

# **Kentucky Ambient Air Quality Annual Report 2002**



Commonwealth of Kentucky  
Natural Resources & Environmental Protection Cabinet  
Department for Environmental Protection  
Division for Air Quality  
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## TABLE OF CONTENTS

<b>Foreword</b>	1
<b>National Ambient Air Quality Standards</b>	3
<b>Air Monitoring Network Sites by County</b>	4
<b>Carbon Monoxide</b>	6
Carbon Monoxide Trends Graphs	7
Carbon Monoxide Statistics	8
<b>Sulfur Dioxide</b>	9
Sulfur Dioxide Trends Graphs	10
Sulfur Dioxide Statistics	11
<b>Nitrogen Dioxide</b>	12
Nitrogen Dioxide Trends Graphs	13
Nitrogen Dioxide Statistics	14
<b>Ozone</b>	15
Ozone Trends Graphs	17
One-hour & Eight-hour Ozone Statistics	18
One-hour Ozone Multi-year Averages	20
Eight-hour Ozone Multi-year Averages	22
<b>Particulate Matter</b>	24
PM <sub>10</sub> Trends Graphs	26
PM <sub>10</sub> Statistics	27
PM <sub>2.5</sub> Statistics	29
<b>Industrial Monitoring</b>	31
Particulate Matter Statistics	32
Sulfur Dioxide Statistics	33
Nitrogen Dioxide Statistics	34
Ozone Statistics	35
<b>Acid Rain</b>	36
Acid Rain Trends Graphs	37
Acid Rain Statistics	38
<b>Division for Air Quality Directory</b>	40



## FOREWORD

The Kentucky Ambient Air Quality Annual Report is produced by the Technical Services Branch of the Kentucky Division for Air Quality. This report presents the summary statistical results of monitoring conducted in the calendar year 2002 to measure the outdoor concentrations of air pollutants in the Commonwealth.

The primary source of data for this report is the Air Quality Surveillance Network operated by the Kentucky Division for Air Quality. The report also contains monitoring data submitted by the Louisville Metro Air Pollution Control District, the National Parks Service and some industries.

### **Network Design and Operation**

The state has operated an air quality monitoring network since July 1967. The 2002 network included 117 monitors in 33 counties (this total includes monitors operated by the Louisville Metro Air Pollution Control District and the National Parks Service at Mammoth Cave).

The monitoring station locations are selected with U.S. Environmental Protection Agency guidance and, in general, are established near high population areas or air pollution sources. Each year the site locations are reviewed to ensure that adequate coverage is being provided.

Many staff hours are devoted to the operation of the monitoring network. Division staff routinely visit the sites to calibrate and maintain the monitoring equipment, collect particulate and acid rain samples, and verify and document data from the continuous monitors.

Because it is imperative that the air monitoring data be accurate and precise, the Division for Air Quality has an extensive quality assurance program. Staff members audit every air monitor quarterly to ensure that each is operating properly. This audit includes monitors operated by the Louisville Metro Air Pollution Control District, the National Park Service and industrial networks.

Monitoring data is used in several ways. The data is used to demonstrate compliance with and/or progress made toward meeting ambient air quality standards and to identify pollution trends. The data is also used to evaluate public health impacts and the possible need to initiate emergency control procedures.

The public has access to the information through this annual report and, on a daily basis, through the Air Quality Index (AQI) message on our website: [www.air.ky.gov/AQIndex.htm](http://www.air.ky.gov/AQIndex.htm) or toll free at: 1-800-AIR-IN-KY. This is a 24-hour report on Kentucky's air quality. During the summer months, the public can also access daily ozone level reports through EPA's AIRNOW website at [www.epa.gov/airnow](http://www.epa.gov/airnow).

## **Report Organization**

This report contains sections on each criteria pollutant with the monitoring data contained in a table arranged alphabetically by county. Acid rain data and data from industrial monitors are presented in separate sections.

The report has been composed and arranged in an attempt to make it “user friendly.” Included in the report are: a National Ambient Air Quality Standards table; a table listing monitors by county; maps indicating monitor locations; pollutant trends graphs; and a division directory.

If you have suggestions or questions concerning this report, please contact Jerry Sudduth, Technical Services Branch, Division for Air Quality, 803 Schenkel Lane, Frankfort, KY 40601.

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## Ambient Air Quality Standards

POLLUTANT	MAXIMUM CONCENTRATION	
	PRIMARY STANDARD	SECONDARY STANDARD
<b>Carbon monoxide</b> 8 hour average 1 hour average	9 ppm (1) 35 ppm (1)	9 ppm (1) 35 ppm (1)
<b>Sulfur oxides</b> 24 hour average annual average 3 hour average	0.14 ppm (1) 0.03 ppm --	-- -- 0.50 ppm (1)
<b>Nitrogen dioxide</b> Annual average	0.05 ppm	0.05 ppm
<b>Lead</b> Calendar Quarter average	1.5 µg/m <sup>3</sup>	1.5 µg/m <sup>3</sup>
<b>Ozone</b> 1 hour average 8 hour average	0.12 ppm (4) 0.08 ppm (5)	0.12 ppm (4) 0.08 ppm (5)
<b>Particulate Matter</b> (measured as PM <sub>10</sub> ) 24 hour average annual average	150 µg/m <sup>3</sup> (3) 50 µg/m <sup>3</sup> (2)	150 µg/m <sup>3</sup> (3) 50 µg/m <sup>3</sup> (2)
<b>Particulate Matter</b> (measured as PM <sub>2.5</sub> ) 24 hour average annual average	65 µg/m <sup>3</sup> (6) 15 µg/m <sup>3</sup> (7)	65 µg/m <sup>3</sup> (6) 15 µg/m <sup>3</sup> (7)

The federal Clean Air Act, as amended by the U.S. Congress in 1970, 1977 and 1990, directs the U.S. Environmental Protection Agency (EPA) to establish NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) defining maximum allowable ambient (outdoor) concentrations for criteria pollutants. The term "criteria pollutants" derives from the requirement that EPA must set criteria or standards for each.

There are two standard goal levels for each of the criteria pollutants. The PRIMARY STANDARD is designed to protect the public health. The SECONDARY STANDARD is designed to protect public health and welfare. Welfare covers damage to plants and animals, impairment of visibility and property damage.

Units of measure in the chart are micrograms of pollutants per cubic meter of air (µg/m<sup>3</sup>) and parts of pollutants per million (ppm) parts of air.

### Footnotes:

- (1) This average is not to be exceeded more than once per year.
- (2) The standard is attained when the expected annual arithmetic mean concentration is less than or equal to 50 µg/m<sup>3</sup>.
- (3) The standard is attained when the expected number of days per calendar year with a twenty-four (24) hour average concentration above 150 µg/m<sup>3</sup> is equal to or less than one (1).
- (4) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm (235 µg/m<sup>3</sup>) is equal to or less than one (1).
- (5) The standard is attained when the 3-year average of the annual fourth-highest daily maximum 8-hr average ozone concentration is less than or equal to 0.08 ppm.
- (6) The standard is attained when the 3-year average of the annual 98th percentile is less than or equal to 65 µg/m<sup>3</sup>.
- (7) The standard is attained when the 3-year average of annual means is less than or equal to 15 µg/m<sup>3</sup>.

**2002 Kentucky Air Monitoring Network Sites by County**

<b>County</b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>SO<sub>2</sub></b>	<b>NO<sub>2</sub></b>	<b>CO</b>	<b>O<sub>3</sub></b>	<b>Pb</b>	<b>AcidRn</b>	<b>WS/WD</b>
Bell	1	1				1			1
Boone						1			
Boyd	1	3	1	1	1	1			1
Bullitt	1	1		1		1			1
Campbell	1	1	1	1		1			
Carter	1					1		1	1
Christian	1								
Daviess	1	2	1	1		1			1
Edmonson <sup>1</sup>						1		1	
Fayette	2	2	1	1	1	2			
Franklin	1								
Graves						1			1
Greenup			1			1			
Hancock			1			1			
Hardin	1	1				1			
Harlan		1							
Henderson	1	2	1	1		1			
Jefferson <sup>2</sup>	4	6	3	2	4	3			1
Jessamine						1			1
Kenton	1	1		1		1			1
Laurel	1	1							
Livingston		1	1			1			1
McCracken	1	2	1	1		1			
McLean						1			1
Madison	1	1							



**2002 Kentucky Air Monitoring Network Sites by County**

<b>County</b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>SO<sub>2</sub></b>	<b>NO<sub>2</sub></b>	<b>CO</b>	<b>O<sub>3</sub></b>	<b>Pb</b>	<b>AcidRn</b>	<b>WS/WD</b>
Marshall		1							
Oldham						1			
Perry	1	1				1			
Pike	1	1	1			1			
Pulaski		1				1			
Scott						1			
Simpson						1			1
Warren	1	1	1	1		1			
<b>Total</b>	<b>23</b>	<b>31</b>	<b>14</b>	<b>11</b>	<b>6</b>	<b>30</b>	<b>0</b>	<b>2</b>	<b>12</b>

<sup>1</sup> Operated by the National Park Service.

<sup>2</sup> Operated by the Louisville Metro Air Pollution Control District.

**2002 Industrial Air Monitoring Network Sites by County**

<b>County</b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>SO<sub>2</sub></b>	<b>NO<sub>2</sub></b>	<b>CO</b>	<b>O<sub>3</sub></b>	<b>Pb</b>	<b>Acid Rn</b>	<b>WS/WD</b>
Christian						1			
Gallatin		1							
Henderson			2						
Mason		1	1						
Scott						1			
Trigg						1			
Webster			1						
Wayne, WV			3	1		1			
<b>Total</b>	<b>0</b>	<b>2</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>

## **Carbon Monoxide**

Carbon monoxide (CO) is an odorless, colorless, poisonous gas that is produced by the incomplete combustion of carbon containing fuels. The primary source of carbon monoxide is the exhaust from motor vehicles which includes highway and non-road vehicles such as construction equipment. Other sources include industrial processes and coal, kerosene and wood burning stoves in homes.

The main health effect of carbon monoxide is its tendency to reduce the oxygen carrying capacity of blood. Carbon monoxide enters the bloodstream in the lungs where it binds chemically with the hemoglobin in red blood cells. Hemoglobin normally carries oxygen to organs and tissues but because CO binds with the hemoglobin over 200 times more readily than oxygen, the amount of oxygen absorbed into the bloodstream is greatly reduced when CO is present. Depending on the level of exposure, CO can cause fatigue and headaches and can impair vision and reflexes. Unconsciousness and even death may occur at high concentrations. The severity of the effects is related to the length of exposure and concentration level of CO.

Carbon monoxide is monitored continuously by analyzers which operate using the non-dispersive infrared photometry method. In this method, ambient air is drawn into a sample cell and a beam of infrared light is passed through it. Carbon monoxide absorbs infrared light and any decrease in the intensity of the beam is due to the presence of CO. The decrease is directly related to the concentration of CO in the ambient air. A detector measures the difference between the sample cell beam and a duplicate beam passing through a reference cell with no CO present. The difference is translated into a measure of the CO present in the ambient air. Data from the analyzer is transmitted by telemetry for entry into an automated data storage system. In 2002 the Division for Air Quality and the Louisville Metro Air Pollution Control District operated six CO monitors in Kentucky.

**Primary NAAQS:** 8-hour average not to exceed 9 ppm more than once per year.  
1-hour average not to exceed 35 ppm more than once per year.

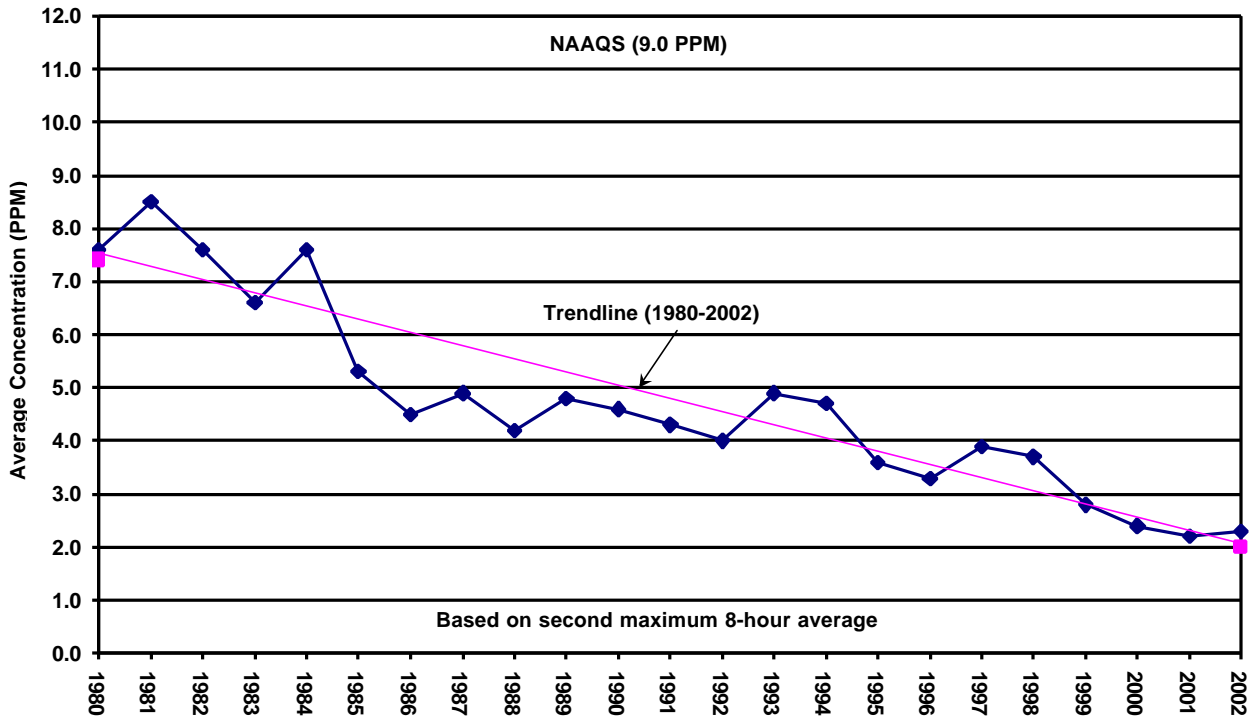
**Secondary NAAQS:** Same as primary standard.

There were no exceedances of the CO standards in 2002. The last exceedance of a standard occurred on January 7, 1998 at Ashland site 21-019-0014 when an 8-hour average of 11.7 ppm was recorded. Prior to the exceedance in Ashland, the most recent exceedance occurred in February 1993 in Louisville where an eight-hour average of 9.5 ppm was recorded at site 21-111-0052. All Kentucky counties are currently in attainment of the standards for carbon monoxide.

