Foreword

The Air Pollution Control Program 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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Table of Contents

List of Tables and Graphs

List of Acronyms

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 less than 10 microns 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 for the pollutant 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 1995:

Air Quality Description	**Number of Days**
Good (1 - 50)	127
Moderate (51 - 100)	106
Unhealthy (101 - 200)	7
Very Unhealthy (201 - 300)	0
Hazardous (301 or above)	0
Total Number of Days	**240**

There were 8 exceedances of the ambient air quality standards in 1995. The maximum index reported was 127 and occurred August 15. Overall, the average index was 50.

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 1995, this network consisted of 19 monitoring sites and 26 air monitoring devices. There were modifications to the network during the course of the year: two sites were closed and three monitors were shut-down. By December 31, the network consisted of 17 sites and 24 monitors (an additional monitor and site closed on December 31, 1995). 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 less than 10 microns in size), and lead (Pb). Total suspended particulates (TSP) were monitored 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 1995 Air Monitoring Network

January 1, 1995 Network

Site Location	Pollutants	Monitoring SLAMS	Objective NAMS	SPM
Bessemer	PM10	1	0	0
Dolomite	PM10, TSP	0	0	2
Downtown	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
Leeds, Lehigh Cement Plant	SO2	0	0	1
McAdory High School	O3	1	0	0
Montgomery Oil	Pb	1	0	0
North Birmingham, Sloss (PM10 closed temporarily 6/30/95)	PM10	0	0	1
North Birmingham, Southern Railroad	CO, PM10	0	1	1
Northside	PM10	1	0	0
Pinson	O3	0	1	0
Tarrant ABC Coke (PM10 closed temporarily 6/30/95)	PM10	0	0	1
Tarrant, Elementary School	PM10, O3	1	1	0
UAB	CO	1	0	0
Wylam	PM10	0	1	0

December 31, 1995 Network

Site Location	Pollutants	Monitoring SLAMS	Objective NAMS	SPM
Bessemer	PM10	1	0	0
Dolomite	PM10, TSP	0	0	2
Downtown	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
Leeds, Lehigh Cement Plant (closed 12/31/95)	SO2	0	0	1
McAdory High School	O3	1	0	0
Montgomery Oil	Pb	1	0	0
North Birmingham, Southern Railroad	CO, PM10	0	1	1
Northside	PM10	1	0	0
Pinson	O3	0	1	0
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 toxic 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. VOC's primary sources 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.

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, statutes, and monuments.

5.0 Monitoring Results

5.1 Carbon Monoxide

In January of 1995, 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. No changes to the network occurred during the year. Carbon monoxide was the responsible pollutant 39 times in the daily air quality index. Of those 39 days, 26 days were in the good category, and 13 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 within 46 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 7.2 ppm, which is within 20 percent of the 9 ppm 8-hour standard (see Table 5.6.1 and Graphs 5.6.1 and 5.6.2). No exceedances of the CO ambient standards were recorded during the year.

5.2 Lead

In January of 1995, the lead monitoring network consisted of 2 monitors (1 SLAMS and 1 NAMS) strategically located throughout Jefferson County. See table 3.1. No changes to the network occurred during the year. The lead quarterly average concentration during the year generally measured less than 0.09 $\mu g/m^3$, which is less than 6 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 1990 to 1995. 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 1995, 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 136 times in the daily air quality index. Of those 136 days, 56 days were in the good category, 73 days were in the moderate category and 7 were in the unhealthy category. Exceedances of the 0.12 ppm ambient standard were recorded on eight separate days at monitoring sites: July 12 and 15; August 10, 11, 14, 15, 18; and September 8 (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.

5.4 Particulate Matter

In January of 1995, the particulate matter (PM10) monitoring network consisted of 11 monitors (5 SLAMS, 2 NAMS and 4 SPM) strategically located throughout Jefferson County. On June 30, 1995, the North Birmingham Sloss site and the Tarrant ABC Coke site closed temporarily. This brought the network total 5 SLAMS, 2 NAMS and 2 SPM (see Table 3.1). PM10 was the responsible pollutant 63 times in the daily air quality index. Of those 63 days, 43 days were in the good category, and 20 days were in the moderate category. The maximum 24-hour PM10 concentration at monitoring sites during the year generally measured less than 145 $\mu g/m^3$, which is within 3 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 36 $\mu g/m^3$, which is within 18 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). No exceedances of the PM10 ambient standards were recorded during the year.

5.5 Sulfur Dioxide

In January of 1995, the sulfur dioxide (SO_2) monitoring network consisted of 2 monitors (1 NAMS and 1 SPM) strategically located throughout Jefferson County. On December 31, 1995, the Lehigh Cement Plant site closed. This brought the network total to 1 NAMS site (see Table 3.1). SO_2 was the responsible pollutant two times in the daily air quality index. Both days were in the good category. The maximum 24-hour SO_2 concentration at monitoring sites during the year generally measured less than 0.02 ppm, which is less than 14 percent of the 0.14 ppm 24-hour ambient standard. The maximum SO_2 annual mean concentration at monitoring sites during the year generally measured less than 0.01 ppm, which is less than 34 percent of the 0.03 ppm annual mean standard. The maximum 3-hour SO_2 concentration at monitoring sites during the year generally measured less than 0.05 ppm which is less than 10 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.

