STATE OF OHIO
AIR QUALITY
CALENDAR YEAR 2009

PREPARED BY

AIR QUALITY AND ANALYSIS UNIT
DIVISION OF AIR POLLUTION CONTROL
OHIO ENVIRONMENTAL PROTECTION AGENCY

Our Mailing address is:

Ohio EPA, Division of Air Pollution Control
PO Box 1049
Columbus, OH 43216-1049

And we are located at:

Ohio EPA, Division of Air Pollution Control
50 West Town Street, Suite 700
Columbus, OH 43215

Ohio EPA's web address is:

www.epa.ohio.gov

The Ohio EPA's general phone number is:

(614) 644-3020

The Division of Air Pollution Control phone number is:

(614) 644-2270

EXECUTIVE SUMMARY

A. General Review

2009 air quality data are summarized for the seven criteria pollutants: particulate matter less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), and lead (Pb). Data are also summarized for total suspended particulates (TSP).

A section discussing Toxics monitoring projects conducted in 2009 is included.

Trend studies are presented for three criteria pollutants: SO_2, CO, and O_3.

Precision and accuracy data gathered through the quality assurance programs are also included.

B. Discussion of Violations

Violations of multiple-year, annual and short term air quality standards by county and pollutant are shown in Figures 3 through 17 and in Table 3.

C. Conclusions

1. There are now 37 PM_{10} monitoring sites and 49 $PM_{2.5}$ monitoring sites with 96 monitors 57 of which are Federal Reference Monitors, 26 continuous, and 14 speciation. In 1987 there were 30 PM_{10} and no $PM_{2.5}$ monitoring sites. Nearly all monitoring for particulate matter is conducted using PM_{10} and $PM_{2.5}$ samplers. Monitoring for TSP has essentially been

discontinued. During 2009, 8 TSP sites reported data, down from 217 sites in 1987. Of those 8 sites all are monitoring for lead or other metals and also report TSP data.

2. Sulfur dioxide levels in urban areas have dropped an average of 39.4% in the last ten years. There were no violations of SO_2 air quality standards in 2009.

3. No overall trend is indicated for the past several years for carbon monoxide. Figure 22 shows individual urban area trends.

4. The relatively high lead concentrations sampled in Fulton County are the result of industrial source monitoring. Monitors are located near lead processing sources in those counties to determine compliance with the standard.

5. Ten counties are monitoring attainment of the 0.075 ppm eight hour ozone standard. There are twenty-three counties with monitored non-attainment based on data for 2007 through 2009. This report uses the ozone standard in effect during 2009.

6. No violations of air quality standards for nitrogen dioxide were recorded in 2009.

7. No air pollution alerts were declared in 2009.

D. The Ohio Network

In 2009 there were a total of 266 monitors at 132 sites reporting data. There were 13 carbon monoxide, 27 sulfur dioxide, 4 nitrogen dioxide, 49 ozone, 42 10 micron particulate (PM_{10}), 96 2.5 micron particulate monitors ($PM_{2.5}$) and 18 lead monitors.

The only states with comparable or more monitors are California with 818, Texas with 311 and Pennsylvania with 243.

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

TOXICS DATA TABLES

Urban Air Toxics

Heavy Metals Data

I. INTRODUCTION

A. General

A variety of substances are generated and released into the atmosphere by a multitude of manmade and natural sources. Those substances that may affect public health and welfare are regarded as "air pollutants". The U.S. EPA has established National Ambient Air Quality Standards (NAAQS) to safeguard the public health and welfare from selected air pollutants. The pollutants for which standards have been promulgated are: Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO), Ozone (O_3), Lead (Pb), Particulate Matter $\leq$ 10 microns (PM_{10}) and Particulate Matter $\leq$ 2.5 microns ($PM_{2.5}$). The standards are ambient concentrations that are expressed in micrograms per cubic meter ($\mu g/m^3$) or parts per million (ppm) per duration (1 hr., 3 hr., etc.) with a restriction (not to be exceeded or not to be exceeded more than once per year, etc.). Table 1 shows the NAAQS in effect at the end of 2009.

In some cases, standards are separated into two parts: primary and secondary. The primary standard sets the level of air pollution above which human health is endangered. The secondary standard sets the level above which the welfare of citizens is endangered due to air pollution damage to crops, animals, vegetation and materials.

This report contains a summary of measured high concentrations of the pollutants, selected statistics, including quality assurance of the data, and trend analyses for various areas in Ohio. A brief description of the pollutants, the sources from which the pollutants originate and the adverse health effects of the pollutants and the monitoring methods, precede the tabulated pollutant concentrations.

Ambient air is generally defined as air that is accessible to the general public. The air that is within (over) the fenced in or guarded areas of facility property is not ambient.

Data for this report were collected by Ohio EPA, local air pollution control agencies and private industry. An indication of the accuracy of data from each reporting organization is located in a separate section on Quality Assurance.

B. Development of the Ohio Air Monitoring System

Society's concern about air pollution brought about the first national law, the Clean Air Act of July 14, 1955. This Act and its subsequent amendments first encouraged, and then authorized, grants to help finance the establishment of state and local air pollution control programs.

