

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

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

September, 1999

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 state-initiated toxic air contaminant rules in Illinois and we make a series of specific recommendations for major improvements in Illinois's Part 232 toxic air contaminant rules. Our proposed changes address the need to control persistent bioaccumulative toxics in the Great Lakes, to reduce emissions of all toxic air pollutants by imposing technology-based controls, and to provide more specific standards to evaluate and limit residual risks to health and environment from toxic air pollutants. The Sierra Club Great Lakes Program seeks adoption of new rules in Illinois to accomplish these objectives.

This document is one of a series of advocacy and educational materials written to help citizens understand state and federal toxic air pollution regulations and to stimulate discussion about potential changes in state regulatory policy to more fully protect public health and the environment. Other documents in this series describe state toxic air pollutant regulations in detail and provide activist's checklists.

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

The Sierra Club Great Lakes Program (SCGLP) has reviewed Illinois' current rules concerning toxic air pollution, found at 35 Ill Adm Code Part 232, that represent the entire State of Illinois initiated efforts at regulating toxic air pollutants and their effects on public health and environment beyond the minimum requirements under the Federal Clean Air Act.

In general, the State of Illinois has done the least of any state in the Sierra Club study (which included Michigan, Ohio, Wisconsin and Illinois) to promulgate regulations going beyond minimum federal requirements in protecting its citizens, the Illinois environment and the Great Lakes from toxic air pollution.

Illinois has not enacted technology-based emission control regulations to limit toxic air pollution beyond minimum federal requirements. Illinois has not established rules that require the assessment and limitation of environmental and public health risks from toxic air pollution.

Illinois has not enacted regulations more stringent than minimum federal requirements that specifically limit emissions of toxic air pollution responsible for air deposition into the Great Lakes and the adverse effects caused by this deposition.

Although the Illinois Environmental Protection Act recognizes that existing minimum federal requirements may not be adequate to protect the public and the environment, and that release of toxic contaminants in the air may endanger the public health and welfare, the state has not effectively and expeditiously pursued state initiatives to limit emissions and control these hazards.

Citizens of Illinois should demand that the Illinois Environmental Protection Agency recommend and that the Illinois Pollution Control Board adopt comprehensive regulations establishing technology-based emission controls and requirements for the assessment and limitation residual risks from toxic air emissions.

2. Major Criticisms of Illinois' Existing Authority and Agency Performance Concerning Toxic Air Contaminants

Although Illinois has not promulgated a comprehensive, state-initiated toxic air pollution control regulation beyond minimum federal requirements, the state does have provisions in its statute and existing regulations concerning the definition of toxic air contaminants and exemptions from any future regulations. These authorities and agency performance indicators are subject to the following significant criticisms:

S Both the Illinois Environmental Protection Act and the Illinois Administrative Regulations define Illinois toxic air contaminants (ITAC) in such a way that a very

high burden must be met before a substance is considered an ITAC. Under these definitions, the Illinois Air Pollution Control Board must find that a proposed ITAC “may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or may pose a significant threat to human health.”

- Illinois’ existing Part 232 rules contain a listing and delisting procedure for Illinois toxic air contaminants that is very complex, outdated and seriously problematic. The procedure relies on 1987-1989 listings of cancer-causing substances instead of using the best, most up to date toxicology information on chemical carcinogens. Under the rule, only toxicology data on rats can be used for determinations on “acute lethality” scores, instead of the best, most representative toxicology data available.
- S** The Part 232 listing and delisting procedures seriously discount adverse toxic effects which are non-incapacitation, don’t increase mortality or are reversible in scoring chemical agents as potential Illinois toxic air contaminants. As such, the rule discounts public health concerns about chemical pollutants which cause temporary adverse physiological effects, reversible pulmonary effects, endocrine disruption effects, reversible neurological effects (i.e. headaches) and other non-mortal effects. The listing procedure even goes as far as defining all human organs into three categories, with significantly diminished concern in the scoring system about toxic air contaminant effects on category III organs.¹
- Although the Illinois Environmental Protection Act requires rulemaking to define environmental criteria for listing of an Illinois toxic air contaminant, the Illinois Pollution Control Board (IPCB) has never issued such rules.
- Although the Illinois statutes requires adoption of regulations “establishing a program to control toxic contaminants released into the air in a manner that protects the public health and environment,” the Illinois Environmental Protection Agency has not proposed such regulations and the Illinois Pollution Control Board has not adopted such regulations.
- S** Both the Illinois statute and administrative regulations contain exemption provisions that will permanently hobble any future toxic air contaminant and Great Lakes protection regulations, unless such exemptions are dropped. The existing

¹ Category III organs include oviducts, epididymides, uterus, prostate, seminal vesicles, ductus deferens, penis, vagina, eyes, bone, nose, peripheral nerves, muscles, urinary bladder, blood vessels, ears, gallbladder, larynx, mammary glands, salivary glands, skin, spleen, tongue, teeth, ureter, urethra, pharynx.

exemptions include dry cleaning operations, storage and handling of motor fuels, combustion processes using commercial fuels and internal combustion engines.

For example, the exemption of combustion processes and commercial fuels will eliminate all capability of any future regulation to control mercury, arsenic and other heavy metal emissions from coal fired power plants.

1. The Sierra Club Great Lakes Program Recommendations for Public Health and Environmental Protection — Changes Needed to Significantly Increase the Stringency of Illinois’s Rules to Control Toxic Air Pollution

1.1 State Policy on Emissions of Airborne Toxicants Should 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 toxicants.

