Pulp and Paper Industry "Cluster Rule"

EPA's Pulp and Paper Cluster Rule will help paper mills significantly reduce releases of dioxin.

In November 1997, EPA issued a final rule that will virtually eliminate dioxin discharges into waterways and reduce many other toxic pollutants into air and water from the nation's pulp and paper mills that produce bleached paper products. This rule will eliminate, over time, all dioxin-based fish advisories that have been attributed to the mills, particularly benefiting subsistence fishers who depend primarily on fish for food. This action for pulping and bleaching mills will result in:

> a 96 percent reduction in dioxin, resulting in undetectable levels to waterways;

> a nearly 60 percent reduction in toxic air pollutants, equal to 160,000 tons annually; and

> the expedited cleanup of 73 rivers and streams around the nation due to reductions in discharges of toxic pollutants.

This rule also adds flexibility because it is a coordinated, simultaneous effort under both the Clean Water Act and the Clean Air Act that allows mills to select the best combination of pollution prevention and control technologies to achieve pollution reductions.

Toxic Contaminant Reduction Efforts

A cooperative EPA, NYSDEC, and Monroe Country project conducted in Rochester, New York, illustrates how unrecognized, potentially significant PCB sources can be located by sampling wastewater at key points within a sewer collection system. Rochester's sewage treatment plant (STP) is the largest U.S. direct discharger of wastewaters to Lake Ontario. Metropolitan areas warrant special attention given their higher concentrations of industrial, manufacturing and waste sites. Wastewater from different parts of Rochester were systematically screened for PCBs. Relatively high levels of PCBs were found in the sewers of west Rochester. Additional sampling conducted further upgradient in the west Rochester sewer system, followed a pattern of high PCB concentrations and identified a manufacturing facility as a current source of PCBs to the sewer. These problems are being addressed through on-site remedial actions and the imposition of new PCB pretreatment requirements for this manufacturer.

Similar contaminant trackdown studies are underway in the Carthage and Lockport STPs to help the Lake Ontario LaMP identify and control sources of critical pollutants. In addition to developing actions to address identified sources, these results will be considered in revising STP discharge permits to be consistent with GLI provisions limiting discharges of persistent toxic substances.

Benzo(a)pyrene/Hexachlorobenzene

The Strategy Challenge: Seek by 2006, reductions in releases of hexachlorobenzene (HCB) and benzo(a) pyrene [B(a)P] that are within, or have the potential to enter, the Great Lakes Basin for sources resulting from human activity.

Residential wood combustion (primarily wood stoves) contributes 46 percent of the B(a)P emissions in the States and Provinces surrounding the Great Lakes. Because wood stoves have an extremely long life, EPA is currently working to implement wood stove change-out programs in Green Bay, Wisconsin and Traverse City, Michigan. During a wood stove change-out program, dealers provide discounts on new gas or wood stoves, which have only 10 percent of the emissions of older wood stoves, if the old stoves are turned in to be scrapped.

To obtain current hexachlorobenzene (HCB) emission levels and information on activities to reduce HCB emissions, letters have been sent to U.S. facilities reporting 1996 HCB releases to the Toxics Release Inventory. EPA's Final Report of Emission Inventory Data for Section 112(c)(6) Pollutants, released in April 1998, lists the source categories for national estimated HCB emissions. Total emissions are estimated at 2.3 tons per year. The Great Lakes Regional Air Toxic Emissions Inventory Report released in August 1998, identifies the source categories for estimated B(a)P point and area source emissions. Total B(a)P emissions are estimated at 60.8 tons per year.

Efforts are being made to work with petroleum refineries and steel mills to obtain voluntary B(a)P reductions in coke oven emissions.

Communications with a rubber tire manufacturing association have begun and discussions concerning HCB reductions are planned.

Alkyl Lead

> ***The Strategy Challenge***: Confirm by 1998 that there is no longer use of alkyl-lead in automotive gasoline. Support and encourage stakeholder efforts to reduce alkyl lead releases from other sources.

The U.S. released a challenge report that concluded that alkyl lead has been virtually eliminated from use in automotive gasoline. Information is being gathered on identifying and encouraging stakeholder efforts to reduce alkyl lead emissions from other sources, and will be presented in a subsequent report.

