Appendix I: Wisconsin Toxic Emissions Inventory

BACKGROUND

The State of Wisconsin conducted its statewide air toxic emissions inventory for the Great Lakes Air Toxic Emissions Inventory Project for calendar year 1999.

The sources inventoried were individual point sources, and non-industrial area sources. The 1999 inventory update includes the addition of emissions from five new area source categories: Aviation Gasoline Distribution, Fluorescent Lamp Breakage, Fluorescent Lamp Recycling, Open Burning of Forest and Wildfires, and Stationary Fuel Combustion. The inventory also concentrated on improvements to the inventory of mercury emissions.

Wisconsin followed the Air Toxic Emissions Inventory Protocol and the area source methodologies agreed upon by the project's Technical Steering Committee in developing its portion of the regional inventory. The Factor Information Retrieval System (FIRE 6.23) and the Reference Tables in the Regional Air Pollution Inventory Development System (RAPIDS) were also utilized in the inventory development. Emission summaries for point and area sources for the state of Wisconsin are provided following this portion of the report document.

DATA SOURCES

Point Source Emissions

Point source emissions information included in the Wisconsin inventory were collected by the Bureau of Air Management of the Wisconsin Department of Natural Resources (WDNR), as part of its annual air emissions inventory process. State regulation, ch. NR 438, Wis. Adm. Code, requires detailed annual emission reports from any source with total, actual, annual emissions above a reporting threshold. The reporting threshold varies for each of the air contaminants covered by the rule. The following are the reporting thresholds (in pounds per year) for each of the pollutants inventoried for this project:

Table I-1: Reporting thresholds (lb/yr) for each of the pollutants inventoried for this project

Pollutant Code	GLC Name	THRESHOLD (LB)	NR438 NAME
ACENAPHTHEN	ACENAPHTHENE		
ACENAPHTHYL	ACENAPHTHYLENE		
ACETALDEHYDE	ACETALDEHYDE	6000	Acetaldehyde
ACETAMIDE	ACETAMIDE	6000	Acetamide
ACETONITRILE	ACETONITRILE	6000	Acetonitrile
ACETOPHENONE	ACETOPHENONE	6000	Acetophenone
ACROLEIN	ACROLEIN	91	Acrolein
ACRYLIC ACID	ACRYLIC ACID	6000	Acrylic acid
ACRYLONITRIL	ACRYLONITRILE	12	Acrylonitrile
ALLYL CHLORI	ALLYL CHLORIDE	1093	Allyl chloride
ANILINE	ANILINE	3648	Aniline
ANTHRACENE	ANTHRACENE		
ANTIMONY	ANTIMONY	179	Antimony & compounds, as Sb
ARSENIC	ARSENIC	12	Arsenic and inorganic compounds, as As
ATRAZINE	ATRAZINE	1829	Atrazine
BENZ(A)ANTHR	BENZ(A)ANTHRACENE	12	Benz(a)anthracene
BENZ(GHI)PE	BENZO(G,H,I)PERYLENE		
BENZENE	BENZENE	150	Benzene
BENZO(A)PYRE	BENZO(A)PYRENE	12	Benzo(a)pyrene
BENZO(B)FLUO	BENZO(B)FLUORANTHENE	12	Benzo(b)fluoranthene
BENZO(K)FLUO	BENZO(K)FLUORANTHENE		
BERYLLIUM	BERYLLIUM	12	Beryllium and beryllium compounds, as Be
BIPHENYL	BIPHENYL	547	Biphenyl
BROMOFORM	BROMOFORM	6000	Bromoform
BROMOMETH	BROMOMETHANE	6000	Methyl bromide
BUTADIENE,13	1,3-BUTADIENE	6000	1,3-Butadiene
CADMIUM	CADMIUM	12	Cadmium and cadmium compounds, as Cd
CAPTAN	CAPTAN	1829	Captan
CARBON DISUL	CARBON DISULFIDE	6000	Carbon disulfide
CARBON TETRA	CARBON TETRACHLORIDE	12	Carbon tetrachloride
CARBONYL SUL	CARBONYL SULFIDE	6000	Carbonyl sulfide
CHLORAMBEN	CHLORAMBEN	6000	Chloramben
CHLORINE	CHLORINE	1093	Chlorine
CHLOROBENZ	CHLOROBENZENE	6000	Chlorobenzene (Monochlorobenzene)
CHLOROETHANE	CHLOROETHANE	6000	Ethyl chloride (Chloroethane)
CHLOROFORM	CHLOROFORM	125	Chloroform
CHLOROPRENE	CHLOROPRENE	6000	beta-Chloroprene
CHROMIUM	CHROMIUM	1	Chromium (VI) compounds, as Cr, water insoluble
CHROMIUM	CHROMIUM	179	Chromium (III) compounds, as Cr
CHROMIUM	CHROMIUM	18	Chromium (VI) compounds, as Cr, water soluble
CHROMIUM	CHROMIUM	179	Chromium (metal)
CHROMIUM	CHROMIUM	179	Chromium (II) compounds, as Cr
CHROMIUM III	CHROMIUM (III)		
CHROMIUM VI	CHROMIUM (VI)		
CHRYSENE	CHRYSENE	12	Benzo(a)phenanthrene
COBALT	COBALT	18	Cobalt, as Co, metal, dust