In 1963, aided in part by this federal program, the Ohio Department of Health established the Ohio Air Sampling Network (OASN) with 21 monitoring sites. The OASN was designed to measure the levels of "Total Suspended Particulate" (TSP) throughout the state.

The Clean Air Act Amendments of 1970 mandated the promulgation of the NAAQS and delegated authority to develop plans for their attainment to the individual states. To oversee the provisions of this Act, the U.S. EPA was formed in February of 1972 by Presidential Order.

After proposing standards for the criteria air pollutants, the U.S. EPA worked with Ohio to set up the State Implementation Plan (SIP) which included a detailed air monitoring program for the original six criteria pollutants: TSP, sulfur dioxide, carbon monoxide, nitrogen dioxide, lead and ozone. The SIP is a state's master plan for achievement of the NAAQS. The SIP contains detailed provisions for reducing concentrations of each of the regulated pollutants, where necessary, to achieve and maintain the NAAQS.

In October 1972, Ohio EPA was established by State law (Ohio Revised Code Section 3745.01) and the air monitoring program was significantly enlarged. Many local air pollution control agencies and private industries participated in this program. See Figure 1 for the location of the five districts and the nine local air agencies currently supporting the air program.

In 1980, the U.S. EPA and Ohio EPA established and designated certain portions of Ohio's network to be a part of the National Air Monitoring Station (NAMS) network, created for the purpose of tracking national trends. In 1980, the US EPA also required that all sites produce data of adequate quality to meet monitoring objectives and adequate quantity to meet statistical and trend requirements. All NAMS sites were to meet these requirements beginning with 1981 data, and all other sites beginning with 1983 data.

On March 20, 1984, the U.S. EPA proposed a standard for inhalable particles of ten micrometers in diameter and smaller. To enable the states to begin collecting data without excessive delay the U.S. EPA provided the states with monitors in late 1984. Ohio's field offices began collecting PM_{10} data during 1985 and a network of sites was primarily located in urban areas. The PM_{10} standard was promulgated on July 1, 1987 and became effective on July 31, 1987.

The U.S. EPA promulgated new particulate monitoring regulations and National Ambient Air Quality Standards on July 18, 1997. The new particulate standard is for particulate matter less than or equal to 2.5 micrometers in diameter. The first monitors began to collect data in January 1999. Monitors to determine the chemical makeup of the particulate were added in the year 2000 and in 2001 hourly reading monitors were added.

The one hour ozone standard was supplemented on July 18, 1997 with an eight hour standard. The eight hour standard is a three year average of the fourth highest daily eight hour averages. The level of the standard was set at 0.08 ppm which was not to be exceeded.

In 2001 The United States Supreme Court found U.S. EPA’s previously proposed implementation plan for ozone unlawful and further held that, in the setting of a standard for ozone pursuant to Section 109 of the Clean Air Act U.S. EPA must set air quality standards at the level that is “requisite”-no higher or lower than is necessary-to protect the public health with an adequate margin of safety. The Supreme Court then sent the case back to the D.C. Circuit Court of Appeals to review U.S. EPA’s subsequent actions. On March 26, 2002, that court upheld U.S. EPA’s revision of the ozone NAAQS, which had been published in the Federal Register by U.S. EPA as a proposal on November 14, 2001.

In March 2008 the 8-Hour ozone standard was changed to be less than or equal to 0.075 ppm as the three year average of each site’s annual fourth high 8-Hour average. The summary tables in this report use the new standard.

In 2009 the standard for lead (Pb) was changed to 0.15 $\mu g/m^3$ as a three month average. This standard replaces the 1.5 $\mu g/m^3$ calendar quarter average. New monitors near presumed sources are to be operational on the first sampling day of January 2010.

During 2009, more than 260 ambient air monitors were operated in Ohio. Table 2 enumerates the number and type of criteria pollutant monitors that were operated in the various District Office and Local Air Agency jurisdictions.

The goals of the ambient monitoring program are to determine compliance with the ambient air quality standards, to provide real-time monitoring of air pollution episodes, to provide data for trend analyses, regulation evaluation and planning, and to provide information to the public on a daily basis concerning the quality of the air in high population areas, near major emission sources and in rural areas.

C. Remote Ambient Data Systems

The Remote Ambient-Air Data System (RADS) is a system for the automatic acquisition and transmission of data from a remote monitor to a central computer. Each continuous monitoring site operated by Ohio EPA's district offices is furnished with a data logger that is polled automatically once a day by the central computer in Columbus.

A major benefit of RADS is that the data can now be handled more quickly with fewer chances of error. Formerly the data was manually read from recorder strip charts, handwritten on a computer input form, keyed into the computer and then made available for retrieval. This process took three to four weeks.

The data in the RADS computer is available for review by the district and central office staff on a daily basis. The individual sites can also be contacted through the data logger for instantaneous data and interrogated further by remote testing of zero-span for any parameter. This is particularly valuable when pollutant levels are, or may become, elevated, as during an air stagnation episode.