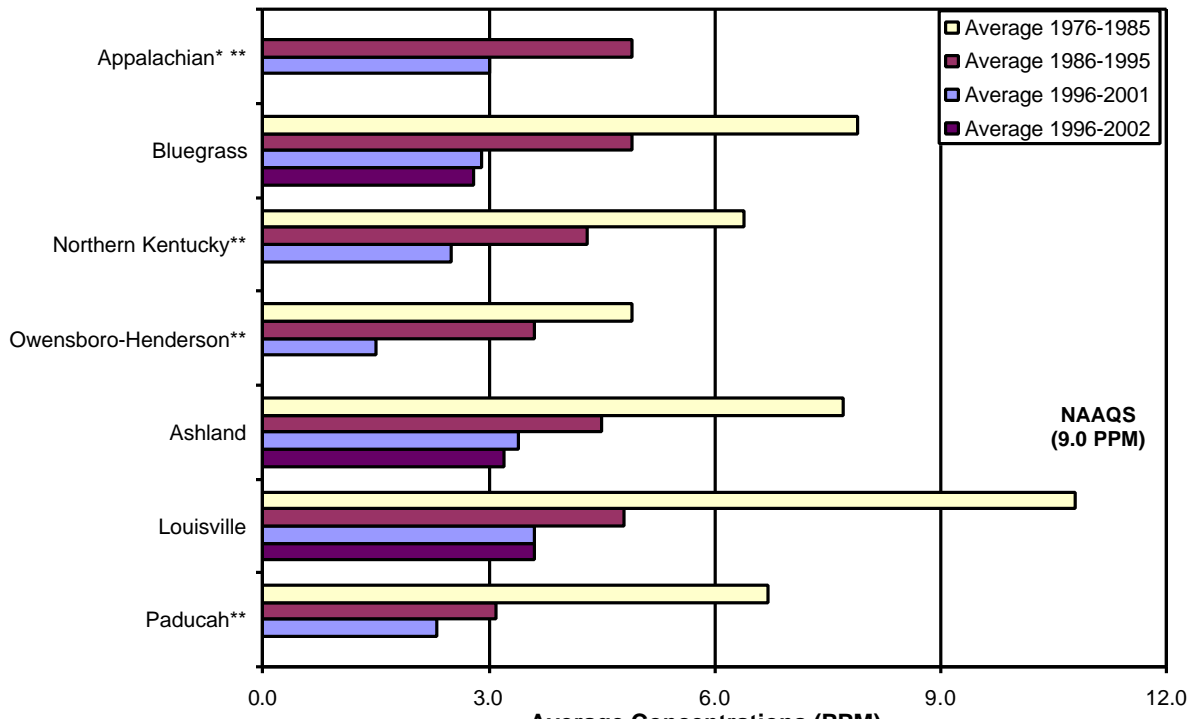
Statewide and regional carbon monoxide levels have declined substantially since 1980, primarily due to improved emission controls on motor vehicles (see Figure 1).

A statistical summary of carbon monoxide data collected in 2002 follows on page 8.

### Statewide Averages for Carbon Monoxide



### Average Regional Concentrations of Carbon Monoxide in Kentucky



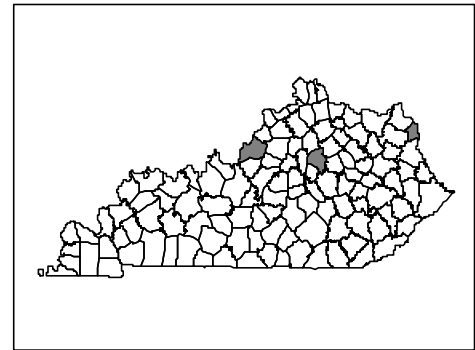
\*Less than ten years of data available for 1986-95  
 \*\* monitoring in these regions ended in 2001

Average Concentrations (PPM)  
 (based on second maximum 8 hr average)

**Figure 1. Carbon Monoxide trends**

Criteria Pollutant Summary Report - 2002

Pollutant: Carbon Monoxide  
 Method: Instrumental/Non-Dispersive Infrared Photometry  
 Data Interval: Hourly  
 Units: Parts-per-million (PPM)



National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: 1-Hour Average 35 PPM  
 8-Hour Average 9 PPM  
 Secondary NAAQS: Same as Primary Standard

County	Site	AIRS-ID	# Obs	1-Hr Averages			8-Hr Averages		
				1 <sup>st</sup> max	2 <sup>nd</sup> max	Obs > 35.0	1 <sup>st</sup> max	2 <sup>nd</sup> max	Obs > 9.0
Boyd	2924 Holt Street Ashland	21-019-0017	8544	2.8	2.7	0	1.8	1.6	0
Fayette	650 Newtown Pike Lexington	21-067-0012	8242	3.8	3.5	0	2.4	2.3	0
Jefferson <sup>1</sup>	424 W. Muhammad Ali Blvd, Louisville	21-111-0045	8419	5.8	4.9	0	3.1	3.0	0
Jefferson <sup>1</sup>	3510 Goldsmith Lane Louisville	21-111-0046	8567	12.4	9.9	0	5.0	4.8	0
Jefferson <sup>1</sup>	7201 Watson Lane Louisville	21-111-0051	4138	3.0	2.9	0	2.0	1.8	0
Jefferson <sup>1</sup>	1735 Bardstown Road Louisville	21-111-1019	8625	4.5	4.2	0	2.9	2.7	0

<sup>1</sup> Carbon monoxide monitors located in Jefferson County are operated by the Louisville Metro Air Pollution Control District.

## **Sulfur Dioxide**

Sulfur dioxide (SO<sub>2</sub>) is a colorless gas that has a pungent odor at concentrations exceeding 0.5 ppm. Sulfur dioxide is produced by the combustion of sulfur containing fuels, ore smelting, petroleum processing and the manufacture of sulfuric acid. Nationwide, coal-fired power plants are the largest sources of sulfur dioxide. Other industrial sources include petroleum refineries and paper mills.

The primary health effect of sulfur dioxide is that it aggravates pre-existing respiratory, cardiovascular and pulmonary diseases. Asthmatics, children and the elderly are especially susceptible to the effects of sulfur dioxide pollution. Sulfur dioxide can also damage the foliage of trees and agricultural crops. It can also combine with moisture in the atmosphere to form sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) which is a component of acid precipitation that causes acidification of soil and water and the erosion of building surfaces.

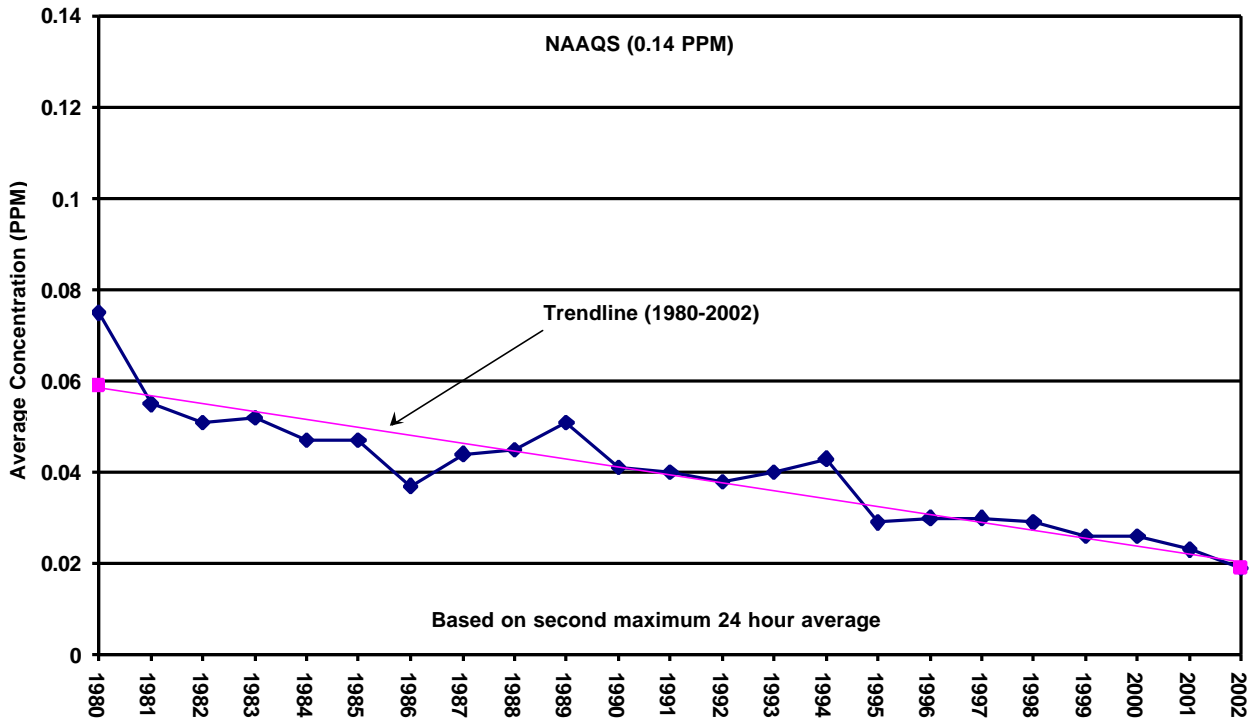
Sulfur dioxide is measured continuously by analyzers which use the ultraviolet (UV) fluorescence method. Fluorescent analyzers irradiate an ambient air sample with ultraviolet light. Sulfur dioxide molecules absorb a portion of this energy, then re-emit the energy at a characteristic wavelength of light. The light energy emitted by the sulfur dioxide molecules is proportional to the concentration of sulfur dioxide present in the sample. A photo multiplier cell measures the light emitted and converts it to a parts per million measurement. Data from the analyzer is transmitted by telemetry for entry into an automated data storage system. In 2002 the Division for Air Quality and the Louisville Metro Air Pollution Control District operated fourteen SO<sub>2</sub> monitors in Kentucky.

<p><b>Primary NAAQS:</b> Annual Arithmetic Mean not to exceed 0.03 ppm. 24-hour concentrations not to exceed 0.14 ppm more than once per year.</p> <p><b>Secondary NAAQS:</b> 3-hour concentrations not to exceed 0.50 ppm more than once per year.</p>
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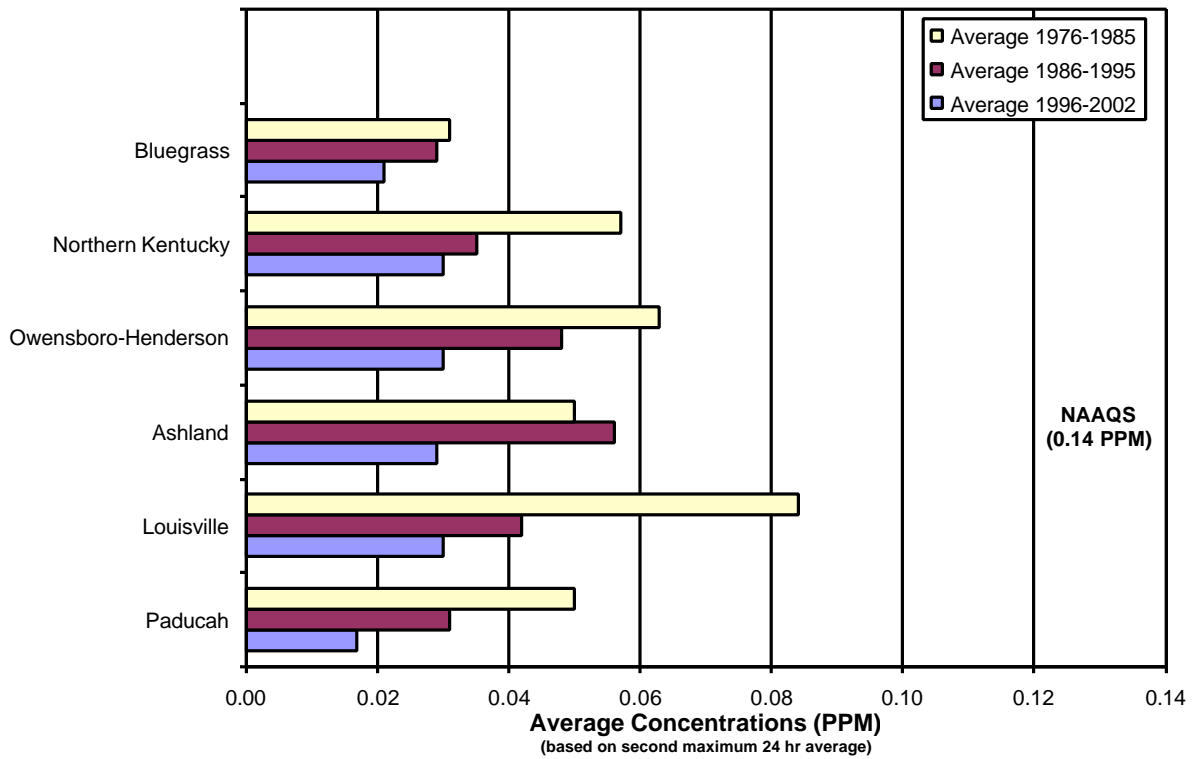
There were no exceedances of any of the sulfur dioxide standards in 2002. The last exceedance of a sulfur dioxide standard occurred in November 1981 when the monitor at Louisville site 21-111-0032 recorded a 24-hour average of 0.159 ppm. Statewide and regional sulfur dioxide levels have declining trends over the past twenty years due at least in part to successful efforts of power plants to curb SO<sub>2</sub> emissions (see Figure 2).

A statistical summary of sulfur dioxide data collected in 2002 follows on page 11.

**Statewide Averages for Sulfur Dioxide**



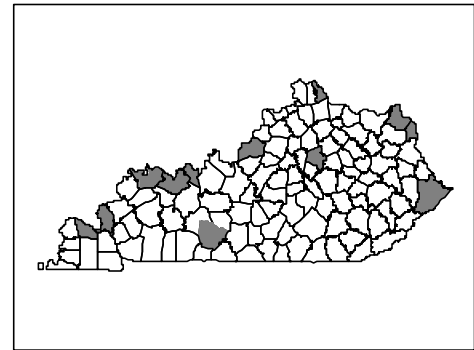
**Average Regional Concentrations of Sulfur Dioxide in Kentucky**



**Figure 2. Sulfur Dioxide trends**

Criteria Pollutant Summary Report - 2002

Pollutant: Sulfur Dioxide  
 Method: Instrumental  
 Ultra-Violet Fluorescence  
 Data Interval: Hourly  
 Units: Parts-per-million (PPM)



National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: Annual Arithmetic Mean 0.03 PPM  
 24-Hour Average 0.14 PPM  
 Secondary NAAQS: 3-Hour Average 0.50 PPM

County	Site	AIRS-ID	# Obs	Annual Mean	24-Hr Average			3-Hr Average		
					1 <sup>st</sup> max	2 <sup>nd</sup> max	Obs> .14	1 <sup>st</sup> max	2 <sup>nd</sup> max	Obs> .50
Boyd	2924 Holt Street Ashland	21-019-0017	8704	.004	.023	.020	0	.047	.041	0
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	8382	.004	.020	.019	0	.074	.063	0
Daviess	US 60 and Pleasant Valley Rd, Owensboro	21-059-0005	8488	.004	.023	.020	0	.052	.051	0
Fayette	650 Newtown Pike Lexington	21-067-0012	8392	.004	.022	.016	0	.043	.036	0
Greenup	Scott & Center Streets Worthington	21-089-0007	8513	.005	.023	.021	0	.053	.041	0
Hancock	2 <sup>nd</sup> & Caroline Avenue Lewisport	21-091-0012	8685	.004	.028	.025	0	.086	.085	0
Henderson	North Green Street Henderson	21-101-0013	6935	.005	.043	.026	0	.109	.100	0
Jefferson <sup>1</sup>	4800 Kaufman Lane Louisville	21-111-0032	4317	.006	.038	.036	0	.116	.087	0
Jefferson <sup>1</sup>	7201 Watson Lane Louisville	21-111-0051	8717	.003	.019	.018	0	.074	.072	0
Jefferson <sup>1</sup>	4201 Algonquin Pkwy Louisville	21-111-1041	8684	.005	.030	.028	0	.137	.112	0
Livingston	763 Bloodworth Road off KY 453	21-139-0004	8679	.003	.018	.017	0	.040	.037	0
McCracken	2901 Powell Street Paducah	21-145-1024	8522	.002	.011	.010	0	.024	.018	0
Pike	101 North Mayo Trail Pikeville	21-195-0002	7590	.002	.010	.008	0	.021	.020	0
Warren	Oakland Elementary School, Oakland	21-227-0008	6147	.002	.022	.010	0	.030	.029	0

<sup>1</sup> Sulfur dioxide monitors located in Jefferson County are operated by the Louisville Metro Air Pollution Control District.

