

Sierra Club Great Lakes Program
An Agenda for Public Health and Environmental Protection

**Minnesota Should Significantly Strengthen
its Toxic Air Pollution Regulations**

September, 2000

Sierra Club Great Lakes Program
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Forward

This document is one in a series produced for the Sierra Club Great Lakes Program in order to facilitate and increase public understanding of toxic substance issues and the connection between toxic air pollution, Great Lakes water pollution and effects on human health and the environment.

In this document, we offer a critique of current Minnesota policies on the control and evaluation of toxic air contaminants and Sierra Club's recommendations for major improvements in measures to protect public health, environment and the Great Lakes from toxic air pollutants.

Our proposed changes address the need to control persistent, bioaccumulative toxic contaminants from air deposition to the Great Lakes and inland waters, to reduce emissions of all toxic air pollutants by imposing technology-based controls and to provide more specific standards to evaluate and limit hazards to health and environment from toxic air pollutants. The Sierra Club Great Lakes Program seeks adoption of new rules in Minnesota to accomplish these objectives.

The Sierra Club Great Lakes Program wishes to acknowledge a generous grant from the Joyce Foundation of Chicago to make these efforts possible.

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1 Introduction and Summary

The Sierra Club Great Lakes Program (SCGLP) has reviewed Minnesota's environmental statutes and Minnesota Pollution Control Agency (MPCA) air and solid waste rules for all provisions that regulate toxic air pollution more stringently than minimum requirements under the Federal Clean Air Act and EPA rules.

In general, Minnesota does not have comprehensive policies to ensure that all toxic air pollution sources are controlled with state-of-the-art technological emission controls. Moreover, Minnesota does not have comprehensive rule-based requirements to assess and limit the hazards and risks posed by toxic air pollution exposure to public health and the environment. MPCA has published some unpromulgated internal agency guidance to evaluate hazards, but even these guidelines do not adequately address potential hazards from toxic air pollution.

Although Minnesota does have some toxic air pollution rules that are more stringent than federal requirements, the state's approach is piecemeal and reactive, rather than preventative and pro-active. In most cases, minimum federal emission control requirements are viewed as the most that the state will achieve in controlling toxic air contaminants.

Citizens of Minnesota should demand that the Minnesota Pollution Control Agency adopt comprehensive policies establishing technology-based toxic air pollution emission controls and requirements for assessing and limiting residual risks from toxic air pollutant sources.

2 Major Elements and Criticisms of Minnesota's Existing Authority Concerning Toxic Air Pollution

While toxic air pollution has been a recognized, serious, longstanding problem beginning in the late 1970's and early 1980's with everything from the Bhopal accident to serious and widespread fish contamination problems, Minnesota's record of accomplishment in the evaluation and control of toxic air pollution is mixed.

While federal toxic air pollution controls will accomplish a great deal, they leave many large gaps in public health and environmental protection. The federal program was meant to be a floor for protective efforts rather than a ceiling. Because of these gaps, it fell to the states to craft toxic air pollution evaluation and control activities that would ensure effective and comprehensive public health protection.

Minnesota has taken certain nationally exemplary steps. The state has an excellent toxic air pollution monitoring system, perhaps the best in the midwest. Minnesota's measures to control mercury and keep toxic chemicals out of waste incinerators are also nationally exemplary.

However, because the state has failed to develop comprehensive regulations on toxic air pollution evaluation and control, most toxic air pollutants remain uncontrolled or poorly controlled beyond minimum federal requirements. The basic Minnesota public policy decision to rely primarily on minimum Federal Clean Air Act requirements jeopardizes the public health and environment of Minnesota citizens.