5.6 Tables and Figures

Table 5.6.1

Carbon Monoxide Maximum Values

1988 - 1995

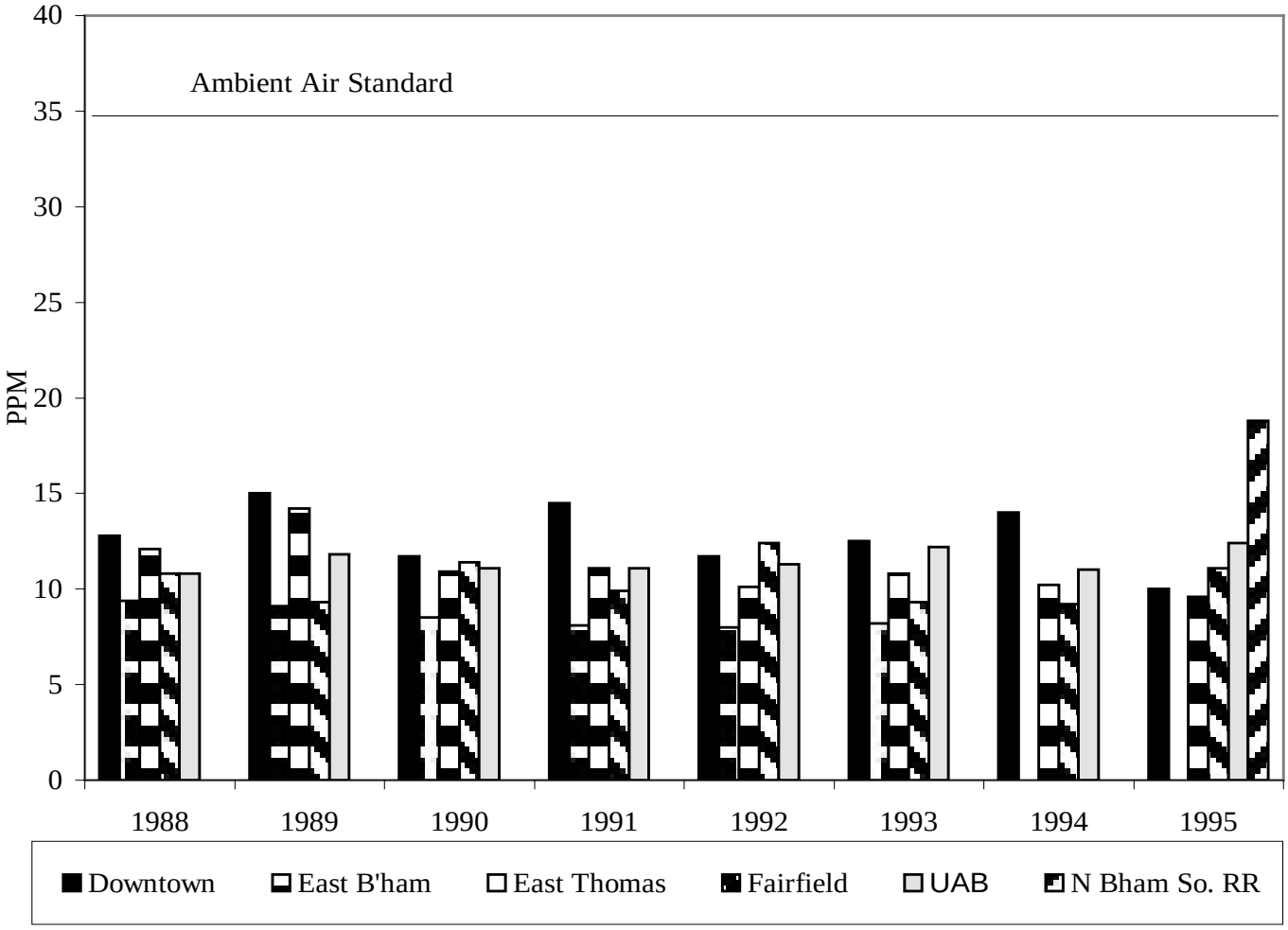
	Year							
Site	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
Downtown								
1-hour max.	12.8	15.0	11.7	14.5	11.7	12.5	14.0	10.0
8-hour max.	7.7	7.6	7.0	7.7	5.6	6.2	6.9	6.2
East Birmingham								
1-hour max.	9.4	9.1	8.5	8.1	8.0	8.2	Closed	
8-hour max.	7.3	6.2	6.2	5.5	6.0	5.2	7/8/93	
East Thomas								
1-hour max.	12.1	14.2	10.9	11.1	10.1	10.8	10.2	9.6
8-hour max.	9.4	8.7	7.3	8.0	8.6	7.8	6.7	7.0
Fairfield								
1-hour max.	10.8	9.3	11.4	9.9	12.4	9.3	9.2	11.1
8-hour max.	7.6	6.5	6.5	6.3	7.5	7.3	7.7	7.2
UAB								
1-hour max.	10.8	11.8	11.1	11.1	11.3	12.2	11.0	12.4
8-hour max.	6.6	7.8	7.1	8.1	6.2	6.2	7.2	6.7
N Bham So. RR								
1-hour max.							Opened	18.8
8-hour max.							10/27/94	6.5

Values measured in parts per million (ppm)