## **Nitrogen Dioxide**

Nitrogen dioxide is a reddish brown gas that is produced during the high temperature combustion of fossil fuels. During combustion, nitrogen and oxygen are combined, or oxidized, to form a family of highly reactive gases called nitrogen oxides ( $\text{NO}_x$ ) which includes nitrogen dioxide ( $\text{NO}_2$ ) and nitrogen oxide ( $\text{NO}$ ). In addition to the nitrogen dioxide produced during combustion, the  $\text{NO}$  produced may, in the presence of sunlight, undergo a photochemical reaction which will also form  $\text{NO}_2$ . The rate of reaction is dependent upon the intensity of the sunlight. Major combustion or oxidation sources that produce nitrogen dioxide include motor vehicles, power plants, incinerators, industrial boilers and some chemical processes.

The primary health effect of nitrogen dioxide is as a lung irritant which can cause an increase in respiratory rate, a decrease in lung function and can increase the susceptibility of the respiratory system to infection. Nitrogen dioxide can also be considered detrimental to human health due to its association in the formation of ozone and the resulting health effects caused by that pollutant. Nitrogen dioxide is also a contributor to the formation of acid precipitation which can damage plant and aquatic life and cause the deterioration of stone and masonry-type buildings and statues.

Nitrogen dioxide is monitored continuously by analyzers which utilize the principle of photometric detection of the chemiluminescence (light) resulting from the gas phase reaction of nitric oxide and ozone. When these two gases react, light at a specific wavelength is produced. In operation, sample air is drawn into the analyzer and split into two streams. The first stream is reacted directly with ozone (which is produced by a generator in the analyzer) and the light energy produced is proportional to the  $\text{NO}$  in the sample. Since  $\text{NO}_2$  does not react with ozone, the second stream of air passes through a catalytic converter that converts the  $\text{NO}_2$  in the sample to  $\text{NO}$ . That stream is then reacted with ozone which will provide a total measurement of nitrogen oxides ( $\text{NO}_x$ ) in the sample. The assumption is that the majority of the  $\text{NO}_x$  value is not  $\text{NO}_2$ . By subtracting the  $\text{NO}$  value obtained by the first stream from the  $\text{NO}_x$  value obtained in the second stream, a  $\text{NO}_2$  value is obtained. Data from the analyzer is transmitted by telemetry for entry into an automated data storage system. In 2002 the Division for Air Quality and the Louisville Metro Air Pollution Control District operated eleven nitrogen dioxide monitors in Kentucky.

**Primary NAAQS:** Annual Arithmetic Mean not to exceed 0.05 ppm.

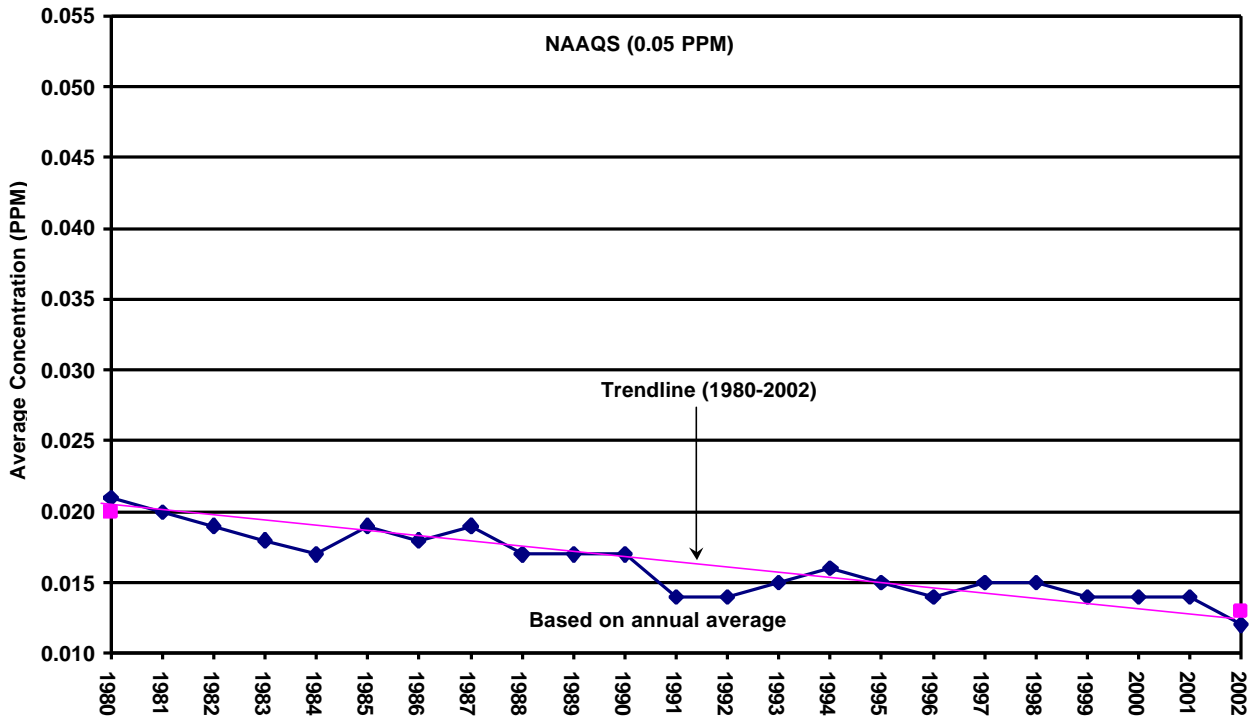
**Secondary NAAQS:** Same as primary standard.

There were no exceedances of the  $\text{NO}_2$  standard in 2002 and there have been no recorded exceedances of the NAAQS since the inception of sampling in 1970. Statewide and regional nitrogen dioxide levels show steady downward trends likely due to the use of pollution control devices on motor vehicles, power plants and industrial boilers (see Figure 3).

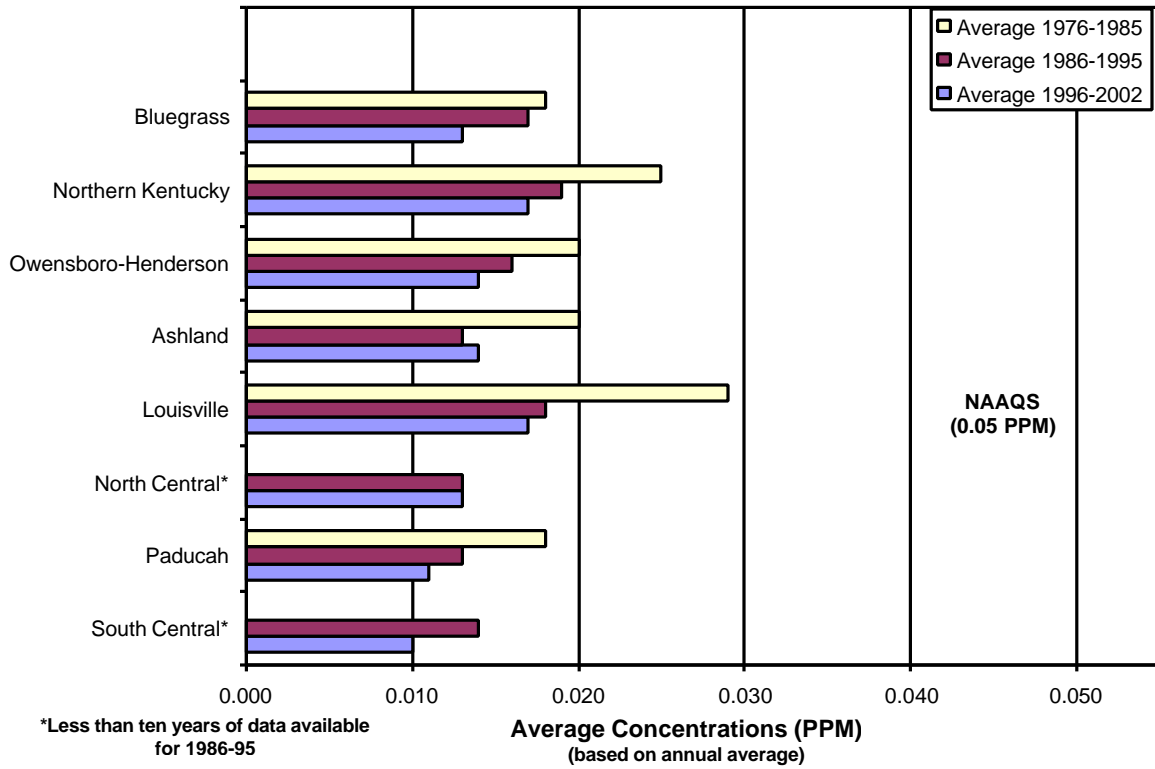
A statistical summary of nitrogen dioxide data collected in 2002 follows on page 14.



**Statewide Averages for Nitrogen Dioxide**



**Average Regional Concentrations of Nitrogen Dioxide in Kentucky**



**Figure 3. Nitrogen Dioxide trends**

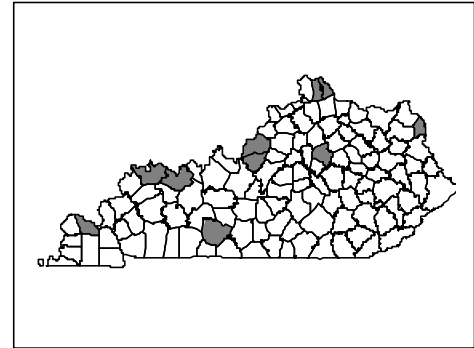
Criteria Pollutant Summary Report - 2002

Pollutant: Nitrogen Dioxide  
 Method: Instrumental/Gas-Phase  
 Chemiluminescence  
 Data Interval: Hourly  
 Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: Annual Arithmetic Mean 0.05 PPM

Secondary NAAQS: Same as Primary Standard



County	Site	AIRS-ID	# Obs	Mean	1-Hr Average	
					1 <sup>st</sup> max	2 <sup>nd</sup> max
Boyd	2924 Holt Street Ashland	21-019-0017	8160	.011	.055	.054
Bullitt	2 <sup>nd</sup> & Carpenter Streets Shepherdsville	21-029-0006	8217	.012	.074	.072
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	8249	.011	.070	.059
Daviess	US 60 and Pleasant Valley Road Owensboro	21-059-0005	8182	.010	.050	.045
Fayette	650 Newtown Pike Lexington	21-067-0012	8113	.012	.071	.069
Henderson	North Green Street Henderson	21-101-0013	6727	.016	.088	.082
Jefferson <sup>1</sup>	7201 Watson Lane Louisville	21-111-0051	4311	.013	.043	.043
Jefferson <sup>1</sup>	1918 Mellwood Avenue Louisville	21-111-1021	8680	.020	.090	.071
Kenton	1401 Dixie Highway Covington	21-117-0007	8250	.016	.074	.073
McCracken	2901 Powell Street Paducah	21-145-1024	8243	.009	.059	.055
Warren	Oakland Elementary School Oakland	21-227-0008	8388	.008	.051	.047

<sup>1</sup> Nitrogen dioxide monitors located in Jefferson County are operated by the Louisville Metro Air Pollution Control District.

## Ozone

Ozone is a colorless gas which is not emitted directly into the atmosphere from sources but forms in the atmosphere from a photochemical reaction between volatile organic compounds and nitrogen oxides in the presence of sunlight. Sources of volatile organic compounds include motor vehicle exhaust, dry cleaning and paint solvents and evaporation of gasoline from storage and transfer facilities. Sources of nitrogen oxides include emissions from motor vehicles, boilers, incinerators and power plants.

In the upper atmosphere, naturally occurring stratospheric ozone (commonly called the ozone layer), shields the earth's surface from the sun's harmful ultraviolet rays. However, tropospheric or ground level ozone causes irritation of the respiratory system and is particularly harmful to those persons with asthma and circulatory problems. Ozone can also cause damage to crops and increase the deterioration of rubber, paints and fabrics.

Ozone is monitored during the period from March 1 thru October 31 each year when meteorological conditions are most conducive to the formation of ozone. During this period, ozone is monitored continuously by analyzers which operate using the ultraviolet photometry method of analysis. In this method, ambient air is drawn into a sample cell and a beam of ultraviolet light is passed thru it. Ozone absorbs ultraviolet light and a decrease in the intensity of the light indicates the presence of ozone. The intensity of the light is first measured with no ozone present to determine a reference value. An ambient sample is then introduced and the intensity of the resultant light is measured by an ultraviolet detector. The amount of light absorbed by the sample indicates the level of ozone present. Data from the analyzers is transmitted by telemetry for entry into an automated data storage system. In 2002 the Division for Air Quality, the National Park Service at Mammoth Cave and the Louisville Metro Air Pollution Control District operated thirty ozone monitors in Kentucky.

**Primary NAAQS:** Maximum one-hour average concentration of 0.12 ppm. Average number of expected exceedances per year not to exceed 1.0 over the last three years.

Maximum 8-hour average concentration of 0.08 ppm (based on a three - year average of the annual fourth highest daily maximum 8-hour averages).

**Secondary NAAQS:** Same as primary standard.

Although the one-hour ozone standard is written with two decimal places, actual monitoring data is recorded to three decimal places and must be rounded to two places for comparison to the standard. Therefore the standard is exceeded when a daily one-hour average is greater than or equal to 0.125 ppm. Additionally the one-hour ozone standard is based on "expected exceedances" rather than actual recorded exceedances. This takes into account periods of missing data caused by monitor malfunction, maintenance and repairs. A formula has been developed to estimate the "expected number of exceedances" that would have occurred if 100% of all possible data values had been

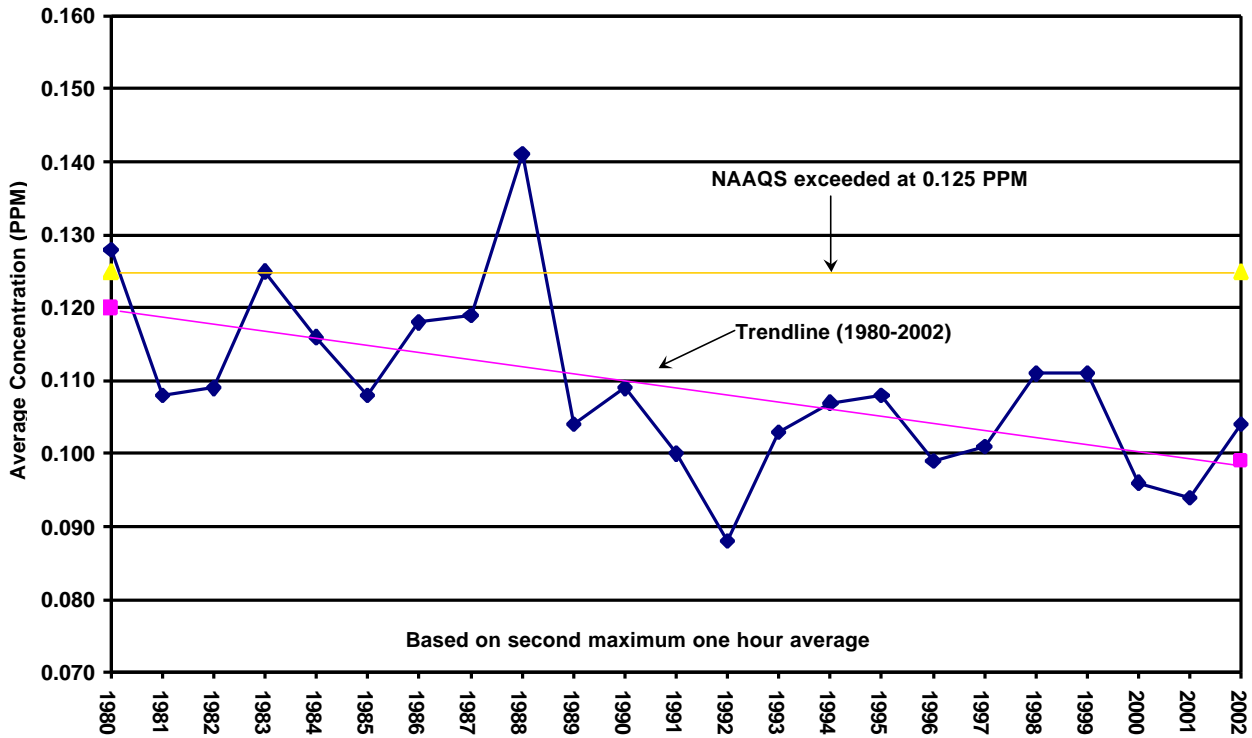
collected. The expected number of exceedances calculated for each monitor is used to determine attainment of the one hour standard. The standard is attained when the expected number of exceedances for a monitor is less than or equal to 1.0 averaged over the last three calendar years. During the period 2000-2002, no monitor had an average expected number of exceedances greater than 1.0 (see one-hour ozone multi-year expected exceedances on pages 20-21).

