

CLEAN WATERS FOR ONTARIO

Municipal/Industrial Strategy for Abatement Overview

STOPPING WATER POLLUTION AT ITS SOURCE



Introduction

In 1986, the Ministry of the Environment initiated the Municipal/Industrial Strategy for Abatement (MISA) to identify and reduce the pollutants discharged from industrial and municipal sources into Ontario's lakes and rivers. The first phase of the program — effluent monitoring for over 300 major industrial direct dischargers — has been completed. The ministry has embarked upon the second phase — the regulation of industrial sector dischargers to reduce the amount of conventional and toxic contaminants being discharged.

The regulations are being developed with input from industry. Each sector has a joint technical committee with representatives from the industry, Ministry of the Environment and an observer from Environment Canada as well as the MISA Advisory Committee (MAC). The MISA Advisory Committee, composed of independent experts from industry, academia and environmental groups, advises the Minister on issues relative to MISA. Draft regulations are also made available for a public review.

In September 1991, Ruth Grier, Minister of the Environment, released a report entitled *Municipal/Industrial Strategy for Abatement: Issues Resolution Process Final Report Summary*. This report represented the culmination of a process begun by the ministry in 1989 to resolve key generic

issues on procedures and criteria affecting limit regulations development.

The report presented the pollution prevention and control strategy that the ministry will employ to achieve virtual elimination of specific persistent toxic chemicals from discharges into Ontario's lakes and rivers. Strategy elements include:

1. The establishment of effluent limits for a list of sector-specific parameters.
2. The effluent cannot kill fish as measured by standardized tests.
3. The establishment of a bans or phase-outs list for specific persistent toxic substances.
4. The reduction of persistent toxic substances which are not slated for zero-discharge and which do not have effluent limits.

Background

The goal of MISA is the virtual elimination of toxic contaminants in municipal and industrial discharges to Ontario's lakes and rivers. The fulfilment of this goal is essential for reducing the risk of damage to the ecosystem and to protect human health.

Prior to 1986, Ontario's approach to water pollution abatement was centred on the identification of site-specific environmental concerns. It was followed by control of effluents being discharged from individual industries and municipalities either through legal

instruments (i.e., Control Orders, Requirements and Directions, Stop Orders and Certificates of Approval), guidelines or voluntary abatement programs.

This approach was satisfactory for dealing with pollution problems such as oxygen depletion or conventional pollutants such as suspended solids, sewage and oils. Applied to persistent toxic contaminants, it had several shortcomings. Control Orders varied from region to region or company to company — a level playing field was lacking. Effluent guidelines, by themselves, did not have legal status. Also, there were no procedures in place to assess the impact of toxic contaminants on a local basis, especially for those substances which accumulate in the environment. By the time environmental impacts were assessed and proven, it was often too late to stop the damage.

- MISA targeted industrial polluters from nine sectors that discharge directly into Ontario's lakes and rivers:
 - Pulp and Paper
 - Petroleum Refining
 - Organic Chemical Manufacturing
 - Iron and Steel
 - Mining
 - Inorganic Chemicals
 - Metal Casting
 - Electric Power Generation
 - Industrial Minerals

plus 412 Municipal Sewage Treatment Plants.

In addition, approximately 12,000 facilities currently discharging into municipal sewer systems are to be regulated through the MISA Sewer Use Control program.

New Principles Incorporated into the MISA Industrial Program

MISA is now shifting from monitoring to prevention and abatement. In anticipation of the effluent limit regulations, many companies have voluntarily initiated abatement actions. The new principles, announced by the Minister in September 1991, include:

- Pollution Prevention
- Bans or Phase-Outs of Persistent Toxic Chemicals
- No Cross-Media Transfer of Pollutants

Pollution Prevention

Pollution prevention is defined as any action which reduces or eliminates the creation of pollutants. It is achieved through raw material substitution, product reformulation, process redesign or modification, or improved maintenance and operations. Since the treatment costs of removing toxic substances by end-of-the-pipe technology can be very high, it can be far cheaper not to produce the persistent toxic chemicals in the first place.