COPPER	COPPER	368	Copper, dust & mists, as Cu
CRESOL MX IS	CRESOL- MIXED ISOMERS	6000	Cresol, all isomers
CRESOL,O	O-CRESOL	6000	o-Cresol
CRESOL,P	P-CRESOL	6000	p-Cresol
CUMENE	CUMENE	6000	Cumene
CYANIDE	CYANIDE		
D,2,4	2,4-D, SALTS AND ESTERS	6000	2,4-D, salts and esters
DIBENZAHAN	DIBENZO(A,H)ANTHRACENE	12	Dibenz(a,h)anthracene
DIBENZOFURAN	DIBENZOFURAN	6000	Dibenzofurans
DIBUTYL PHTH	DIBUTYL PHTHALATE	1829	Dibutyl phthalate
DIBUTYL PHTH	DIBUTYL PHTHALATE	1829	Dibutyl phthalate
DICHLORETH12	1,2-DICHLOROETHANE	12	1,2-Dichloroethane (EDC)
DICHLORVOS	DICHLORVOS	368	Dichlorvos
DICLBENZ,14	1,4-DICHLOROBENZENE	6000	p-Dichlorobenzene
DICLPROPE,13	1,3-DICHLOROPROPENE	1829	Dichloropropene
DIETHANOLAMI	DIETHANOLAMINE	5477	Diethanolamine
DIMETH PHTHA	DIMETHYL PHTHALATE	1829	Dimethylphthalate
DIMETH SULFA	DIMETHYL SULFATE	12	Dimethyl sulfate
DIMETHFORMAM	DIMETHYLFORMAMIDE, N,N-	6000	N,N-Dimethylformamide
DINITROPH,24	2,4-DINITROPHENOL	6000	2,4-Dinitrophenol
DIOCTYL PHTH	DIOCTYL PHTHALATE	125	Di(2-ethylhexyl) phthalate (DEHP)
DIOXANE	1,4-DIOXANE	125	1,4-Dioxane
EPICLHYDRIN	EPICHLOROHYDRIN	150	Epichlorohydrin
EPOXYBUT,12	1,2-EPOXYBUTANE	6000	1,2-Epoxybutane (1,2-Butylene oxide)
ETHYLBENZENE	ETHYLBENZENE	6000	Ethyl benzene
ETHYLENE GLY	ETHYLENE GLYCOL	6000	Ethylene glycol vapor
ETHYLENE OXI	ETHYLENE OXIDE	12	Ethylene oxide
FLUORANTHENE	FLUORANTHENE	12	Benzo(j,k)fluorene
FLUORENE	FLUORENE		
FORMALDEHYDE	FORMALDEHYDE	125	Formaldehyde
GLYCOL ETHRS	GLYCOL ETHERS (MISC.)		
HCL	HYDROCHLORIC ACID	1556	Hydrogen chloride
HEXACL-1,3-C	1,2,3,4,5,5-HEXACHLORO-1,3-CYCLOPENTADIENE	37	Hexachlorocyclopentadiene
HEXAMETHYL16	HEXAMETHYLENE-1,6-DIISOCYANATE	6000	Hexamethylene-1,6-diisocyanate
HEXANE	N-HEXANE	6000	n-Hexane
HEXCLBENZENE	HEXACHLOROBENZENE	12	Hexachlorobenzene (HCB)
HF	HYDROGEN FLUORIDE	557	Hydrogen fluoride
HYDRAZINE	HYDRAZINE	125	Hydrazine and hydrazine sulfate
HYDROGEN CYA	HYDROGEN CYANIDE	2218	Hydrogen cyanide
HYDROGEN SUL	HYDROGEN SULFIDE		
HYDROQUINONE	HYDROQUINONE	725	Hydroquinone
INDN(123CDPY	INDENO(1,2,3-C,D)PYRENE	12	Indeno(1,2,3-cd)pyrene
ISOPHORONE	ISOPHORONE	5550	Isophorone
LEAD	LEAD	6000	Lead compounds
LEAD CMP	LEAD COMPOUNDS		
MALEIC ANHYD	MALEIC ANHYDRIDE	368	Maleic anhydride
MANGANESE	MANGANESE	1114	Manganese, as Mn, dust and compounds
MERCURY	MERCURY	18	Mercury, as Hg, vapor, all forms except alkyl