In November 1997 the U.S. EPA adopted an eight-hour ozone standard based on scientific and medical research which indicated that extended exposure to lower levels of ozone may be as harmful as short term exposure to elevated levels. The eight-hour standard is set at 0.08 ppm and is exceeded when an average level of ozone over an eight hour period is 0.085 ppm or greater. The standard is attained if the fourth highest daily 8-hour average for each of the three most recent years are averaged and that average is less than 0.085 ppm. Eight-hour multi-year averages for 2000-2002 can be found on pages 22-23. In 2002 there were 229 exceedances of the 8-hour standard with all monitors recording at least one 8-hour exceedance. Only preliminary attainment designations have been made based on eight-hour readings.

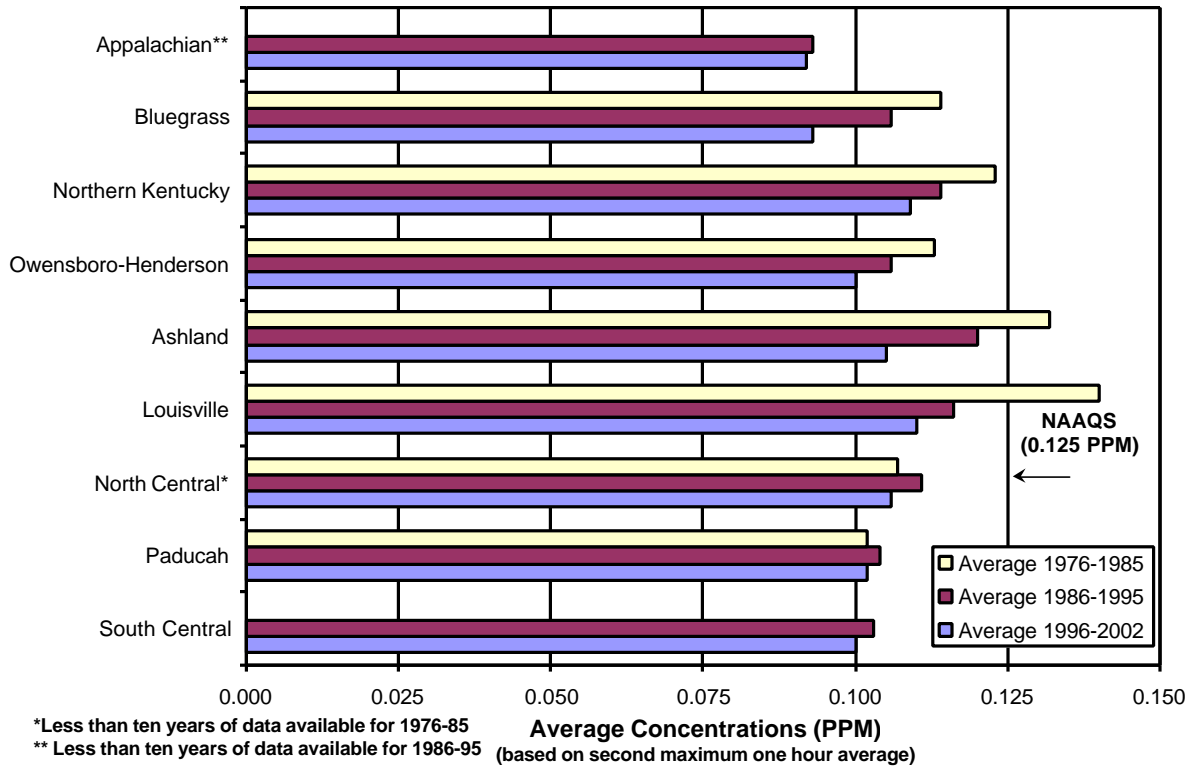
There has been a general decline in ozone levels over the past twenty-five years based on one-hour data as seen in Figure 4. This downward trend is the result of emission controls on vehicles, such as catalytic converters, and controls on industrial sources of VOC's and nitrogen oxides.

A statistical summary of one-hour and eight-hour ozone data collected in 2002 follows on pages 18-19.

### Statewide Averages for Ozone



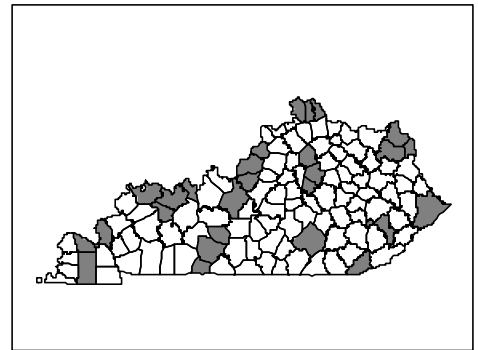
### Average Regional Concentrations of Ozone in Kentucky



**Figure 4. Ozone trends**

Criteria Pollutant Summary Report - 2002

Pollutant: Ozone  
 Method: Ultra-Violet Photometry  
 Data Interval: Hourly  
 Units: Parts-per-million (PPM)



National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: 1-Hour (1 per year/3 years) 0.12 PPM  
 8-hour (3 year avg of 4<sup>th</sup> max.) 0.08 PPM

Secondary NAAQS: Same as Primary Standard

County	Site	AIRS-ID	# Obs	1-Hr Average			8-Hr Average				
				Obs> 0.124	1 <sup>st</sup> max	2 <sup>nd</sup> max	Obs> 0.084	1 <sup>st</sup> max	2 <sup>nd</sup> max	3 <sup>rd</sup> max	4 <sup>th</sup> max
Bell	34 <sup>th</sup> & Dorchester Middlesboro	21-013-0002	5861	0	.108	.101	9	.098	.096	.094	.091
Boone	KY 338 & Rabbit Hash Rd, Eastbend	21-015-0003	5861	0	.114	.114	15	.100	.095	.094	.094
Boyd	2924 Holt Street Ashland	21-019-0017	5844	2	.127	.125	23	.107	.105	.103	.102
Bullitt	2 <sup>nd</sup> & Carpenter St Shepherdsville	21-029-0006	5805	1	.125	.114	10	.104	.094	.092	.091
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	5839	0	.123	.119	24	.114	.112	.107	.102
Carter	Camp Webb Grayson Lake	21-043-0500	5725	0	.113	.109	4	.094	.093	.088	.086
Daviess	US 60 and Pleasant Valley, Owensboro	21-059-0005	5837	0	.114	.109	4	.101	.091	.088	.086
Edmonson <sup>1</sup>	Alfred Cook Road Mammoth Cave	21-061-0501	7971	0	.114	.099	4	.100	.091	.086	.085
Fayette	Iron Works Pike Lexington	21-067-0001	5855	0	.098	.092	2	.088	.087	.082	.081
Fayette	650 Newtown Pike Lexington	21-067-0012	5858	0	.092	.092	1	.087	.082	.082	.080
Graves	Byerly Farm on KY 1949, Symsonia	21-083-0003	5867	0	.111	.106	6	.098	.094	.093	.092
Greenup	Scott & Center St Worthington	21-089-0007	5833	0	.119	.104	2	.100	.086	.084	.084
Hancock	2 <sup>nd</sup> & Caroline Lewisport	21-091-0012	5834	0	.114	.111	7	.097	.095	.093	.093
Hardin	801 North Miles St Elizabethtown	21-093-0006	5650	0	.118	.103	2	.099	.090	.084	.084
Henderson	Baskett Fire Dept. Baskett	21-101-0014	5740	0	.118	.099	8	.104	.090	.087	.087
Jefferson <sup>2</sup>	7601 Bardstown Rd Louisville	21-111-0027	5722	0	.122	.111	4	.094	.091	.090	.085
Jefferson <sup>2</sup>	7201 Watson Lane Louisville	21-111-0051	5859	0	.122	.116	15	.104	.099	.097	.096
Jefferson <sup>2</sup>	1918 Mellwood Ave Louisville	21-111-1021	5877	0	.116	.109	7	.091	.089	.089	.088

Ozone Summary Report Continued

County	Site	AIRS-ID	# Obs	1-Hr Average			8-Hr Average				
				Obs> 0.124	1 <sup>st</sup> max	2 <sup>nd</sup> max	Obs> 0.084	1 <sup>st</sup> max	2 <sup>nd</sup> max	3 <sup>rd</sup> max	4 <sup>th</sup> max
Jessamine	DOT Garage US27 Nicholasville	21-113-0001	5821	0	.104	.098	4	.093	.089	.086	.085
Kenton	1401 Dixie Highway Covington	21-117-0007	5807	0	.121	.115	19	.111	.107	.103	.096
Livingston	KYDOT, 811 US60E Smithland	21-139-0003	5462	0	.104	.101	12	.096	.090	.090	.090
McCracken	2901 Powell Street Paducah	21-145-1024	5840	0	.101	.097	5	.093	.088	.086	.086
McLean	3962 KY 815 Guffie	21-149-0001	5460	0	.116	.105	13	.097	.096	.096	.095
Oldham	DOT Garage, 3995 Morgan Rd, Buckner	21-185-0004	5834	0	.124	.108	12	.105	.098	.097	.091
Perry	Perry Co Horse Park Hazard	21-193-0003	5562	0	.096	.095	3	.088	.086	.085	.083
Pike	101 North Mayo Trail, Pikeville	21-195-0002	5851	0	.106	.092	2	.086	.085	.084	.082
Pulaski	Clifty Street Somerset	21-199-0003	5863	0	.100	.095	2	.092	.087	.082	.081
Scott	Fire Station on KY32 Sadieville	21-209-0001	5856	0	.095	.092	1	.086	.082	.080	.076
Simpson	DOT Garage on KY 1008, Franklin	21-213-0004	5847	0	.104	.098	2	.087	.085	.081	.081
Warren	Oakland Elementary School, Oakland	21-227-0008	5801	0	.107	.101	7	.099	.093	.092	.090

<sup>1</sup> Monitor operated by the National Park Service at Mammoth Cave.

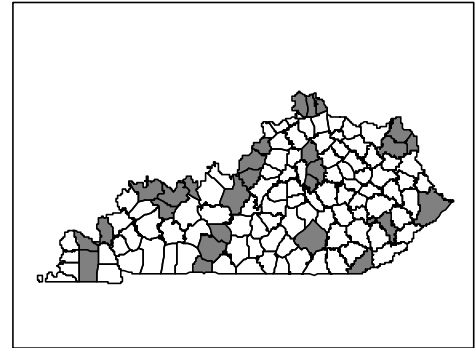
<sup>2</sup> Ozone monitors located in Jefferson County are operated by the Louisville Metro Air Pollution Control District.

Criteria Pollutant Multi-year Summary Report - 2002  
3 Year Average of One-hour Expected Exceedances

Pollutant: Ozone  
Method: Ultra-Violet Photometry  
Data Interval: Hourly  
Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: 1-Hour (1 per year/3 years) 0.12 PPM  
8-Hour (3-year avg of 4<sup>th</sup> max.) 0.08 PPM  
Secondary NAAQS: Same as Primary Standard



County	Site	AIRS-ID	2000		2001		2002		3 year expected avg
			Actual	Expect	Actual	Expect	Actual	Expect	
Bell	34 <sup>th</sup> & Dorchester Middlesboro	21-013-0002	0	0	0	0	0	0	0.0
Boone	KY 338 & Rabbit Hash Road, Eastbend	21-015-0003	0	0	0	0	0	0	0.0
Boyd	2924 Holt Street Ashland	21-019-0017	*	*	*	*	2	2.0	*
Bullitt	2 <sup>nd</sup> & Carpenter Streets Shepherdsville	21-029-0006	0	0	1	1.0	1	1.0	0.7
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	0	0	0	0	0	0	0.0
Carter	Camp Webb Grayson Lake	21-043-0500	0	0	0	0	0	0	0.0
Daviess	US 60 & Pleasant Valley Road, Owensboro	21-059-0005	0	0	0	0	0	0	0.0
Edmonson <sup>1</sup>	Alfred Cook Road Mammoth Cave	21-061-0501	0	0	0	0	0	0	0.0
Fayette	Iron Works Pike Lexington	21-067-0001	0	0	0	0	0	0	0.0
Fayette	650 Newtown Pike Lexington	21-067-0012	0	0	0	0	0	0	0.0
Graves	Byerly Farm, KY 1949 Symsonia	21-083-0003	0	0	0	0	0	0	0.0
Greenup	Scott & Center Streets Worthington	21-089-0007	0	0	0	0	0	0	0.0
Hancock	2 <sup>nd</sup> & Caroline Streets Lewisport	21-091-0012	0	0	0	0	0	0	0.0
Hardin	801 North Miles Street Elizabethtown	21-093-0006	0	0	0	0	0	0	0.0
Henderson	Baskett Fire Dept Baskett	21-101-0014	0	0	0	0	0	0	0.0
Jefferson <sup>2</sup>	7601 Bardstown Road Louisville	21-111-0027	0	0	0	0	0	0	0.0
Jefferson <sup>2</sup>	7201 Watson Lane Louisville	21-111-0051	0	0	0	0	0	0	0.0
Jefferson <sup>2</sup>	1918 Mellwood Ave Louisville	21-111-1021	0	0	0	0	0	0	0.0



Ozone 3 Year 1-Hour Averages Continued

County	Site	AIRS-ID	2000		2001		2002		3 year expected Avg
			Actual	Expect	Actual	Expect	Actual	Expect	
Jessamine	DOT Garage US 27 Nicholasville	21-113-0001	0	0	0	0	0	0	0.0
Kenton	1401 Dixie Highway Covington	21-117-0007	0	0	0	0	0	0	0.0
Livingston	KYDOT, 811 US 60 East Smithland	21-139-0003	0	0	0	0	0	0	0.0
McCracken	2901 Powell Street Paducah	21-145-1024	0	0	0	0	0	0	0.0
McLean	3962 KY 815 Guffie	21-149-0001	0	0	0	0	0	0	0.0
Oldham	DOT Garage, 3995 Morgan Rd, Buckner	21-185-0004	0	0	0	0	0	0	0.0
Perry	Perry County Horse Park Hazard	21-193-0003	0	0	0	0	0	0	0.0
Pike	101 North Mayo Trail Pikeville	21-195-0002	0	0	0	0	0	0	0.0
Pulaski	Clifty Street Somerset	21-199-0003	0	0	0	0	0	0	0.0
Scott	Fire Station on KY 32 Sadieville	21-209-0001	0	0	0	0	0	0	0.0
Simpson	DOT Garage, KY 1008 Franklin	21-213-0004	0	0	0	0	0	0	0.0
Warren	Oakland Elementary Sch Oakland	21-227-0008	0	0	0	0	0	0	0.0

<sup>1</sup> Monitor operated by the National Park Service at Mammoth Cave.