RADS was installed during the fall of 1985 and went into operation on January 1, 1986. Local air agencies have automated their continuous monitors and Ohio EPA has expanded RADS to include the automation of the local air agencies' networks. Industrial networks will also be added.

RADS has been upgraded for remote access to the data by digital cellular wireless technology to telemeter data to the central computer.

D. Data Availability on the Internet

For the past several years Ohio EPA has provided ozone and $PM_{2.5}$ data updates several times a day to the U.S. EPA for a public outreach web site where current data and data forecasts are displayed in the form of tables and maps. This web site can be viewed at: www.epa.gov/airnow/where/. From this site different states can be chosen to view forecasts of ozone and $PM_{2.5}$ levels and to link to animated ozone concentration maps.

As part of the AIRNow effort there is also a page that displays a map of North America that has sites that can be clicked upon for current environmental data. This page is updated frequently and is called Enviroflash at: www.enviroflash.info.

Historical ambient air quality data can also be found at: www.epa.gov/air/data/. This site is a gateway to maps, reports and user selected data that reside in the U.S. EPA's Air Quality System (AQS) database.

A third data source is at: www.epa.gov/airexplorer. This site has interactive maps, graphs and data tables. The data include all of the criteria pollutants as well as $PM_{2.5}$ speciation parameters and Air Quality Index (AQI) values.

For those with specific health concerns (asthma, heart disease) or who want general information for older adults, children or who are active outdoors and who want to compare the air quality of different counties or states, the U.S. EPA has a web site that allows comparisons at: www.epa.gov/aircompare/ .

E. Designation of Air Quality Control Regions

The fact that air pollution does not respect state boundaries was recognized in early control efforts. To effectively deal with pollution and attain the NAAQS, U.S. EPA, with advice from local governments and the public, divided the nation into areas called Air Quality Control Regions (AQCR's). Boundaries for each region were set by consideration of air pollution levels, population density, geography, and common meteorological conditions. While AQCR's may consist of parts of more than one state, each state has the authority to implement air quality standards only in its portion of the region. Portions of Ohio are included in a total of fourteen different AQCR's, each labeled numerically and by geographical description. Figure 2 illustrates the boundaries of Ohio's AQCR's.

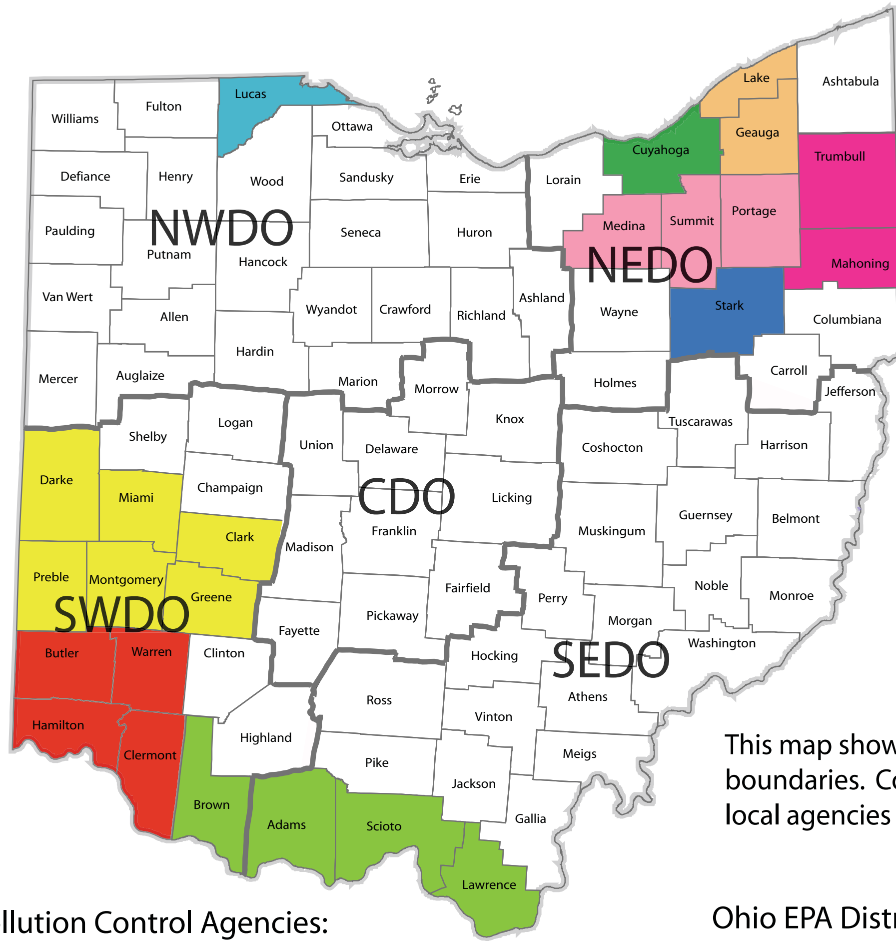
TABLE 1
U.S. EPA & OHIO EPA AMBIENT AIR QUALITY STANDARDS
NATIONAL AMBIENT AIR QUALITY STANDARDS