Bans or Phase-Outs of Persistent Toxic Chemicals

Traditional approaches to environmental management have resulted in residual contamination of the environment through accidental or planned releases of persistent toxic chemicals. Banning or phasing out the most persistent toxic chemicals is the only effective means to ensure that they will not be present in our environment. In April 1992, a list of 21 primary substances and 46 secondary substances known to be persistent, toxic and bioaccumulative in the environment was released by the Minister as candidates for bans or phase-outs.

"Persistent" refers to the capacity of a substance to remain chemically stable (i.e. the time it takes for half of the mass of a chemical to be degraded or otherwise lost from a medium is greater than or equal to eight weeks. "Toxic" refers to the capacity of a substance to be harmful to the environment and/or to human health when ingested, inhaled or absorbed even in relatively small quantities. "Bioaccumulative" refers to the capacity of a chemical to build up in tissues to a level higher than the surrounding medium (e.g. fish accumulating contaminants from water). Bioaccumulation can lead to increased exposure via food intake and increasing concentrations of contaminants through the food chain.

No Cross-Media Transfer of Pollutants

The transfer of pollutants from one medium to another (i.e., from water to land or air) is not acceptable. Applied to MISA, this principle will favor process and technologies which prevent persistent toxic chemicals from entering another environmental medium. For example, it will not be acceptable for a company to reduce its toxic water emissions by increasing toxic releases to air.

Pollution Prevention and Control Measures for MISA

The data generated under the MISA monitoring program identified specific substances present in discharges from industries. With the pollution prevention and control measures, the MISA program will include the following components:

1. *Limits for a List of Sector-Specific Parameters*
Regulations specifying effluent limits will be imposed on a sector-by-

sector basis. By setting limits for a list of key parameters, control of key conventional pollutants as well as persistent toxic chemicals can be achieved.

2. *No Acute Toxicity in Effluents*
Regulations requiring all effluents not to kill fish and waterfleas.
3. *List of Candidate Substances for Bans or Phase-Outs*

There are more than 100,000 chemicals currently used in commerce worldwide. A number are known to be persistent, toxic and bioaccumulative. These contaminants consequently are a top priority for removal from the environment. Ontario has taken the lead in doing the scientific work to identify the most hazardous substances.

Experience with bans or phase-outs of substances which cause particular harm to the environment, such as PCBs, shows that, when required, industries can reduce the generation of toxic contaminants and/or find alternatives for their use.

A Candidate Substances List for Bans or Phase-Outs was released in April 1992 by Ruth Grier as part of Ontario's commitment to the Great Lakes Water Quality Agreement. It specifies the 21 contaminants on the primary list and 46 substances on the secondary list which are candidates to be eliminated from discharge into Ontario's environment. This list has been given to both the Great Lakes Governors and the federal government which has initiated a consultation process on bans or phase-outs that includes the industry and the public.

4. *Toxic Reduction Plans (TRPs)*

As a companion activity to MISA and to reduce the discharge of other toxic chemicals not captured by the Candidate Substances List for Bans or Phase-Outs, the ministry is developing Toxic Reduction Plans in partnership with industry.

Industries will be encouraged to develop TRPs, which provide a logical, comprehensive process and flexible implementation strategy for those reductions. A generic guidance document will be produced to assist industry in developing broad-based, multimedia pollution prevention programs.

These tools will describe how to identify, assess and implement opportunities for prevention planning and how to stimulate the ongoing search for such opportunities. Companies that adopt this approach typically find that they reduce both their operating costs and potential liabilities in addition to helping to preserve the environment.

Currently, the MISA program is proceeding with the first two components. The second two components, bans or phase-outs and toxic reduction plans, are being developed as a separate pollution prevention initiative by the Ministry of the Environment.

For further information, please contact the ministry's Public Information Centre, at 135 St. Clair Ave. W., Toronto, M4V 1P5, tel: in Toronto, (416) 323-4321, in other area codes, 1-800-565-4923.

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February 2, 1993

Dear Sir/Madam:

Ontario's waterways are a precious resource, yet for too long we have taken them for granted. The Ministry of the Environment's goal is to protect our lakes and rivers, and prevent further pollution for future generations.