Minnesota has enacted some beneficial requirements to control toxic air contaminants that go beyond minimum federal requirements:

- Minnesota has put nationally exemplary requirements in place to control mercury from consumer products, electrical devices and auto salvage.
- Minnesota law and regulations on the toxic contents of packaging that may eventually reach municipal waste incinerators are also nationally exemplary.
- Minnesota has banned installation and operation of small waste incinerators that tend to cause large emissions of toxic air pollution in the aggregate.
- For the largest incinerators burning municipal solid waste, Minnesota has promulgated important and effective emission testing, continuous monitoring, emission limitation, ash testing and toxic source reduction requirements. Some of these requirements also apply to other types of waste combustors.
- Minnesota places important waste-related rules on lead acid batteries to keep these devices out of municipal waste combustion units.
- The state requires certain industries to prepare pollution prevention plans and annual reports that should help prod dischargers into more environmentally beneficial practices.
- Minnesota has a nationally exemplary requirement that allows the state to withhold the granting of environmental permits at a site to air discharge violators who have unresolved compliance problems .
- Minnesota law targets potential inhalation health hazards from hydrogen sulfide emissions from concentrated animal feeding operations.

- Minnesota has already adopted more stringent ozone and particulate matter health standards that were issued by U.S. EPA and that are presently held up in litigation at the national level.
- Minnesota has an extensive network of air monitoring sites for toxic air pollution that is probably the most extensive in the midwest.
- MPCA has taken leadership among the states to identify the contribution that mobile source emissions makes to toxic air pollution problems.

Despite this progress to control toxic air contaminants, many serious deficiencies remain and there is a crucial need to address the following issues:

- There are no Minnesota rules that comprehensively address emissions of all persistent, bioaccumulative toxic air contaminants that cause public health and environmental damages from air deposition to the Great Lakes.
- Minnesota rules do not require that toxic air pollution emission sources install best available control technology
- Minnesota rules do not require both the comprehensive evaluation of all health and environmental effects and the limitation of these risks for all new and/or modified toxic air pollution sources.
- Minnesota does not clearly and unambiguously prohibit toxic air polluters from designating emissions data as confidential by either statute or rule.
- Minnesota's failure enact a general duty to prohibit toxic emissions that interfere with the comfortable enjoyment of life and property means that the state will be unable to ensure environmental justice in disproportionately affected communities.
- Minnesota's high emission thresholds in its permit rules means many facilities will never be evaluated and controlled for emissions of both common and toxic air pollution. Minnesota's environmental review process completely misses all emission sources that do not require a state permit.
- Minnesota's permit rules allow sources to omit certain types of information about expected toxic emissions when they are not major stationary sources as defined. The rules also allow emission sources to withhold information during the permit process concerning pollutants that might be released during accidents.
- The decision by the Minnesota Department of Health (MDH) and the MPCA to establish target risks from public exposure to airborne carcinogens at a level of 1

in 100,000 cancer incidence means that Minnesota citizens may be exposed to 10 times the amount of these cancer causing substances than many other states that have limited carcinogenic risks to one in one million.

- MDH's proposed health risk values fail to set limits for many different cancer causing chemicals that other states already regulate as airborne carcinogens.
- The Minnesota Department of Health proposals for health risk values (HRVs) used in making decisions about acceptable public exposure to toxic air pollutants will allow dramatically larger exposure to harmful toxic pollutants (that are not carcinogens) than would be allowed in states like Texas or Michigan.
- Minnesota allows lenient regulation of boilers and industrial furnaces that burn refused derived fuels if the amount these combustion units use is less than 30% of total fuels used, even though such units are likely to release toxic air pollutants..
- Minnesota's rules for hospital and metal recovery waste combustors are completely out of date. The states rules for waste combustors that do not burn municipal waste and for intermediate sized municipal waste combustors should be made more stringent. Minnesota has completely exempted waste combustors that only burn tires or tire derived fuel from all of its most stringent waste combustor rules.
- Minnesota should remove a provision allowing industries to hold their pollution prevention plans confidential from the public.
- Minnesota's statutes defining the ability of the MPCA to set ambient air quality standards to protect public health are confusing, rambling and contradictory.

