POLLUTION CONTROL DIVISION

ANNUAL REPORT 2001

Mayor of Metropolitan Government of

Nashville & Davidson County

The Honorable Bill Purcell

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The Metro Public Health Department is committed to providing health prtection, promotion and information products to everyone in Nashville so they can enjoy healthy living free from disease, injury and disability.

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3. INTRODUCTION

The 1990 Clean Air Act Amendments state, "The prevention and control of air pollution at its source is a primary responsibility of state and local governments." Chapter 10.56 of the Metropolitan Code of Laws charges the Metropolitan Board of Health with the responsibility of adopting, promulgating, and enforcing such rules and regulations as necessary to achieve and maintain such levels of air quality as will protect human health and safety, and to the greatest degree practical, prevent injury to plant life and property and foster the comfort and convenience of the inhabitants of the Metropolitan Government area. This report covers the activities conducted by the Metro Public Health Department, Pollution Control Division in carrying out these responsibilities for the calendar year 2001.

The purpose and objective of the Division of Pollution Control is to protect and enhance the quality of ambient air in Metropolitan Nashville and Davidson County so as to protect the public health and welfare of the population.

4. ENGINEERING ACTIVITIES

Table I and Figures 1 through 5, present the 2001 annual emission inventory for five criteria pollutants (particulate matter, sulfur dioxide, nitrogen oxide, carbon monoxide, and volatile organic compounds).

Figure 1 shows that miscellaneous sources account for 91% of the total 2001 particulate emissions. Dust from paved roads accounts for 86% of the total 2001 particulate emissions. Figure 2 shows that fuel combustion accounts for approximately 68% of the total 2001 sulfur dioxide emissions. Figure 3 shows that the on-road and non-road mobile source emissions account for 84% of the total 2001 nitrogen oxide emissions. Figure 4 shows that 94% of the 2001 carbon monoxide emissions are contributed by on-road and non-road mobile sources. Figure 5 shows that on-road and non-road mobile sources account for approximately 58% of the total 2001 volatile organic compound emissions, and approximately 14% is contributed by other solvent usage including degreasing, graphic arts, and consumer/commercial solvents.

Table II and Figure 6, are a comparison of Nitrogen Dioxide and Volatile Organic Compound emissions for the past nine (9) years.

In 2001 an annual hazardous air pollutant emission inventory was completed. The 2001 hazardous air pollutant inventory is shown in Table III.

During 2001, the Engineering Section reviewed plans and specifications for 62 new and/or modified stationary sources and issued the following permits:

Construction Permits:	49
Operating Permits:	516

In addition to the above permits, 193 permits were issued for asbestos removal and 7 burning permits using an air curtain destructor were issued. Revenue generated from the issuance of permits in 2001 was $521,320.50.

During 2001 this agency observed the following compliance source tests:

4	Particulate
3	Nitrogen Oxides
3	Volatile Organic Compound
3	Hydrogen Chloride
3	Carbon Monoxide
3	Dioxin/furan
3	Sulfur Dioxide

5. PART 70 OPERATING PERMIT PROGRAM

On October 13, 1993, the Metropolitan Board of Health adopted Regulation No. 13, "Part 70 Operating Permit Program". Subsequently, EPA granted full approval to the Metropolitan Health Department, Pollution Control Division's Part 70 Operating Permit Program. All affected facilities were required to submit Part 70 Operating Permit Applications to the Pollution Control Division within twelve months of the effective date of March 15, 1996. The Pollution Control Division received four (4) applications in 1996, eleven (11) applications during 1997 and two (2) applications in 1998. All seventeen (17) applications were reviewed and determined to be complete. Subsequently, five (5) Part 70 Operating Permits were issued in 1997, six (6) were issued in 1998 and three (3) were issued in 1999. The remaining three (3) permits were issued in 2000. The following facilities have received a Part 70 Operating Permit. OMC-Stratos Boats closed shortly after their Part 70 Operating Permit was issued. Therefore, there are currently sixteen (16) facilities operating in Davidson County with Part 70 Operating Permits.

Permit Number	Issue Date	Facility Name
70-0002	2000	E.I. du Pont de Nemours and Co.
70-0025	2000	Opryland USA
70-0039	1997	Vanderbilt University
70-0040	1999	Visteon
70-0042	1999	The Aerostructures Corporation
70-0045	1998	Bruce Hardwood Flooring, LLC
70-0050	1998	Nashville Thermal Transfer Corp.
70-0074	1997	Ouimet Corporation
70-0085	1998	OMC-Stratos Boats
70-0081	1998	U.S. Tobacco Manufacturing Co.
70-0120	1999	Peterbilt Motor Company
70-0133	1997	Gibson Fiberglass
70-0141	1998	Whirlpool Corporation
70-0154	1997	Aqua Bath
70-0189	1998	Bordeaux Landfill
70-0241	1997	Vanderbilt Medical Center
70-0255	2000	MM Nashville Energy

TABLE I
2001 DAVIDSON COUNTY ANNUAL EMISSION INVENTORY

STATIONARY SOURCES—TONS PER YEAR										
	PARTICULATE		SULFUR OXIDES		NITROGEN OXIDES		CARBON MONOXIDE		VOL. ORG. COMP.	
SOURCE CATEGORY	AREA	POINT	AREA	POINT	AREA	POINT	AREA	POINT	AREA	POINT
TRANS. & MKT. OF VOC										
VOL Storage & Handling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0
Bulk Gasoline Terminals	0.0	0.0	0.0	0.0	0.0	5.8	0.0	19.5	8.6	229.3
Bulk Gasoline Plants	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.0
Tank Truck Unl. (Stage I)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	186.3	0.0
Vehicle Refuel. (Stage II)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	151.0	0.0
Tank Trucks in Transit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.9	0.0
SUBTOTAL	0.0	0.0	0.0	0.0	0.0	5.8	0.0	19.5	403.7	229.3
TOTAL AREA + POINT	0.0		0.0		5.8		19.5		633.0	
INDUSTRIAL PROCESSES										
Adhesives	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.2
Aerospace	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	6.9	464.4
Misc. Metal Products	1.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	41.5	71.1
Inorganic Chemical Mfg.	0.0	12.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
Organic Chemical Mfg.	0.0	8.7	0.0	0.0	0.0	0.0	0.0	3,793.7	0.0	854.0
Textile Mfg.	7.8	44.3	0.0	0.0	0.2	0.0	0.2	0.0	4.7	11.9
Rubber Tire Mfg.	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0
Plastic Products Mfg.	0.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	7.3	32.0
Fiberglass Mfg.	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	24.7
Wood Products Mfg.	1.7	13.8	0.0	0.3	0.0	10.5	0.0	214.7	63.3	138.8
Clay & Glass	8.0	170.8	0.0	307.7	0.0	1,335.4	0.0	20.0	2.2	35.5
Mineral Products	86.2	47.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Asphalt Plants	11.2	26.4	1.5	28.3	6.8	11.9	46.0	153.0	6.4	32.8
Paint Mfg.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.8	0.0
Food & Agriculture	2.6	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.4
Primary/Sec. Metals	3.0	0.0	1.2	0.0	0.4	0.0	3.1	0.0	0.6	0.0
Fabric/Vinyl Coating	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.8
Large Appliance Coating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.0
Ship Building	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBTOTAL	123.6	327.9	2.6	336.3	7.4	1,357.8	49.2	4,181.4	155.7	1,819.8
TOTAL AREA + POINT	451.5		338.9		1,365.2		4,230.7		1,975.5	

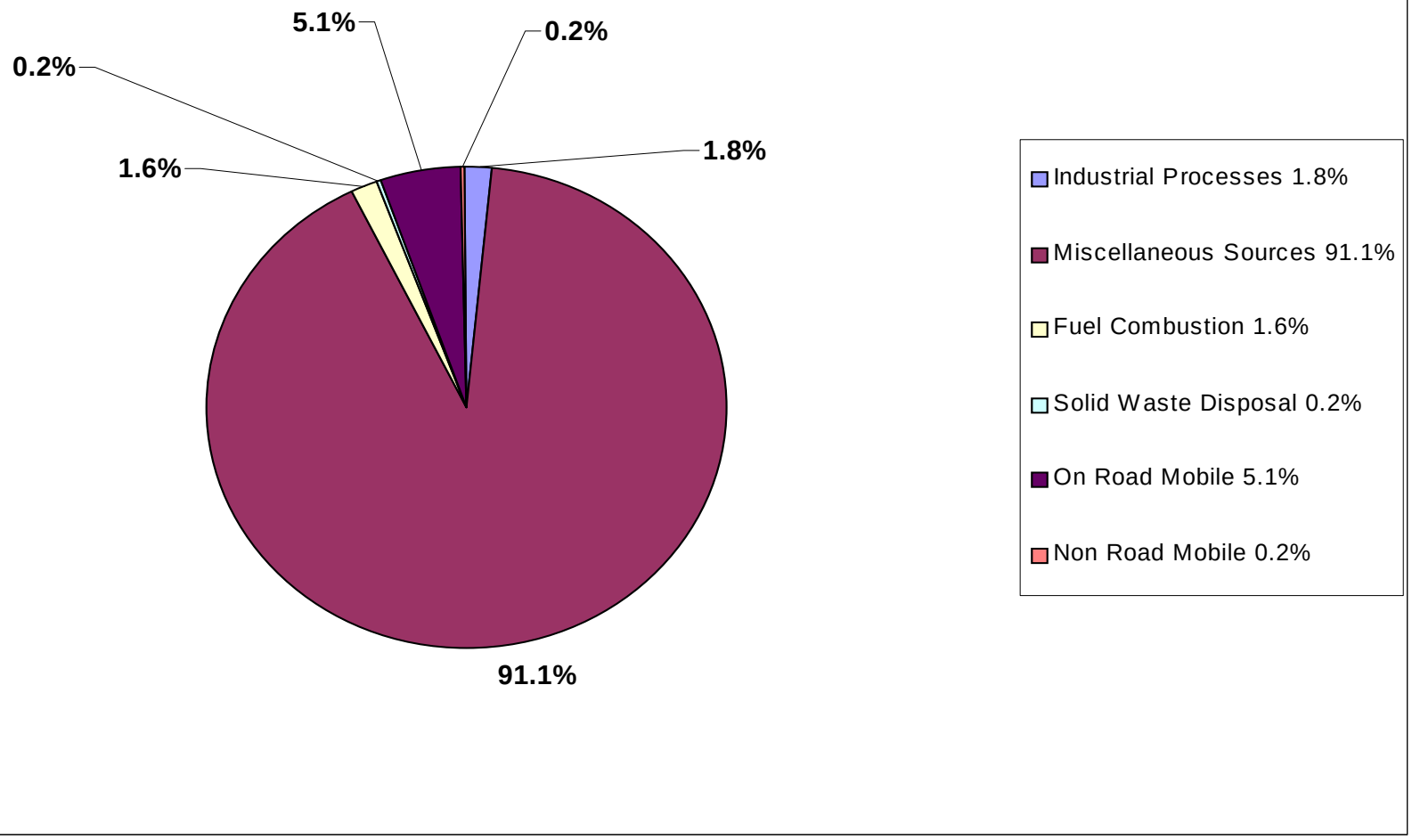
TABLE I (continued)
2001 DAVIDSON COUNTY ANNUAL EMISSION INVENTORY

STATIONARY SOURCES—TONS PER YEAR										
	PARTICULATE		SULFUR OXIDES		NITROGEN OXIDES		CARBON MONOXIDE		VOL. ORG. COMP.	
SOURCE CATEGORY	AREA	POINT	AREA	POINT	AREA	POINT	AREA	POINT	AREA	POINT
NON-IND. SURFACE COAT.										
Architectural	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,026.1	0.0
Auto Refinishing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	728.4	0.0
Traffic Markings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	130.1	0.0
SUBTOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,884.7	0.0
TOTAL AREA + POINT	0.0		0.0		0.0		0.0		1,884.7	
OTHER SOLVENT USE										
Cold Cleaners (exc. Perc)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,017.6	0.0
Degreas. (exc. Cold clean.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.0
Graphic Arts	0.6	0.0	0.0	0.0	1.4	1.2	0.4	3.7	107.7	120.5
Dry Cleaning (exc. Perc)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0
Cons./Comm. Solv. Use	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,713.0	0.0
SUBTOTAL	0.6	0.0	0.0	0.0	1.4	1.2	0.4	3.7	2,846.3	152.5
TOTAL AREA + POINT	0.6		0.0		2.7		4.1		2,998.8	
MISC. SOURCES										
Pesticide Application	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	503.2	0.0
Landfills	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0
Scrap and Waste Material	16.9	0.0	0.5	0.0	7.1	0.0	1.5	0.0	0.6	0.0
Biogenic (PCBEIS)	na	na	na	na	na	na	na	na	na	na
Dust From Paved Roads	21,548.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Projects	1,206.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agricultural Tilling	74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBTOTAL	22,845.7	0.0	0.5	0.0	7.1	0.0	1.5	0.0	503.7	15.0
TOTAL AREA + POINT	22,845.7		0.5		7.1		1.5		518.7	
FUEL COMBUSTION										
Residential	165.7	0.0	57.1	0.0	435.6	0.0	1,072.3	0.0	783.6	0.0
Commercial/Institutional	6.3	13.2	5.2	863.8	120.3	713.8	67.4	387.4	7.6	18.2
Industrial	0.0	212.6	0.0	6,145.6	0.0	1,847.9	0.0	344.0	0.0	17.2
Stationary Internal Comb.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBTOTAL	172.0	225.8	62.3	7,009.3	555.9	2,561.7	1,139.7	731.4	791.2	35.5
TOTAL AREA + POINT	397.8		7,071.7		3,117.6		1,871.1		826.6	
SOLID WASTE DISPOSAL										
Incinerators	1.2	0.9	0.2	84.1	0.8	402.9	0.7	126.1	0.2	11.7
POTW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.3	0.0
TSDF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Structure Fires (including auto/truck fires)	31.5	0.0	0.0	0.0	0.0	0.0	259.7	0.0	35.2	0.0
Forest & Grass Fires	22.8	0.0	0.0	0.0	0.3	0.0	101.1	0.0	24.7	0.0
SUBTOTAL	55.6	0.9	0.2	84.1	1.2	402.9	361.5	126.1	86.4	11.7
TOTAL AREA + POINT	56.5		84.3		404.1		487.6		98.1	
TOTAL STATIONARY SOURCES	23,197.4	554.7	65.6	7,429.7	573.0	4,329.4	1,552.3	5,062.1	6,671.7	2,263.7
TOTAL STA. AREA + POINT	23,752		7,495.3		4,902.3		6,614.5		8,935.4	

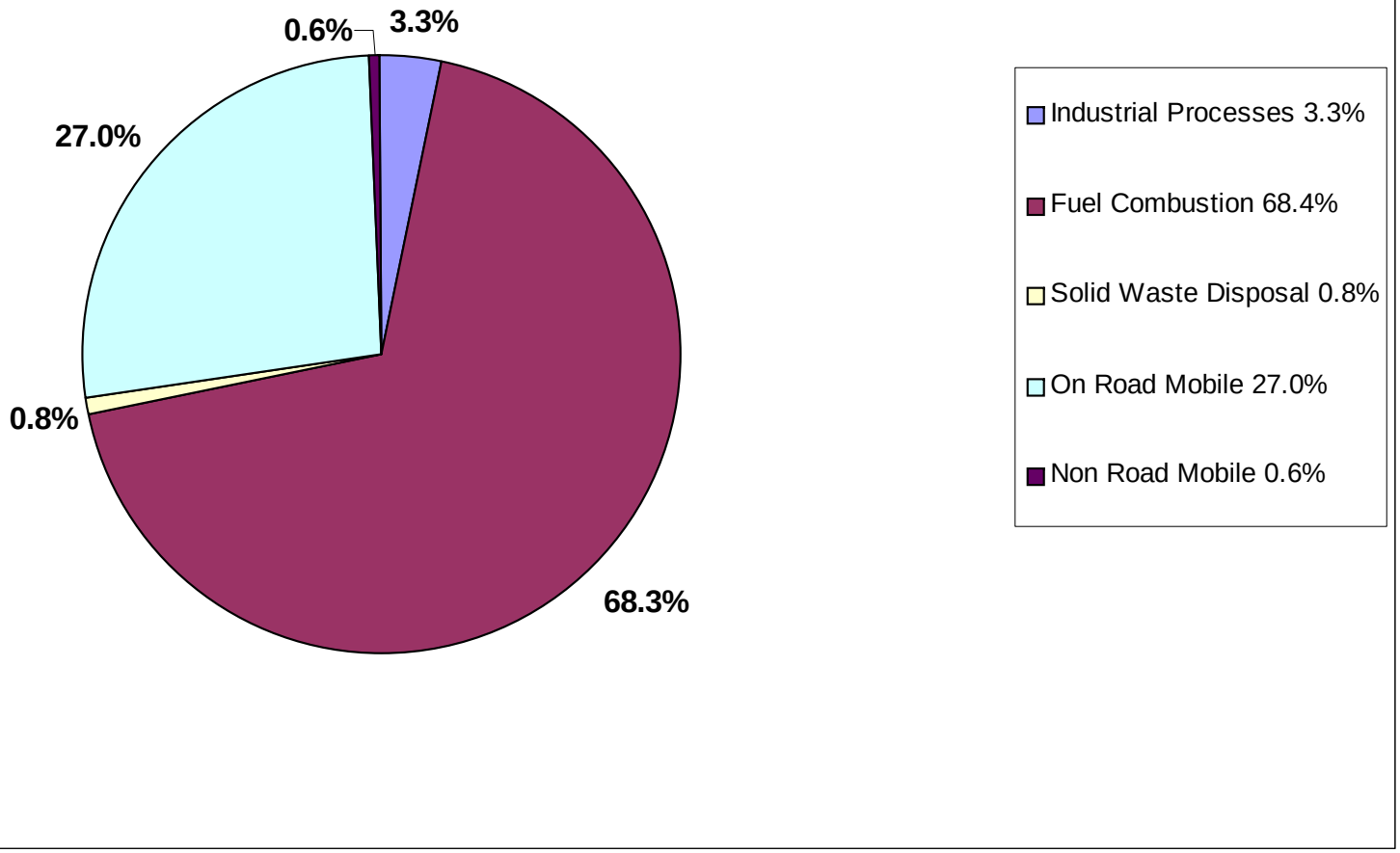
TABLE I (continued)
2001 DAVIDSON COUNTY ANNUAL EMISSION INVENTORY