The Ontario government has released a clean water regulation for the pulp and paper industry. I am pleased to provide you with a copy of the draft. This is one of our many initiatives to protect Ontario's lakes and rivers.

This regulation is both progressive and practical. It establishes timetables and shows the Ontario Government's commitment to zero discharge of persistent toxic substances.

I welcome your comments on the enclosed draft regulation. These can be sent to me at the above address, no later than April 2, 1993.

Thank you for your interest in Ontario's clean water programs. I look forward to hearing from you.

Yours sincerely,

Ruth Grier
Minister





news release

Ministry
of the
Environment

February 2, 1993

COMPREHENSIVE CLEAN WATER REGULATION FOR ONTARIO'S PULP AND PAPER INDUSTRY

Environment Minister Ruth Grier today released a comprehensive clean water regulation targeting a wide range of substances from Ontario's 26 pulp and paper mills, including organochlorines. New stringent limits will greatly reduce those chemicals that pose a threat to human health and the environment. Ontario's goal is for a zero discharge of organochlorines by 2002.

"We must safeguard health. More than 30 million people, 6 million in Ontario, depend on the Great Lakes for their drinking water. The Great Lakes can no longer sustain this kind of toxic overload," Mrs. Grier said.

Pulp and paper mills are responsible for more than 90 per cent of the organochlorines -- a family of chlorine-based chemicals that includes known cancer-causing agents -- discharged into the Great Lakes and Ontario's waterways.

"To protect the Great Lakes' ecosystem, our economic and community well-being, we must act now. This pulp and paper regulation is both progressive and practical. By eliminating organochlorines in stages, we have addressed industry's requests for practical timeframes and long-term certainty so it can plan for its future investments," Mrs. Grier said.

In its 1992 report on the Great Lakes, the International Joint Commission stated that organochlorines are "dangerous to the environment, deleterious to the human condition, and can no longer be tolerated in the ecosystem, whether or not unassailable scientific proof of acute or chronic damage is universally accepted."

"Pollution prevention is the foundation for this new clean water regulation," added Mrs. Grier. "It furthers the Ontario government's commitment to the Great Lakes Water Quality Agreement's principle of zero discharge of persistent toxic substances. This includes the binational Lake Superior program which is designed to protect the integrity of our largest great lake. The clean water regulation will help meet the goal of the Remedial Action Plans in the eight toxic hot spots around the lakes affected by pulp and paper mill pollution."

"In addition to significant reductions, the pulp and paper industry is required to plan for the elimination of chlorine. It will lead Ontario into the 21st century with cleaner water by eliminating some toxic substances and reducing others by close to 100 per cent within three years," Mrs. Grier added.

Natural Resources Minister Bud Wildman said, "We recognize the challenge this new regulation poses for our forest industry. We will be discussing with them how to develop new technologies to meet those challenges. We must work together to ensure the environmental and economic sustainability of our industry, our resources and our communities."

All four categories of pulp and paper mills (kraft, sulphite/mechanical, corrugating, de-inking/board/fine papers/tissue)-must meet the limits proposed in the regulation for all substances. Compared to 1990, a number of substances will be reduced dramatically by 1995, including:

- . chloroform, 96 per cent reduction
- . phenol, 88 per cent reduction
- . Biochemical Oxygen Demand (BOD), 84 per cent reduction
- . toluene, 83 per cent reduction

"The government understands that this is a period of transition for the industry as it restructures for sustainability and moves towards a greener future. We will continue to work with companies. Indeed, we will enhance our support as they research new technologies and new processes," Mrs. Grier said.

The regulation includes limits that must be met by 1995 for the following substances: Biochemical Oxygen Demand (BOD), total suspended solids, total phosphorus, chloroform, toluene, phenol, 2,3,7,8-TCDD (dioxins) and 2,3,7,8-TCDF (furans). Discharges from pulp and paper mills will also have to meet a stringent toxicity test: the wastewaters must be safe enough for fish to survive.

