



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
WATER

MEMORANDUM

SUBJECT: Interim Strategy for the Regulation of Pulp and Paper  
Mill Dioxin Discharges to the Waters of the United  
States

FROM: *Rebecca W. Hanmer*  
Rebecca W. Hanmer  
Acting Assistant Administrator for Water (WH-556)

TO: Water Management Division Directors  
NPDES State Directors

EPA's goal is to eliminate the presence of dioxin in discharges from pulp and paper mills to the waters of the United States. Attached is an interim strategy for the regulation of dioxin discharges from these mills. This interim strategy calls for (1) aggressive action to fully implement or, where necessary, to develop State water quality standards for dioxin applicable to all water bodies where mills using chlorine bleach processes are discharging; (2) collection of data on each of the 104 affected mills, including dioxin levels in their pulps, effluents and sludges; (3) detailed technical evaluation of wastewater treatment technologies and/or in-process changes to reduce or eliminate the presence of dioxin in wastewater discharges; and (4) issuance of NPDES permits that regulate and require monitoring for dioxin, examine effluent toxicity and provide for modification to tighten controls consistent with the final strategy and the requirements of the Clean Water Act (CWA).

Although this document should be used now, I would appreciate having your comments on this interim strategy and ask that you send any comments to me on implementation of the strategy. We plan to issue a final strategy after reviewing your comments and the results of the EPA/Paper Industry Cooperative Dioxin Study now underway to characterize dioxin in the pulp, effluent and sludge of 104 pulp and paper mills.

Also, you should be aware that the Office of Research and Development (ORD) has developed an expert system which can be used on an IBM-compatible personal computer to walk through a dioxin exposure assessment. This expert system is now out for peer review. ORD expects it to be available for your use this calendar year.

We are developing material similar to the interim strategy to address permitting of newly constructed bleach kraft pulp and paper mills.

If you would like to discuss this, please feel free to call Jim Elder (FTS/202-475-8488) if you have questions on NPDES permitting; or call Martha Prothro (FTS/202-382-5400) with questions on water quality standards, analytical studies or evaluation of technology such as the Bioaccumulation Study or the Cooperative Study.

Attachment

cc: Environmental Services Division Directors  
Water Quality Branch Chiefs  
Water Permits Branch Chiefs  
Charles Elkins (TS-792)  
Susan G. Lepow (LE-132W)  
Mahesh Podar (PM-221)  
Eric Strassler (PM-223)

This interim strategy calls for (1) aggressive action to fully implement, or, where necessary, develop State water quality standards for dioxin at all sites where mills using chlorine bleach processes are discharging; (2) collection of data on each of the 104 affected mills, including dioxin levels in their effluents, sludges, and sludges; (3) detailed technical evaluation of wastewater treatment technologies and/or in-process changes to reduce or eliminate the presence of dioxin in wastewater discharges; and (4) issuance of NPDES permits that regulate and require monitoring for dioxin, examine effluent toxicity and provide for modification to tighten controls consistent with the final strategy and the requirements of the Clean Water Act (CWA).

Water Quality Standards Development

The Regions will assure that all affected States develop a firm State water quality regulatory basis for controlling dioxin at the affected sites as quickly as possible. To accomplish this task, the Regions will begin immediately to work with States to develop appropriate numerical water quality criteria for dioxin for waters receiving discharges from the affected pulp and paper mills. The criteria can be based upon the existing EPA criteria document for dioxin and/or site-specific conditions. In all cases, initial steps necessary for the adoption of numerical water quality criteria (or derived numeric criteria) for dioxin should begin immediately. Such steps include completion of any necessary exposure assessments, State selection of the preferred risk level, and completion of appropriate monitoring data and background documents. A list of documents which can be used to assist in adopting dioxin criteria, including development of site-specific risk assessments, is attached. Public

## Interim Strategy for the Regulation of Pulp and Paper Mill Dioxin Discharges to the Waters of the United States

EPA's goal is to eliminate the presence of dioxin in discharges from pulp and paper mills to the waters of the United States. Ultimately, this goal should be reflected in National Pollutant Discharge Elimination System (NPDES) permits based on future national technology-based effluent guidelines and/or on State water quality standards designed to protect aquatic life and human health.