MERCURY	MERCURY	3.7	Mercury, as Hg, alkyl compounds
MERCURY	MERCURY	37	Mercury, as Hg, aryl & inorganic compounds, all forms excpt alkyl
METEN BIS,44	4,4-METHYLENE BIS(2-CHLOROANILINE)	125	4,4'-Methylene bis(2-chloroaniline) (MOCA)
METH ETH KET	METHYL ETHYL KETONE	6000	Methyl ethyl ketone (2-Butanone) (MEK)
METH IODIDE	METHYL IODIDE	125	Methyl iodide
METH ISOBUT	METHYL ISOBUTYL KETONE	6000	Methyl isobutyl ketone
METH METHACR	METHYL METHACRYLATE	6000	Methyl methacrylate
METH TERT BU	METHYL TERT BUTYL ETHER	6000	Methyl tert-butyl ether
METHANOL	METHANOL	6000	Methanol
METHENE DIAN	4,4-METHYLENE DIANILINE	125	4,4'-Methylenedianiline (and dihydrochloride)
METHENE(B)4-	4,4-METHYLENEDIPHENYL DIISOCYANATE	44	Methylene bisphenyl isocyanate (MDI)
METHYL CHLOR	METHYL CHLORIDE	6000	Methyl chloride
METHYLENE CL	METHYLENE CHLORIDE	6000	Methylene chloride
NAPHTHALENE	NAPHTHALENE	6000	Naphthalene
NI SUBSULF	NICKEL SUBSULFIDE	12	Nickel subsulfide
NICKEL	NICKEL	125	Nickel compounds other than nickel subsulfide, as Ni
NICKEL CMP	NICKEL COMPOUNDS		
NITROPHENL,4	4-NITROPHENOL	6000	4-Nitrophenol
NITROPROPA,2	2-NITROPROPANE	125	2-Nitropropane
PCBS	POLYCHLORINATED BIPHENYLS (PCBS)	0.05	Polychlorinated biphenyls (PCB)
PCDD	POLYCHLORINATED DIBENZODIOXINS, TOTAL		
PCDF	POLYCHLORINATED DIBENZOFURANS, TOTAL		
PERC	TETRACHLOROETHYLENE	6000	Perchloroethylene
PHENANTHRENE	PHENANTHRENE		
PHENOL	PHENOL	6000	Phenol
PHOSGENE	PHOSGENE	147	Phosgene
PHOSPHINE	PHOSPHINE	147	Phosphine
PHOSPHORUS	PHOSPHORUS (YELLOW OR WHITE)	37	Phosphorus (yellow)
PHTHALIC ANH	PHTHALIC ANHYDRIDE	2186	Phthalic anyhydride
PROPIONALDEH	PROPIONALDEHYDE	6000	Propionaldehyde
PRPLENE DICH	PROPYLENE DICHLORIDE	6000	Propylene dichloride
PRPLENE OXID	PROPYLENE OXIDE	125	Propylene oxide
PYRENE	PYRENE		
SELENIUM	SELENIUM	73	Selenium and compounds, as Se
STYRENE	STYRENE	6000	Styrene, monomer
TCDD,2378	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.00005	2,3,7,8-Tetrachlorodibenzo-p-dioxin
TCE,111	1,1,1-TRICHLOROETHANE	6000	Methyl chloroform (1,1,1-Trichloroethane)
TETCLET,1122	1,1,2,2-TETRACHLOROETHANE	2554	1,1,2,2-Tetrachloroethane
TOLUENE	TOLUENE	6000	Toluene (Toluol)
TOLUENE24DII	TOLUENE-2,4-DIISOCYANATE	15	Toluene-2,4-diisocyanate (TDI)
TOLUIDINE,O-	O-TOLUIDINE	12	o-Toluidine
TRICHLORETHY	TRICHLOROETHYLENE	6000	Trichloroethylene
TRICLETH,112	1,1,2-TRICHLOROETHANE	6000	1,1,2-Trichloroethane
TRIETHAMINE	TRIETHYLAMINE	6000	Triethylamine
TRIME-PENTAN	2,2,4-TRIMETHYLPENTANE	6000	2,2,4-Trimethylpentane

VINLIDENE CL	VINYLIDENE CHLORIDE	6000	Vinylidene chloride
VINYL ACETAT	VINYL ACETATE	6000	Vinyl acetate
VINYL CHLOR	VINYL CHLORIDE	150	Vinyl chloride
XYLENE,M	M-XYLENE	6000	m-Xylene
XYLENE,O	O-XYLENE	6000	o-Xylene
XYLENE,P	P-XYLENE	6000	p-Xylene
XYLENES ISO	XYLENES (MIXED ISOMERS)	6000	Xylene, mixed isomers (Xylol)

The point source data submitted by Wisconsin are for calendar year 1999 and include emission estimates as reported by all sources in the state. Toxic emission estimates are made by sources and then reported to the WDNR. Sources are required to report and certify actual, annual emissions in pounds per year, and identify the method used to make the estimate. These estimates account for any emission controls in place.