MOBILE SOURCES—TONS PER YEAR										
	PARTICULATE		SULFUR OXIDES		NITROGEN OXIDES		CARBON MONOXIDE		VOL. ORG. COMP.	
SOURCE CATEGORY	AREA	POINT	AREA	POINT	AREA	POINT	AREA	POINT	AREA	POINT
ON-ROAD MOBILE										
LDGV	294.6	0.0	750.9	0.0	9,428.5	0.0	50,133.3	0.0	5,419.5	0.0
LDGT1	63.5	0.0	224.2	0.0	2,238.6	0.0	13,569.5	0.0	1,395.6	0.0
LDGT2	15.0	0.0	52.9	0.0	731.0	0.0	4,282.3	0.0	453.8	0.0
HDGV	72.3	0.0	63.0	0.0	1,057.9	0.0	4,522.4	0.0	302.9	0.0
LDDV	17.9	0.0	31.3	0.0	73.9	0.0	49.0	0.0	20.1	0.0
LDDT	5.5	0.0	8.8	0.0	22.9	0.0	14.8	0.0	7.3	0.0
HDDT	810.5	0.0	1,656.5	0.0	6,091.6	0.0	3,340.3	0.0	651.8	0.0
MC	0.9	0.0	0.6	0.0	25.1	0.0	213.8	0.0	40.3	0.0
SUBTOTAL	1,280.3	0.0	2,788.3	0.0	19,669.4	0.0	76,125.5	0.0	8,291.7	0.0
TOTAL AREA + POINT	1,280.3		2,788.3		19,669.4		76,125.5		8,291.7	
NON-ROAD MOBILE										
Railroad Locomotives	9.6	0.0	28.0	0.0	386.4	0.0	55.6	0.0	24.1	0.0
Aircraft	37.3	0.0	31.1	0.0	609.4	0.0	1,683.9	0.0	221.8	0.0
33-City Study/Off Highway	0.0	0.0	0.0	0.0	4,210.8	0.0	32,692.8	0.0	3,817.1	0.0
SUBTOTAL	46.9	0.0	59.1	0.0	5,206.5	0.0	34,432.3	0.0	4,063.0	0.0
TOTAL AREA + POINT	46.9		59.1		5,206.5		34,432.3		4,063.0	
TOTAL MOBILE SOURCES	1,327.1	0.0	2,847.4	0.0	24,876.0	0.0	110,557.8	0.0	12,354.7	0.0
TOTAL MOBILE AREA + POINT	1,327.1		2,847.4		24,876.0		110,557.8		12,354.7	
TOTAL STATIONARY + MOBILE	24,524.5	554.7	2,913.0	7,429.7	25,448.9	4,329.4	112,110.1	5,062.1	19,026.4	2,263.7
GRAND TOTAL AREA + POINT	25,079.2		10,342.7		29,778.3		117,172.3		21,290.1	

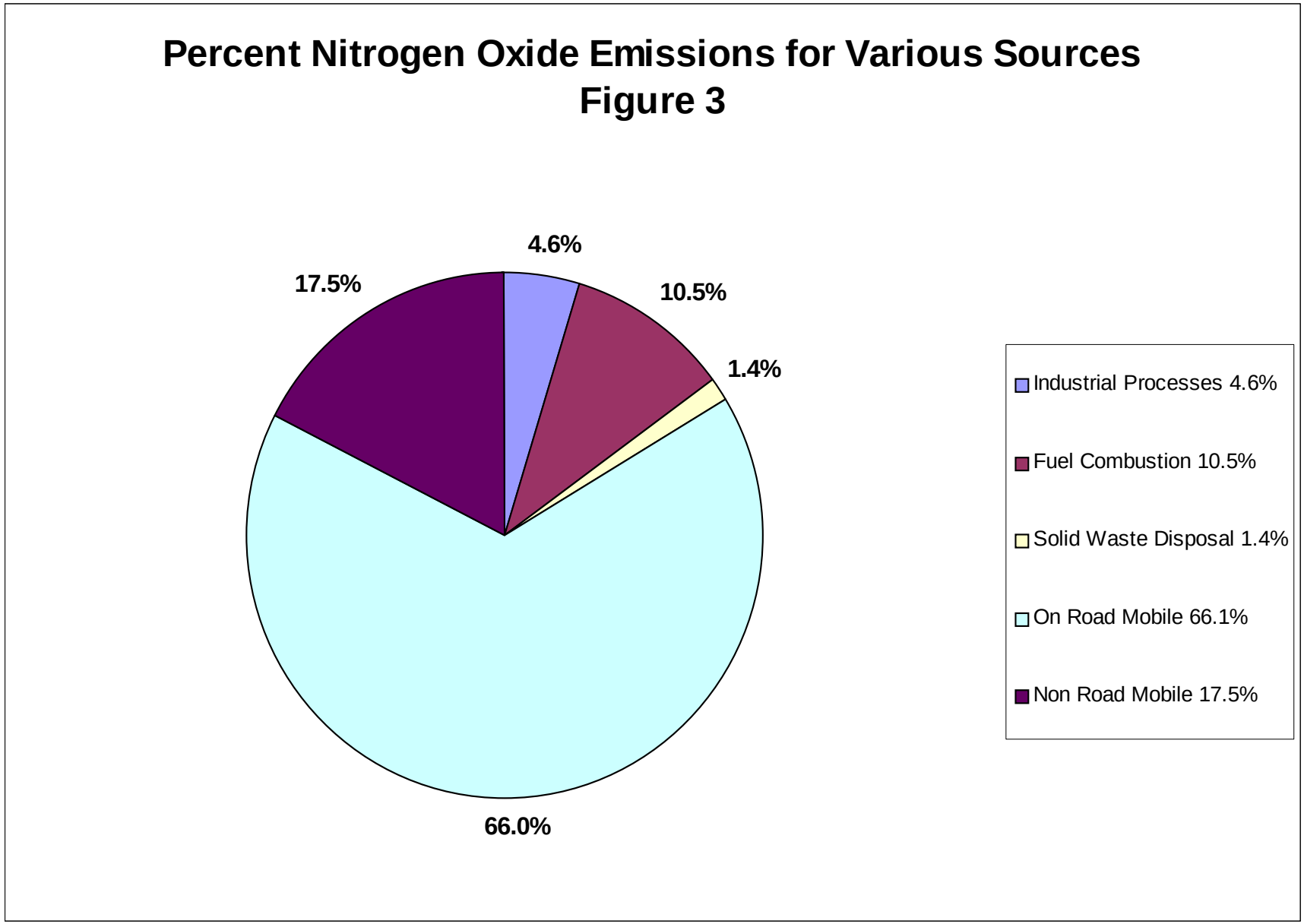
Percent Particulate Emissions for Various Sources
Figure 1



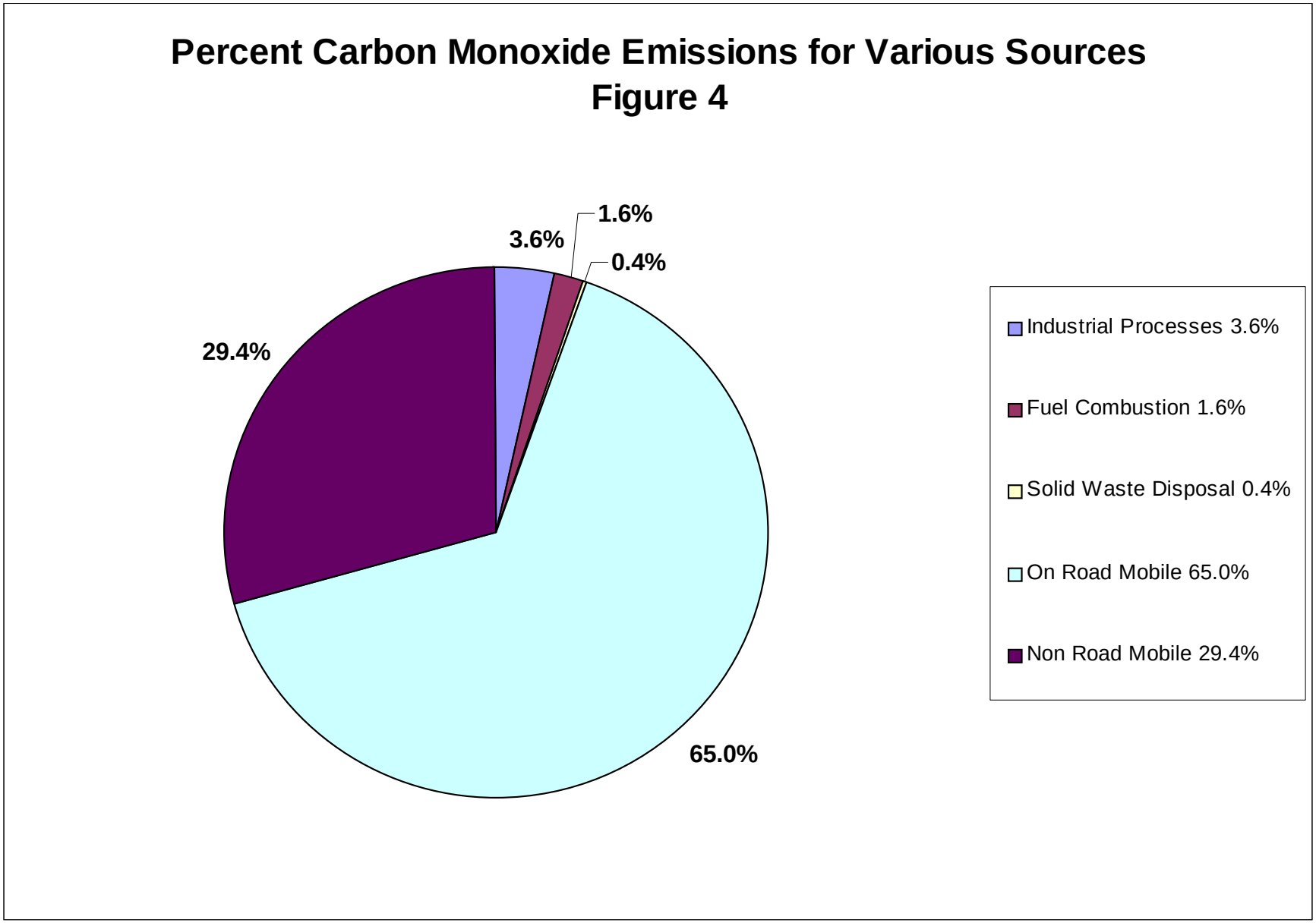
Percent Sulfur Dioxide Emissions for Various Sources
Figure 2



Percent Nitrogen Oxide Emissions for Various Sources
Figure 3



Percent Carbon Monoxide Emissions for Various Sources
Figure 4



Percent Volatile Organic Compound Emissions for Various Sources
Figure 5

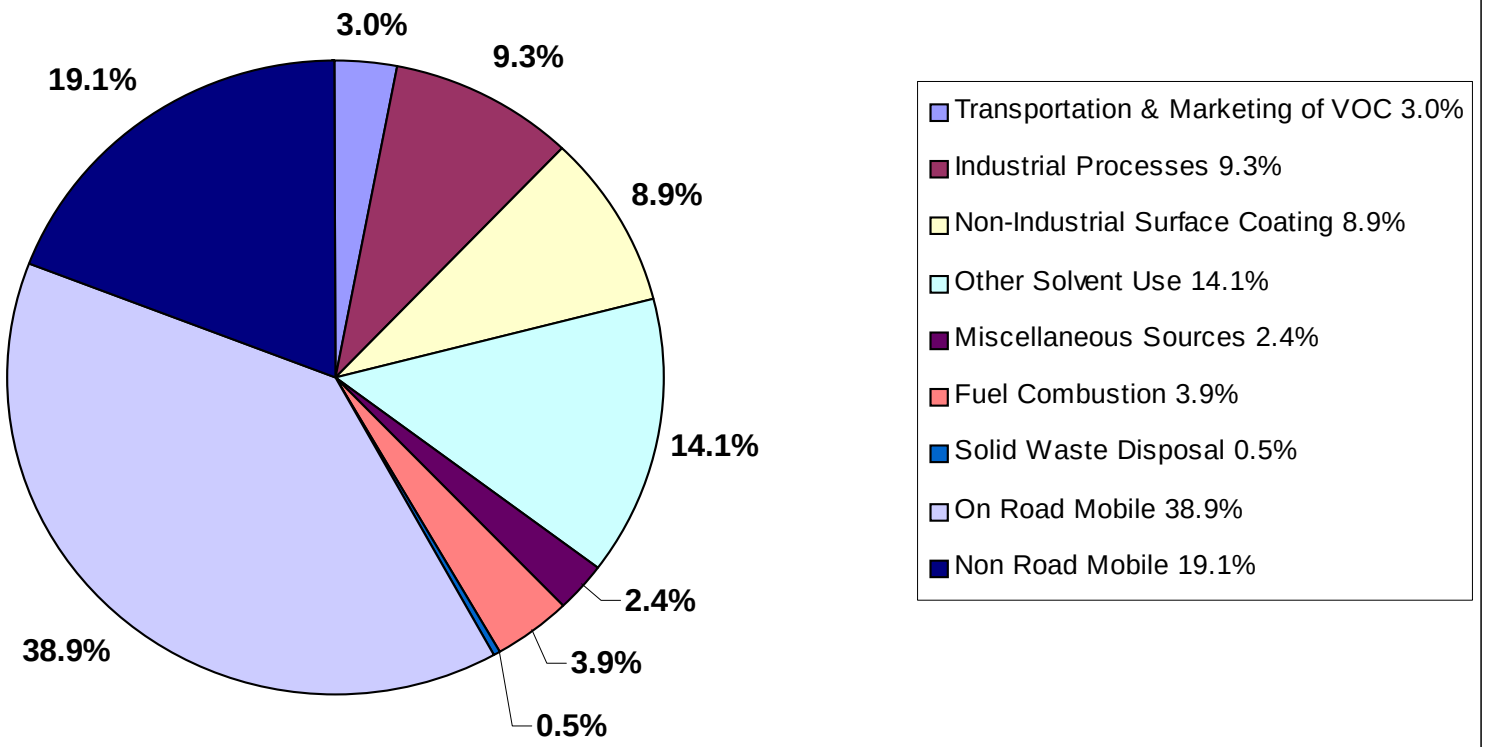


TABLE II
1993 – 2001 Annual Comparison of Nitrogen Dioxide and Volatile Organic Compound Emissions

NITROGEN DIOXIDE (TONS/YEAR)

Source Category	1993	1994	1995	1996	1997	1998	1999	2000	2001
Transportation & Marketing of VOC	0	0	0	6	4	5	5	5	6
Industrial Process	1,801	1,674	1,307	1,765	2,146	1,877	1,914	1,672	1,365
Other Solvents	0	0	0	0	8	0	0	0	3
Miscellaneous	0	0	16	28	28	6	8	2	7
Fuel Combustion	2,711	3,012	2,626	3,251	3,331	3,023	2,866	3,063	3,118
Solid Waste	572	480	459	452	457	501	458	460	404
On-Road Mobile	17,550	21,691	21,771	20,940	21,216	20,754	21,001	18,548	19,669
Non-Road Mobile	3,994	4,544	4,464	4,423	4,309	4,511	4,585	4,825	5,207
TOTAL	**26,644**	**31,399**	**30,647**	**30,865**	**31,499**	**30,677**	**30,836**	**28,575**	**29,778**

VOLATILE ORGANIC COMPOUND (TONS/YEAR)