			MAXIMUM ALLOWABLE CONCENTRATION	
POLLUTANT	DURATION	RESTRICTION	PRIMARY	SECONDARY
$PM_{2.5}$	Annual arithmetic mean	Not to be exceeded Three year average	15.0 μg/m^3	15.0 μg/m^3
	24-Hour concentration	Not to be exceeded Three year average of 98^{th} percentile	35 μg/m^3	35 μg/m^3
PM_{10}	24-Hr concentration	Not to be exceeded more than once per year averaged over three years	150 μg/m^3	150 μg/m^3
SULFUR DIOXIDE	Annual Mean	Not to be exceeded	0.03 ppm (80 μg/m^3)	
	24-Hr mean concentration	Not to be exceeded more than once per year	0.14 ppm (365 μg/m^3)	
	3-Hr mean concentration	Not to be exceeded more than once per year		0.5 ppm (1300 μg/m^3)
CARBON MONOXIDE	8-Hr mean concentration	Not to be exceeded more than once per year	9 ppm (10 mg/m^3)	
	1-Hr concentration	Not to be exceeded more than once per year	35 ppm (40 mg/m^3)	
OZONE	8-Hr concentration	Each year's fourth high averaged over three years. Not to be exceeded	0.075 ppm	0.075 ppm
	1-Hr concentration*	Not to be exceeded more than three times in three years	0.12 ppm (244 μg/m^3)	0.12 ppm (244 μg/m^3)
NITROGEN DIOXIDE	1-Hour Average	Each year's 98^{th} percentile value averaged over 3 years. Not to be exceeded	100 ppb	
	Annual mean	Not to be exceeded	53 ppb	0.053 ppm
LEAD	3-Month mean concentration	Each year's three month average over a three year period. Not to be exceeded.	0.15 μg/m^3	0.15 μg/m^3

Notes:
Primary standards are established for the protection of public health
Secondary standards are established for the protection of public welfare
*revoked for Ohio

μg/m^3 = micrograms per cubic meter
ppm = parts per million
ppb = parts per billion
mg/m^3 = milligrams per cubic meter

Figure 1



This map shows jurisdictional boundaries. Colored areas represent local agencies within Ohio EPA districts

Local Air Pollution Control Agencies:

1 — **Frank Markunas, Interim Administrator**
Akron Regional Air Quality Management District
146 South High St., Room 904
Akron, Ohio 44308
(330) 375-2480 FAX: (330) 375-2402
E-Mail: Markufr@ci.akron.oh.us

2 — **Dan Aleman, Administrator**
Air Pollution Control Division
Canton City Health Department
420 Market Ave. North
Canton, Ohio 44702-1544
(330) 489-3385 FAX: (330) 489-3335
E-Mail: daleman@cantonhealth.org

3 — **Cory R. Chadwick, Director**
Dept. of Environmental Services
Air Quality Programs
250 William Howard Taft Road
Cincinnati, Ohio 45219-2660
(513) 946-7777 FAX: (513) 946-7778
E-Mail: cory.chadwick@hamilton-co.org

4 — **Michael Kryzwicki, Acting Commissioner**
Dept. of Public Health & Welfare
Division of the Environment
75 Erieview Plaza, 2nd Floor
Cleveland, Ohio 44114
(216) 664-2297 FAX: (216) 420-8047
E-Mail: Mkrzywic@city.cleveland.oh.us

5 — **John Paul, Director**
Regional Air Pollution Control Agency
Montgomery County Health Department
117 South Main St.
PO Box 972
Dayton, Ohio 45422-1280
(937) 225-4435 FAX: (937) 225-3486
E-Mail: paulja@rapca.org

6 — **Bert Mechenbier, Supervisor**
Lake County General Health District
Air Pollution Control
33 Mill St.
Painesville, Ohio 44077
(440) 350-2543 FAX: (440) 350-2548
E-Mail: bmechenbier@lcghd.org

7 — **Cindy Charles, Director**
Air Pollution Unit
Portmouth City Health Department
605 Washington Street, Third Floor
Portsmouth, Ohio 45662
(740) 353-5156 FAX: (740) 353-3638
E-Mail: cindy.charles@epa.state.oh.us

8 — **Karen Granata, Administrator**
City of Toledo
Division of Environmental Services
348 South Erie St.
Toledo, Ohio 43604
(419) 936-3015 FAX: (419) 936-3959
E-Mail: karen.granata@toledo.oh.gov

9 — **Neil Altman, Acting Administrator**
Mahoning-Trumbull APC Agency
345 Oak Hill Ave., Suite 200
Youngstown, Ohio 44502
(330) 743-3333 FAX: (330) 744-1928
E-Mail: comish47@cboss.com

Ohio EPA District Offices:

CDO — **Adam Ward, APC Supervisor**
Central District Office
50 West Town St., Suite 700
Columbus, Ohio 43215
(614) 728-3778 FAX: (614) 728-3898
E-Mail: adam.ward@epa.ohio.gov