Wisconsin's annual emissions inventory is not limited to any particular type of industry or process. If the total emissions for a source exceed the reporting threshold for a given pollutant, the source is required to provide information on any process emitting any amount of that pollutant. This approach should cover most source industrial categories (SIC) and industrial process codes (SCCs). However, many SIC and SCC codes are not responsible for air emissions above any of the reporting thresholds.

Area Source Emissions

Emissions from twenty area sources were inventoried for the 1999 inventory project. These area sources are:

- Agricultural Pesticides
- Auto Body Refinishing
- Consumer and Commercial Solvents
- Fuel Marketing
- Human Cremation
- Fluorescent Lamp Breakage
- Landfills
- Publicly Owned Treatment Works (POTW)
- Residential Wood Combustion
- Stationary Fuel Combustion
- Architectural Surface Coatings
- Aviation Gasoline Distribution
- Dry Cleaning
- Graphic Arts
- Industrial Surface Coatings
- Fluorescent Lamp Recycling
- Open Burning Forest and Wildfires
- Residential Fuel Combustion
- Solvent Cleaning
- Traffic Markings

Where appropriate, area source estimates were reconciled with the state point source inventory. The 1999 inventory update included both new inventoried area sources and the use of revised methodology for some area sources, e.g. the use of employment based emission factors for “auto body refinishing” instead of population based factors in 1998.

The following subsections describe the general procedures used to calculate each type of source as well as any deviations from the standard methodologies set by the project’s Technical Steering Committee. SIC/NAICS and county specific employment numbers were estimated using a combination of the 1999 statewide employment numbers for major NAICS reported by the

Wisconsin Department of Workforce Development and the 1999 Wisconsin Business Patterns published by the U.S. Department of Commerce, Bureau of the Census. 1999 county population data were obtained from Bureau of Health Information of the Department of Health and Family Services (http://www.dhfs.state.wi.us/population/index.htm).

Agricultural Pesticides

The SIC code for this category is 0115 (Agricultural Production Crops, Corn). Emissions were calculated following the 1996 National Toxics Inventory (NTI) methodology for agricultural pesticides. The information on state total acres of corn and the percent of corn crops to which Atrazine is applied was obtained from the USDA (http://usda.mannlib.cornell.edu/usda). The County specific corn acreage was obtained from the 1999 Census of Agriculture, which was carried out by the National Agricultural Statistics Service of USDA (http://www.nass.usda.gov/census).

Three hazardous air pollutants were listed in the agricultural pesticides fields: (1) Atrazine; (2) Trifluralin; (3) Hexachlorobenzene. Atrazine is applied exclusively in corn crops. Atrazine used were calculated using a per acre emission factor, 0.80 Lb/Acre. Then atrazine emissions were calculated by multiplying used atrazine a weight factor, 18% of atrazine applied. Hexachlorobenzene emissions were estimated by multiplying 8.40E-08 LB HCB/LB of atrazine used. Trifuralin is typically not used in Wisconsin.

Architectural Surface Coating

Emissions were calculated by speciating each toxic from the total VOC content of all surface coatings used. Emissions from solvent-based coatings and water-based coatings were estimated separately, but were added together for total emissions. The total amounts of coatings used were estimated using a per capita emission factor.

Auto Body Refinishing

The NAICS code for this category is 811121 (Automotive Body, Paint, and Interior Repair and Maintenance). Emissions were calculated by speciating each toxic from total VOC emissions. VOC numbers for this source category were calculated using a per employee factor, 4,238 LB VOC/employee.

Aviation Gasoline Distribution

TetraEthylLead (TEL) and ethylene dichloride emissions were estimated in aviation gasoline. Emissions were calculated following the 1999 National Emissions Inventory (NEI) methodology. Aviation fuel use data were obtained from the 2000 Wisconsin Energy Statistics published by the Wisconsin Energy Bureau, Department of Administration. Fuel was apportioned to the county level using the fraction of general aviation LTO cycles for each county. Emissions were calculated by multiplying specific toxic emission factors, i.e. 1.78E-05 (mass TEL/mass leaded aviation gasoline) and 1.16836E-6 (LB/gal gasoline).

Consumer and Commercial Solvents

Emissions were calculated by multiplying the estimated 1999 county population by a per capita emission factor.

