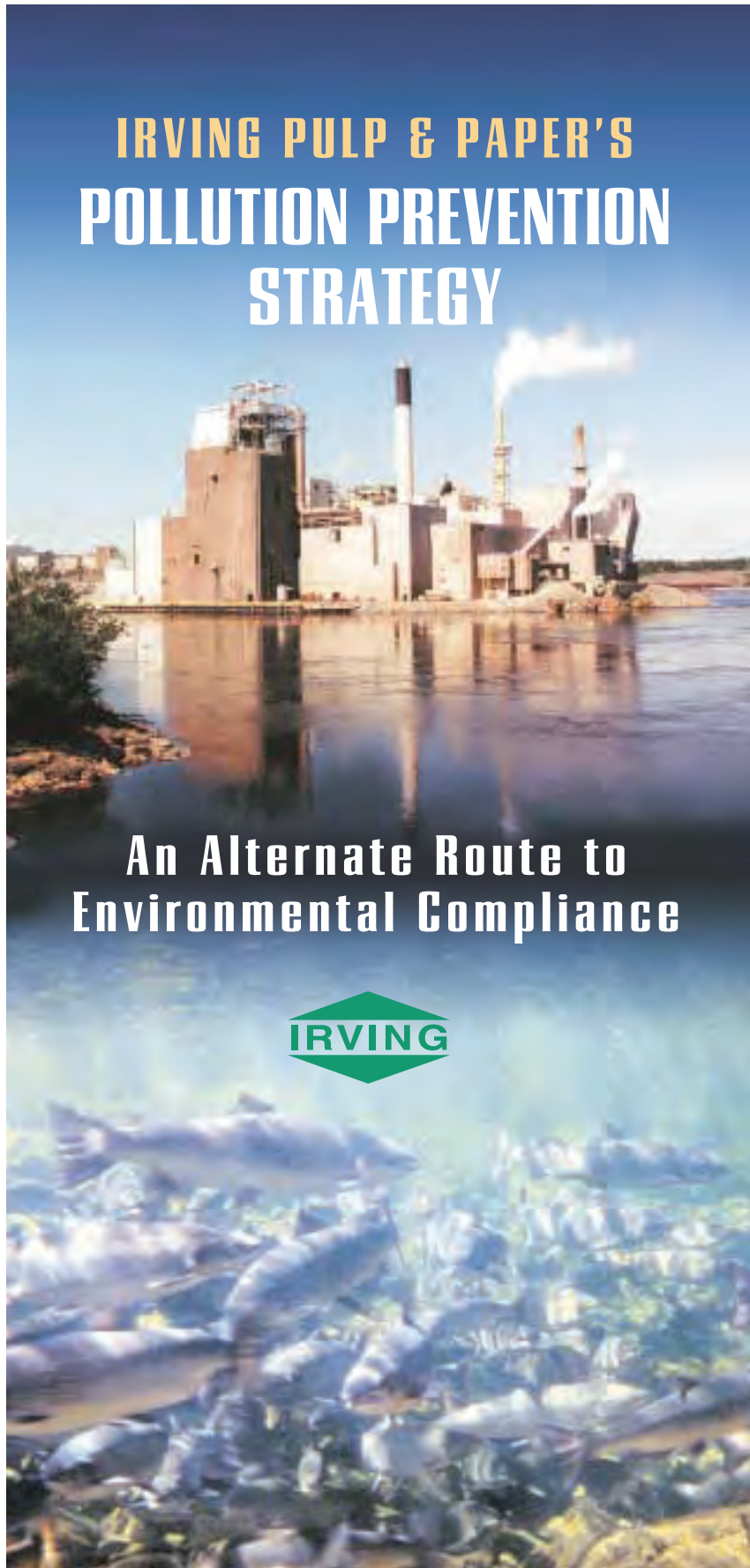


IRVING PULP & PAPER'S POLLUTION PREVENTION STRATEGY

**An Alternate Route to
Environmental Compliance**



THE CHALLENGE

Pollution Prevention is the use of processes, practices, materials, products and energy that avoid or minimize the creation of pollutants and waste and reduce the overall risk to human health or the environment. — *Environment Canada Mission Statement, 1995*

New Options For Environmental Compliance

To meet government regulations most mills went with a conventional secondary treatment lagoon. Treating pollution after it has exited the mill pipe has been the standard technology enabling mills to meet regulations with limited costs. Faced with local opposition to a lagoon, Irving Pulp & Paper underwent a complete Environmental Impact Assessment. Following this assessment and after researching other options, the mill decided to go in an unprecedented direction. Irving Pulp & Paper launched a pollution prevention strategy that would see them meet regulations by recovering, reducing and reusing pulp-making materials. Irving Pulp & Paper would break new ground in the industry by preventing pollution at the source, inside the mill, before it exited the pipe. This approach was complementary to the Environment Canada initiative for Pollution Prevention.

The Strategy

Irving Pulp & Paper planned their pollution prevention strategy around the best available technologies of the day. At the time of design there were not enough known technologies to take them all the way to environmental compliance, but they believed that with the rate of technological advancement and the ongoing research, new technology would evolve by the time the known technologies were in place.