Graph 5.6.1

Carbon Monoxide Maximum 1-Hour Averages

1988-1995



Graph 5.6.2

Carbon Monoxide Maximum 8-Hour Averages

1988 - 1995

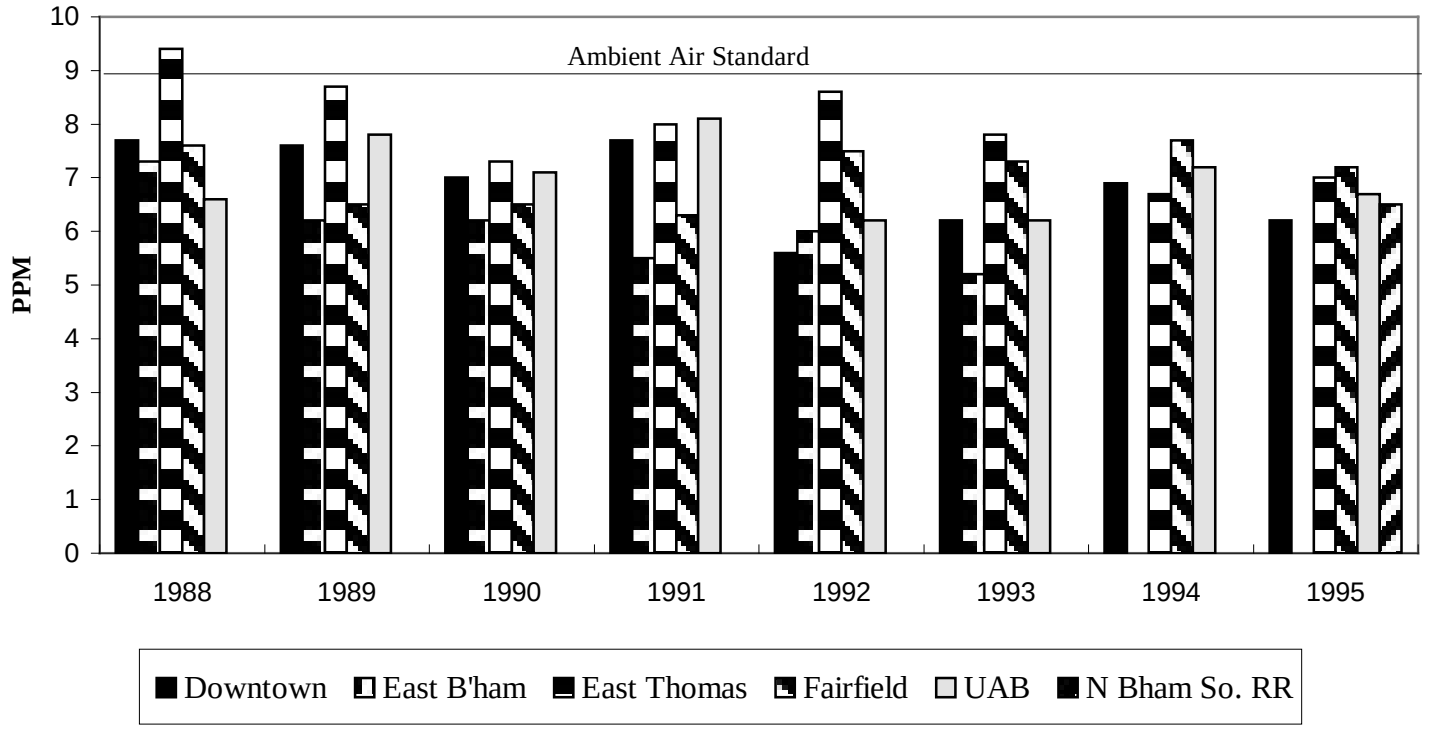


Table 5.6.2

Lead Quarterly Mean Values
1990 - 1995

Monitor Location	Year 1990	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Hayes Int'l		0.46	0.46	0.94	0.43
East Birmingham		0.17	0.12	0.11	0.12
East Thomas		0.07	0.06	0.1	0.14
Ilco Pasture		0.19	0.32	0.66	0.56
Leeds Elementary		0.06	0.07	0.11	0.08
Montgomery Oil		1.67	1.42	1.44	1.63
New Jerusalem Church		0.13	0.16	0.24	0.35

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		

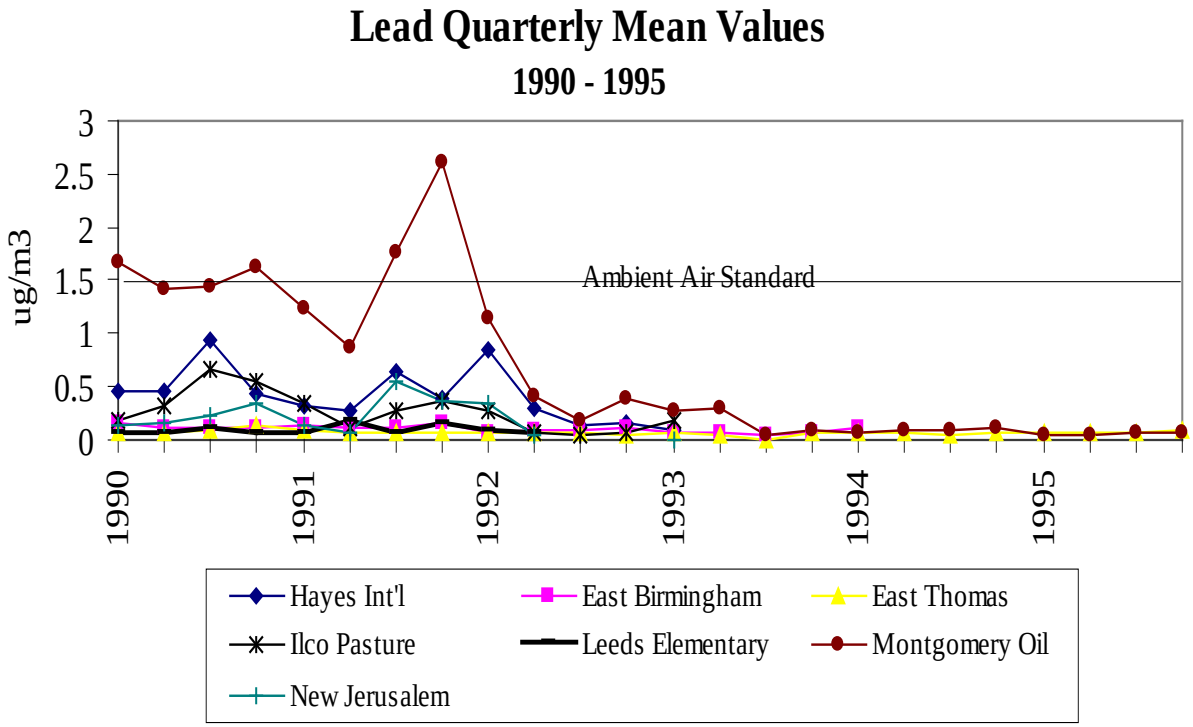
Monitor Location	Year 1993	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Hayes Int'l	(Closed 3/31/93)	0.09			
East Birmingham		0.08	0.06	0.04	0.08
East Thomas		0.06	0.04	0.01	0.07
Ilco Pasture	(Closed 3/31/93)	0.18			
Montgomery Oil		0.28	0.3	0.04	0.1

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		0.05	0.05	0.06	0.07

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

Graph 5.6.3


Lead Quarterly Mean Values
1990 - 1995
ug/m3
3
2.5
2
1.5
1
0.5
0
Ambient Air Standard
1990
1991
1992
1993
1994
1995
Hayes Int'l
East Birmingham
East Thomas
Ilco Pasture
Leeds Elementary
Montgomery Oil
New Jerusalem