Four Office of Water, State, and EPA Regional activities are necessary to achieve this goal. Many other activities related to controlling dioxin are underway in other EPA Offices. A final strategy for the regulation of dioxin in pulp and paper mill discharges to the waters of the United States will be issued as soon as possible after review of data now being developed as discussed below.

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### Water Quality Standards Development

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participation must be provided for as required by federal regulations. In addition, the Office of Water will provide assistance to Regions and States in specific cases.

Regions and States should confer upon and expeditiously resolve any other State water quality standards issues including variances or changes in use designation that need to be resolved in order to address discharges of dioxin from pulp and paper mills. The goal is to clear the way to set water quality-based effluent limitations in permits and to encourage the industry to take all steps necessary to develop technologies that will eliminate dioxin from their discharges at the earliest achievable date.

Regions may also need to assist States in immediate State actions to protect human health through issuance of fish consumption advisories or bans.

#### Collection of Data

EPA is now receiving data from the National Bioaccumulation Study and the EPA/Paper Industry Cooperative Dioxin Study.

As part of the National Bioaccumulation Study, EPA is obtaining analyses of dioxin levels in fish which have been or are being collected near bleached kraft pulp mills. Fish tissue data from areas near a number of these mills have already been distributed to the Regions. Release of the data generated as part of the Bioaccumulation Study is being handled using the procedures established in February 1988.

The EPA/Paper Industry Cooperative Dioxin Study was signed by all parties on April 25, 1988. As a result of this study, EPA will receive dioxin data from 104 pulp mills that bleach chemical pulps, including process information and dioxin analyses on effluent, sludge and pulp from all 104 mills. Headquarters staff will provide individual mill data to the Regions as it becomes available. This study will be completed for all mills by April 1989.

Staff are in the process of validating analytical methods for dioxins in pulp mill matrices. Additionally, analytical comparability studies are being conducted between several U.S. and Canadian laboratories. This study will ensure that laboratory capacity will be available for Regional and State dioxin activities.

#### Technical Evaluation of Wastewater Treatment Technologies and/or In-Process Changes to Reduce or Eliminate Dioxin Discharges

EPA has initiated a program to revise the existing pulp and paper effluent limitations guidelines regulation, with a view

toward establishing best available technology economically achievable (BAT) limitations for dioxin and other nonconventional or toxic pollutants of concern. As a part of this activity, EPA is evaluating the effectiveness of various process modifications, such as oxygen delignification and chlorine dioxide bleaching, in reducing dioxin generation and discharge. Detailed evaluation of some of these mills has already begun.

As a part of the Cooperative Dioxin Study, the paper industry has agreed to conduct a more intensive study of bleaching lines at approximately 25 mills. This study includes detailed process evaluation at mills that use a variety of bleaching processes. The objectives of the study include determination of the bleaching operations in which dioxin is formed, process conditions affecting dioxin formation and factors affecting dioxin removal from the bleaching process.

EPA staff have conducted a treatability study at two bleached kraft facilities to evaluate total suspended solids (TSS) and dioxin reduction resulting from coagulant and polymer addition. When these results are final, a report of the results will be provided to the Regions.

EPA staff will also seek information from other governments, including Sweden and Canada, concerning their technology evaluations, and make the information available to the Regions and States as appropriate.