Source Category	1993	1994	1995	1996	1997	1998	1999	2000	2001
Transportation & Marketing of VOC	1,787	1,490	883	729	683	696	691	676	633
Industrial Processes	2,032	1,666	1,730	2,651	2,185	2,579	1,868	1,675	1,976
Non-Industrial Surface Coating	1,930	2,436	2,182	1,951	1,898	1,920	1,973	1,999	1,885
Other Solvents	3,145	2,837	2,844	2,747	2,760	2,752	2,749	3,004	2,999
Miscellaneous	236	233	204	572	569	507	498	511	519
Fuel Combustion	5,477	5,556	5,563	5,639	5,679	5,716	5,780	1,250	827
Solid Waste	252	224	235	196	128	157	113	101	98
On-Road Mobile	9,621	10,044	9,646	8,770	9,150	9,412	9,852	8,557	8,292
Non-Road Mobile	3,573	3,313	3,196	2,713	4,615	4,257	4,274	4,475	4,063
TOTAL	**28,053**	**27,799**	**26,482**	**25,967**	**27,666**	**28,016**	**27,798**	**22,247**	**21,290**

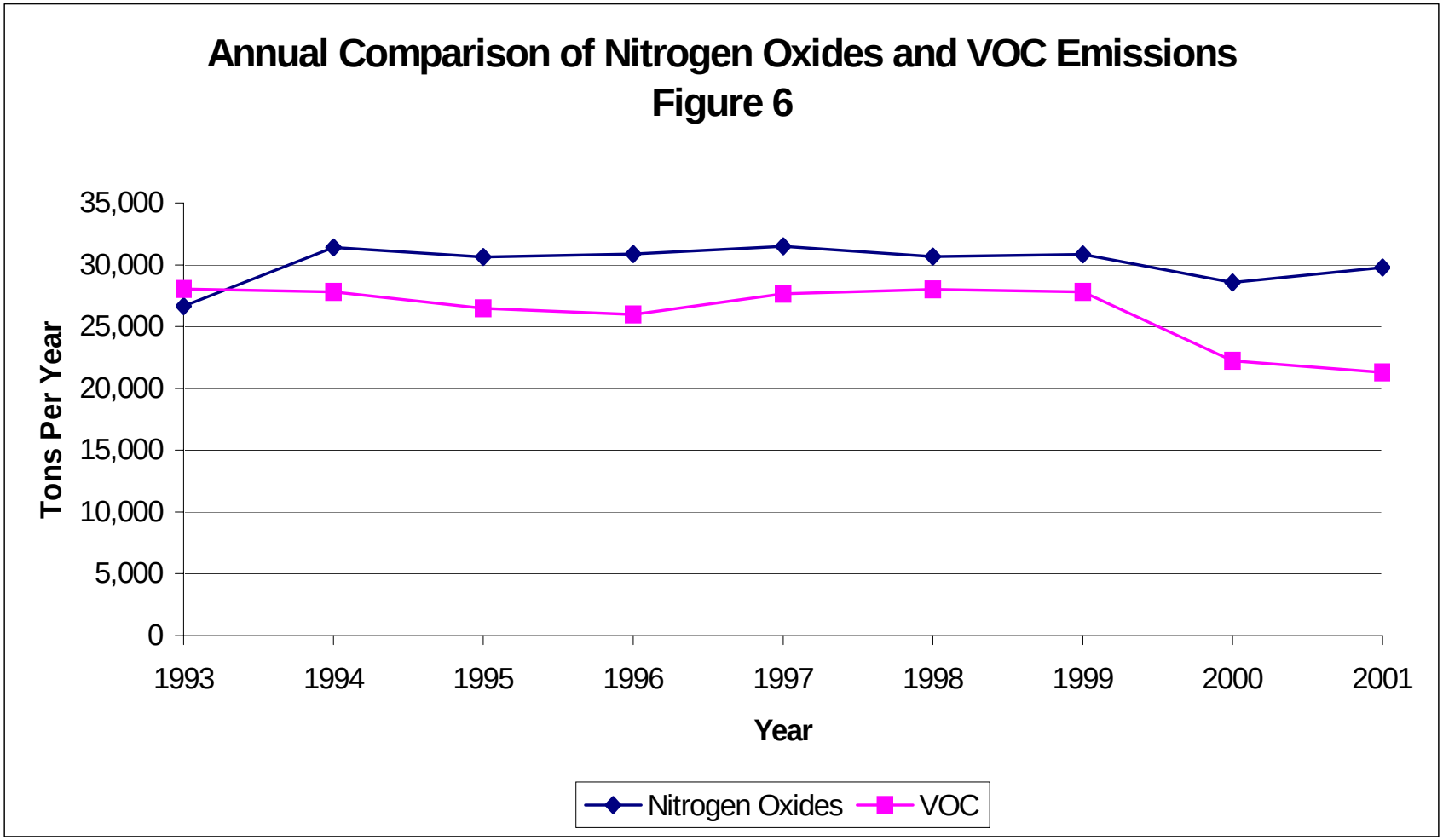

Annual Comparison of Nitrogen Oxides and VOC Emissions
Figure 6
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Tons Per Year
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year
Nitrogen Oxides
VOC

TABLE III
2001 Davidson County Hazardous Air Pollutant Emission Inventory

POLLUTANT	CAS #	TPY
1,1,2,2-Tetrachloroethane	79-34-5	0.055
1,1,2-trichloroethane	79-00-5	0.093
1,3-Butadiene	106-99-0	126.871
1,3-Dichloropropene	542-75-6	45.228
1,4-Dichlorobenzene	106-46-7	23.568
1,4-Dioxane	123-91-1	3.473
2,2,4-Trimentylpentane	540-84-1	172.763
2-Chloroacetophenone	532-27-4	0.001
2-Nitropropane	79-46-9	0.001
4,4'Methylenediphenyl Diisocyanate	101-68-8	0.014
Acetaldehyde	75-07-0	188.811
Acetophenone	98-86-2	2.499
Acrolein	107-02-8	9.466
Acrylic acid	79-10-7	0.013
Acrylonitrile	107-13-1	0.100
Arsenic	00-00-0	0.079
Benzene	71-43-2	222.978
Benzyl Chloride	100-44-7	0.186
Biphenyl	92-52-4	5.147
Bis (2-Ethyl Hexyl) Phthlate	117-81-7	2.744
Bromoform	75-25-2	0.006
Carbon Disulfide	75-15-0	0.087
Carbon Tetrachloride	56-23-5	0.042
Carbonyl Sulfide	463-58-1	0.009
Chlorine	7782-50-5	2.580
Chlorobenzene	108-90-7	20.360
Chloroform	67-66-3	0.502
Chromium Compounds	00-00-0	0.163
Cobalt	00-00-0	0.792
Cumene	98-82-8	1.788
Cyanide	00-00-0	0.670
Dibenzofurans	132-64-9	0.002
Dibutyl phthalate	84-74-2	0.253
Diethanolamine	111-42-2	0.226
Dimethyl Formamide	68-12-2	3.237
Dimethyl Sulfate	77-78-1	0.007
Ethyl Chloride	75-00-3	2.314
Ethylbenzene	100-41-4	121.815
Ethylene Dichloride	107-06-2	0.231
Ethylene Glycol	107-21-1	40.859
Ethylene Oxide	75-21-8	4.847
Ethylidine Dichloride	75-34-3	0.006
Formaldehyde	50-00-0	358.408
Glycol Ethers	00-00-0	37.874
Hexamethylene 1,6-Diisocyanate	822-06-0	0.090
Hexane	110-54-3	248.808
Hydrochloric Acid	7647-01-0	347.442
Hydrogen Fluoride	7664-39-3	47.062
Hydroquinone	123-31-9	0.113

TABLE III (continued)
2001 Davidson County Hazardous Air Pollutant Emission Inventory

POLLUTANT	CAS #	TPY
Isophorone	78-59-1	0.426
Lead	00-00-0	0.346
Magnesium	00-00-0	1.270
Manganese	00-00-0	0.770
Mercury	00-00-0	0.006
Methanol	67-56-1	497.886
Methyl Bromide	74-83-9	85.168
Methyl Chloride	74-87-3	2.047
Methyl chloroform	71-55-6	109.620
Methyl Ethyl Ketone	78-93-3	75.706
Methyl Hydrazine	60-34-4	0.046
Methyl Isobutyl Ketone	108-10-1	24.127
Methyl Methacrylate	80-62-6	0.701
Methyl tert-butyl ether	1634-04-4	3.715
Methylene Chloride	75-09-2	39.772
m-Xylene	108-38-3	39.418
Naphthalene	91-20-3	28.003
Nickel	00-00-0	0.093
o-Xylene	95-47-6	171.097
Phenol	108-95-2	0.611
Phosphine	7803-51-2	0.371
Phthalic Anhydride	85-44-9	0.801
Polycyclic Organic Matter	00-00-0	0.072
Propionaldehyde	123-38-6	58.560
Propylene Dichloride	78-87-5	0.006
Propylene Glycol	57-55-6	0.670
Propylene Oxide	75-56-9	0.309
p-Xylene	106-42-3	209.440
Quinone	106-51-4	0.129
Selenium	00-00-0	0.042
Styrene	100-42-5	57.561
Tetrachloroethylene	127-18-4	75.403
Toluene	108-88-3	767.037
Trichloroethylene	79-01-6	49.532
Triethylamine	121-44-8	3.287
Vinyl Acetate	108-05-4	1.276
Vinyl Chloride	75-01-4	0.137
Vinylidene Chloride	75-35-4	0.006
Xylene	1330-20-7	322.315
Total of All Hazardous Air Pollutants		**4672.465 Tons Per Year**

6. FIELD ENFORCEMENT ACTIVITIES

Field enforcement includes two main areas of compliance activities: (1) - Inspection of stationary sources; and (2) - Citizen complaint investigation. All stationary sources are inspected annually. These inspections include a physical tour of the facility, checking of air pollution control equipment, fuel usage, emissions, recordkeeping, and general facility conditions. During 2001 this agency conducted 1,406 inspections of stationary air pollution sources. In addition to the stationary source inspections, there were 274 inspections conducted at asbestos removal sites and 65 indoor air quality inspections. The staff observed 80 pressure-decay tests on gasoline dispensing facilities. During 2001 this agency investigated 226 complaints. The field personnel investigate complaints to determine if there is a valid air pollution problem and, if so, appropriate action is taken.

During 2001, this agency issued 35 notices of violation and three (3) consent agreements resulting in the collection of $40,170 in penalties.

7. MONITORING ACTIVITIES

During 2001 this agency operated 11 aerometric stations. Five (5) of these stations are manual, where PM_{10} is measured by operating a selective size inlet sampler (SSI). During 2001, a new PM_{10} site was added at the Lentz Public Health Center to aid in the generation of a daily Air Quality Index (AQI). Total suspended particulate (TSP) sampling was suspended December 31, 1998 due to the standard being revoked by EPA. Beginning January 1, 1999, fine particulate ($PM_{2.5}$) samplers were installed at one existing site (Lockeland School) and at two new sites (Hillwood High School and Wright Middle School). During 2001, a continuous $PM_{2.5}$ monitor was added to the Lockeland site. This agency also operated three continuous carbon monoxide, two continuous ozone, one continuous sulfur dioxide and one continuous nitrogen oxides/nitrogen dioxide analyzers. All ambient air monitoring is conducted in strict accordance with Federal guidelines. The locations of these aerometric stations are shown in Figure 7 and a listing of the addresses is given in Table IV. A list of the National Ambient Air Quality Standards for all criteria pollutants is presented in Table V. During the pollen season, March through October, this agency operates a Durham sampler measuring pollen. The Durham sampler is located on the roof of the Metro Public Health Department parking garage at 311 23rd Avenue North.

The daily air quality index and pollen count is made available to the public by calling (615) 340-0488 and on the Metro Public Health Department's website which can be found at http://healthweb.nashville.org.

Following Table V is a discussion of the Ambient Air Quality contaminant concentrations measured in Davidson County during 2001.

LOCATION OF AIR MONITORING SITES
Figure 7

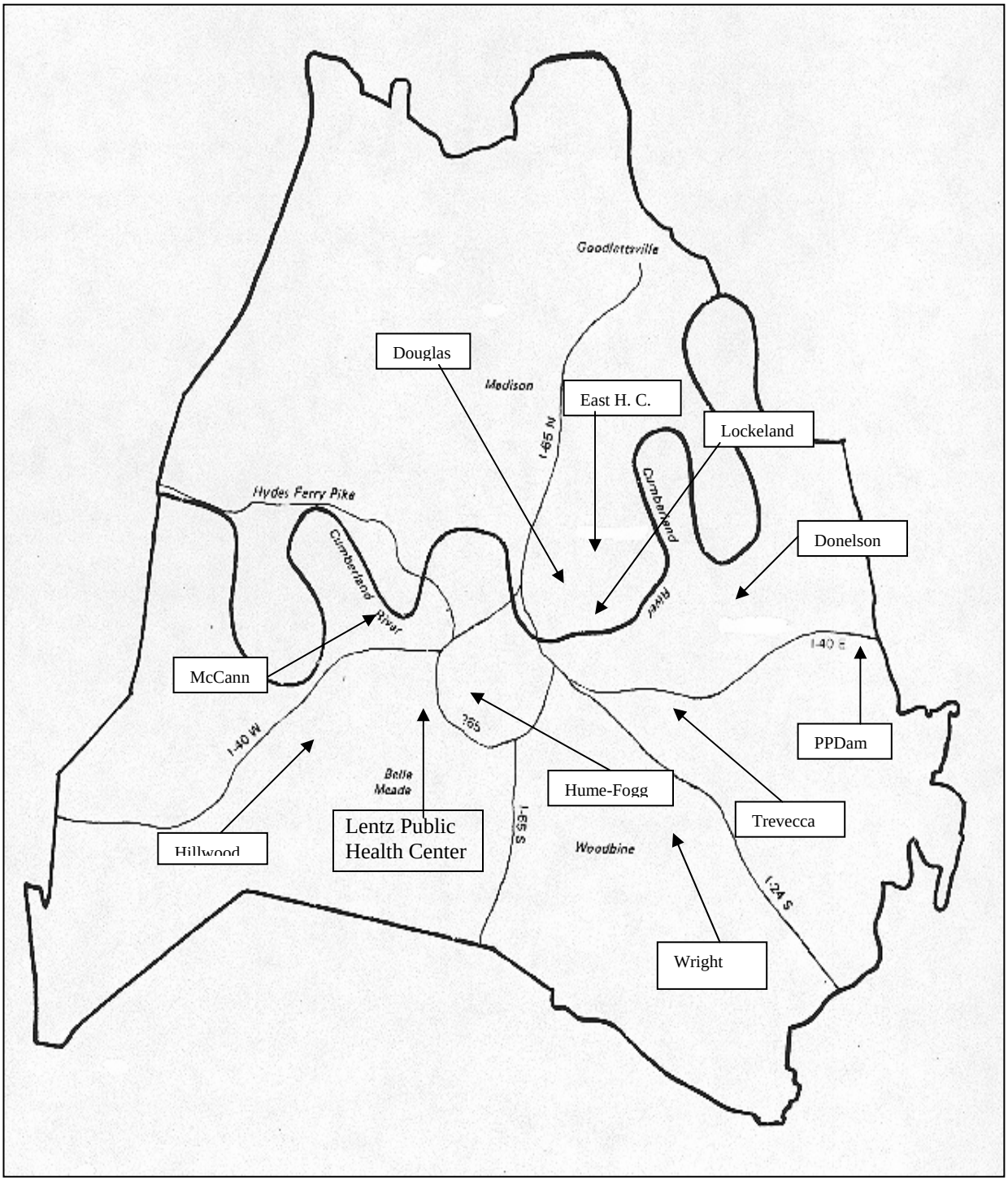


TABLE IV
SITE LOCATION & CLASSIFICATION

Site No.	Address	UTM Coordinates		Land Use	Pollutants Sampled
47-037-0002	Trevecca Nazarene College 333 Murfreesboro Road	522.1	3999.9	CC-C	PM_{10}**
47-037-0011	East Nashville Health Center 1015 East Trinity Lane	522.9	4006.7	CC-R	SO_2*, NO_2**, Ozone*, PM_{10}**
47-037-0021	Hume-Fogg Magnet School 700 Broadway	519.7	4001.7	CC-C	CO*
47-037-0023	Lockeland Middle School 101 South Seventeenth St.	523.5	4003.5	CC-R	PM_{10}**, $PM_{2.5}$**
47-037-0024	McCann School 1300 56th Avenue North	513.1	4002.0	CC-R, I	PM_{10}**
47-037-0025	Wright Middle School 180 McCall Street	523.9	3995.1	S-R	$PM_{2.5}$**
47-037-0026	Percy Priest Dam	533.9	4000.7	Background	Ozone**
47-037-0028	Donelson Library 2315 Lebanon Road	528.5	4002.7	S-C	CO*
47-037-0031	Douglas Park 210 North Seventh St.	521.3	4003.6	CC-R	CO*
47-037-0036	Hillwood High School 400 Davidson Road	511.4	3997.1	S-R	$PM_{2.5}$**
AQI Site	Lentz Public Health Center 311 23rd Avenue North	517.3	4000.6	CC-C	PM_{10}

Land Use Terms
CC-Center City S-Suburban
I-Industrial C-Commercial R-Residential

Monitor Classification
*NAMS-National Air Monitoring Stations
**SLAMS-State/Local Air Monitoring Stations

TABLE V
AMBIENT AIR QUALITY STANDARDS*

CONTAMINANTS	PRIMARY STANDARD			SECONDARY STANDARD		
	CONCENTRATION		AVERAGE INTERVAL	CONCENTRATION		AVERAGE INTERVAL
	µg/m³	PPM		µg/m³	PPM	
PM_{10}	50 150		AAM 24-HR	50 150		AAM 24-HR
$PM_{2.5}$	15 65		AAM 24-HR	15 65		AAM 24-HR
Sulfur Dioxide	80 365	0.03 0.14	AAM 24-HR 3-HR	1,300	0.5	3-HR
Carbon Monoxide	40,000 10,000	35.0 9.0	1-HR 8-HR	No secondary standard		
Ozone	235 157	0.12 0.08	1-HR 8-HR	235 157	0.12 0.08	1-HR 8-HR
Nitrogen Dioxide	100	0.053	AAM	100	0.05	AAM
Lead	1.5		QA	1.5		QA

AAM – Annual Arithmetic Mean QA – Quarterly Average

*On July 17, 1997, EPA revised the ozone standard by phasing out and replacing the 1-hour standard with an 8-hour standard to protect against longer exposure periods. Subsequently, the

1-hour standard was revoked in many areas across the United States, including Davidson County. Compliance with the new 8-hour ozone standard is attained at each monitoring site if the 3-year average of the annual fourth highest daily maximum is less than or equal to 0.08 ppm. The 8-hour ozone standard was challenged in federal court, and returned to EPA for various clarifications. In the interim, the 1-hour ozone standard has been reinstated. Therefore, Nashville and the Middle Tennessee area are under our original maintenance plan until the 8-hour issues have been resolved.