The reader is referred to the Sierra Club document, "A Narrative Report on Minnesota's Air Pollution Rules Affecting Toxic Air Pollutants," for further analysis of Minnesota toxic air pollution rules going beyond minimum federal requirements.

3 Recommendations for Changes Needed to Protect Public Health and the Environment

3.1 Emphasize the Precautionary Principle, Virtual Elimination of Persistent Bioaccumulative Toxicants, Toxics Use Reduction, Pollution Prevention Practices and Chemical Testing Programs

The Sierra Club embraces the precautionary principle in setting policy to control toxic air pollution. We should not wait for definitive scientific proof of environmental

and public health damages before implementing prudent preventive measures to limit emissions and to evaluate and limit subsequent public health and environmental impacts from toxic air pollution.

The Sierra Club strongly opposes the use of quantitative risk assessment as a justification to allow uncontrolled, poorly controlled or poorly characterized emissions of toxic air pollutants to the environment. Quantitative risk assessment used in this manner will inevitably lead to excessive human and environmental exposures, failure to account for exposure to multiple and synergistic environmental contaminants and unreliable characterization of potential real-world health and environmental threats. Moreover, existing risk assessment procedures often fail to consider all pathways of exposure and potential future hazards from bioaccumulation of persistent toxic contaminants.

In the case of persistent bioaccumulative toxic contaminants, the Sierra Club supports virtual elimination of emissions and zero discharge as the goal for point and area sources. For chemicals that exhibit persistence, bioaccumulation, or both, virtual elimination and zero discharge should be the required policy in the Great Lakes states and provinces to achieve Great Lakes restoration.

For all other toxic air pollutants, the Sierra Club strongly embraces toxics use reduction and pollution prevention to dramatically reduce public health threats and environmental impacts. Zero discharge through changes in industrial processes and the elimination of toxic materials should still be the goal in dealing with toxic air pollution.

In all cases, industries seeking to emit toxic air contaminants should be under a “reverse onus” to prove that such emissions do not pose a threat to our Great Lakes environment and public health *prior to* their widespread use and/or release. This burden of proof should never rest on the public.

The Sierra Club recommends that environmental agencies require industries wishing to use and/or emit toxic chemicals to submit detailed toxicological data on such chemicals. State and federal environmental regulators should insist on detailed toxicological testing of high production-volume chemicals to determine the potential of these materials to cause cancer, neurological damage, endocrine disruption and/or other harmful effects. Such testing must take place before emissions are permitted.

3.2 Minnesota Should Adopt Comprehensive Technology-Based Emission Control Requirements for New, Modified and Existing Sources

Minnesota’s present air pollution rules do not contain a comprehensive requirement that all toxic air contaminant sources must utilize state-of-the-art technology-based engineered emission controls for all new, modified and existing emission sources.

Minnesota's failure to ensure state-of-the-art emission controls on toxic air contaminants fails to protect the public trust in air resources and fails to protect public health, communities and the environment.

With comprehensive technology-based emission control requirements, sources must install emission control equipment or make changes to processes and process equipment to reduce emissions. Any residual threats to public health and environmental protection can then be evaluated and controlled with more stringent technological controls.

The SCGLP recommends the following technology-based emissions control technology requirements:

Pollutant or Source Category	Emission Control Requirement
Persistent bioaccumulative toxics from either new, modified or existing sources	Lowest Achievable Emission Rate (LAER) technically achievable, consistent with “virtual elimination” goals of the Binational Toxics Strategy
Known or suspected human carcinogens as indicated by credible evidence; chemical compounds having serious chronic endocrine disruption, teratogenic and/or neurological effects in human systems	Lowest Achievable Emission Rate (LAER) technically achievable
New, modified or existing municipal solid waste or medical waste incinerators	Lowest Achievable Emission Rate (LAER) technically achievable, consistent with “virtual elimination” goals of the Binational Toxics Strategy
New or modified sources of all airborne toxicants other than those indicated above	Best Available Control Technology (BACT) determined by a top-down methodology similar to BACT for Prevention of Significant Deterioration Sources
New, modified and/or existing sources of airborne toxicants which are serious pulmonary irritants and/or sensitizers with serious acute and chronic effects on respiratory function (i.e. hydrogen sulfide, sulfuric or nitric acid aerosol, isocyanates, chlorine and chlorine dioxide, hydrogen flouride, etc.)	Best Available Control Technology (BACT) determined by a top-down methodology similar to BACT for Prevention of Significant Deterioration Sources
Existing sources of airborne toxicants other than those noted above which are listed by rule and which are not otherwise subject to requirements for new/modified sources	Reasonably Available Control Technology similar to a level of stringency associated with CAA Maximum Achievable Control Technology requirements for existing sources