Dry Cleaning

This category included commercial and coin operated dry cleaners. The amount of PERC (in gallons) used for dry cleaning in the state was obtained from the Wisconsin Department of Revenue. The Wisconsin Department of Revenue imposes a tax on the use of Perchloroethylene for dry cleaning. The amount of PERC was then apportioned to the counties based on population. Only those counties with dry cleaning establishments were included. A list of dry cleaning establishments was obtained from the Wisconsin Department of Commerce.

PERC emissions were calculated based on the type of type of dry cleaning machine used, and controls in place. The fractions of the average machine type/control combinations were estimated from the data from the initial notification for Dry Cleaning. Of the machines in used, 78% are dry to dry; 22% transfer machines. 83% of the dry to dry machines are controlled while 17% has no controls. Of the transfer machines, 86% have controls while 14 % are uncontrolled.

Fluorescent Lamp Breakage

Emission estimation followed the methodology in the "Documentation for the 1999 Base Year Non-point Source National Emission Inventory for Hazardous Air Pollutants". In 1999, 620 million lamps, containing 17 tons of Hg, were discarded in U.S. The amount of Hg discarded in Wisconsin was obtained by apportioning Wisconsin's population to the national population. 70% of these lamps (Hg) were assumed to end up in landfills. It is assumed that 6.6% of the mercury contained n lamps is released to the atmosphere. The estimated emissions from this category are 30.5 pounds.

Fluorescent Lamp Recycling

Emissions for this category were calculated following the methodology indicated in the Documentation for the 1999 Base Year Non Point Source National Emissions Inventory for Hazardous Air Pollutants(ftp://ftp.epa.gov/EmisInventory/draftnei99ver2/haps/documentation/). In 1999, 620 million lamps were discarded in the U.S. The amount of lamps discarded in Wisconsin was obtained by apportioning Wisconsin's population to the national population. A 30% recycling rate was assumed. The names and locations of fluorescent lamp-recycling facilities were obtained from Wisconsin DNR Waste Management Program (http://www.dnr.state.wi.us/markets/). The number of recycled lamps for each county with lamp recycling (non drop-off) facilities was by estimated by apportioning the county population to the number of discarded lamps in the state, and multiplying that amount by the recycling rate. Mercury emissions were calculated by multiplying the number of lamps recycled by and emission factor of 0.00088-mg Hg/lamp. The estimated mercury emissions from this category amount to 0.007 pounds.

Fuel Marketing

Emissions were calculated using VOC speciation and toxic specific emission factors. VOC emission factors were based on units of gasoline dispensed. County gasoline usage was derived from population, statewide gasoline consumption, and county vehicle miles traveled (VMT). Stage 1 calculations for all counties, except 20 counties in or around the ozone non-attainment area of the state, where controlled submerge filling is required, included 80% uncontrolled submerge filling and 20 % uncontrolled splash filling. Information on tank filling procedures was obtained from the state's Liquid Underground Storage Tank (LUST) Program. In addition, a 15% reduction was applied to VOC emissions from transit losses, tank breathing and spillage to account for the effect of gasoline vapor pressure regulations. A rule effectiveness of 90 % and rule penetration of 100% was assumed for Stage I. This resulted in an overall control efficiency of 96.22%. Stage 2 (vehicle gas tank filling) controls were applied to a 9 county ozone non-attainment area of the state. This included 95% control with rule effectiveness and rule penetration of 90%. Reformulate gasoline (RFG) factors were also applied, if any, to the counties that sell reformulate gasoline during ozone season. 1,3-Butadiene and 1,2-Dibromoethane were not inventoried for this category. These pollutants were erroneously included in the 1996 inventory.

Graphic Arts

Employment information from NAICS group 323 and 511 were used to estimate emissions. The total employment data of each county was adjusted to avoid double counting by deducting 1998 point source employment data. Emissions were calculated by speciating each toxic from the total VOC emissions. A VOC emission factor of 70.1 LB/employee/year was developed using emissions information from the 1996 and 1997 Wisconsin inventory for small point sources (emissions less than 5 TPY) in SIC group 27%%.

Human Cremation

The SIC for this category is 7261 (Funeral Service and Crematories). Emissions for this category were calculated following the methodology indicated in the Documentation For The 1999 Base Year Nonpoint Source National Emissions Inventory for Hazardous Air Pollutants (ftp://ftp.epa.gov/EmisInventory/draftnei99ver2/haps/documentation/). Emissions were calculated using emission factors based on the weight cremated. The number of bodies cremated by county was obtained from Department of Health and Family Services, Wisconsin Bureau of Health Information. The allocation of emissions to the county level is not accurate for this source category. The numbers of bodies cremated in a particular county indicate the final disposition of the body, and not necessarily the location where the cremation took place. Crematories are not regulated in the state; therefore, the exact location of crematories is unknown.