In addition, the limit of organochlorine discharge for the eight kraft mills, measured by AOX *, is set at 1.5 kilograms/tonne of pulp by Dec. 31, 1995 and at 0.8 kilogram/tonne of pulp by Dec. 31, 1999. In order to achieve the goal of zero discharge of AOX by 2002, the kraft mills must also submit AOX Elimination Plans to the government under the following schedule:

- initial AOX Elimination Plans to be produced 6 months after regulation is passed
- interim plans by Dec. 31, 1995 and
- final AOX Elimination Plans by Dec. 31, 1998.

All kraft mills in Ontario are currently operating at levels below the 2.5 kilograms/tonne limit of AOX as required by existing control orders.

The draft limit regulations, which were developed through a consultative process that began in 1986 under the MISA program (Municipal/Industrial Strategy for Abatement), are available for a 60-day public comment and review period.

Copies of the Draft Effluent Limits Regulations for the Pulp and Paper Sector (PIBS #2100) and supporting technical materials including backgrounders and reports (see attached list) can be obtained by calling the Ministry of the Environment's Public Information Centre at (416) 323-4321.

* AOX : Adsorbable Organic Halides, an analytical method for measuring all organochlorines collectively rather than individually. Organochlorines are a family of carbon-based compounds bound by chlorine atoms.

FOR MORE INFORMATION:

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Joyce McLean (416) 323-4364; Minister's Office

Gerry Merchant (416) 323-4333; Public Affairs and Communications Services Branch

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SUPPORTING DOCUMENTS:

- Draft Development Document For the Pulp and Paper Sector Effluent Limit Regulation, 250 pages.

Report describes the steps involved in the development of limits for the Pulp and Paper Sector and contains the draft regulation and the background technical information used to develop the draft regulation

- Protocol for Conducting A Storm Water Control Study, 10 pages.

The protocol describes the role and responsibilities of the discharger in preventing contaminants from escaping through stormwater runoff and the requirements that must be followed in conducting a stormwater control study

- Protocol for Sampling and Analysis of Industrial/Municipal Wastewater, 150 pages.

Outlines procedures to be followed by industry when sampling and analyzing effluent under MISA regulations.

BACKGROUND MATERIAL:

- Clean Waters for Ontario: Municipal/Industrial Strategy for Abatement Overview, (PIBS #2100), 4 pages.
- Clean Water Regulation: Pulp and Paper Sector, 8 pages.

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CLEAN WATER REGULATION: Pulp & Paper Sector

Eliminating substances of concern

Ontario has unveiled comprehensive water pollution regulations to prevent the discharge of toxic contaminants from the province's pulp and paper mills. Based on current scientific findings, monitoring data and recent advances in pulp and paper-making technology, the proposed limits will prohibit the release of substantial amounts of hazardous chemicals every year.

The clean water regulation for the pulp and paper sector, issued under the Municipal Industrial Strategy for Abatement (MISA) program, is a breakthrough in Ontario's campaign against water pollution. The goal of MISA is the virtual elimination of persistent toxic substances in the effluents discharged from pulp and paper mills to the province's rivers and lakes.

The clean water regulation promotes a new direction for protecting the environment — pollution prevention. Today's low-waste production technologies save raw materials, water and energy while dramatically cutting the amount of pollution that must be treated.

The stricter environmental standards in the regulation can be turned to a firm's competitive advantage. Stressing pollution prevention and a switch to less-toxic process chemicals over expensive, end-of-the-pipe solutions will help companies meet the regulation effectively.

A more efficient, more productive, and more competitive pulp and paper industry will be better positioned to meet the challenges of changing world paper markets. Purchasers in both the public and private sector are increasingly demanding environmentally-friendly products. To ensure they are well positioned for future markets, Ontario's pulp and paper industry must be able to offer recycled newsprint, chlorine-free papers and other green consumer products.

The draft pulp and paper regulation doesn't specify what kind of abatement equipment a company must install, or how it must treat its waste waters. Instead, the regulation sets technically feasible, scientifically sound standards that will reduce the amount of contamination a mill may release. In the case of organochlorines, the regulation will stimulate the development of new technologies that will eliminate their release.