3.3 Minnesota Should Amend its Regulations to Establish a Regulatory Process for Hazard and Risk Assessment and Limitations on Residual Hazards and Risks

For new and modified sources of toxic air pollution, Minnesota should regulate the full spectrum of toxic air contaminants emitted after the application of technology-based controls as recommended in the prior section.

According to the National Institute for Environmental Health Sciences:

“There are 50,000 chemicals in commercial production. It is estimated that about 10,000 are in significant commercial production and perhaps 2,000 present significant exposure levels. We do not know what fraction of those have been adequately tested, but certainly it is not much more than 10 to 30 percent.”¹

New and modified sources will pose the greatest long term potential for public and environmental exposure because they will be in existence and emitting for the longest period of time. New and modified sources also offer the most significant opportunities to impose modern toxic air contaminant controls.

3.4 Minnesota’s Proposed Health Risk Values from the Minnesota Health Department Allow Excessive Health Risks and Subpar Protection Compared to Other States

The Minnesota Health Department and the Minnesota Pollution Control Agency should revise their proposed policies to ensure that the public risks from exposure to airborne cancer causing agents does not exceed one in a million. The current MDH/MPCA target risk level is one in 100,000 for the inhalation exposure pathway. As a result, Minnesota thus allows ten times the amount of public exposure to cancer causing agents as would be allowed in most other states running programs to regulate toxic air contaminants.

In addition, some proposed health risk values for other toxic substances allow dramatically higher public exposures that would be permitted in other states with toxic air pollution regulatory programs. MDH and MPCA should re-evaluated and significantly increase the stringency of their proposed health risk values.

¹ See <http://www.niehs.nih.gov/oc/factsheets/ead/text.htm>

3.5 A New Process-Based Minnesota Risk Assessment Regulation Should Always Rely on Using the Best, Most Up-to-Date Toxicology Information Available

Under a process based rule for pathway analysis, exposure determination, risk assessment and risk limitation, explicit procedures would precisely define how such assessments should be conducted and what data should be used. Such a process-based rule would require the use of the best possible toxicology data available for risk and hazard assessment purposes. If no toxicology data is available, then a stringent ambient limitation of 0.1 micrograms/cubic meter on an annual average should be imposed. The entire structure of the process should always encourage the development of the best, most representative toxicology data available, rather than merely relying on static “table based” ambient health criteria.

For environmental carcinogens, Minnesota should enact rules to require risk assessment and enforceable limitations of quantitative risk to be less than one in a million cancer risk incidence. The linearized multi-stage model of carcinogenicity should be used for a conservative prediction of one in a million risk levels for airborne concentrations assuming a 70 year lifetime exposure. The assumption of this model is that there is no threshold for increases in risk from exposure to proven or suspected human cancer-causing materials; and that elevations in cancer risk can be caused by chemical agents that either initiate or promote carcinogenic processes.

Risk assessment for environmental carcinogens should rely on all available credible and up-to-date scientific evidence of carcinogenicity and dose response relationships, rather than a static list-based process relying on data that can be ten or more years old.

Individual permitted emissions for new and modified sources of environmental carcinogens should not cause lifetime cancer risks from inhalation exposure at the company property line to exceed one in a million.

For non-carcinogens, the procedure would specify the appropriate species difference, route difference and dose conversions and other uncertainty factors to be used.

