Foreword

The Air and Solid Waste Division of the Jefferson County Department of Health prepares this report annually. It analyzes the results of air monitoring stations located throughout Jefferson County for the purpose of measuring the outdoor concentrations of those pollutants for which the U. S. Environmental Protection Agency has established ambient air quality standards (with the exception of nitrogen dioxide, which is not necessary in an urban area the size of Birmingham):

- Carbon Monoxide
- Ozone
- Lead
- Particulate Matter
- Sulfur Dioxide

This report includes general discussions of the background information, possible sources, and health effects of each pollutant along with any occurrences of exceedances of air quality standards. Also included is a summary of field enforcement activities. An effective field enforcement program contributes directly to improved air quality and pollutant level measurements within acceptable limits.

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List of Tables and Graphs

List of Acronyms and Symbols

CO	carbon monoxide
EPA	Environmental Protection Agency
NAMS	National Air Monitoring Station
NO_x	oxides of nitrogen
O_3	ozone
Pb	lead
PM10	particulate matter of size 10 microns or less in diameter
ppm	parts per million
SLAMS	State and Local Air Monitoring Station
SMOPs	synthetic minor operating permits
SO_2	sulfur dioxide
SPM	Special Purpose Monitoring
TSP	total suspended particulates
$\mu g/m^3$	micrograms per cubic meter
VOCs	volatile organic compounds

Executive Summary

The uniform air quality index was created for use as a standard measure of overall air quality. It is a national index that was designed to meet the needs of all citizens. The daily index report is based on the uniform pollutants' standards index structure that includes the pollutants for which primary short term National Ambient Air Quality Standards have been established. These pollutants are: particulate matter (PM10), sulfur dioxide (SO_2), carbon monoxide (CO), and ozone (O_3) (see Table 2.1).

The ambient concentration of each pollutant is scaled on a range from zero (0) to five hundred (500) with one hundred corresponding to the National Ambient Air Quality Standard, or level at which the pollutant is considered unhealthful, and five hundred corresponding to the significant harm level. The intermediate range breakpoints of 200, 300 and 400 represent increasing measures toward the significant harm level.

The air quality index is available daily, Monday through Friday, by dialing (205) 933-0583. The following table summarizes the measurements of overall air quality in Jefferson County for 1996:

Air Quality Description	**Number of Days***
Good (1 - 50)	154
Moderate (51 - 100)	90
Unhealthy (101 - 200)	3
Very Unhealthy (201 - 300)	0
Hazardous (301 or above)	0
Total Number of Days	**247**

*The air quality index is developed Monday through Friday. Therefore, the table above does not include every measurement recorded during the year.

There were 4 days of exceedances (of which one occurred on the weekend) of the ambient air quality standards in 1996 at National Air Monitoring Stations (NAMS) and State and Local Air Monitoring Stations (SLAMS). The maximum index reported was 128 and occurred July 1. Overall, the average index was 46.

1.0 Introduction

The Jefferson County Department of Health operates an air pollution control program with its goal being to ensure that citizens of Jefferson County have access to air which meets the health standards as established by the Environmental Protection Agency (EPA). A significant portion of the air pollution resources is devoted to monitoring pollutant levels in the ambient air (that portion of the atmosphere to which the general public has access). Also, the information received from the monitoring network about pollutant levels is used as the basis for developing any control strategies necessary to ensure that health standards are attained and maintained.

2.0 Ambient Air Quality Standards

The Environmental Protection Agency (EPA) has established two national ambient air quality standards: primary and secondary. The primary standards are designed to protect public health with an adequate margin of safety. The secondary standards are designed to protect public welfare related values such as property, materials, plants and animal life. The Air Pollution Control Program of Jefferson County utilizes the standards established by the EPA. Those standards are:

Table 2.1

National Ambient Air Quality Standards

Pollutant and time period*	**Standard (mean levels)**	
	Primary	**Secondary**
PM10 (Inhalable particulates)		
(Micrograms per cubic meter)		
Annual mean level	50	50
24-hour average	150	150
Sulfur dioxide		
(Parts per million)		
Annual mean level	0.03	
24-hour average	0.14	
3-hour average		0.5
Nitrogen dioxide		
(Parts per million)		
Annual mean level	0.053	0.053
Carbon monoxide		
(Parts per million)		
8-hour average	9	None
1-hour average	35	None
Ozone		
(Parts per million)		
1-hour average	0.12	0.12
Lead		
(Micrograms per cubic meter)		
3-month mean level	1.5	1.5

*Short-term standards (24-hour and less) are not to be exceeded more than once a year. Long-term standards are maximum permissible mean-level concentrations that are never to be exceeded.

3.0 Monitoring Network Types

Data provided through a complex network of air monitoring stations located throughout Jefferson County determine the quality of the ambient air in the County. In January 1996, this network consisted of 15 monitoring sites and 22 air monitoring devices. There were modifications to the network during the course of the year: 1 site was closed, 2 sites were opened, 2 monitors were shut-down and 3 monitors were started. By December 31, the network consisted of 16 sites and 23 monitors. See Table 3.1. The air pollutants monitored at these sites were: ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), total suspended particulates (TSP), PM10 (particulates 10 microns and less in size), and lead (Pb). Total suspended particulates (TSP) were monitored for a portion of 1996 for reasons of continuity; there is no ambient standard for TSP. Nitrogen dioxide is not monitored because the county population is less than one million, and monitoring is therefore not required. Each air monitoring device was classified as one of the following: State and Local Air Monitoring Station (SLAMS), National Air Monitoring Station (NAMS), or Special Purpose Monitoring (SPM) based on the general monitoring objectives.

The objective of the SLAMS network is to collect data that provide an overview of the state's air quality used in the development of statewide control strategies.

The primary objective of the NAMS network is to monitor in areas where the pollutant concentration levels and population exposures are likely to be high. EPA uses the data to develop nationwide control strategies.

The objective of the SPM network is to provide data for the development and refinement of local control strategies. The data also verify maintenance of air standards in areas not monitored by either the SLAMS or NAMS networks.

Table 3.1

Jefferson County 1996 Air Monitoring Network

January 1, 1996 Network

Site Location	Pollutants	Monitoring SLAMS	Objective NAMS	Objective SPM
Bessemer	PM10	1	0	0
Dolomite (TSP closed 5/7/96)	PM10, TSP	0	0	2
Downtown (CO closed 6/16/96)	CO	1	0	0
East Thomas	CO, Pb	0	2	0
Fairfield	CO, O3, PM10, SO2	1	2	1
Hoover	O3	1	0	0
Inglenook	PM10	1	0	0
Leeds, Elementary School	PM10	1	0	0
McAdory High School	O3	1	0	0
North Birmingham, Southern Railroad	CO, PM10	0	1	1
Northside School	PM10	1	0	0
Pinson High School	O3	0	1	0
Tarrant, Elementary School	PM10, O3	1	1	0
UAB	CO	1	0	0
Wylam	PM10	0	1	0

December 31, 1996 Network

Site Location	Pollutants	Monitoring SLAMS	Objective NAMS	Objective SPM
Bessemer	PM10	1	0	0
Dolomite	PM10	0	0	1
East Thomas	CO, Pb	0	2	0
Fairfield	CO, O3, PM10, SO2	1	2	1
Hoover	O3	1	0	0
Inglenook	PM10	1	0	0
Leeds, Elementary School	PM10	1	0	0
McAdory High School	O3	1	0	0
North Birmingham, Sloss (CO started 9/25/96; PM10 reopened 1/24/96)	CO, PM10	0	0	2
North Birmingham, Southern Railroad	CO, PM10	0	1	1
Northside School	PM10	1	0	0
Pinson High School	O3	0	1	0
Tarrant ABC Coke (PM10 reopened 1/24/96)	PM10	0	0	1
Tarrant, Elementary School	PM10, O3	1	1	0
UAB	CO	1	0	0
Wylam	PM10	0	1	0

4.0 Description of Pollutants

4.1 Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless and tasteless gas. It is emitted into the atmosphere by both natural and man-made sources. Globally, total emissions of CO are greater than emissions of any other air pollutant, due to the widespread extent of low-level emissions from natural sources.

The major natural source of CO is the spontaneous oxidation of naturally occurring methane. Other natural sources include the oceans, plant growth and decay, terpene oxidation, and forest fires. Globally, natural sources account for nearly 90 percent of CO emissions.

The major man-made source of CO is the incomplete combustion of carbon-based fuels. Gasoline motor vehicles--primarily automobiles and light duty trucks--are the most common source. Other sources include industrial process losses, open burning and industrial or utility boilers.