Octachlorostyrene

An extensive review of literature was conducted to establish potential sources, releases and environmental loadings of OCS that may enter the Great Lakes Basin. Although OCS has been gaining attention because it is persistent, bioaccumulative and toxic, EPA has not previously compiled any inventory of sources and releases, regional or nationwide. In December 1998, the U.S. released a challenge report for OCS . The report concluded that insufficient OCS data exists, thus confirmation of no use or release of OCS from sources that enter the Great Lakes Basin cannot be made. Additional information would be needed to confirm with certainty that there are continuing releases of OSC.

> ***The Strategy Challenge***: Confirm by 1998 that there is no longer use or release from sources that enter the Great Lakes Basin of the industrial byproduct/contaminant octachlorostyrene (OCS). If ongoing, long-range sources of this substance are confirmed from outside the U.S., work within international frameworks to reduce or phase out releases of this substance.

Pesticides

> ***The Strategy Challenge***: Confirm by 1998 that there is no longer use or release from sources that enter the Great Lakes Basin of five bioaccumulative pesticides (chlordane, aldrin/dieldrin, DDT, mirex, and toxaphene).

In the Great Lakes Basin, the predominant trend in environmental concentrations of pesticides is a general decline in most media. For example, DDT levels in Lake Michigan lake trout have declined from 13 parts per million (ppm) to 1 ppm over the period from 1972 to 1992. Typical sediment analysis in the Great Lakes shows the accumulation of pesticides in lake sediments and the amounts deposited declining after peak-use years. Based on recent water concentration measurements, the quantities of chlordane, aldrin/dieldrin, DDT, mirex and toxaphene remaining in the water column of all five Great Lakes total about 48,000 pounds. Non-atmospheric sources of these pesticides entering the Great Lakes have been suggested, measurements, the quantities of chlordane, aldrin/dieldrin, DDT, mirex and toxaphene remaining in the water column of all five Great Lakes total about 48,000 pounds. Non-atmospheric sources of these pesticides entering the Great Lakes have been suggested, but have not been confirmed in follow-up testing.

Information has been collected and assessed to confirm that all Level I pesticides have been canceled. All production facilities in the U.S. have been closed. No evidence of non-atmospheric sources entering the Great Lakes have been identified. The U.S. released a challenge report that concluded that, in spite of the above, it cannot be concluded that the challenge has been met. This is due to the potential for use or release from sources that enter the Great Lakes Basin from the following:

(1) remaining stockpiles -- as significant quantities of the Level I pesticides continue to be collected in Clean Sweeps in the Great Lakes Region, stored materials may be used or released to the environment;

(2) atmospheric contributions from continued production and use internationally; and

(3) release from reservoir sources -- sediments, soil and localized contaminated industrial sites remain a potential release source for the Great Lakes Basin.

The Great Lakes Program has implemented a multifaceted approach to address pesticides and the attendant potential for groundwater contamination in the Great Lakes Basin. In Great Lakes Basin counties, the overall use of agricultural pesticides has decreased by almost 10 million pounds from 1994 to 1995. Annual pesticide usage now stands at 57 million pounds. There is increasing concern not only because of toxic contamination from these substances, but also because of their potentially endocrine disrupting properties.

Federal Actions

The Food Quality Protection Act of 1996 established a new standard of safety for pesticide residues in food. EPA must conclude with "reasonable certainty" that "no harm" to human health will be caused by residues in food. Pesticide exposure (from food, drinking water, home and garden use, and other non-occupational sources) must be considered in determining allowable levels of pesticides in food. EPA has met an important deadline in the new law by issuing a schedule showing how the Agency will reassess the more than 9,700 existing "tolerances" — or maximum pesticide residue limits for foods — by August 2006, considering the pesticides that appear to pose the greatest risk first. Protection of infants and children is a high priority. Of the approximately 1,800 organophosphate tolerances receiving priority review, over 300 are for residues on crops that are among the top twenty foods consumed by children.

In a recent USGS study of pesticides in streams (USGS Water Resources Investigations Report 98-4245, 1999), atrazine was detected in every sample (although criteria for the protection of drinking-water quality were rarely exceeded), regardless of the dominant land use in the basin or time of the year. Cyanazine, prometon, simazine, desethyla-trazine, and metolachlor were found in 71 to 99 percent of all samples. In areas where pesticides were applied in similar quantities, basins with poorly drained soils tended to have higher concentrations of pesticides. This is believed to be tied to increased use of tile drains in these fields. Tile drains deliver surface runoff carrying pesticides directly to the steams. In areas where pesticides were applied in similar quantities, streams that had a greater input from groundwater had smaller concentrations of pesticides. The increased percolation allows for increased attachment of pesticides to soil.