In the case of persistent bioaccumulative toxicants, 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 air toxics 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.

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

Currently, Illinois Part 232 toxic air contaminant rules do not contain any technology-based emission control requirements on emissions of Illinois toxic air contaminants.

Illinois’s failure to ensure state-of-the-art emission controls doesn’t represent a precautionary approach, doesn’t protect the public trust in air resources and doesn’t 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.

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

1.3 Illinois Should Amend its Regulations to Establish a Regulatory Process for Risk Assessment and Limitations on Residual Risks

For new and modified sources of toxic air pollution, Illinois should regulate the full spectrum of air toxic materials emitted after the application of technology-based controls as indicated 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.”²

By contrast, current Illinois regulations designate only 347 toxic air contaminants for future potential regulation. Clearly, most toxic air pollutants will be unregulated in Illinois in the absence of a revised process for listing and regulating toxic air pollutants.

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 new, modern air contaminant controls designed to curb emissions.

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

Illinois’ current reliance on out of date information on chemical carcinogens will always lead to the regulations being out-of-date and unable to protect public health with the latest, most up-to-date toxicology information.

Under a process based rule for pathway analysis, exposure determination, risk assessment and risk limitation, explicit procedures are set forth in the rule on precisely how such assessments should be conducted and what data is to be used. Such a process-based rule would require the use of the best possible toxicology data available for risk assessment purposes. If no toxicology data is available, then a stringent ambient limitation of 0.1 micrograms/cubic meter for an annual average should be imposed. The entire structure of the process should always encourage the development of the best, most

² See <http://www.niehs.nih.gov/oc/factsheets/ead/text.htm>

reflective toxicology data available, rather than merely relying on static “table based” toxicology information.

For environmental carcinogens, the process set forth in the rule would show the appropriate risk assessment procedure for the determination of what exposure is associated with a one in a million risk for environmental carcinogens. 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.

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

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, 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.

1.5 Illinois Should Impose Comprehensive Multi-Pathway Exposure Assessment and Risk Characterization Procedures and Residual Risk-Base 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.

Illinois 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 Illinois 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.

1.6 For Classes of Particular Compounds Posing Unique Risks, Illinois 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. Illinois 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 or decisions to allow irretrievable commitment of natural resources that would allow local or regional biodiversity to be damaged.

1.7 Illinois'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.

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

1.8 Illinois's Exemptions from Toxic Air Pollution Regulations Must be Revised

Illinois's present system of exemptions in its statute and in the Part 232 rules should be revised because major classes of toxic air pollutant sources are exempted and unregulated through these exemptions. In particular, the present exemption for fossil fuel burning devices will lead to unregulated emissions of mercury, arsenic and polycyclic aromatic hydrocarbons (PAH) from fossil fuel burning combustors, such as electric utilities, cement plants and industrial boilers. Recent information shows that such industries can be major sources of mercury and other toxic air pollutants.

1.9 Enforcement of Requirements on Incinerators

Although the current Illinois Environmental Protection Act calls for stringent rulemaking for municipal waste incinerators over 25 tons per day within one year of the statute's amendment, the Illinois Environmental Protection Agency only recommended adopting the federal rules concerning these sources for units over 250 tons per day, leaving the small units uncontrolled in violation of the statute.

Illinois should ensure that all municipal waste incinerators down to 25 tons per day are covered by a stringent state regulation that exceeds the minimum federal requirements and ensures that all toxic air pollutants are controlled with state-of-the-art emission control technology. In addition, Illinois should ensure that municipalities take measures to remove mercury and other heavy metal containing materials from the solid waste stream before such municipal wastes can be received by a municipal waste incinerator.

1.10 Illinois Should Regulate All Poly-Chlorinated Dibenzodioxins/Furans Congeners and PCDD/PCDF-like Compounds by Using Toxic Equivalency Factors (TEF)

Currently, Illinois lists 2,3,7,8 tetra-chloro-dibenzo(p)dioxin (TCDD), "chlorinated dibenzo dioxins," and "chlorinated dibenzofurans" as toxic air contaminants; only hexachlorodibenzodioxin is listed as chemical carcinogen.

Illinois should regulate all poly-chlorinated dibenzo dioxins/furans through a system of toxic equivalency factors and lowest achievable emission rate technology-based emission controls. Moreover, toxic equivalents of polychlorinated dibenzodioxins and polychlorinated dibenzofurans should be listed in the regulation as an airborne carcinogen.

1.11 Illinois Should Promulgate Rules to Restrict and/or Ban Certain Commercial, Societal and Manufacturing Uses of Mercury

Illinois should promulgate rules to restrict and/or ban the sale, use, and disposal of certain mercury-containing items and work practices involving mercury. These restrictions are intended to reduce or eliminate mercury pollution in the environment or to achieve mercury use reductions where feasible and prudent alternatives exist. The restrictions would also reduce mercury use patterns when frivolous (such as use in clothing) or when such patterns are otherwise expected to cause unnecessary mercury

emissions to the environment. Finally, some of these restrictions can be expected to reduce the potential for serious indoor mercury contamination problems.

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

1.12 Illinois Should More Stringently Restrict Open Burning

Open burning of construction waste, trash and leaves can emit a wide variety of toxic air contaminants. These emissions not only cause local nuisances and property damage through soiling and odors, such emissions will likely cause severe difficulty for people with respiratory ailments.

Open burning can be a significant regional source of toxic metals, poly-chlorinated dibenzo-dioxins/furans and polycyclic aromatic hydrocarbons, all of concern for Great Lakes water quality. As a result, these sources should come under more stringent state rule control.