*The EPA also revised the primary and secondary particulate matter standards by changing the form of the existing 24-hour and annual particulate matter standards for particles 10 micrometers in diameter (PM_{10}) or smaller. Compliance with the 24-hour standard is attained when the three-year average of the annual 99^{th} percentile of the 24-hour monitored concentrations are less than or equal to 150 $\mu g/m^3$. Compliance with the annual standard is attained when the annual arithmetic mean is less than or equal to 50 $\mu g/m^3$.

*The EPA also established 24-hour and annual standards for "fine" particles ($PM_{2.5}$ or particles 2.5 micrometers in diameter or smaller). Compliance with the 24-hour standard is attained when the 3-year average of the annual 98^{th} percentile of 24-hour monitored concentrations is less than or equal to 65 $\mu g/m^3$. Compliance with the annual standard is attained when the 3-year average of the annual arithmetic mean is less than or equal to 15 $\mu g/m^3$. The new $PM_{2.5}$ standard was also challenged in federal court, and its current status is similar to that of the new 8-hour ozone standard.

Ambient monitoring for $PM_{2.5}$ began January 1, 1999. The ambient network was installed and sampling began as planned. However, due to equipment and software problems from the manufacturer, the data collected for most of 1999 is questionable as to its validity. Sampler and software modifications were performed in September, 1999, and we are much more comfortable with the validity of the data generated after that date. Therefore, only the $PM_{2.5}$ data generated beginning October, 1999 and later are presented in this report. A continuous $PM_{2.5}$ monitor became operational in December, 2000. This monitor is used primarily to aid in the generation of the daily Air Quality Index.

PARTICULATE MATTER

The air pollution called “particulate matter” includes airborne pollutants of materials such as dust, soot, pollen, aerosols, etc. Particulates range in diameter from 0.005 to 250 microns. There are many sources of particulate matter that includes both natural and anthropogenic (man-made).

PM_{10} and $PM_{2.5}$ focus on those particles with aerodynamic diameters smaller than 10 micrometers and 2.5 micrometer respectively, which are likely to be responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract. Particulate matter has a negative effect on breathing and respiratory systems. It aggravates existing respiratory and cardiovascular disease. The elderly, children and people with chronic pulmonary or cardiovascular disease, or asthma are especially sensitive to the effects of particulate matter.
The concentration of particulate matter in the ambient air ($\mu g/m^3$) is computed by measuring the mass of the particulate matter collected and the volume of air sampled. For determining the

average concentrations of particulate matter, a 24-hour sampling period is used. After sampling for 24 hours, the filter is removed and returned to the laboratory where it is allowed to equilibrate and is weighed.

In 2001, the Pollution Control Division operated five (5) sites equipped with PM_{10} samplers and three (3) sites equipped with $PM_{2.5}$ samplers. Tables VI and VII present a summary of the measured PM_{10} concentrations during 2001. This data shows that the ambient air quality standard for PM_{10} was not exceeded in 2001. Tables VIII and IX and Figures 8 and 9 compare the PM_{10} concentrations for the past eleven (11) years. Tables X, XI, XII and XIII present a summary of the 2001 $PM_{2.5}$ data. Figures 10 and 11 summarize the maximum 24 hour and annual average $PM_{2.5}$ concentrations for the last calendar quarter of 1999, 2000 and 2001. Figure 10 indicates that Nashville and Davidson County is in compliance with the maximum 24 hour $PM_{2.5}$ concentration. However, Figure 11 shows that, if the current trend continues and EPA adopts the proposed $PM_{2.5}$ standard, Davidson County may violate the annual average $PM_{2.5}$ National Ambient Air Quality Standard.

TABLE VI
2001 SUMMARY OF PM_{10} ($\mu G/M^3$)

SITE LOCATION	Trevecca	East	Lockeland	McCann
Number of Observations	60	58	60	59
Maximum 24-Hr Concentration	60	46	46	61
Date of Maximum Concentration	7/24	7/24	7/24	11/15
2nd Maximum 24-Hr Concentration	58	45	44	55
Date of 2nd Maximum 24-Hr. Concentration	11/15	6/24	5/1	5/7
Annual Arithmetic Mean	30	24	24	29
Number of Exceedance of 24-Hr Standard	0	0	0	0

TABLE VII
2001 QUARTERLY COMPARISON OF PM_{10} ARITHMETIC MEAN ($\mu G/M^3$)

Site Location	1st	2nd	3rd	4th	Annual
Trevecca	25	32	34	28	30
East	21	25	27	22	24
Lockeland	19	26	28	21	24
McCann	27	30	31	29	29

TABLE VIII
1991 - 2001 24-HOUR MAXIMUM PM_{10} CONCENTRATIONS ($\mu G/M^3$)

Site Location	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Trevecca	73	61	83	73	69	61	76	70	68	81	60
East	70	55	57	63	64	64	54	50	52	63	46
Lockeland	76	58	72	63	65	55	51	53	55	61	46
McCann	76	65	79	85	70	76	65	56	60	79	61

TABLE IX
1991 – 2001 ANNUAL AVERAGE PM_{10} CONCENTRATIONS ($\mu G/M^3$)

Site Location	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Trevecca	35	31	32	32	34	33	34	32	31	33	30
East	31	30	27	28	27	24	25	25	24	27	24
Lockeland	32	28	28	25	27	26	23	25	24	26	24
McCann	38	33	36	36	35	30	30	28	27	30	29

TABLE X
2001 SUMMARY OF $PM_{2.5}$ ($\mu G/M^3$)

SITE LOCATION	Lockeland	Wright	Hillwood
Number of Observations	348	113	325
Maximum 24-Hr Concentration	38.2	33.4	35.5
Date of Maximum Concentration	3/30	11/18	3/30
2nd Maximum 24-Hr Concentration	37.1	31.7	33.1
Date of 2nd Maximum 24-Hr. Concentration	11/17	7/18	7/23
Annual Arithmetic Mean	15.23	14.64	13.39
Number of Exceedances of 24-Hr Standard	0	0	0

TABLE XI
2001 QUARTERLY COMPARISON OF $PM_{2.5}$ ARITHMETIC MEAN ($\mu G/M^3$)

Site Location	1st	2nd	3rd	4th	Annual
Lockeland	15.2628	15.2024	17.6122	12.8287	15.23
Wright	14.5678	14.1300	16.9925	12.8785	14.64
Hillwood	13.5963	12.9465	15.8105	11.2093	13.39

TABLE XII
1999 - 2001 24-HOUR MAXIMUM $PM_{2.5}$ CONCENTRATIONS ($\mu G/M^3$)

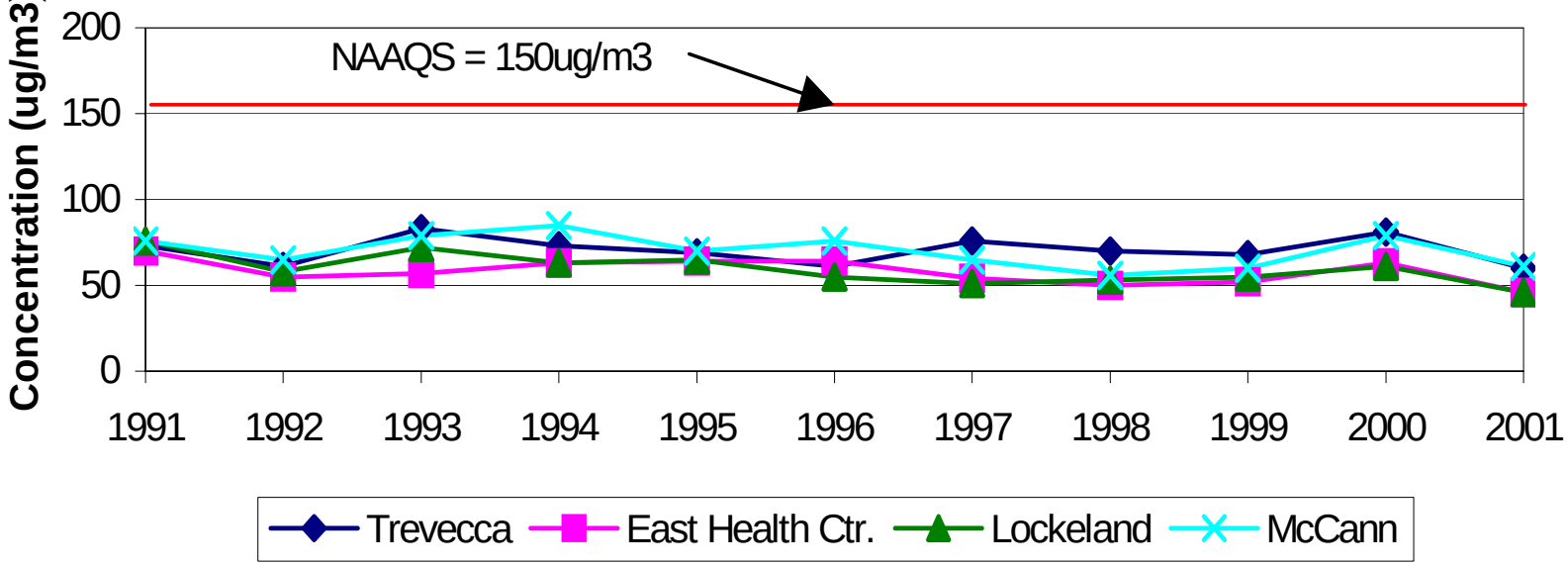
Site Location	1999	2000	2001
Lockeland	55.8	42.3	38.2
Wright	34.0	52.4	33.4
Hillwood	58.2	38.6	35.5

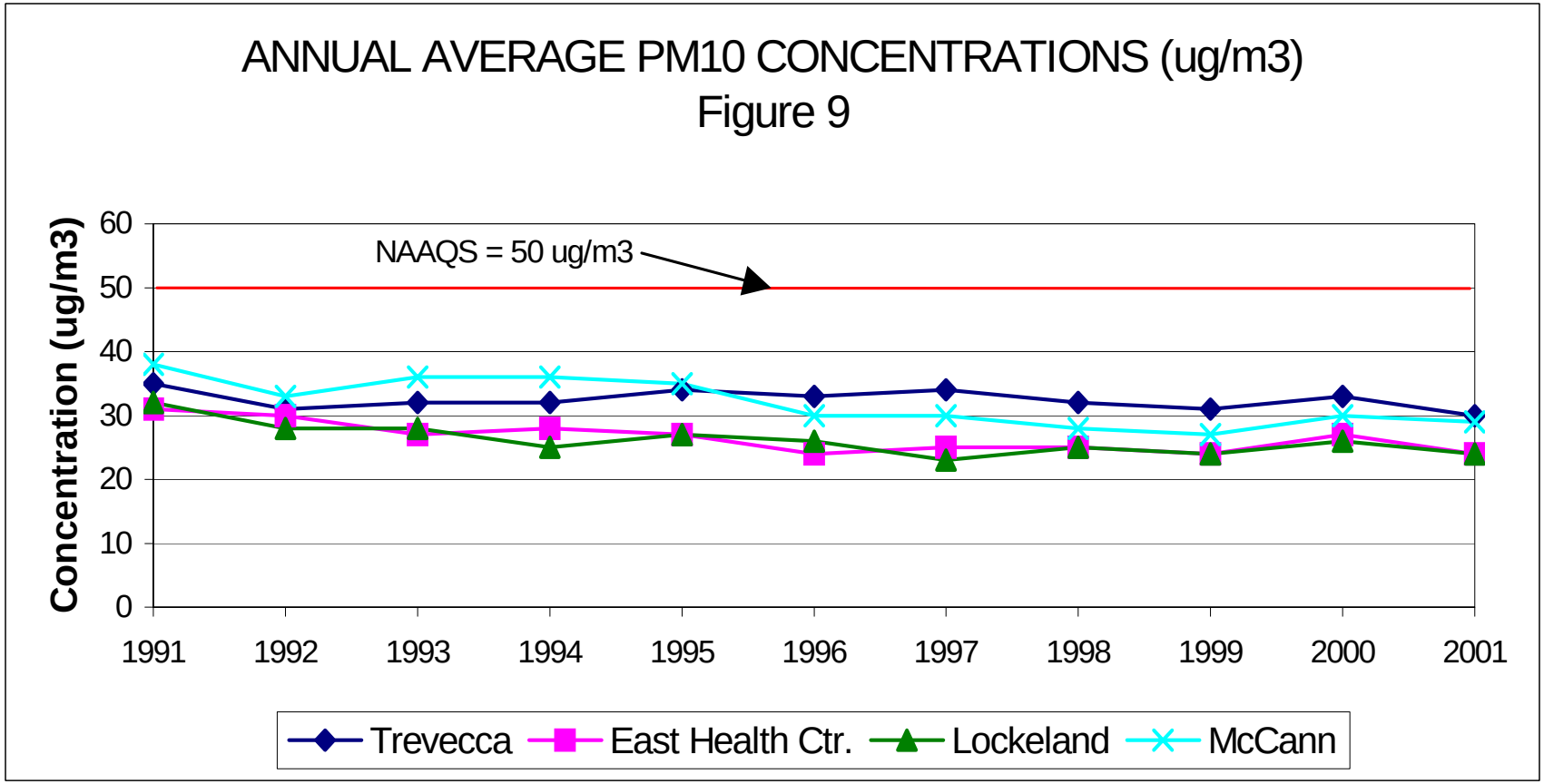
TABLE XIII
1999 – 2001 ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS ($\mu G/M^3$)

Site Location	1999	2000	2001	3 YEAR AVG.
Lockeland	18.83	16.97	15.23	17.0
Wright	16.48	16.83	14.64	16.0
Hillwood	16.83	15.86	13.39	15.4
Spatial Avg. of All 3 Monitors	17.4	16.6	14.4	16.1

