Committee To Study The Public Health and Environmental Benefits of Requiring Stationary and Mobile Sources that Burn Virgin Petroleum Products or Coal to Comply with the Requirements of the Air Toxic Control Act

(SB 93, Chapter 088, Section 001, Laws of 2001)

Final Report

June 18, 2003

Committee Members

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I. EXECUTIVE SUMMARY

The New Hampshire Air Toxics Control Act was enacted in 1987 to regulate emissions of toxic chemicals to the air from previously unregulated, non-combustion sources. Since toxic chemical emissions from fuel combustion were, to an extent, indirectly controlled through existing air pollution regulations, mobile sources and stationary sources that burn virgin petroleum products or coal, were considered exempt from the requirements of the Act. However, recent information suggests that emissions of toxic air pollutants from these exempt sources may pose a more serious threat to public health than previously believed. To address these concerns, Senate Bill 93 was enacted establishing a committee to: *"study the public health and environmental benefit of requiring stationary and mobile sources that burn virgin petroleum products or coal to comply with the requirements of the Air Toxics Control Act"*. The Committee was formed and immediately began a series of quarterly meetings at which the Department of Environmental Services (DES) researched and presented specific detailed, scientific data on the sources and associated public health impacts of regulated toxic air pollutants in New Hampshire. This information was used by the Committee to evaluate the costs and benefits of expanding the Air Toxics Control Act to include toxic chemicals emitted from these sources, and the findings are presented in this Final Report. The findings of the committee conclude that:

1. There are several tools available for evaluating the impacts of toxic air pollutants in NH.
2. One such tool, EPA's **Toxic Release Inventory (TRI)**, is useful in evaluating overall toxic releases from large stationary sources, but **does not represent all stationary sources** in the state, **nor does it evaluate emissions with respect to the relative toxicity of chemical released**.
3. Based on the DES emissions inventory of permitted stationary sources, approximately **$^2/_3$ of all priority air toxics emitted by <u>stationary</u> sources come from facilities already subject to the NH Air Toxics Control Program**.
4. Based on the DES inventory area source emissions, approximately **95% of all priority air toxics emitted by New Hampshire <u>area</u> sources come from facilities already subject to the NH Air Toxics Control Program**.
5. An evaluation of all stationary, area and mobile source emissions in the state indicates that almost **75% of all priority toxics are emitted by <u>mobile</u> sources, which are currently <u>exempt</u> from the NH Air Toxics Control Program**.
6. An evaluation of the human health risk drivers from air toxics in New Hampshire indicates that **seven toxic air pollutants represent over 90% of human health risk from air toxics in NH**, and that **<u>mobile sources</u> are primarily responsible** for emissions of these pollutants.
7. Dispersion modeling evaluations of toxic air pollutant emissions in NH indicate that the **emissions from typical <u>stationary</u> and <u>area</u> sources burning coal, wood or virgin petroleum products already comply** with the requirements of the New Hampshire Air Toxics Control Program.
8. Modeled **<u>mobile</u> source impacts of vehicles traveling directly <u>on</u> or <u>through</u> representative high-traffic locations show impacts <u>near or above</u> the compliance criteria** for several priority toxic air pollutants. These impacts **may be even higher** if contributions from other nearby mobile sources were also included.

Based on these conclusions, the Committee is confident that **<u>stationary</u>** and **<u>area</u>** sources burning coal, wood, natural gas or virgin petroleum products in the state **do not currently represent major health risks from toxic air pollutant emissions**, and that expanding the New

Hampshire Air Toxics Control Act to include these sources would do little at this time to improve air quality and human health in the state. However, it is evident that **mobile sources are a major source of important toxic air pollutants in the state, and play a significant role in the exposure of New Hampshire citizens to toxic air pollutants and their health impacts**. As a result, members of the Committee agreed that in order to address the increasing health risks from toxic air pollutants in the state, future air toxics control efforts should focus more attention on reducing emissions from mobile sources. The Committee offers several specific recommendations to address the air quality impacts of mobile source by encouraging the use of cleaner fuels and technology, reducing our use of fuel burning vehicles and equipment, increasing enforcement of existing regulations, and providing options for funding these efforts.

II. INTRODUCTION

On June 19, 2001 Senate Bill 93 was signed into law, establishing a committee to: *"study the public health and environmental benefit of requiring stationary and mobile sources that burn virgin petroleum products or coal to comply with the requirements of the Air Toxics Control Act"*. The Committee was formed and immediately began a series of quarterly meetings at which the Department of Environmental Services (DES) was asked to present specific detailed, scientific data on the sources and associated public health impacts of regulated toxic air pollutants in New Hampshire. This information was used by the Committee to evaluate the relative benefits and costs of expanding the Air Toxics Control Act to include emissions from these unregulated fuel combustion sources. This document represents the Final Report of the two-year legislative study committee process. The Report provides background information on the Air Toxics Control Act, the rationale for establishing the Study Committee, a summary of the Committee's findings, and the Committee's recommendations for future legislative action.

III. BACKGROUND

The New Hampshire Air Toxics Control Program was established by statute in the Air Toxic Control Act (RSA 125-I); and its implementing regulations are codified in the New Hampshire Code of Administrative Rules, Chapter Env-A 1400. The purpose of the Act is to *"promote the public health of the state by reducing human exposure to toxic chemicals by regulating releases of toxic chemicals into the ambient air"*. Prior to adoption of the statute by the New Hampshire Legislature in 1987 and subsequent amendments in 1996, air pollution regulations were designed primarily for emissions of "*criteria*" pollutants resulting from fuel combustion processes, and emissions of toxic chemicals from manufacturing processes were essentially unregulated. The Air Toxics Control Act was designed primarily to control emissions of toxic chemicals from these unregulated sources. Since implementation of the Act in 1987, NH has reduced toxic air pollutant emissions from these sources by over 85% (see Figure 1). It was also recognized that although fuel combustion also releases many of the same toxic chemicals, these emissions were, to an extent, indirectly controlled through regulations controlling criteria pollutant emissions. In an effort to reduce the regulatory burden and avoid duplicative requirements for businesses and operations that were already subject to air emissions regulation, The Act exempts:

(a) *Normal agricultural operations and the application of pesticides regulated pursuant to RSA 430:28 through RSA 430:48.*

(b) *Emissions of regulated toxic air pollutants resulting from mobile sources and the combustion of virgin petroleum products at stationary sources.*

(c) *Pursuant to rules adopted under RSA 541-A by the commissioner, those air contaminants and categories of stationary sources whose emissions of regulated toxic air pollutants are adequately regulated under other provisions of state or federal law, or based on available information pose little risk to human health.*

Recent information, however, suggests that toxic air emissions from some of these exempt sources, especially mobile and stationary source fuel combustion, may pose a more serious threat to public health than previously believed, and concern has been growing among scientists, regulators, public health professionals and citizens. For example:

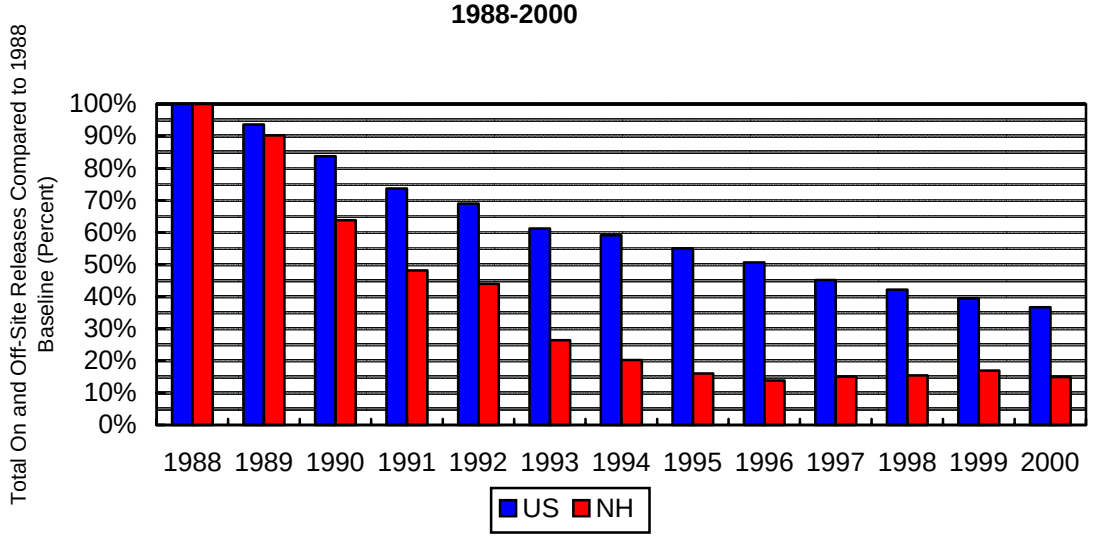
- Based on the US EPA 1996 National Toxics Inventory data, mobile sources (cars, trucks, buses, etc.) account for over **50%** of the **total amount** of air toxics released to the atmosphere **nationwide**, and over **70%** in **New Hampshire**.

- A DES analysis of the US EPA Cumulative Exposure Project, which estimates human exposure to over 100 hazardous air pollutants everywhere in the United States, shows that over **44%** of the **human health risk** from exposure to these hazardous air pollutants in New Hampshire was attributable to emissions from mobile sources.

