there remains considerable controversy over the risk factor established. Numerous studies indicate that there are increased lung cancer risks associated with diesel emissions. One factor that contributes to the adverse health impacts is that most diesel particulate is in the inhalable particle range (10 microns in diameter), with the majority of the mass less than 2.5 microns in diameter. Fine particulate matter penetrates into the deepest regions of the lungs and poses the greatest threat to human health.

- *Determination that Regulation Under NR 445 is Necessary to Provide Public Health Protection.*

The second step in the NR 445 listing process is the evaluation of the hazardous air contaminant against a set of criteria that includes whether other regulations provide adequate public health protection from an air toxics perspective. Diesel generators must meet state and federal emission limits for stationary sources. The most limiting of these for diesel generators are the emission limits necessary to protect the National Ambient Air Quality Standards (NAAQS) for nitrogen oxides and particulate matter. Under these regulations, new "major" air pollution sources must install best available control technology. Diesel generators seldom, if ever, have particulate matter emissions exceeding the major source applicability thresholds and therefore are not required to install emission control technologies to reduce their emissions. Staff reviewed the permits issued to over 200 diesel generators in 1999 and 2000 and found that none required the installation of control technologies. Commercially available add-on control technologies can significantly reduce particulate emissions, from between 70 to 95 percent in combination with lower sulfur fuels.

The principal argument against state regulation of diesel generators is that current and anticipated federal diesel engine and fuel standards will address diesel emissions and that Wisconsin's air program should be consistent with the national efforts. There are several reasons why staff has concluded that these federal regulations are not adequate to protect against the cancer health risk.

The federal standards for emissions from both on-road and off-road diesel engines have focused on nitrogen oxide emissions and their contribution to ozone formation rather than on particulate emissions and their contribution to lung cancer risks. Federal emission standards for diesel engines, the Tier 2 and Tier 3 standards, set emission rates for both nitrogen oxides and particulate matter. However, some of the control strategies used to set these standards acknowledge that reducing nitrogen oxide emissions in these engines can actually cause an increase in particulate emissions.

This is characterized as a "NOx vs. PM" trade off and was considered in setting the Tier 2 and 3 emissions standards. This results in establishing Tier 3 particulate matter emission rates that are considerably higher than what can be achieved with currently commercially available add-on control technologies. US EPA clearly states in their October 2001 Staff Technical Paper for Nonroad Diesel Emission Standards, "The lack of restrictive Tier 3 PM standards makes it directionally easier for manufacturers to meet the relatively more restrictive NOx+NMHC standard by changing the balance of the NOx vs. PM trade-off from the Tier 2 engine designs." Therefore, it has been determined that Tier 3 particulate emission standards do not represent, nor are intended to represent a level which reflects best available control technology for particulates.

In addition to the primary objective being NOx emission reductions rather than PM emission reductions, the federal engine standards apply to the manufacture of new engines, not to the use of existing engines. Diesel generators have very low turnover rates. They are reliable sturdy producers of power that do not need frequent replacement. Reliance on federal new engine standards would do little to reduce emissions from the current stock of generators. Unlike cars, a few years of patience would not result in a consumer-driven improvement in air emissions.

Proposal for a Performance Based Standard.

The Department is proposing a performance-based standard for existing sources instead of an emission standard, which in this case would be best available control technology (BACT). This approach is more efficient in cases where the emission source, operational characteristics and available control options are very similar, as is the case with diesel generators. It has the advantage of being simpler and more straightforward and provides more certainty to sources. The decision to set a performance-based standard rather than an emission standard has not been controversial.

Briefly, the proposal sets a performance standard for internal combustion compressed ignition engines (ICCE) that combust fuel oil. The standard applies to non-emergency stationary ICCE engines over 100 horsepower. External combustion units, such as industrial boilers, very small engines, and engines used to provide essential services are exempted from the proposed standard.

The performance standard has three levels:

- A fuel use requirement for all affected engines
- An emission rate for existing stationary engines and a BACT standard for new/modified engines combusting more than 40,000 gallons/ year
- BACT for engine testing facilities combusting more than 40,000 gallons/ year

The proposal is the product of numerous TAG meetings and stakeholder meetings. Although the recommendation to regulate diesel emissions will continue to be controversial, many of the issues related to the specifics of the proposed performance standard have largely been resolved. These include:

- The requirement to use on-road diesel fuel, which is readily available, rather than to use a fuel specified in terms of future federal fuel standards.
- Limiting the applicability to stationary sources and excluding portable sources from control requirements.
- Clarifying that individual engines tested in an engine testing facility are not subject to the performance standard. Instead, the BACT standard applies to the testing facility.
- Exempting essential services from the performance standards.
- Limiting reporting and compliance requirements for existing sources to self-certification in lieu of permits.
- Accepting 3rd party certification (US EPA, CARB) in lieu of requiring emission testing.

Concern has been voiced over the cost of retrofitting existing engines. The Department's research of currently available retrofit technology has found a range of costs depending on the technology used and the size of the engine. A range of $4 to $50 per horsepower annualized cost has been estimated by the California Air Resources Board and the Manufacturers of Emissions Control Association.

Listing of Silica and Wood Dust

The rule revisions propose listing silica and wood dust but exempting them from regulation until such time as additional follow up work is completed. The proposal directs the Department to conduct studies of the emissions of these substances, including the sources and amounts of emissions and alternative strategies for minimizing public health risks. Many complex questions need to be answered. Department staff decided that rather than addressing these during the rule revision process, it would be wiser to establish special studies that would be conducted after the current rule revision process was concluded. The results of the follow up work can be included in the next round of rule revisions.

The proposed listing of silica has generated considerable interest on the part of industry and the environmental communities. Early in the rule revision process, the Department received over 30 petitions from concerned citizens urging it to regulate silica. In response to the petitions, the department said that it was planning to list silica but not to include regulatory requirements and instead planned to conduct a special study following the NR 445 rule revision.

Wood dust is emitted by a wide diversity of sources, from loggers to users of powdered wood dust. For some source categories, an existing regulation may provide adequate public health protection from a toxics perspective; for other source categories, there may be no other regulations or the regulations that apply may not provide adequate health protection. Given the large number of source categories, the Department is proposing to exempt wood dust from regulation and to conduct a special study.

The industrial community supports the proposed special studies but argues that silica and wood dust should not be listed. The listing protocol includes the need for additional information as one of the criteria that the department will consider in determining whether or not to list a substance. By establishing, in the revised rule, special studies for both these substances, the department acknowledges the need for additional information and thus, they argue, these substances should not be listed.

The Department proposes to list, exempt from regulation on an interim basis, and study both substances. This is what it committed to do in its responses to the petitions on regulating silica emissions. Based on that commitment and understanding, the petitioners have accepted this proposal. There is also a precedent for this approach in the special studies of chloroform and formaldehyde established when the current rule was promulgated in 1988.

The proposed rule directs staff to consult with affected industry, public health officials and other interested parties in evaluating the sources and amounts of emissions and alternative strategies for minimizing public health. It further directs that a progress report be submitted to the Natural Resources Board within two years.

This approach has no regulatory impact. Nor does it pre-judge the outcome of the studies. Based on the evaluations, the studies may recommend regulating emissions of these substances, may recommend regulations for certain types of sources and other approaches for other sources, may recommend de-listing the substance because other regulations are adequate, or may recommend a new and innovative approach to minimizing the public health risks.

Regulation of Respirable Coal Dust

Respirable coal dust is proposed to be listed in NR 445 for its acute non-cancer health effects. The proposed emission standard for respirable coal dust is 21.6 ug/M3 (over a 24 hour averaging time) for bituminous, sub-bituminous and lignite coal. It is 9.6 ug/M3 for anthracite coal, which is rarely used in Wisconsin. At this level, emission concentrations off property should not result in acute non-cancer health effects for the general population.

Coal dust is currently regulated as a fugitive dust under ch. NR 415, Control of Particulate Emissions. An analysis of NR 415 regulations was conducted to assess whether NR 415 provides adequate public health protection from an air toxics perspective. Staff concluded that it does not. Industry argues that additional information is needed to make that determination and for that reason coal dust should not be listed. Instead, the rule should require a special study, similar to the studies of silica and wood dust emissions.

The rule revisions propose three additional compliance demonstration alternatives specifically for coal dust in recognition that managing emissions from transporting, handling and storing coal is fundamentally different from managing emissions from a stack.

Evaluation of Ch. NR 415

The staff analysis of Ch. NR 415 concluded that it does not provide a regulatory framework to assure that the public would be adequately protected from the acute non-cancer health effects of respirable coal dust. The reasons include:

- NR 415 does not establish emission limits that could be compared to the NR 445 emission standard for coal dust to evaluate the adequacy of public health protection provided. NR 415 prohibits sources from emitting particulate matter that would substantially contribute to exceeding the ambient air quality standard for total suspended particulate matter. This is an air quality standard, similar to the ozone standard, rather than an emission standard that limits emissions from a particular source, such as VOC or NOx emission standards. It is not set to provide public health protection from specific hazardous air contaminants. Many substances listed in NR 445 are particulate matter but they are regulated as hazardous air pollutants with pollutant specific emissions standards that reflect their relative toxicity.

- NR 415 does not set a minimum performance standard for dust mitigation practices that could be evaluated to determine the adequacy of public health protection provided for respirable coal dust. NR 415 requires sources that emit particulate matter to take precautions to prevent the particulate matter from becoming airborne but does not prescribe minimum management standards or requirements. Facilities with coal piles have developed fugitive dust control plans. The practices vary from facility to facility but can include adding water or dust suppression agents, unloading rail cars in enclosed facilities that may also have baghouses to capture fugitive dusts, enclosed conveyor belts, tire washing to reduce coal dust from traffic in and out of the coal pile area and even, at the MG&E facility in Madison, a wall around the coal pile.

- The correction of problems related to citizen complaints of visible coal dust emissions (nuisance problems) and the absence of health-related complaints is not a sufficient basis to conclude that NR 415 provides adequate protection of public health. There have been citizen complaints about visible coal dust, such as coal dust settling on boats in a nearby marina. In these cases, the department has worked with the facility to implement additional management practices. However, the coal dust that is visible and leads to nuisance complaints consists of the larger particles of coal dust. The finer particles, those that lodge deep in the lungs when inhaled and are the subject of NR 445, are not visible.

- Department staff attempted to evaluate the adequacy of NR 415 to meet the NR 445 standards by examining ambient air monitoring data. There is a very limited amount of PM 10 monitoring data near coal handling facilities…only one site in the state. (PM10 is respirable dust size.) This site is on the roof of a three-story building across the street from a coal handling facility. It is not well sited for evaluating the facility's coal dust emissions, which was not its purpose. Nevertheless, the Department felt that reviewing the monitoring data from this site might be directionally informative. The results found that several samples from the site indicated that the proposed standard could be exceeded off the source's property.

For these reasons, the Department has concluded that NR 415 does not provide the regulatory framework for assuring that public health will be adequately protected from emissions of respirable coal dust.

Compliance Demonstration Alternatives

Although NR 415 does not provide the regulatory framework to assure that facilities are managing their coal dust such that their emissions do not pose a public health problem, there may well be individual facilities that are. Others may need to augment their management practices under this proposal.

In recognition of the fact that the management of coal dust emissions is fundamentally different from the management of the traditional stack emissions, the rule revisions include three alternative methods for demonstrating compliance. These are in addition to the option, available to all sources of acute, non-cancer HAPs, of a source-specific modeling demonstration. These three options are:

- A source specific ambient air monitoring demonstration
- A industry sector or area specific ambient monitoring demonstration
- A variance similar to the variance available to sources of emissions of substances with chronic non-cancer health effects.

The Department is continuing to work with affected stakeholders in developing the guidance for these options.

Other Less Controversial Issues

The issues discussed above are those that are believed will generate the most controversy. Throughout the 30-month rule development process, a wide range of issues have been raised, discussed and for the most part resolved. However, elements of these issues may surface in public comments. The following is a brief synopsis of some of these:

Alternative Compliance Options to BACT/LAER for Carcinogens

The rule revisions allow sources that are currently required to meet the BACT/LAER technology standard to demonstrate that their emissions do not exceed the risk based threshold or that they meet one of the alternative compliance demonstration options. They would then no longer need to comply with the BACT/LAER requirement. This may result in higher emissions.

Compliance Certification as an Alternative to Revising Operation Permits or Obtaining Construction Permits

With the exception of BACT/LAER determinations, which will continue to require Department approval, sources may self-certify that they comply with NR 445 standards. This precludes the need for existing sources to re-open operation permits prior to their normal renewal and for new/modified sources to obtain a construction permit. In all cases, the NR 445 requirements will eventually be included in the operation permit.