CO poses a threat to human health because of its ability to react with hemoglobin that carries oxygen to cell tissue. Hemoglobin preferentially absorbs CO, thus reducing the amount of oxygen transported throughout the body. Most people will experience symptoms including dizziness and headaches when exposed to high levels of CO. Eliminating exposure causes blood to return to normal levels of oxygen.

4.2 Lead

Lead is a toxic metal that comes from natural and man-made sources and is also relatively abundant. Typically, lead ingestion is attributed to four components of the human environment: food, inhaled air, dusts of various types, and drinking water.

Calculations of natural contributions using geochemical information indicate that natural sources contribute a relatively small amount of lead to the atmosphere. Natural sources include soil erosion by wind, volcanic dust, forest fires, sea salt, and the decay of radon gas.

The major sources of man-made lead emissions to the ambient air include smelting operations and lead mining. Other sources include coal-fired power plants, lead battery manufacturing, and municipal solid waste incineration. Leaded gasoline has been phased-out and is not a major source.

Lead absorption poses a threat to human health because of its accumulative properties. High concentration of lead in the bloodstream of children causes severe and permanent neurological damage or death. Some lead-containing chemicals have been shown to cause cancer in animals.

4.3 Ozone

Ozone is a highly reactive oxidant gas with a pungent odor and a faint bluish color. Ozone is photochemically produced in the atmosphere when volatile organic compounds (VOCs) combine with oxides of nitrogen (NOx) and carbon monoxide (CO) in the presence of sunlight. In the lower atmosphere, ozone is the predominant component of photochemical smog and is most likely to reach high concentration levels on hot, dry, summer days when sunlight is intense and wind movement is low.

In urban areas, man-made emissions of nitrogen oxides and VOCs lead to the formation of ozone in the lower atmosphere. Nitrogen oxides are primarily emitted from combustion sources such as motor vehicles and boilers. Primary sources of VOCs include motor vehicle exhaust, gasoline evaporation from storage facilities or tanker trucks, paint, and industrial use of solvents or coatings.

Ozone is a pulmonary irritant. Symptoms include irritation of the eyes, nose, throat and lungs as well as reduced lung function, asthma, stuffy nose, reduced resistance to colds and other infections. Ozone also damages plants, trees, rubber and fabrics.

Currently, the Jefferson and Shelby County area is considered marginally nonattainment for ozone. This means that the area is out of compliance with Federal standards. An Ozone Awareness Program is underway in Jefferson and Shelby Counties to educate citizens about the health and economic effects of being ozone nonattainment. In addition, the program is designed to encourage citizens to take voluntary actions to help decrease ozone levels.

4.4 Particulates

Particulate matter consists of airborne solid particles ranging from about 0.001 to 500 micrometers in diameter. Particulate matter includes: dust, soot and other tiny bits of solid materials released into and moving around in the air. PM10 consists of particles less than or equal to 10 micrometers in diameter and is the basis for the ambient air quality standard. Dustfall is particles larger than 10 micrometers. Total suspended particulate (TSP) is a measure of the total airborne particles in the air. PM10 is a subset of the total airborne particles in the air.

Particulate matter has many sources including: burning of diesel fuels by trucks, buses and other diesel engines; incineration of garbage; mixing and application of fertilizers and pesticides; road construction; vehicular tire wear and exhaust; operation of fireplaces and wood stoves; and industrial processes (such as steel making and mining operations).

Exposure to high concentrations of particulate pollution (PM10) causes eye, nose and throat irritation, aggravation of chronic lung disease, and symptoms of heart and respiratory problems. Particulates are the main source of haze that reduces visibility.

4.5 Sulfur Dioxide

Sulfur dioxide is a colorless, nonflammable gas formed during combustion of sulfur-containing fuels such as coal and oil. Partly converted by photochemical and catalytic reactions in the atmosphere, sulfur dioxide becomes sulfur trioxide, sulfuric acid, and various sulfate particles that can also have adverse health and welfare effects.

Globally, man-made emissions account for one-third of the total emissions of sulfur compounds in the atmosphere. Of the natural emissions, most are hydrogen sulfide released from the decay of organic matter or sulfate particles released in the sea spray. The combustion of sulfur-containing coal and oil in utility and industrial boilers is the major man-made source of sulfur dioxide emissions.

Sulfur dioxide is an irritant to the pulmonary system, primarily affecting the upper respiratory system. Damage to lungs occurs with deep inhalation of particles absorbing sulfur dioxide. Sulfur dioxide plays an important role in the production of acid rain (acid aerosols), which damages trees and lakes. Acid aerosols also erode stone used in buildings, statues, and monuments.

5.0 Monitoring Results

5.1 Carbon Monoxide

In January of 1996, the carbon monoxide monitoring network consisted of 5 monitors (2 SLAMS, 2 NAMS and 1 SPM) strategically located throughout Jefferson County. See Table 3.1. On September 25, 1996, a CO special purpose monitor was installed at the North Birmingham, Sloss site. Carbon monoxide was the responsible pollutant 34 times in the daily air quality index. Of those 34 days, 30 days were in the good category, and 4 days were in the moderate category. The maximum 1-hour CO concentration at monitoring sites during the year generally measured less than 18.8 ppm, which is 54 percent of the 35 ppm 1-hour ambient standard. The maximum 8-hour CO concentration at monitoring sites during the year generally measured less than 12.2 ppm, which is 135 percent of the 9 ppm 8-hour standard (see Table 5.6.1 and Graphs 5.6.1 and 5.6.2). Two exceedances of the 8-hour CO ambient standards were recorded during the year at the North Birmingham, Sloss SPM site. No exceedances were recorded at NAMS or SLAMS sites.

5.2 Lead

In January of 1996, the lead monitoring network consisted of 1 monitor (1 NAMS) located at the East Thomas site in Jefferson County. See table 3.1. The Montgomery Oil monitor closed as of January 1, 1996. The lead quarterly average concentration during the year generally measured less than 0.13 $\mu g/m^3$, which is 9 percent of the 1.5 $\mu g/m^3$ quarterly average ambient standard (see Table 5.6.2 and Graphs 5.6.3 and 5.6.4). Graph 5.6.3 shows a dramatic drop in lead mean values from 1991 to 1996. This decrease is a result of a combination of the removal of lead from gasoline and the closure of the ILCO lead smelting plant in Leeds. No exceedance of the lead ambient standard was recorded during the year.

5.3 Ozone

In January of 1996, the ozone monitoring network consisted of 5 monitors (3 SLAMS and 2 NAMS) strategically located throughout Jefferson County. No changes to the network occurred during the year. Ozone was the responsible pollutant 128 times in the daily air quality index. Of those 128 days, 60 days were in the good category, 65 days were in the moderate category and 3 were in the unhealthy category. Exceedances of the 0.12 ppm ambient standard were recorded on four separate days at monitoring sites: May 23 and 24; June 30; and July 5 (see Table 5.6.3 and Graph 5.6.5). The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to one. An area is classified as attainment when the average number of days over a three-year period, with an hourly concentration above the standard, is one or less at each monitoring site. Jefferson and Shelby counties are currently classified as a marginal nonattainment area for ozone.

5.4 Particulate Matter

In January of 1996, the particulate matter (PM10) monitoring network consisted of 9 monitors (5 SLAMS, 2 NAMS and 2 SPM) strategically located throughout Jefferson County. On January 24, 1996, the North Birmingham Sloss and the Tarrant ABC Coke monitoring sites reopened. This brought the network total 5 SLAMS, 2 NAMS and 4 SPM (see Table 3.1). PM10 was the responsible pollutant 84 times in the daily air quality index. Of those 84 days, 63 days were in the good category, and 21 days were in the moderate category. The maximum 24-hour PM10 concentration at monitoring sites during the year generally measured less than 282 $\mu g/m^3$, which is 188 percent of the 150 $\mu g/m^3$ 24-hour ambient standard. The maximum annual mean concentration at monitoring sites during the year generally measured less than 46 $\mu g/m^3$, which is 92 percent of the 50 $\mu g/m^3$ annual mean standard (see Table 5.6.4 and Graphs 5.6.6 and 5.6.7). Nine exceedances of the PM10 ambient standards were recorded at SPM sites during the year. No exceedances were recorded at NAMS or SLAMS sites.