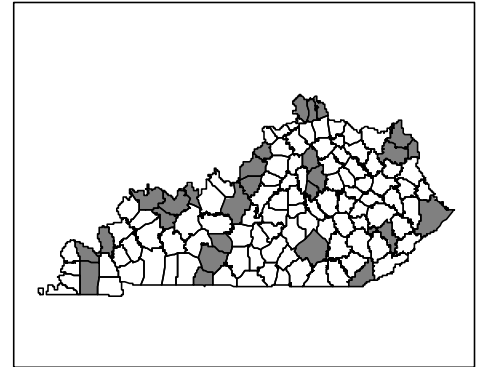
<sup>2</sup> Ozone monitors located in Jefferson County are operated by the Louisville Metro Air Pollution Control District.

Criteria Pollutant Multi-year Summary Report - 2002  
8-Hour 4<sup>th</sup> Maximum 3 Year Average

Pollutant: Ozone  
Method: Ultra-Violet Photometry  
Data Interval: Hourly  
Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: 1-Hour (1 per year/3 year) 0.12 PPM  
8-Hour (3-year avg of 4<sup>th</sup> max.) 0.08 PPM  
Secondary NAAQS: Same as Primary Standard



County	Site	AIRS-ID	2000 4 <sup>th</sup> max	2001 4 <sup>th</sup> max	2002 4 <sup>th</sup> max	3 year Avg. 4 <sup>th</sup> max
Bell	34 <sup>th</sup> & Dorchester Middlesboro	21-013-0002	.090	.077	.091	.086
Boone	KY 338 & Rabbit Hash Road Eastbend	21-015-0003	.083	.083	.094	.086
Boyd	2924 Holt Street Ashland	21-019-0017	.079	.085	.102	.088
Bullitt	2 <sup>nd</sup> & Carpenter Streets Shepherdsville	21-029-0006	.082	.082	.091	.085
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	.093	.088	.102	.094
Carter	Camp Webb Grayson Lake	21-043-0500	.080	.076	.086	.080
Daviess	US 60 & Pleasant Valley Rd Owensboro	21-059-0005	.074	.073	.086	.077
Edmonson <sup>1</sup>	Alfred Cook Road Mammoth Cave	21-061-0501	.088	.080	.085	.084
Fayette	Iron Works Pike Lexington	21-067-0001	.062	.066	.081	.069
Fayette	650 Newtown Pike Lexington	21-067-0012	.076	.078	.080	.078
Graves	Byerly Farm on KY 1949 Symsonia	21-083-0003	.080	.073	.092	.081
Greenup	Scott & Center Streets Worthington	21-089-0007	.077	.088	.084	.083
Hancock	2 <sup>nd</sup> & Caroline Streets Lewisport	21-091-0012	.079	.077	.093	.083
Hardin	801 North Miles Street Elizabethtown	21-093-0006	.079	.080	.084	.081
Henderson	Baskett Fire Dept Baskett	21-101-0014	.078	.074	.087	.079
Jefferson <sup>2</sup>	7601 Bardstown Road Louisville	21-111-0027	.090	.081	.085	.085
Jefferson <sup>2</sup>	7201 Watson Lane Louisville	21-111-0051	.076	.081	.096	.084
Jefferson <sup>2</sup>	1918 Mellwood Avenue Louisville	21-111-1021	.084	.077	.088	.083

Ozone 3 Year 8-Hour Continued

County	Site	AIRS-ID	2000 4 <sup>th</sup> Max	2001 4 <sup>th</sup> Max	2002 4 <sup>th</sup> Max	3 year Avg. 4 <sup>th</sup> max
Jessamine	DOT Garage US 27 Bypass Nicholasville	21-113-0001	.077	.076	.085	.079
Kenton	1401 Dixie Highway Covington	21-117-0007	.087	.082	.096	.088
Livingston	KYDOT, 811 US 60 East Smithland	21-139-0003	.078	.084	.090	.084
McCracken	2901 Powell Street Paducah	21-145-1024	.084	.077	.086	.082
McLean	3962 KY 815 Guffie	21-149-0001	.079	.078	.095	.084
Oldham	DOT Garage, 3995 Morgan Road, Buckner	21-185-0004	.085	.086	.091	.087
Perry	Perry County Horse Park Hazard	21-193-0003	.072	.072	.083	.075
Pike	101 North Mayo Trail Pikeville	21-195-0002	.078	.075	.082	.078
Pulaski	Clifty Street Somerset	21-199-0003	.087	.077	.081	.081
Scott	Fire Station on KY 32 Sadieville	21-209-0001	.070	.066	.076	.071
Simpson	DOT Garage, KY 1008 Franklin	21-213-0004	.085	.085	.081	.083
Warren	Oakland Elementary School Oakland	21-227-0008	.088	.081	.090	.086

<sup>1</sup> Monitor operated by the National Park Service at Mammoth Cave.

<sup>2</sup> Ozone monitors located in Jefferson County are operated by the Louisville Metro Air Pollution Control District.

## **Particulate Matter - (PM<sub>10</sub> / PM<sub>2.5</sub>)**

Particulate matter is a broad classification of non-gaseous pollutants that consists of very fine solid particles and liquid droplets or aerosols. Particulates are produced from many sources, including utility plants, wood burning stoves, leaf burning, vehicle exhaust, incinerators, rock quarries, coal processing, smelting, construction, farming and roadways. Common forms of particulates include fly ash, soot, soil, minerals, fibers, metals, oil aerosols and tire rubber.

The primary health effects of particulates are that they aggravate respiratory and cardiovascular disease and in large amounts increase the death rates of sufferers. The elderly, children, and people with chronic lung disease are especially sensitive to particulate matter. Particulate matter can soil and damage a wide range of man-made items such as building surfaces and may damage vegetation by interfering with plant photosynthesis due to the formation of a film on leaves reducing exposure to sunlight. Particulate pollution can also produce haze which diminishes visibility and the amount of sunlight reaching the earth.

Particulate matter is categorized according to particle diameter due to the health impacts caused by particles of differing sizes. Particles that are greater than fifty microns (50µm) in diameter rapidly settle out of the air due to gravity and pose a limited health risk. Particles that are less than fifty microns in diameter remain suspended in the air for longer periods and are classified as Total Suspended Particulates (TSP). The larger of these particles (between 10 and 50 microns) rarely penetrate deeply into the human respiratory system but are trapped and removed by the body's natural defenses. Early research on the effects of smaller or "fine particulate matter" indicated that particles ten microns in diameter or less posed the greatest risk to human health. Particulate matter ten microns or less in diameter is referred to as PM<sub>10</sub> and is a subset of fine particles within the TSP category. Particles in the PM<sub>10</sub> range are small enough to evade the body's natural defense systems and penetrate into the lungs, where tissue is damaged and the immune system is weakened.

**Primary NAAQS:** Annual Arithmetic Mean not to exceed 50 µg/m<sup>3</sup> (based on a three-year avg).

Maximum 24-hour concentration of 150 µg/m<sup>3</sup>. Average number of expected exceedances per year not to exceed 1.0 over last three years.

**Secondary NAAQS:** Same as primary standard.

As a result of the research on fine particulate matter, the U. S. EPA adopted a PM<sub>10</sub> standard on July 1, 1987 replacing the previous TSP standard. In 2002, the Division for Air Quality and the Louisville Metro Air Pollution Control District operated a combined network of thirty-one PM<sub>10</sub> samplers in Kentucky. Twenty-three of those are intermittent type samplers that operate for twenty-four hours every sixth day. These samplers operate by drawing a measured volume of air thru a pre-weighed filter over a 24 hour period. Before reaching the filter the air passes through an impaction chamber where larger particles fall out of the airstream while particles smaller than ten microns pass on to the sample filter where they are collected. After completion of the sample run the filter is removed from the sampler and reweighed to determine the mass of the particulates collected. Sample

results are entered manually into a data storage system. The network also includes eight continuously operating PM<sub>10</sub> samplers that provide results daily. These samplers determine sample weights electronically and transmit results by telemetry for entry into an automated data storage system.

There were no exceedances of the PM<sub>10</sub> standards in 2002. The last PM<sub>10</sub> exceedance occurred on January 7, 2000 at Louisville site 21-111-0043 where a 24-hour sample of 152 µg/m<sup>3</sup> was collected. Prior to that, the only previous exceedance of a PM<sub>10</sub> standard occurred on August 27, 1990 in Ashland where a 24-hour value of 182 µg/m<sup>3</sup> was collected. All Kentucky counties are currently in attainment with the PM<sub>10</sub> standards. Statewide and regional PM<sub>10</sub> levels have shown declining trends as seen in Figure 5.

A statistical summary of PM<sub>10</sub> data collected during 2002 follows on pages 27-28.

### PM<sub>2.5</sub>

Medical and scientific research on the health effects of particulate matter continued after the adoption of the PM<sub>10</sub> standard. As a result of further research it was determined that very fine particles in the 2.5 micron size range have a more adverse effect on human health. In response to these findings the EPA adopted a PM<sub>2.5</sub> standard which became effective September 16, 1997.

PM<sub>2.5</sub> is monitored by intermittent and continuous type samplers that collect samples over a 24-hour run cycle. While most samplers operate every third day some operate every sixth day and some every day. PM<sub>2.5</sub> sample collection and analysis methods are similar to those for PM<sub>10</sub>. Sample results are entered into an electronic data storage system. In 2002, the Division for Air Quality and the Louisville Metro Air Pollution Control District operated a network of twenty-three samplers.

**Primary NAAQS:** Annual Arithmetic Mean not to exceed 15 µg/m<sup>3</sup> (based on a three-year avg).

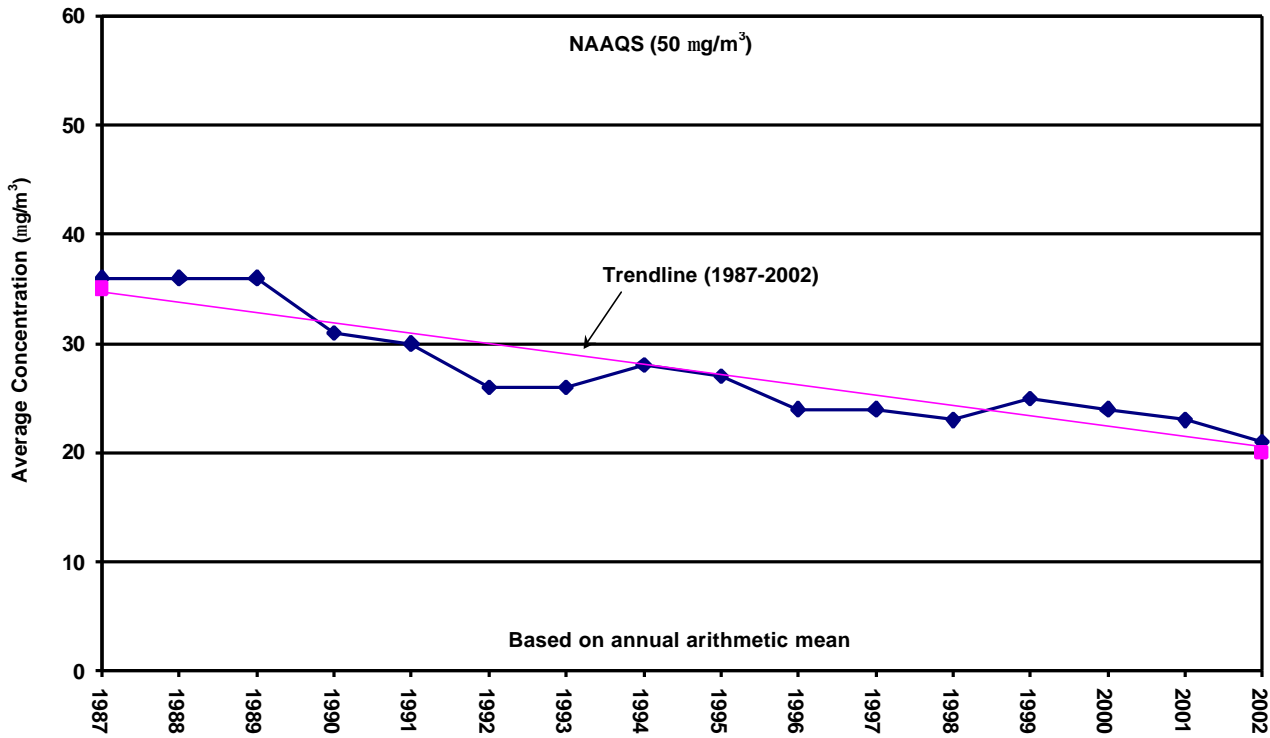
24-hour concentration not to exceed 65 µg/m<sup>3</sup>. (based on a three-year average of the annual 98<sup>th</sup> percentiles).

**Secondary NAAQS:** Same as primary standard.

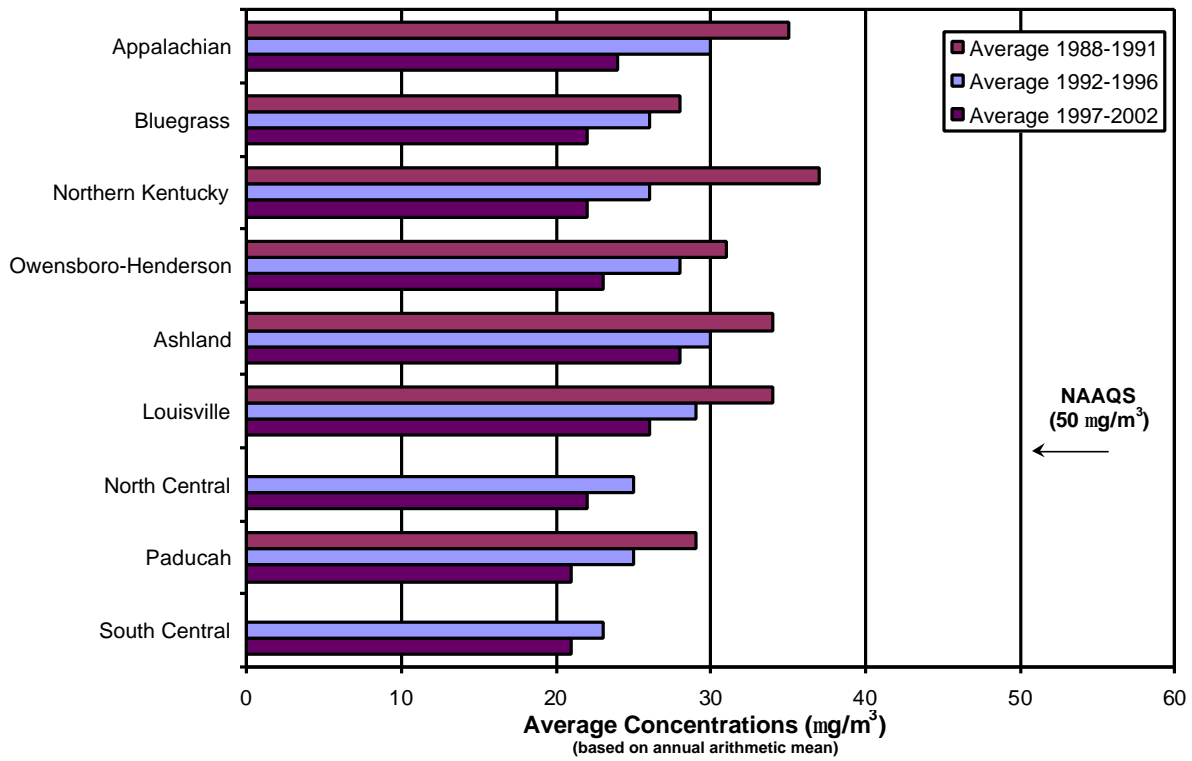
There were three exceedances of the 24-hour standard in 2002. Louisville site 21-111-0044 recorded two exceedances and Louisville site 21-111-0043 had the other. Eight samplers exceeded the annual standard statewide. No attainment designations have been determined at this time.