This process places greater reliance on sources to make correct compliance determinations, with the potential for public exposure to unhealthy emissions if mistakes are made. It also has the practical effect of delaying the opportunity for public comment. In practice, the department believes that this will result in greater overall public health protection in a timelier manner than relying on the permitting process, which is facing a large backlog.

Indoor Fugitive Emissions

Public health officials may argue that the current exemption for indoor fugitive emissions for non-carcinogens should be made consistent with that for carcinogens. This would require a showing that OSHA standards were met. This issue was raised at a TAG meeting. Department staff believes that most of the concerns can be met through guidance.

Accidental Spills

A subgroup was established to address issues relating to the notification requirements for accidental air releases. Membership included TAG members and members of the original NR 706 advisory group. Ch. NR 706 sets forth the hazardous substance discharge notification and source confirmation requirements. The charge to the group was to advise the Department on consolidating the spill notification requirements into one rule and on clarifying the notification requirements without changing the already existing requirements contained in NR 706.

After several meetings, the Department concluded that this was becoming a more difficult and complex task than had been anticipated and that consensus was unlikely to be reached. Department staff decided not to revise either rule, but to undertake additional outreach with stakeholders on hazardous substance spill reporting, especially as it related to air releases. The Department's Spill Team Leader met with the TAG and clarified that notification is required when an accidental spill is determined by the facility to involve a hazardous substance and to be a threat to public health, safety, welfare or the environment. This issue is no longer expected to be controversial.

Asphalt Fume

Asphalt fume was initially proposed to be added to the list of regulated substances for its acute non-cancer health effects. Department staff met with members of the Wisconsin Transportation Builders Association, the Wisconsin Asphalt Paving Association, the Asphalt Institute and the National Asphalt Pavement Association. Subsequent to the initial draft NR 445 List, the Environmental Protection Agency issued an assessment report on hot mix asphalt plant emissions that provided detailed new information on the constituents of asphalt fume, most of which are also regulated under NR 445. After evaluating the information received from industry, an on-site visit to a large asphalt plant and the EPA Assessment Report, the Department concluded that regulating asphalt fume in addition to regulating the specific chemicals and compounds that make up the fume would provide for little additional environmental benefit. Thus, the decision was made to not list asphalt fume in NR 445 but instead to use the 51 specific standards for 35 chemicals and compounds that make up the asphalt fume. The decision to regulate the individual constituents rather than the entire mixture may generate comments related to the additive or synergistic effects.

Environmental Analysis

The proposed rule revisions have been reviewed under WEPA and it has been determined that this is a Type III action under NR 150.03(6)(b), Wis. Adm. Code. The revisions are an update to an existing rule and the only anticipated environmental effects are the reduction of toxic releases to the environment. This Type III action requires notification under NR 150.02(1)(b), but does not require other WEPA related notification.

Small Business Analysis

The Small Business Analysis was conducted as part of the Business Impact Analysis described in the Regulatory Impact Section. This included interviews with small businesses conducted by the Department of Commerce Small Business Clean Air Assistance Program. Several measures are included in the rule revision that will substantially reduce the regulatory impact for most small businesses. These include the incidental emitters and the due diligence/safe harbor provisions. Small businesses that need to reduce or limit their emissions will benefit from other measures, such as the compliance certification process.

Background Information

Attachment 5, Understanding Wisconsin's Hazardous Air Pollutant Rules and Requirements, was prepared as a background document for the NR 445 TAG to help them understand the current NR 445 and related rules and the regulatory process.

Attachment 6, The Impact of the Current NR 445 on Wisconsin's Hazardous Air Emissions, is a review of emission reductions achieved through the current NR 445 regulations.

LIST OF ATTACHMENTS TO BACKGROUND MEMO

1. Participants in the NR 445 Technical Advisory Group
2. TAG meeting materials and presentations
3. Outreach Presentations and sub-group meetings for NR 445 Rule Revision
4. Application of Decision Criteria for Listing in Proposed Ch. NR 445
5. Understanding Wisconsin's Hazardous Air Pollutant Rules and Requirements, a primer prepared for the layperson that describes the current hazardous air pollutant program.
6. The Impact of the Current NR 445 Regulation on Wisconsin's Hazardous Air Emissions, a review of emission reductions achieved through the current regulations.

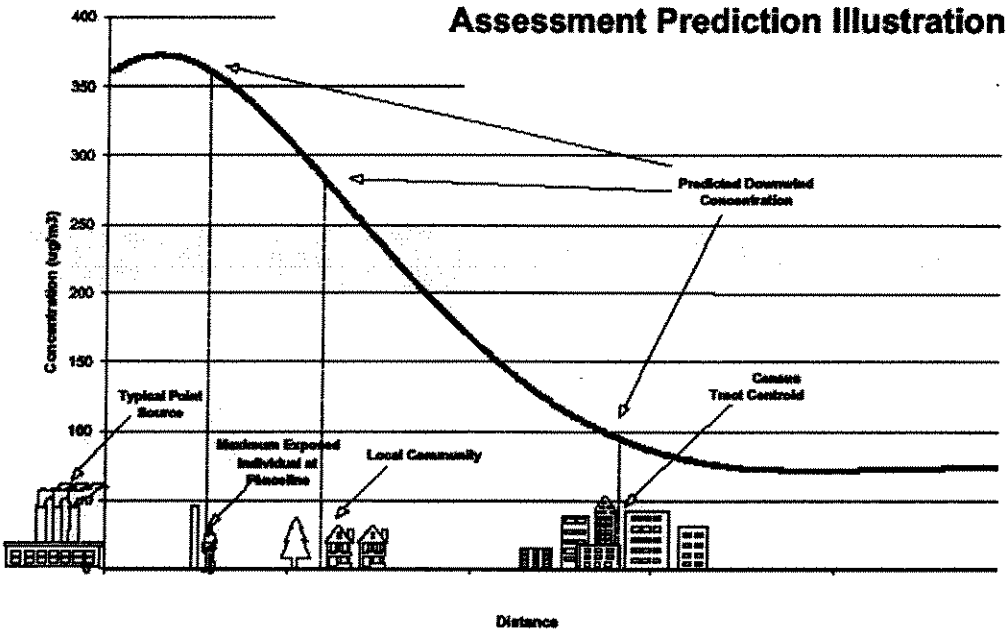
Table A
Emission Thresholds, Standards and Control Requirements for All Sources of Hazardous Air Contaminants

Hazardous Air Contaminant	CAS Number	Thresholds for Emission Points[1] (expressed as lbs/hr or lbs/yr) Threshold Levels based on ht. of Stack				Ambient Air Standard (per time period in column (h) expressed as micrograms per cubic meter)	Time Period for Standard and Threshold	Control Requirement
		Emissions from Stacks <25 ft	Emissions from Stacks 25 to <40 ft	Emissions from Stacks 40 to <75 ft	Emissions from Stacks ≥75 ft			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
Acetaldehyde	75-07-0	3.36	10.7	20.6	55.3	4,504	1 Hr	N/A
Acetic acid	64-19-7	808	3,318	7,900	27,845	N/A	Annual	BACT
Acetic anhydride	108-24-7	1.32	5.12	10.3	39.8	589	24 Hr Avg	N/A
Acetone Cyanohydrin, as CN	75-86-5	1.12	4.36	8.79	33.9	501	24 Hr Avg	N/A
Acetonitrile	75-05-8	1.22	3.89	7.48	20.1	1,636	1 Hr	N/A
Acetophenone	98-86-2	3.61	14	28.3	109	1,612	24 Hr Avg	N/A
Acrolein	107-02-8	2.64	10.3	20.7	79.7	1,179	24 Hr Avg	N/A
Acrylamide	79-06-1	0.0171	0.0545	0.105	0.281	22.9	1 Hr	N/A
Acrylic acid	79-10-7	0.00161	0.00626	0.0126	0.0486	0.72	24 Hr Avg	N/A
Acrylonitrile	107-13-1	1.37	5.62	13.4	47.1	N/A	Annual	BACT
Adipic Acid	124-04-9	178	730	1,738	6,126	1	Annual	N/A
Adiponitrile	111-69-3	0.317	1.23	2.48	9.56	141	24 Hr Avg	N/A
Aflatoxins	1402-68-2	26.1	107	256	901	N/A	Annual	BACT
Allyl alcohol	107-18-6	0.269	1.04	2.11	8.11	120	24 Hr Avg	N/A
Allyl chloride	107-05-1	0.475	1.85	3.72	14.3	212	24 Hr Avg	N/A
Allyl glycidyl ether	106-92-3	2.43	10	23.8	83.9	N/A	Annual	LAER
Aluminum alkyls and soluble salts, as Al	7429-90-5	0.0638	0.248	0.5	1.93	28.5	24 Hr Avg	N/A
Aluminum pyro powders, as Al	7429-90-5	0.168	0.653	1.32	5.07	75.1	24 Hr Avg	N/A
o-Aminoazotoluene (2-Aminoazotoluene)	97-56-3	0.251	0.974	1.97	7.57	112	24 Hr Avg	N/A
4-Aminobiphenyl	92-67-1	0.107	0.417	0.842	3.24	48	24 Hr Avg	N/A
Ammonia	7664-41-7	0.269	1.04	2.11	8.11	120	24 Hr Avg	N/A
Ammonium perfluorooctanoate	3825-26-1	1.62	6.64	15.8	55.7	N/A	Annual	BACT
Aniline	62-53-3	0.296	1.22	2.9	10.2	N/A	Annual	LAER
o-Anisidine and o-anisidine hydrochloride (mixtures and isomers)	29191-52-4	17,769	73,000	173,810	612,587	100	Annual	N/A
Antimony and compounds, as Sb	7440-36-0	0.935	3.63	7.33	28.2	418	24 Hr Avg	N/A
Antimony trioxide	1309-64-4	0.000537	0.00209	0.00421	0.0162	0.24	24 Hr Avg	N/A
Arsenic, elemental and inorganic compounds, as As	7440-38-2	0.409	1.59	3.21	12.4	183	24 Hr Avg	N/A
Arsine	7784-42-1	44.4	183	435	1,531	N/A	Annual	BACT
Asbestos, all forms	1332-21-4	0.0271	0.105	0.212	0.817	12.1	24 Hr Avg	N/A
Aziridine (Ethylenimine)	151-56-4	0.0269	0.104	0.211	0.811	12	24 Hr Avg	N/A
Barium, soluble compounds, as Ba	7440-39-3	35.5	146	348	1,225	0.2	Annual	N/A
Benz(a)anthracene	56-55-3	0.413	1.7	4.04	14.2	N/A	Annual	LAER
		0.00856	0.0333	0.0671	0.258	3.83	24 Hr Avg	N/A
		8.88	36.5	86.9	306	0.05	Annual	N/A
		2.43	10	23.8	83.9	N/A	Annual	LAER
		0.0473	0.184	0.371	1.43	21.1	24 Hr Avg	N/A
		0.0269	0.104	0.211	0.811	12	24 Hr Avg	N/A
		16.2	66.4	158	557	N/A	Annual	BACT

The Impact of the Current NR 445 on Wisconsin's Hazardous Air Emissions

The purpose of Chapter NR 445, Wisconsin's Hazardous Air Pollutant regulation, is to protect public health and welfare from inhalation exposure to hazardous air pollutants that are emitted by stationary sources.

Unlike criteria pollutants (volatile organic compounds, nitrogen oxides and sulfur dioxide), the concern with most hazardous air emissions are primarily their immediate local impacts. Regional or even countywide emissions are not as great a concern as the impact at the local neighborhood level. Small sources are often located near residential neighborhoods, have short stack heights or even exhaust hazardous emissions horizontally out of a side wall, and therefore can provide far greater public exposure and health risk than greater emissions from tall stacks. While emissions from small sources may involve smaller quantities of pollutants, the impact to the local community can be very significant. The illustration below shows how emission concentrations change with the distance from the source.



Ch. NR 445 accomplishes its objectives by:

- identifying and listing specific hazardous air pollutants,
- setting ambient air concentration standards for the non-carcinogenic pollutants, and
- requiring state-of-the-art technology controls for significant emissions of carcinogens.

Simply identifying and listing hazardous air pollutants can have an impact on sources of emissions. Some firms have adopted, as part of their corporate culture, an objective of being environmentally friendly. They may substitute or reformulate materials in order to

avoid the use and environmental release of any material considered 'hazardous'. The decision not to use or to minimize use of materials considered 'hazardous' occurs either shortly after a new or updated listing of hazardous air pollutants in Ch. NR 445, or before starting a new process or before modifying an existing process. Similarly, some sources avoid use of hazardous materials because of the added cost and burden of recordkeeping for these materials. Emissions of hazardous pollutants listed under ch. NR 445 that are above certain threshold levels are required to be reported in the annual emissions inventory required under ch. NR 438. DNR does not know how many sources voluntarily chose to not use hazardous materials for either of these reasons, or how much hazardous emissions are prevented by these decisions, but anecdotally DNR understands these emission reductions occur and the amount could be significant to local air quality.