- Based on data from the 2000 US EPA Toxic Release Inventory (that requires industries that "manufacture, process, or otherwise use" certain toxic chemicals to report releases), over **60%** of all reported toxic chemical air releases **from industrial sources** in New Hampshire in 1999 were emitted from New Hampshire's 3 fossil fuel burning power plants.

- Recent NH DES studies show that combustion of exempt fuels account for about half of emissions of several persistent bioaccumulative toxics (PBTs) -- including mercury and dioxin in New Hampshire.

Figure 1.
Reduction in Toxic Chemical Air Releases from Manufacturing Facilities, USA and NH
1988-2000



Source: US Environmental Protection Agency, Toxics Release Inventory. Emissions totals represent 1988 core chemicals released to the air from original industry categories (SIC codes 20-39).

In recent years the media has also focused on some of this information, and has highlighted what some allege to be a lack of regulation for these sources on the part of the Federal and State governments. In light of this information and the related public concern, the New Hampshire Legislature established this study committee to assure that emissions of toxic air pollutants from stationary and mobile sources that burn virgin petroleum products or coal in New Hampshire are

adequately addressed, and, if necessary, make recommendations to regulate and reduce emissions of regulated toxic air pollutants from these sources.

IV. SUMMARY OF FINDINGS

A. **Definition of Toxic Air Pollutants:** "Toxic air pollutants" is a term often used to describe a broad category of pollutants that, at sufficient concentrations and exposure, are known or suspected of having serious toxicological effects on living organisms. EPA defines toxic air pollutants as: "those pollutants that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects."[1] Individually, toxic air pollutants can differ substantially according to their toxic effects, routes of exposure and level of toxicity. EPA regulates emissions of 188 chemical substances known as "hazardous air pollutants" (HAPs), while the New Hampshire Air Toxics Control Program regulates the emissions of over 750 "regulated toxic air pollutants" (RTAPs). New Hampshire RTAPs include all 188 Federal HAPs, plus all other chemical substances for which the American Conference of Governmental Industrial Hygienists (ACGIH) has established occupational exposure limits for inhalation. HAPs and RTAPs do not include common air contaminants known as "criteria" pollutants (SO_2, NO_2, CO, PM, O_3) that are regulated under other specific air pollution programs. For the purposes of this report, toxic air pollutants will include any chemical substance listed as a RTAP in New Hampshire Code of Administrative Rules, Chapter Env-A 1400.

B. **Inventories of New Hampshire Toxic Air Pollutant Emissions:** Emissions of toxic air pollutants are tracked and reported by EPA and DES for a number of purposes. The Committee found that there are several sources of information on toxic air pollutant emissions and impacts in New Hampshire. These data were examined in order to estimate total, statewide distributions of sources of toxic air pollutants, and to ascertain the contribution of toxic air pollutants from sources in the state that are currently subject to the New Hampshire Air Toxics Control Program, as well as sources that are currently exempt. The available sources of inventory information include:

- US EPA's Toxic Release Inventory (TRI)
- DES Air Pollutant Emissions Inventory (Env-A 700 and Env-A 900)
- DES Area Source Emissions Inventory
- DES Mobile Source Emissions Inventory

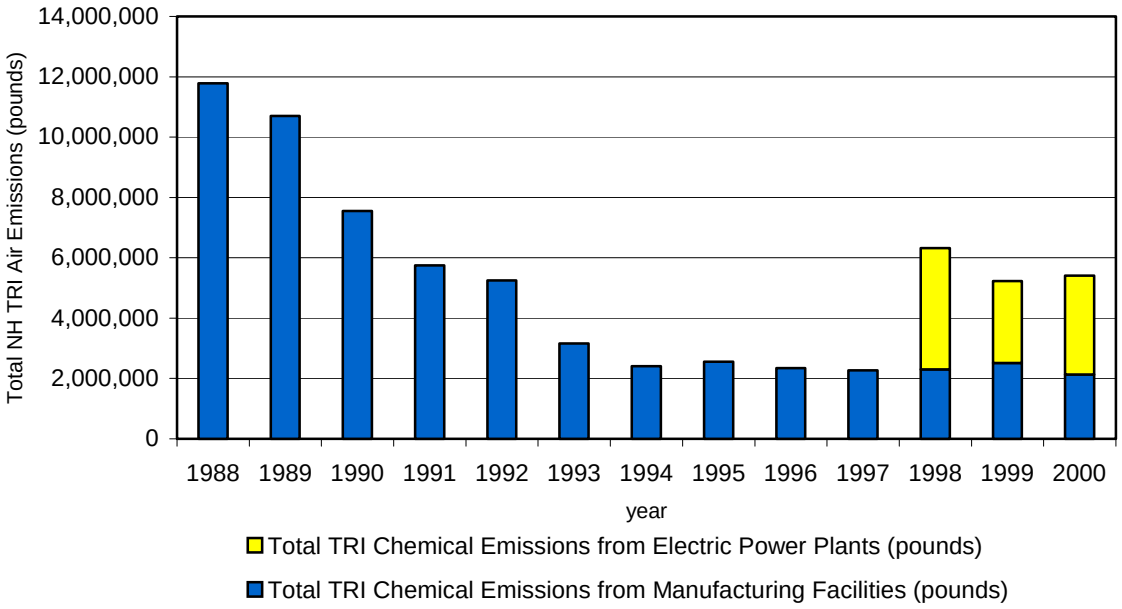
Each of these emissions inventory programs is discussed below.

US EPA's Toxics Release Inventory (TRI) is a publicly available database maintained by EPA that contains information on toxic chemical releases from businesses *that manufacture, process, or otherwise use* a list of over 650 regulated toxic chemicals at or above threshold quantities. The TRI was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990, and

[1] *Taking Toxics Out of the Air - Progress in Setting Maximum Achievable Control Technology Standards Under the Clean Air Act.* Report # EPA-452/K-00-002. United States Environmental Protection Agency, Offcie of Air Quality Planning and Standards, Research Triangle Park, NC; August 2000.

requires affected industries to annually report emissions of chemicals to the air as well as wastewater releases and waste disposal. The goal of TRI is to hold chemical generators accountable for minimizing and properly managing toxic chemicals, and to allow citizens access to information on chemicals used by businesses in their communities. In addition to businesses that *manufacture, process or use* listed chemicals above the reporting thresholds, TRI added releases of toxic pollutants from electric utilities beginning in 1998. A summary of total statewide TRI air emissions since 1988 is provided in Figure 2, below.

Figure 2
Total New Hampshire TRI Air Emissions 1988-2000



As indicated in Figure 2, total statewide TRI air emissions from manufacturing facilities (currently regulated under the NH Air Toxics Control Program) have decreased substantially over the past decade. The addition of electric utilities to the TRI database in 1998, however, indicates that electric utilities, (currently **NOT** regulated under the NH Air Toxics Control Program) now account for more **TOTAL** TRI air emissions than all New Hampshire manufacturers combined. It is important to keep in mind, however, that the TRI data represents the **TOTAL** mass of all combined TRI chemicals released to the air annually, and does not account for the relative toxicity of individual chemicals released. As a result, those industries emitting relatively high amounts of low toxicity chemicals may be ranked higher than industries emitting lower amounts of highly toxic chemicals. Table 1 presents a summary of New Hampshire 1999 TRI air emissions by source category, and Table 2 presents a list of the major TRI chemical air emissions from electric utilities in 1999.

<u>DES Toxic Air Pollutant Emissions Inventory – Stationary Sources.</u> DES began a detailed state inventory of annual emissions of *criteria* pollutants from *permitted stationary* sources beginning in 1995 as part of rule changes to New Hampshire Code of Administrative Rules, Chapter Env-A 700 *Permit Fee System* and Chapter Env-A 900 *Owner or Operator*

Obligations. These rules require all permitted stationary air pollution sources in the state to report emissions data to DES on an annual basis, and DES compiles this data annually in a statewide emissions inventory. In 1999, further rule revisions expanded the emissions

Table 1
1999 TRI air emissions by source category

Industry	Total Air Emissions (lbs)
Electric Utilities	2,712,745
Paper	886,828
Plastics	730,620
Other Manufacturing	267,437
Textiles	129,976
Fabricated Metals	129,839
Electrical Equip.	90,044
Transportation Equip.	64,867
Primary Metals	64,246
Miscellaneous	37,085
Chemicals	29,568
Measure/Photo.	26,860
Leather	17,460
Printing	10,802
TOTAL	**5,198,377**

Table 2
1999 TRI Air Releases from Electric Utilities

Chemical	Total Air Emissions (lbs)
HYDROCHLORIC ACID (AEROSOLS)	1,854,000
SULFURIC ACID (AEROSOLS)	635,000
HYDROGEN FLUORIDE	192,200
AMMONIA	28,800
BARIUM COMPOUNDS	1,243
NICKEL COMPOUNDS	807
MANGANESE COMPOUNDS	275
ZINC COMPOUNDS	250
CHROMIUM COMPOUNDS	170
TOTAL	**2,712,745**

reporting requirements to include toxic air pollutants regulated under the Air Toxics Control Program from all permitted sources. This air toxics emissions inventory is in the process of being phased in by DES, and is currently tracking 29 RTAPs that have been identified by the US EPA as ***priority*** hazardous air pollutants (i.e.. – RTAPs representing the ***greatest health***

risk to NH residents). The 29 priority RTAPs are listed in Table 3, and the DES stationary source emissions inventory results for 2000 are presented in Tables 4.