SEDO — **Bruce Weinberg, APC Supervisor**
Southeast District Office
2195 Front St.
Logan, Ohio 43138
(740) 385-8501 FAX: (740) 385-6490
E-Mail: bruce.weinberg@epa.ohio.gov

NEDO — **Ed Fasko, APC Supervisor**
Northeast District Office
2110 Aurora Rd.
Twinsburg, Ohio 44087
(330) 425-9171 FAX: (330) 487-0769
E-Mail: Ed.Fasko@epa.ohio.gov

NWDO — **Mark Budge, APC Supervisor**
Northwest District Office
347 North Dunbridge Rd.
Bowling Green, Ohio 43402
(419) 352-8461 FAX: (419) 352-8468
E-Mail: mark.budge@epa.ohio.gov

SWDO — **Tom Schneider, APC Supervisor**
Southwest District Office
401 East Fifth St.
Dayton, Ohio 45402-2911
(937) 285-6357 FAX: (937) 285-6249
E-Mail: tom.schneider@epa.ohio.gov

5/28/10

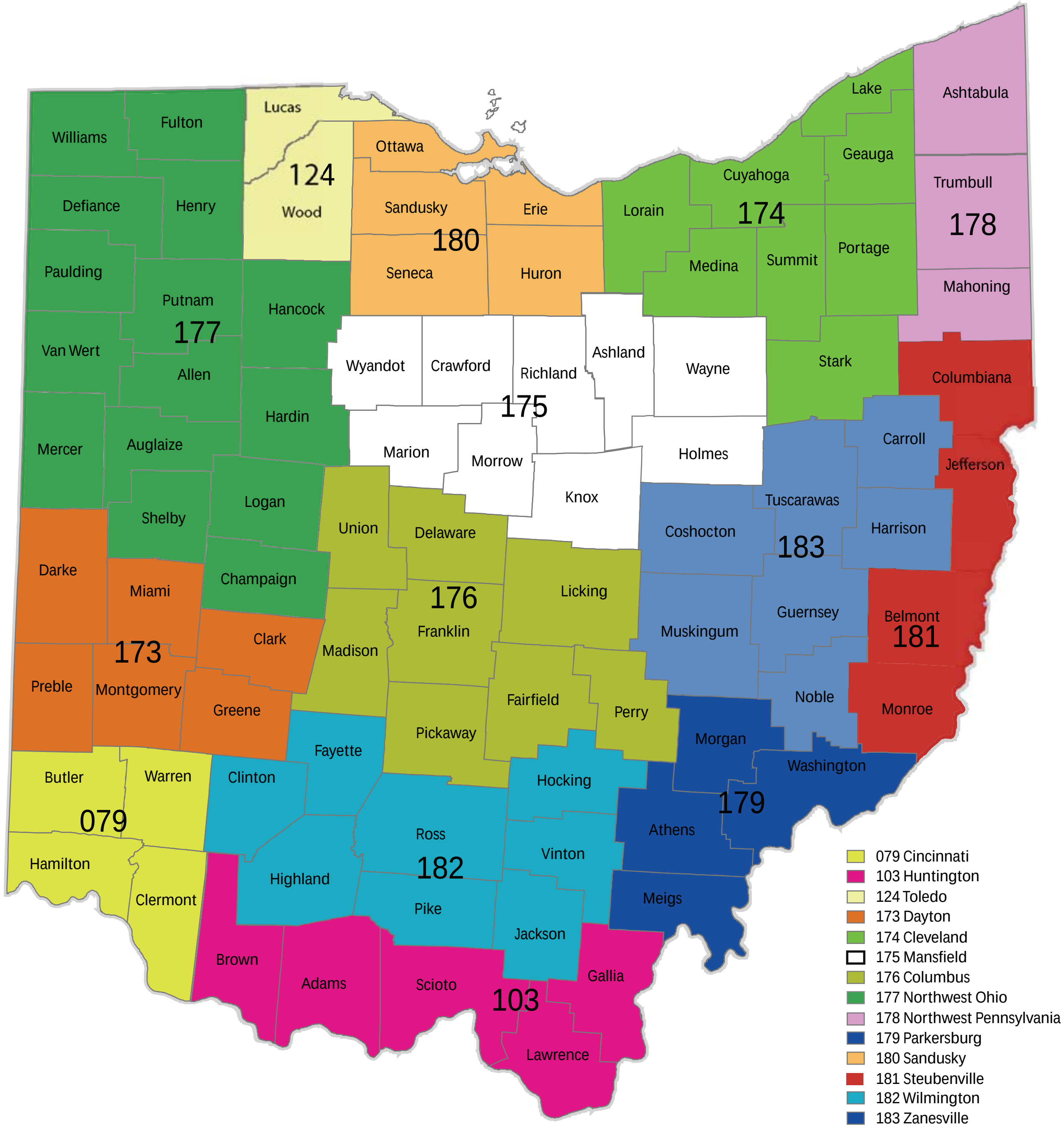


Figure 2

Air Quality Control Regions in Ohio

TABLE 2

AMBIENT AIR MONITORING SITES IN OHIO (2009)