Modeled air concentrations of toxic air pollutants should not exceed screening levels predicted by the applicable rule-described process based on the use of the best toxicology information available.

Here is the hierarchy of available toxicology data on non-carcinogens in order of increasing quality for community air pollution risk evaluation procedures as one goes down the table:

Toxicology Data for Risk Assessment for Non-Carcinogens
No data available; use 0.1 ug/M3 for annual average screening level
Only LD-50 available
An LC-50 is available
An oral route, 7 day No Observable Effects Level is available
An inhalation route, 7 day No Observable Effects Level is available
An ACGIH TLV is available; use 1% of the TLV as screening level
A NIOSH recommended occupational health exposure guideline is available; use 1% of the guideline as the screening level
An EPA Reference Dose is available
An EPA Reference Concentration is available

For each of the above types of toxicology data, appropriate and conservative dose route conversion factors, species difference factors and other uncertainty factors should be used to ensure public health protection.

For toxic air pollutants with acute toxicity, dose conversion factors and other uncertainty factors should use respiration rates, body sizes and whole body dose calculations appropriate to protect children who spend a great deal of their time outdoors.

For pulmonary irritants and sensitizers, such as toluene di-isocyanate and chlorine dioxide, short term averaging times as brief as ten minutes should be considered for maximum health protection and such standards should protect sensitive groups in the population.

3.6 Minnesota Should Impose Comprehensive Multi-Pathway Exposure Assessment and Risk Characterization Procedures and Residual Risk-Based Emission Standards for Emissions of Persistent Bioaccumulative Toxic Air Pollutants from New, Modified and Existing Sources

All new, modified and existing sources should be required to perform residual risk assessments after applying technology-based emission control requirements for persistent bioaccumulative toxicants, known or suspected carcinogens and other toxic pollutants.

Minnesota should ensure any lists of regulated toxic air contaminants it uses in the future be properly coordinated with designated Tier 1 and 2 pollutants under the U.S./Canada Binational Toxics Strategy. Additional chemical compounds that display

persistent bioaccumulative behaviors should also be added in future Minnesota toxic air pollution rule amendments.

Risk assessment for persistent bioaccumulative toxicants should incorporate multi-pathway exposure assessment and should identify sensitive demographic population subgroups (i.e. subsistence fishers, local consumers and farmers who may be more at risk from exposure on farmland adjacent to airborne toxicant sources, etc.).

An individual source, together with other multiple sources and background, should not be permitted to cause excess cancer risks calculated for all pathways to exceed one in 100,000.

3.7 For Classes of Particular Compounds Posing Unique Risks, Minnesota Should Require Ecological Risk Assessment

Certain materials, such as tri-butyl tin, pose unique ecological risks that will not be reflected in multi-pathway human health risk assessments. Minnesota should develop a rule-based process to identify these materials and to require ecological risk assessment during permitting. In cases where ecological risk assessment is warranted because of an individual toxic air pollutant, permitting of emission sources should not allow exclusive use of natural resources that would allow local or regional biodiversity to be damaged.

3.8 Minnesota's Toxic Air Pollution Regulations Should be Coordinated with Emerging Regulation for Non-Point Source Atmospheric Inputs to Impaired Water Bodies Under the Federal Clean Water Act's Total Maximum Daily Load Program

Non-point source atmospheric pollution of the Great Lakes and inland lakes of this region has emerged as a serious public health and environmental problem. Under the Clean Water Act's program to develop Total Maximum Daily Load budgets for water bodies impaired by airborne deposition of chemical contaminants, measures must be taken to roll back emissions from existing sources and to prevent new sources from making problems worse.

Minnesota's toxic air pollution regulations should be amended to authorize TMDL-based toxicant contamination budget limitations during permitting of new, modified and existing toxic air contaminant sources.