Table 3
List of Priority Regulated Toxic Air Pollutants

1,3-butadiene	ethylene oxide
1,3-dichloropropene	formaldehyde
acetaldehyde	hexachlorobenzene
acrolein	lead
acrylonitrile	manganese
arsenic	mercury
benzene	methyl chloride
beryllium	methylene chloride
cadmium	nickel
carbon tetrachloride	p-dichlorobenzene
chloroform	propylene dichloride
chromium	tetrachloroethylene
dioxin/furans TEQ	trichloroethylene
ethylene dibromide	vinyl chloride
ethylene dichloride	

Table 4
Summary of Stationary Source *Priority* Air Toxics Emissions Inventory By Chemical 2000

***Priority* Regulated Toxic Air Pollutant (RTAP)**	Estimated Emissions from Sources **Currently Exempt** (lbs)	Estimated Emissions from Sources **Currently Subject** (lbs)	**Total** Emissions (lbs)	Estimated % of Total Emissions from Sources **Currently Exempt**	Estimated % of Total Emissions from Sources **Currently Subject**
trichloroethylene	0	58,099	58,099	0.0%	100.0%
benzene	16,452	27,538	43,990	37.4%	62.6%
formaldehyde	15,721	15,268	30,989	50.7%	49.3%
acetaldehyde	3,827	21,512	25,338	15.1%	84.9%
manganese	24,888	41.69	24,930	99.8%	0.2%
ethylene oxide	0	18,440	18,440	0.0%	100.0%
chloroform	55.60	8,539	8,595	0.6%	99.4%
nickel	8,516	42.86	8,559	99.5%	0.5%
lead	6,307	403.6	6,711	94.0%	6.0%
chromium	3,733	30.92	3,764	99.2%	0.8%
tetrachloroethylene	70.84	1,950	2,021	3.5%	96.5%
1,3-butadiene	0.0267	1,286	1,286	0.0%	100.0%
other	2,764	1,520	4,284	64.5%	35.5%
Total	**85,097**	**156,192**	**241,289**	**35.3%**	**64.7%**

The DES emissions inventory differs from the TRI emissions inventory in two main respects:

1. The DES emissions inventory includes a greater number (405) of RTAP sources than the TRI emissions inventory (111) due to TRI reporting threshold levels.

2. The TRI emissions inventory includes a broad range of chemicals of varying toxicity while the DES emissions inventory currently focuses only on those toxic air pollutants that represent the greatest human health risk.

Consequently, these two emissions inventories show significantly different results in terms of major sources and principal pollutants. In addition, the DES stationary source emissions inventory data presented in Table 4 indicates that up to $^{1}/_{3}$ of all priority RTAPs are emitted by combustion sources currently exempt from the New Hampshire Air Toxics Control Program.

<u>DES Toxic Air Pollutant Emissions Inventory – Area Sources.</u> "Area" sources are defined as facilities or devices that individually emit small quantities of air pollutants, but collectively may be significant sources of toxic air pollutants. Examples of "area" sources include autobody shops, print shops, gasoline filling stations, dry cleaners, and residential fuel combustion for home heating. Area source emissions of toxic air pollutants in New Hampshire are estimated annually using EPA "area" source emissions factors and modeling techniques; and are based on "activity levels" (activity level may take into account population, quantity sold, number of employees in a business type, etc.). To avoid double-counting, permitted stationary source emissions are checked and subtracted from the area source emissions in overlapping categories. Area source emissions distribution by source category are depicted in Figure 3, and the most recent emissions inventory results (2000) are presented in Tables 5.

Figure 3 – NH Air Toxics Area Source Emissions Inventory by Industry Type

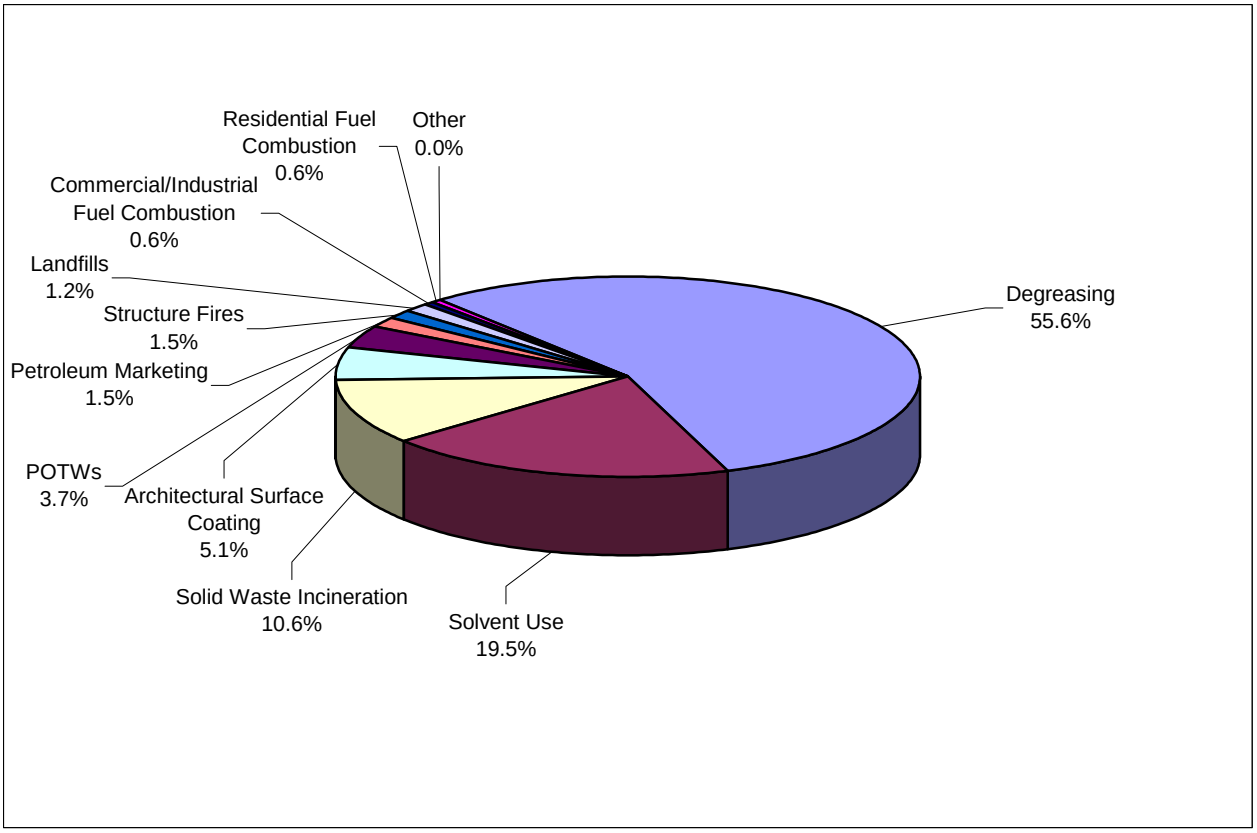


Table 5
Summary of Area Source *Priority* Air Toxics Emissions Inventory By Chemical 2000

Pollutant	emissions from sources currently exempt (lbs/yr)	emissions from sources currently subject (lbs/yr)	total emissions (lbs/yr)
trichloroethylene	0.00	530,676	530,676
methylene chloride (dichloromethane)	143	421,521	421,664
tetrachloroethylene (perchloroethylene)	64	195,170	195,235
1,3-dichloropropene	0.00	192,160	192,160
benzene	28,480	117,970	146,450
nickel nompounds	151	83,759	83,910
p-dichlorobenzene	0.00	42,959	42,959
acrolein	23,052	818	23,870
formaldehyde	17,372	1,555	18,928
ethylene oxide	0.00	18,608	18,608
chloroform	12	14,952	14,964
methyl chloride (chloromethane)	49	7,338	7,387
vinyl chloride	7.56	3,353	3,360
acrylonitrile	0.00	3,267	3,267
carbon tetrachloride	319	2,410	2,729
acetaldehyde	1,750	661	2,411
other	2,075	965	3,040
Total	**75,550**	**1,639,109**	**1,714,658**

DES Toxic Air Pollutant Emissions Inventory – Mobile Sources. Toxic air pollutant emissions from mobile sources are divided into two categories: "on-road" mobile sources and "non-road" mobile sources. On-road mobile sources include registered trucks, automobiles, motorcycles, etc. that routinely travel on New Hampshire's roads and highways. Non-road mobile sources include recreational vehicles (dirt bikes, snowmobiles, etc.), farm equipment, construction equipment, lawn and garden equipment, marine engines, aircraft, and locomotives. **All** mobile sources in the state are currently exempt from the New Hampshire Air Toxics Control Program.