5.5 Sulfur Dioxide

In January of 1996, the sulfur dioxide (SO_2) monitoring network consisted of 1 monitor (1 NAMS) located in Fairfield. SO_2 was the responsible pollutant one time in the daily air quality index and was in the good category. The maximum 24-hour SO_2 concentration at the monitoring site during the year generally measured less than 0.02 ppm, which is 14 percent of the 0.14 ppm 24-hour ambient standard. The maximum SO_2 annual mean concentration at the monitoring site during the year generally measured less than 0.004 ppm, which is 13 percent of the 0.03 ppm annual mean standard. The maximum 3-hour SO_2 concentration at monitoring the site during the year generally measured less than 0.06 ppm which is 12 percent of the 0.5 parts per million 3-hour ambient standard (see Table 5.6.5 and Graphs 5.6.8, 5.6.9 and 5.6.10). No exceedances of the SO_2 ambient standards were recorded during the year. Due to the low SO_2 emission levels from industrial sources in the vicinity of the Fairfield monitoring site, the Health Department has requested that this monitor be relocated to an alternative site.

5.6 Tables and Figures

Table 5.6.1

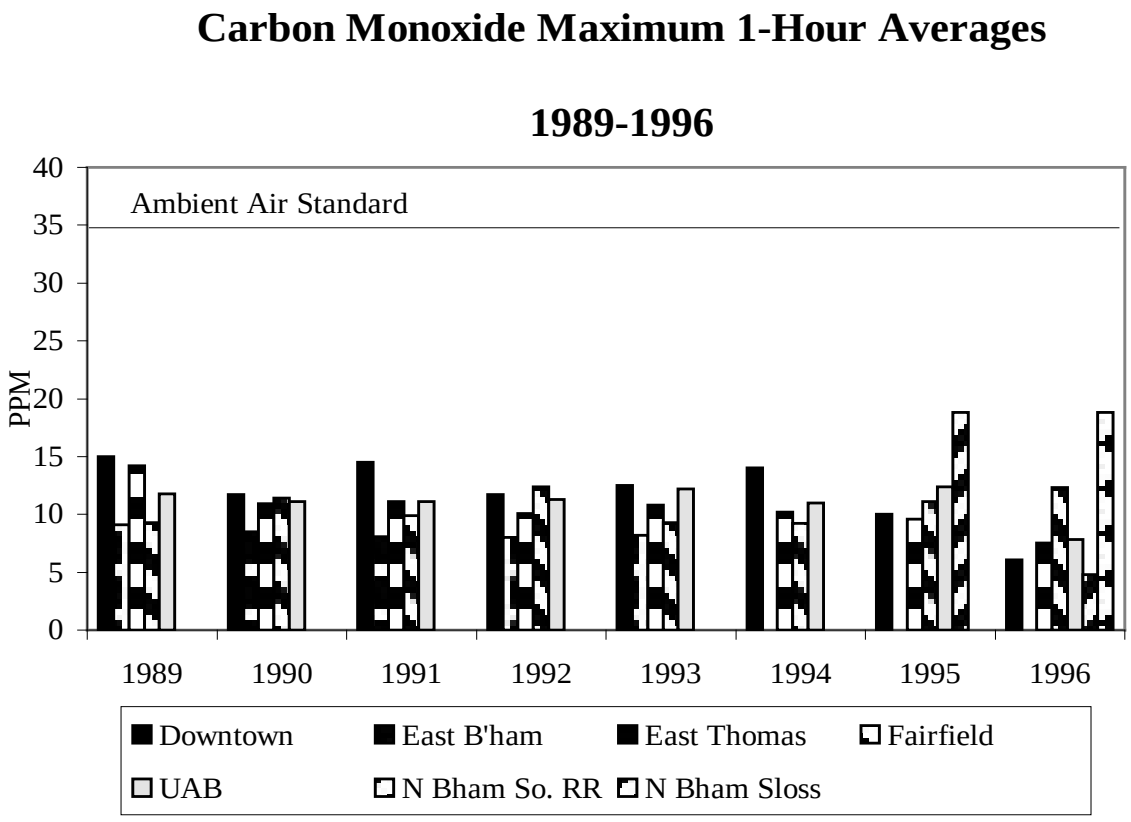
Carbon Monoxide Maximum Values

1989 - 1996

	Year							
Site	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
Downtown								
1-hour max.	15.0	11.7	14.5	11.7	12.5	14.0	10.0	6.1
8-hour max.	7.6	7.0	7.7	5.6	6.2	6.9	6.2	4.5
East Birmingham								
1-hour max.	9.1	8.5	8.1	8.0	8.2	Closed		
8-hour max.	6.2	6.2	5.5	6.0	5.2	7/8/93		
East Thomas								
1-hour max.	14.2	10.9	11.1	10.1	10.8	10.2	9.6	7.5
8-hour max.	8.7	7.3	8.0	8.6	7.8	6.7	7.0	5.8
Fairfield								
1-hour max.	9.3	11.4	9.9	12.4	9.3	9.2	11.1	12.3
8-hour max.	6.5	6.5	6.3	7.5	7.3	7.7	7.2	5.3
UAB								
1-hour max.	11.8	11.1	11.1	11.3	12.2	11.0	12.4	7.8
8-hour max.	7.8	7.1	8.1	6.2	6.2	7.2	6.7	6.2
N Bham, So. RR								
1-hour max.						Opened	18.8	4.8
8-hour max.						10/27/94	6.5	3.5
N Bham, Sloss								
1-hour max.							Opened	18.8
8-hour max.							9/25/96	**12.2**

Values measured in parts per million (ppm).
Ambient air exceedances are in bold characters.

Graph 5.6.1


Carbon Monoxide Maximum 1-Hour Averages
1989-1996
Ambient Air Standard
PPM
40
35
30
25
20
15
10
5
0
1989
1990
1991
1992
1993
1994
1995
1996
Downtown
East B'ham
East Thomas
Fairfield
UAB
N Bham So. RR
N Bham Sloss

Graph 5.6.2

Carbon Monoxide Maximum 8-Hour Averages

1989 - 1996

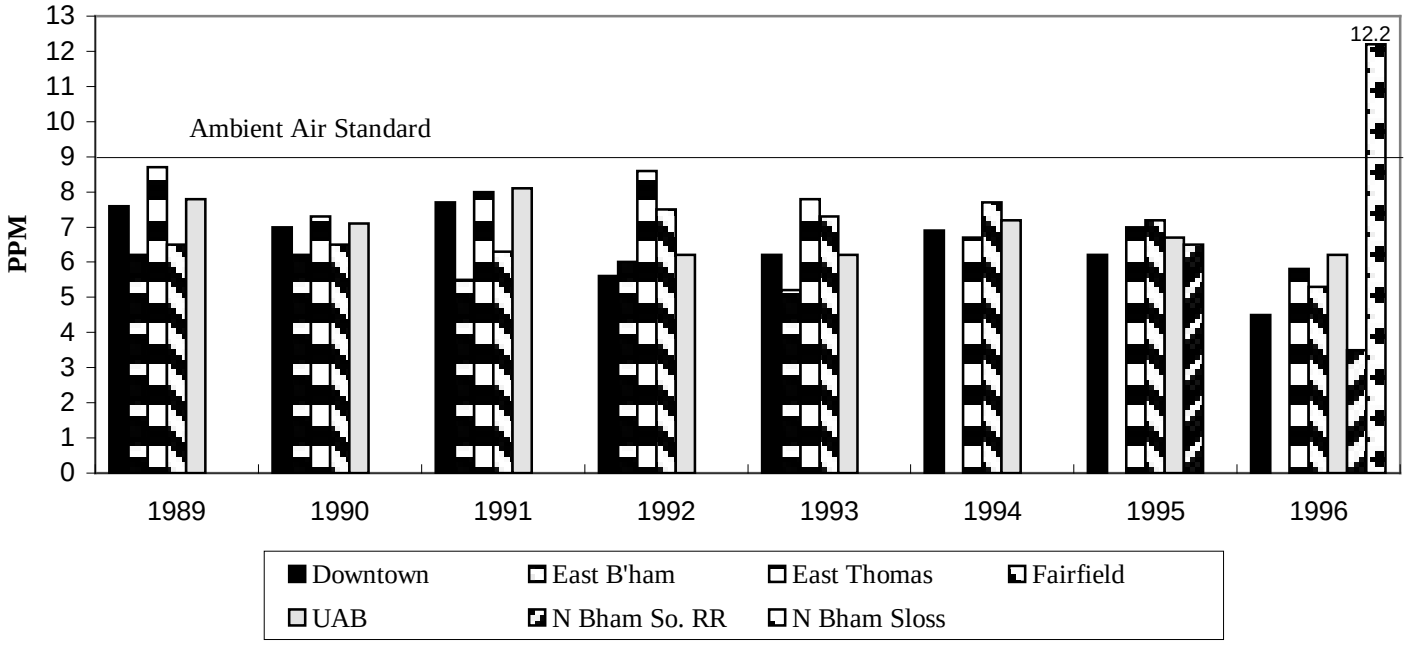


Table 5.6.2

Lead Quarterly Mean Values
1991 - 1996

Monitor Location	Year 1991	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Hayes Int'l		0.31	0.27	0.63	0.39
East Birmingham		0.13	0.12	0.12	0.15
East Thomas		0.09	0.06	0.06	0.07
Ilco Pasture		0.35	0.11	0.28	0.37
Leeds Elementary		0.07	0.18	0.07	0.16
Montgomery Oil		1.24	0.86	1.76	2.6
New Jerusalem Church		0.14	0.08	0.54	0.37