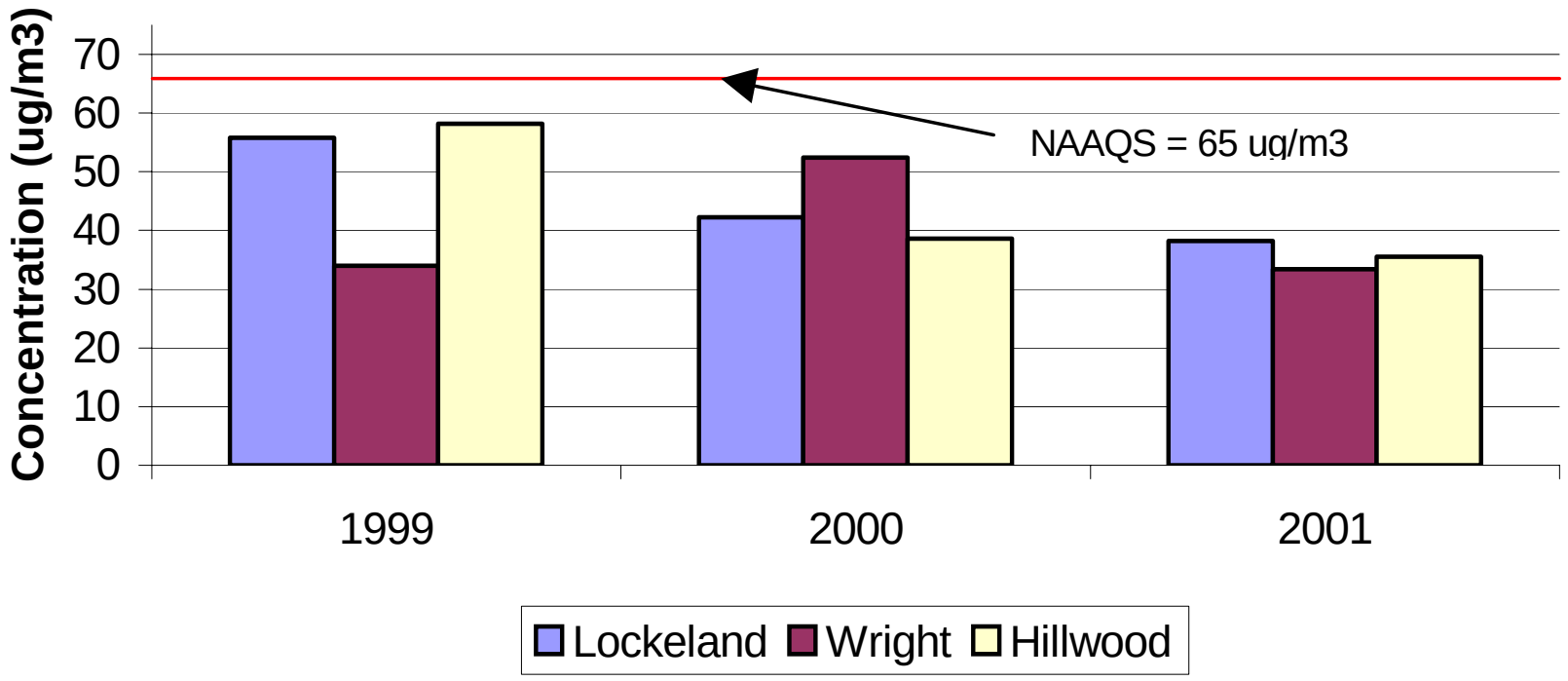
MAXIMUM 24-HOUR PM10 CONCENTRATIONS (ug/m3)

Figure 8

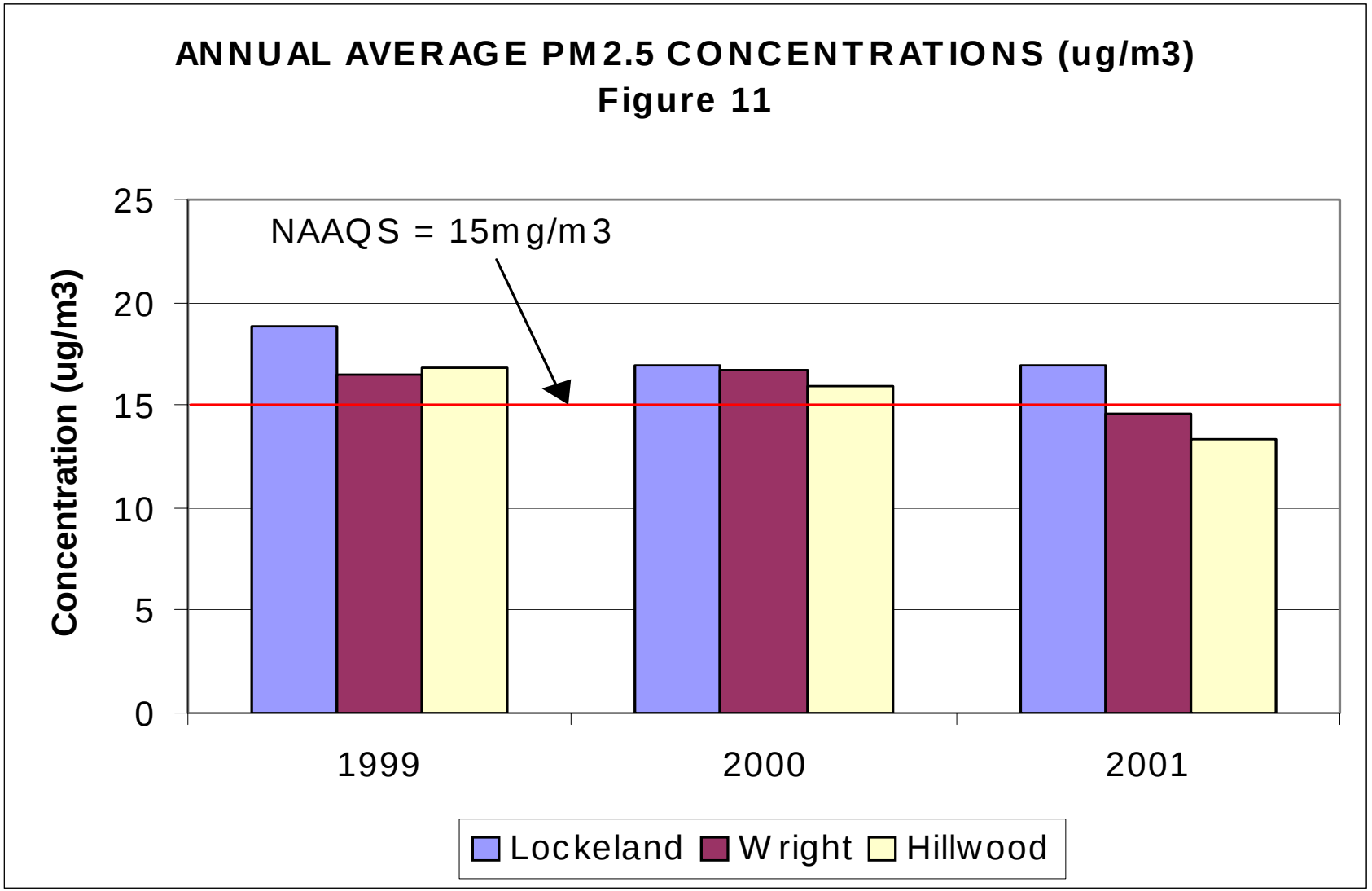



ANNUAL AVERAGE PM10 CONCENTRATIONS (ug/m3)
Figure 9
Concentration (ug/m3)
60
50
40
30
20
10
0
NAAQS = 50 ug/m3
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Trevecca
East Health Ctr.
Lockeland
McCann

MAXIMUM 24-HOUR PM2.5 CONCENTRATIONS (ug/m3)
Figure 10



ANNUAL AVERAGE PM2.5 CONCENTRATIONS (ug/m3)
Figure 11



LEAD

The traditional major sources of ambient lead are from the combustion of leaded gasoline, and the manufacture of lead storage batteries. During 1997, the Metropolitan Health Department operated high-volume samplers at two (2) sites. Samples were taken every 6th day on the same schedule as the PM_{10} samplers. The filters were analyzed for suspended lead. Table XIV is a summary of the suspended lead concentrations measured in 1997. This data shows that the Ambient Air Quality Standard of 1.5 $\mu g/m^3$ averaged on a calendar quarter was not exceeded in 1997. The maximum calendar quarter concentration measured over the six (6) years previous to 1997 was 0.10 $\mu g/m^3$. This data indicates that ambient lead concentrations are relatively insignificant. Based on low monitored lead levels and EPA guidance, ambient monitoring for lead was discontinued in Nashville and Davidson County on December 31, 1997.

TABLE XIV
1997 QUARTERLY COMPARISON OF LEAD, ARITHMETIC MEAN (µG/M^3)

SITE	1ST	2ND	3RD	4TH	ANNUAL
MHDA—1400 8th Avenue North	0.06	0.06	0.06	0.06	0.06
NES—1214 Church Street	0.08	0.07	0.07	0.07	0.07

SULFUR DIOXIDE

Sulfur dioxide is a heavy, pungent, colorless gas that combines easily with water vapor to form sulfuric acid. The major health concerns associated with exposure to sulfur dioxide include effects on breathing, respiratory illness, alterations in the lungs' defenses, and aggravation of existing cardiovascular disease. Sulfur dioxide was measured at East Health Center (site 0011) during 2001. Table XV presents a summary of this data. The data shows that the annual arithmetic mean, the 24-hour average or the 3-hour average standards of 0.03 ppm, 0.14 ppm and 0.5 PPM respectively were not violated in 2001. The main source of sulfur dioxide in Metropolitan Nashville and Davidson County is from fuel combustion.

TABLE XV
2001 SULFUR DIOXIDE (PPM), SITE 247-037-0011, EAST HEALTH CENTER

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
No. of Observations	742	670	739	719	742	715	737	737	717	739	718	742	8717
Arithmetic Mean	0.006	0.004	0.004	0.004	0.004	0.006	0.003	0.002	0.005	0.003	0.002	0.005	0.004
Highest 24-Hr Conc.	0.017	0.011	0.012	0.016	0.009	0.011	0.010	0.007	0.009	0.011	0.006	0.009	0.017
Date of Highest 24-Hr Conc.	1/2	2/17	3/3	4/28	5/13	6/25	7/12	8/1	9/29	10/30	11/16	12/2	1/2
2nd Highest 24-Hr Conc.	0.011	0.010	0.010	0.010	0.007	0.010	0.007	0.005	0.008	0.008	0.005	0.008	0.016
Date of 2nd Highest 24-Hr Conc.	1/17	2/11	3/29	4/29	5/12	6/12	7/7	8/2	9/4	10/1	11/12	12/21	4/28
Highest 3-Hr Conc.	0.032	0.028	0.035	0.078	0.023	0.022	0.029	0.014	0.026	0.029	0.016	0.028	0.078
Date of Highest 3-Hr Conc.	1/2	2/23	3/29	4/28	5/13	6/25	7/12	8/1	9/4	10/30	11/16	12/2	4/28
2nd Highest 3-Hr Conc.	0.031	0.025	0.033	0.022	0.012	0.020	0.016	0.011	0.016	0.011	0.013	0.019	0.035
Date of 2nd Highest 3-Hr Conc.	1/17	2/11	3/3	4/29	5/12	6/12	7/30	8/2	9/29	10/1	11/12	12/29	3/29
Annual or 3-Hr Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0

NITROGEN OXIDE

Air is composed of approximately 78% nitrogen and 21% oxygen. When combustion occurs at high temperatures, such as in automobile engines and in other fossil fuel combustion, nitrogen combines with oxygen to form several different gaseous compounds collectively known as oxides of nitrogen (NO_x). Of these, nitrogen dioxide (NO_2) and nitric oxide (NO) are the most important from an air pollution standpoint. Nitrogen dioxide can irritate the lungs and lower resistance to respiratory infections. Nitrogen dioxide contributes to the formation of ozone through a chemical reaction with volatile organic compounds in the presence of sunlight. On-road mobile sources emitted 66% of the nitrogen dioxide emissions in 2001 with light duty gasoline cars and light duty gasoline trucks responsible for 42% of the total nitrogen dioxide emissions.

Nitrogen dioxide was measured at East Health Center (site 0011) during 2001. Table XVI presents a summary of this data and shows that the annual arithmetic mean standard of 0.05 PPM for nitrogen dioxide was not violated in 2001.

TABLE XVI
2001 NITROGEN DIOXIDE (PPM), SITE 247-037-0011, EAST HEALTH CENTER

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
No. of Observations	741	670	719	717	742	712	733	737	711	737	716	740	8675
Arithmetic Mean	0.021	0.018	0.017	0.015	0.017	0.015	0.017	0.018	0.016	0.20	0.021	0.017	0.018
Highest 24-Hr Conc.	0.034	0.035	0.025	0.027	0.032	0.025	0.026	0.027	0.031	0.032	0.028	0.030	0.038
Date of Highest 24-Hr Conc.	1/23	2/7	3/14	4/27	5/4	6/11	7/16	8/15	9/17	10/02	11/16	12/5	11/16
2nd Highest 24-Hr Conc.	0.033	0.030	0.025	0.025	0.030	0.023	0.026	0.025	0.027	0.032	0.027	0.029	0.037
Date of 2nd Highest 24-Hr Conc.	1/10	2/20	3/11	4/26	5/3	6/19	7/24	8/21	9/13	10/31	11/7	12/4	11/7
No. of 24-Hour Conc													
0.0 - 0.049	31	28	31	30	31	30	31	31	30	31	30	31	365
0.050 - 0.089	0	0	0	0	0	0	0	0	0	0	0	0	0
0.090 - 0.129	0	0	0	0	0	0	0	0	0	0	0	0	0
0.130 - 0.169	0	0	0	0	0	0	0	0	0	0	0	0	0

OZONE

Ozone (O_3) is an unstable, pungent gas in the stratosphere, about ten miles above the earth, which protects us by shielding us from the sun's ultraviolet rays. Tropospheric ozone at the earth's surface has a different effect. It is an eye, nose and throat irritant. It can lower a person's resistance to infection, cause shortness of breath, and over time could damage the lungs. It is also harmful to plants and animals.

Ozone is not released directly from sources. It is produced by a complex series of chemical reactions called photochemical oxidation involving the reaction of nonmethane hydrocarbons and nitrogen dioxide in the presence of sunlight. Ozone is a seasonal problem occurring normally from April through September when warm, sunny weather is abundant. High ozone levels occur in the afternoon after the temperature has risen and the precursors have had time to react. The major sources of volatile

organic compounds includes various types of industrial processes, surface coating, solvent usage, fuel combustion and automobiles. Tables XVII and XVIII are summaries of the 1-hour ozone concentrations for 2001. The data shows that the old National Ambient Air Quality one-hour standard of 0.12 PPM was not exceeded in 2001. The maximum concentration of 0.106 was measured at Percy Priest Dam (site 0026) on July 23, 2001. Table XIX compares the measured ozone concentration for the past several years.

TABLE XVII
2001 OZONE (PPM), DAILY MAXIMUM 1-HOUR VALUES, SITE 247-037-0011, EAST HEALTH CENTER

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
No. of Observations	741	670	740	718	742	717	739	739	717	739	718	742	8722
Highest 1-Hr Conc.	0.036	0.050	0.052	0.068	0.075	0.088	0.078	0.079	0.065	0.058	0.063	0.040	0.088
Date of Highest Conc.	1/30	2/7	3/11	4/27	5/5	6/12	7/30	8/1	9/17	10/2	11/18	12/5	6/12
2nd Highest 1-Hr Conc.	0.035	0.050	0.045	0.068	0.072	0.083	0.075	0.072	0.064	0.056	0.049	0.037	0.083
Date of 2nd Highest Conc.	1/29	2/9	3/23	4/28	5/15	6/10	7/10	8/2	9/13	10/4	11/8	12/4	6/10
3rd Highest 1-Hr Conc.	0.033	0.048	0.045	0.059	0.071	0.083	0.074	0.072	0.063	0.056	0.049	0.037	0.083
Date of 3rd Highest Conc.	1/31	2/8	3/28	4/29	5/4	6/20	7/23	8/21	9/22	10/20	11/17	12/22	6/20
4th Highest 1-Hr Conc.	0.029	0.042	0.044	0.058	0.069	0.079	0.073	0.070	0.063	0.052	0.045	0.034	0.079
Date of 4th Highest Conc.	1/20	2/6	3/24	4/26	5/6	6/13	7/24	8/22	9/23	10/31	11/14	12/23	6/13
No. of 1-Hr Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of 1-Hr Concentrations													
0.000 - 0.044	741	658	732	630	577	565	541	590	646	705	705	742	7832
0.045 - 0.084	0	12	8	88	165	150	198	149	71	34	13	0	888
0.085 - 0.124	0	0	0	0	0	2	0	0	0	0	0	0	2
0.125 - 0.164	0	0	0	0	0	0	0	0	0	0	0	0	0
0.165 - 0.204	0	0	0	0	0	0	0	0	0	0	0	0	0
0.205 - 0.404	0	0	0	0	0	0	0	0	0	0	0	0	0
0.405 - 0.504	0	0	0	0	0	0	0	0	0	0	0	0	0
0.505 - 0.604	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE XVIII
2001 OZONE (PPM), DAILY MAXIMUM 1-HOUR VALUES, SITE 247-037-0026, PERCY PRIEST DAM

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
No. of Observations	742	671	738	718	735	708	738	738	718	742	714	743	8705
Highest 1-Hr Conc.	0.049	0.066	0.059	0.078	0.078	0.100	0.106	0.086	0.076	0.071	0.070	0.057	0.106
Date of Highest Conc.	1/29	2/7	3/11	4/27	5/3	6/20	7/23	8/21	9/13	10/2	11/18	12/5	7/23
2nd Highest 1-Hr Conc.	0.049	0.065	0.053	0.069	0.078	0.094	0.084	0.084	0.076	0.069	0.057	0.051	0.100
Date of 2nd Highest Conc.	1/30	2/8	3/19	4/28	5/4	6/13	7/24	8/2	9/23	10/4	11/14	12/4	6/20
3rd Highest 1-Hr Conc.	0.036	0.059	0.053	0.065	0.077	0.088	0.080	0.079	0.075	0.064	0.056	0.044	0.094
Date of 3rd Highest Conc.	1/31	2/9	3/28	4/30	5/15	6/12	7/10	8/13	9/22	10/31	11/15	12/3	6/13
4th Highest 1-Hr Conc.	0.032	0.052	0.050	0.061	0.076	0.085	0.075	0.077	0.073	0.063	0.055	0.041	0.088
Date of 4th Highest Conc.	1/25	2/6	3/10	4/19	5/6	6/10	7/30	8/1	9/17	10/20	11/16	12/22	6/12
No. of 1-Hr Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of 1-Hr Concentrations													
0.000 - 0.044	731	620	676	565	494	526	517	532	578	657	681	733	7310
0.045 - 0.084	11	51	62	153	241	170	214	204	140	85	33	10	1374
0.085 - 0.124	0	0	0	0	0	12	7	2	0	0	0	0	21
0.125 - 0.164	0	0	0	0	0	0	0	0	0	0	0	0	0
0.165 - 0.204	0	0	0	0	0	0	0	0	0	0	0	0	0
0.205 - 0.404	0	0	0	0	0	0	0	0	0	0	0	0	0
0.405 - 0.504	0	0	0	0	0	0	0	0	0	0	0	0	0
0.505 - 0.604	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE XIX
2001 OZONE (PPM), DAILY MAX. 8-HOUR AVG. VALUES, SITE 247-037-0011, EAST HEALTH CENTER