A statistical summary of 2002 PM<sub>2.5</sub> data appears on page 29-30.

**Statewide Averages for PM<sub>10</sub>**



**Average Regional Concentrations of PM<sub>10</sub> in Kentucky**



**Figure 5. PM<sub>10</sub> trends**

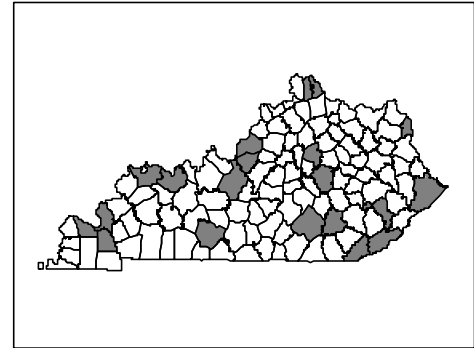
Criteria Pollutant Summary Report - 2002

Pollutant: Particulate Matter PM<sub>10</sub>  
 Method: Gravimetric  
 Data Interval: 24-Hour  
 Units: Micro-grams per cubic meter (µg/m<sup>3</sup>)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: Annual Arith Mean (3yr avg) 50 µg/m<sup>3</sup>  
 24-hour average 150 µg/m<sup>3</sup>

Secondary NAAQS: Same as Primary Standard



County	Site	AIRS-ID	# Obs	Mean	24-hour Average				
					Obs >150	1 <sup>st</sup> max	2 <sup>nd</sup> max	3 <sup>rd</sup> max	4 <sup>th</sup> max
Bell	34 <sup>th</sup> & Dorchester Middlesboro	21-013-0002	59	22	0	54	37	37	37
Boyd	122 22 <sup>nd</sup> Street Ashland	21-019-0002	60	28	0	66	62	58	54
Boyd	2924 Holt Street Ashland	21-019-0017	348	21	0	70	65	64	59
Boyd	2802 Louisa Street Catlettsburg	21-019-2001	61	23	0	62	53	45	43
Bullitt	2 <sup>nd</sup> & Carpenter Street Shepherdsville	21-029-0006	59	20	0	44	40	39	39
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	55	22	0	61	58	49	45
Daviess	US 60 and Pleasant Valley Rd, Owensboro	21-059-0005	344	20	0	85	77	64	62
Daviess	KY Wesleyan College Owensboro	21-059-0014	58	19	0	36	35	33	33
Fayette	650 Newtown Pike Lexington	21-067-0012	348	21	0	98	74	71	55
Fayette	533 South Limestone Lexington	21-067-0014	60	22	0	48	46	43	40
Hardin	801 North Miles Street Elizabethtown	21-093-0006	58	18	0	39	38	36	35
Harlan	110 First Street Harlan	21-095-0003	61	23	0	43	43	40	39
Henderson	Bend Gate School Henderson	21-101-0006	32	22	0	53	51	41	38
Henderson	North Green Street Henderson	21-101-0013	296	22	0	86	77	75	67
Jefferson <sup>1</sup>	37 <sup>th</sup> & Southern Ave Louisville	21-111-0043	59	25	0	52	52	46	42
Jefferson <sup>1</sup>	1032 Beecher Avenue Louisville	21-111-0044	144	26	0	66	66	60	59
Jefferson <sup>1</sup>	850 Barret Avenue Louisville	21-111-0048	30	22	0	42	40	33	31
Jefferson <sup>1</sup>	7201 Watson Lane Louisville	21-111-0051	15	20	0	33	31	27	21
Jefferson <sup>1</sup>	2425 Portland Avenue Louisville	21-111-1009	28	20	0	33	29	28	27
Jefferson <sup>1</sup>	7709 Preston Highway Okolona	21-111-3001	30	21	0	36	36	35	31

PM<sub>10</sub> Summary Report Continued

County	Site	AIRS-ID	# Obs	Mean	24-hour Average				
					Obs >150	1 <sup>st</sup> max	2 <sup>nd</sup> max	3 <sup>rd</sup> max	4 <sup>th</sup> max
Kenton	1401 Dixie Highway Covington	21-117-0007	351	19	0	77	59	53	52
Laurel	London-Corbin Airport London	21-125-0004	39	20	0	43	39	35	32
Livingston	763 Bloodworth Road, off KY 453	21-139-0004	59	19	0	51	36	32	31
McCracken	342 Lone Oak Road Paducah	21-145-1004	55	18	0	61	38	37	34
McCracken	2901 Powell Street Paducah	21-145-1024	345	20	0	83	79	73	72
Madison	Mayfield School Richmond	21-151-0003	57	18	0	43	41	38	37
Marshall	24 Main Street Calvert City	21-157-0010	59	22	0	57	50	49	49
Perry	Perry Co. Horse Park Hazard	21-193-0003	61	23	0	61	54	43	39
Pike	101 North Mayo Trail Pikeville	21-195-0002	329	22	0	65	57	48	47
Pulaski	Clifty Street Somerset	21-199-0003	60	19	0	44	38	36	32
Warren	Oakland Ele. School Oakland	21-227-0008	343	17	0	50	50	48	48

<sup>1</sup> PM<sub>10</sub> samplers located in Jefferson County are operated by the Louisville Metro Air Pollution Control District.



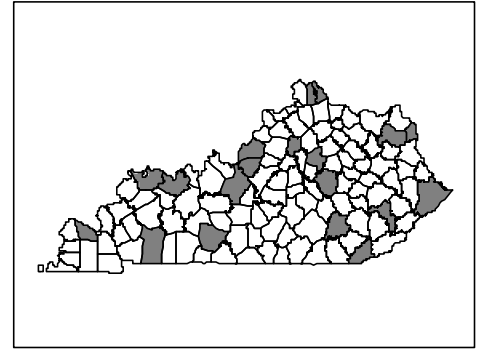
Criteria Pollutant Summary Report - 2002

Pollutant: Particulate Matter PM<sub>2.5</sub>  
 Method: Gravimetric  
 Data Interval: 24-Hour  
 Units: Micro-grams per cubic meter (µg/m<sup>3</sup>)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: Annual Arithmetic Mean (3yr avg) 15µg/m<sup>3</sup>  
 24-hour (3yr avg of 98<sup>th</sup> percentile) 65µg/m<sup>3</sup>

Secondary NAAQS: Same as Primary Standard



County	Site	AIRS-ID	# Obs	Mean	24-Hour Average				
					Obs >65	1 <sup>st</sup> max	2 <sup>nd</sup> max	3 <sup>rd</sup> max	4 <sup>th</sup> max
Bell	34 <sup>th</sup> & Dorchester Middlesboro	21-013-0002	57	14.3	0	34.5	25.9	24.5	24.1
Boyd	2924 Holt Street Ashland	21-019-0017	116	15.5	0	46.8	44.2	39.4	39.2
Bullitt	2 <sup>nd</sup> & Carpenter Street Shepherdsville	21-029-0006	116	14.7	0	53.2	45.0	34.1	32.8
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	99	14.8	0	42.5	42.3	38.9	37.7
Carter	Camp Webb Grayson Lake	21-043-0500	115	12.4	0	39.3	37.0	29.8	27.9
Christian	10800 Pilot Rock Road Hopkinsville	21-047-0006	107	13.1	0	35.0	32.0	29.3	25.8
Daviess	KY Wesleyan College Owensboro	21-059-0014	111	14.6	0	49.3	34.6	29.5	28.7
Fayette	650 Newtown Pike Lexington	21-067-0012	115	15.1	0	56.0	53.3	41.6	33.2
Fayette	533 South Limestone Lexington	21-067-0014	115	15.6	0	51.9	49.9	41.0	34.1
Franklin	803 Schenkel Lane Frankfort	21-073-0006	111	13.7	0	47.2	46.2	35.0	32.9
Hardin	801 North Miles Street Elizabethtown	21-093-0006	115	14.0	0	48.8	37.1	32.2	32.1
Henderson	Bend Gate School Henderson	21-101-0006	119	14.2	0	49.9	45.8	41.4	35.8
Jefferson <sup>1</sup>	37 <sup>th</sup> & Southern Avenue Louisville	21-111-0043	319	17.2	1	80.2	54.5	50.0	49.8
Jefferson <sup>1</sup>	1032 Beecher Avenue Louisville	21-111-0044	330	17.5	2	100.6	69.4	58.8	57.4
Jefferson <sup>1</sup>	850 Barret Avenue Louisville	21-111-0048	104	16.3	0	52.1	45.8	44.7	38.0
Jefferson <sup>1</sup>	7201 Watson Lane Louisville	21-111-0051	51	15.3	0	30.5	29.6	28.8	28.3
Kenton	1401 Dixie Highway Covington	21-117-0007	107	15.1	0	39.5	38.0	37.8	37.4
Laurel	London-Corbin Airport London	21-125-0004	47	13.0	0	31.6	27.3	24.5	23.5

PM<sub>2.5</sub> Summary Report Continued

County	Site	AIRS-ID	# Obs	Mean	24-hour Average				
					Obs >65	1 <sup>st</sup> max	2 <sup>nd</sup> max	3 <sup>rd</sup> max	4 <sup>th</sup> max
McCracken	342 Lone Oak Road Paducah	21-145-1004	103	12.6	0	44.3	34.4	30.2	28.3
Madison	Mayfield School Richmond	21-151-0003	109	13.5	0	49.8	34.6	33.7	32.8
Perry	Perry Co Horse Park Hazard	21-193-0003	50	13.0	0	25.4	23.2	22.0	21.2
Pike	101 North Mayo Trail Pikeville	21-195-0002	119	13.6	0	41.7	38.2	29.7	29.0
Warren	Kereiakes Park Bowling Green	21-227-0007	119	13.3	0	32.0	31.0	29.1	26.7

<sup>1</sup> PM<sub>2.5</sub> samplers located in Jefferson County are operated by the Louisville Metro Air Pollution Control District.

## **Industrial Data**

Various industries within the Commonwealth of Kentucky operate air monitoring networks and subsequently report the data from these networks to the Division for Air Quality. Monitoring activity designed to measure the background levels of selected pollutants prior to construction of a proposed source or the expansion of an existing source is termed PSD (Prevention of Significant Deterioration of air quality) monitoring. This type of network is normally set up to operate for approximately one year. Monitoring designed to measure the impact of new or expanded sources on the air quality of an area is termed post-construction monitoring. A third type of monitoring is termed compliance monitoring and is usually set up around existing sources to demonstrate compliance with permit conditions and ambient air standards.

Regardless of the type of monitoring undertaken by these industrial networks, all must meet the following requirements.

- The Division must receive and approve a copy of the monitoring plan for each network prior to commencement of monitoring.
- A member of the Technical Services Branch of the Division for Air Quality must inspect the monitoring site(s) before monitoring begins to ensure that applicable siting criteria are met.
- Operators of networks with CO, SO<sub>2</sub>, and NO<sub>2</sub> monitors must use gaseous standards that are traceable to National Institute of Standards and Technology (NIST) gaseous Standard Reference Materials (SRM) to generate test concentrations.
- Test concentrations of O<sub>3</sub> must be obtained in accordance with the UV photometric calibration procedure specified in 40 CFR Part 50, Appendix D, or by means of a certified ozone transfer standard.
- Flow measurements must be made with a flow measuring device that is referenced to an authoritative volume or other standard.
- All samplers and monitors used for monitoring criteria pollutants must be approved as EPA reference or equivalent methods.
- All monitors are audited once each calendar quarter by a member of the Division's Quality Assurance Section.
- Air monitoring reports from these networks are due at the Division for Air Quality no later than 90 days after the end of each calendar quarter. These air monitoring reports are to consist of the raw data from each network (usually on a 3.5" diskette), a missing data report (explaining any gaps in the data), monitor calibrations, results from the biweekly precision checks carried out on each automated analyzer, audit reports, and copies of sections of the strip charts (only when requested).

The data from each network is reviewed for completeness and accuracy and to determine if there are any exceedances of any primary or secondary pollutant standards. A letter of receipt is sent to the operator of each network when their data has been received and reviewed. If corrections are deemed necessary, the network operator is notified so the corrections can be made and the data resubmitted.

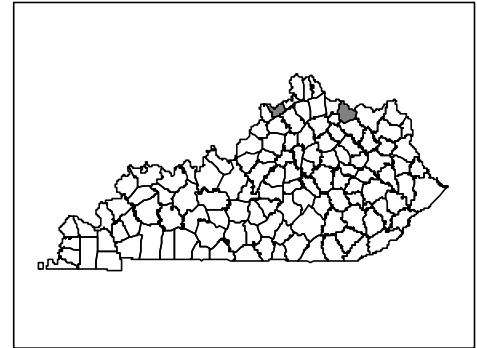
A statistical summary of industrial data collected in 2002 follows on pages 32-35.

Industrial - Criteria Pollutant Summary Report - 2002  
 Sites Operated by Industry

Pollutant: Particulate Matter PM<sub>10</sub>  
 Method: Gravimetric  
 Data Interval: 24-Hour  
 Units: Micro-grams per cubic meter (µg/m<sup>3</sup>)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: Annual Arith Mean (3yr avg) 50 µg/m<sup>3</sup>  
 24-hour average 150 µg/m<sup>3</sup>  
 Secondary NAAQS: Same as Primary Standard



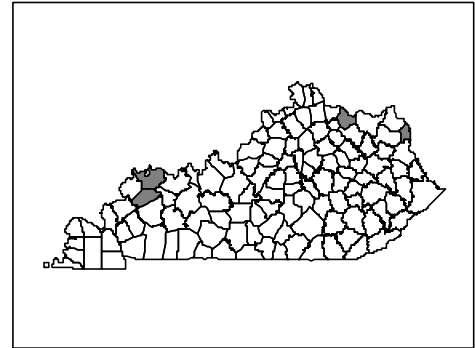
County	Site	Facility-ID	# Obs	Annual Mean	Obs >150	1 <sup>st</sup> max	2 <sup>nd</sup> max	3 <sup>rd</sup> max	4 <sup>th</sup> max
Carroll	US Highway 42 Ghent	North American Stainless	57	26	0	80	69	64	50
Mason	KY 576 Maysville	East Kentucky Power	42	19	0	69	42	39	31

Industrial - Criteria Pollutant Summary Report - 2002  
 Sites Operated by Industry

Pollutant: Sulfur Dioxide  
 Method: Ultra-Violet Fluorescence  
 Data Interval: Hourly  
 Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: Annual Arithmetic Mean 0.03 PPM  
 24-Hour Average 0.14 PPM  
 Secondary NAAQS: 3-Hour Average 0.50 PPM



County	Site	Facility-ID	# Obs	Annual Mean	24-Hr Average			3-Hr Average		
					1 <sup>st</sup> max	2 <sup>nd</sup> max	Obs >.14	1 <sup>st</sup> max	2 <sup>nd</sup> max	Obs >.50
Henderson	US 41 & KY 2096 Sebree	Western KY Electric	8124	.002	.029	.027	0	.161	.105	0
Henderson	KY 2097 Sebree	Western KY Electric	8200	.005	.049	.037	0	.155	.137	0
Mason	KY 576 Maysville	East Kentucky Power	6299	.003	.026	.025	0	.100	.086	0
Webster	Bell Gibson Road	Western KY Electric	8212	.007	.130	.128	0	.335	.307	0
Wayne, WV	Spring Brook Dr Kenova, WV	Ashland-Marathon	8583	.008	.027	.025	0	.085	.072	0
Wayne, WV	Route 52 Neal, WV	Ashland-Marathon	8579	.009	.031	.028	0	.090	.072	0
Wayne, WV	Big Sandy Road Neal, WV	Ashland-Marathon	8684	.008	.041	.034	0	.098	.072	0