Industrial Surface Coating

SIC specific, per employee VOC emission factors were derived using emissions information from the 1997, 1998 and 1999 WDNR air emissions inventory for industrial point sources following guidance from the EIIP documentation. Toxic emissions were calculated by speciating each toxic from the total VOC emissions. VOC numbers for all, except three AMS groups from

this source category, were calculated using a per employee emission factor. VOC for the remaining three AMS groups including Miscellaneous Manufacturing, Industrial Maintenance, and Other Special Purpose, were calculated using a per capita emission factor. Toxic speciation profiles were obtained from U.S. EPA, Speciate, Version 3.1. RTP, NC.

Landfills

The SIC for this category is 4953 (Refuse Systems). Emissions were calculated by applying the equations from the US EPA Landfill Air Emissions Estimation Model. The input variables needed to generate emissions for a single facility using these equations were tons of waste received per year, total years since the facility opened, and total years the facility has been closed. Landfill data were obtained from the WDNR, Bureau of Solid and Hazardous Waste. Emissions for each facility in a county were added to obtain emissions per county.
Adjustments were made to emissions from facilities with flaring by applying a 75% capture efficiency and a 98% control efficiency in accordance to state regulations.

Open Burning: Forest and Wildfires

Emissions estimates followed the method in the "Documentation for the 1999 Base Year Non-point Source National Emission Inventory". Emissions were obtained by multiplying pollutant emission factors by the biomass consumed in the fires. 10.4 ton biomass/acre was used to convert acreage burned to biomass consumed. WDNR Bureau of Forestry provided the number of acres burned. Emissions were estimated under two types of combustion conditions, flaming and smoldering. It was assumed 75 percent of biomass burned under flaming conditions while the other 25 percent burned under smoldering conditions.

Publicly Owned Treatment Works

The SIC for this category is 4952 (Sewerage Systems). For this category, a methodology developed by the Minnesota Pollution Control Agency was used. The methodology assumes a typical POTW configuration and related processes. Emissions are calculated using generic emission factors from FIRE 6.23 and effluent wastewater flow data. Wastewater data were obtained from the WDNR, Bureau of Integrated Science Services. The amount of wastewater treated was point source adjusted to avoid the double counting.

Residential Fuel Combustion

Emissions were based on units of fuel used. Four fuel types were included with this source category: coal, distillate fuel oil, liquefied petro gas, and natural gas. Fuel use data were obtained from the 2000 Wisconsin Energy Statistics published by the Wisconsin Energy Bureau, Department of Administration. Fuel was apportioned to the county level using the fraction of total households for each county.

Residential Wood Combustion

Calculated emissions were based on units of wood fuel used. Emission factors were available for three wood burning stove types including conventional, catalytic, and non-catalytic. Wisconsin chose to apportion the 1999 county specific wood fuel use data obtained from the 2000 Wisconsin Energy Statistics into the three wood burning types based on county specific percentages. These percentages were developed from data obtained in the Residential Fuelwood Consumption and Production in Wisconsin, 1994 developed by the United States Department of Agriculture, Forest Service.

Solvent Cleaning

The NAICS codes for this category are 331-337, 339, 488, 4411, and 8111. Emissions were calculated by speciating each toxic from the total VOC emissions. VOC emissions were calculated using a per employee emission factor. A statewide Pollution Prevention Adjustment factor of 85% was applied to the emission estimates. In addition a source control factor of 30% was applied to clean-up solvent usage in the 9-county ozone non-attainment area.

Stationary Fuel Combustion

This category represents the aggregation of mercury emissions from fuel combustion processes at facilities whose emissions are below reporting levels, and which did not have to report their emissions to the Air Program's emissions inventory database. This source was created in an effort to improve the state and regional mercury emissions inventory. A total of 107 facilities with combustion processes associated with mercury emissions (i.e., with available emission factors in FIRE) were identified. Emissions from these facilities were estimated using RAPIDS and then aggregated at the county level. The total mercury emissions from this source category amount to 18.92 pounds.

Traffic Markings

The SIC for this category is 1611 (Highway and Street Construction). Emissions were based on total traffic paint used in each county, the air toxic volume percent in the paint used, and the air toxic density. A control efficiency of 26.8% and a rule effectiveness of 75.9% were applied to nine counties in the ozone non-attainment area. These counties are Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Waukesha and Washington. Total traffic paint used in each county was calculated by apportioning the gallons of paint used in each traffic district, to the mileage percentage of paved roads in each county within the traffic district. Information on the amount of paint applied was obtained from the Wisconsin Department of Transportation. The assumption was made that the reapplication rate was once per year. The miles of paved road in each county were obtained from the Wisconsin Blue Book 1997-1998. Park and forest roads were not included.