3.9 Minnesota Should Enact New Requirements to Control Emissions from Waste Combustion

Minnesota should ensure that all municipal, commercial and industrial waste incinerators and other waste combustion units comply with new, stringent state regulations that exceed the minimum federal requirements and ensure that all toxic air pollutants from these sources are controlled with state-of-the-art emission control technology.

Although Minnesota has enacted some exemplary requirements designed to keep mercury and other toxic metals out of municipal waste incinerators, additional emphasis on source separation and pollution prevention should be able to achieve additional reductions in these persistent and bioaccumulative pollutants. In particular, source separation and recycling of plastics, other consumer products and household hazardous wastes may allow additional reductions in toxic metal emissions, acid gases and toxic constituents of incinerator ash.

Given recent chlorinated dioxin/furan emission studies on residential open burning, Minnesota should enact a comprehensive, statewide ban on the open burning of residential trash. Minnesota should also restrict the open burning of leaves and landscape waste in favor of composting and other methods of disposal.

3.10 Minnesota Should Stringently Regulate All Poly-Chlorinated Dibenzodioxins/Furans Emissions

Minnesota should regulate all poly-chlorinated dibenzo dioxins/furans emissions through a system of toxic equivalency factors to recognize the varying toxicity of each different form of these compounds. These toxic equivalency factors should be used when evaluating and limiting residual risks at all such emission sources.

Minnesota should impose technology-based emission controls reflecting lowest achievable emission rate (LAER) stringency on all new, modified and existing dioxin/furan emission sources.

3.11 Minnesota Should Enact Policies to Control Mercury Emissions from Electric Utility Plants, Industrial Boilers and Other Industrial Sources

Although Minnesota requires reporting of mercury emissions from electric utility plants, the reporting requirement contains a loophole that should be eliminated. The loophole allows mercury emissions arising from electricity generated for interstate sales to be excluded from reporting. Minnesota should revise its reporting requirements to ensure that all utility mercury emissions are reported annually.

Minnesota electric utilities and coal-fired industrial boilers should be put under a burden to significantly reduce emissions of mercury through fuel switching or potential emission controls. Other industrial sectors, such as primary smelters and mining facilities should be required to test and control mercury emissions. Electric utilities and other large mercury dischargers should achieve reductions in mercury emissions of at least 90%.

3.12 Minnesota Should Ensure that its Current Requirements to Regulate and/or Ban Commercial, Societal and Manufacturing Users of Mercury are Effectively Enforced

Minnesota has already enacted many of the proposals in the table below that the Sierra Club is recommending for all Great Lakes States for mercury control and regulation. The focus for governmental and citizen efforts in Minnesota should be to ensure that such requirements are effectively enforced.

Proposed Restrictions, Bans and Work Practices Concerning Mercury Products
Ban on sale of mercury-containing games, apparel, decorations and novelties
Requirement for recyclers to remove mercury switches for mercury recovery from vehicle processing and white goods
Requirement for health care facilities to collect mercury-containing medical batteries and recycle for mercury recovery
Requirement for building demolition companies to collect mercury containing thermostats and electrical switches for mercury recovery and/or proper disposal
Ban the sale and use of mercury fever thermometers
Restrict use of mercury meteorological instruments by government, industry and scientific users
Ban on the sale of household mercury thermostats and electrical switches
Requirement for mortuaries to recover dental amalgams before cremation
Prohibit bulk mercury sale to general public and restrict sale only to government, scientific, educational and industrial users; mercury sales for ritualistic uses to be banned
Restrict sale of batteries to minimal mercury content achievable with current battery manufacturing techniques
Require proper disposal techniques for mercury-containing fluorescent lights for large commercial, government, educational, industrial and institutional users
Require fugitive control measures for preparation of dental amalgams, collection measures for water recovered from dental drilling for amalgam removal and restrictions on disposal of removed amalgams
Prohibition on incineration of phenol mercuric acetate wastes in cement kilns
Restrictions and performance standards on mercury recovery operations to limit fugitive emissions and environmental impacts
Provide money and staff for the mercury "Clean Sweep" programs