Over the past decade, approximately 90,000 pounds of pesticides have been collected in the Great Lakes Basin Clean Sweeps collection program. This is quite significant considering that these collections represent about twice the total quantity estimated to be contained in the water of all five Great Lakes.

In 1998, EPA Region 5 states disposed of over 4 million pounds of waste pesticides. Wisconsin and Minnesota have disposed of over 1 million pounds of pesticides since the late 1980s. In 1997, 12,000 pounds of DDT were disposed of in Wisconsin. The states also participate in the recycling of pesticide containers to reduce waste sent to landfills. At the end of 1998, EPA Region 5 had recycled 2,000 tons of plastic containers.

Pollution Prevention (P2)

Prevention is the preferred means to avert the generation of harmful substances and thereby to reduce their release to the environment; it heads off ecological damage and saves resources otherwise needed to treat or clean up contaminants. EPA's Toxic Release Inventory (TRI) database provides information to the public about releases, waste management, and waste transfers of toxic chemicals from certain manufacturing facilities into the environment and provides one method of measuring the effectiveness of pollution prevention efforts. The 1993 program data (released in 1995) illustrated that all of the Great Lakes Basin States and Counties had shown a decrease in releases of targeted chemicals between 1988 and 1993.

The Pollution Prevention Unit of the New York State Department of Environmental Conservation (NYSDEC) is conducting a Comparative Risk Project that will develop a risk-based P2 strategy for New York State. Risk information will be used to develop a statewide pollution prevention strategy that will focus on those stressors found to be posing the greatest risk.

DaimlerChrysler, Ford, and General Motors (the Big Three automakers) reported a 48 percent reduction in TRI reportable releases from 1991 until 1997 in the fourth and final U.S. Automotive Pollution Prevention Project Progress Report. A renewal of partnership between the Big Three automakers and the Michigan DEQ was announced in September 1999. The Michigan Auto Project will serve as the successor to the aforementioned U.S. Auto Project, which concluded in 1998. It will focus on reducing pollution during vehicle manufacturing and assembly.

The Council of Great Lakes Governors, along with the Environmental Defense Fund and the Printing Industries of America, Inc. (PIA), successfully launched the Great Printers Project in 1993. The project centered around developing and implementing precedent setting environmental policy recommendations for the printing industry in the Great Lakes Basin.

Michigan Pulp and Paper mills achieved or surpassed eight of nine industry-wide emission reduction goals set for 1997. Started in 1996, the Pulp and Paper Pollution Prevention Program has 15 current members who make up over 75 percent of the total paper production in the state. These mills have tracked their pollution releases and emissions since 1987. Since that time, production has increased 30 percent, while air and water pollution have decreased 29 percent, and hazardous waste generation decreased by 94 percent.

FOCUS ON CLEANING UP THE NIAGARA RIVER

Famous for its spectacular waterfalls, the Niagara River flows for 37 miles from Lake Erie to Lake Ontario. Along the way, the river provides drinking water, recreational opportunities, and hydropower electricity. Over time, this important resource has received significant quantities of pollution from both point and nonpoint sources. Of particular concern were the high levels of toxicants, including mercury, PCBs, dioxins, and pesticides, many of which accumulate in the food chain, threatening the ecological health of the river ecosystem and those who consume its fish and wildlife.

In 1987, alarmed by the river's high levels of toxic chemicals, Canadian and U.S. government agencies (NYSDEC, EPA, Environment Canada and the Ontario Ministry of the Environment

[OMOE]) committed to reduce toxic inputs to the river by developing the Niagara River Toxics Management Plan (the Plan). The Plan targeted 18 priority toxic chemicals and called for 50 percent loadings reductions of 10 of these substances by 1996. Some of the actions taken to reduce toxic loadings to the river include reducing both nonpoint and point source toxicants discharges; cleaning up nearby hazardous waste sites contributing contaminated groundwater and runoff to the river; and diverting contaminated groundwater to a STP. Work continues to contain nonpoint sources on the U.S. side, particularly at 26 significant hazardous waste sites on the U.S. side of the river.

U.S. remedial activities to contain and/or remove the wastes have been completed at 13 waste sites and are under construction at another 10. EPA estimates this work has reduced waste site contaminant loads to the river by at least 80 percent. All sites should be remediated by the year 2003. To date, $320 million has already been spent on waste site remediation, and the dollars are still mounting. Partially as a result of these activities, New York just recently downgraded the fish consumption advisory for a portion of Gill Creek (a tributary to the Niagara River) from the Hyde Park Dam to the mouth (see Figure 8).