MERCURY

Part of the regional inventory compilation included the effort to improve emission estimates of mercury. For this purpose, three additional area source categories were included in the Wisconsin's portion of the 1999 regional inventory, namely Fluorescent Lamp Breakage, Fluorescent Lamp Recycling and the Stationary Fuel Combustion.
The Stationary Fuel Combustion category resulted from the identification of 107 stationary combustion sources that did not report mercury to the state emissions inventory. The emissions from these sources were estimated using FIRE 6.23 emission factors. The mercury emissions estimated from these sources were below the reporting threshold under the state emissions reporting rule, NR 438. The aggregated mercury emissions from this category amounted to 18.92 pounds. Emissions from Fluorescent Lamp Breakage contributed 30.5 pounds to the state total emissions, while those from Fluorescent Lamp Recycling amounted to only 0.007 pounds.
For point sources, mercury emissions from coal combustion processes at twelve facilities in the Paper Industry were corrected based on the Mercury Advisory Group emission estimates for industrial boilers. The revised estimates resulted in equal or lower emissions from those reported by the same facilities in 1999.

Mercury emissions from point and areas sources in the state for the year 1999 were estimated at 5,381 pounds. Of that total, approximately 5,227 pounds come from point sources while the remainder 153 comes from non-industrial area sources. The mercury emissions were associated with 86 source categories and 42 process categories. Table 1 presents mercury statewide emissions by process category. The top seven process categories account for approximately 92.42 percent of the mercury emissions.

Table I-2: 1999 Mercury Emissions by Process Category

Process Category	Emissions (pounds)	Percent of total
COAL COMBUSTION	2504.70	46.55%
CHLORO-ALKALI	1081.71	20.10%
SITE REMEDIATION	946.00	17.58%
INCINERATION	188.07	3.50%
MISC MFG	153.02	2.84%
SOLID WASTE COMBUSTION	99.42	1.85%
OTHER (Less than 1% of total)	407.93	7.58%
TOTAL	5380.85	100.00%

INFORMATION

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Table I-3: Wisconsin - Statewide Emissions (LB/yr)

Pollutant	Point Sources	Area Sources	Total
ACENAPHTHEN	0.03	14694.05	14694.08
ACENAPHTHYL	0.17	196987.48	196987.65
ACETALDEHYDE	489245.8	24232.69	513478.49
ACETAMIDE		0.64	0.64
ACETONITRILE	72.2		72.2
ACETOPHENONE	687	45.44	732.44
ACROLEIN	14456.99	24525.24	38982.23
ACRYLIC ACID	10.85	0.02	10.87
ACRYLONITRIL	1413.26	2880.39	4293.65
ALLYL CHLORI	24.51		24.51
ANILINE	0.001		0.001
ANTHRACENE	0.02	18204.53	18204.55
ANTIMONY	8240.62	0.32	8240.94
ARSENIC	4578.72	112.49	4691.21
ATRAZINE		191808	191808
BENZ(A)ANTHR	67.64	25385.08	25452.72
BENZ(GHI)PE	0.0047	13948.22	13948.2247
BENZENE	246837.72	2553039.74	2799877.46
BENZO(A)PYRE	87.24	7632.96	7720.2
BENZO(B)FLUO	0.64	7991.13	7991.77
BENZO(K)FLUO	0.0025	2930.86	2930.8625
BERYLLIUM	534.52	92.46	626.98
BIPHENYL	57706		57706
BROMOFORM	71.37		71.37
BROMOMETH	7437.76		7437.76
BUTADIENE,13		23421.25	23421.25
CADMIUM	2566.94	303.72	2870.66
CAPTAN	0.27		0.27
CARBON DISUL	371771.51	384.06	372155.57
CARBON TETRA	5466.5	2057.87	7524.37
CARBONYL SUL	4126	285.34	4411.34
CHLORAMBEN	0		0
CHLORINE	69398.83		69398.83
CHLOROBENZ	19789.03	379378.55	399167.58
CHLOROETHANE	20.71	697.21	717.92
CHLOROFORM	292824.3	15015.37	307839.67
CHLOROPRENE	53.7		53.7
CHROMIUM	9848.19	395.57	10243.76
CHROMIUM III	10318.57		10318.57
CHROMIUM VI	209.96		209.96
CHRYSENE		18180.55	18180.55
COBALT	2225.14	16.18	2241.32
COPPER	23644.06	250.21	23894.27
CRESOL MX IS	320.56		320.56
CRESOL,O	9.58		9.58
CRESOL,P	5.07		5.07
CUMENE	3675.2	2761.73	6436.93
CYANIDE	502		502
D,2,4	178.09		178.09
DIBENZAHAN	1.3	2833.82	2835.12
DIBENZOFURAN		39.18	39.18
DIBUTYL PHTH	454.21	116473.52	116927.73
DICHLORETH12	645.09	4017.36	4662.45
DICHLORVOS	24.78		24.78
DICLBENZ,14	135.04	412494.52	412629.56
DICLPROPE,13		847228.8	847228.8
DIETHANOLAMI	9593.18		9593.18
DIMETH PHTHA	9269.84		9269.84
DIMETH SULFA	125.54		125.54
DIMETHFORMAM	215539.05	52001.05	267540.1
DINITROPH,24	0.01		0.01
DIOCTYL PHTH	56.66		56.66
DIOXANE	151.65	52.95	204.6
EPICLHYDRIN	579		579
EPOXYBUT,12	193		193
ETHYLBENZENE	229826.49	490848.07	720674.56
ETHYLENE GLY	32658.84	469868.47	502527.31
ETHYLENE OXI	2222.32	79957.22	82179.54
FLUORANTHENE	29.4	23812.4	23841.8
FLUORENE	0.03	30123.61	30123.64
FORMALDEHYDE	392586.4	170483.4	563069.8
GLYCOL ETHRS	57400	199905.53	257305.53
HCL	10964336.11	23253.11	10987589.22
HEXACL-1,3-C	71.73		71.73