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
No. of Observations	744	672	744	720	744	720	744	744	720	738	720	744	8754
Highest 8-Hr Avg. Conc.	0.031	0.045	0.045	0.062	0.067	0.078	0.070	0.069	0.059	0.051	0.045	0.032	0.078
Date of Highest Conc.	1/30	2/8	3/11	4/27	5/5	6/20	7/23	8/1	9/13	10/4	11/18	12/29	6/20
2nd Highest 8-Hr Avg. Conc.	0.027	0.041	0.041	0.060	0.065	0.076	0.066	0.066	0.057	0.048	0.034	0.031	0.076
Date of 2nd Highest Conc.	1/29	2/9	3/23	4/28	5/15	6/12	7/30	8/2	9/17	10/2	11/1	12/30	6/12
3rd Highest 8-Hr Avg. Conc.	0.024	0.036	0.040	0.055	0.063	0.074	0.064	0.060	0.055	0.044	0.033	0.029	0.074
Date of 3rd Highest Conc.	1/24	2/26	3/28	4/30	5/4	6/10	7/22	8/21	9/22	10/20	11/3	12/22	6/10
4th Highest 8-Hr Avg. Conc.	0.023	0.035	0.038	0.053	0.059	0.069	0.063	0.059	0.055	0.041	0.033	0.028	0.070
Date of 4th Highest Conc.	1/20	2/25	3/13	4/29	5/6	6/13	7/10	8/22	9/23	10/21	11/4	12/5	7/23
No. of 8-Hr Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of 1-Hr Concentrations													
0.000 - 0.064	744	672	744	720	741	697	738	738	720	738	720	744	8716
0.065 - 0.084	0	0	0	0	3	23	6	6	0	0	0	0	38
0.085 - 0.104	0	0	0	0	0	0	0	0	0	0	0	0	0
0.105 - 0.124	0	0	0	0	0	0	0	0	0	0	0	0	0
0.125 - 0.374	0	0	0	0	0	0	0	0	0	0	0	0	0
Greater Than 0.374	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE XX
2001 OZONE (PPM), DAILY MAX. 8-HOUR AVG. VALUES, SITE 247-037-0026, PERCY PRIEST DAM

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
No. of Observations	744	672	738	720	733	708	744	738	720	744	708	744	8713
Highest 8-Hr Avg. Conc.	0.045	0.058	0.055	0.070	0.073	0.093	0.097	0.074	0.067	0.063	0.058	0.047	0.097
Date of Highest Conc.	1/29	2/7	3/11	4/27	5/15	6/20	7/23	8/2	9/17	10/4	11/18	12/5	7/23
2nd Highest 8-Hr Avg. Conc.	0.045	0.058	0.051	0.064	0.070	0.079	0.074	0.073	0.066	0.056	0.045	0.044	0.093
Date of 2nd Highest Conc.	1/30	2/8	3/28	4/28	5/4	6/10	7/24	8/21	9/22	10/02	11/13	12/4	6/20
3rd Highest 8-Hr Avg. Conc.	0.028	0.054	0.047	0.061	0.069	0.079	0.073	0.070	0.065	0.055	0.043	0.035	0.079
Date of 3rd Highest Conc.	1/25	2/9	3/19	4/30	5/5	6/13	7/10	8/22	9/13	10/31	11/15	12/22	6/10
4th Highest 8-Hr Avg. Conc.	0.027	0.046	0.045	0.056	0.065	0.078	0.069	0.069	0.064	0.053	0.040	0.031	0.079
Date of 4th Highest Conc.	1/14	2/19	3/10	4/19	5/2	6/12	7/22	8/25	9/23	10/3	11/1	12/3	6/13
No. of 8-Hr Exceedances	0	0	0	0	0	1	1	0	0	0	0	0	2
No. of 8-Hr Concentrations													
0.000 - 0.064	744	672	738	716	716	659	718	715	715	744	708	744	8589
0.065 - 0.084	0	0	0	4	17	45	21	23	5	0	0	0	115
0.085 - 0.104	0	0	0	0	0	4	5	0	0	0	0	0	9
0.105 - 0.124	0	0	0	0	0	0	0	0	0	0	0	0	0
0.125 - 0.374	0	0	0	0	0	0	0	0	0	0	0	0	0
Greater Than 0.374	0	0	0	0	0	0	0	0	0	0	0	0	0

Tables XIX and XX are summaries of the 8-hour average ozone concentrations for 2001. The data shows that the proposed new 8-hour average ozone National Ambient Air Quality Standard of 0.08 PPM was exceeded on two (2) days in 2001. The maximum concentration of 0.097 was measured at Percy Priest Dam Visitor Center (site 0026) on July 23, 2001. Table XXI compares the 1-hour daily maximum ozone concentrations from 1980 through 2001 at East Health Center and Percy Priest Dam. Table XXII compares the 8-hour ozone concentrations for the past five (5) years.

TABLE XXI

1980 - 2001 ANNUAL COMPARISON 1-HOUR OZONE CONCENTRATIONS (PPM)

SITE 247-037-0011 EAST HEALTH CENTER

YEAR	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Highest 1-Hr. Conc.	0.130	0.095	0.110	0.135	0.120	0.090	0.105	0.105	0.145	0.100	0.110	0.095	0.090	0.105	0.090	0.110	0.100	0.130	0.114	0.117	0.104	0.088
2nd Highest 1-Hr. Conc.	0.130	0.095	0.105	0.120	0.100	0.085	0.095	0.090	0.130	0.095	0.105	0.075	0.080	0.100	0.090	0.105	0.100	0.125	0.105	0.116	0.091	0.083
3rd Highest 1-Hr. Conc.	0.130	0.090	0.105	0.115	0.085	0.080	0.085	0.090	0.125	0.090	0.100	0.075	0.080	0.100	0.090	0.100	0.095	0.110	0.102	0.107	0.085	0.083
4th Highest 1-Hr. Conc.	0.130	0.090	0.095	0.115	0.085	0.080	0.080	0.090	0.120	0.085	0.095	0.070	0.075	0.090	0.090	0.100	0.095	0.110	0.101	0.101	0.084	0.079
No. of 1-Hr. Exceedances	5	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	2	0	0	0	0
No. of Days Std. Exceeded	4	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	2	0	0	0	0

SITE 247-037-0026 PERCY PRIEST DAM

YEAR	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Highest 1-Hr. Conc.	0.100	0.085	0.070	0.095	0.115	0.075	0.085	0.115	0.130	0.085	0.115	0.105	0.105	0.100	0.105	0.115	0.125	0.120	0.141	0.129	0.109	0.106
2nd Highest 1-Hr. Conc.	0.090	0.075	0.065	0.090	0.100	0.075	0.085	0.095	0.130	0.080	0.100	0.095	0.095	0.090	0.095	0.110	0.110	0.100	0.120	0.123	0.106	0.100
3rd Highest 1-Hr. Conc.	0.090	0.065	0.060	0.090	0.085	0.070	0.085	0.095	0.125	0.080	0.095	0.095	0.080	0.090	0.080	0.110	0.105	0.095	0.112	0.120	0.103	0.094
4th Highest 1-Hr. Conc.	0.090	0.065	0.055	0.090	0.080	0.070	0.080	0.090	0.120	0.075	0.085	0.095	0.080	0.090	0.080	0.110	0.100	0.095	0.111	0.118	0.099	0.088
No. of 1-Hr. Exceedances	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	3	1	0	0
No. of Days Std. Exceeded	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	1	1	0	0

TABLE XXII 1997 – 2001 ANNUAL COMPARISON 8-HOUR OZONE CONCENTRATIONS (PPM)					
SITE 247-037-0011 EAST HEALTH CENTER					
YEAR	1997	1998	1999	2000	2001
Highest 8-hour average concentration	0.104	0.095	0.103	0.084	0.078
2nd highest 8-hour average concentration	0.098	0.092	0.102	0.081	0.076
3rd highest 8-hour average concentration	0.098	0.092	0.090	0.075	0.074
4th highest 8-hour average concentration	0.097	0.089	0.088	0.072	0.070
No. of days 8-hour standard exceeded	8	4	9	0	0
SITE 247-037-0026 PERCY PRIEST DAM					
YEAR	1997	1998	1999	2000	2001
Highest 8-hour average concentration	0.102	0.107	0.101	0.096	0.097
2nd highest 8-hour average concentration	0.087	0.100	0.100	0.085	0.093
3rd highest 8-hour average concentration	0.087	0.093	0.098	0.085	0.079
4th highest 8-hour average concentration	0.086	0.091	0.098	0.084	0.079
No. of days 8-hour standard exceeded	4	12	15	3	2

The Middle Tennessee ozone nonattainment area, which includes Davidson, Sumner, Rutherford, Williamson, and Wilson Counties, was reclassified to attainment for the 1-hour ozone NAAQS on October 30, 1996. With the Federal court challenge to the proposed new 8-hour ozone standard, the area is currently operating under an existing maintenance plan for ozone.

Table XXIII shows that over the three-year period of 1999 through 2001, none of the ozone monitors in the Middle Tennessee area measured a violation of the original 1-hour National Ambient Air Quality Standard (NAAQS) by measuring more than one (1.0) exceedance per year on the average. However, the monitors located at Percy Priest Dam, Eagleville, Old Hickory Dam, Cottontown, Fairview and Cedars of Lebanon State Park showed a violation of the more stringent 8-hour average NAAQS by the average of the fourth highest value over the 3-year period being greater than 0.084 ppm.

TABLE XXIII
1999 – 2001 SUMMARY OF 1-HOUR AND 8-HOUR MAXIMUM OZONE CONCENTRATIONS IN THE MIDDLE TENNESSEE AREA

SITE NUMBER	YEAR	MAXIMUM CONCENTRATIONS								NO. OF EXCEEDANCES	
		1st 1-Hr.	1st 8-Hr.	2nd 1-Hr.	2nd 8-Hr.	3rd 1-Hr.	3rd 8-Hr.	4th 1-Hr.	4th 8-Hr.	1-Hr.	8-Hr.
247-037-0011	1999	0.117	0.103	0.116	0.102	0.107	0.090	0.101	0.088	0	9
	2000	0.104	0.084	0.091	0.081	0.085	0.075	0.084	0.072	0	0
	2001	0.088	0.078	0.083	0.076	0.083	0.074	0.079	0.070	0	0
AVERAGE NUMBER OF EXCEEDANCES PER YEAR										**0**	**3.0**
247-037-0026	1999	0.129	0.101	0.123	0.100	0.120	0.098	0.118	0.098	1	15
	2000	0.109	0.096	0.106	0.085	0.103	0.085	0.099	0.084	0	3
	2001	0.106	0.097	0.100	0.093	0.094	0.079	0.088	0.079	0	2
AVERAGE NUMBER OF EXCEEDANCES PER YEAR										**0.33**	**6.67**
247-149-0101*	1999	0.116	0.105	0.116	0.102	0.111	0.100	0.106	0.096	0	11
	2000	0.102	0.092	0.100	0.088	0.095	0.088	0.095	0.086	0	6
	2001	0.088	0.082	0.088	0.078	0.085	0.078	0.084	0.076	0	0
AVERAGE NUMBER OF EXCEEDANCES PER YEAR										**0**	**5.67**
247-165-0007*	1999	0.132	0.110	0.123	0.109	0.119	0.101	0.119	0.101	1	28
	2000	0.123	0.108	0.122	0.097	0.116	0.096	0.108	0.093	0	10
	2001	0.113	0.103	0.110	0.093	0.099	0.090	0.099	0.086	0	6
AVERAGE NUMBER OF EXCEEDANCES PER YEAR										**0.33**	**14.67**
247-165-0101*	1999	0.120	0.105	0.114	0.098	0.113	0.096	0.111	0.095	0	11
	2000	0.110	0.093	0.109	0.092	0.109	0.092	0.102	0.089	0	5
	2001	0.109	0.096	0.108	0.093	0.099	0.088	0.098	0.086	0	4
AVERAGE NUMBER OF EXCEEDANCES PER YEAR										**0**	**6.67**
247-187-0106*	1999	0.121	0.103	0.114	0.103	0.109	0.103	0.106	0.097	0	15
	2000	0.122	0.103	0.119	0.091	0.108	0.089	0.101	0.088	0	8
	2001	0.097	0.083	0.091	0.082	0.091	0.080	0.089	0.080	0	0
AVERAGE NUMBER OF EXCEEDANCES PER YEAR										**0**	**7.67**
247-189-0103*	1999	0.141	0.119	0.119	0.099	0.110	0.095	0.109	0.094	1	15
	2000	0.118	0.098	0.104	0.093	0.101	0.089	0.100	0.088	0	6
	2001	0.096	0.084	0.092	0.082	0.089	0.080	0.088	0.079	0	0
AVERAGE NUMBER OF EXCEEDANCES PER YEAR										**0.33**	**7**

247-037-0011 East Health Center, Davidson County
247-037-0026 Percy Priest Lake, Davidson County
247-149-0101* Eagleville, Rutherford County
247-165-0007* Old Hickory Dam, Sumner County
247-165-0101* Cottontown, Sumner County
247-187-0106* Fairview, Williamson County
247-189-0103* Cedars of Lebanon, Wilson County

*OPERATED BY THE STATE OF TENNESSEE--DIVISION OF AIR POLLUTION CONTROL

CARBON MONOXIDE

Carbon monoxide is a colorless, odorless gas that is a product of incomplete combustion. The major source of carbon monoxide is the internal combustion engine, particularly the automobile. Carbon monoxide enters the bloodstream and reduces oxygen delivery to the body's organs and tissues. The method used for measuring carbon monoxide is a non-dispersive infrared method. During 2001, carbon monoxide was measured at three sites: one in the downtown area, Hume Fogg Magnet School (site 0021); one in an urbanized neighborhood, Douglas Park (site 0031); and one in a suburban neighborhood, Donelson Library (site 0028). Tables XXIV through XXVII present a summary of the carbon monoxide data for 2001. This data shows that the National Ambient Air Quality Standard was not violated at any site during 2001.