Graph 5.6.4

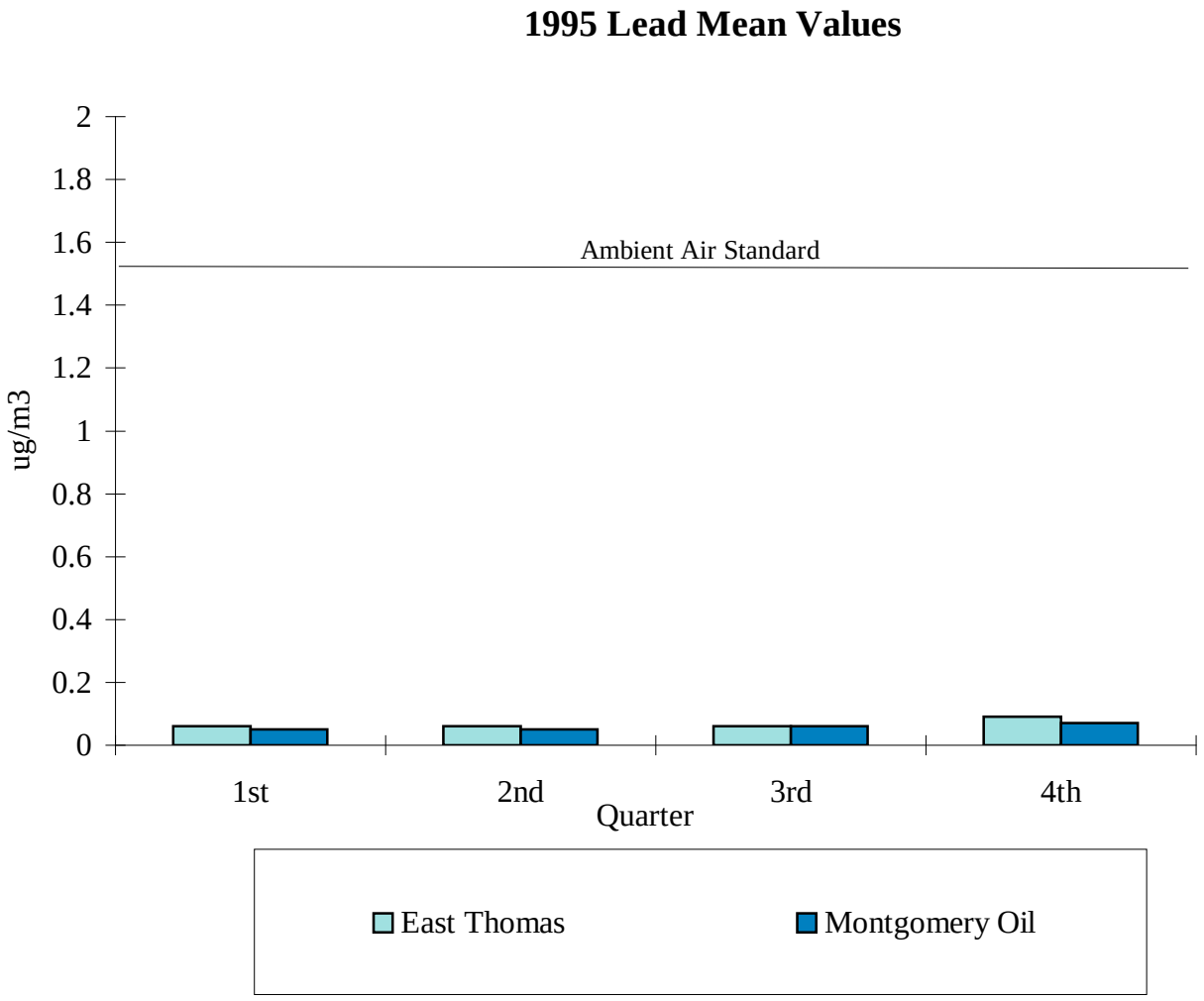

1995 Lead Mean Values
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
ug/m3
Ambient Air Standard
1st
2nd
3rd
4th
Quarter
East Thomas
Montgomery Oil

Table 5.6.3

Ozone Maximum Values

1990 - 1995

		Year					
		1990	**1991**	**1992**	**1993**	**1994**	**1995**
Fairfield	1.	0.120	0.115	0.119	0.120	0.109	0.120
	2.	0.117	0.109	0.113	0.111	0.098	0.119
	3.	0.110	0.108	0.112	0.108	0.093	0.117
	4.	0.109	0.105	0.107	0.104	0.090	0.113
Tarrant	1.	**0.127**	0.093	**0.129**	0.112	0.079	**0.142**
	2.	0.121	0.092	0.115	0.108	0.079	**0.127**
	3.	0.119	0.090	0.096	0.103	0.078	0.123
	4.	0.117	0.089	0.095	0.095	0.076	0.114
Pinson	1.	**0.126**	0.109	**0.138**	0.115	0.099	0.118
	2.	0.115	0.106	0.111	0.098	0.090	0.115
	3.	0.113	0.095	0.104	0.098	0.090	0.111
	4.	0.113	0.095	0.104	0.093	0.090	0.107
McAdory	1.	0.117	0.088	0.104	0.106	0.107	**0.153**
	2.	0.111	0.085	0.101	0.104	0.099	**0.132**
	3.	0.111	0.079	0.091	0.102	0.098	**0.128**
	4.	0.107	0.079	0.089	0.101	0.096	**0.127**
Hoover	1.	**0.131**	0.106	0.106	**0.135**	0.116	**0.125**
	2.	**0.126**	0.103	0.091	0.113	0.108	**0.125**
	3.	**0.125**	0.103	0.088	0.113	0.099	**0.125**
	4.	**0.125**	0.102	0.087	0.110	0.096	0.124

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

Graph 5.6.5

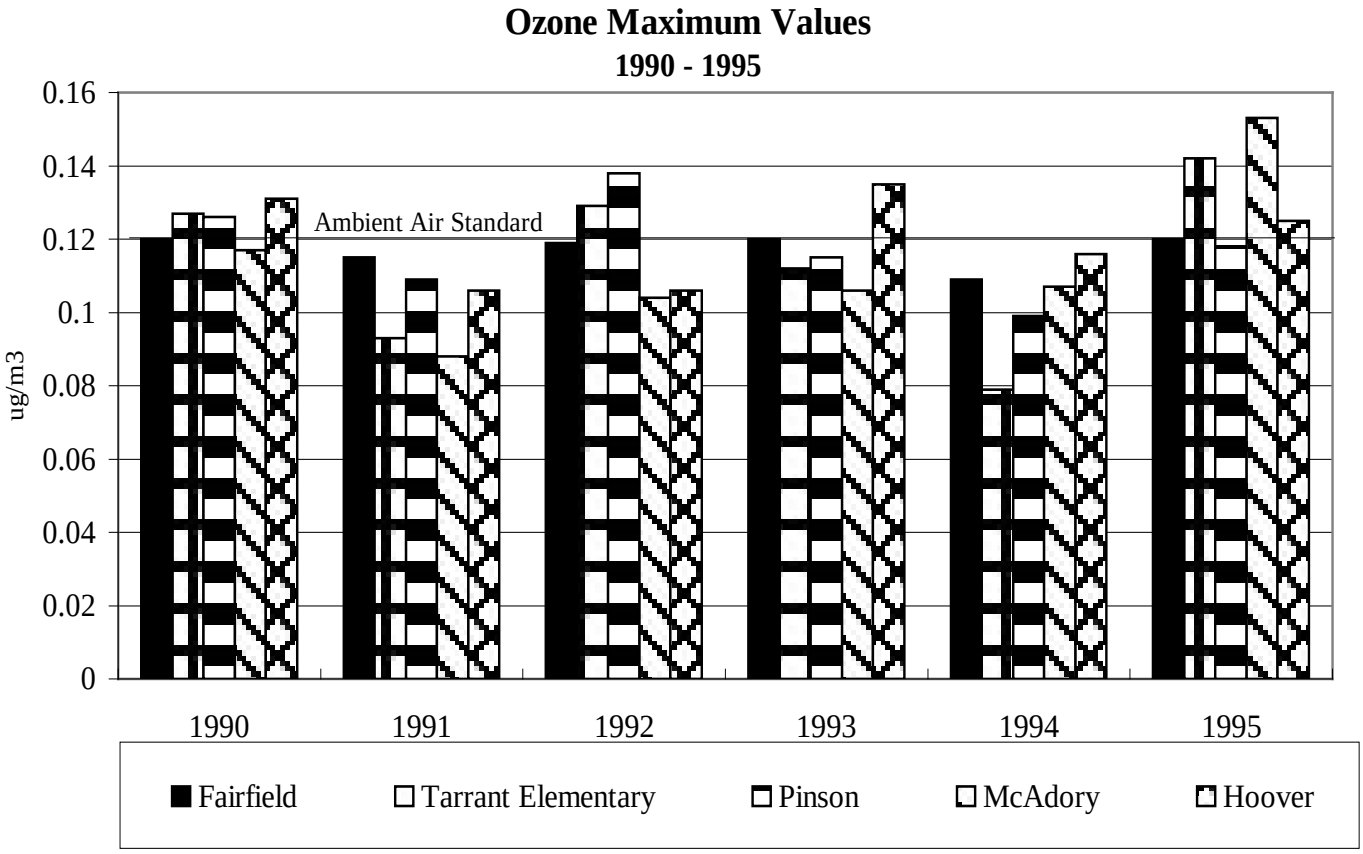

Ozone Maximum Values
1990 - 1995
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
ug/m3
Ambient Air Standard
1990
1991
1992
1993
1994
1995
Fairfield
Tarrant Elementary
Pinson
McAdory
Hoover