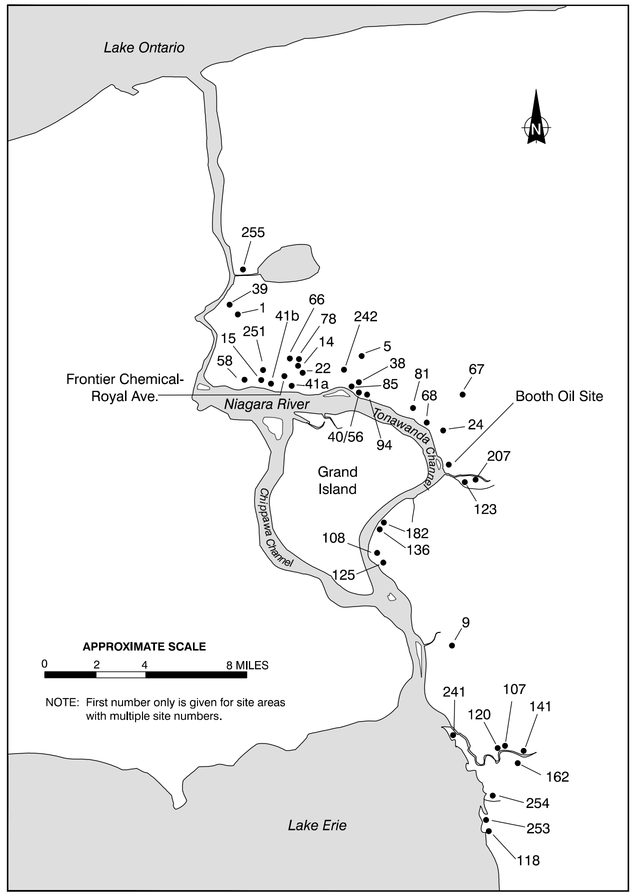

Figure 8. Hazardous waste sites on the U.S. side of the Niagara River.

An intensive monitoring program involving sampling at the head and mouth of the river, as well as measuring concentrations of toxicants in the river's fish and mussel species, shows that the plan is yielding significant results. Between 1986 and 1996, the levels of many of the priority toxicants found at the river's head and mouth have dropped by over 50 percent. Dated sediment core samples collected from the Niagara River depositional zone in Lake Ontario tell the history of toxic chemical loadings from the Niagara River to Lake Ontario. The concentrations of many chemicals in these cores have decreased significantly since the 1960s and 1970s. The data show that suspended sediments flowing through the Niagara River are becoming cleaner. The older contaminated sediments in this depositional area are being buried by the new cleaner sediments. The figures on the next page show decreasing levels of mirex (Figure 9), 2,3,7,8-trichlorodibenzo-p-dioxin (TCDD) dioxin (Figure 10), and PCB (Figure 11) contamination in sediment being deposited at the mouth of the Niagara River and provide a dramatic example of the success of contaminant reduction efforts in the Great Lakes.

In addition, toxicants found in fish and mussels have been drastically reduced. These reductions point to the effectiveness of remedial programs in reducing inputs of contaminants to the Niagara River. To ensure that these encouraging trends continue in the future, the U.S. and Canada reaffirmed their commitment to the Plan in 1996.

The U.S. and Canada have reported annually to the public on progress in reducing toxic contamination in the Niagara River. Most recently, in May 1999, the two governments reported that the improving trends in river contamination are continuing. In October 1999, the Four Parties (EPA, EC, NYSDEC, and OMOE) held a public meeting at which time the most recent Progress Report and

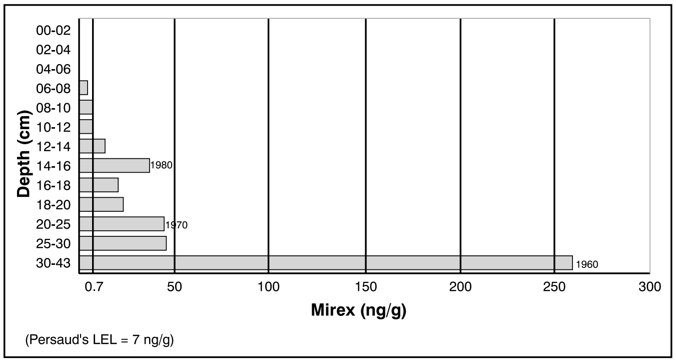

Figure 9. Decreasing mirex levels in sediments at the mouth of the Niagara River (Source: Niagara River Toxics Management Plan Report and Workplan, Niagara River Secretariat, May 1999).