Monitor Location	Year 1992	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Hayes Int'l		0.84	0.29	0.14	0.15
East Birmingham		0.08	0.09	0.1	0.12
East Thomas		0.08	0.08	0.06	0.05
Ilco Pasture		0.28	0.07	0.05	0.07
Leeds Elementary	(Closed 7/1/92)	0.09	0.06		
Montgomery Oil		1.15	0.41	0.18	0.39
New Jerusalem Church	(Closed 7/1/92)	0.35	0.04		

Monitor Location	Year 1993	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Hayes Int'l	(Closed 3/31/93)	0.09			
East Birmingham		0.08	0.06	0.04	0.08
East Thomas		0.06	0.04	0.01	0.07
Ilco Pasture	(Closed 3/31/93)	0.18			
Montgomery Oil		0.28	0.3	0.04	0.1

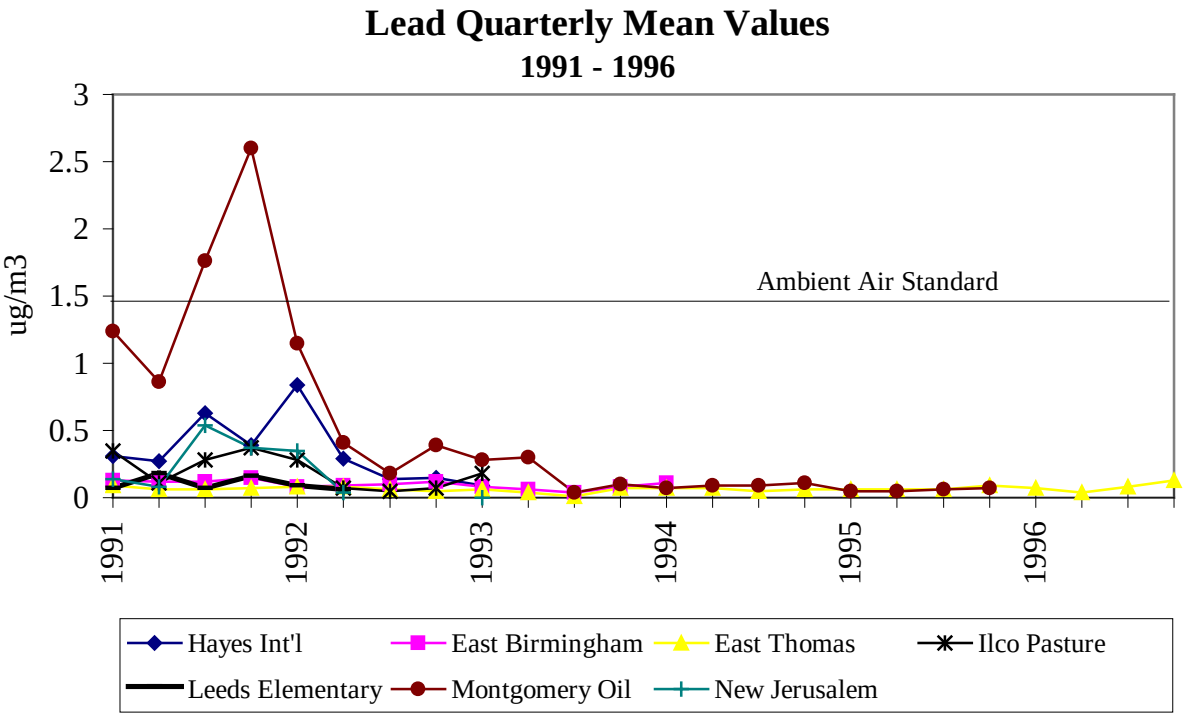
Monitor Location	Year 1994	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
East Birmingham	(Closed 3/31/94)	0.11			
East Thomas		0.07	0.07	0.05	0.06
Montgomery Oil		0.07	0.09	0.09	0.11

Monitor Location	Year 1995	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
East Thomas		0.06	0.06	0.06	0.09
Montgomery Oil	(Closed 1/1/96)	0.05	0.05	0.06	0.07

Monitor Location	Year 1996	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
East Thomas		0.07	0.04	0.08	0.13

Values measured in micrograms per cubic meter ($\mu g/m^3$).

Graph 5.6.3


Lead Quarterly Mean Values
1991 - 1996
ug/m3
3
2.5
2
1.5
1
0.5
0
Ambient Air Standard
1991
1992
1993
1994
1995
1996
Hayes Int'l
East Birmingham
East Thomas
Ilco Pasture
Leeds Elementary
Montgomery Oil
New Jerusalem