1. Objectives Of The Strategy

- Remove, reuse and recycle chemicals and other pulp-making materials.
- Modernize technology to improve efficiency, cost-competitiveness and environmental performance.
- Address community concerns against a conventional secondary treatment lagoon.
- Minimize mill outflow.



2. Implementing Best Available Technologies - Highlights

- Improved Brown Stock Washing - Recovers more used chemicals and unusable wood components.
- Closed Brown Stock Screening - Decreases outflow volume from the mill by recovering dirty process wash water that contains used chemicals and unusable wood components.
- Elemental Chlorine Free Bleaching - Replaces former process with more environmentally responsible bleaching agents.
- Condensate Stripping Column - Removes wood alcohol for incineration allowing the cleaned water to be reused.



Improved Brown Stock Washing

Elemental Chlorine Free Bleaching



PIONEERING CHANGE

3. Oxygen Delignification

- Decreases amount of chemicals needed in bleaching process by removing unusable wood products.
- Unusable wood products are incinerated and generate heat for the mill.



Oxygen Delignification



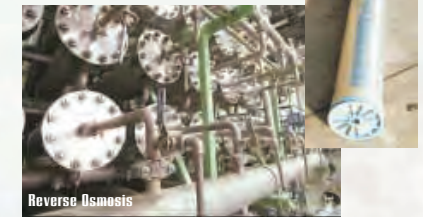
Reverse Osmosis

4. Reverse Osmosis

- Filters products from water by using specialized membranes under high pressure. This allows increased recycling and reuse of filtered water.
- Awarded patent for unique application of well-known technology.
- Removes compounds largely responsible for endocrine disruption in fish.



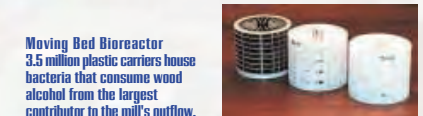
210 specialized membranes on 5' x 10" spools remove 10 - 15 gallons of concentrated filtrate per minute.



Reverse Osmosis

5. Moving Bed Bioreactor

- Consumes wood alcohols from the largest contributor to the mill's outflow.
- A unique application for the biological system. It had never been used before in the kraft pulping industry in this application.
- This system was the final technology needed to bring the mill into environmental compliance with all the federal regulations.



Moving Bed Bioreactor 3.5 million plastic carriers house bacteria that consume wood alcohol from the largest contributor to the mill's outflow.

6. Environmental Performance Review

- Pioneered advances in pollution prevention technologies in our industry.



- Non-traditional approach to meeting environmental regulations and community concerns.
- Irving Pulp & Paper has discovered new technological application that eliminates their potential for endocrine disruption at Reversing Falls. The University of New Brunswick in Saint John is working in cooperation with Environment Canada to research some of the compounds responsible for endocrine disruption that are removed by Irving Pulp & Paper's reverse osmosis system. Endocrine disruption is an emerging global issue with implications for both humans and wildlife.
- Involved mill employees and experts in the industry to reach significant environmental and scientific milestone.
- Patented applications of new technologies for export potential to pulp mills around the world.

THE NEXT CHAPTER

1. Seek out additional opportunities to further improve our environmental performance.
2. Continue publicizing our progress and results within the industry and academic community.
3. Communicate with the public and interested stakeholders on new industry advances and ongoing progress.



REFLECTIONS

"Implementing this pollution prevention program was an important and innovative step. Many of the technologies are new in their application to the pulp and paper industry, providing greater options to the industry in how they deal with their wastes. The reduction in endocrine disruptors was an unexpected and positive environmental benefit."

- John Clarke, Head of Pollution Control with Environment Canada, Atlantic Region

"Pollution Prevention is a new option the industry has that they didn't have five years ago. This is a technology the company can export."

- Wally Vrooman, President Vrooman Environmental Inc.

"Irving Pulp & Paper is further ahead on the endocrine disrupter issue than probably every other mill in Canada."

- Dr. Deborah MacLatchy, University of New Brunswick Saint John Campus

"When you look at the chemistry of the effluent produced in the pulp making process and what you have to get rid of, you know there's a way either by recycling, reusing or removing elements. We just had to find it."

- Wayne Sprague, Irving Pulp & Paper employee

"Throughout this project there was an excitement and a pride — amongst all of the employees — that we were pioneering new applications of new technologies for export potential to pulp mills around the world."

- Jim Brewster, Production Manager, Irving Pulp & Paper

"This environmental achievement is a tremendous tribute to the teamwork, determination and skills of the men and women at Irving Pulp & Paper. No other mill in the world has done what they have accomplished."

- Jim Irving, President, J.D. Irving, Limited

"In addressing community concerns, a real scientific advancement has been achieved for the industry."

- Willa Mavis, Innkeeper, Inn on the Cove, Saint John, NB



CONTACT US



For more information on Irving Pulp & Paper's innovative approach to pollution prevention, please contact:

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Tours are available for individuals and groups.

Please contact Irving Pulp & Paper's Human Resources Department for more information or to set up a tour.

Phone: (506) 635 - 7735



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