Table 5.6.4

Particulate Matter (PM10) Maximums

1990 - 1995

	Year					
	1990	**1991**	**1990**	**1993**	**1994**	**1995**
Bessemer (m)						
Annual Mean	34	32	28	28	25	27
24-hour Averages						
1st Max	65	82	53	75	69	58
2nd Max	62	79	52	58	50	56
Dolomite (c)						
Annual Mean	--	--	--	--	35	36
24-hour Averages						
1st Max	--	--	--	--	109	118
2nd Max	--	--	--	--	107	109
Inglenook (m)						
Annual Mean	35	31	29	27	25	24
24-hour Averages						
1st Max	77	87	54	73	50	57
2nd Max	72	75	52	62	47	57
Leeds Elementary School (m)						
Annual Mean	31	31	28	25	24	25
24-hour Averages						
1st Max	69	77	54	67	56	63
2nd Max	61	70	52	61	48	50
North Birmingham, So. RR (c)						
Annual Mean	45	42	39	36	34	34
24-hour Averages						
1st Max	148	134	142	98	108	123
2nd Max	140	133	122	85	104	95

(continued on following page)

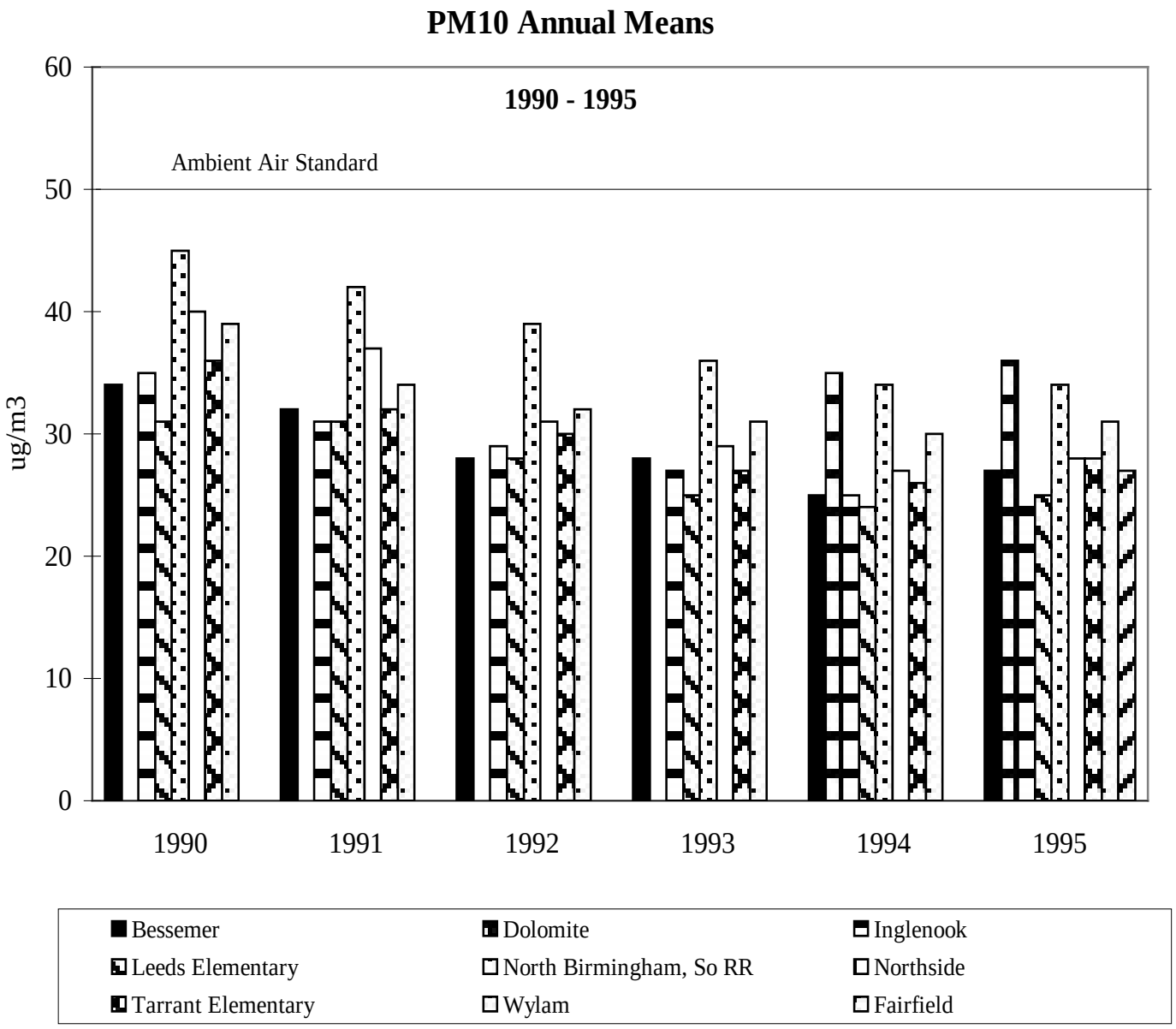
Particulate Matter (PM10) Maximums

1990 - 1995

	Year					
	1990	**1991**	**1990**	**1993**	**1994**	**1995**
Northside (m)						
Annual Mean	40	37	31	29	27	28
24-hour Averages						
1st Max	92	87	69	69	69	52
2nd Max	77	80	66	69	58	52
Tarrant Elementary (m)						
Annual Mean	36	32	30	27	26	28
24-hour Averages						
1st Max	101	99	60	72	52	58
2nd Max	76	76	55	58	50	57
Wylam (c)						
Annual Mean	39	34	32	31	30	31
24-hour Averages						
1st Max	104	86	108	81	116	145 E
2nd Max	104	86	92	76	83	83
Fairfield (m)						
Annual Mean	--	--	--	--	--	27
24-hour Averages						
1st Max	--	--	--	--	--	54
2nd Max	--	--	--	--	--	54

Values measured in $\mu g/m^3$.
(c) - continuous monitor; (m) - manual monitor; E - Exceptional event data (forest fire).
Note: North Birmingham Sloss and Tarrant ABC are not included because there is no full year of data available for PM10.