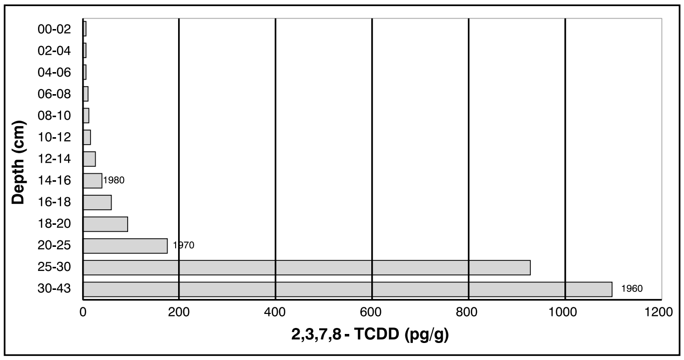

Figure 10. Decreasing 2,3,7,8-TCDD levels in sediments at the mouth of the Niagara River (Source: Niagara River Toxics Management Plan Report and Workplan, Niagara River Secretariat, May 1999).

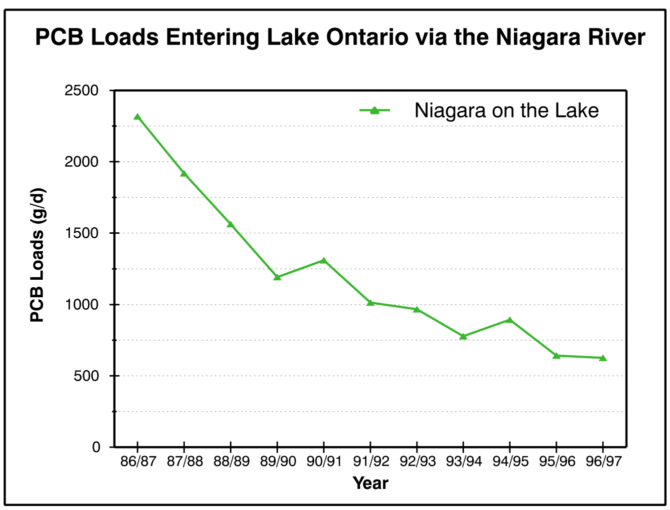

Figure 11. Decreasing PCB loads entering Lake Ontario (Source: Niagara River Toxics Management Plan Report and Workplan, Niagara River Secretariat, May 1999).

Work Plan were released. The Progress Report includes the results of monitoring activities and descriptions of recent activities. The Work Plan identifies the Four Party activities for the upcoming year and includes a focus on identifying and remediating current sources of priority toxicants that exceed water quality criteria and/or contaminate sport fish.

ADDRESSING ATMOSPHERIC DEPOSITION

During the 1980s, studies showed that atmospheric deposition may be a major pathway of some toxic contaminants to the Great Lakes. In response, the U.S. program has initiated a variety of regulations, inventories, and monitoring activities to reduce these loadings and to monitor how successful these actions have been.

Integrated Atmospheric Deposition Network (IADN)

The U.S. and Canada established IADN, a joint monitoring network designed to assess the magnitude and trends of atmospheric deposition of target chemicals (polynuclear aromatic hydrocarbons [PAHs], PCBs, dichlorodiphenyldichloroethane [DDE], DDT, lindane, lead, and more recently, toxaphene) to the Great Lakes, and to determine emission sources whenever possible. IADN involves a series of monitoring stations on each of the Great Lakes in both Canada and the U.S.

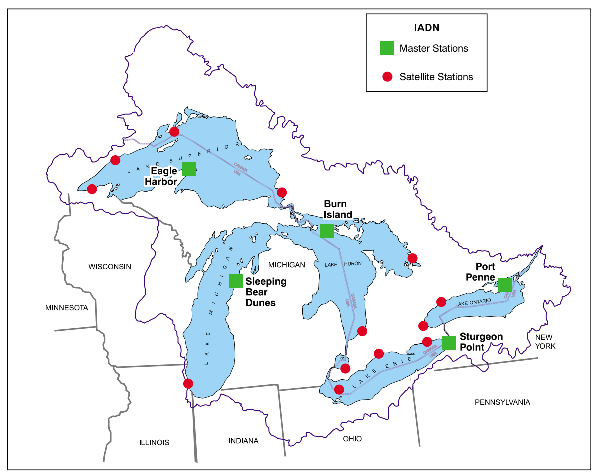

Figure 12. The distribution of IADN sites in the Great Lakes Basin.