Graph 5.6.4

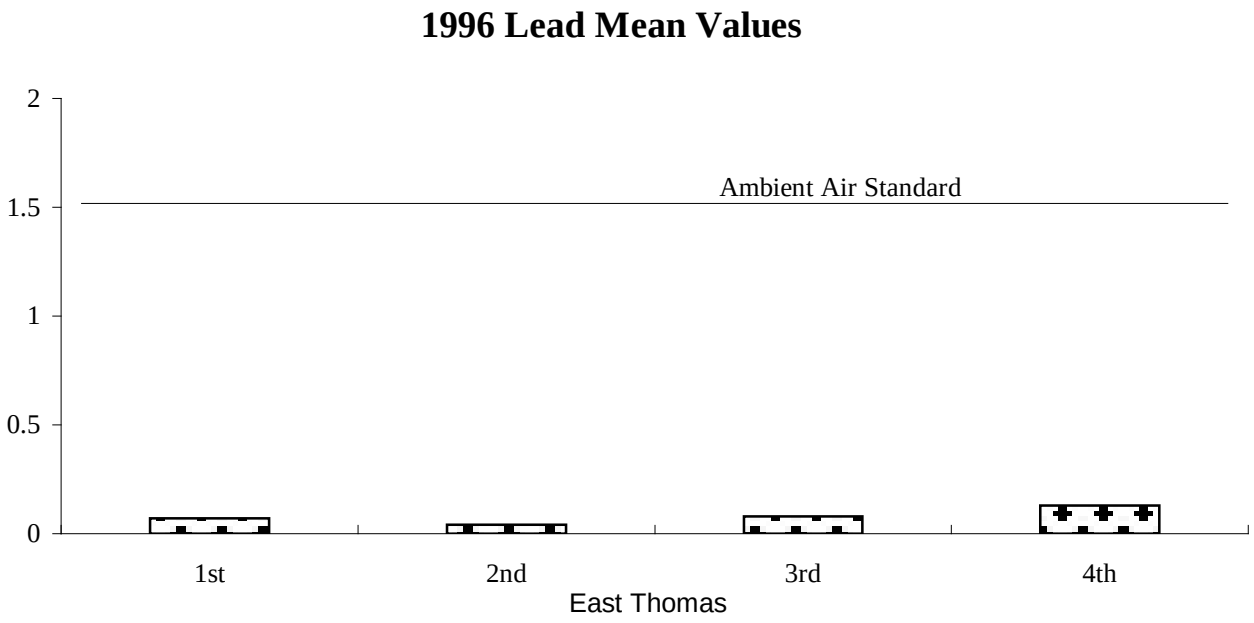

1996 Lead Mean Values
2
1.5
1
0.5
0
Ambient Air Standard
1st
2nd
3rd
4th
East Thomas

Table 5.6.3

Ozone Maximum Values

1991 - 1996

		Year					
		1991	**1992**	**1993**	**1994**	**1995**	**1996**
Fairfield	1.	0.115	0.119	0.120	0.109	0.120	0.117
	2.	0.109	0.113	0.111	0.098	0.119	0.117
	3.	0.108	0.112	0.108	0.093	0.117	0.116
	4.	0.105	0.107	0.104	0.090	0.113	0.113
Tarrant	1.	0.093	**0.129**	0.112	0.079	**0.142**	**0.126**
	2.	0.092	0.115	0.108	0.079	**0.127**	0.117
	3.	0.090	0.096	0.103	0.078	0.123	0.112
	4.	0.089	0.095	0.095	0.076	0.114	0.107
Pinson	1.	0.109	**0.138**	0.115	0.099	0.118	**0.131**
	2.	0.106	0.111	0.098	0.090	0.115	**0.126**
	3.	0.095	0.104	0.098	0.090	0.111	0.114
	4.	0.095	0.104	0.093	0.090	0.107	0.101
McAdory	1.	0.088	0.104	0.106	0.107	**0.153**	**0.144**
	2.	0.085	0.101	0.104	0.099	**0.132**	**0.138**
	3.	0.079	0.091	0.102	0.098	**0.128**	0.113
	4.	0.079	0.089	0.101	0.096	**0.127**	0.110
Hoover	1.	0.106	0.106	**0.135**	0.116	**0.125**	**0.143**
	2.	0.103	0.091	0.113	0.108	**0.125**	**0.141**
	3.	0.103	0.088	0.113	0.099	**0.125**	0.123
	4.	0.102	0.087	0.110	0.096	0.124	0.114

Ambient air exceedances are in bold characters.
Values measured in ppm.

Graph 5.6.5

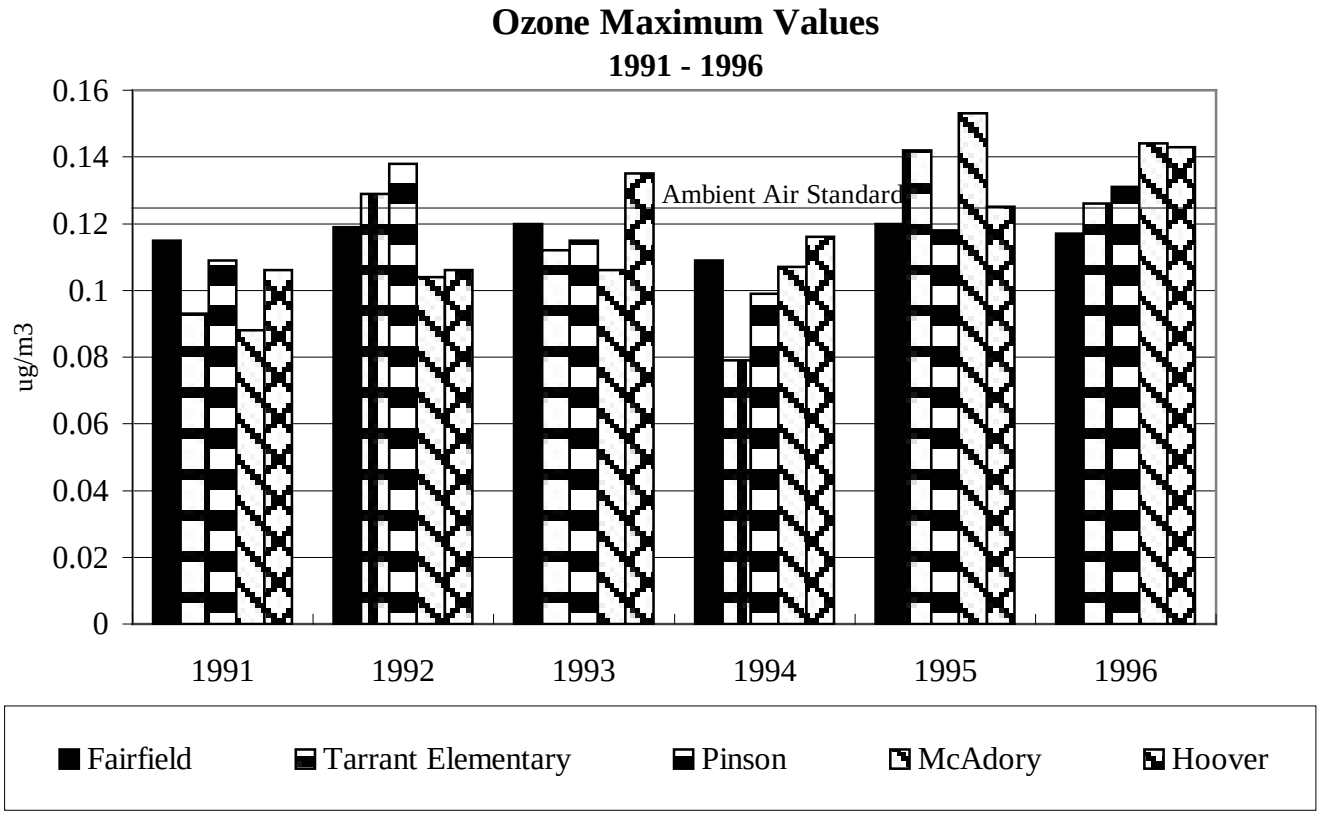

Ozone Maximum Values
1991 - 1996
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
ug/m3
Ambient Air Standard
1991
1992
1993
1994
1995
1996
Fairfield
Tarrant Elementary
Pinson
McAdory
Hoover

Table 5.6.4

Particulate Matter (PM10) Maximums

1991 - 1996

	Year					
	1991	**1992**	**1993**	**1994**	**1995**	**1996**
Bessemer (m)						
Annual Mean	32	28	28	25	27	25
24-hour Averages						
1st Max	82	53	75	69	58	53
2nd Max	79	52	58	50	56	43
Dolomite (c)						
Annual Mean	--	--	--	35	36	33
24-hour Averages						
1st Max	--	--	--	109	118	125
2nd Max	--	--	--	107	109	106
Inglenook (m)						
Annual Mean	31	29	27	25	24	25
24-hour Averages						
1st Max	87	54	73	50	57	57
2nd Max	75	52	62	47	57	51
Leeds Elementary School (m)						
Annual Mean	31	28	25	24	25	24
24-hour Averages						
1st Max	77	54	67	56	63	54
2nd Max	70	52	61	48	50	41
North Birmingham, So. RR (c)						
Annual Mean	42	39	36	34	34	34
24-hour Averages						
1st Max	134	142	98	108	123	106
2nd Max	133	122	85	104	95	100

(continued on following page)