For the calendar year 2000 Air Emissions Inventory, 846 sources reported emitting 212 hazardous air pollutants. The most commonly emitted hazardous air pollutants were formaldehyde, toluene, xylene, benzene, methyl ethyl ketone, n-hexane, ammonia, and glycol ethers with over 100 sources reporting emissions of each pollutant. The greatest amount of emissions reported were of hydrogen chloride, methanol, xylene, sulfuric acid, toluene, hydrogen fluoride, methyl ethyl ketone, glycol ethers, styrene, stoddard solvent and ammonia with each pollutant having total reported emissions of over 1,000,000 pounds.

Sources that emit significant amounts of hazardous air pollutants typically comply with ch. NR 445 by one of the following methods.

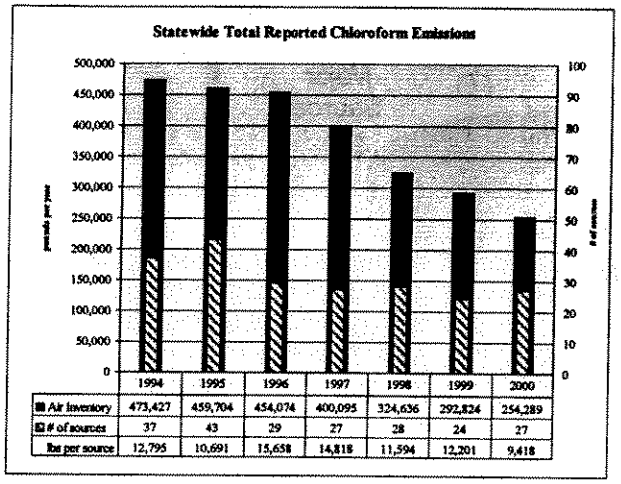
- Reformulate or substitute materials (e.g. use water-based coatings)
- Meet a fuel use exemption criteria (e.g. use only clean burning fuels)
- Change the process to reduce emissions (e.g. use chemical scavengers that prevent release of hazardous pollutants from the process)
- Raise the stack height to achieve greater dispersion
- Reduce emissions by use of emission control equipment

Sources that have the potential to emit significant amounts of hazardous air pollutants but that typically do not operate anywhere near their full potential often take operating restrictions (e.g. hours operated each day or process rates) to reduce their potential to emit hazardous air pollutants. These are not real emission reductions and are therefore <u>not</u> considered in this review of emission reductions achieved by ch. NR 445.

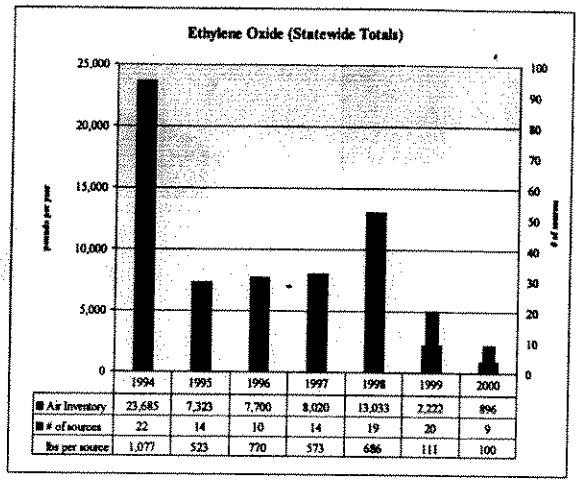
Ch. NR 445 has accomplished significant reductions in hazardous air pollutant emissions for specific types of sources and individual sources. Most notable is the reduction of all types of incinerators in Wisconsin, from small grocery store incinerators to municipal solid waste incinerators, resulting in reduced emissions of dioxins, metals, formaldehyde, and benzene, among other pollutants. The wide distribution of incinerators and their emissions affected a large portion of Wisconsin's population. Previously small incinerators were commonly used at supermarkets, apartment buildings, hospitals and commercial establishments. There were over 100 hospital incinerators and an undocumented number of incinerators at commercial establishments. Today, Wisconsin has just a few sources incinerating solid waste (2 burn municipal waste, one burns

hospital waste, several burn pathological waste) and no small commercial incinerators. In 1998, Illinois, in contrast, had 70 incinerators at supermarkets.

Ch. NR 445 also provided significant reductions in chloroform emissions from pulp mills and ethylene oxide emissions from hospital sterilizers. Both are listed in ch. NR 445 as probable carcinogens.



	1994	1995	1996	1997	1998	1999	2000
Air Inventory	473,427	459,704	454,074	400,095	324,636	292,824	254,289
# of sources	37	43	29	27	28	24	27
lbs per source	12,795	10,691	15,658	14,818	11,594	12,201	9,418



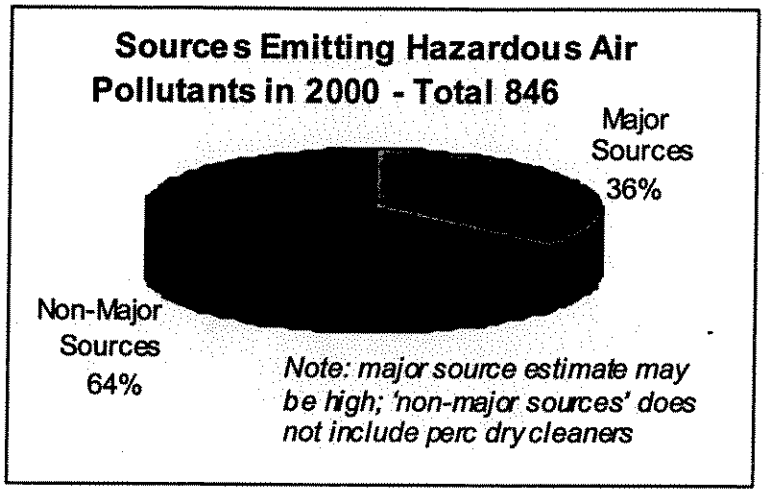
	1994	1995	1996	1997	1998	1999	2000
Air Inventory	23,685	7,323	7,700	8,020	13,033	2,222	896
# of sources	22	14	10	14	19	20	9
lbs per source	1,077	523	770	573	686	111	100

Emissions from wood burning sources have also been reduced. Excessive amounts of benzene and formaldehyde are emitted from incomplete combustion of waste wood, bark and other fuels. Many wood burning sources (such as wood product manufacturers, utilities and paper mills) have reduced their benzene and formaldehyde emissions by meeting an exemption under ch. NR 445 for sources that can demonstrate that they provide good combustion technology. This exemption has also reduced the amount of burning of painted and treated wood which would emit metals and other hazardous pollutants, because the exemption is only provided for combustion of clean wood.

The self-assessment of hazardous emissions that is required by ch. NR 445 has made sources more aware of their hazardous emissions. For example, foundries have become more aware of benzene emissions from the casting process. Many foundries have taken action to reduce these benzene emissions through better design of sand additives. In this case, and in many others, greater care in process design to reduce emissions has the added benefit of also reducing the use of costly raw materials, and thereby provides significant cost savings to the industry.

With the development of the National Emission Standards for Hazardous Air Pollutants (NESHAPs, also known as MACTs) starting in mid-1990, ch. NR 445 took on a different role. With national MACT regulations taking the lead role at major facilities, ch. NR 445 plays the lead role with the regulation of hazardous emissions from smaller sources. "Major sources" for the federal MACT program are defined as those with a potential to emit 10 tons per year of a single Clean Air Act hazardous air pollutant, or 25 tons per year of a combination of the 188 federal hazardous air pollutants. For the non-major sources, the MACT regulations only apply to the few sources subject to an area source

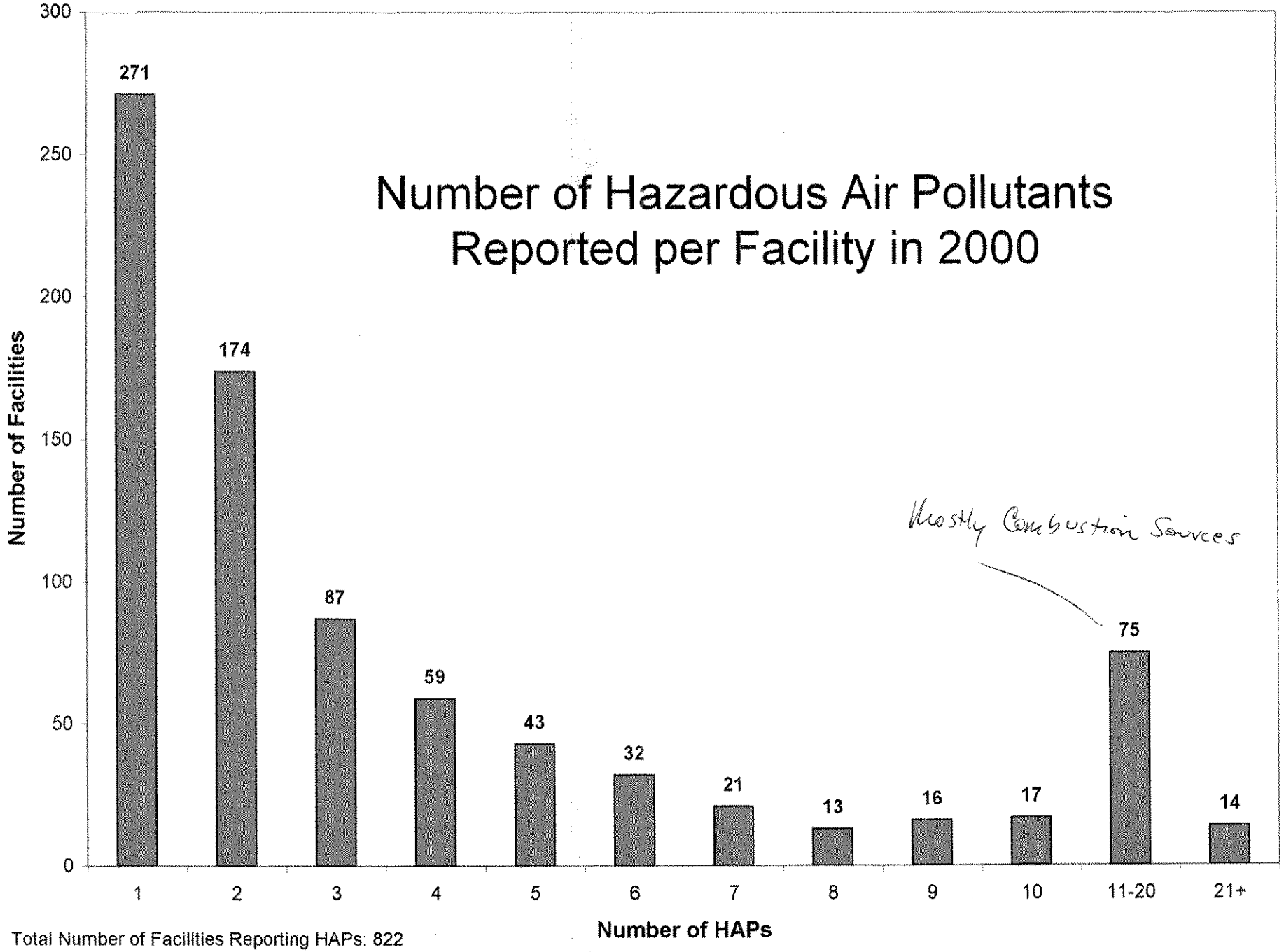
MACT, such as chromium electroplaters. As shown in the pie chart below, nearly two thirds of the sources reporting hazardous air emissions do not meet the "major source" definition. With the exception of the few area source MACT standards, only NR 445 applies to these smaller sources for the purposes of hazardous air emissions.



For major sources, NR 445 applies to emission units that are not subject to a MACT. In some cases, the MACT limitations are similar to the limits previously required under ch. NR 445. For emission units not addressed by the MACT, the ch. NR 445 requirements remain in effect. For example, at one facility the MACT basically provides the same requirements as previously required under ch. NR 445 for the production units. However the MACT does not address emissions of over 4000 pounds of benzene in the wastewater treatment system. For the wastewater system, the ch. NR 445 limitations remain in effect to reduce emissions.

Ch. NR 445 also applies to emission units that emit state-only hazardous air pollutants, such as ammonia and stoddard solvent (mineral spirits). Emissions of these two pollutants exceeded one million pounds each in the year 2000. These two hazardous air pollutants are regulated under NR 445 for their acute non-cancer health effects and, in the case of ammonia for its chronic non-cancer health effects.

In summary, hazardous air pollutants are a public health concern at the local level, the federal program affects about a third of the sources in Wisconsin that emit hazardous air pollutants, and ch. NR 445 has resulted in significant reductions in hazardous emissions through a combination of voluntary actions taken by sources to not use or to minimize their use of hazardous materials and of regulatory actions taken to meet the ch. NR 445 emission standards.