Once every two years, IADN reports on the atmospheric deposition of chemicals to each Great Lake. IADN started in 1990 and the first phase ended in 1997. In 1998, the U.S. and Canada agreed to continue the program until at least 2004.

The first binational report on IADN data, published in December 1994, indicated that there was little spatial variability in many of the critical chemical species across the Basin, although the influence of urban areas is clearly substantial, especially in heavily developed areas such as the southwestern shores of Lake Michigan near Chicago.

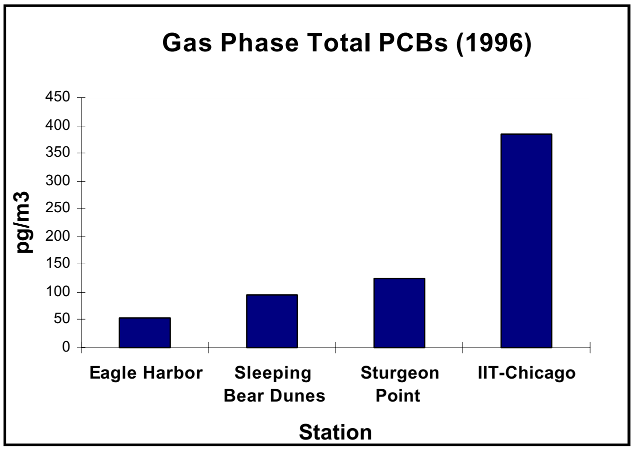

Figure 13. The influence of urban areas on air emissions is illustrated in this chart comparing a Chicago site to less urban areas. (Source: Technical Summary of Progress Under the IADN Program, 1990-1996, EC/EPA, January 1998)

Air pollutant deposition is highest in and around cities. Rain contaminated by PCBs in Chicago's air can increase wet deposition to Lake Michigan by 50 to 200 percent. In FY 1999, EPA's Great Lakes Program published information about atmospheric deposition of pollutants to each Great Lake at:

www.epa.gov/glnpo/iadn

From 1988 to 1996, deposition of PCBs to Lakes Michigan and Superior has decreased by approximately 90 percent, and in Lake Erie, there was an 80 percent reduction. Similarly, deposition of DDT to Lake Michigan has decreased by about 80 percent, and for Lakes Superior and Erie, there was a 90 percent decrease for the same time period.

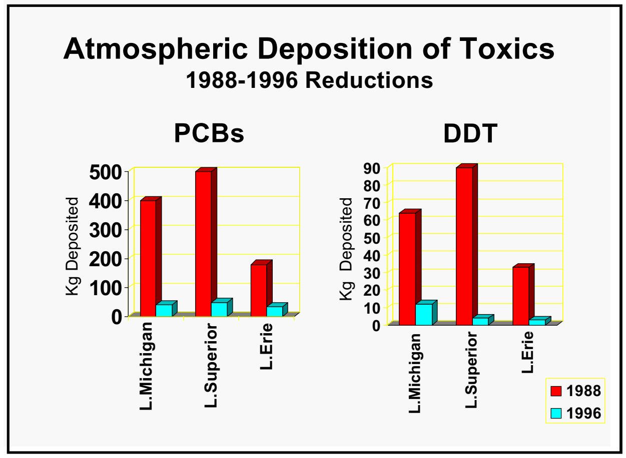

Figure 14. Atmospheric monitoring has shown that wet and dry deposition of PCBs and DDT (no gas exchange included) have been on the decrease (Source: 1988 data from Hoff, et. al., 1996; 1996 data from Preliminary IADN Loadings Data, Report in Progress).

In January 1998, the governments of Canada and the U.S. released their **Technical Summary of Progress under the Integrated Atmospheric Deposition Program 1990–1996**. Data are from 1986 to 1994 for one monitoring location in Lake Superior (Sibley), one in Lake Erie (Pelee), and one in Lake Ontario (Point Petre). Some of the findings for long-term spatial and temporal trends for four chemicals are listed below.

> PCB concentrations in air are generally decreasing. Wet and dry deposition of PCBs to Lake Michigan have decreased from 880 pounds in 1988 to 92 pounds in 1996. Wet and dry deposition to Lake Superior fell from 550 to 50, and in Lake Erie it fell from 180 to 34.

> Dieldrin concentrations show a general decrease, with recorded values 3 to 4 times higher at the Pelee station than at the other stations. The proximity of the station to agricultural activities and increased insecticide usage could explain these higher concentrations.