Toxic air pollutant emissions from New Hampshire on-road mobile sources were calculated using an EPA mobile source emissions inventory model that takes into consideration factors routinely tracked by the New Hampshire Department of Transportation including: traffic counts, vehicle miles traveled (VMT), average age of vehicle fleet, vehicle mix, fuels used (RFG), and interstate traffic patterns. The model uses these factors to estimate the amounts and statewide distributions of toxic air pollutant emissions from all on-road sources on an annual basis. Non-road toxic air pollutant emissions were calculated using EPA non-road modeling techniques that make use of available "activity level" data such as population density, equipment type, quantity sold, land use, business type, construction activity, recreational opportunities, etc. On-road and non-road mobile source emissions inventory results for 2000 are presented in Tables 6. It should be noted that although the mobile source emissions model does account for the majority of toxic air pollutants emitted, it does not evaluate the entire list of *priority toxics.*

Table 6
Summary of Mobile Source *Priority* Air Toxics Emissions Inventory By Chemical 2000

Pollutant	Mobile sources	
	On-Road Mobile Source Emissions (lbs/yr)	Non-Road Mobile Source Emissions (lbs/yr)
Benzene	2,679,465	996,298
Lead Compounds	71,321	--
Manganese Compounds	3,431	--
Chromium Compounds	256	--
Beryllium Compounds	197	--
Nickel Compounds	171	--
Mercury Compounds	57	--
Formaldehyde	--	1,202,855
Acetaldehyde	--	375,597
1,3-Butadiene	--	234,867
Acrolein	--	51,365
Total	**2,754,897**	**2,860,982**

Summary of New Hampshire Toxic Air Pollutant Emissions Inventory Data: Several sources of air toxics emissions inventory data for New Hampshire are were investigated by the Committee. Summaries of these data are presented in Table 7 and Figures 4 and 5, below. Examination of these emissions inventory sources reveals the following:

- While EPA's Toxic Release Inventory (TRI) includes important information on toxic air pollutant emissions from large facilities that *manufacture, process, or otherwise use* regulated toxic chemicals at or above threshold quantities in the state, it does not represent all stationary source categories, nor does it take into account the relative toxicity of pollutants emitted.

- DES emissions inventory data for *permitted, stationary sources* in the state indicate that about $^{2}/_{3}$ of all *priority toxics* emitted come from facilities already subject to the NH Air Toxics Control Program.

- DES emissions inventory data for smaller, *area sources* in the state indicate that almost 95% of all *priority toxics* emitted come from facilities already subject to the NH Air Toxics Control Program.

- However, overall, more than 76% of all *priority toxics* in the state are emitted by sources currently exempt from the New Hampshire Air Toxics Control Program, with the vast majority of these emissions attributed to *on-road and non-road mobile sources*.

Table 7
Summary of New Hampshire *Priority* Air Toxics Emissions By Chemical

Pollutant	Area Sources emissions from sources currently exempt (lbs/yr)	Area Sources emissions from sources currently subject (lbs/yr)	Stationary Sources emissions from sources currently exempt (lbs/yr)	Stationary Sources emissions from sources currently subject (lbs/yr)	Mobile Sources On-Road Mobile Source Emissions (lbs/yr)	Mobile Sources Non-Road Mobile Source Emissions (lbs/yr)	emissions from sources currently exempt (lbs/yr)	emissions from sources currently subject (lbs/yr)	total emissions (lbs/yr)
Benzene	28,480	117,970	16,452	27,538	2,679,465	996,298	**3,720,694**	145,509	**3,866,203**
Formaldehyde	17,372	1,555	15,721	15,268	0	1,202,855	**1,235,948**	16,824	**1,252,771**
Trichloroethylene	0	530,676	0	58,099	0	0	**0**	588,775	**588,775**
Methylene chloride	143	421,521	478	6	0	0	**621**	421,527	**422,148**
Acetaldehyde	1,750	661	3,827	21,512	0	375,597	**381,174**	22,173	**403,347**
1,3-Butadiene	0	53	0	1,286	0	234,867	**234,867**	1,340	**236,206**
Tetrachloroethylene	64	195,170	71	1,950	0	0	**135**	197,120	**197,256**
1,3-Dichloropropene	0	192,160	0	0	0	0	**0**	192,160	**192,160**
Nickel Compounds	151	83,759	8,516	43	171	0	**8,838**	83,802	**92,640**
Lead Compounds	401	437	6,307	404	71,321	0	**78,029**	840	**78,870**
Acrolein	23,052	818	446	627	0	51,365	**74,863**	1,445	**76,308**
p-Dichlorobenzene	0	42,959	0	1	0	0	**0**	42,960	**42,960**
Ethylene oxide	0	18,608	0	18,440	0	0	**0**	37,048	**37,048**
Manganese Compounds	941	0	24,888	42	3,431	0	**29,261**	42	**29,302**
Chloroform	12	14,952	56	8,539	0	0	**67**	23,491	**23,559**
Methyl chloride	49	7,338	264	0	0	0	**312**	7,338	**7,651**
Chromium Compounds	144	0	3,733	31	256	0	**4,133**	31	**4,164**
Acrylonitrile	0	3,267	0	211	0	0	**0**	3,478	**3,478**
Vinyl chloride	8	3,353	0	1	0	0	**8**	3,353	**3,361**
Carbon tetrachloride	319	2,410	0	438	0	0	**319**	2,848	**3,168**
Cadmium Compounds	122	0	732	15	0	0	**854**	15	**869**
Mercury Compounds	124	0	381	136	57	0	**562**	137	**698**
Beryllium Compounds	118	0	272	0	197	0	**588**	0	**588**
Arsenic Compounds	195	0	192	68	0	0	**387**	68	**455**
Ethylene dichloride	15	301	0	5	0	0	**15**	306	**321**
Propylene dichloride	14	172	0	6	0	0	**14**	179	**193**
Ethylene dibromide	0	1	0	5	0	0	**0**	6	**6**
Hexachlorobenzene	0	0	0	0	0	0	**0**	0	**0**
Dioxin/Furan TEQ	0.0000036	0	0.0028	0.0016	0	0	**0.0028**	0.0016	**0.0044**
Total	**73,475**	**1,638,143**	**82,334**	**154,672**	**2,754,897**	**2,860,982**	**5,771,688**	**1,792,815**	**7,564,503**

Figure 4 – Total New Hampshire Air Toxics Emissions by Source Category

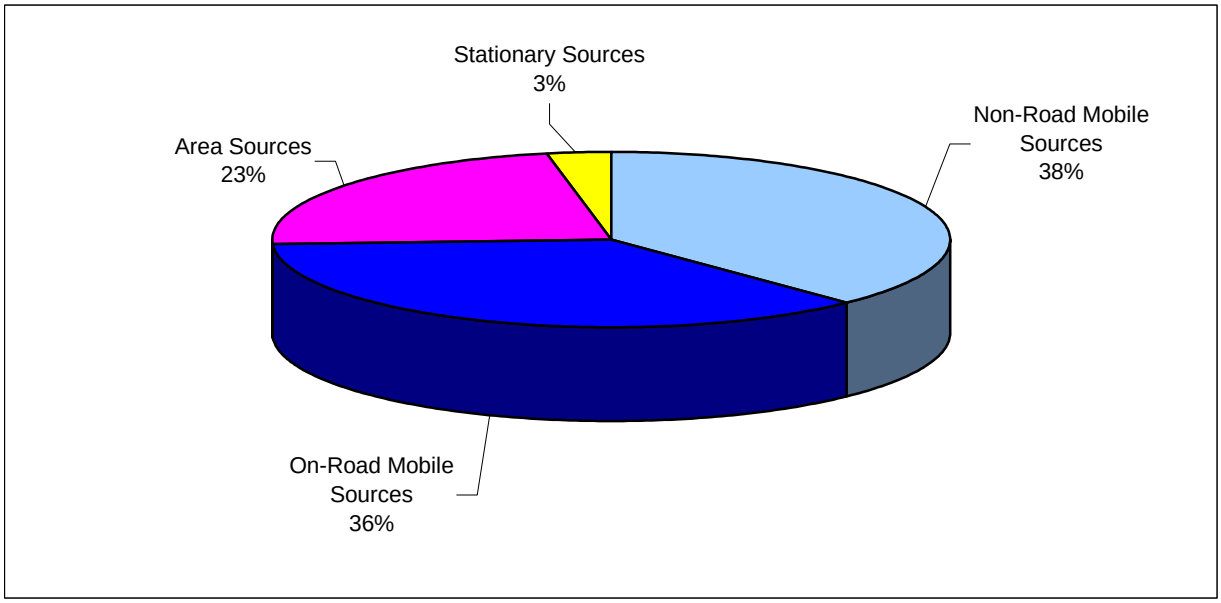
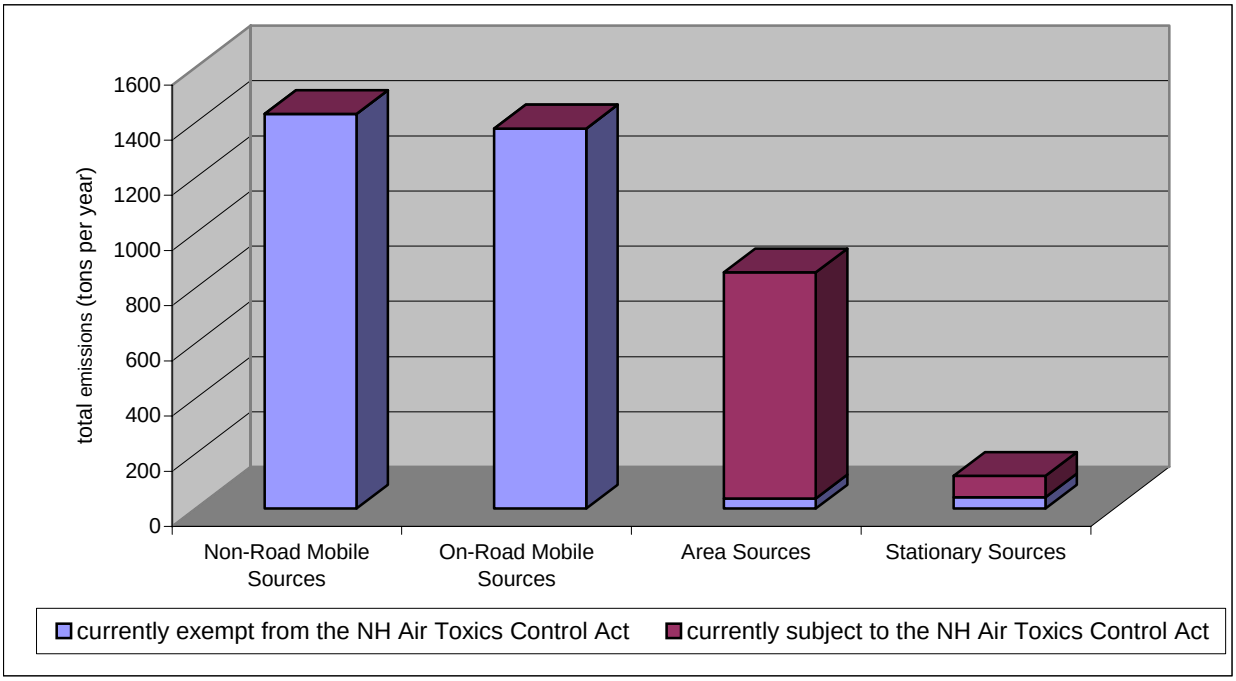