Graph 5.6.6


PM10 Annual Means
1990 - 1995
Ambient Air Standard
ug/m3
60
50
40
30
20
10
0
1990
1991
1992
1993
1994
1995
Bessemer
Dolomite
Inglenook
Leeds Elementary
North Birmingham, So RR
Northside
Tarrant Elementary
Wylam
Fairfield

Graph 5.6.7

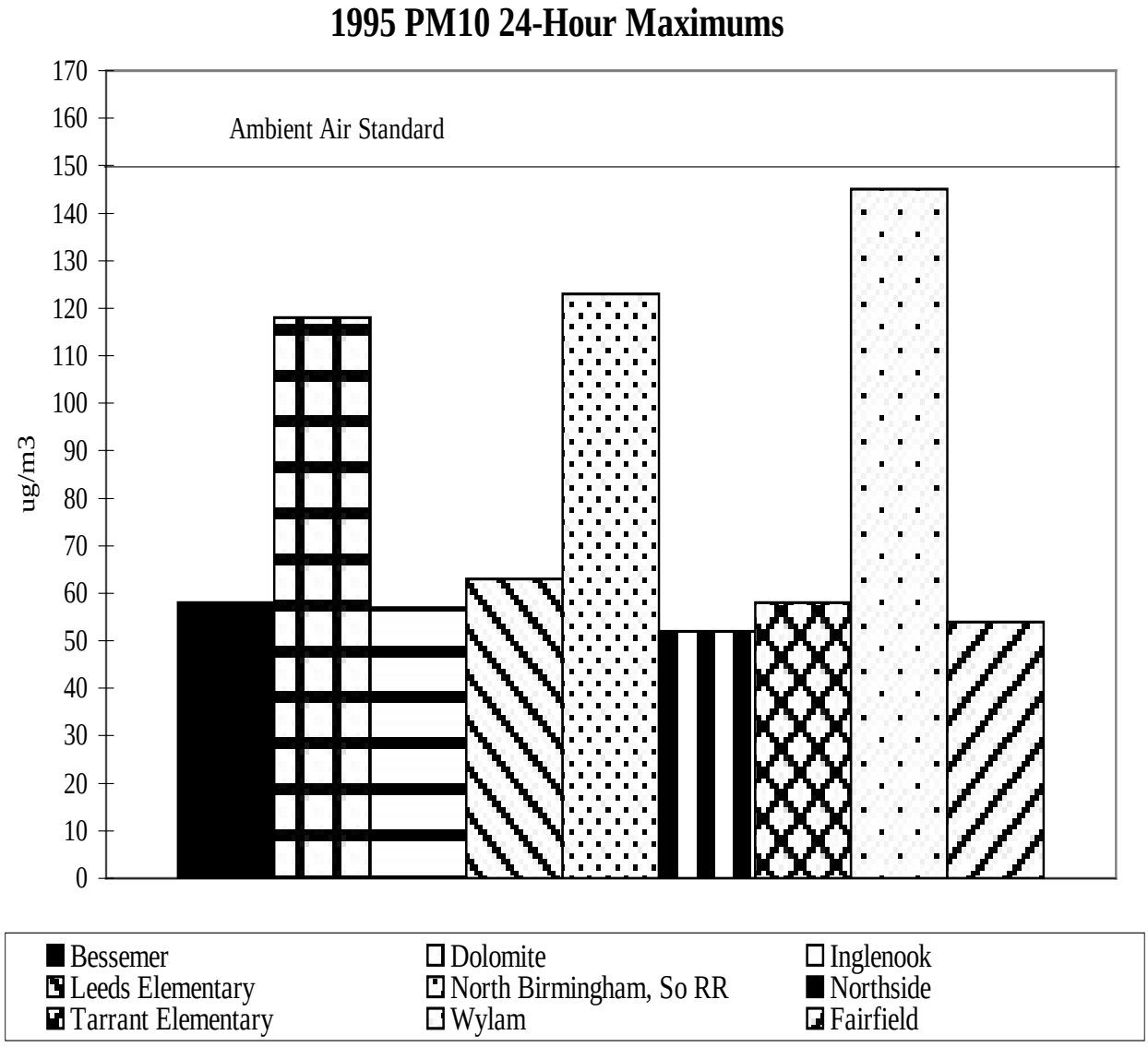

1995 PM10 24-Hour Maximums
Ambient Air Standard
ug/m3
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Bessemer
Dolomite
Inglenook
Leeds Elementary
North Birmingham, So RR
Northside
Tarrant Elementary
Wylam
Fairfield

Table 5.6.5

Sulfur Dioxide 24-Hour Maximums and Annual Means
1990 - 1995

Leeds Sunset View Apts.	**1990**	**1991**	**1992**	**1993**	**1994**	
Annual Mean	0.02	0.02	0.01	0.01	closed 1/27/94	
24-hour Averages						
1st Max	0.26	0.14	0.05	0.02		
2nd Max	0.21	0.12	0.03	0.02		
3-hour Averages						
1st Max	0.59	0.28	0.16	0.062		
2nd Max	0.57	0.27	0.15	0.061		

Fairfield	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
Annual Mean	0.01	0.01	0.01	0.01	0.01	0.01
24-hour Averages						
1st Max	0.03	0.02	0.04	0.05	0.05	0.02
2nd Max	0.02	0.02	0.03	0.05	0.04	0.02
3-hour Averages						
1st Max	0.08	0.06	0.10	0.08	0.08	0.05
2nd Max	0.07	0.06	0.09	0.08	0.08	0.04