Local Air Agency/ District Office	$PM_{2.5}$	PM_{10}	Sulfur Dioxide SO_2	Ozone O_3	Carbon Monoxide CO	Nitrogen Dioxide NO_2	Lead	Total
Akron	5	0	3	4	3	1	0	16
Canton	2	0	0	3	1	0	0	6
Cincinnati (HC-DOES)	10	5	1	7	1	1	1	26
Cleveland	7	6	4	4	3	1	5	30
Lake Co. Health District	1	1	2	3	1	0	0	8
Warren-Youngstown (M-TAPCA)	2	4	1	3	0	0	0	10
Toledo	3	1	0	3	0	0	0	7
Dayton (RAPCA)	4	2	1	6	2	0	0	15
Portsmouth	2	3/3	3/2	2	0	0	0	10/5
CDO	3	1	1	7	1	0	1	14
NEDO	1	3	2	2	0	0	3	11
NWDO	0	0/6	1	2	0	0	2	5/6
SEDO	3	2	6	2	1	1	2	17
SWDO	0	0	0	1	0	0	1/3	2/3
Totals	43	28/9	25/2	49	13	4	15/3	177/14

Sites required by Ohio EPA: Government Operated/Industry Operated

II. Summary of 2009 Air Quality Data

The following pages, in a series of maps and tables, summarize the data presented in Section V of the report.

Figures 3-13 indicate the highest annual and second highest concentrations for PM_{10}, $PM_{2.5}$, SO_2, CO, and NO_2, respectively, in each county where data were collected. Sites not meeting National Aerometric Data Bank (NADB)[1] requirements were marked with asterisks.

Figure 14 indicates the second highest 1-Hour concentration of ozone recorded in each county.

FIGURE 15 indicates the counties in which the highest reading ozone monitor recorded a three year average of fourth highest eight hour averages greater than the standard.

Figure 16 indicates the three year average of the 4^{th} high 8-Hour averages of ozone. The highest reading site was used.

Figure 17 indicates the highest three-month average concentration of lead in each county where data were collected.

Table 3 gives a breakdown of air quality standard violations by county.

A more detailed presentation of air quality data can be found in Section V of the report.

---

[1]The NADB averaging criteria for PM_{10} and $PM_{2.5}$ monitors requires that at least seventy-five percent of scheduled samples are collected each quarter. Many intermittent monitors in Ohio run on a six-day sampling schedule (one daily reading every six days) yielding up to sixty-one samples per year. To meet NADB averaging criteria for continuous (hourly) monitors, a monitor must have valid data for at least seventy-five percent of each calendar quarter, approximately 1655 hours. For a valid ozone monitoring day (1-Hr standard), the monitor must collect at least seventy-five percent of the hours between 9am and 9pm.