Total Number of Facilities Reporting HAPs: 822

Source: 2000 Air Emissions Inventory

SUMMARY OF STATE HAZARDOUS AIR POLLUTANT PROGRAMS

Introduction

Wisconsin is not the only state regulating air toxics beyond the limits required by the CAA. As part of an effort to identify other state air toxics program, the DNR conducted a survey and extensive background research on 26 states across the nation. Out of the 26 states contacted, 16 had programs stricter than the federal government's MACT program. 23 states have not been contacted yet. Out of the 23 not contacted, the DNR, according to available information and research, anticipates that at least 5 of the states have or are developing state only air toxics programs. In all, at least 16, and probably 21 or more states have air toxics programs stricter than the federal MACT program.

Research revealed wide variation in the size and structure of state only air toxics programs. Programs differ, sometimes substantially, on factors such as listing criteria, health based thresholds, regulatory strategies, timelines, agency discretion, and other policy and program characteristics. Despite the wide variation in state only air toxics programs, several distinct regulatory strategies emerged. A brief summary of observed regulatory strategies is provided below. State names will not be attached to the regulatory strategies described below because these strategies often overlap within individual state-only programs, and the entire population of states has not been researched or surveyed.[1]

Full Disclosure of All Chemicals Emitted

Some states require sources to report every chemical they emit. The chemicals are automatically added to a guidance list used for permit reviews. Acceptable ambient levels and other emission limitations are determined on a chemical by chemical basis by reviewing available literature. Generally, states with this regulatory scheme are not limited to reviewing specific sources, and can use any available information in their health-based determinations. The chemicals on the guidance list are used for permit reviews. If a source emits more than what is specified on the guidance list, the source must enter negotiations with the state to limit or otherwise abate emissions to the point where human health is not endangered. The permit review process is iterative and flexible in this regulatory scheme, at the discretion of the state. Chemicals and thresholds can be added and modified quickly under this scheme, and without a formal rule revision process.

Agency Discretion for Listing and Threshold Determination – Guidance for Permit Process

This regulatory approach is very similar to the full disclosure scheme, with the exception that sources are not required to report all chemicals emitted. The state determines which chemicals are problematic, usually by an interagency determination between the state's air pollution control agency and state health officials to balance policy needs and likely human health impacts. The burden to determine chemicals of concern falls on the state. The determination process is completely within the state government, and chemicals determined to be risky are added to a guidance list for permitting. If a source emits more than what is specified on the guidance list, the source must enter negotiations with the state to limit or otherwise abate emissions to the point

[1] States employ a large variety of regulatory schemes. It is important to note that nearly every state employs variations or combinations of the strategies and other factors described in this brief analysis. These generalized regulatory methods represent the DNR's interpretation of technical data and rule information, and should be used for general policy comparisons only.

where human health is not endangered. Use of the chemical list in the permitting process is iterative and flexible with significant regulatory discretion. States with this regulatory scheme maintain the flexibility to change listings and thresholds quickly.

Agency Discretion for Listing and Threshold Determination - Rule

Other states have lists and emission standards defined in rules, based on broad authority to protect public health. In this case, the state has the burden to identify and determine chemicals of concern, and it is the state that determines which chemicals are problematic through an interagency determination between the state's air pollution control agency and state health officials. Using this method, the agencies work together to make determinations based on likely health impacts in their state, while balancing political considerations and policy needs. The state proposes additions or modifications to the list spelled out in rule, but must follow a formal rulemaking process. States with this scheme are not tied to specific third party lists, and act on agency discretion when making listing and standard determinations. The State has the flexibility to propose what chemicals should be regulated and to what level, but must go through a formal rulemaking process, which significantly slows down additions and revisions to the regulated list of chemicals.

Third Party Listing and Threshold Determination – Guidance for Permit Process

Wisconsin

Some states are linked to specific third party lists to make listings and determinations for their permitting processes. States may modify guidance standards and chemical lists depending upon information provided by third parties. The chemical lists and standards are in a constant state of flux, using the latest information on human health effects of chemicals in the environment. Changes to the list and standards are made by the state without rulemaking procedures according to changes in the third party lists. The guidance list of air toxics and standards is used in the permitting process. If a source emits enough of a chemical to trigger standards in the list, the source must negotiate with the state to eliminate the risk to the public. Chemical determinations and standards are determined by third parties, but the application of the standards in permit processes is flexible, and controlled by the state.

Third Party Listing and Threshold Determination – Rule

Some states, like Wisconsin, are linked to specific third party lists that are frozen in time and spelled out by rule. The state, based on the third party sources, develops a list of chemicals and health based standards that need to be updated. In order to change the list used in permit decisions, the state must go through a formal rule making process. This structure limits state flexibility in chemical identification, listing, and standard determination, and also limits the ability of the state to update the list to reflect current health based standards. Generally, this structure slows the speed at which the state can add or revise state-only air toxics standards, but ensures consistency over time by linking with respected third parties.

Technical State Agency Listing and Threshold Determination

Some states must reach independent scientific toxicology and risk determinations in order to list and regulate air toxics. Under this scheme, state toxicologists reach an independent determination about the toxicity and risks attributable to individual chemicals. Once this determination is made, the state must go through rulemaking procedures to regulate the chemical. This structure, while thorough and theoretically providing the best scientific rationale for regulation, is cumbersome and slow. For each individual chemical, the state must spend significant resources studying and reaching an independent conclusion. Adding and modifying chemicals under this regulatory structure is very difficult.

Independent Panel List and Threshold Determination

Under this regulatory strategy, the state, concerned citizens, industry groups, or other actors approach an independent air toxics board with requests to regulate chemicals. Entities with standing to approach the board vary by scheme, as does composition of the board. Once concerns or requests reach the board, it conducts an independent analysis of research, and performs original research as necessary to determine if the chemical needs to be listed. Independent boards typically employ toxicologists and scientific experts, and may or may not convene regularly. This regulatory scheme takes the determination and standard setting duties away from the state agency responsible for regulating air toxics. The state may request certain chemicals be regulated, but the board makes the determination and sets the standards based on available literature, independent toxicology data, and scientific expertise. This structure, while very thorough, and scientifically sound, adds an additional step to the listing and standard setting process, and increases the time investment necessary to add or modify regulated air toxics.

Industrial Process/Technology

Some states mirror the federal government's current MACT strategy, but increase the number of chemicals regulated, the applicable sources, and required technologies. The state determines chemicals of concern, associated industrial practices, and best available technologies to control the pollution. As part of an iterative rule making procedure, the state can modify or add requirements. Some states simply require sources to add technologies to emission points where specific classes of air toxics are emitted. This regulatory method avoids the complications of setting health-based standards, while providing some level of pollution abatement.

Geographical

Some states employ a geographical air toxics regulatory approach. The state determines areas of high concentration of dangerous chemicals, and focuses its efforts on those specific areas and chemicals. The state identifies areas and chemicals of concern, and organizes efforts within the community to limit pollution by using incentives and cooperative programs coupled with emission limitations. An independent review board oversees the agency under this mechanism, to ensure proper standard levels and approaches. This method potentially saves state resources by focusing efforts on areas of concern.

Other Factors

In addition to varied regulatory methods, state-only air toxics programs differ in many other significant areas. The level of detail necessary to describe these differences is too great to present in this document, but it must be noted that nearly every state studied has unique policies and standards as a result of political and institutional limitations. Even within similar regulatory schemes, states often have significantly different de minimis levels, regulated sources, number of regulated chemicals (anywhere from 100 up to approximately 2000), data requirements for listing and standard setting, exempt sources, variance procedures, and update procedures. Some states even have the option for a petition system to add, delete, or modify chemicals and standards on the state regulated list. In such instances, the department, or an independent group determines validity of the petition, and makes a listing and standard determination.

Adding to the difficulty of categorizing states is the fact that several states are in the process of developing or updating their rules. The state-only air toxics regulatory environment is dynamic, and can be expected to remain that way.

Wisconsin's Place Within the State-Only Air Toxics Population

As described above, states employ a wide range of regulatory strategies to address the public health concern of air toxics. Within this regulatory universe, the State of Wisconsin's approach falls somewhere in the middle. The DNR does not have the authority to easily modify its list of regulated chemicals and standards, as some states do. The DNR also lacks some of the flexibility available in different regulatory structures. At the same time, the DNR is not saddled with independent determination requirements that slow the regulatory process to a crawl. Another positive is that the DNR does have the ability to regulate chemicals using health-based standards, which protect the citizens of Wisconsin better than some available strategies. Wisconsin sits squarely in the middle of the expanse of regulatory options.

1/85
1/52

7/2/03 NR 445 mtg WMC : Schoepke & Fassbender
Johnsrud, Loomis, Kedzie, Johnson &
Leg Council - John Stoltzenberg

More substances the higher the cost for business. Identifying those contaminants is the biggest cost.
Must determine 1.) Do you exceed what is being emitted from the stack 2.) Then determine if you are exceeding at/past the fence.

Johnson, Dan (Legislature)

Subject: dj: Leg Council mtg
Location: Leg Council conference room

Start: Wed 06/11/2003 2:00 PM
End: Wed 06/11/2003 3:00 PM

Recurrence: (none)

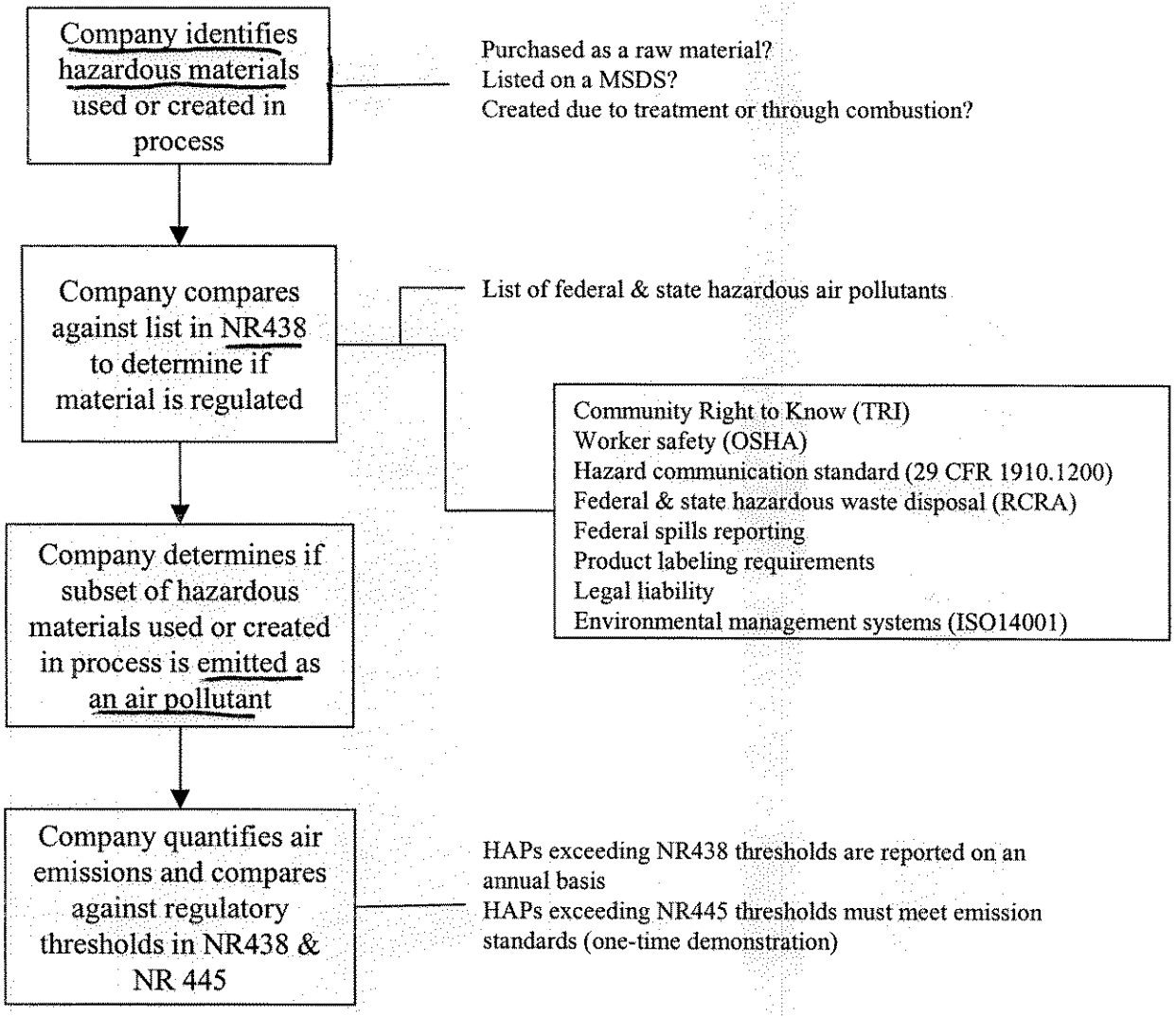
I've included below the set of questions on background information I had mentioned in an earlier note. I recognize that you may not have answers to all of these questions by our Wednesday meeting, but we can discuss the materials you do have plus respond to any clarifications you want from us.