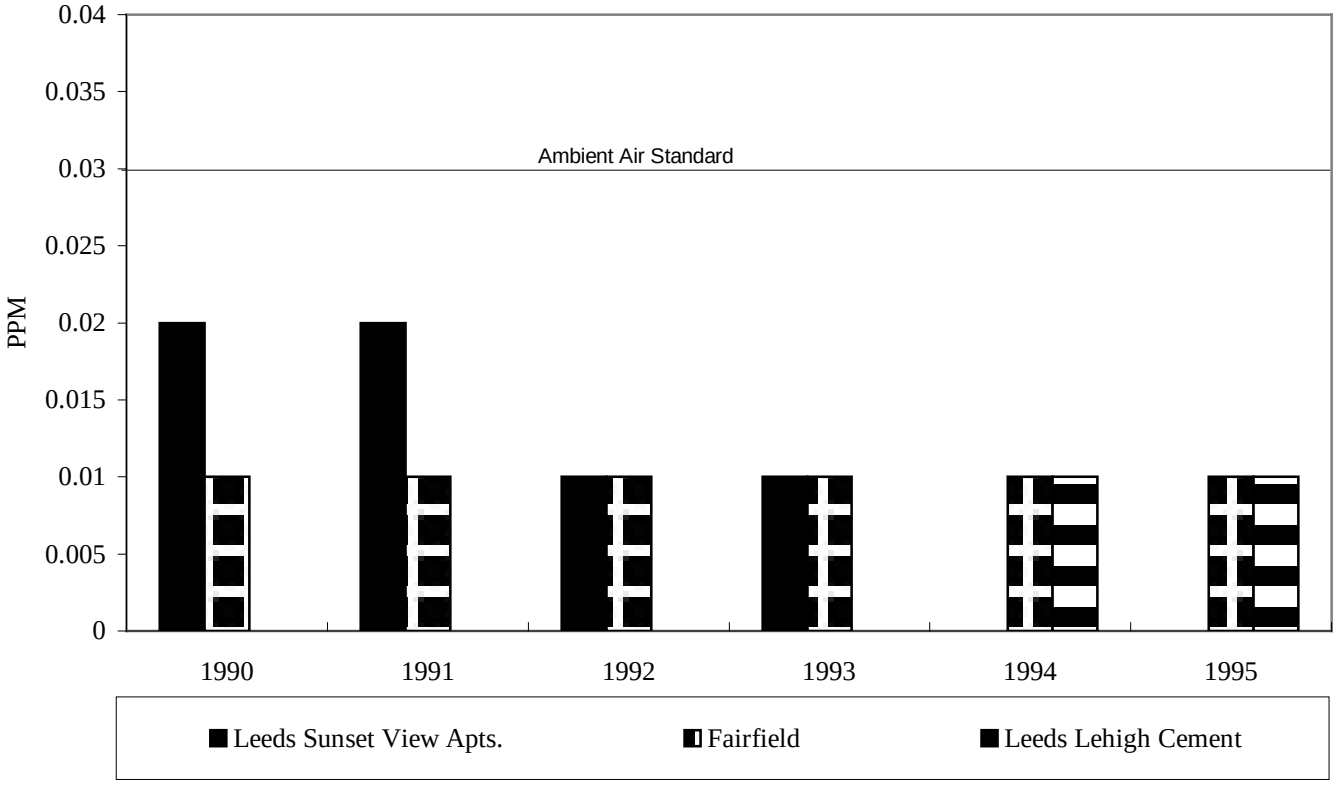
Leeds Lehigh Cement Plant (closed 12/31/95)	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
Annual Mean				***	0.01	0.01
24-hour Averages						
1st Max				*0.02	0.02	0.02
2nd Max				*0.02	0.02	0.01
3-hour Averages						
1st Max				*0.05	0.07	0.04
2nd Max				*0.04	0.07	0.03