Particulate Matter (PM10) Maximums

1991 - 1996

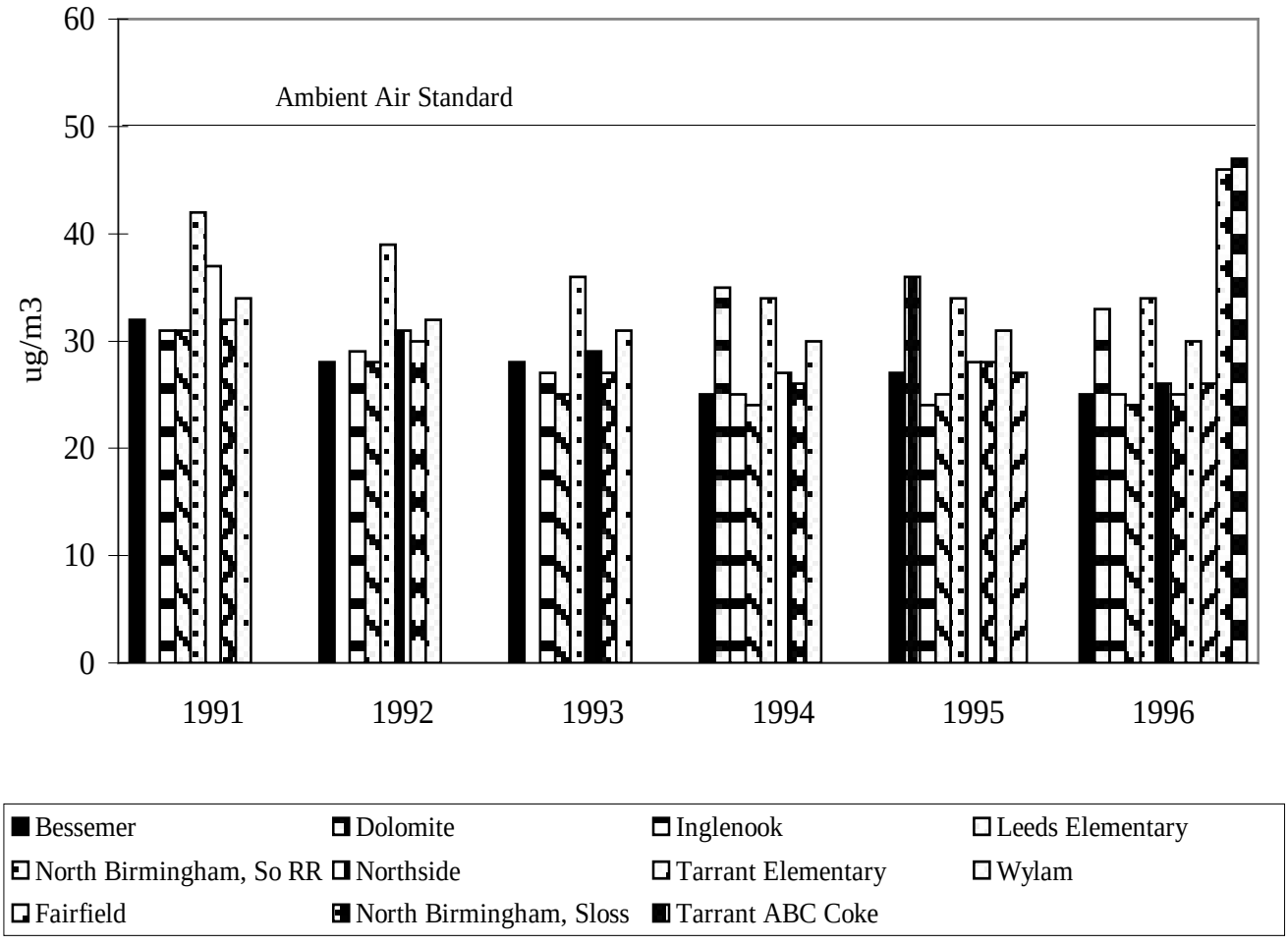
	Year					
	1991	**1992**	**1993**	**1994**	**1995**	**1996**
Northside (m)						
Annual Mean	37	31	29	27	28	26
24-hour Averages						
1st Max	87	69	69	69	52	56
2nd Max	80	66	69	58	52	53
Tarrant Elementary (m)						
Annual Mean	32	30	27	26	28	25
24-hour Averages						
1st Max	99	60	72	52	58	58
2nd Max	76	55	58	50	57	46
Wylam (c)						
Annual Mean	34	32	31	30	31	30
24-hour Averages						
1st Max	86	108	81	116	145 E	109
2nd Max	86	92	76	83	83	83
Fairfield (m)						
Annual Mean	--	--	--	--	27	26
24-hour Averages						
1st Max	--	--	--	--	54	67
2nd Max	--	--	--	--	54	46
North Birmingham, Sloss (c)						
Annual Mean	--	--	--	--	--	46
24-hour Averages						
1st Max	--	--	--	--	--	**188**
2nd Max	--	--	--	--	--	139
Tarrant ABC Coke (c)						
Annual Mean	--	--	--	--	--	47
24-hour Averages						
1st Max	--	--	--	--	--	**282**
2nd Max	--	--	--	--	--	**198**

Values measured in $\mu g/m^3$.
(c) - continuous monitor; (m) - manual monitor; E - Exceptional event data (forest fire).
Ambient air exceedances are in bold characters.

Graph 5.6.6

PM10 Annual Means

1991 - 1996



Graph 5.6.7

1996 PM10 24-Hour Maximums

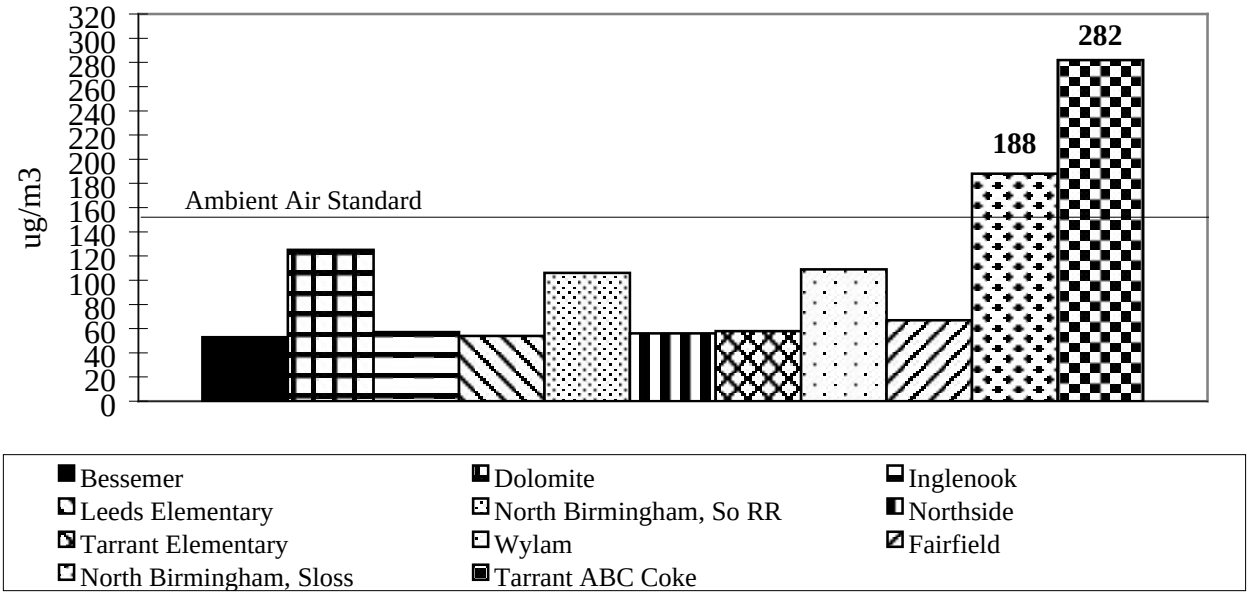


Table 5.6.5

Sulfur Dioxide 24-Hour Maximums and Annual Means
1991 - 1996

Leeds Sunset View Apts.	**1991**	**1992**	**1993**	**1994**
Annual Mean	0.02	0.01	0.01	closed 1/27/94
24-hour Averages				
1st Max	0.14	0.05	0.02	
2nd Max	0.12	0.03	0.02	
3-hour Averages				
1st Max	0.28	0.16	0.062	
2nd Max	0.27	0.15	0.061	

Fairfield	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
Annual Mean	0.01	0.01	0.01	0.01	0.01	<0.01
24-hour Averages						
1st Max	0.02	0.04	0.05	0.05	0.02	0.02
2nd Max	0.02	0.03	0.05	0.04	0.02	0.02
3-hour Averages						
1st Max	0.06	0.10	0.08	0.08	0.05	0.06
2nd Max	0.06	0.09	0.08	0.08	0.04	0.04