PM$_{10}$

Figure 3

2009 PM$_{10}$ Highest Annual Mean Concentration
(In counties where data were collected-values in ug/m^3)

PM_{10}

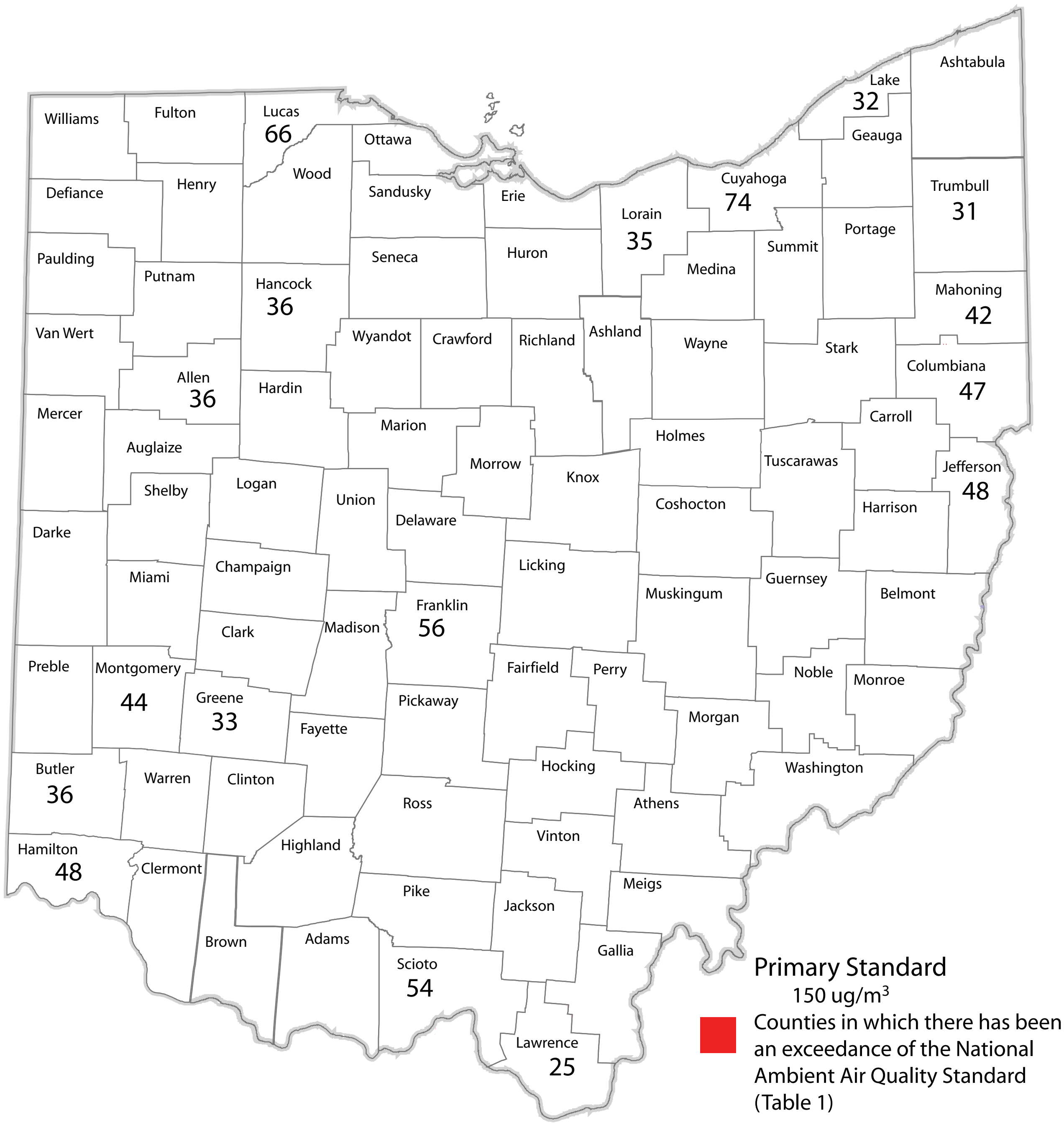


Figure 4

2009 PM_{10} 2nd High 24-Hour Concentration
(In counties where data were collected-values in ug/m^3)

$PM_{2.5}$