The limits will take effect at the end of 1995, with additional AOX reductions phased in over the next six years. The clean water regulation will ensure the health of the environment and give companies time to prepare long-range plans to modernize plants, upgrade aging equipment, and expand into new product lines.

*The pollution
prevention limits
are practical,
progressive, and
environmentally
sound.*

"The Ontario government's goal is for a zero discharge of organochlorines by 2002. By eliminating organochlorines in stages, we have addressed industry's requests for practical timeframes and long-term certainty so it can plan for its future investments."
— Environment Minister Ruth Grier

The limits are based on what can be achieved using low-waste, modern paper-making technologies.

Over 90% of the organochlorines discharged by industry into the province's waterways originate from the pulp and paper sector.

Ten parameters are covered by the new clean water regulation

AOX: Adsorbable Organic Halides, an analytical method for measuring all organochlorines collectively rather than individually; formed as an unwanted by-product of the chlorine-based pulp bleaching process used in kraft mills.

BOD5: Biochemical Oxygen Demand, a measure of the amount of oxygen needed by microorganisms to break down organic wastes over a five-day period

Chloroform: a by-product of chlorine bleaching, this organochlorine is a suspected human carcinogen (cancer-causing agent)

Phenol: used as a disinfectant or to make resins, may cause cancer

Toluene: a dangerous solvent that attacks the nervous system and is very toxic to aquatic communities

2,3,7,8 TCDD: an organochlorine and the most toxic form of dioxin

2,3,7,8 TCDF: also an organochlorine and the most toxic furan

TP: Total Phosphorus, the amount of dissolved and particulate, organic and inorganic phosphorus

TSS: Total Suspended Solids, the dirt and grit that can clog the gills of fish

Toxicity: a standardized test to assess whether a mill's effluent kills fish or small invertebrates over a specified period

The zero discharge of AOX by 2002

Prior to the release of this draft regulation, the provincial guidelines for the pulp and paper industry did not reflect what efficient, low-waste technologies can achieve. There were no common industry standards that applied to all the direct discharging mills. Many harmful pollutants were not regulated at all, and the standards for a number of other contaminants still allowed unacceptably high levels of pollution.

The regulation sets new effluent limits for ten different parameters: adsorbable organic halides (AOX), biochemical oxygen demand (BOD5), chloroform, phenol, toluene, 2,3,7,8 TCDD (a dioxin), 2,3,7,8 TCDF (a furan), total phosphorus (TP), total sus-

pended solids (TSS), and aquatic toxicity. Specific limits are specified for each of the province's 26 mills depending on the pulp and paper subsector they fall under.

The Ontario government is committed to the zero discharge of the organochlorines (known collectively as AOX, a term that refers to the analytical method used to measure their presence) from the eight Ontario kraft mills that bleach pulp with chlorine. Organochlorines are a large family of chlorine-based compounds which are generally toxic and include mutation and cancer-causing agents.

The Ontario government's objective is to eliminate AOX entirely from the industry's effluents by the year 2002. To achieve this goal, each kraft mill

*The Great Lakes are
the world's largest
source of fresh water.*

*The Pulp and Paper
regulation furthers
the Ontario
government's
continuing
commitment to the
protecting the Great
Lakes and adhering
to the US - Canada
Great Lakes Water
Quality Agreement.*

must reduce their loadings and meet the limits of 1.5 kg/tonne AOX by 1995 and 0.8 kg/tonne by 1999. As well, each kraft pulp mill must submit a series of detailed AOX elimination plans outlining how it intends to meet the government's goal of zero AOX by 2002. The first is due six months after the clean water regulation takes effect. Interim plans must be completed by December 31, 1995 with the final plans due by the end of 1998.

The environmental impact will be widespread and sustained. By 1995, both BOD and toluene discharges will be slashed by 85% from 1990 levels, phenol by 88% and chloroform by 96%.