Pollutant	Point Sources	Area Sources	Total
HEXAMETHYL16	2857.65		2857.65
HEXANE	206187.54	3009775.41	3215962.95
HEXCLBENZENE		0.09	0.09
HF	1498558.04	68.31	1498626.35
HYDRAZINE	3.7		3.7
HYDROGEN CYA	21503.9		21503.9
HYDROGEN SUL	282898.53		282898.53
HYDROQUINONE	3611.6		3611.6
INDN(123CDPY	0.01	2884.53	2884.54
ISOPHORONE	8243.63	5024.98	13268.61
LEAD	2624.46	259.48	2883.94
LEAD CMP	52861.64		52861.64
MALEIC ANHYD	26.2		26.2
MANGANESE	62885.75	441.83	63327.58
MERCURY	5227.61	153.24	5380.85
METEN BIS,44	4183		4183
METH ETH KET	1962545.03	3982006.17	5944551.2
METH IODIDE	127.49		127.49
METH ISOBUT	695453.84	1957060.9	2652514.74
METH METHACR	60320.71	1058.66	61379.37
METH TERT BU	1716	113.85	1829.85
METHANOL	5239976.97	3378324.84	8618301.81
METHENE DIAN	2867.72		2867.72
METHENE(B)4-	28056.85		28056.85
METHYL CHLOR	48631.87	38210.35	86842.22
METHYLENE CL	621103.55	1556254	2177357.55
NAPHTHALENE	58731.46	743901.31	802632.77
NI SUBSULF	536.32		536.32
NICKEL	188.99	355.91	544.9
NICKEL CMP	21336.85		21336.85
NITROPHENL,4	0.0099		0.0099
NITROPROPA,2		10.33	10.33
PCBS	130.67		130.67
PCDD	0.01	0.000065	0.010065
PCDF	0.11	0.0001	0.1101
PERC	45580.35	2144801.03	2190381.38
PHENANTHRENE	0.37	322049.28	322049.65
PHENOL	112205.51	0.29	112205.8
PHOSGENE		0.53	0.53
PHOSPHINE	70		70
PHOSPHORUS	37.04		37.04
PHTHALIC ANH	114.42		114.42
PROPIONALDEH	8549	6.84	8555.84
PRPLENE DICH		175.81	175.81
PRPLENE OXID	435.44	2445.78	2881.22
PYRENE	0.07	25987.06	25987.13
SELENIUM	10004.55	286.22	10290.77
STYRENE	1499179.97	9258.8	1508438.77
TCDD,2378	0.0038		0.0038
TCE,111	299.46	6980057.42	6980356.88
TETCLET,1122	0.25	1610.67	1610.92
TOLUENE	2195539.07	12038598.68	14234137.75
TOLUENE24DII	146.81		146.81
TOLUIDINE,O-	68.96		68.96
TRICHLORETHY	417794.66	4807456.09	5225250.75
TRICLETH,112	193.47		193.47
TRIETHAMINE	109028.69	4442.66	113471.35
TRIME-PENTAN		216680.1	216680.1
VINLIDENE CL		167.61	167.61
VINYL ACETAT	33022.39	0.24	33022.63
VINYL CHLOR	32.44	34188.13	34220.57
XYLENE,M	10456.46	130280.81	140737.27
XYLENE,O	1246.67	292345.41	293592.08
XYLENE,P	293.87	82122.3	82416.17
XYLENES ISO	2417386.65	10450441.78	12867828.43