Figure 5
Total Exempt and Non-Exempt Air Toxics Emissions By Source Category



C. **Air Toxics and Human Health in New Hampshire:** Since toxic air pollutants differ considerably in their toxic effects and levels of toxicity, the Committee was interested not only in examining total releases of chemicals to the air from various sources, but also the "relative risk" of health effects from exposure to these pollutants and the distribution of potential health risks across the state. To accomplish this, the Committee examined data from EPA's National Air Toxics Assessment (NATA) for New Hampshire. The NATA project uses air toxics emissions inventory data for *"priority toxics"* (provided by DES as described above for New Hampshire) to predict concentrations of these pollutants in the ambient air everywhere in the US, and assesses the relative risks to human health from exposure these pollutants. The goal of the NATA is to identify those toxic air pollutants that are of greatest potential concern in terms of contribution to potential adverse health effects, and to set priorities for future air toxics control measures. The most recent NATA evaluation was conducted using 1996 emissions data. DES has evaluated and used this data extensively for evaluating the effectiveness of the New Hampshire Air Toxics Control Program and other air pollution control efforts in the state.

The NATA evaluation consists of a 4 –step process that includes:

1. quantifying the releases of toxic air pollutants into the ambient air from all sources;
2. estimating annual average concentrations of toxic pollutants in the air everywhere in the United States by conducing a dispersion modeling analysis of these emissions;
3. predicting the exposure of local populations to these pollutants; and
4. assessing the risk of cancer and non-cancer adverse health effects resulting from these exposures.

The results of this evaluation for New Hampshire were complied and analyzed by DES and are summarized in Table 8 and Figures 6&7. Results indicate that 6 of the approximately 30 *priority toxics* each represent a risk to human health at or above the 1 in 1 million benchmark level **everywhere** in the US including New Hampshire, and that 7 of these pollutants represent over 90% of these risks to human health in New Hampshire. Overall, **fuel combustion**, particularly from **mobile sources** is the primary source of these risks. As mentioned previously, fuel combustion and mobile sources are all currently exempt from the New Hampshire Air Toxics Control Program. In addition, human health risk from exposure to air toxics across the state tends to correlate closely with population and traffic density. It should also be noted that the NATA data presented here evaluates *average, annual state-wide* risks only, that communities may be more affected by local sources, and that actual risk drivers may vary from day to day and location to location.

Figure 6

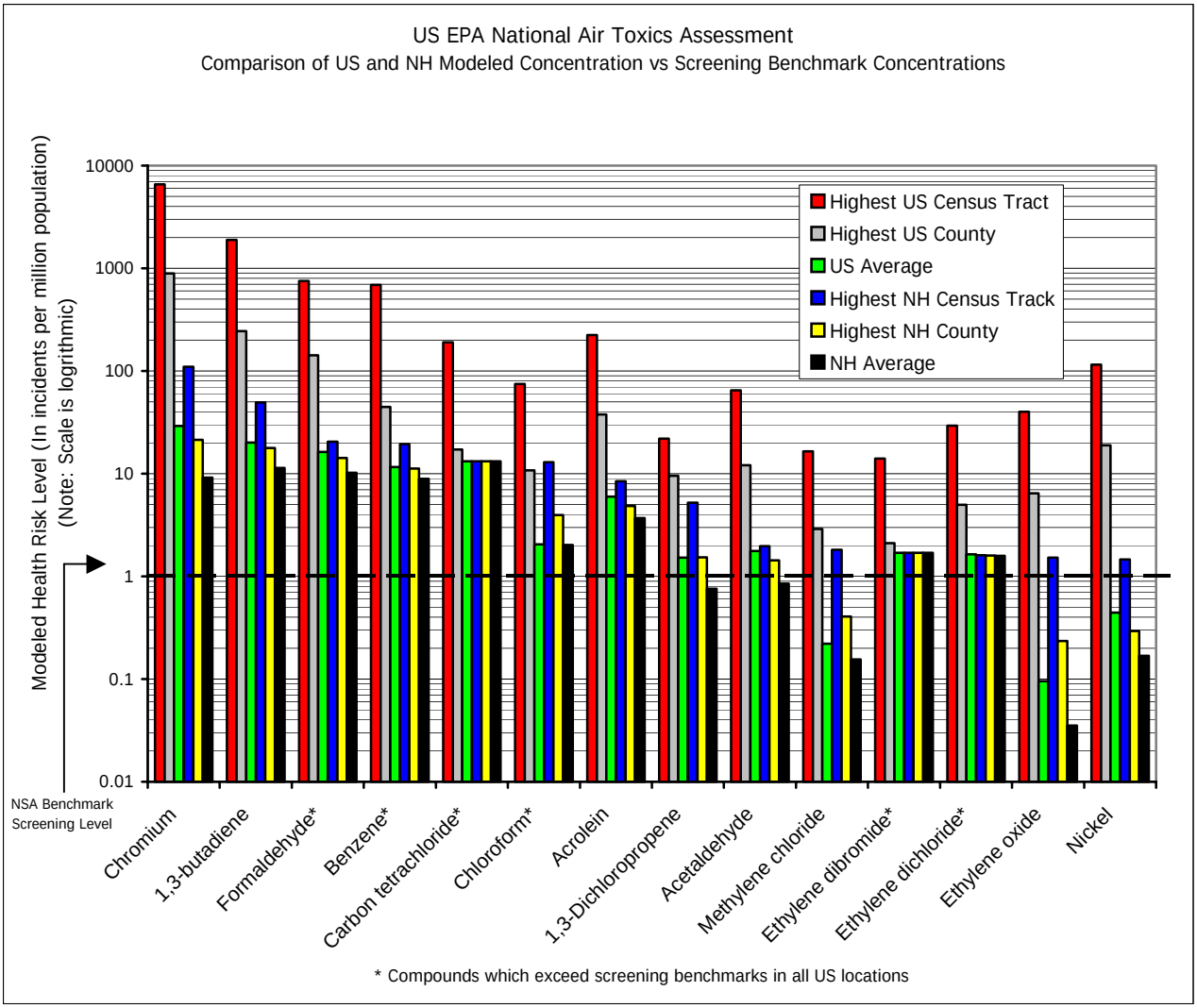
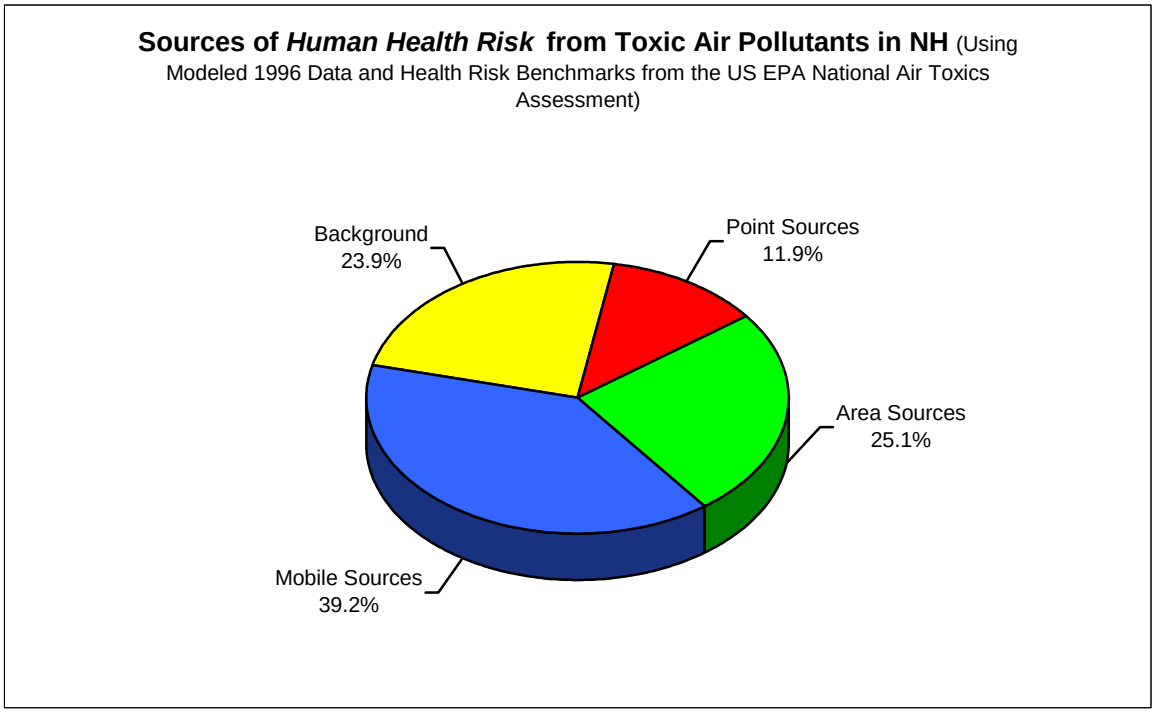