The use of new technologies and process changes that will prevent these pollutants from entering the environment will also significantly reduce the levels of other contaminants. By reducing the ten parameters specified in the regulation, the mills will also cut the release of sulphide, volatile suspended solids, chlorinated phenolics and several toxic resin and fatty acids.

Protecting the Great Lakes

The new regulation will improve the quality of the Great Lakes making them more hospitable for fish and other wildlife. The regulation will stem the build-up of dangerous toxic compounds, protect human and aquatic health and help maintain an acceptable level of water quality in the Great Lakes.

Six of the province's kraft mills discharge their wastewaters directly into the Great Lakes basin. The elimination of AOX will help safeguard the drinking water supplies of the more than 30 million people in Canada and the United States who live in the basin.

In its 1992 report on the Great Lakes, the International Joint Commission stated that organochlorines are "dangerous to the environment, deleterious to the human condition, and can no longer be tolerated in the ecosystem, whether or not unsailable scientific proof of acute or chronic damage is universally accepted."

The proposed effluent limits support the recommendations of the International Joint Commission to phase out persistent toxic discharges to the Great Lakes.

The pulp and paper sector at a glance

Ontario's pulp and paper industry employs 16,000 men and women, making it the fifth largest manufacturing sector in the province. The industry provides one out of every three manufacturing jobs in Northern Ontario.

There are 26 pulp and paper mills discharging waste water directly into Ontario's lakes and rivers. Five of these plants are located in Eastern Ontario, six in South-Central Ontario, and 15 in Northern Ontario. Their waste waters either flow through northern watersheds into Lake Winnipeg and James Bay, or drain south into the Great Lakes. The effluent from one mill, located near Huntsville, drains into Vernon Lake.

Eighteen of these mills produce pulp directly from logs or wood chips, nine through a variety of chemical/mechanical methods, and nine through the kraft process. Eight of the nine kraft mills also use chlorine to bleach pulp. The province's remaining mills manufacture paper products from purchased pulp, some of these facilities relying increasingly on waste paper.

The regulation divides Ontario's 26 pulp and paper mills into four subsectors based on the pulp and paper technology and processes they employ.

Sulphate (kraft) mills:

Boise Cascade, Fort Frances
Canadian Pacific Forest Products,
Dryden
Canadian Pacific Forest Products,
Thunder Bay
Domtar, Cornwall
Domtar, Red Rock
Eddy Forest Products, Espanola
James River, Marathon
Kimberly-Clark, Terrace Bay
Malette, Smooth Rock Falls

Corrugating mills:

Domtar, Trenton
MacMillan-Bloedel, Sturgeon Falls

Deinking/board/fine papers/tissue mills:

Beaver Wood Fibre, Thorold
Domtar Fine Papers, St. Catharines
Eddy Forest Products, Ottawa
Noranda Forest Products, Thorold
Kimberly-Clark, Huntsville
Kimberly-Clark, St. Catharines
Strathcona, Napanee
Sonoco, Trenton

Sulphite-mechanical pulp mills:

Abitibi-Price Fort William Mill,
Thunder Bay
Abitibi-Price, Provincial Papers,
Thunder Bay
Abitibi-Price, Iroquois Falls
Boise Cascade, Kenora
Quebec & Ontario Paper, Thorold
St. Marys Paper, Sault Ste. Marie
Spruce Falls, Kapuskasing

Eight locations in Ontario designated as areas of concern by the International Joint Commission have pulp and paper mills that contribute to the area's pollution problem:

*Thunder Bay,
Nipigon Bay,
Jackfish Bay,
Peninsular
Harbour/Marathon,
Spanish Harbour,
Sault Ste. Marie,
Cornwall, Trenton
(Bay of Quinte).*

What are the major environmental concerns?

The Ministry of Environment is concerned about the environmental impact of the wide variety of toxic compounds, oxygen-depleting substances and suspended solids found in the waste waters from pulp and paper plants. The discharges from mills contaminate water, sediments and aquatic life both in the immediate receiving waters and throughout the Great Lakes ecosystem.

Over the last 20 years, pollution control efforts have been directed towards reducing the huge quantities of suspended solids and organic wastes generated by the industry. While substantial reductions have been achieved, these substances still pose a major pollution problem.