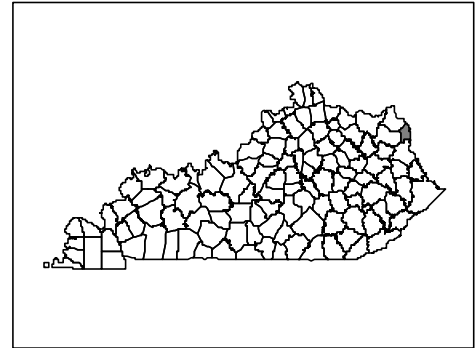
Industrial - Criteria Pollutant Summary Report - 2002  
 Sites Operated by Industry

Pollutant: Nitrogen Dioxide  
 Method: Instrumental/Chemiluminescence  
 Data Interval: Hourly  
 Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: Annual Arithmetic Mean 0.05 PPM

Secondary NAAQS: Same as Primary Standard



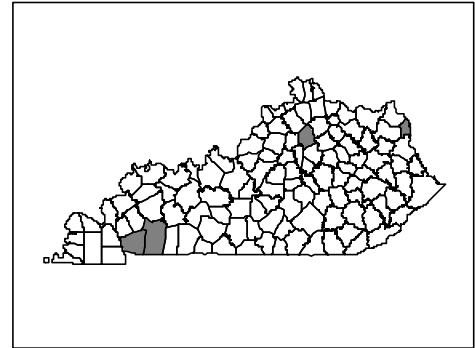
County	Site	Facility-ID	# Obs	Annual Mean	1-Hr Average	
					1 <sup>st</sup> max	2 <sup>nd</sup> max
Wayne, WV	Spring Brook Drive, Kenova, WV	Ashland-Marathon	8550	.016	.097	.093

Industrial - Criteria Pollutant Summary Report - 2002  
 Sites Operated by Industry

Pollutant: Ozone  
 Method: Ultra-Violet Photometry  
 Data Interval: Hourly  
 Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: 1-Hour (1 per year/3 years) 0.12 PPM  
 8-Hour (3 year avg of 4<sup>th</sup> max.) 0.08 PPM  
 Secondary NAAQS: Same as Primary Standard



County	Site	Facility-ID	# Obs	1-Hr Average			8-hour Average				
				Obs >0.12	1 <sup>st</sup> max	2 <sup>nd</sup> max	Obs >0.08	1 <sup>st</sup> max	2 <sup>nd</sup> max	3 <sup>rd</sup> max	4 <sup>th</sup> max
Christian	10800 Pilot Rock Rd Hopkinsville	TVA	5738	0	.103	.100	9	.097	.095	.095	.093
Scott	4673 Muddy Ford Rd Oxford	Toyota	5582	0	.105	.104	6	.096	.095	.090	.089
Trigg	Mulberry Flat Road Land Between Lakes	TVA	5862	0	.091	.088	0	.080	.080	.078	.078
Wayne, WV	Spring Brook Drive Kenova, WV	Ashland-Marathon	8709	2	.142	.129	11	.111	.105	.099	.098

## **Acid Rain**

Acid rain includes precipitation in the form of snow, sleet, hail, rain or fog that has a low pH level resulting from emissions of pollutants into the atmosphere, especially sulfur dioxide and nitrogen oxides. Acidified rainwater contains combinations of sulfuric and nitric acids that form when water vapor and sulfur dioxide and nitrogen oxides react. Major sources of sulfur dioxide include power plants, paper and wood pulp processing plants and facilities with coal fired boilers. Nitrogen oxides are produced primarily from the combustion of fossil fuels in the engines of cars, trucks and other vehicles and from power plant emissions.

Aquatic life appears to be most sensitive to the effects of acid rain. Small changes in the pH levels of lakes and streams may prevent some fish species and other aquatic life forms from reproducing. Many insects cannot survive in acidic waters and therefore birds and mammals that depend on insects for food may suffer abnormally high mortality rates. Acid rain can also alter soil chemistry and nutrient availability, in turn weakening trees and shrubs and causing them to be more vulnerable to insects, diseases and fungus infestations. Acid rain may also damage agricultural crops and has been blamed for deterioration of monuments and building surfaces.

Acid rain monitoring stations operate on a weekly sampling schedule. Cumulative precipitation events occurring during a seven day period are collected in one container to represent a one-week sample. An automatic wet/dry precipitation collector is used to collect the sample. The sampler consists of two collection containers. The “wet” container is fitted with a clean plastic sample bag for collection of precipitation. The “dry” container, designed for dry particulate collection is not presently utilized for sample collection. The sampler employs a moisture sensor which activates an electrically driven movable container lid that covers the wet container during dry periods and then moves to cover the dry container when precipitation occurs. At the end of each weekly sampling period, the wet container is removed and replaced with a new, clean container for the next sampling period. After the sample is removed, field measurements of pH and conductivity are made and recorded. The remaining sample is then shipped to Frankfort where laboratory analysis is conducted to determine levels for pH, conductivity, sulfates, nitrates, phosphates, ammonia and metal ions. In 2002, the Division for Air Quality operated two acid rain sites, one at Mammoth Cave National Park and one at Grayson Lake State Park.

Annual pH averages for both sites have shown modest upward trends since 1985 meaning that rainfall is gradually becoming less acidic (see Figure 6). This improvement is due at least in part to successful efforts of power plants to curb sulfur dioxide and nitrogen dioxide emissions.

A statistical summary of acid rain data collected in 2002 follows on pages 38-39.



Average pH of Rainfall in Kentucky

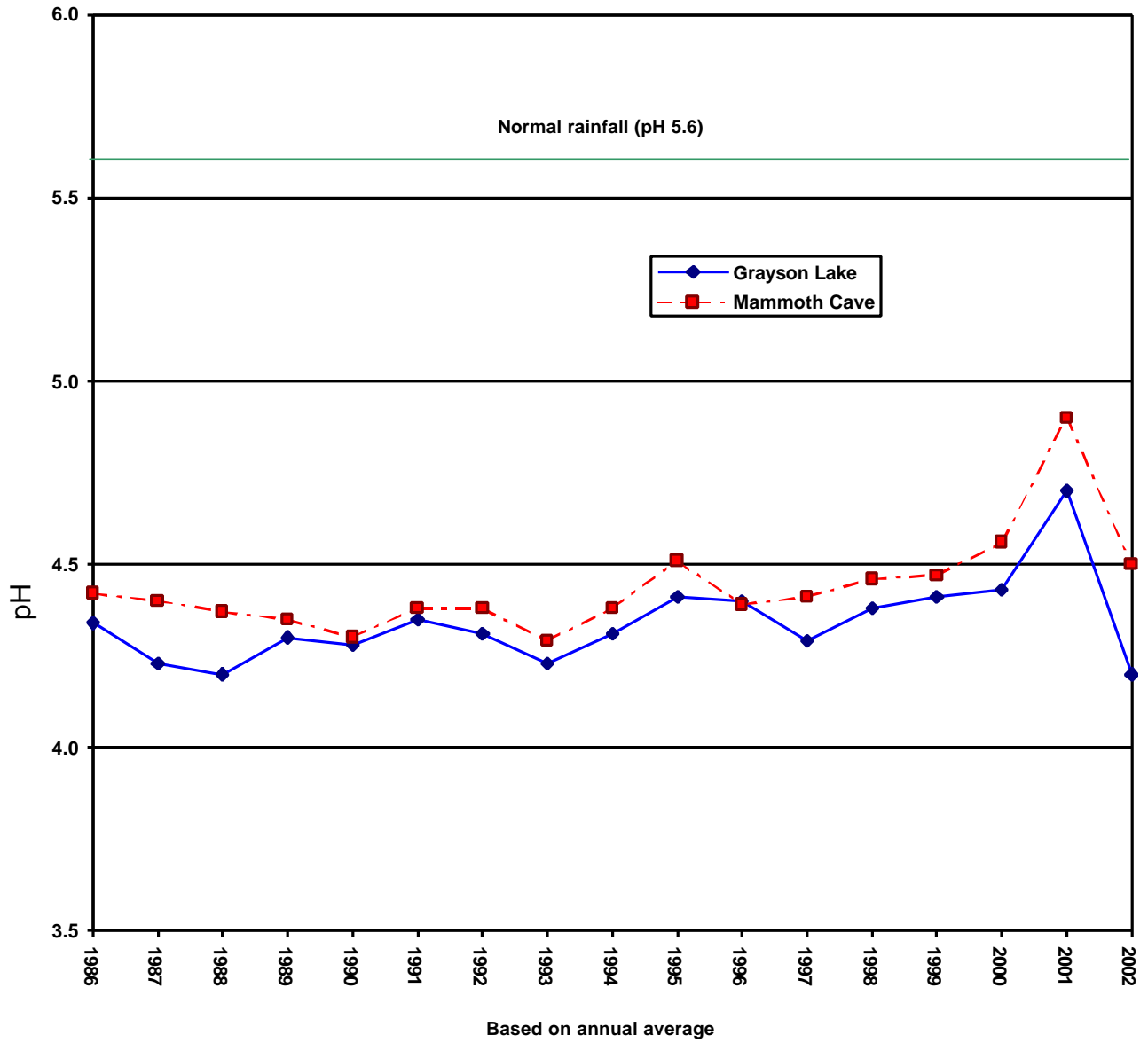


Figure 6. pH trends

Acid Rain Pollutants Summary Report - 2002

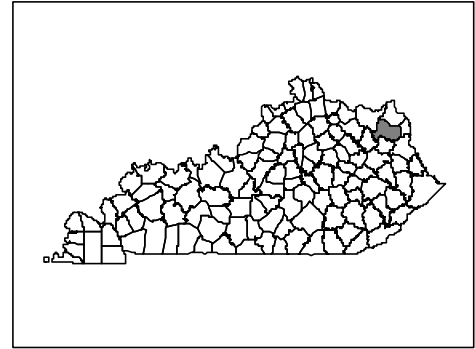
Agency: Kentucky Division for Air Quality

Site ID: 21-043-0500

County: Carter

Location: Grayson Lake  
Camp Webb

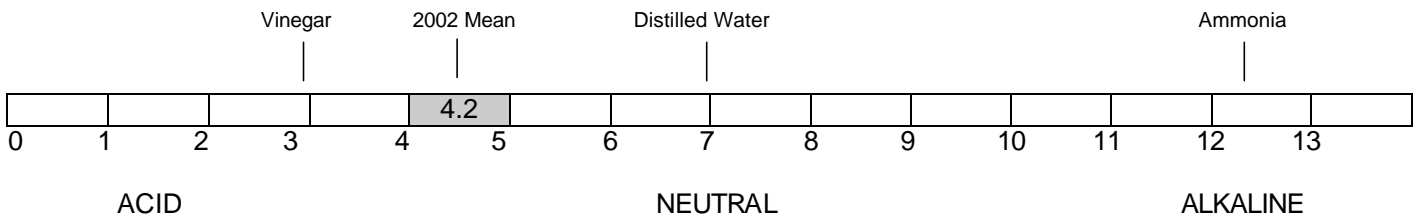
Method: Wet/Dry Collector  
Laboratory Analytical



Parameter	Units	# Obs	Arithmetic Mean	1 <sup>st</sup> Max	2 <sup>nd</sup> Max	3 <sup>rd</sup> Max	4 <sup>th</sup> Max
Acidity	Mg/L	40	4.4	9.6	8.4	7.3	7.1
Ammonia	Mg/L	39	0.3	1.0	0.6	0.5	0.5
Calcium	Mg/L	8	0.7	2.0	0.9	0.8	0.4
Chloride	Mg/L	41	0.1	0.5	0.4	0.3	0.3
Conductivity	µmho	40	16.9	45.3	35.7	33.9	30.0
Magnesium	Mg/L	10	0.1	0.6	0.1	0.1	0.1
Nitrate	Mg/L	42	1.2	4.7	3.3	2.7	2.0
Potassium	Mg/L	2	0.2	0.3	0.1	-	-
Sodium	Mg/L	3	0.4	0.6	0.4	0.3	-
Sulfate	Mg/L	42	1.6	5.8	5.0	3.8	2.9

pH is measured on a scale ranging from zero to fourteen where neutral substances such as distilled water are around seven on the scale. The more acidic substances such as vinegar would be on the lower end of the scale while alkaline substances such as ammonia would be on the upper end of the scale. The chart below indicates where the pH measurements for 2002 at Grayson Lake fall on this scale.

pH Scale

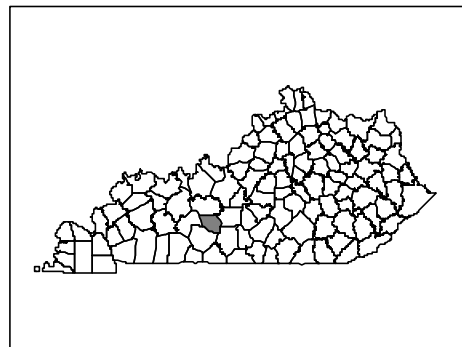


Acid Rain Pollutants Summary Report - 2002

Agency: National Parks Service and  
Kentucky Division for Air Quality

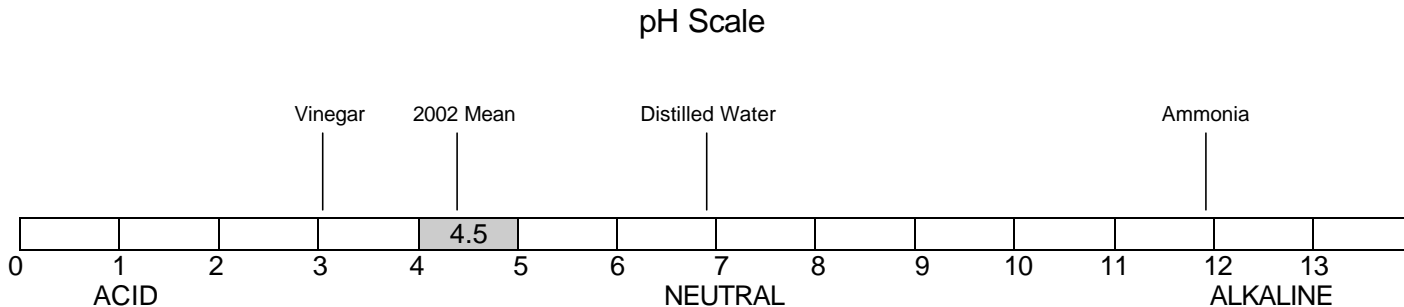
Site Id: 21-061-0501  
County: Edmonson  
Location: Mammoth Cave National Park  
Alfred Cook Road

Method: Wet/Dry Collector  
Laboratory Analytical

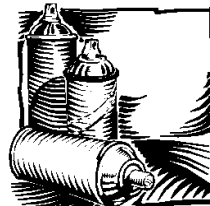


Parameter	Units	# Obs.	Arithmetic Mean	1 <sup>st</sup> Max	2 <sup>nd</sup> Max	3 <sup>rd</sup> Max	4 <sup>th</sup> Max
Acidity	Mg/L	33	3.6	6.7	6.6	5.4	5.3
Ammonia	Mg/L	31	0.4	1.2	1.1	0.7	0.6
Calcium	Mg/L	10	0.6	1.5	0.9	0.8	0.7
Chloride	Mg/L	33	0.3	1.6	0.8	0.6	0.6
Conductivity	µmho	33	16.3	34.9	33.4	31.6	30.2
Magnesium	Mg/L	18	0.2	0.8	0.2	0.2	0.2
Nitrate	Mg/L	33	1.2	4.2	3.8	2.0	1.8
Potassium	Mg/L	3	0.2	0.5	0.1	0.1	-
Sodium	Mg/L	3	0.6	0.9	0.4	0.4	-
Sulfate	Mg/L	33	1.6	4.5	3.1	2.8	2.7

pH is measured on a scale ranging from zero to fourteen where neutral substances such as distilled water are around seven on the scale. The more acidic substances such as vinegar would be on the lower end of the scale while alkaline substances such as ammonia would be on the upper end of the scale. The chart below indicates where the pH measurements for 2002 at Mammoth Cave fall on this scale.