Table 8
EPA National Air Toxics Assessment – New Hampshire Human Health Risk by Pollutant

Chemical Name	NATA Screening Benchmark (ug/m3)	NH State-Wide Average (ug/m3)	NH State-Wide Risk Contribution
Carbon tetrachloride	0.067	0.88	**20.4%**
1,3-butadiene	0.0036	0.041	**17.6%**
Formaldehyde	0.077	0.78	**15.8%**
Chromium	0.000080	0.00073	**14.2%**
Benzene	0.12	1.1	**13.8%**
Acrolein	0.020	0.074	**5.7%**
Chloroform	0.044	0.088	**3.1%**
Ethylene dibromide	0.0046	0.0077	2.6%
Ethylene dichloride	0.039	0.061	2.5%
Acetaldehyde	0.46	0.39	1.3%
1,3-Dichloropropene	0.063	0.047	1.2%
Trichloroethylene	0.59	0.11	0.3%
Nickel	0.0050	0.00084	0.3%
Methylene chloride	2.1	0.33	0.2%
Arsenic	0.00023	0.000032	0.2%
Perchloroethylene	1.7	0.22	0.2%
Vinyl chloride	0.012	0.0014	0.2%
Acrylonitrile	0.015	0.0010	0.1%
Ethylene oxide	0.044	0.0015	0.1%
Cadmium	0.00056	0.000018	0.0%
1,1,2,2-tetrachloroethane	0.017	0.0005	0.0%
Beryllium	0.00042	0.0000067	0.0%
Manganese	0.050	0.00078	0.0%

Figure 7



D. **Air Toxics Impacts of Exempt Stationary Sources:** Based on the emissions inventory information and air toxics human health risk analysis described above, it was evident to the Committee that further evaluation of the air toxics impacts of exempt stationary source fuel combustion processes was warranted. As a result, the Committee asked DES to conduct an analysis of ambient air impacts from exempt fuel-burning sources to determine whether or not their current emissions would comply with the requirements of the NH Air Toxics Control Program. In order to accomplish this, DES selected a variety of NH sources with common combustion devices that burn "virgin fuels". Using EPA "AP-42" air toxics emission factors for these combustion devices and fuels, DES conducted air dispersion modeling analyses and compared ambient air toxics impacts with corresponding ambient air limits (AALs) in the NH Air Toxics Control Program. A summary of the devices and fuel types evaluated is presented in Table 9, and results of the analyses are presented in Tables 10&11.

Table 9 - Representative Sources and Fuels Evaluated

Representative Sources	Representative Fuels
Industrial Boilers	Distillate (#2) Fuel Oil
Commercial Boilers	Residual (#6) Fuel Oil
Stationary Internal Combustion Engines	Diesel Fuel
Power Plants	Natural Gas
Small Electric Generator Units	Wood
Industrial Processes	Coal

Table 10
Comparison of Emissions from Representative Exempt Sources with NH Ambient Air Limits

Unit Type Fuel	Sm. Hospital Boiler #4 Fuel Oil		Lg. Hospital Boilers #6 Fuel Oil		New Public School Boilers Natural Gas		Old Public School Boilers #2 Fuel Oil		Commercial Boiler #6 Fuel Oil		Industrial Boiler #6 Fuel Oil	
	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)
benzene	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ethylbenzene	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
formaldehyde	2.1%	0.3%	1.8%	1.1%	8.8%	1.3%	6.1%	1.4%	0.6%	0.1%	1.1%	0.2%
naphthalene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1,1,1-trichloroethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
toluene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
o-xylene	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
benz(a)anthracene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
benzo[b]fluoranthene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
chrysene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
phenanthrene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
pyrene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
arsenic	1.3%	0.2%	2.6%	1.6%	0.8%	0.1%	3.9%	0.9%	0.9%	0.2%	1.6%	0.3%
beryllium	1.8%	0.2%	0.1%	0.0%	0.1%	0.0%	5.2%	0.8%	0.0%	0.0%	0.1%	0.0%
cadmium	1.0%	0.1%	0.8%	0.5%	4.6%	0.7%	2.9%	0.7%	0.3%	0.1%	0.5%	0.1%
chromium	1.0%	0.1%	1.6%	1.0%	5.9%	0.9%	2.9%	0.7%	0.6%	0.1%	1.0%	0.2%
copper	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
lead	0.6%	0.1%	0.6%	0.4%			1.7%	0.4%	0.2%	0.0%	0.4%	0.1%
mercury	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%
nickel	0.1%	0.0%	16.5%	10.2%	0.9%	0.1%	0.3%	0.1%	5.8%	1.3%	10.3%	1.8%
selenium	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%
zinc	0.0%	0.0%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%

Table 11
Comparison of Emissions from Representative Exempt Sources with NH Ambient Air Limits

Unit Type	Wood-Fired Boiler		Wood-Fired Boiler		Wood-Fired Power Plant		Gas Turbine Power Plant		Coal-Fired Power Plant				Power Generator	
Fuel	Waste Wood		Wood Chips		Wood Chips		Natural Gas		Bituminous Coal		Diesel Engines Diesel Fuel		#2 Fuel Oil	
	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)	(% of 24-hr AAL)	(% of annual AAL)
benzene	4.7%	0.7%	10.3%	1.9%	5.0%	1.7%	0.0%	0.0%	0.3%	0.1%	9.5%	0.5%	0.0%	0.0%
ethylbenzene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%			0.0%	0.0%
formaldehyde	21.5%	3.0%	47.4%	8.5%	22.8%	7.9%	4.4%	0.2%	0.2%	0.0%	52.8%	2.7%	2.0%	0.2%
acetaldehyde	0.0%	0.1%	0.1%	0.2%	0.0%	0.1%			0.0%	0.0%	0.3%	0.2%		
acrolein	31.0%	**121.9%**	68.4%	**339.2%**	32.9%	**315.0%**			0.4%	2.2%	6.6%	9.2%		
naphthalene	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
1,1,1-trichloroethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%
toluene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
o-xylene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
benz(a)anthracene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.7%	0.3%	0.0%	0.0%
benzo[b]fluoranthene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
chrysene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
phenanthrene	0.1%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
pyrene	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
benzo(a)pyrene	3.3%	0.3%	7.3%	0.9%	3.5%	0.8%			0.0%	0.0%	2.2%	0.1%		
arsenic	3.9%	0.6%	8.6%	1.6%	4.1%	1.4%	0.4%	0.0%	14.1%	2.6%			1.2%	0.2%
beryllium	0.3%	0.0%	0.8%	0.1%	0.4%	0.1%	0.0%	0.0%	1.3%	0.2%			1.7%	0.1%
cadmium	0.7%	0.1%	1.6%	0.3%	0.8%	0.3%	2.3%	0.1%	1.8%	0.3%			0.9%	0.1%
chromium	3.7%	0.5%	8.2%	1.5%	3.9%	1.4%	3.0%	0.2%	9.0%	1.6%			0.9%	0.1%
copper	0.1%	0.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%					0.0%	0.0%
lead	1.7%	0.2%	3.7%	0.7%	1.8%	0.6%			2.9%	0.5%			0.6%	0.1%
mercury	0.1%	0.0%	0.2%	0.0%	0.1%	0.0%	0.1%	0.0%	0.3%	0.0%			0.1%	0.0%
nickel	0.6%	0.1%	1.3%	0.2%	0.6%	0.2%	0.4%	0.0%	1.0%	0.2%			0.1%	0.0%
selenium	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.4%			0.2%	0.0%
zinc	0.1%	0.0%	0.2%	0.0%	0.1%	0.0%	0.1%	0.0%					0.0%	0.0%
hydrochloric acid									55.1%	9.1%				
hydrogen fluoride									22.7%	4.1%				

As indicated, emissions from most exempt stationary sources already comply with the air toxics AALs at this time, with the possible exception of one compound, acrolein, whose emissions from wood combustion sources were slightly above the annual AAL.

E. **Air Toxics Impacts of Exempt Area and Mobile Sources:** Based on the emissions inventory information and air toxics human health risk analysis, the Committee was also interested in the compliance status of exempt area and mobile sources. In order to complete this evaluation, the Committee asked DES to conduct an analysis of ambient air impacts of toxic air pollutants from typical, exempt fuel-burning area sources, and typical mobile source ambient air impacts.