TABLE XXIV
2001 CARBON MONOXIDE (PPM), SITE 247-037-0021, HUME FOGG MAGNET SCHOOL

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
No. of Observations	742	670	741	718	742	717	741	741	718	741	718	740	8729
Highest 1-Hr Conc.	4.5	5.0	4.8	2.3	3.3	2.9	2.4	2.5	2.6	4.2	4.8	3.3	5.0
Date of Highest Conc.	1/10	2/1	3/23	4/10	5/4	6/15	7/20	8/11	9/19	10/30	11/8	12/21	2/1
2nd Highest 1-Hr Cond.	4.3	3.9	3.7	2.1	3.1	2.7	2.4	2.5	2.6	4.1	4.8	3.2	4.8
Date of 2nd Highest 1-Hr Conc.	1/7	2/6	3/11	4/3	5/4	6/15	7/20	8/16	9/19	10/20	11/8	12/19	3/23
No. of 1-Hr Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0
Highest 8-Hr Conc.	3.2	2.7	2.8	1.4	2.2	1.5	1.7	1.6	2.0	3.2	3.7	2.6	3.7
Date of Highest 8-Hr Conc.	1/10	2/6	3/24	4/14	5/5	6/15	7/7	8/26	9/23	10/31	11/8	12/19	11/8
2nd Highest 8-Hr Conc.	3.2	2.7	2.5	1.4	1.8	1.3	1.4	1.5	1.7	3.0	3.7	2.3	3.7
Date of 2nd Highest 8-Hr Conc.	1/11	2/7	3/11	4/28	5/4	6/12	7/20	8/11	9/19	10/30	11/18	12/3	11/18
No. of 8-Hr Exceedance	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of 8-Hr Concentration													
0 - 4.9	742	670	741	718	742	717	741	741	718	741	718	740	8729
5.0 - 8.9	0	0	0	0	0	0	0	0	0	0	0	0	0
9.0 - 12.9	0	0	0	0	0	0	0	0	0	0	0	0	0
13.0 - 16.9	0	0	0	0	0	0	0	0	0	0	0	0	0
17.0 - 20.9	0	0	0	0	0	0	0	0	0	0	0	0	0
21.0 - 24.9	0	0	0	0	0	0	0	0	0	0	0	0	0
25.0 - 28.0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greater Than 28.0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE XXV
2001 CARBON MONOXIDE (PPM), SITE 247-037-0028, DONELSON LIBRARY

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
No. of Observations	743	669	741	717	740	717	742	740	718	742	718	741	8728
Highest 1-Hr Conc.	3.9	1.7	1.7	1.5	2.1	1.5	1.1	1.1	2.1	1.9	2.9	2.1	3.9
Date of Highest Conc.	1/16	2/1	3/23	4/4	5/22	6/27	7/5	8/13	9/15	10/30	11/7	12/2	1/16
2nd Highest 1-Hr. Conc.	3.5	1.6	1.6	1.4	2.0	1.4	1.0	1.1	1.5	1.8	2.9	2.1	3.5
Date of 2nd Highest 1-Hr Conc.	1/10	2/2	3/7	4/13	5/22	6/13	7/1	8/17	9/14	10/30	11/16	12/3	1/10
No. of 1-Hr Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0
Highest 8-Hr. Conc.	2.7	1.1	1.2	1.2	1.9	1.0	0.9	0.7	1.1	1.5	2.8	1.9	2.8
Date of Highest 8-Hr Conc.	1/16	2/2	3/8	4/14	5/22	6/13	7/2	8/14	9/27	10/31	11/17	12/3	11/17
2nd Highest 8-Hr. Conc.	2.3	0.9	1.2	1.0	1.0	1.0	0.8	0.6	0.9	1.4	2.3	1.5	2.7
Date of 2nd Highest 8-Hr. Conc.	1/11	2/1	3/24	4/28	5/5	6/23	7/1	8/13	9/28	10/30	11/7	12/2	1/16
No. of 8-Hr Exceedance	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of 8-Hr Concentration													
0-4.9	743	669	741	717	740	717	742	740	718	742	718	741	8728
5.0-8.9	0	0	0	0	0	0	0	0	0	0	0	0	0
9.0-12.9	0	0	0	0	0	0	0	0	0	0	0	0	0
13.0-16.9	0	0	0	0	0	0	0	0	0	0	0	0	0
17.0-20.9	0	0	0	0	0	0	0	0	0	0	0	0	0
21.0-24.9	0	0	0	0	0	0	0	0	0	0	0	0	0
25.0-28.0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greater Than 28.0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE XXVI
2001 CARBON MONOXIDE (PPM), SITE 247-037-0031, DOUGLAS PARK

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
No. of Observations	742	668	741	718	741	717	742	736	728	742	717	741	8723
Highest 1-Hr Conc.	6.5	7.7	5.9	4.5	3.9	3.2	3.8	2.9	3.2	5.6	7.1	5.8	7.7
Date of Highest Conc.	1/10	2/7	3/24	4/4	5/3	6/12	7/7	8/21	9/20	10/31	11/16	12/2	2/7
2nd Highest 1-Hr. Conc.	6.4	5.8	5.1	4.3	3.6	2.8	3.2	2.9	3.2	5.3	7.1	5.7	7.1
Date of 2nd Highest 1-Hr. Conc.	1/10	2/7	3/24	4/4	5/3	6/13	7/6	8/26	9/22	10/30	11/16	12/3	11/16
No. of 1-Hr. Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0
Highest 8-Hr. Conc.	5.6	5.1	4.2	3.4	3.1	2.1	2.7	2.2	2.4	4.6	6.6	4.9	6.6
Date of Highest 8-Hr. Conc.	1/11	2/7	3/24	4/5	5/4	6/2	7/7	8/18	9/21	10/31	11/17	12/3	11/17
2nd Highest 8-Hr. Conc.	4.7	4.3	3.6	2.5	2.9	2.1	1.7	2.2	2.4	4.1	5.7	4.8	5.7
Date of 2nd Highest 8-Hr. Conc.	1/14	2/4	3/11	4/14	5/5	6/11	7/6	8/26	9/23	10/30	11/18	12/19	11/18
No. of 8-Hr Exceedance	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of 8-Hr Conc.													
0 - 4.9	739	666	744	720	744	720	744	736	720	744	688	744	8709
5.0 - 8.9	5	2	0	0	0	0	0	0	0	0	32	0	39
9.0 - 12.9	0	0	0	0	0	0	0	0	0	0	0	0	0
13.0 - 16.9	0	0	0	0	0	0	0	0	0	0	0	0	0
17.0 - 20.9	0	0	0	0	0	0	0	0	0	0	0	0	0
21.0 - 24.9	0	0	0	0	0	0	0	0	0	0	0	0	0
25.0 - 28.0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greater Than 28.0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE XXVII
2001 SUMMARY OF CARBON MONOXIDE CONCENTRATIONS (PPM)

SITE	247-037-0021	247-037-0028	247-037-0031	ANNUAL
Highest 1-Hr Conc.	5.0	3.9	7.7	7.7
2nd Highest 1-Hr Conc.	4.8	3.5	7.1	7.1
Highest 8-Hr Conc.	3.7	2.8	6.6	6.6
2nd Highest 8-Hr Conc.	3.7	2.7	5.7	5.7
No. of 1-Hr Exceedances	0	0	0	0
No. of 8-Hr Exceedances	0	0	0	0
No. of Days 8-Hr Exceedances	0	0	0	0

SITE 247-037-0021 HUME FOGG MAGNET SCHOOL
247-037-0028 DONELSON LIBRARY, 2315 LEBANON ROAD
247-037-0031 DOUGLAS PARK, 210 NORTH SEVENTH STREET

Tables XXVIII, XXIX and XXX, and Figures 12 and 13, show a comparison of the concentrations of carbon monoxide over the past several years. This data shows that the National Ambient Air Quality 8-hour Standard of 9.0 PPM has not been exceeded since 1987.

TABLE XXVIII
1980 – 2001 ANNUAL COMPARISON CARBON MONOXIDE CONCENTRATIONS, (PPM)
SITE 247-037-0021 HUME FOGG MAGNET SCHOOL

YEAR	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Highest 1-Hr Conc.	16.5	16.5	23.0	17.0	19.5	16.0	15.0	14.0	12.5	11.0	9.5	7.5	8.5	11.0	9.0	7.5	6.0	7.5	6.9	7.9	5.7	5.0
2nd Highest 1-Hr Conc.	14.0	16.0	22.5	16.5	17.0	14.0	15.0	12.0	11.0	11.0	8.0	7.5	8.0	8.5	9.0	7.0	5.5	7.0	5.8	7.6	5.7	4.8
Highest 8-Hr Conc.	9.3	12.9	17.9	11.6	10.8	8.9	9.9	9.3	8.0	8.8	7.8	5.3	6.3	7.0	6.3	6.5	4.4	5.8	4.9	6.2	3.9	3.7
2nd Highest 8-Hr Conc.	8.9	10.3	15.6	10.8	10.1	7.8	9.5	8.2	7.8	7.6	5.8	4.9	5.8	8.5	5.4	4.8	4.1	5.1	4.6	5.2	3.6	3.7
No. of 1-Hr Exceedances of the Standard (35PPM)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of 8-Hr Exceedances of the Standard (9PPM)	1	4	6	20	8	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of Days 8-Hr. Standard Exceeded (Standard = 9PPM)	1	3	5	20	8	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

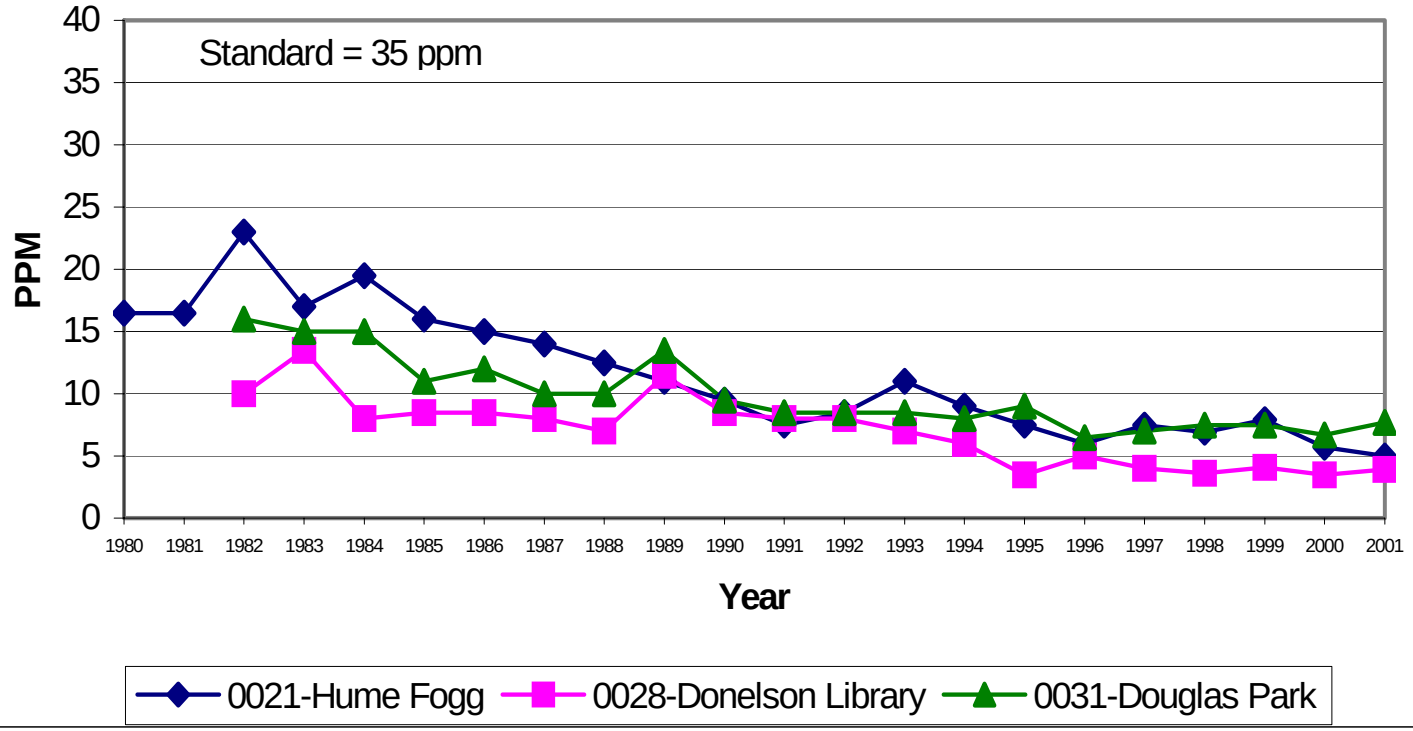
TABLE XXIX
1982 - 2001 ANNUAL COMPARISON OF CARBON MONOXIDE CONCENTRATIONS, (PPM)
SITE 247-037-0028 DONELSON LIBRARY

YEAR	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Highest 1-Hr Conc.	10.0	13.5	8.0	8.5	8.5	8.0	7.0	11.5	8.5	8.0	8.0	7.0	6.0	3.5	5.0	4.0	3.6	4.1	3.5	3.9
2nd Highest 1-Hr Conc.	9.5	8.0	7.5	7.0	6.5	8.0	7.0	7.0	7.5	6.5	7.0	6.8	5.5	3.0	4.5	4.0	3.4	4.0	3.4	3.5
Highest 8-Hr Conc.	6.1	9.5	6.6	4.1	6.3	4.4	6.1	5.6	5.6	5.5	4.4	5.8	4.1	2.8	2.7	2.9	3.1	3.6	3.0	2.8
2nd Highest 8-Hr Conc.	5.9	4.9	6.2	3.8	5.8	4.1	4.5	5.6	4.3	3.4	4.4	5.4	3.1	2.4	2.5	2.8	2.8	2.6	2.4	2.7
No. of 1-Hr Exceedances of the Standard (35PPM)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of 8-Hr Exceedances of the Standard (9PPM)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of Days 8-Hr. Standard Exceeded (Standard = 9PPM)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

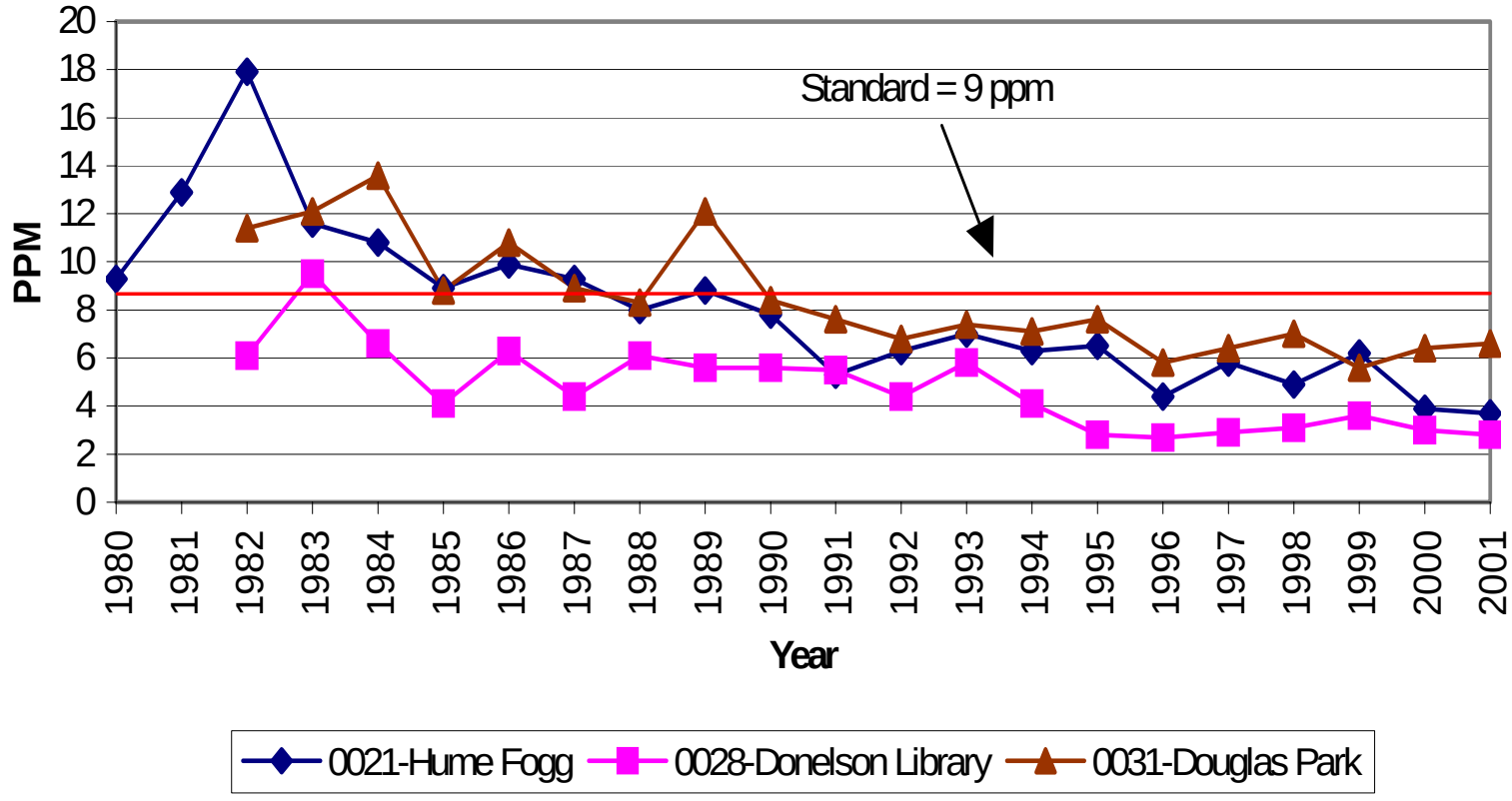
TABLE XXX
1982 - 2001 ANNUAL COMPARISON OF CARBON MONOXIDE CONCENTRATIONS, (PPM)
SITE 247-037-0031 DOUGLAS PARK

YEAR	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Highest 1-Hr Concentration	16.0	15.0	15.0	11.0	12.0	10.0	10.0	13.5	9.5	8.5	8.5	8.5	8.0	9.0	6.5	7.0	7.5	7.5	6.7	7.7
2nd Highest 1-Hr Concentration	12.5	13.5	15.0	10.0	12.0	9.0	9.5	12.5	9.0	8.5	8.0	8.5	8.0	8.5	6.0	7.0	7.2	7.2	6.7	7.1
Highest 8-Hr Concentration	11.4	12.1	13.6	8.8	10.8	8.9	8.3	12.1	8.4	7.6	6.8	7.4	7.1	7.6	5.8	6.4	7.0	5.6	6.4	6.6
2nd Highest 8-Hr Concentration	10.6	10.7	13.3	7.1	10.2	8.1	7.0	8.3	7.7	6.2	6.4	7.3	7.1	7.3	5.0	6.3	6.1	5.3	5.6	5.7
No. of 1-Hr Exceedances of the Standard (35PPM)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of 8-Hr Exceedances of the Standard (9PPM)	5	7	17	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
No. of Days 8-Hr. Standard Exceeded (Standard = 9PPM)	5	6	16	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

ANNUAL COMPARISON CARBON MONOXIDE CONCENTRATIONS (PPM)
Highest 1-Hour Concentrations
Figure 12



ANNUAL COMPARISON OF CARBON MONOXIDE CONCENTRATIONS (PPM)
Highest 8-Hour Average Concentrations
Figure 13



AIR QUALITY INDEX

The Air Quality Index (AQI) was developed by the Environmental Protection Agency (EPA) to provide accurate, timely, and easily understandable information about daily levels of air pollution. The AQI converts the measured pollutant concentration to a number on a scale of 0 to 500 with critical breakpoints in between representing ranges of air pollution. The AQI provides general information to the public about air quality and associated health effects. Another purpose of the AQI is to maintain a standardized air quality reporting method across the country.