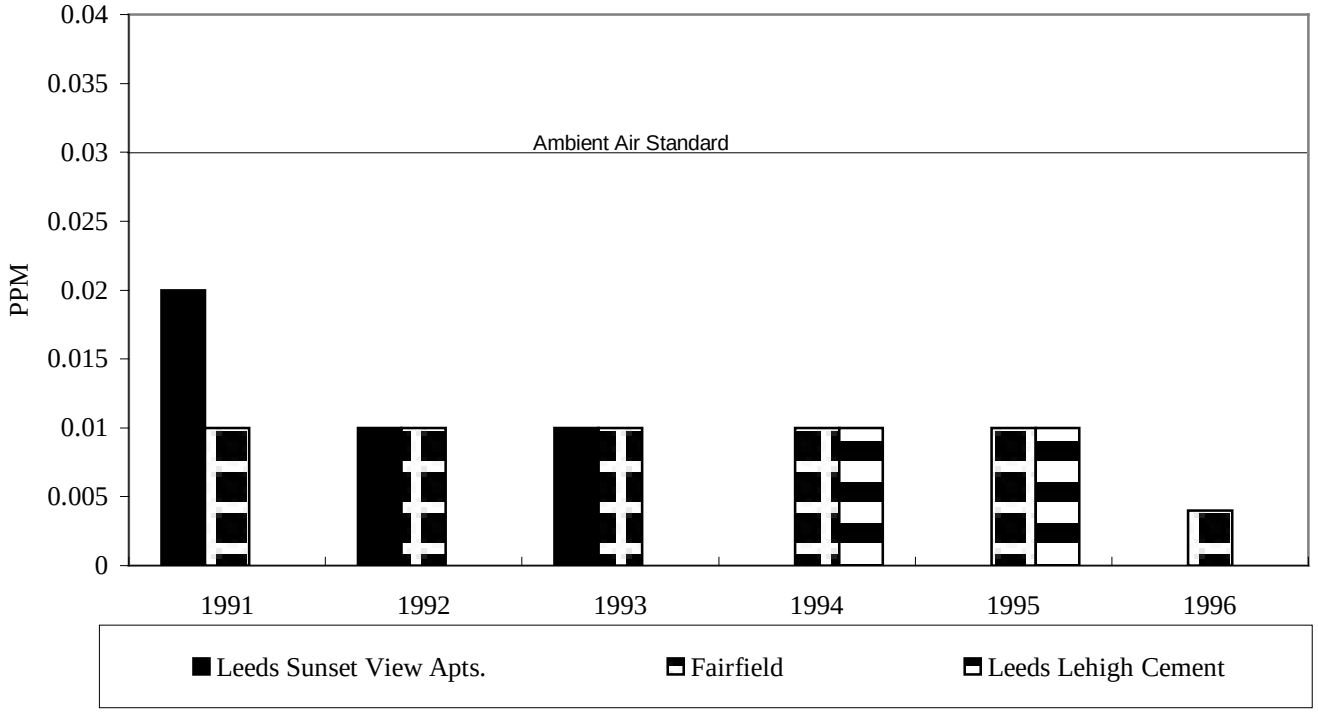
Leeds Lehigh Cement Plant (closed 12/31/95)	**1991**	**1992**	**1993**	**1994**	**1995**
Annual Mean			***	0.01	0.01
24-hour Averages					
1st Max			*0.02	0.02	0.02
2nd Max			*0.02	0.02	0.01
3-hour Averages					
1st Max			*0.05	0.07	0.04
2nd Max			*0.04	0.07	0.03

Values measured in ppm.
*Based on 7 months of data.
*** Insufficient number of samples.

Graph 5.6.8

Sulfur Dioxide Annual Means

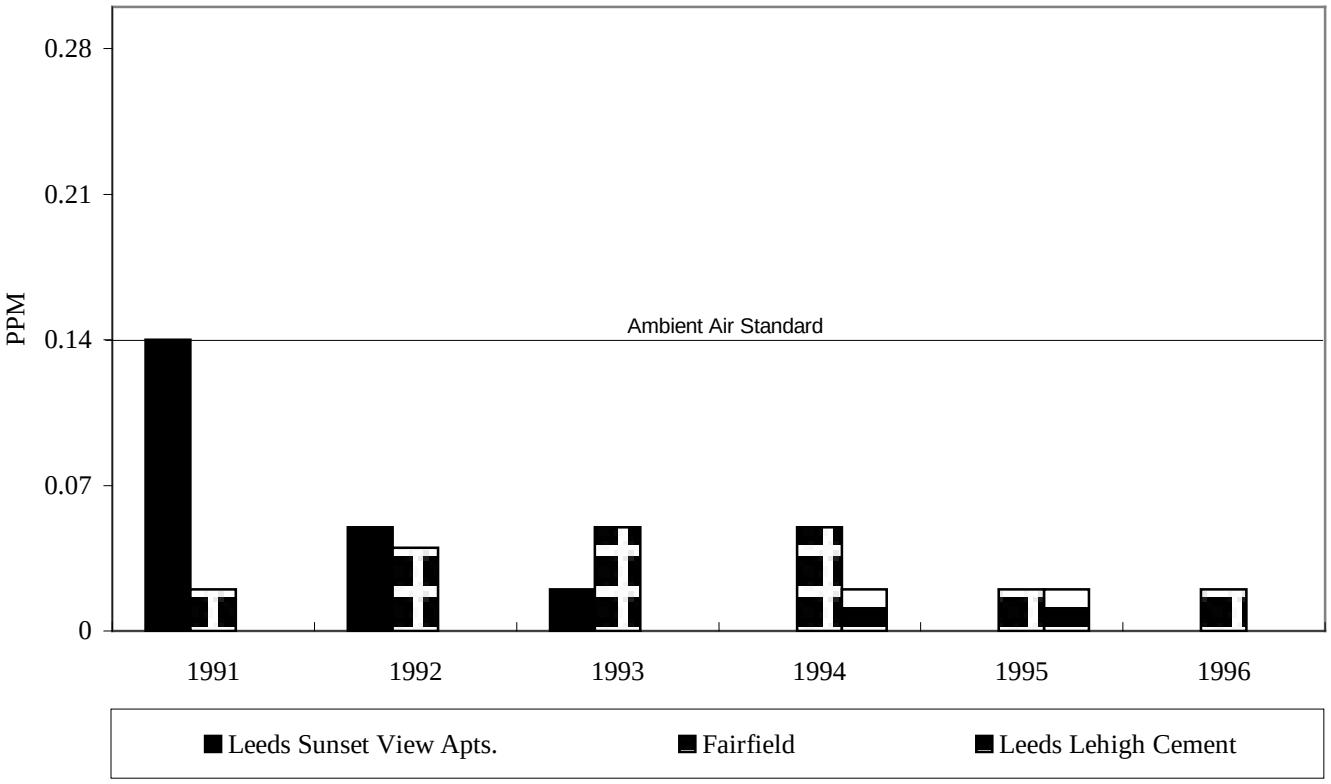
1991 - 1996



Graph 5.6.9

Sulfur Dioxide Maximum 24-Hour Averages

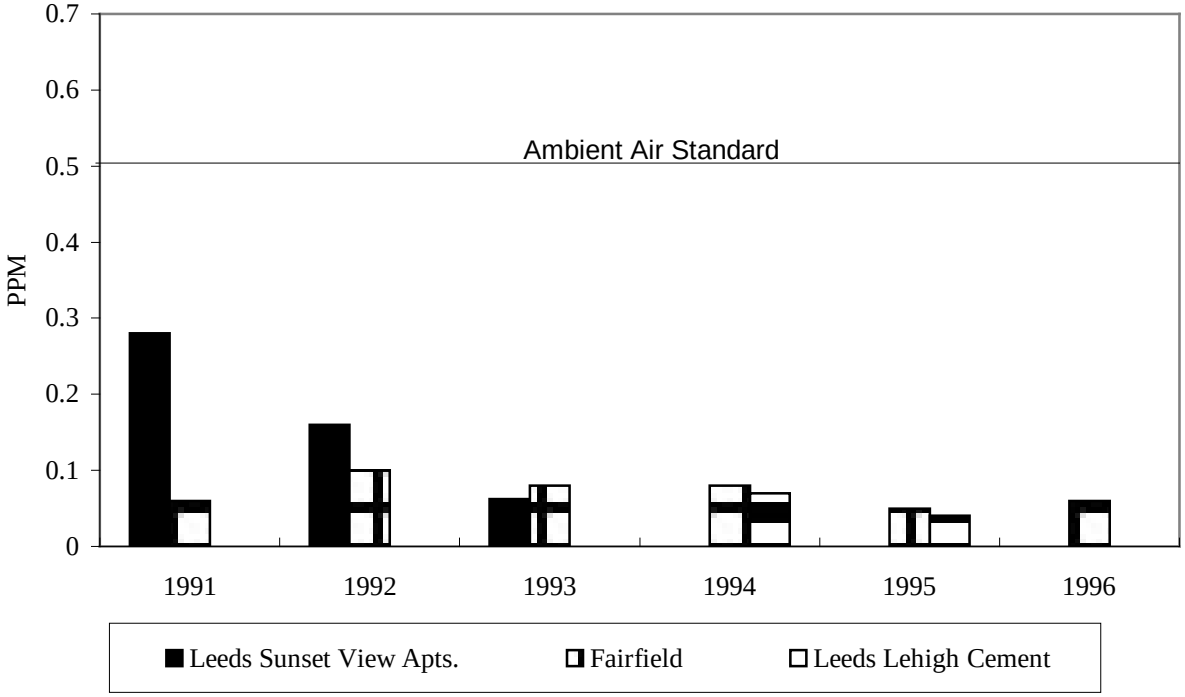
1991 - 1996



Graph 5.6.10

Sulfur Dioxide Maximum 3-Hour Averages

1991 - 1996



6.0 Exceedances of the Ambient Air Quality Standards

An exceedance of an ambient standard is the occurrence of a pollutant concentration that is greater than the numerical value of the standard for a period of time equal to the averaging time specified by the standard (see Table 2.1). A violation of an ambient standard, at a single monitor, is the occurrence of more exceedances of the numerical value of the standard than is allowed within a specified period of time. An excludable exceedance is one that occurred as a result of an unusual natural or man-made event such as a severe drought, wildfire, tornado, structural fire, or temporary construction project near a monitor. The question of whether or not an exceedance will be excluded arises in determining the attainment status of an area. It is not a question of whether or not the exceedance occurred, but rather, of what it represents. An exceedance can only be excluded after consultation with the Alabama Department of Environmental Management (ADEM) and EPA.