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

Graph 5.6.8

Sulfur Dioxide Annual Means

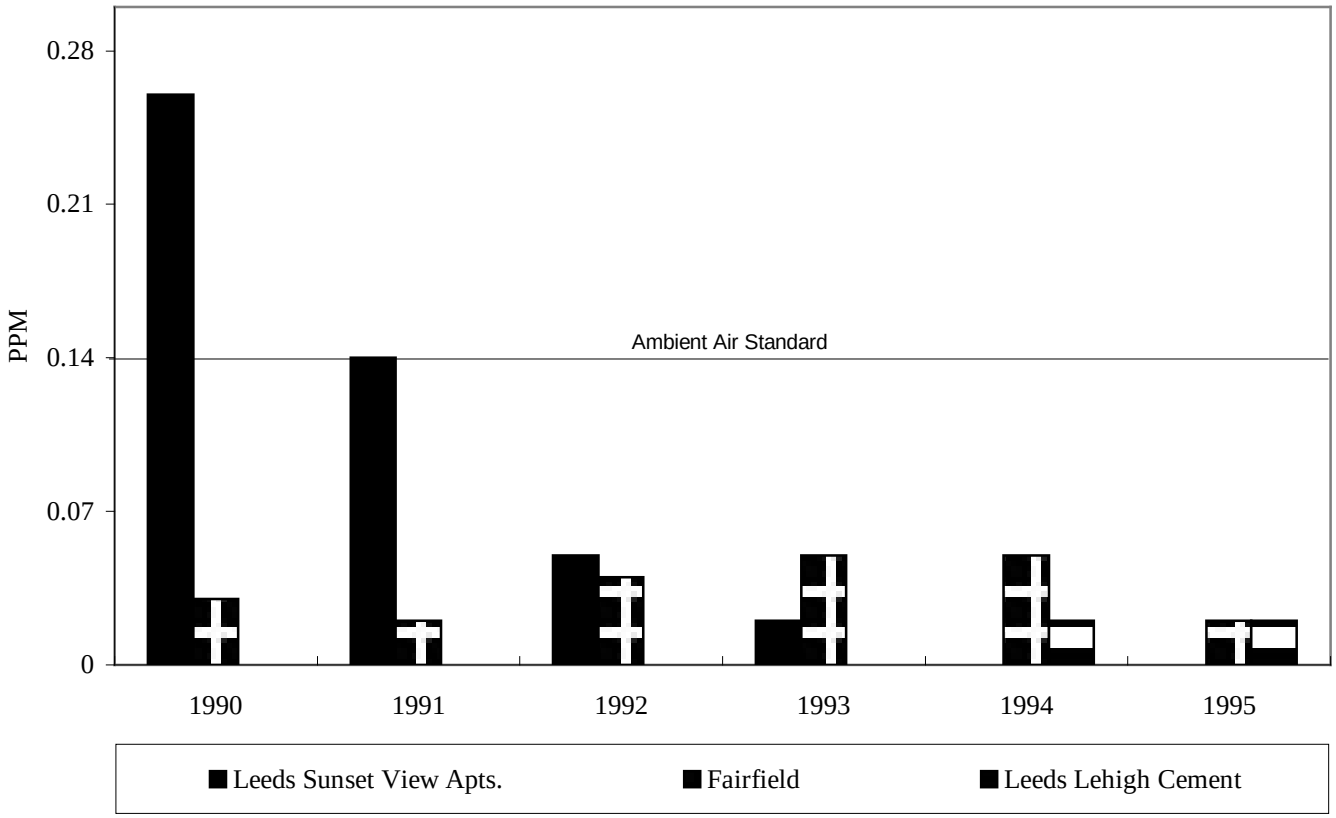
1990 - 1995



Graph 5.6.9

Sulfur Dioxide Maximum 24-Hour Averages

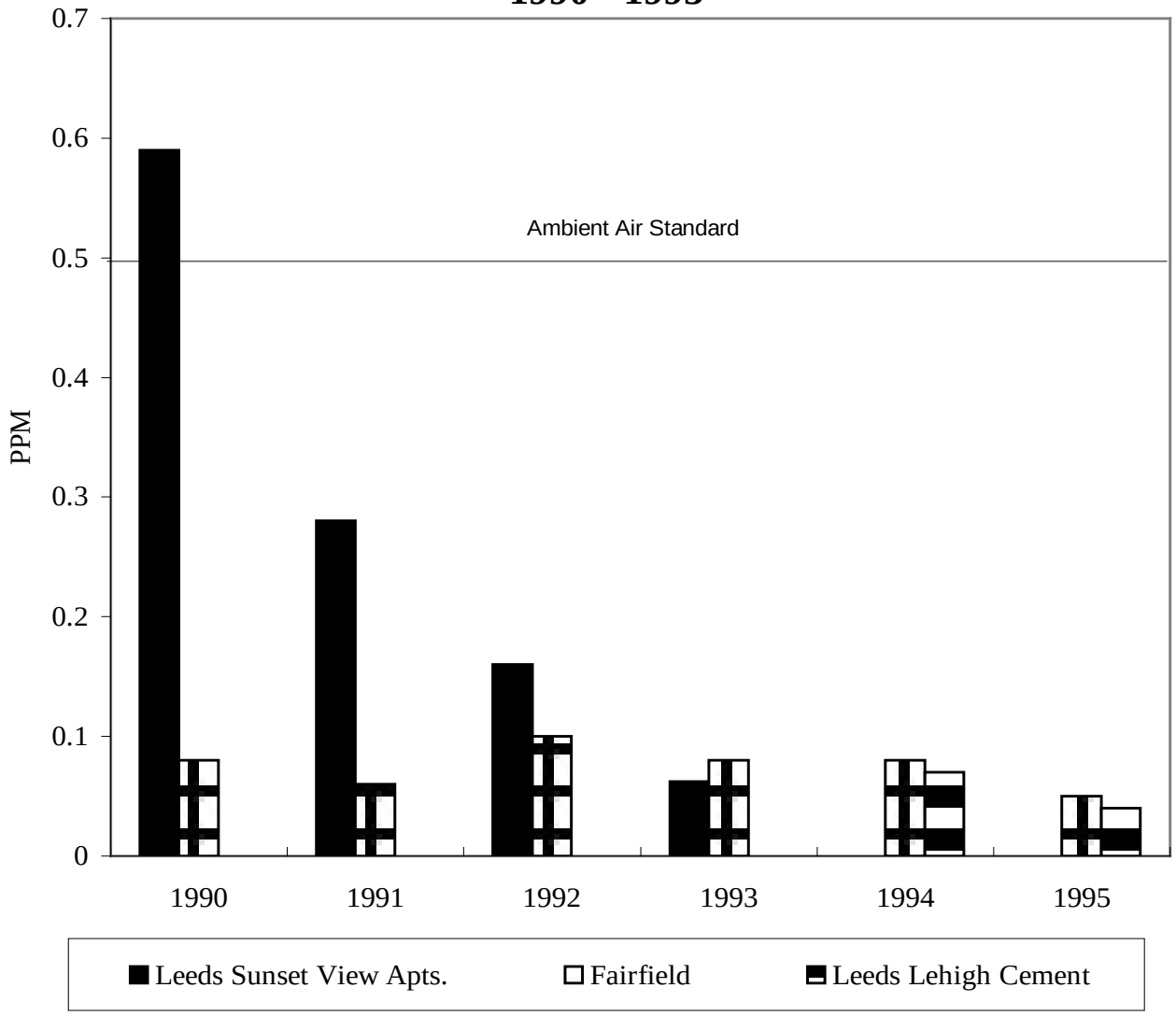
1990 - 1995



Graph 5.6.10

Sulfur Dioxide Maximum 3-Hour Averages

1990 - 1995



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 ambient standards on eight separate days in 1995. Measurements for sulfur dioxide, carbon monoxide, particulate matter (10 microns and smaller) and lead did not exceed ambient standards during 1995.

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 Field Services sanitarians in the Air Pollution Control Program. Minor air pollution sources receive a comprehensive inspection, including emission calculations on a biennial basis. Synthetic Minor and Major air pollution sources receive annual inspections 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 control engineer or sanitarian prepares a comprehensive inspection report that is stored in the facility file maintained by the Air Pollution Control Program.

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 identified with complaints, or have recent violations documented, have more frequent inspections. Due to the concern for the potential release of pathogens, the emission limits for medical waste incinerators are more restrictive and the units receive annual inspections. During 1995, there were 254 field patrol observations of incinerators, 35 visible emission evaluations, 25 inspections, and 8 Notices of Violation issued.

7.2 Open Burning

Due to smoke nuisance and the emission of volatile organic compounds (VOCs), Jefferson County regulates open burning. Generally, open burning is prohibited except under specific circumstances allowed by the regulations. All open burning is prohibited during the months of June, July and August. The issuing of open burning authorizations for land clearing operations 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. Regulations require a minimum of 500 feet from the nearest occupied dwelling and a minimum of 150 feet from the nearest public road. In 1995, the Air Pollution Program of the Jefferson County Department of Health issued 433 open burning authorizations.

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 1995, there were 324 complaints investigated, 96 Advisory Notices written, and 76 Notices of Violation issued.

Table 7.1

1995 Field Enforcement Activities

Industrial Sources:	
Field Patrol Observations	2229
Visible Emission Evaluations	176
Inspections	284
Notices of Violation	1
Incinerators:	
Field Patrol Observations	254
Visible Emissions Evaluation	35
Inspections	25
Notices of Violation	8
Open Burning:	
Field Patrol Observations	81
Authorizations	433
Notices of Advisory	96
Notices of Violation	76
Gasoline Dispensing Facilities & Tanker Trucks:	
Field Patrol Observations	104
Inspections	6
Notices of Violation	1
Complaints Investigated:	
Point Sources	31
Open Burning	324
Asbestos Abatement	39
All Others	143

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 source. Using established emission factors to assure allowable air emission standards, calculations are made to determine the estimated emissions for the proposed source. In 1995, air permits were issued for 208 new or modified sources.

The Jefferson County Department of Health Title V Operating Permits Program became effective on December 15, 1995. This program requires the issuance of operating permits to all major stationary sources as defined in Chapter 18 of the Jefferson County Department of Health Air Pollution Control Rules and Regulations.

With the emergence of the Title V program, sources may choose to apply for synthetic minor operating permits (SMOPs) in accordance with Chapter 17 of the Jefferson County Department of Health Air Pollution Control Rules and Regulations.

Table 8.1

Source	Number of Permits Issued
Industrial	47
Gas Tanker Trucks	152
Gasoline Dispensing	4
Incinerators	2
UST Soil Remediation	3
Total	**208**