The next phase of IADN will address concerns and comments of a 1997 science review panel about the following:

- addressing data quality,
- addressing urban inputs,
- developing a joint database,
- making data readily available,
- gathering simultaneous air/water data, and
- developing a chemical selection process.

In addition, one IADN master station (to be determined) will initiate mercury monitoring for a 5-year period, beginning in the fall of 2000.

The following sections illustrate how some of these concerns are being addressed.

Great Lakes Regional Air Toxics Emissions Inventory

In response to the 1986 Great Lakes Governors' Toxic Substances Control Agreement's specified provisions to address atmospheric deposition, the Great Lakes States and the Province of Ontario, in cooperation with EPA and the Great Lakes Commission (GLC), developed the Great Lakes Regional Air Toxics Emissions Inventory and the Regional Air Pollutant Inventory Development System (RAPIDS), a computerized inventory that houses the emissions data. RAPIDS has been developed to identify the sources that are the largest contributors to the total emissions in a given geographic area. In December 1999, the GLC released an updated Toxic Air Emissions Inventory in a continuing effort to quantify the toxic air emissions that impact the waters and communities of the Great Lakes Basin. The new inventory, using 1996 data, focuses on point and area sources such as industrial facilities, small businesses and residential units. In early 2000, a new element of the inventory was released that addresses emissions from mobile sources such as motor vehicles and airplanes.

This inventory represents the best single compilation of emissions data from all eight Great Lakes states and the Province of Ontario for point and area sources. Working cooperatively through the GLC, work on the inventory is undertaken by the air quality departments of each Great Lakes state and Province of Ontario. The inventory project strengthens decisionmaking capabilities in the basin by promoting interjurisdictional consistency in data collection and analysis, establishing standard procedures and protocols, developing an automated emission estimation and inventory system, and demonstrating the value of Internet technology to exchange environmental data. The objective of this ongoing partnership with EPA is to provide researchers and policymakers with basinwide data on the source and emission levels of toxic air contaminants. Select emissions levels are listed in Table 2 below.

Compound	Pounds/Year
Manganese	3,336,000
Lead	891,000
Mercury	220,000
Napthalene	16,438,000
Phenanthrene	6,445,000
Toluene	545,000,000
Xylene	311,000,000
Benzene	144,000,000

Table 2. Select Pollutant Emissions Levels in the Great Lakes Region (based on 1996 sample data) (Source: 1996 Inventory of Toxic Air Emissions, December 1999, Great Lakes Commission).

For more information, please access the full report at:

www.glc.org/air/1996/1996.html

Using RAPIDS, state air regulatory agencies are building statewide air toxic contaminant inventories for point, area, and mobile sources for air pollutants of concern to the Great Lakes, including mercury, PCBs, and dioxin. These inventories will help guide the states in future regulatory and P2 efforts. The next basinwide inventory for point, area, and mobile sources for 1997 is expected to be completed in March 2001.

The implementation of MACT standards will help achieve emission reductions from a variety of industries throughout the basin.

Regulatory Actions

EPA is also using its authorities under the Clean Air Act to reduce emissions of toxic air pollutants from many other sources. Maximum Achievable Control Technology (MACT) standards have been and are continuing to be developed to reduce emissions of 188 hazardous air pollutants from a diverse list of source types ranging from steel mills to synthetic chemical manufacturing to dry cleaners. Included on the list of pollutants are mercury, dioxins, PCBs, HCB, and other Great Lakes pollutants of concern. Other activities are focused on urban areas, electric utility steam generating units, and sources of mercury.

The 1990 Clean Air Act Amendments (enacted on November 15, 1990) required MACT standards to be developed over specific periods of time from the date of enactment for a number of source categories. For the 45 source categories in the 2- and 4-year MACT groups, EPA estimates that the regulations will reduce air toxic emissions by approximately 1 million tons per year; for the 42 source categories in the 7-year MACT group, EPA has proposed or promulgated regulations that are estimated to reduce air toxic emissions by 500,000 tons per year. Many of these regulations have already been issued, and EPA expects them all to be completed by the end of the year 2000. These are more fully explained below.

As with most industrialized countries, combustion is the dominant source of dioxins in the U.S. Of all combustion processes, municipal and medical waste incineration appears to be the largest dioxin sources over the last decade. As a result of Federal and State efforts, emissions from these sources have been reduced during the 1987-1995 period by approximately 86 percent and 80 percent respectively. These decreases are based on a draft inventory conducted as part of EPA's Dioxin Reassessment. With the full implementation of MACT rules for these sources, EPA anticipates dioxin reductions from municipal waste incinerators to reach about 98 percent, and 96 percent from medical waste incinerators. These reductions are from preregulatory baseline levels.