John

Questions on Clearinghouse Rule 02-97, Relating to Hazardous Air Pollutants

1. What was the justification for the original ch. NR 445 rule adopted in 1988? (A copy of the "green sheet" for the original rule should be a sufficient response to this question.)
2. What are the major steps in the risk analysis leading to the specification of a particular emission limit for a hazardous air pollutant for the limits in the original ch. NR 445 rule, CHR 02-97 and current federal emission standards for hazardous air contaminants?
3. What steps does the owner or operator of a stationary source have to follow to determine applicability and compliance with CHR 02-97? Does the DNR have a flowchart of the expected steps?
4. Does the U.S. EPA regulate or use stack height as part of its hazardous air pollutant regulations?
5. What are the common names and usage of chemicals added to the list of regulated chemicals under CHR 02-97? How many of these chemicals are known to be used in Wisconsin?
6. Which, if any, of the chemicals added to the list of regulated chemicals under CHR 02-97 have been the subject of either complaints to the DNR or enforcement actions by the DNR?
7. In developing CHR 02-97, did the DNR consider further categorizing or ranking the added chemicals by factors such as quantity of use, acute or chronic toxicity or likelihood of exposure to the public?

8. Why didn't the DNR adopt only the federal standards? Are there any chemicals on EPA's list that are not on DNR's proposed list? If there are chemicals on DNR's proposed list that are also on EPA's list, how do these emission limits compare?


Company identifies hazardous materials used or created in process
Purchased as a raw material?
Listed on a MSDS?
Created due to treatment or through combustion?
Company compares against list in NR438 to determine if material is regulated
List of federal & state hazardous air pollutants
Community Right to Know (TRI)
Worker safety (OSHA)
Hazard communication standard (29 CFR 1910.1200)
Federal & state hazardous waste disposal (RCRA)
Federal spills reporting
Product labeling requirements
Legal liability
Environmental management systems (ISO14001)
Company determines if subset of hazardous materials used or created in process is emitted as an air pollutant
Company quantifies air emissions and compares against regulatory thresholds in NR438 & NR 445
HAPs exceeding NR438 thresholds are reported on an annual basis
HAPs exceeding NR445 thresholds must meet emission standards (one-time demonstration)

	HISTORY OF NR 445
Date	**Action**
April, 1981	Department proposed to inlcude 1,1,1-tricholoreahane and methylene chloride in Reasonably Available Control Technology (RACT) regulations for controlling precursos of ozone. This proposal resulted in considerable controversy
July, 1982	NRB exempted the two compounds from RACT and approved a resolution to appoint a task force to monitor scientific literature on the health impacts of the two compounds and report back within two years.
Feb. 1983	The Air Pollution Control Board, an advisory committee to the Natural Resources Board, requested that the task force charge be expanded to look at the adequacy of existing regulation of hazardous air pollutants in general. This was prompted by concern over the lack of direction in hazarodus air pollution control at the federal level.
May, 1983	The Hazardous Emissions Task Force was formed, composed of seven members. Its charge was to:
	1. Recommend a definition for a "toxic and/or hazardous air emission".
	2. Recommend a methodology (standard setting process) to be established in rulemaking for establishin emisison limits to adequately protect public health and welfare.
	3. Examine potential health impacts surring the use of 1,1,1,-trichloroethane and methylene chloride and make recommnedations as to the adequacy of existing regulations applied to those compounds.
	4. Recommend which soruces of hazardous emisisons should be exempt from permit requirements because the potential emissions would not pose a significant threat to public health, safety or welfare.
July, 1985	The Task Force submitted its "Report of Recommendations", which was approved by a vote of 5 to 2. The recommendations included:
	1. A definition of a hazardous air contaminant
	2. Emission control recommendations for approximately 500 chemicals
	3. A recommendation that a successor group be established to monitor the development and publication of new data and make recommendations for modifications to the list of chemicals.
	4. A statement that the Task Force did not presuppose the existence or absence of a hazardous air contaminant problem in Wisconsin, but was making its recommendations with an eye toward prevention of such problems.
March, 1986	Air Management staff summarized Task Force recommendations, including draft rules, in an information item to the Natural Resources Board. Board directed staff to hold public information meetings to gather inofrmation on impacats of the draft rule.
June, 1986	Six informational meetings were held. Meetings resulted in numerous comments but little quantitative information on cost impacts of proposed rule.
Oct. 1986	Air Management staff presented to the NRB a summary of public information meeting comments. It proposed conducting a survey of 30 randomly selected sources in representative industries to assess the impacts of the rule.
Feb. 1987	NRB authorized public hearings on the proposed rule
July-Feb 1988	Meetings held with industrial and environmental groups to revise the rules to accommodate public concerns
April, 1988	NRB directs staff to continue discussions with industrial and environmental interests
May, 1988	NR 445 was adopted by the Natural Resources Board. The rule consists of 4 component parts:
	1. Defined hazardous air contaminant

	2. Established emission limits and regulated emissions of 437 substances in four different tables.
	3. Permit exemption requirements
	4. Compliance dates
	The rule also required the department to review the acceptable ambient air concentrations (AAC) for the 163 Table 4 chemicals and submit a report with recommended revised limits by October 1990.
May, 1990	Court of Appeals affirmed the DNR acted within its statutory authority when it promulgated NR 445.
	1. The court ruled that DNR did not exceed its authority when it included benzene in NR445 because NR 445 regulates difference sources of benzene that the Clean Air Act does.
	2. The court found "absurd" the claim that DNR should make separate findings for each of the 405 regulated substances. The NRB's single finding of need for the rule constitute a finding that emission standards were needed for each substance.
Nov. 1990	Department submitted the Table 4 Report. The report examined all 163 chemicals for changes in the AACs as well as evidence of carcinogencity. A group of 38 chemicals was also examined for chronic toxicity.
January, 1991	NRB authorized public hearings on revisions to NR 445 which included establishing standards based on chronic noncarcinogenic health effects.
Sept. 1991	NRB adopted the proposed rule except for the reference concentrations (chronic non-cancer toxicity based limits) provisions and directed staff to continue working with industry
Aug. 1994	NRB adopted a revised rule incorporating reference concentrations
Feb. 2000	DNR establishes NR 445 Technical Advisory Group and begins the first comprehensive updating of NR 445.

CAA Chemicals not regulated under NR 445

N=28

Note: Nearly all of these chemicals are not regulated by NR 445, but are part of the permitting and reporting requirements in NR 407 and 438.

Chemical	CAS#	NR407?	NR438?	NR445?
Acetamide	60-35-5	Yes	Yes	No
2-Acetylaminofluorene	53-96-3	Yes	Yes	No
Carbonyl sulfide	463-58-1	Yes	Yes	No
Chloramben	133-90-4	Yes	Yes	No
Chloroacetic acid	79-11-8	Yes	Yes	No
Chlorobenzilate	510-15-6	Yes	Yes	No
2,4-D, salts and esters	94-75-7	Yes	Yes	No
DDE	72-55-9	Yes	Yes	No
Dibenzofurans	132-64-9	Yes	Yes	No
2,4-Dinitrophenol	51-28-5	Yes	Yes	No
Methanol	67-56-1	Yes	Yes	No
Methoxychlor	72-43-5	Yes	Yes	No
Methyl chloroform (1,1,1-Trichloro	71-55-6	Yes	Yes	No
Methyl ethyl ketone (2-Butanone;	78-93-3	Yes	Yes	No
4-Nitrobiphenyl	92-93-3	Yes	Yes	No
4-Nitrophenol	100-02-7	Yes	Yes	No
Propionaldehyde	123-38-6	Yes	Yes	No
Quinoline	91-22-5	Yes	Yes	No
Styrene oxide	96-09-3	Yes	Yes	No
Titanium tetrachloride	7550-45-0	Yes	Yes	No
2,4,5-Trichlorophenol	95-95-4	Yes	Yes	No
Trifluralin	1582-09-8	Yes	Yes	No
2,2,4-Trimethylpentane	540-84-1	Yes	Yes	No
1,2-Diphenylhydrazine	122-66-7	No	No	No
Glycol Ethers		No	Yes	No
Fine Mineral Fibers		Yes	Yes	No
Polycyclic Organic Matter		No	Yes	No
Radionuclides (including radon)		No	No	No

Garber, Caroline M

From: Myers, Jeff D
Sent: Wednesday, June 11, 2003 1:00 PM
To: Garber, Caroline M; Stewart, Andrew M; Thompson, Joe; Myers, Jeff D; Fritz, Roger A; Park, Robert W
Subject: Link to SHWEC's HAPs HELP: David Liebl at UWEX - Solid and Haz. Waste Educ. Center (SHWEC) HAPs Help Info.

David Liebl at SHWEC has helped us out by developing fact sheets on about 79 of the HAPs that are in the rule revision. He did not look at some of the pharmaceuticals or pesticides, because his work is with small businesses typically and he looks a pollution prevention.

I think you will find this to be a useful link.

Air program staff have looked over and quality assured the proposed NR 438 and NR 445 thresholds and have looked briefly at the rest of the fact sheets.

http://www.uwex.edu/shwec/LIEBL/HAPs%20Help%20ver1.pdf

DATE: May 23, 1988 1400

TO: Natural Resources Board

FROM: C. D. Besadny CDB

SUBJECT: Air Toxics Rules

At the April Natural Resources Board Meeting, staff presented the proposed hazardous air emission rules and recommended them for adoption. After extensive public presentations and discussion, the Board directed the staff to continue discussions with the representatives of the industrial and environmental interests to see if one particular problem area could be resolved. That problem area, as it was discussed and understood at the Board meeting, is the question of how the rule should address the regulation of those substances which are classified as cancer-causing on the basis of animal test data, and are called the "B2" substances.

Following the Board directive, we have had several meetings and continued our discussions. Through the course of those discussions we have exchanged proposals and counterproposals to see if some middle ground could be found. Regrettably, despite the best efforts of all involved, we are still not able to reach agreement. While substantial progress was made in further understanding our differences, we are not able to resolve the issue of how to address the "B2" substances.

Despite the fact that the negotiations did not result in agreement, they were productive. Several areas were identified in which the rule language could be clarified or reworked to improve the rule and make it more workable, and we believe it is appropriate to amend the proposed rule to reflect this.

Attached to this memo are proposed amendments which reflect the changes which the staff recommends to the rule presented in the April Green Sheet. Each proposed amendment is briefly explained and then is set forth in the language which would actually amend the rule. Staff will go through each of these proposals in more detail at the Board meeting.

These proposed amendments address the following items:

1/2/3. April 22, 1988 memo to the Natural Resources Board proposing changes to address service stations, hospital incinerators, and wastewater treatment plants

4. Separate BACT/LAER definitions for toxics

5. Study and extended time frames for chloroform and formaldehyde

6. Exemption for good combustion of wood

7. Listing/delisting procedure

8. Adjust determination of emission units subject to BACT/LAER

9. Exemption for indoor fugitive emissions of carcinogens

10. Compliance plan review extensions

11. Addition of nitrosoamines to Table 3

12. Typographical errors

Staff recommends adoption of the rule as presented in the April Green Sheet as amended by the items listed above.

ITEM 1
"Service Stations (April 22 Memo)"

Explanation:

As incorporated in Don Theiler's memo of April 22, 1988, this change raises the cutoff for gasoline stations from 1 million gallons/year without Stage 1 vapor recovery to 1.25 million gallons/year and from 1.5 million gallons/year to 2 million gallons/year for those with Stage 1. Information submitted by the oil industry changed the assumptions made by staff in estimating the amount of benzene in evaporative gasoline emissions.

Changed Rule Provision:

NR 445.04(3)(c)

4. Emissions from any gasoline dispensing facility which meets the requirements of s. NR 420.04(3)(b) to (i) and which dispenses less than two million gallons of gasoline a year or can otherwise demonstrate to the satisfaction of the department that it will not exceed an emission limitation for a Table 3 hazardous air contaminant.

5. Emissions from any gasoline dispensing facility which does not meet the requirements of s. NR 420.04(3)(b) to (i) and which dispenses less than 1.25 million gallons of gasoline a year or can otherwise demonstrate to the satisfaction of the department that it will not exceed an emission limitation for a Table 3 hazardous air contaminant.