Ozone measurements exceeded the one-hour ambient standard on four separate days in 1996 at SLAMS and NAMS sites. Particulate Matter measurements exceeded the 24-hour ambient standard on nine separate days in 1996 at SPM sites. Carbon monoxide measurements exceeded the 8-hour standard on two separate days in 1996 at SPM sites. Measurements for sulfur dioxide and lead did not exceed ambient standards during 1996.

7.0 Field Enforcement Activities

7.1 Industrial and Commercial Facilities

7.1.1 Inspections

All air pollution sources are subject to regular field patrol observations by sanitarians and air pollution control engineers. Minor and Synthetic Minor air pollution sources receive a comprehensive inspection by the assigned sanitarian or air pollution control engineer on a biennial basis. Major air pollution sources are inspected annually by the air pollution control engineer or sanitarian assigned to that facility. The inspection includes a review of relevant records and a walk-through of the facility, accompanied by the facility's environmental contact, to check emissions from each source and to ascertain the condition and performance of each control device. A meeting with facility personnel follows the conclusion of the inspection to discuss any problems observed and to establish remedial action if required. The air pollution control engineer or sanitarian prepares a comprehensive inspection report that is stored in the facility file maintained by the Air Pollution Control Program. Emissions for all sources are calculated annually. During 1996, there were 2424 field patrol observations of commercial and industrial facilities, 201 visible emission evaluations, 222 inspections, and 2 Notices of Violation issued.

7.1.2 Incinerators

General waste incinerators receive a comprehensive inspection by Field Services sanitarians biennially. Examination of the unit determines if all burners function properly and if the unit received proper maintenance. Visible emission evaluations during unit operations determine compliance with the visible emission standard. Units with complaints, or those with recent violations documented, receive more frequent inspections. Due to the concern for the potential release of pathogens and hydrochloric acid, the emission limits for medical waste incinerators are more restrictive and the units receive annual inspections. During 1996, there were 136 field patrol observations of incinerators, 15 visible emission evaluations, 23 inspections, and 1 Notice of Violation issued. The Jefferson County Board of Education removed most of its school incinerator units from service in 1996, reducing the number of incinerators operating in the county.

7.2 Open Burning

Due to smoke nuisance, as well as particulate and volatile organic compound (VOC) emissions, Jefferson County regulates open burning. Generally, open burning is prohibited except under specific circumstances allowed by the regulations. All open burning for construction and right-of-way clearing is prohibited during the months of June, July and August. The issuing of open burning authorizations for land clearing operations during September through May requires a site evaluation by a Field Services sanitarian to determine if the material and the circumstances meet regulation requirements, and to set distance restrictions for the burning site. The Air Pollution Control program issued 403 open burning authorizations in 1996.

Field Service sanitarians also investigate complaints regarding open burning. An Advisory Notice or Official Notice of Violation is issued if the investigation determines a violation of the regulations. Enforcement of the open burning regulations has increased through routine assessment of penalties against repeat violators. In 1996, 369 open burning complaints were investigated, 72 Advisory Notices issued, and 90 Notices of Violation written.

7.3 Other Programs

7.3.1 Gasoline Dispensing Facilities and Tanker Trucks

The Air Pollution Control Program regulates gasoline dispensing facilities and tanker trucks due to emissions of volatile organic compounds (VOCs). Gasoline dispensing facilities must have and use Stage I Vapor Balance equipment while filling storage tanks. Gasoline tanker trucks are required to recover gasoline vapors while filling or emptying the truck vessels. Gasoline tanker trucks must certify vapor tightness annually and display an Air Sticker issued annually by the Air Pollution Control Program. There were 496 Air Stickers issued in 1996. During 1996, there were 100 field patrol observations of gasoline dispensing facilities and tanker trucks, 16 inspections, and 1 Notice of Violation issued.

7.3.2 Asbestos Abatement

The Air Pollution Control Program enforces the National Emission Standard for Asbestos during renovation and demolition operations. During 1996, there were 310 regulated asbestos abatement or demolition notifications received, 115 inspections, 33 complaints investigated, and 8 Notices of Violation issued.

7.3.3 Indoor Air Quality

The Air Pollution Control Program acts as an information and referral resource regarding indoor air quality problems. Indoor air quality complaints in public buildings are investigated to a limited degree. Owners are often referred to resources for more complex investigations or solutions. Individuals complaining about residential indoor air quality problems are referred to resources for additional information. The Air Pollution Control Program has no regulations regarding indoor air quality at this time, so no enforcement action is taken. Complainants may be referred to other agencies, like the Occupational Health and Safety Administration, if appropriate. During 1996, there were 40 indoor air complaints investigated and 79 responses made to inquiries.

7.3.4 Dry Cleaners

The National Perchloroethylene (Perc) Air Emission Standards for Dry Cleaning Facilities, 40 CFR 63, Subpart M, were adopted by the Jefferson County Department of Health on December 15, 1995. During 1996, 76 facilities subject to this standard were identified. Of these subject facilities, 36 are classified as small facilities and 40 are large facilities. There are no major perchloroethylene dry cleaners in the county at this time. Information regarding compliance with the new standards was distributed to all regulated facilities.

7.4 Solid Waste Eradication Program

As of October 1, 1996, the Solid Waste Eradication Program was moved to the division now known as the Air and Solid Waste Division. The Solid Waste Program works to achieve sanitary collection, transportation, and disposal of garbage and rubbish by administering the regulations affecting Solid Waste Collection and Transportation under the Rules of the State Board of Health Chapter 420-3-5. The activities of the Program include inspection and permitting of scrap tire haulers, garbage collection vehicles, transfer stations, and waste processing facilities. Solid Waste also investigates complaints regarding illegal dumping of garbage and rubbish, and works together with the Alabama Department of Environmental Management Land Division to achieve compliance with solid waste disposal requirements.

Table 7.1

1996 Field Enforcement Activities

Industrial Sources:	
Field Patrol Observations	2424
Visible Emission Evaluations	201
Inspections	222
Notices of Violation	2
Source Tests Observed	18
Incinerators:	
Field Patrol Observations	136
Visible Emission Evaluations	15
Inspections	23
Notices of Violation	1
Open Burning:	
Field Patrol Observations	300
Authorizations	403
Advisory Notices	72
Notices of Violation	90
Gasoline Dispensing Facilities & Tanker Trucks:	
Field Patrol Observations	100
Inspections	16
Notices of Violation	1
Tanker Truck Air Stickers	496
Asbestos Abatement:	
Inspections	115
Notices of Violation	8
Complaints Investigated:	
Point Sources	98
Open Burning	369
Asbestos Abatement	33
Indoor Air	40
Solid Waste	35
All Others	157
Total Complaints	**732**

8.0 Air Permits

Air permit applications must be submitted prior to the construction of new sources that have the potential to emit air pollutants and before the modification of existing air pollution sources. The type of emission source determines the information required in the application. The Engineering Section evaluates the degree of air pollution control required for all emission points within each facility. Using established emission factors to assure allowable air emission standards, calculations are made to determine the estimated emissions for the proposed source. In 1996, air permits were issued for 184 new or modified sources. The Air Pollution Control Program has begun permitting Title V Operating Permits to Major Sources under Chapter 18 of the Jefferson County Board of Health Air Pollution Control Rules and Regulations. Qualified sources may apply for and receive a Synthetic Minor Operating Permit under Chapter 17 of the Regulations. Minor Sources receive Air Permits under Chapter 2 of the Regulations.

Table 8.1

Source	**Number of Permits Issued**
Industrial/Commercial	66
Gasoline Tanker Trucks	102
Gasoline Dispensing Facilities	5
Incinerators	8
UST Soil Remediation	3
Total	**184**

Source Permit Class	**Number of Permits Issued**
Title V Major	4
Synthetic Minor	37
Minor	143

Jefferson County Department of Health
Environmental Health Services
Air and Solid Waste Division
1400 Sixth Avenue South
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