DES accomplished this task for area sources by focusing on ambient air impacts of toxic air pollutants from home heating devices in a typical urban neighborhood. DES selected a typical, densely populated residential area in an urban community, determined the density of housing units, assumed each housing unit uses oil for heating and that each house burns the equivalent of the average NH household. Using EPA "AP-42" emission factors, DES conducted an air dispersion modeling analysis to determine ambient air impacts of the heating devices as a "group", and compared the resulting ambient air toxics impacts with corresponding ambient air limits (AALs). Assumptions used included:

- Average NH household burns 903 gal/yr of home heating oil
- Based on Nashua, NH heating degree day data, peak monthly fuel use is 172 gallons per household (January).
- All homes in an area 500m X 500m were assumed to burn oil for heating and comprised the "area" source.
- Using Nashua GIS data, there are approximately 165 homes in a typical residential area of 500m X 500m.
- The "area" source was modeled and emissions impacts were compared with AALs.

The typical neighborhood evaluated is depicted in Figure 8, and results of the area source evaluation are presented in Table 12. As indicated, ambient air impacts for toxic air pollutants were well within the AALs.

Figure 8
Typical 500m x 500m Urban Neighborhood Evaluated – Nashua, NH

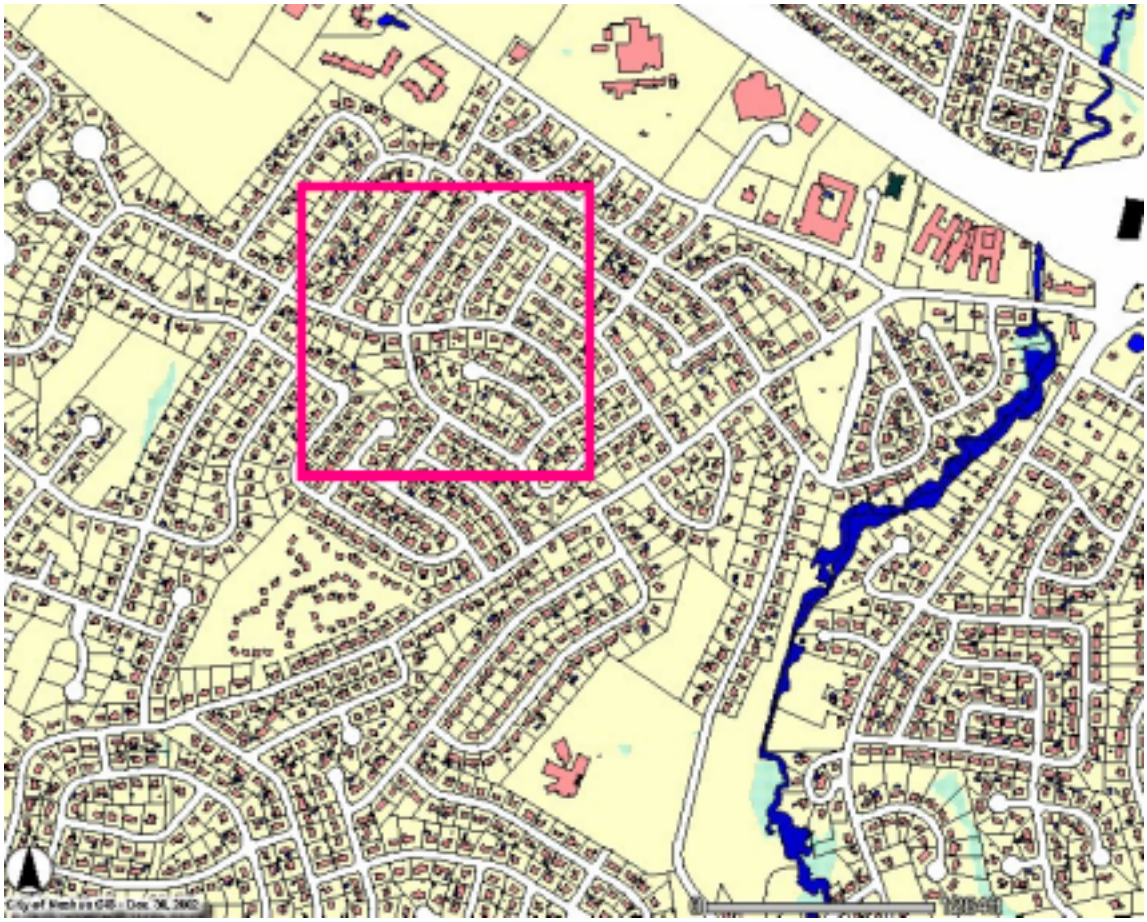


Table 12
Comparison of "Area Source" Emissions for Typical Residential Home Heating with NH Ambient Air Limits (AALs)

RTAP	24-hr Impact (ug/m3)	24-hr AAL (ug/m3)	Annual Impact (ug/m3)	Annual AAL (ug/m3)
Acetaldehyde	0.0028	161	0.0014	9.0
Arsenic	0.00032	0.036	0.00016	0.024
Benzene	0.00012	5.7	0.000060	3.8
Benzo[b]fluoranthene	0.00000089	0.36	0.00000044	0.24
Beryllium	0.00024	0.020	0.00012	0.020
Cadmium	0.00024	0.036	0.00012	0.024
Chromium	0.00024	0.036	0.00012	0.024
Chrysene	0.0000014	0.36	0.0000007	0.24
Formaldehyde	0.019	1.3	0.010	0.88
Lead	0.00073	0.18	0.00036	0.12
Manganese	0.00049	1.0	0.00024	0.050
Mercury	0.00024	0.30	0.00012	0.30
Naphthalene	0.00066	186	0.00033	3.0
Nickel, metal	0.00024	3.6	0.00012	2.4
Phenanthrene	0.000006	0.71	0.0000030	0.48
Pyrene	0.0000024	0.71	0.0000012	0.48
Selenium	0.0012	0.71	0.00060	0.48

A similar evaluation was conducted for mobile source impacts. DES selected one busy roadway intersection and one heavily traveled highway section. For each of these locations, DES determined the peak hourly traffic volumes, and using standard emission factors and assuming a standard vehicle type mix for NH, conducted mobile source air dispersion modeling to determine ambient air impacts of the intersection and the highway stretch. To complete the analysis, DES conducted the following:

- Selected one busy intersection and one congested interstate highway stretch in Salem, NH using traffic volume data from DOT EIS for I-93 expansion project.
- Used typical signal cycle times and traffic speeds.
- Used peak hourly traffic flow data provided by DOT.
- The impact of mobile sources was modeled and emissions impacts were compared with AALs.

The modeled interstate highway section and highway intersection are depicted in Figure 9 and the results of the dispersion modeling analysis are presented in Tables 13&14.

As indicated modeled mobile source impacts from the representative high-traffic intersection and highway section under heavy traffic conditions show impacts near or over the AALs for several priority RTAPs. It should be noted, however, that these evaluations are only estimations, and that the actual impacts of mobile source emissions could vary considerably. In addition, it should be noted that these ambient air impacts are a result of emissions from vehicles traveling directly **on** or **through** the high-traffic areas, and do not include contributions from other nearby mobile sources.

Figure 9
Modeled Mobile Source Intersection and Highway Section

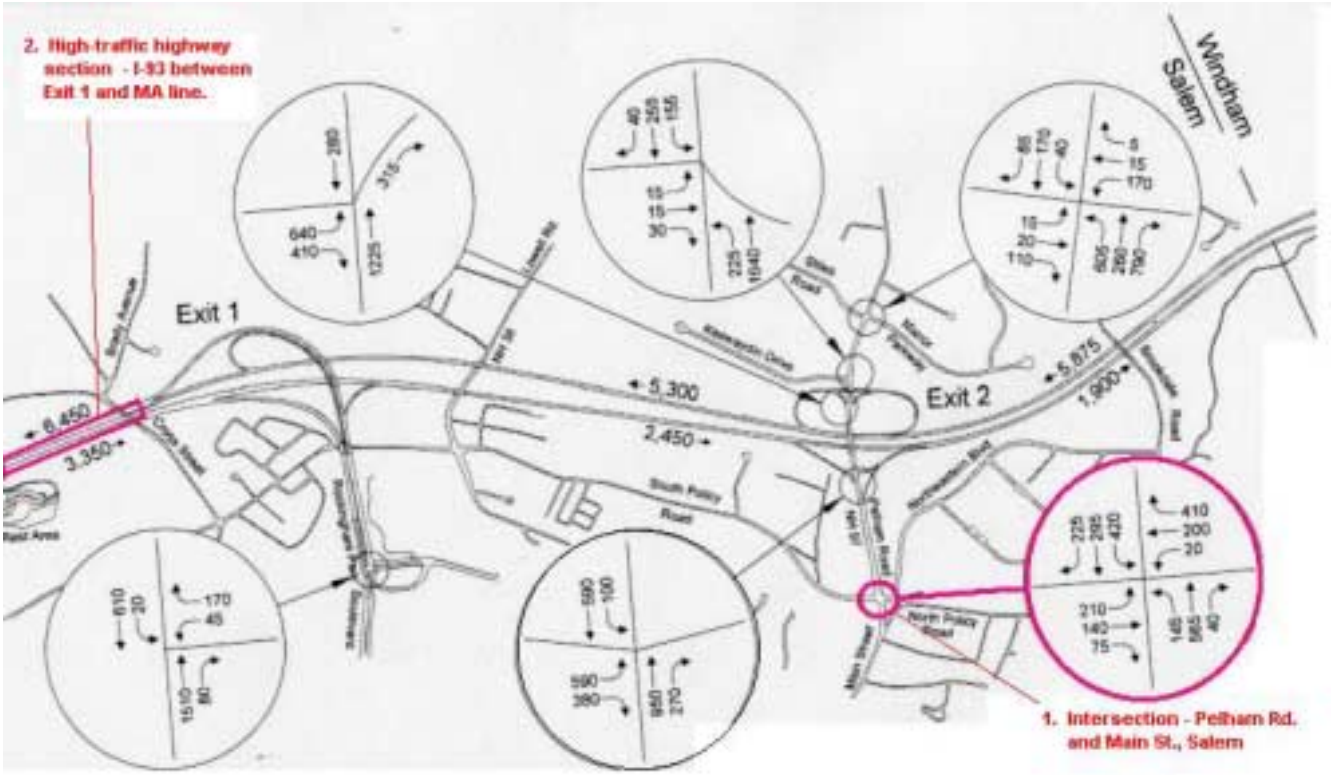


Table 13
Comparison of Mobile Source Emissions for Representative High-traffic Intersection with NH Ambient Air Limits (AALs)