NR 445.05(3)(c)

4. Emissions from any gasoline dispensing facility which meets the requirements of s. NR 420.04(3)(b) to (i) and which in 1986 dispensed less than two million gallons of gasoline or can otherwise demonstrate to the satisfaction of the department that it did not exceed an emission limitation for a hazardous air contaminant contained in Table 3 of s. NR 445.04.

5. Emissions from any gasoline dispensing facility which does not meet the requirements of s. NR 420.04(3)(b) to (i) and which in 1986 dispensed less than 1.25 million gallons or can otherwise demonstrate to the satisfaction of the department that it did not exceed an emission limitation for a hazardous air contaminant in Table 3 of s. NR 445.04.

ITEM 2
"Hospital Incinerators (April 22 Memo)"

Explanation:

This change provides a variance from lowest achievable emission rate for incinerators. This variance provision is available for all other sources under the rule. With this change, incinerator owners can now apply for a variance from lowest achievable emission rate if they meet the variance requirements.

Changed Rule Provision:

NR 445.04

(6) Variance. The owner or operator of a source may apply for and the department may grant a variance from an emission limitation of sub. (3)(a) or sub. (4) if the applicant demonstrates to the satisfaction of the department that compliance with sub. (3)(a) or sub (4) would be economically infeasible, and that residual emissions of the hazardous air contaminant in question would not cause significant harm to the environment or public health, and the source's emissions are controlled to a level which is the best available control technology. The department shall publish a notice of and hold a public hearing on any preliminary determination to approve a variance request under this subsection. The department shall grant or deny a variance request within 90 business days after the close of the public hearing on the request. The department shall review any variance granted under this subsection on a 5 year basis. Following its review and after notice and an opportunity for a public hearing and public comment, the department may modify, extend or rescind the variance.

NR 445.05

(8) Variance. The owner or operator of a source may apply for and the department may grant a variance from an emission limitation of sub. (3)(a) or sub. (5) if the applicant demonstrates to the satisfaction of the department that compliance with sub. (3)(a) or sub. (5) would be economically infeasible, and that residual emissions of the hazardous air contaminant in question would not cause significant harm to the environment or public health, and the source's emissions are controlled to a level which is the best available control technology. The department shall publish a notice of and hold a public hearing on any preliminary determination to approve a variance request under this subsection. The department shall grant or deny a variance request within 90 business days after the close of the public hearing on the request. The department shall review any variance granted under this subsection on a 5 year basis. Following its review and after notice and an opportunity for a public hearing and public comment, the department may modify, extend or rescind the variance.

ITEM 3
"Study and Compliance Schedule for Wastewater Treatment Facilities"
(April 22 Memo)

Explanation:

This change would require department staff, with the cooperation of industrial and municipal wastewater treatment facilities, to undertake a study of hazardous air contaminants and emission control techniques applicable to wastewater treatment facilities and to report to the Natural Resources Board 27 months from the promulgation of this rule. This modification also incorporates the extended timeframes for compliance for wastewater treatment facilities contained in an April 22, 1988 memo from Don Theiler to the Natural Resources Board.

Changed Rule Provision:

NR 445.06

(5) The Department staff shall with the cooperation of affected industrial and municipal wastewater treatment facilities, within 24 months of the effective date of this rule . . . [revisor inserts date] . . ., undertake and complete a study of the types and quantities of hazardous air contaminants emitted from wastewater treatment facilities and emission control techniques applicable to hazardous air contaminants emitted from wastewater treatment facilities. The department staff shall submit a report of its study to the natural resources board within 27 months of the effective date of this rule . . .[revisor inserts date] . . ..

NR 445.05(6)

(g). Compliance schedule for wastewater treatment facilities. The owner or operator of any wastewater treatment facility shall:

1. Notify the Department's Bureau of Air Management in writing by 14 months of the effective date of this rule . . . [revisor inserts date] . . ., which of the hazardous air contaminants in Tables 1, 3 and 4 of s. NR 445.04 the source is capable of emitting and the potential emissions of each hazardous air contaminant in the table by the source;
2. Submit to the Department by 42 months of the effective date of this rule . . . [revisor inserts date] . . . a compliance plan for achieving compliance with subs. (1), (3), and (4); and
3. Achieve final compliance with subs. (1), (3) and (4) by 54 months of the effective date of this rule . . . [revisor inserts date] . . .if compliance consists of measures other than installation of control equipment (e.g., material substitution), or by 66 months of the effective date of this rule . . . [revisor inserts date] . . . if compliance requires installation of control equipment.

ITEM 4
"Separate BACT and LAER Definitions for Toxics"

Explanation:

This modification would remove the reference to the statutory definitions of "best available control technology" and "lowest achievable emission rate" and add specific definitions for those terms within the proposed rule. The rule would redefine "best available control technology" to incorporate emission reductions which are "practically" achievable.

The effect of this modification would be definitions of these terms which are specific to chapter NR 445 and would differentiate these terms from BACT and LAER for criteria pollutants under federally reviewed programs.

Changed Rule Provision:

NR 445.02

(4) "Best available control technology" means an emission limit for a hazardous air contaminant based on the maximum degree of reduction practically achievable as specified by the department on an individual case-by-case basis taking into account energy, economic and environmental impacts and other costs related to the source.

(8) "Lowest achievable emission rate" means the rate of emission of a hazardous air contaminant which reflects the more stringent of the following:

(a) The most stringent emission limitation for the hazardous air contaminant which is contained in the air pollution regulatory program of any state for this class or category of source, unless an applicant for a permit demonstrates that this limitation is not achievable; or

(b) The most stringent emission limitation for the hazardous air contaminant which is achieved in practice by the class or category of source.

ITEM 5

"Study and Extended Timeframes for Chloroform and Formaldehyde"

Explanation:

This addition would require the department staff to undertake a study of emissions and control technologies for sources of chloroform and formaldehyde and to report to the Natural Resources Board 27 months from the promulgation of this rule.

This addition also extends the compliance schedule for sources of chloroform or formaldehyde to the extended schedule provided for wastewater treatment facilities. This provision also changes the deminimus emission rate for sources of chloroform from 25 pounds per year to 250 pounds per year.

Changed Rule Provisions:

Change the entry for chloroform in Group B of Table 3 of s. NR 445.04 to read:

Chloroform	67-66-3	250.0*

Change the entry for formaldehyde in Group B of Table 3 of s. NR 445.04 to read:

Formaldehyde	50-00-0	250.0*

Add as a footnote to Table 3 of s. NR 445.04:

*For existing sources, see s. NR 445.05(7)

NR 445.05(7) CHLOROFORM AND FORMALDEHYDE STUDY AND COMPLIANCE REQUIREMENTS

(a) The department staff shall, after consultation with the department of health and social services within 24 months of the effective date of this rule..[revisor inserts date]...,undertake and complete a study of the emissions of chloroform and formaldehyde. The study shall include an inventory of sources and amount of emissions of chloroform and formaldehyde in Wisconsin, and the control technologies available to control emissions of chloroform and formaldehyde. The department staff shall submit a report of its study to the natural resources board within 27 months of the effective date of this rule...[revisor inserts date].....

(b) The owner or operator of any source subject to sub.(3) which emits chloroform or formaldehyde in amounts greater than those listed in Group B of Table 3 of s. NR 445.04 for chloroform or formaldehyde shall:

1. Notify the departments' bureau of air management in writing by 14 months of the effective date of this rule...[revisor inserts date]...that the source is capable of emitting chloroform or formaldehyde and the allowable emission of chloroform or formaldehyde by the source;
2. Submit to the department by 42 months of the effective date

of this rule...[revisor inserts date]...a compliance plan for achieving compliance with the emission limits under sub.(3) for chloroform and formaldehyde; and

3. Achieve final compliance with the emission limits under sub.(3) for chloroform and formaldehyde by 54 months of the effective date of this rule...[revisor inserts date]... if compliance consists of measures other than installation of control equipment (e.g.,material substitution), or by 66 months of the effective date of this rule...[revisor inserts date]... if compliance requires installation of control equipment.

ITEM 6
"Exemption for Good Combustion of Wood"

Explanation:

This change to the proposed rule would exempt from control for carcinogens sources which combust wood in combustion units which operate with good combustion technology. The provision also provides guidance on what constitutes "good combustion technology."

Changed Rule Provision:

NR445.05(3)(c)6. Emissions from the combustion of wood by combustion units which operate with good combustion technology. Good combustion technology means that technology which provides for a minimization of emissions of hazardous air contaminants listed on Table 3 of s. NR 445.04. Good combustion technology will be determined on an individual case-by-case basis by the department, taking into account the fuel to be burned, the economic and environmental impacts of the combustion, and other costs related to the source. Good combustion technology may include, but is not limited to, consideration of such factors as temperature, residence time, carbon monoxide emissions, excess oxygen, and turbulence.

ITEM 7

"Listing/Delisting Procedure"

Explanation:

This modification identifies the national and international agencies the department shall monitor for changes to the lists of hazardous air contaminants. If a substance is included on both the National Toxicology Program and International Agency for Research on Cancer lists there is a presumption that the substance will be listed on Table 3 of s. NR 445.04.. The modification also provides that the carcinogenic presumption may be overcome for adding or deleting carcinogens based on the greater weight of the evidence.

Changed Rule Provision:

445.06(3) The department shall monitor changes in the classifications of hazardous air contaminants in Tables 1 to 4 of s. NR 445.04 as reported by the American conference of governmental industrial hygienists, the United States environmental protection agency, the International agency for research on cancer, and the National toxicology program and shall prepare rule modifications to the tables to incorporate these changes. The department shall presume that any hazardous air contaminant which is included on a list of known or suspected carcinogens by both the International agency for research on cancer and the national toxicology program is a hazardous air contaminant which should be listed in Table 3 of s. NR 445.04. This presumption may be overcome for adding or removing contaminants to or from Table 3 of s. NR 445.04 if the greater weight of the evidence demonstrates the presumption is incorrect.

ITEM 8

"Adjust Determination of Emission Units Subject to BACT/LAER"

Explanation:

This modification would remove the requirement for BACT or LAER control of emissions units which emit more than 10% of the emission rate listed in Table 3 of the proposed rule. Instead, the modification would limit controls to only those emission units sufficient to reduce emissions below the rates listed in Table 3, beginning with control of the largest emitting unit.

The effect of this modification would be to limit control of emissions to below the rates listed in Table 3 rather than to minimize emissions from all significant emitting sources. Financially, this change allows cost control for affected facilities since emission controls may be necessary for a smaller number of emission limits.

Changed Rule Provision:

NR 445.04(3) TABLE 3 SUBSTANCES.

(a) Group A. Except as provided in par. (c), the owner or operator of any facility on which construction or modification commenced after the effective date of this rule . . . [revisor inserts date] . . . and which emits any hazardous air contaminant listed in group A of Table 3 in amounts greater than those listed in group A of Table 3 shall control emissions of those hazardous air contaminants to a level which is the lowest achievable emission rate. The lowest achievable emission rate shall be met by the emissions unit at the facility which emits the greatest amount of the hazardous air contaminant. If application of the lowest achievable emission rate to this emission unit does not reduce facility emissions of the hazardous air contaminant to a level less than the rate listed in group A of Table 3 for the hazardous air contaminant, then the lowest achievable emission rate shall be met by other emission units at the facility which emit decreasingly smaller amounts of the hazardous air contaminant until emissions from the facility are below the emission rate listed in group A of Table 3 or until all emission units at the facility which emit at least 10% of the lbs/yr. rate listed in group A of Table 3 for the hazardous air contaminant have met the lowest achievable emissions rate. If application of lowest achievable emissions rate to these emission units does not result in the control of at least 50% of the potential emissions of the hazardous air contaminant from the facility, then the department may require application of lowest achievable emission rate on a reasonable array of smaller emission units which emit the hazardous air contaminant.

(b) Group B. Except as provided in par. (c), the owner or operator of any facility on which construction or modification commenced after the effective date of this rule . . . [revisor inserts date] . . . and which emits any hazardous air contaminant listed in group B of Table 3 in amounts greater than those listed in group B of Table 3

shall control emissions of those hazardous air contaminants to a level which is the best available control technology. The best available control technology shall be met by the emissions unit at the facility which emits the greatest amount of the hazardous air contaminant. If application of the best available control technology to this emission unit does not reduce facility emissions of the hazardous air contaminant to a level less than the rate listed in group B of Table 3 for the hazardous air contaminant, then best available control technology shall be met by other emission units at the facility which emit decreasingly smaller amounts of the hazardous air contaminant until emissions from the facility are below the emission rate listed in group B of Table 3 or until all emissions units at the facility which emit at least 10% of the lbs/yr. rate listed in group B of Table 3 for the hazardous air contaminant have met best available control technology. If application of best available control technology to these emissions units does not result in the control of at least 50% of the potential emissions of the hazardous air contaminant from the facility, then the department may require application of best available control technology on a reasonable array of smaller emission units which emit the hazardous air contaminant.