In addition, environmental scientists continue to express concern about the presence and impact of persistent or acutely toxic substances in mill effluents. Many of these compounds do not readily break down and may bioaccumulate up the food chain to threaten both environmental and human health. Those pollutants raising the greatest environmental concern are the persistent toxic chemicals (such as the organochlorines and heavy metals), sulphur compounds, and fish-killing resin and fatty acids.

Some 75 pollutants have been measured overall in the waste waters discharged by mills; the toxic contaminants vary depending on the type of pulp and paper-making process and chemicals used. Organochlorines

*New pulp and paper
production systems,
water conservation
measures, and
pollution prevention
technologies can cut
discharges
dramatically.*

*Most of Ontario's
kraft mills have
already begun
effective programs to
comply with the new
effluent limits for
AOX.*

(AOX), unwanted byproducts of the chlorine bleaching process found in the effluents of kraft mills, are a parameter of special concern due to their toxicity and possible persistence. These stable chemicals can build up in the tissues of plants and animals with chronic and irreversible effects. Some may cause mutations or cancers. Dioxins and furans are probably the most notorious compounds in this large family; the regulation singles out chlorinated dioxin 2,3,7,8-TCDD and chlorinated furan 2,3,7,8-TCDF for special attention.

The development of the discharge regulation

The MISA program, under which the clean water regulation falls, was announced in 1986. As a first step, the Pulp and Paper Effluent Monitoring Regulation was made law in July, 1989. A year-long testing program identified and measured the toxic contaminants in the effluent from each of the province's pulp and paper mills.

This information was used by Ministry staff to assess which contaminants posed an environmental threat. The Ministry was aided by a joint technical committee with representatives from the pulp and paper industry and the MOE, an observer from Environment Canada and the Minister's MISA Advisory Committee. The Minister also met with mayors from Northern municipalities, industry and labour representatives, and environment groups before the release of the draft regulation.

The proposed limits reflect the low levels of contamination one could expect to find in the waste water from a modern mill that uses the best available technology. The requirements for AOX reduction are designed to stimulate the development of new, cleaner pulp and paper-making technology.

In complying with the effluent limits, mills are expected to implement a variety of in-plant measures designed to prevent pollution at source. For example, mills could substitute a less toxic chemical for a more dangerous one, or install a more efficient piece of process equipment — as well as traditional abatement systems designed to treat end-of-the-pipe effluents.

The regulation does not require a mill to install a particular type of control system or equipment; therefore a company is free to find the most effective or cost-efficient way to meet the effluent limits.

The elimination of AOX

More than 250 different organochlorines have been detected in the effluents from pulp and paper mills. Measured collectively as Adsorbable Organic Halides or AOX, it makes sense to control them collectively rather than set dozens of separate effluent limits for different organochlorines. This is the approach being taken by British Columbia and Quebec, as well as a number of European countries.

In 1989, the MOE issued Control Orders requiring all kraft mills to reduce AOX effluents to 2.5 kilograms per tonne of air-dried bleached pulp by December 31, 1991. As a result, a number of mills began to reduce or abandon the use of molecular chlorine in favour of chlorine compounds that produce less AOX. These efforts have continued so that today most of the province's kraft mills are close to the 1.5 kilogram limit proposed in the new regulation. However, despite these reduction efforts, mills are still discharging more than 5,500 tonnes of AOX each year.

AOX can no longer be tolerated in the ecosystem; discharges must be further reduced and eventually eliminated. Under the new clean water regulation, kraft mills will have to cut monthly average discharges to 1.5 kilograms of AOX per (air-dried) tonne of pulp they produce by December 31, 1995. By the end of 1999, the limit drops to 0.8 kilograms.

While they are achieving these reductions, each mill must prepare and submit a series of elimination plans to show how it will be able to meet the government's objective of zero discharge of AOX by the year 2002.

How will the discharge regulation work?