#### Issuance of Interim NPDES Permits

As soon as possible, permits for the affected mills shall be reissued or reopened to establish an appropriate best professional judgment (BPJ) BAT effluent limitation for dioxin for the mill. The method used for developing a BPJ BAT limitation for dioxin for an individual mill and the limitation itself will depend on site-specific circumstances at the facility. The effluent limitation can be developed by first requiring the mill to conduct a study leading to development and implementation of short- and long-term plans for minimization of use of chlorine and chlorine derivatives in bleach plant operations. In-plant or other controls may be used in determining the appropriate BPJ BAT effluent limitation. One basis for the effluent limitation would be the reduction of dioxin that can be achieved through optimization of suspended solids controls, particularly from secondary clarifiers or lagoons at biological treatment facilities. (The results of the treatability study may be useful to assist in developing this limitation.) Initially, the Office of Water will provide assistance to some Regional and State permitting authorities in developing these interim control approaches. We are now working to identify appropriate candidate mills for which interim control requirements will be developed. We will share the experience

gained in developing permit provisions for these mills with other affected Regions and States.

The interim BPJ BAT limitation should in most cases be more stringent than the existing discharge. Compliance with these effluent limitations will be required as soon as possible.

Dioxin effluent monitoring shall be required, but where effluent monitoring is unlikely to provide useful data, may be established for individual process discharges or other appropriate in-plant locations. The Cooperative Dioxin Study will provide dioxin data from effluents, pulps and sludges from 104 mills that bleach chemical pulps with chlorine or chlorine derivatives. These data will be made available to the Regions and States as they are received and may be helpful in modifying or developing the permit monitoring requirements to reflect the significance of the discharges. Ambient monitoring of the water column, sediments and fish may be required in the permit or alternatively through other mechanisms. The availability of laboratory capacity may impact the frequency of monitoring required.

The permit shall require both chronic and acute aquatic toxicity monitoring, a toxicity reduction evaluation (TRE) and other requirements as necessary to ensure the mills are working toward a reduction, as soon as possible, of dioxin discharges for the long-term protection of water quality and human health.

The permit shall also contain a specific reopener. The reopener shall provide for modification of the permit to reflect any additional information or data, including information on the feasibility of process changes or new treatability data. The reopener will also provide for modification, if necessary, to reflect the final permitting strategy for dioxin in pulp and paper effluents and any effluent guidelines limitations promulgated for dioxins during the permit term.

Discharges from many if not all of the pulp and paper mills will also be covered by section 304(1) of the CWA. Interpretation of provisions of section 304(1) will be addressed soon in proposed regulations. To the extent that pulp and paper mill discharges of dioxin are covered by section 304(1), the regulations will provide the Agency's permitting approach.

Attachment

Selected Bibliography Relevant to Adopting  
State Water Quality Criteria for Dioxin

"Guidelines for Deriving Water Quality Criteria for the Protection of Human Health," Federal Register, Vol. 45, No. 231, p. 79347, November 28, 1980.

Draft "Guidelines for the Preparation of Water Quality Advisories for Human Health Protection," (Request for Science Advisory Board Review), June 30, 1987.

"Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and - Dibenzo Furans (CDDs and CDFs)," [Co-authored by Frank Gostomski], EPA 625/3-87/012, March 1987.

"Ambient Water Quality Criteria for 2,3,7,8-Tetrachloro-Dibenzo-p-Dioxin," EPA 440/5-84/007, February 1984.

"Quality Criteria for Water - 1986," EPA 440/5-86/001, May 1987.

"Technical Support Document for Water Quality-Based Toxics Control," EPA 440/4-85/032, September 1985.

Draft "Guidance for Establishment of Ambient Criteria to Limit Human Exposure to Contaminants in Fish and Shellfish," (Under Office of Water Review), June 1988.

"Interim Sediment Criteria Values for Nonpolar Hydrophobic Organic Contaminants," Sediment Criteria Document Number 17, May 1988.

Public Review Draft, "Proposed Risk Management Actions for Dioxin Contamination at Midland, Michigan," EPA 905/4-88-006, April 1988.

"Risk Assessment for Dioxin Contamination at Midland, Michigan," EPA 905/4-88-005, April 1988.

Draft "Guidance Manual for Assessing Human Health Risks from Chemical Contamination of Fish and Shellfish," (Under Office of Water Review), October 1987.