Compound	24-hr Impact (ug/m3)	24-hr AAL (ug/m3)	Annual Impact (ug/m3)	Annual AAL (ug/m3)
Benzene	3.2	5.7	0.80	3.8
MBTE	7.2	3,000	1.8	3,000
1,3-Butadiene	0.4	16	0.10	10
Formaldehyde	**1.4**	**1.3**	0.60	0.88
Acetaldehyde	0.40	161	0.10	9.0
Acrolein	0.040	0.82	0.010	0.020
Toluene	14	671	3.5	400
Ethylbenzene	2.8	1,000	0.70	1,000
Xylene	9.6	1,550	2.4	1,033

Table 14
Comparison of Mobile Source Emissions for Representative High-traffic Intersection with NH Ambient Air Limits (AALs)

Compound	24-hr Impact (ug/m3)	24-hr AAL (ug/m3)	Annual Impact (ug/m3)	Annual AAL (ug/m3)
Benzene	5.2	5.7	1.3	3.8
MBTE	8.8	3,000	2.2	3,000
1,3-Butadiene	0.80	16	0.20	10
Formaldehyde	**3.4**	**1.3**	**1.1**	**0.88**
Acetaldehyde	0.80	161	0.20	9.0
Acrolein	0.040	0.82	0.010	0.020
Toluene	16	671	4.0	400
Ethylbenzene	3.2	1,000	0.80	1,000
Xylene	10.8	1,550	2.7	1,033

F. **Summary of Key Findings:** The key findings of the Committee are summarized below:

1. There are a number of tools available for evaluating the impacts of toxic air pollutants in the state.
2. One such tool, EPA's Toxic Release Inventory (TRI) is useful in evaluating overall toxic releases from large stationary sources, but does not represent all stationary sources in the state, nor does it evaluate emissions with respect to the relative toxicity of chemical released.
3. Based on the DES emissions inventory of permitted stationary sources, approximately $^{2}/_{3}$ of all priority air toxics emitted by stationary sources come from facilities already subject to the NH Air Toxics Control Program.
4. Based on the DES inventory area source emissions, approximately 95% of all priority air toxics emitted by New Hampshire area sources come from facilities already subject to the NH Air Toxics Control Program.
5. An evaluation of all stationary, area and mobile source emissions in the state indicates that almost 75% of all priority toxics are emitted by mobile sources, which are currently exempt from the NH Air Toxics Control Program.
6. An evaluation of the human health risk drivers from air toxics in New Hampshire indicates that only 7 toxic air pollutants represent over 90% of human health risk in NH, and overall, fuel combustion is the primary source of these pollutants, particularly mobile sources.
7. Dispersion modeling evaluations of toxic air pollutant emissions from stationary sources that burn virgin fuels in NH indicate that the emissions from most sources and fuels are already in compliance with the requirements of the New Hampshire Air Toxics Control Program at this time with the possible exception of one compound, acrolein, whose emissions from wood combustion sources were slightly above the annual AAL.
8. Combined ambient air impacts from area sources (home heating in the representative residential neighborhood) were well below the AALs for the RTAPs evaluated.

10. Modeled mobile source impacts from one representative high-traffic intersection and one highway section under heavy traffic conditions show impacts near or over the AALs for several priority RTAPs. In addition, these evaluations only estimated the emissions from vehicles traveling directly **on** or **through** the high-traffic areas, and did not include contributions from other nearby mobile sources.

V. CONCLUSIONS/RECOMMENDATIONS

Based on the information gathered, the Committee is confident that **stationary** and **area** fuel combustion sources **in the state**, including coal and oil combustion from NH power plants, do not currently represent major health risks from **air toxics emissions**, and that expanding the New Hampshire Air Toxics Control Act to include these sources would do little at this time to improve air quality and human health in the state. However, it is evident that mobile sources are a major source of important toxic air pollutants in the state, and play a significant role in the exposure of New Hampshire citizens to toxic air pollutants and their health impacts. As a result, members of the Committee agreed that in order to address the increasing health risks from toxic air pollutants in the state, future efforts should focus more attention on reducing emissions from mobile sources. The 1990 Clean Air Act precludes states from taking direct action to set more stringent requirements for engine emissions and fuel quality than is required under federal law. More stringent federal regulations for both on-road and non-road engines and fuels will be implemented over the next 2-5 years, but will only affect emissions from **new** vehicles and equipment sold. Consequently, additional efforts to address mobile source air toxics in New Hampshire are limited mainly to measures that: encourage the use of cleaner fuels/technology; reduce our use of fuel burning vehicles and equipment; and increase enforcement of existing regulations. New Hampshire has already begun to address some of these concerns through programs such as:

- The ***Granite State Clean Cars*** program that is a partnership between DES, DOT, the New Hampshire Automobile Dealer's Association, and others to provide help consumers identify new automobiles with the lowest emissions.
- The DES ***School Bus anti-Idling Initiative*** that encourages New Hampshire school transportation providers to voluntarily reduce diesel school bus idling.
- The ***New Hampshire Clean Marine Engine Initiative*** that is a partnership between DES and the New Hampshire Marine Trades Association (NHMTA) to accelerate the phase-in and encourage consumers to purchase new, low-pollution marine engines in New Hampshire.
- The New Hampshire ***Alternative Fuel Vehicle Program*** that has introduced more than 30 electric, natural gas and hybrid-electric vehicles into the state's motor vehicle pool, as well as compressed natural gas refueling infrastructure.
- The New Hampshire DOT ***Rideshare*** program that encourages ridesharing and helps commuters find alternative ways to travel to and from work. The NH ***Rideshare*** program includes a comprehensive, statewide carpooling and ridesharing system, provides free commuter matching services, and includes 25 Park and Ride lots maintained for commuters by the DOT.
- New Hampshire DOT's participation in U.S. EPA's ***Congestion Mitigation Air Quality (CMAQ)*** program that helps fund these and other projects in the state that reduce air pollution emissions and ambient air impacts from mobile sources.

To further address these concerns, the Committee offers the following recommendations:

Encourage the use of cleaner fuels/technology:

1. Examine the possibility of New Hampshire joining other northeast states in adopting Low Emission Vehicle II (LEV II) standards for new vehicles.
2. Examine the possibility of providing tax credits/incentives to encourage consumers and businesses to purchase ultra-clean vehicles such as electric, hybrid electric, natural gas or fuel cell vehicles.
3. Examine the possibility of providing tax credits/incentives to encourage businesses and fleet operators to purchase new vehicles with "clean" diesel engines, or to retrofit existing vehicles with advanced pollution controls such as catalytic oxidizers and/or particulate matter filters.
4. Examine the possibility of providing incentives to develop infrastructure and/or subsidize the early availability of ultra-low sulfur diesel fuel in New Hampshire.
5. Encourage and promote requiring state government to purchase clean technology or low emissions vehicles and associated infrastructure for all new state agency vehicles (NH is currently working with the New England Governor's Conference on a regional cooperative agreement).

Reduce our use of fuel burning vehicles and equipment:

6. Examine the possibility of requiring and/or assisting state and local land use planning organizations to consider transportation air quality impacts of new development projects.
7. Encourage the use of public transportation systems such as commuter rail.
8. Encourage DOT and DES to assist New Hampshire businesses and communities to adopt car pool, ride share, or telecommuting options for employees.
9. Encourage the development infrastructure that allows citizens to use alternative transportation such as bicycling/walking to travel to from work/schools/commercial areas.

Increase enforcement of existing regulations:

10. Examine the possibility of authorizing local law enforcement departments to enforce New Hampshire's existing anti-idling regulations/laws.
11. Examine the possibility of authorizing local law enforcement departments to enforce New Hampshire's existing diesel opacity regulations/laws.

Finally, the Committee recognizes that efforts to reduce emissions from mobile sources in New Hampshire must be adequately funded in order to be successful. At DES, funding for most air pollution control programs is derived mainly through a combination of emissions-based fees for air pollution emissions from permitted stationary sources and federal grants. Over the last several years, stationary source emissions have continued to decrease, resulting in the increasing role of mobile sources as principal sources of air pollution emissions. Despite this changing situation, permitted stationary sources are still the primary source of funding for air pollution control programs, and no mechanism is currently in place to shift a portion of the financial burden to mobile sources, the principal air pollution source. As a result, the Committee offers the following additional recommendations:

Funding Options:

12. Consider funding mobile source air pollution control programs at DES through a dedicated environmental assessment on motorized vehicles registered in the state.