NR 445.05(3) TABLE 3 SUBSTANCES.

(a) Group A. Except as provided in par. (c), the owner or operator of any facility on which construction or modification last commenced on or before the effective date of this rule . . . [revisor inserts date] . . . and which emits any hazardous air contaminant listed in group A of Table 3 of s. NR 445.04 in amounts greater than those listed in group A of Table 3 of s. NR 445.04 shall control emissions of those hazardous air contaminants to a level which is the lowest achievable emission rate. The lowest achievable emission rate shall be met by the emissions unit at the facility which emits the greatest amount of the hazardous air contaminant. If application of the lowest achievable emission rate to this emission unit does not reduce facility emissions of the hazardous air contaminant to a level less than the rate listed in group A of Table 3 of s. NR 445.04 for the hazardous air contaminant, then the lowest achievable emission rate shall be met by other emission units at the facility which emit decreasingly smaller amounts of the hazardous air contaminant until emissions from the facility are below the emission rate listed in group A of Table 3 of s. NR 445.04 or until all emission units at the facility which emit at least 10% of the lbs/yr. rate listed in group A of Table 3 of s. NR 445.04 for the hazardous air contaminant have met the lowest achievable emissions rate. If application of lowest achievable emissions rate to these emission units does not result in the control of at least 50% of the potential emissions of the hazardous air contaminant from the facility, then the department may require application of lowest achievable emission rate on a reasonable array of smaller emission units which emit the hazardous air contaminant.

(b) Group B. Except as provided in par. (c), the owner or operator of any facility on which construction or modification last commenced on or before the effective date of this rule . . . [revisor inserts date] . . . and which emits any hazardous air contaminant listed in group B of Table 3 of s. NR 445.04 in amounts greater than those listed in group B of Table 3 of s. NR 445.04 shall control emissions of those hazardous air contaminants to a level which is the best available control technology. The best available control technology shall be met by the emissions unit at the facility which emits the greatest amount of the hazardous air contaminant. If application of the best available control technology to this emission unit does not reduce facility emissions of the hazardous air contaminant to a level less than the rate listed in group B of Table 3 of s. NR 445.04 for the hazardous air contaminant, then best available control technology shall be met by other emission units at the facility which emit decreasingly smaller amounts of the hazardous air contaminant until emissions from the facility are below the emission rate listed in group B of Table 3 of s. NR 445.04 or until all emissions units at the facility which emit at least 10% of the lbs/yr. rate listed in group B of Table 3 of s. NR 445.04 for the hazardous air contaminant have met best available control technology. If application of best available control technology to these emissions units does not result in the control of at least 50% of the potential emissions of the hazardous air contaminant from the facility, then the department may require application of best available control technology on a reasonable array of smaller emission units which emit the hazardous air contaminant.

ITEM 9

"Exemption for Indoor Fugitive Emissions of Carcinogens"

Explanation:

This modification would exempt indoor fugitive emissions of "known and suspected" carcinogens from control if these carcinogens were exhausted from general building ventilation, if the carcinogens had a threshold limit value assigned by the ACGIH, and if the source provides the department with proof which indicates that the source is in compliance (e.g., a completed OSHA inspection document). Affected sources have argued that control of these carcinogens would be difficult, if not infeasible, and that many of these carcinogens are limited in the workplace by OSHA.

Changed Rule Provision:

NR 445.04(3)(c)

6. Indoor emissions which are exhausted to the ambient air through general building ventilation and which have a threshold limit value established by the American conference of governmental and industrial hygienists and for which the source demonstrates to the department that it is in compliance with applicable occupational safety and health administration requirements.

NR 445.05(3)(c)

6. Indoor emissions which are exhausted to the ambient air through general building ventilation and which have a threshold limit value established by the American conference of governmental and industrial hygienists and for which the source demonstrates to the department that it is in compliance with applicable occupational safety and health administration requirements.

ITEM 10
"Compliance Plan Review Extensions"

Explanation:

This modification would extend the provision that the department review and act on compliance plans for "acute" contaminants as well as carcinogens. The modification provides that the department complete action on compliance plans within six months of submittal. If the department fails to complete action on the plan within six months, the source's other compliance schedule for hazardous air contaminants will be extended six additional months.

Changed Rule Provision:

NR 445.05(6)

(c) Department review. The department shall review any compliance plan submitted under par. (a) to determine whether the control technology is adequate. Department approval, conditional approval, or disapproval of any compliance plan shall be completed within 6 months after the applicable deadline date provided in par. (a)1.b., 2.b. or 3.b.. If the Department does not complete its review and approve, disapprove or conditionally approve a source's compliance plan within 6 months after the applicable deadline date provided in par. (a)1.b., 2.b. or 3.b., the source's compliance requirements under par. (a)1.c., 2.c. or 3.c. shall be extended by 6 additional months.

ITEM 11
"Addition of Nitrosoamines to Table 3"

Explanation:

This item adds 14 substances known as "nitrosoamines" to the list of hazardous air contaminants in Group B of Table 3 in s. NR 445.04. Both the International Agency for Research on Cancer and the National Toxicology Program have classified these contaminants as substances that may reasonably be anticipated to be carcinogens.

The effect of this addition would be to require sources which emit a total of more than 250 pounds per year of "nitrosoamines" to comply with emission limits.

Changed Rule Provision:

Add the following hazardous air contaminants to Group B of Table 3 of s. NR 445.04:

Nitrosoamines (A total of all listed compounds)		250.0
N-Nitrosodi-n-butylamine	924-16-3	
N-Nitrosodiethanolamine	1116-54-7	
N-Nitrosodiethylamine	55-18-5	
N-Nitrosodimethylamine	62-75-9	
P-Nitrosodiphynylamine	156-10-5	
N-Nitrosodi-n-propylamine	621-64-7	
N-Nitroso-n-ethylurea	759-73-9	
N-Nitroso-n-methylurea	684-93-5	
N-Nitrosomethylvinylamine	4549-40-0	
N-Nitrosomarpholine	59-89-2	
N^1-Nitrosonornicotine	53759-22-1	
N-Nitrosopiperidine	100-75-4	
N-Nitrosopyrrolidine	930-55-2	
N-Nitrososarcosine	13256-22-9	

ITEM 12
"Typographical Errors"

Explanation:

The change corrects several typographical errors in the rule which were identified in Don Theiler's April 22, 1988 memo to the Natural Resources Board or were identified in subsequent review.

Changed Rule Provision:

a. The two columns on Tables 1, 2, and 4 entitled "emission rate in pounds/hour" are for sources with emission points less than 25 feet on the left and equal to or greater than 25 feet on the right. The "less than" (<) and "equal to or greater than" (≥) signs were inadvertently omitted from these tables.

b. The title "Group B Contaminants" should precede the substance acrylonitrile on Table 3 on page 34. This label was also inadvertently omitted.

c. The substance toluene diisocyanate (CAS Number 584-84-9) should be deleted from Table 3 on page 35. This substance is listed on Table 1 and should not appear on Table 3.

d. Sections NR 445.04(5)(b)3. and NR 445.05(6)(d)6. were inadvertently omitted from the rule. The language of both sections is the same and should be added to read:

"The owner or operator of a source is not required to consider emissions resulting directly from naturally occurring constituents in windblown soil."

e. The last sentence of s. NR 445.05(1)(intro.) should be revised to add the phrase "off the source's property" after the phrase "ambient air concentrations". The last sentence of s. NR 445.05(1)(intro.) should conclude: ". . . to cause ambient air concentrations off the source's property which exceed the limits in par. (a) or (b).".

f. The following sentence, which appears in s. NR 445.04(5)(c) and NR 445.05(6)(e) of the rule should also be added between the second last sentence and the last sentence of s. NR 445.05(6)(f)2.:

"Material reformulation which requires substantial capital expenditures for process equipment which was made with prior department approval and which results in a reduction of emissions of hazardous air contaminants which is sufficient to comply with the limitations of s. NR 445.05, may be construed as installation of control equipment under this subdivision.".

INFORMATION ON ADDITIONAL SUBSTANCES

We promised to provide information on the substances that we are still proposing to add to NR 445. The attached table includes information on:

- The likelihood that the substance is found in Wisconsin, based on an analysis of a national Material Safety Data Sheet database that sorted chemicals by the frequency of occurrence in products produced by, and used in, manufacturing.

- The likely use of the substance, as determined through literature reviews.

- Where available, examples of companies that may be affected by the addition of the substance to NR 445. We determined this by reviewing the Air Emissions Inventory and identifying companies that reported emissions of the substance. **NOTE:** Many of the proposed new substances are not required to be reported to the emissions inventory, so we have no data on potentially affected companies. (see table)

Chemical or Agent (No Duplicates)	CAS #	Likelihood of being found in Wisconsin (Low, Mod, High)	Use	Examples of Possible Affected Wisconsin Companies (Note: Virgin Fossil Fuel combustion emissions are currently exempt)	Comments
1,1,1,2-Tetrafluoroethane	811-97-2	H	Solvents, propellants, lubricants refrigerants, mold release agents	Chemical not reportable to inventory	
1,1-Difluoroethane	75-37-6	H	Adhesives, propellants, lubricants, refrigerant, mold release agent	Chemical not reportable to inventory	
1,2-Epoxybutane (1,2-Butylene oxide)	106-88-7	H	Multiple Uses - Adhesives, degreasers, solvents	Chemical not reportable to inventory	
1,3,5-Triglycidyl-s-triazinetrione	2451-62-9	H	Paints (powder coatings)	Chemical not reportable to inventory	
1,6- Hexanediamine	124-09-4	H	Manuf. Of Plastics	Chemical not reportable to inventory	
1-Chloro-1,1-difluoroethane (Hydrochlorofluorocarbon-142b; HCFC-142b; R-142b)	75-68-3	M	Plastics, adhesives, refrigerants	Chemical not reportable to inventory	
1-Hexene	592-41-6	M	Solvent, flavoring, insecticide, cosmetics, chemical intermediate	Chemical not reportable to inventory	
1-Nitropropane	108-03-2	H	Multiple Uses - solvent, chemical intermediate; rocket propellant	Chemical not reportable to inventory	
1-Nitropyrene	5522-43-0	M	Photosensitive Printing	Chemical not reportable to inventory	
2,4,6-Trichlorophenol	88-06-2	M	Pesticide, chemical intermediate	One source, well below <25 ft threshold	Threshold <25ft = 573 lbs/yr
2,4,6-Trinitrotoluene (TNT)	118-96-7	M	Chemical intermediate and in explosives	Chemical not reportable to inventory	
2-Chloroacetophenone	532-27-4	L	A type of tear gas	Chemical not reportable to inventory	
4-Vinyl cyclohexene	100-40-3	M	Manuf. Of Plastics	Chemical not reportable to inventory	
5-Methyl chrysene	3697-24-3	H	Product of incomplete combustion	Chemical not reportable to inventory	
Acetophenone	98-86-2	M	Catalyst	2 sources, both below < 25ft threshold	Threshold <25ft = 23,126 lbs/yr
Adipic Acid	124-04-9	H	Electrical insulation and flux rosin	Chemical not reportable to inventory	
Adiponitrile	111-69-3	M	Chemical Intermediate - nylon and other chemicals	Chemical not reportable to inventory	
Allyl glycidyl ether	106-92-3	M	Multiple Uses - Plastices and Polymers	Chemical not reportable to inventory	
Ammonium perfluorooctanoate	3825-26-1	M	Manuf. Of Plastics	Chemical not reportable to inventory	