The daily air quality index and pollen count is made available to the public by the PCD by calling (615) 340-0488 and on the Metro Public Health Department's website which can be found at http://healthweb.nashville.org. The measured concentrations of carbon monoxide, ozone, sulfur dioxide, $PM_{2.5}$, PM_{10} and nitrogen dioxide are used to generate the AQI. It is furnished daily, Monday through Friday, by 9:00 a.m. Included in the numerical value is a descriptive word and cautionary statement, when applicable. Table XXXI summarizes the daily AQI for 2001. Table XXXII shows a comparison of the Air Quality Index categories along with the general health effects and cautionary statements associated with each pollutant.

TABLE XXXI
2001 AQI SUMMARY

Range	Number of Days	% of Total Days
Good	134	53%
Moderate	114	45%
Unhealthy for Sensitive Groups	3	1%

The maximum Air Quality Index in 2001 was on July 24, 2001 when the 8-hour average ozone concentration reached 0.097 ppm at the Percy Priest Dam monitoring site. The 0.097 ppm concentration resulted in a reported AQI of 132.

TABLE XXXII
AQI CAUTIONARY STATEMENTS

AQI Category	Ozone (ppm)		Particulate Matter ($\mu g/m^3$)		Carbon Monoxide (ppm)	Sulfur Dioxide (ppm)	Nitrogen Dioxide (ppm)
	8-Hour	1-Hour	$PM_{2.5}$ 24-Hour	PM_{10} 24-Hour	8-Hour	24-Hour	1-Hour
Good	None		None	None	None	None	None
Moderate	Unusually sensitive people should consider limiting prolonged outdoor exertion.		None	None	None	None	None
Unhealthy for Sensitive Groups	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.	Active children and adults, and people with respiratory disease, such as asthma, should limit heavy outdoor exertion.	People with respiratory or heart disease, the elderly and children should limit prolonged exertion.	People with respiratory disease, such as asthma, should limit outdoor exertion.	People with cardiovascular disease, such as angina, should limit heavy exertion and avoid sources of CO, such as heavy traffic.	People with asthma should consider limiting outdoor exertion.	None
Unhealthy	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.	Active children and adults, and people with respiratory disease, such as asthma, should avoid heavy outdoor exertion; everyone else, especially children, should limit heavy outdoor exertion.	People with respiratory or heart disease, the elderly and children should avoid prolonged exertion; everyone else should limit prolonged exertion.		People with cardiovascular disease, such as angina, should limit moderate exertion and avoid sources of CO such as heavy traffic.	Children, asthmatics, and people with heart or lung disease should limit outdoor exertion.	None
Very Unhealthy	Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.	Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.	People with respiratory or heart disease, the elderly and children should avoid any outdoor activity; everyone else should avoid prolonged exertion.	People with respiratory disease, such as asthma, should avoid any outdoor activity; everyone else, especially the elderly and children, should limit outdoor exertion.	People with cardiovascular disease, such as angina, should avoid exertion and sources of CO, such as heavy traffic.	Children, asthmatics, and people with heart or lung disease should avoid outdoor exertion; everyone else should limit outdoor exertion.	Children and people with respiratory disease, such as asthma, should limit heavy outdoor exertion.
Hazardous	Everyone should avoid all outdoor exertion.	Everyone should avoid all outdoor exertion.	Everyone should avoid any outdoor exertion; people with respiratory or heart disease, the elderly and children should remain indoors.	Everyone should avoid any outdoor exertion; people with respiratory disease, such as asthma, should remain indoors.	People with cardiovascular disease, such as angina, should avoid exertion and sources of CO, such as heavy traffic; everyone else should limit heavy exertion.	Children, asthmatics, and people with heart or lung disease should remain indoors; everyone else should avoid outdoor exertion.	Children, and people with respiratory disease, such as asthma, should limit moderate or heavy outdoor exertion.

POLLEN

Pollen is a small, spherical shaped grain which is produced by plants and is necessary for plant fertilization. Each plant has its own pollinating season which tends to be fairly constant from year to year. In this region, trees generally pollinate from around the first of March through May, grass from the first of March until killing frost and ragweed in the fall. The actual amount of pollen in the air, at any given time, depends on the weather conditions, as well as total amount of pollen produced.

Pollen is measured using a Durham pollen sampler. Pollen is collected on a microscope slide which has been smeared with a light coating of white petroleum jelly or silicone grease. The slide is exposed for 24 hours and then returned to the laboratory where it is stained with a few drops of Calberia's staining solution. The pollen on the slide is read with a microscope on low power (10X). Five (5) scans across the stained area are counted, and the pollen count is computed as the number of grains of pollen per square centimeter. The following is used for the pollen count:

0 to 5 Pollen Grains/cm^2	Slight
6 to 15 Pollen Grains/cm^2	Moderate
16 to 25 Pollen Grains/cm^2	Heavy
Greater than 25 Pollen Grains/cm^2	Extremely Heavy

TABLE XXXIII
2001 POLLEN COUNT SUMMARY

Range	Number of Days	% of Total Days
Slight	72	42%
Moderate	49	29%
Heavy	13	8%
Extremely Heavy	37	22%

The maximum daily pollen count for Nashville during 2001 was 1333 grains/cm^2 measured April 11, 2001, due to the combination of elm, oak and poplar.

A daily update of the Pollen Count can be found on the website at http://healthweb.nashville.org or by calling the recorded message at (615) 340-0488.

8. INDOOR AIR QUALITY

According to the Environmental Protection Agency (EPA), we spend approximately 90% of our time indoors. For certain populations (infants, the elderly and those confined due to illness or injury), that time approaches 100%. Groups such as the EPA and the American Lung Association (ALA) have stated that our indoor environment may be more polluted than our outdoor environment. Tobacco smoking (and secondhand smoke), asthma, radon, mold, other biologicals, carbon monoxide and nuisance odors are just a few of the things that can make our indoor environment unpleasant or even unhealthy.

Currently, there is an Indoor Air Quality (IAQ) program operated as a segment of the Pollution Control Division (PCD). This program has been in existence for several years. The program is not regulatory. It is a voluntary program that seeks to provide education, information, diagnostic services, where possible, and suggestions on to how to improve indoor air quality. The focus of the IAQ program is on homes, apartments, daycare centers and public and private schools. The Tennessee Occupational Safety and Health Administration (TOSHA) is responsible for the health and safety of employees at commercial and industrial establishments.

During 2001, 68 on-site IAQ investigations were conducted. There were many more telephone calls from people looking for information or guidance on how to correct a particular situation or how to generally improve their indoor air quality. Complaints and requests for assistance have been received from homeowners, renters, students, parents and staff at public and private schools, church members, parents and staff at daycare centers and employees and employers at commercial and industrial facilities.

Mold has become the hot topic recently. Mold is certainly not new. We exist with mold on a daily basis. There is always a little mold everywhere - in the air and on many surfaces. Generally, it is when a person has become sensitized to mold that it becomes a noticeable problem causing respiratory discomfort. However, the symptoms may be quite severe if the person is asthmatic or has an otherwise compromised pulmonary or immune system. There is evidence that some molds produce toxic by-products (mycotoxins). The current recommendations from the Environmental Protection Agency and the Centers for Disease Control are based on a common-sense approach for any mold contamination existing inside buildings and homes. The hazards presented by molds that may contain mycotoxins should be considered the same as other common molds which can grow in your home. It is not necessary to determine what type of mold you may have. All molds should be treated the same with respect to potential health risks and removal.

For the most part, one should take routine measures to prevent mold growth in the home. Moisture control is the key to mold control. In most cases, mold can be cleaned off surfaces with soap and water and the surfaces sanitized with a weak bleach solution. Mold under carpets typically requires that the carpets be removed. Once mold starts to grow in insulation or wallboard the only way to deal with the problem is by removal and replacement. If you have an

extensive amount of mold, and you do not think you can manage the cleanup on your own, you may want to contact a professional who has experience in cleaning mold in buildings and homes.

9. VEHICLE INSPECTION PROGRAM

The Federal Clean Air Act as amended mandates a Vehicle Inspection Program in non-attainment areas that could not demonstrate attainment of the National Ambient Air Quality Standard for carbon monoxide and ozone by December 31, 1982. The allowable emission standards for various vehicle types and ages are listed in Table XXXIV. Davidson County could not demonstrate attainment by December 31, 1982; therefore, a five-year extension was requested to demonstrate attainment of the National Ambient Air Quality Standard for carbon monoxide and ozone. This extension was granted based on Davidson County implementing a Vehicle Inspection Program by January 1, 1982. Failure to implement this mandatory vehicle inspection program could result in sanctions including federal highway funds, air program funds and a construction moratorium.

Carbon monoxide (CO) is a colorless, odorless gas that is a product of incomplete combustion. The major source of carbon monoxide is light duty gasoline powered vehicles. Ozone (O_3) is a colorless, pungent gas that is produced by the reaction of sunlight with hydrocarbon and nitrogen oxides. A major source of hydrocarbons and nitrogen oxides is the light duty gasoline powered vehicles.

This section describes the results of Davidson County's Vehicle Inspection Program for the period of January 1, 2001 through December 31, 2001.

INSPECTION PROGRAM DESCRIPTION

The Metropolitan Code of Nashville and Davidson County, Chapter 10.56, "Air Pollution Control," Section 10.56.240, "Internal Combustion Engines," authorizes the Metropolitan Board of Health to develop and implement a vehicle inspection maintenance program. On May 31, 1981, the Metropolitan Board of Health adopted the Metro Public Health Department, Division of Pollution Control's, Regulation No. 8, "Regulation of Emissions From Light-Duty Motor Vehicles Through Mandatory Vehicle Inspection and Maintenance Program," which provides for a vehicle inspection program for all light duty vehicles manufactured from 1975 through current model year with a maximum gross vehicle weight of 8500 pounds or less. The only exceptions are diesel or electric powered light duty vehicles and motorcycles. This regulation was approved by the Metropolitan Council of Nashville and Davidson County May 17, 1983, Resolution No. R83-1471. The program approved by the Metropolitan Council is a centralized program operated by a contractor.

The Davidson County Vehicle Inspection Program requires all light duty gasoline vehicles to be inspected annually. Vehicles found to have excessive emissions must be repaired and retested and must pass the emissions test prior to being issued a Davidson County wheel tax license.

The Davidson County's Vehicle Inspection Program uses an idle test procedure. The vehicles are tested at idle RPM with the transmission in neutral or park. If the vehicle fails to pass this test, a high RPM Precondition is used and the vehicle is given a second idle test. A vehicle does not fail the initial test unless if fails both of the idle tests. A licensed vehicle inspector licensed by the Metro Public Health Department must make all inspections.

The Vehicle Inspection Program became mandatory January 1, 1985. Before the owner of a light duty vehicle can purchase the Davidson County wheel tax license, they must show proof that the vehicle has met the allowable tailpipe emission standards of the Vehicle Inspection Program.

Effective December 1, 1994, the program was changed to require all vehicles, 1975 and newer, to go through the vehicle inspection program. The program was further expanded to require a visual three-point anti-tampering inspection. This includes: gas cap; gasoline inlet restrictor; and catalytic converter.

Table XXXIV
Maximum Idle Speed Allowable Emissions
During Idle Speed Test

Vehicle Model Year	Carbon Monoxide %		Hydrocarbon (PPM)	
	LIGHT DUTY VEHICLES LESS THAN OR EQUAL TO 6000 LBS. GVWR	LIGHT DUTY VEHICLES GREATER THAN 6000 LBS. GVWR	LIGHT DUTY VEHICLES LESS THAN OR EQUAL TO 6000 LBS. GVWR	LIGHT DUTY VEHICLES GREATER THAN 6000 LBS. GVWR
1975	5.0	6.5	500	750
1976	5.0	6.5	500	750
1977	5.0	6.5	500	750
1978	4.0	6.0	400	600
1979	4.0	6.0	400	600
1980	3.0	4.5	300	400
1981 & Newer	1.2	4.0	220	400

OPERATING STATISTICS

During 2001, the Davidson County Vehicle Inspection Program performed 511,490 emission inspections. Compared to the 505,918 inspections done during 2000, there was a increase of 5,572 inspections.

EMISSION INSPECTION PASSING AND FAIL RATES

Table XXXV is a summary of the total number of vehicles inspected during 2001. For 2001, the over-all pass rate for vehicles during the initial test was 94% and the fail rate was 6%.

TABLE XXXV
2001 SUMMARY OF VEHICLES TESTED
by the
DAVIDSON COUNTY VEHICLE INSPECTION PROGRAM

Total Number of Vehicles Tested	511,490
Number of Initial Tests Performed	**478,332**
Percent of Total Vehicles Tested	93.5%
Number of Vehicles that Passed the Initial Test	449,447
Percent of Vehicles that Passed the Initial Test	**94.0%**
Number of Vehicles that Failed the Initial Test	28,885
Percent of Vehicles that Failed the Initial Test	**6.0%**
Number of First Retests Performed	23,915
Number of Vehicles that Passed the First Retest	14,985
Percent of Vehicles that Passed the First Retest	62.7%
Number of Vehicles that Failed the First Retest	8,930
Percent of Vehicles that Failed the First Retest	37.3%
Number of Other Retests Performed	9,243
Number of Vehicles that Passed Any Other Retest	4,644
Percent of Vehicles that Passed Any Other Retest	50.2%
Number of Vehicles that Failed Any Other Retest	4,599
Percent of Vehicles that Failed Any Other Retest	49.8%

The initial inspection fail rates have decreased significantly since the beginning of the Vehicle Inspection Program. The initial inspection fail rates rounded to the nearest percent by year since the program start-up are contained in Table XXXVI.

TABLE XXXVI
INITIAL EMISSION INSPECTION FAIL RATE

YEAR	FAIL RATE
1986	18%
1987	16%
1988	14%
1989	12%
1990	11%
1991	9%
1992	7%
1993	7%
1994	7%
1995	10%
1996	9%
1997	8%
1998	8%
1999	7%
2000	6%
2001	6%

The most reasonable explanation for the decreasing fail rates in the test program is that affected vehicles are being better maintained and many gross polluters have been taken out of service. Encouraging motorists to maintain their vehicles is an essential goal of the program.

Also, note that the fail rate went up beginning in 1995 after years of decline. This is due to the adding of a three-point anti-tampering inspection into the program in 1995.

This data shows that the Davidson County Vehicle Inspection Program is effective in reducing tailpipe emissions from light duty vehicles.

QUALITY ASSURANCE

The Metro Public Health Department Vehicle Inspection Staff is also assigned the duty of auditing all the emission inspection facilities in the Davidson County program. The program has six test centers as seen in Table XXXVII.

TABLE XXXVII
TEST CENTER LOCATIONS
DAVIDSON COUNTY

Station 1	501 Craighead Street
Station 2	3494 Dickerson Road
Station 3	715 Gallatin Road North, Madison
Station 4	3363 Stoners Bend Drive
Station 5	1317 Antioch Pike
Station 6	7008 West Belt Drive

The audit involves review of inspection facility records and compliance with administrative requirements and tests of emission inspection equipment to ensure that the equipment is operating in accordance with all federal and local requirements. Audits are conducted twice a month on all inspection facilities. Gas analyzer audits involve tests to ensure that the gas analyzers are measuring criterion gases (i.e., hydrocarbons, carbon monoxide and carbon dioxide) accurately. During 2001, there were 645 gas analyzer audits on 13 gas analyzers used by the test centers. Also, there were 31 undercover activities conducted on contractor inspection facilities.

ENFORCEMENT

During the 2001 inspection year different enforcement activities were instituted to ensure compliance with the vehicle inspection program. The staff issued the following:

Notices of violation	180
Citations	439
Court fines collected	$5,065.50

Due to the enforcement efforts of the staff, the Davidson County Vehicle Inspection Program has a 98% compliance rate. Overall, the data shows that the Davidson County Vehicle Inspection Program is effective in reducing tailpipe emissions from light duty vehicles, since the dirty vehicles are being identified and repaired.

10. OTHER ACTIVITIES

During 2001, the staff attended 40 EPA workshops or training courses. Semi-annually in 2001, the State of Tennessee Visible Emission Evaluation School certified four environmentalists to conduct visible emissions evaluations. The staff made five presentations.

In addition to the ambient monitoring activities previously presented, the Pollution Control Division Laboratory performed analysis on 47 samples for asbestos and 56 other particulate matter samples.

During 2001, this agency's revenue included:

$521,320.50	Operating Permits and Emission-based fees
$ 40,170.00	Penalties
$405,040.00	Vehicle Inspection Program

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