In July 1999, EPA tightened standards for controlling hazardous air pollutants such as dioxin and lead emitted from incinerators, cement kilns, and lightweight aggregate kilns burning hazardous waste. Dioxin and furan emissions at these facilities will be reduced by 70 percent, mercury emissions will be reduced by 55 percent, and metals emissions will be reduced by up to 86 percent. The incinerators and cement kilns controlled under these standards burn 80 percent of the hazardous waste combusted each year in America. These standards, combined with previous measures to control air toxicants from sources like medical incinerators and municipal combustors, should reduce total emissions of dioxin by 95 percent, emissions of mercury by 80 percent, and emissions of lead and cadmium by 83 percent.

Regarding mercury emissions, EPA has established emission standards (for new units) and emission guidelines (to be implemented by states for existing units) for municipal waste combustors and medical waste incinerators (the latter is referred to as the hospital/medical/infectious waste incinerator final rule because it covers both hospital waste and medical infectious waste). When fully implemented, these rules will reduce mercury emissions from municipal waste sources by about 90 percent and from medical incinerators by 95 percent. Work is underway to develop standards for several categories of combustion units (including hazardous waste and nonhazardous boilers) and for chlor-alkali plants.

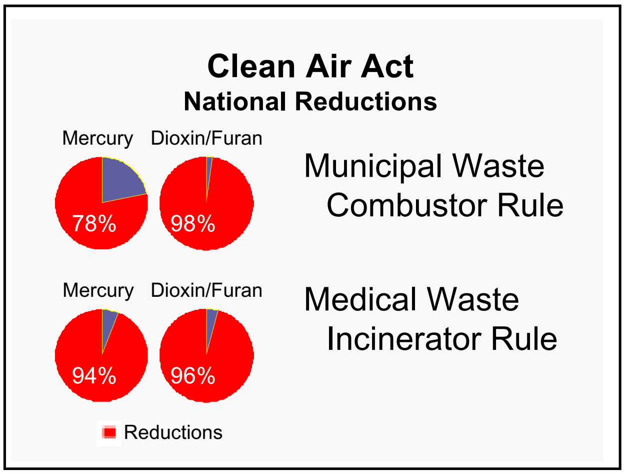

Figure 15. Significant reductions in mercury and dioxin/furan emissions will be achieved under rules targeting municipal and medical waste incinerators.

As stated earlier in this report, coal-burning electric utilities, the highest remaining source category in the U.S., will be addressed by regulations by 2004. EPA and the U. S. Department of Energy (DOE) will support the development and commercialization of cost-effective control technologies for mercury. Efforts are underway to continue to report and communicate with the public on progress made in all of these areas.

The use of leaded gasoline in on-road vehicles is prohibited under Clean Air Act regulations. As a result, the use of leaded gas in on-road vehicles has been virtually eliminated. In 1998, EPA issued a notice that includes “Gasoline Distribution Stage I Aviation” in a listing under Section 112(c)(6) of the Clean Air Act that places the evaporative loss emissions of aviation gas associated with airplane fueling, a source of alkyl lead, on a schedule for the development of MACT regulations.

Lead emissions in the Great Lakes region have declined at a rate of 6.4 percent per year from 1982 to 1993. Lead deposition to the Great Lakes correspondingly declined from 1988 to 1996. These reductions can be attributed to the reduction of lead in gasoline and the increased use of unleaded gasoline.

As a result of the Synthetic Organic Chemical Manufacturing Industry Hazardous Organic National Emission Standards for Hazardous Air Pollutants, there has been about a 90% reduction in HCB air emissions since 1990. A June 1999 air toxic standard for pesticide active ingredients will further reduce HCB emissions.

EPA Region 5 toxic air emissions, as reported in the TRI, have decreased overall from 585 million pounds per year in 1987 to the current level of 215 million pounds, a reduction of more than 60 percent.

MANAGING GREAT LAKES SEDIMENTS

One of the most prevalent problems in the Great Lakes is contaminated bottom sediments. Contaminated sediments impact virtually all AOCs and are a source of continuing pollutant loadings to nearshore areas and open lakes waters. Cycling of contaminants from bottom sediments is a leading source of contamination of the Great Lakes food chain.

Contaminated sediments can also cause severe economic impacts on our harbors and restrict