Chemical or Agent (No Duplicates)	CAS #	Likelihood of being found in Wisconsin (Low, Mod, High)	Use	Examples of Possible Affected Wisconsin Companies (Note: Virgin Fossil Fuel combustion emissions are currently exempt)	Comments
Antimony trioxide	1309-64-4	H	Metallurgy, adhesives, coatings, lubricants, paints	Possibly affected: Milwaukee Gray Iron; Kohler-Co-Metals Processing Co (Sheboygan Co.); Stora-Enso Biron and Wis. Rapids Mills (Wood Co.)	Antimony compounds is what was reported- exact species of antimony may be different stack heights may be higher Threshold <25ft = 35.5 lbs/yr; >75ft = 1,225 lbs/yr
Benzo(j)fluoranthene	205-82-3	H	Product of incomplete combustion	Chemical not reportable to inventory	
Benzo(k)fluoranthene	207-08-9	H	Product of incomplete combustion	Chemical not reportable to inventory	
Benzoyl chloride	98-88-4	M	Plastics and coatings	Chemical not reportable to inventory	
Benzyl acetate	140-11-4	H	Chemical intermediate	Chemical not reportable to inventory	
Bis(2-dimethylaminoethyl) ether (DMAEE)	3033-62-3	L	Coatings, resins, polyurethane foams, flocculants	Chemical not reportable to inventory	
Bismuth telluride, as Bi2Te3: Se-Doped	1304-82-1	M	Metallurgy, fire protection, electronic devices	Chemical not reportable to inventory	
Bromodichloromethane	75-27-4	H	Chemical intermediate	Chemical not reportable to inventory	
Bromoform	75-25-2	H	Chemical intermediate, solvent	Milwaukee Metro Sewerage District (2 locations) reported < 1 lb/yr, which is was well below <25ft threshold	Threshold <25 ft = 2,435 lbs/yr
Butylated hydroxyanisole (BHA)	25013-16-5	H	Food additive/anti-oxidant	Chemical not reportable to inventory	
C.I. Basic Red 9 monohydrochloride	569-61-9	M	Medicine/Research (Biological Stain)	Chemical not reportable to inventory	
Chlorendic acid	115-28-6	H	Multiple Uses - Chemical Intermediate, flame retardant	Chemical not reportable to inventory	
Chlorinated paraffins (C12; 60% chlorine)	108171-26-2	H	Multiple Uses - adhesives, lubricants, flame retardants	Chemical not reportable to inventory	
Chlorodifluoromethane (Hydrochlorofluorocarbon-22; HCFC-22; R-22)	75-45-6	H	Plastics, adhesives, solvents, lubricants, insulation, mold release compounds, propellants and refrigerants	3 facilities reported, all were well below < 25ft threshold	Threshold <25ft = 8.8 million lbs/yr

Chemical or Agent (No Duplicates)	CAS #	Likelihood of being found in Wisconsin (Low, Mod, High)	Use	Examples of Possible Affected Wisconsin Companies (Note: Virgin Fossil Fuel combustion emissions are currently exempt)	Comments
Copper and compounds, fume, as Cu	7440-50-8	H	Welding, adhesives, alloys, greases, paints, batteries, electrical wiring	2 Sources possibly affected: Kohler Co-Metals Processing Co (Sheboygan County) and Appleton Coated L.L.C. (Outagamie Co). There may be more sources affected, but it is impossible to tell from the inventory data.	47 sources currently reports copper emissions & 27 are above the <25 ft threshold. Two sources report above the >75 stack threshold. Threshold <25ft = 93.7 lbs/yr; >75 ft = 2,838 lbs/yr
Cyclonite	121-82-4	H	Rodenticide & Explosives	Chemical not reportable to inventory	
Danthron (1,8-Dihydroxyanthroquinone)	117-10-2	H	Multiple Uses- dyes, medicine, lab chemical	Chemical not reportable to inventory	
DDT (Dichloro-diphenyltrichloroethane)	50-29-3	L	Pesticide	Chemical not reportable to inventory	
Dibenzo(a,e)pyrene	192-65-4	H	Product of incomplete combustion	Chemical not reportable to inventory	
Dibenzo(a,l)pyrene	191-30-0	H	Product of incomplete combustion	Chemical not reportable to inventory	
Dibutylphenyl phosphate	2528-36-1	M	Chemical intermediate	Chemical not reportable to inventory	
Diglycidyl resorcinol ether	101-90-6	M	Adhesives	Chemical not reportable to inventory	
Dimethylethoxysilane	14857-34-2	L	Waterproofing high temperature ceramics	Chemical not reportable to inventory	
Dinitolmide	148-01-6	L	Insecticide/Fungicide	Chemical not reportable to inventory	
Direct black 38 (Benzidine-based dye)	1937-37-7	M	Dye	Chemical not reportable to inventory	
Direct blue 6 (Benzidine-based dye)	2602-46-2	L	Dye	Chemical not reportable to inventory	
Disperse Blue 1	2475-45-8	L	Dye	Chemical not reportable to inventory	
Disulfiram	97-77-8	M	Adhesives, cauking compounds	Chemical not reportable to inventory	
Erionite (Zeolites)	66733-21-9	L	Ion exchange resins	Chemical not reportable to inventory	
Ethyl bromide	74-96-4	M	Chemical intermediate and solvent	Chemical not reportable to inventory	
Ethyl cyanoacrylate	7085-85-0	H	Adhesives	Chemical not reportable to inventory	
Ethyl tert-butyl ether (ETBE)	637-92-3	H	Petroleum refining and gasoline distribution; chemical intermediate	Chemical not reportable to inventory	
Fenamiphos	22224-92-6	M	Pesticide	Chemical not reportable to inventory	
Flour Dust (inhalable fraction)		H	Food and agricultural products	Chemical not reportable to inventory	
Formamide	75-12-7	M	Chemical intermediate, solvent	Chemical not reportable to inventory	

Chemical or Agent (No Duplicates)	CAS #	Likelihood of being found in Wisconsin (Low, Mod, High)	Use	Examples of Possible Affected Wisconsin Companies (Note: Virgin Fossil Fuel combustion emissions are currently exempt)	Comments
Formic acid	64-18-6	H	Paint & epoxy stripper, plating solution	Chemical not reportable to inventory	
Furan	110-00-9	M	Chemical Intermediate	Chemical not reportable to inventory	
Glutaraldehyde	111-30-8	H	Multiple Uses - water treatment, photographic developer, leather tanning	Chemical not reportable to inventory	
Graphite (all forms except graphite fiber)	7782-42-5	H	Adhesives, automotive parts, welding, toner, lubricants, molding, metallurgy, electrical components	Chemical not reportable to inventory	
Hexachloroethane	67-72-1	H	Chemical intermediate, metal coating, oil and gas drilling, pesticide and lab chemical	Chemical not reportable to inventory	
Hexamethylene-1,6-diisocyanate (HDI)	822-06-0	H	Manuf. Of plastics, foams, paints, coatings, catalysts	4 sources possibly affected: Imperial Industries, Inc. (Marathon Co.), Advanced Coatings Inc (Washington Co.), Donaldson Company, Inc. (2 sites) (St. Croix Co.), Waukesha Electric Systems	All 4 sources had emissions above <25ft threshold. Advanced Coatings, Inc. and Imperial Industries, Inc. were > 75 ft threshold. Threshold <25ft = 1.78 lbs/yr; >75 ft = 61.3 lbs/yr
Iron oxide dust and fume, as Fe	1309-37-1	H	Paints, polishing compounds, welding electrode, welding flux, welding powder,	4 sources reported, - none are expected to have emissions above thresholds	Prior reporting was only for water soluble iron salts, which is not the same as iron oxide dust and fume
Isoprene	78-79-5	M	Abrasives, resins, brake linings	Chemical not reportable to inventory	
Kaolin	1332-58-7	H	Adhesives, building materials, paints, paper, pigments	Chemical not reportable to inventory	
Kepone (Chlordecone)	143-50-0	L	Insecticide/Fungicide	Chemical not reportable to inventory	

Chemical or Agent (No Duplicates)	CAS #	Likelihood of being found in Wisconsin (Low, Mod, High)	Use	Examples of Possible Affected Wisconsin Companies (Note: Virgin Fossil Fuel combustion emissions are currently exempt)	Comments
Lead Acetate, as Pb	301-04-2	M	Coatings, acrylic enamel	Kohler Co - Metals Processing - Co (Sheboygan Co) possibly affected - 121 lbs of lead and 428 lbs of lead compounds reported in 2001.	Lead Acetate is not currently required to be reported separately. Analysis is based on lead and lead compound. Threshold for lead acetate for <25ft = 22.2 lb/yr ; >75 ft = 766 lb/yr . Lead acetate is not expected from fuel combustion
Lead Phosphate, as Pb	7446-27-7	M	Manuf. Of plastics and special types of glass	Kohler Co - Metals Processing - Co (Sheboygan Co) possibly affected - 121 lbs of lead and 428 lbs of lead compounds reported in 2001.	Lead phosphate is not currently required to be reported separately. Analysis is based on lead and lead compound. Threshold for lead phosphate for <25ft = 148 lb/yr ; >75 ft = 5,105lb/yr . Lead phosphate is not expected from fuel combustion
Metribuzin	21087-64-9	M	Herbicide	Chemical not reportable to inventory	
Mirex	2385-85-5	L	Pesticide	Chemical not reportable to inventory	
Molybdenum, as Mo, metal and insoluble compounds	7439-98-7	H	Metallurgy, lubricants, paints	5 sources reported, - none have emissions above thresholds	Threshold <25ft = 4,704 lbs/yr

Chemical or Agent (No Duplicates)	CAS #	Likelihood of being found in Wisconsin (Low, Mod, High)	Use	Examples of Possible Affected Wisconsin Companies (Note: Virgin Fossil Fuel combustion emissions are currently exempt)	Comments
Nickel carbonyl, as Ni	13463-39-3	H	Metallurgy(Steel Production), Chemical intermediate	Some possibly affected, but reporting is not currently required for nickel carbonyl, so it is impossible to determine at this time.	Virgin fossil fuel combustion is exempt; 80 sources (foundries and a large number of coal and fossil fuel boilers) reported nickel and compounds. Since nickel and compounds were reported it is difficult to know how much of this is nickel carbonyl. Nickel carbonyl thresholds <25ft = 6.83 lb/yr; >75 ft = 236 lb/yr. 63 sources were above the <25ft threshold & 21sources were above the >75 ft threshold
Nitrilotriacetic acid	139-13-9	H	Water treatment, photographic developer; food products	Chemical not reportable to inventory	
Nitrous oxide	10024-97-2	H	Multiple Uses-chemical intermediate;anesthetic;propellant in food	Chemical not reportable to inventory	
N-Methyl-N'-nitro-N-nitrosoguanidine (MNNG)	70-25-7	M	Medical/Lab/Research Chemical	Chemical not reportable to inventory	
o- Chlorobenzylidene malononitrile	2698-41-1	M	A type of tear gas	Chemical not reportable to inventory	
o-Aminoazotoluene (2-Aminoazotoluene)	97-56-3	M	Adhesives, lubricants, electrical insulation	Chemical not reportable to inventory	
P,p'-Oxybis(benzenesulfonyl hydrazide)	80-51-3	M	Manufacture of rubber, plastics and foams	Chemical not reportable to inventory	
Pentyl Acetate (mixtures and isomers)	628-63-7	H	Paints and coatings	Chemical not reportable to inventory	
Perfluoroisobutylene	382-21-8	M	Manuf. Of Plastics (Teflon)	Chemical not reportable to inventory	
Persulfates (Ammonium, Potassium, Sodium)	7727-54-0	H	bleaching powders, photographic etching	Chemical not reportable to inventory	

Chemical or Agent (No Duplicates)	CAS #	Likelihood of being found in Wisconsin (Low, Mod, High)	Use	Examples of Possible Affected Wisconsin Companies (Note: Virgin Fossil Fuel combustion emissions are currently exempt)	Comments
Phenolphthalein	77-09-8	L	Laxative; lab chemical	Chemical not reportable to inventory	
Picric acid	88-89-1	M	Batteries, matches, leather, textiles, medicines, colored glass, explosives	Chemical not reportable to inventory	
Polybrominated biphenyls (PBBs; Bromodiphenyls)	59536-65-1	L	Formerly used in plastics, coatings, plastic foams	Chemical not reportable to inventory	
Propionic acid	79-09-4	H	Adhesives, photographic processing	Chemical not reportable to inventory	
Quintobenzene (Pentachloronitrobenzene)	82-68-8	M	Pesticide	Chemical not reportable to inventory	
Refractory Ceramic Fibers (respirable size)		M	Insulation and certain high temperature ceramics	Chemical not reportable to inventory	
Safrole	94-59-7	M	Preservative, fragrance, antiseptic, chemical intermediate	Chemical not reportable to inventory	
Sodium Azide, as sodium azide or hydrazoic acid vapor	26628-22-8	H	Preservative, explosive	Chemical not reportable to inventory	
Sodium metabisulfite	7681-57-4	H	Water treatment chemicals; photographic developer and fixers	Chemical not reportable to inventory	
Strong inorganic acid mists containing sulfuric acid (>35% by weight)	7664-93-9	H	Concentrated cleaning solutions	Possibly affected sources are Boumatic (Dane Co.), Charter Steel (Ozaukee), America's Best Quality Coating (Milwaukee Co.) and Ansul Incorporated (Marinette Co.)	47 sources currently report sulfuric acid emissions. Most are coal fired boilers which are not expected to emit strong sulfuric acid. **Impossible to tell which ones emit strong sulfuric acid.** 46 sources report above the <25ft threshold; 44 sources report above the >75 stack threshold. Threshold <25ft = 2.4 lbs/yr; >75 ft = 83.9 lbs/yr
Sulfometuron methyl	74222-97-2	M	Pesticide	Chemical not reportable to inventory	
Sulprofos	35400-43-2	M	Pesticide	Chemical not reportable to inventory	