# Kentucky Division for Air Quality



# DIRECTORY



Natural Resources and Environmental  
Protection Cabinet



Kentucky Natural Resources & Environmental Protection Cabinet  
Department for Environmental Protection

## **Division for Air Quality**

**803 Schenkel Lane**  
**Frankfort, KY 40601-1403**  
**Telephone: (502) 573-3382**  
**Fax: (502) 573-3787**  
Web site: <http://www.air.ky.gov>

The Natural Resources and Environmental Protection Cabinet is the state agency responsible for the protection and preservation of Kentucky's land, air and water resources. The Cabinet is divided into three departments: Natural Resources; Surface Mining Reclamation and Enforcement; and Environmental Protection.

The **Division for Air Quality (DAQ)** is in the Cabinet's Department for Environmental Protection. The division is the state agency primarily responsible for enforcing the state and federal air quality standards in the Commonwealth of Kentucky with the goal of protecting public health and welfare.

To achieve that goal, the division operates a multi-faceted program with staff performing separate but interrelated tasks. The Division for Air Quality is organized as follows:

*Director's Office*

*Enforcement Branch*

*Field Operations Branch (Regional Air Quality Offices)*

*Permit Review Branch*

*Special Programs Branch (formerly Asbestos Abatement)*

*Technical Services Branch (includes air monitoring and emissions inventory)*

*Program Planning & Administration Branch*

Included in this directory are contacts, telephone numbers and information about each branch's responsibilities.

The Division for Air Quality operates a toll-free air quality index message number: **1-800-AIR-IN-KY**. This report on Kentucky's air quality gives the pollutant index number, the pollutant responsible for the index number, and whether the air quality is in the good, moderate, or unhealthy category in Lexington, Northern Kentucky, Owensboro, Henderson, Ashland, Paducah, Bowling Green, Pikeville and Louisville areas.



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## Director's Office

**John Lyons, Director**

**E-Mail: [john.lyons@mail.state.ky.us](mailto:john.lyons@mail.state.ky.us)**

**Diana J. Andrews, Assistant Director;**

**E-Mail: [diana.andrews@mail.state.ky.us](mailto:diana.andrews@mail.state.ky.us)**

**Telephone: (502) 573-3382 Fax: :(502) 573-3787**

### ***Mission Statement***

The Division for Air Quality's mission is to protect public health and the environment by achieving and maintaining acceptable air quality through maintenance of a comprehensive air monitoring network; effective partnering with air pollution sources and the public to control air pollution; timely dissemination of accurate and useful information; judicious use of program resources; and operation of a reasonable, effective compliance assurance program.

## **PUBLIC EDUCATION/INFORMATION AND OUTREACH**



The primary focus of the division's education and information activities is "*Clean Air for Kentucky*." This program features a hot air balloon and an Air Quality Resource Guide which provides educational materials for teachers, camp leaders and other educators. This Guide has been developed to supplement textbook information on air pollution. The material can be adapted for use with K-12 grades. The guide contains resource materials, fact sheets, the air pollutant gremlins, classroom activities, games, quizzes, experiments, puzzles, coloring sheets and other helpful information about air quality.

The division's Clean Air for Kentucky educational exhibit includes handout materials and is available upon request for conferences, workshops, convention and other special events. Speakers are also available.

To receive an Air Quality Resource Guide; schedule the exhibit and/or a speaker for your conference, camp or other event; schedule a teacher workshop or in-service day; or receive information on a Clean Air for Kentucky hot air balloon visit (there is a cost) to an environmental event, contact: Lillie Cox through e-mail: [lillie.cox@mail.state.ky.us](mailto:lillie.cox@mail.state.ky.us) or by regular mail at this address: Division for Air Quality, 803 Schenkel Lane, Frankfort, Kentucky 40601-1403; telephone: (502) 573-3382 or (800)-928-0047 (in Kentucky). Visit our web site: <http://www.air.ky.gov>



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## Data Management

**Gerald Dunn, Resource Management Analyst**

**E-Mail: [gerald.dunn@mail.state.ky.us](mailto:gerald.dunn@mail.state.ky.us)**

**Tonya Mattingly, Systems Support Technician**

**E-Mail: [tonya.mattingly@mail.state.ky.us](mailto:tonya.mattingly@mail.state.ky.us)**

### **Responsibilities**

- Installs and maintains complex equipment and software
- Coordinate data management activities for the Division for Air Quality
- Assist the division's employee training coordinator with developing training opportunities.
- Acts as a network administrator as necessary



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## Enforcement Branch

**Pat Johnston, Manager**

**E-Mail: [pat.johnston@mail.state.ky.us](mailto:pat.johnston@mail.state.ky.us)**

### ***Branch Responsibilities***

- Negotiate enforcement agreements to resolve violations of Division for Air Quality regulations.
- Conduct administrative conferences between violating facilities and division officials.
- Negotiate terms of settlement agreements and/or agreed orders.
- Refer cases to the Cabinet's Office of Legal Services when agreement cannot be reached at the division level.



## Field Operations Branch

Kevin Flowers, Manager

E-mail: [kevin.flowers@mail.state.ky.us](mailto:kevin.flowers@mail.state.ky.us)

Robbin Edwards, Complaints Coordinator

E-mail: [robbin.edwards@mail.state.ky.us](mailto:robbin.edwards@mail.state.ky.us)

*Environmental Emergency, 24-hour; (502) 564-2380 or (800) 928-2380*

### ***Branch Responsibilities***

- Inspect air emission sources.
- Operate air quality monitors.
- Certify gasoline tank trucks.
- Enforce state and federal air quality regulations.
- Initiate enforcement action against violators of air quality regulations.
- Receive and investigate air quality complaints.
- Maintain and update department computer records concerning citizen complaints, release reporting and emergency response.
- Provide technical assistance and training to the regulated community and the general public.
- Inspect asbestos removals and school's asbestos-management practices.

## **Air Quality Regional Offices**

### **Ashland Regional Office**

**Kathleen Buban, Supervisor** e-mail: [kathleen.buban@mail.state.ky.us](mailto:kathleen.buban@mail.state.ky.us)

1550 Wolohan Drive, Suite 1, Ashland KY 41102-8942

Telephone: (606) 929-5285 Fax: (606) 928-1267

**Bath, Boyd, Bracken, Carter, Elliott, Fleming, Greenup, Lawrence, Lewis, Mason, Menifee, Montgomery, Morgan, Robertson and Rowan**

### **Bowling Green Regional Office**

**Bill Blacketer, Supervisor** e-mail: [bill.blacketer@mail.state.ky.us](mailto:bill.blacketer@mail.state.ky.us)

1508 Westen Avenue, Bowling Green KY 42104-3356

Telephone: (270) 746-7475 Fax: (270) 746-7865

**Adair, Allen, Barren, Butler, Cumberland, Edmonson, Green, Hart, Larue, Logan, Marion, Metcalfe, Monroe, Simpson, Taylor, Todd and Warren**



**Florence Regional Office**

**Clay Redmond, Supervisor** e-mail: [clay.redmond@mail.state.ky.us](mailto:clay.redmond@mail.state.ky.us)

8020 Veterans Memorial Drive, Suite 110, Florence KY 41042-7570

Telephone: (859) 292-6411 Fax: (859) 292-6657

**Boone, Campbell, Carroll, Gallatin, Grant, Harrison, Henry, Kenton, Nicholas, Owen, Pendleton and Trimble**

**Frankfort Regional Office**

**Mark Ritter, Supervisor** e-mail: [mark.ritter@mail.state.ky.us](mailto:mark.ritter@mail.state.ky.us)

643 Teton Trail, Suite B, Frankfort KY 40601-1758

Telephone: (502) 564-3358 Fax: (502) 564-5043

**Anderson, Bourbon, Bullitt, Clark, Estill, Fayette, Franklin, Garrard, Hardin, Jessamine, Madison, Mercer, Nelson, Oldham, Powell, Scott, Shelby, Spencer, Washington and Woodford**

**Hazard Regional Office**

**Jack Hurt, Supervisor** e-mail: [jack.hurt@mail.state.ky.us](mailto:jack.hurt@mail.state.ky.us)

233 Birch Street, Suite 2, Hazard KY 41701-2179

Telephone: (606) 435-6022 Fax: (606) 435-6025

**Breathitt, Floyd, Harlan, Johnson, Knott, Lee, Leslie, Letcher, Magoffin, Martin, Owsley, Perry, Pike and Wolfe**

**London Regional Office**

**Mike Hannon, Supervisor** e-mail: [mike.hannon@mail.state.ky.us](mailto:mike.hannon@mail.state.ky.us)

875 S. Main Street, London KY 40741-9008

Telephone: (606) 878-0157 Fax: (606) 877-9091

**Bell, Boyle, Casey, Clay, Clinton, Jackson, Knox, Laurel, Lincoln, McCreary, Pulaski, Rockcastle, Russell, Wayne and Whitley**

**Owensboro Regional Office**

**Pat Barker, Supervisor** e-mail: [pat.barker@mail.state.ky.us](mailto:pat.barker@mail.state.ky.us)

3032 Alvey Park Drive, W., Suite 700, Owensboro KY 42303-2191

Telephone: (270) 687-7304 Fax: (270) 687-7204

**Breckenridge, Daviess, Grayson, Hancock, Henderson, Hopkins, Meade, McLean, Muhlenberg, Ohio, Union and Webster**

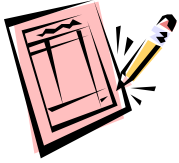
**Paducah Regional Office**

**Bill Clark, Supervisor** e-mail: [billj.clark@mail.state.ky.us](mailto:billj.clark@mail.state.ky.us)

4500 Clarks River Road, Paducah KY 42003-0823

Telephone: (270) 898-8468 Fax: (270) 898-8640

**Ballard, Caldwell, Calloway, Carlisle, Christian, Crittenden, Fulton, Graves, Hickman, Livingston, Lyon, McCracken, Marshall and Trigg**



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# Permit Review Branch

**Don Newell, Manager**

**E-Mail: [donald.newell@mail.state.ky.us](mailto:donald.newell@mail.state.ky.us)**

## **Section Supervisors**

Chemical Section, John Jump

Combustion Section, Ben Markin

Minerals Section, John Castanis

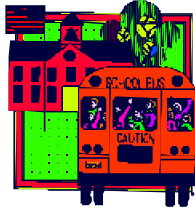
Surface Coating Section, Rick Shewekah

Metallurgy Section, April Webb

Permit Support Section, Allan Elliott

## ***Branch Responsibilities***

- Review registration forms to determine whether proposed new sources or existing source modifications require permits or permit revisions.
- Provide guidance during reapplication meetings with new sources.
- Review permit applications to determine whether air contaminant sources proposing to construct or operate in Kentucky are able to do so in compliance with state and federal air quality laws.
- Respond to public inquiries concerning permits and other environmental issues.
- Recommend issuance or denial of permits.
- Serve as technical consultant to other branches of the Division for Air Quality relative to regulation development, compliance demonstration tests, and enforcement actions.
- Monitor facility operations during demonstrations of compliance conducted by air contaminant sources.
- Make necessary modifications to permits in response to changes in environmental laws.
- Make confidentiality determinations.
- Operate and maintain the division file room, map room and library.
- Review and comment on environmental impact statements, A-95 applications, U.S. Army Corps of Engineers and Coast Guard public notices, pollution control tax exemption certification applications and wastewater facility plans.



# Special Programs Branch

**Parker H. Moore, Manager**

**E-mail: [parker.moore@mail.state.ky.us](mailto:parker.moore@mail.state.ky.us)**

## ***Branch Responsibilities:***

- Administer regulations pertaining to asbestos management, vehicle emission testing in Northern Kentucky, and risk management for facilities with hazardous chemicals.
- Certify asbestos abatement professionals.
- Review asbestos management plans for all school buildings in Kentucky.
- Review facilities' risk management plans for hazardous chemicals.
- Oversee vehicle emissions testing contractor performance; coordinate with repair industry.
- Provide information to the public regarding asbestos management, Northern Kentucky's vehicle emissions testing program, and hazardous chemicals risk management programs.
- Participate in enforcement proceedings to resolve violations involving asbestos, vehicle emissions testing, and chemical risk management.



## Vehicle Testing Program

### Hours of Operation

<b>Monday, Wednesday</b>	<b>8 AM-7 PM</b>
<b>Tuesday, Thursday, Friday</b>	<b>8 AM-5 PM</b>
<b>Saturday</b>	<b>8 AM-1 PM</b>
<b>Sunday and Holidays</b>	<b>Closed</b>



Barry Adkins  
 2029 Rolling Hills Dr.  
 Covington, KY 41017  
 Phone: (606) 426-3364  
 Fax: (606) 426-3360

Mia Schmitt  
 1426 Gloria Terrell Dr.  
 Wilder, KY 41071  
 Phone: (606) 442-3370  
 Fax: (606) 442-8333

Chris Juilfs  
 5760 Constitution Drive  
 Florence, KY 41042  
 Phone: (606) 746-6771  
 Fax: (606) 746-6771



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# Technical Services Branch

Larry Garrison, Manager

E-Mail: [larry.garrison@mail.state.ky.us](mailto:larry.garrison@mail.state.ky.us)

## **Section Supervisors**

Technical Support Section, Roger Cook

Quality Assurance Section, William Sudduth

Source Sampling Section, Gerald Slucher

Emissions Inventory Section, Andrea Wilson

## ***Branch Responsibilities***

- Plan and support the operation of the air monitoring network.
- Maintain statewide computerized air monitoring data acquisition network; maintain state and federal ambient air quality data bases.
- Observe and evaluate tests performed on air pollution sources to determine compliance with air emission standards.
- Conduct quality assurance programs for ambient and in-stack continuous emission monitoring (CEM) systems.
- Maintain state and federal computerized data base systems of air pollution sources and emissions inventory.
- Prepare and issue air quality reports.
- Prepare and issue emissions inventory reports.
- Prepare and issue the daily air quality index.

# Program Planning & Administration Branch

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**Lona Brewer, Manager**

**E-Mail: [lona.brewer@mail.state.ky.us](mailto:lona.brewer@mail.state.ky.us)**

## **Section Supervisors**

Evaluation Section, John Gowins

Regulation Development Section, Vacant

Administration Section, Nina Hockensmith

## ***Branch Responsibilities***

- Prepare the state implementation plan (SIP) to achieve and maintain national and state air quality standards.
- Draft and process air pollution control regulations.
- Monitor progress toward achieving the division's objectives.
- Measure trends in the reduction of emissions and improvement in air quality.
- Prepare and monitor the division's air quality management plan.
- Examine and evaluate division programs and recommend necessary improvements.
- Prepare and monitor federal grants and division budgets.
- Perform administrative functions for the division such as inventory, personnel actions, purchases and training records.
- Act as Liaison between this agency and the Air Pollution Control District of Jefferson County.
- Represent division on voluntary ozone reduction programs.
- Act as a clearinghouse for information about indoor air quality issues and federal refrigerant programs.
- Coordinate with the Business and Environmental Assistance Program at the University of Kentucky.