When the new effluent limits go into effect on December 31, 1995, they will significantly reduce the release of contaminants into the environment. Much of the BOD, toluene, phenol and chloroform will be removed from pulp and paper mill waste waters. The most toxic forms of dioxin and furan must be reduced to non-detectable levels. The other dangerous organochlorines will be eliminated altogether in a series of phased stages. In all, stringent new effluent limits are set for ten waste water parameters.

The type of mill and the processes it employs will play a role in determining the effluent limits that must be met. For instance, a kraft mill that uses a chlorine-based bleaching process will need to implement a more complex pollution prevention program than a

firm that has already made the switch away from chlorine bleaching. The regulation differentiates between four basic classes of pulp and paper mill: (1) sulphate (kraft) mills, (2) mills using a sulphite-mechanical pulping process, (3) corrugating mills, and (4) de-inking/board/fine papers/tissue mills. The regulation sets process effluent limits and monitoring requirements for each of the 26 mills across the province, based on their class, production levels and the daily and monthly discharge standards.

The regulation also incorporates a number of standard monitoring and reporting requirements (in common with the clean water regulations being developed for other MISA sectors). Sections of the regulation govern: compliance monitoring, the location of sampling points, sampling and analytical procedures, toxicity testing, the calculation of loadings, effluent flow measurements, monitoring quality control, stormwater controls, record keeping, and reports to the Ministry.

The day the regulation is filed, pulp and paper mills must begin to compile their sampling plans and stormwater control studies. The AOX standard of 2.5 kilograms per air-dried tonne of pulp applies from day one. The regulation's monitoring, measuring and reporting provisions take effect 90 days later. Daily and monthly limits take effect December 31, 1995.

Parameter	Ontario (Proposed)*	British Columbia	Quebec	Federal
BOD, 5-day	2.91-5.0	7.5-21.0	5.0-9.0	7.5
TSS	4.57-7.87	11.25-37.5	8.0	11.25
TP	0.05-0.08	—	—	—
Chloroform	0.001-0.002	—	—	—
Toluene	0.0001-0.0002	—	—	—
Phenol	0.0002-0.0004	—	—	—
2,3,7,8 TCDD	n.m.***	—	**	n.m.
2,3,7,8 TCDF	n.m.	—	**	n.m.
Toxicity	Non-acutely lethal			
AOX	1.5 (Dec 31, 1995)	1.5 (Dec 31, 1995)	1.5-2.5 (Dec 31, 1993)	—
	0.8 (Dec 31, 1999)	0.0 (Dec 31, 2000 or 2002)	1.0-2.0 (Sept 30, 1995)	—
	0.0**** (Dec 31, 2002)		0.8 (Dec 31, 2000)	—

* Monthly loading limits in kilograms/tonne of air-dried pulp
 ** Total of dioxins and furans not to exceed 15 ppq as 2,3,7,8-TCDD
 *** n.m.— Not Measurable
 **** Target

What's the next stage?

The draft clean water regulation is being released for a 60-day public review. All the comments will be collected, reviewed and evaluated by Ministry staff, necessary amendments will be made to the regulation, and a final draft will be published in the Ontario Gazette.

How can I learn more?

To receive more information on the Draft Effluent Limits Regulation for the Pulp and Paper Sector, fill out the coupon on this page and mail it to:

MISA Pulp and Paper Effluent Limits Regulation
Ontario Ministry of the Environment,
135 St. Clair Avenue West,
Toronto, Ontario M4V 1P5

- ☐ Send me the Draft Pulp and Paper Effluent Limits Regulation
- ☐ Send me more information on the MISA program
- ☐ Send me list of related background documents and technical reports

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Do you have any questions or comments?

You can also call the Ministry of Environment Public Information Centre at 1-800-565-4923, or the following MOE Regional Offices:

Central Region, Toronto (416) 424-3000
Northeastern Region, Sudbury (705) 675-4501
Northwestern Region, Thunder Bay (807) 475-1205
Southeastern Region, Kingston (613) 549-4000
Southwestern Region, London (519) 661-2200
West Central Region, Hamilton (416) 521-7640

Send your comments to: Ruth Grier,
Minister of the Environment, 135 St.
Clair Avenue West, Toronto, Ontario
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