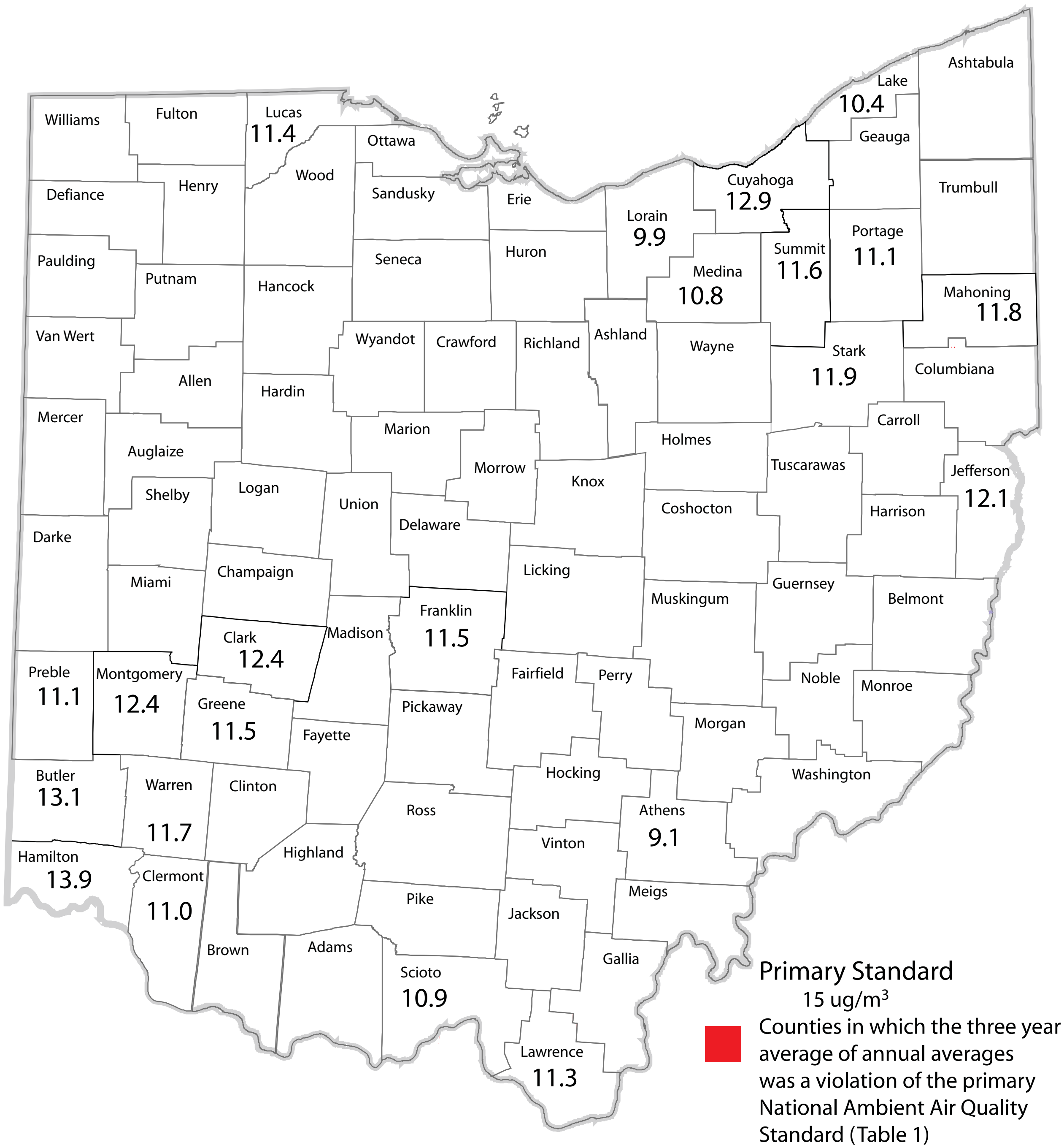


Figure 5

2009 $PM_{2.5}$ Highest Annual Concentration
(In counties where data were collected-values in ug/m^3)

PM$_{2.5}$

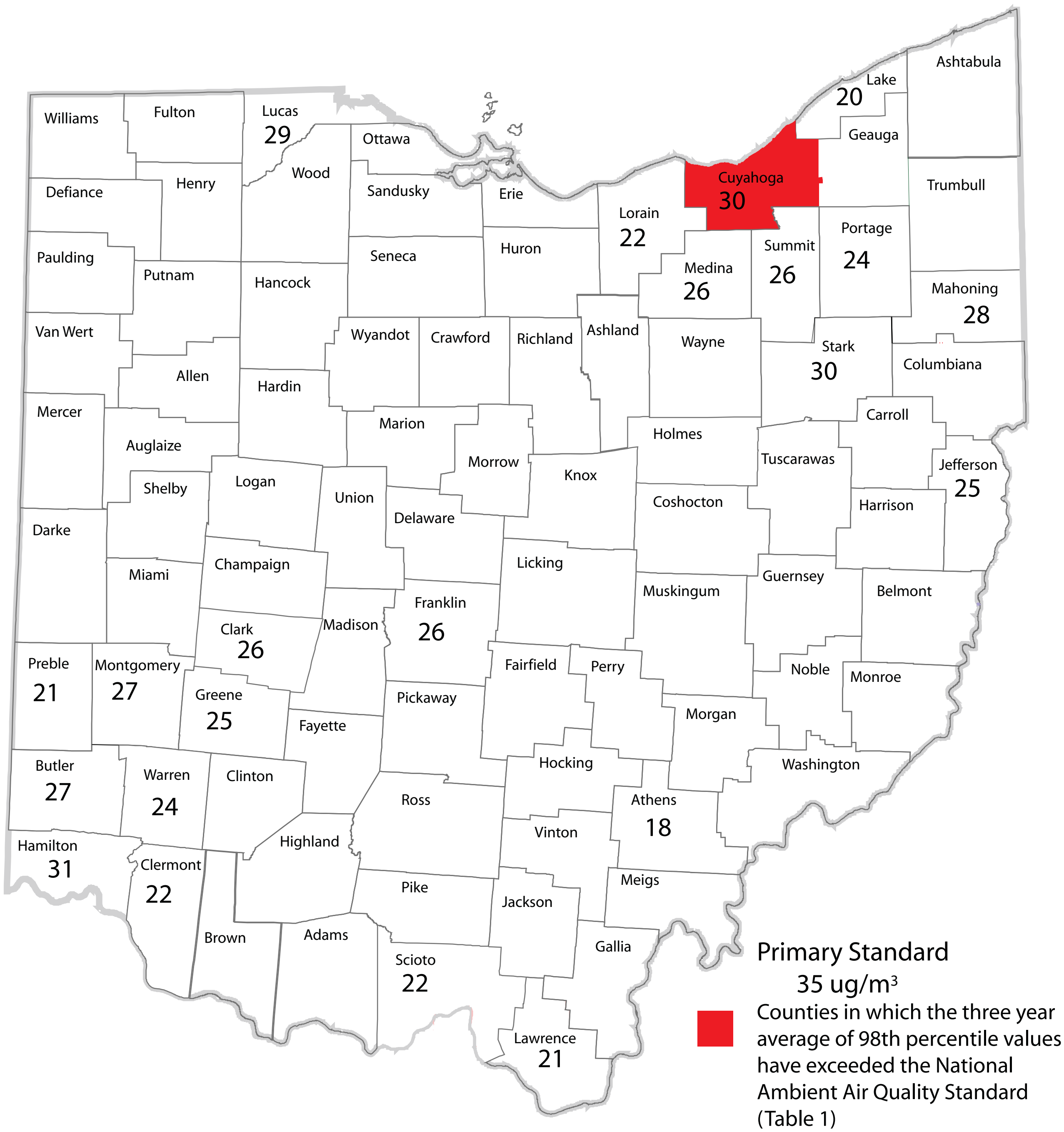


Figure 6

2009 PM$_{2.5}$ 98th Percentile 24-Hour Concentration
(In counties where data were collected-values in ug/m^3)

$PM_{2.5}$

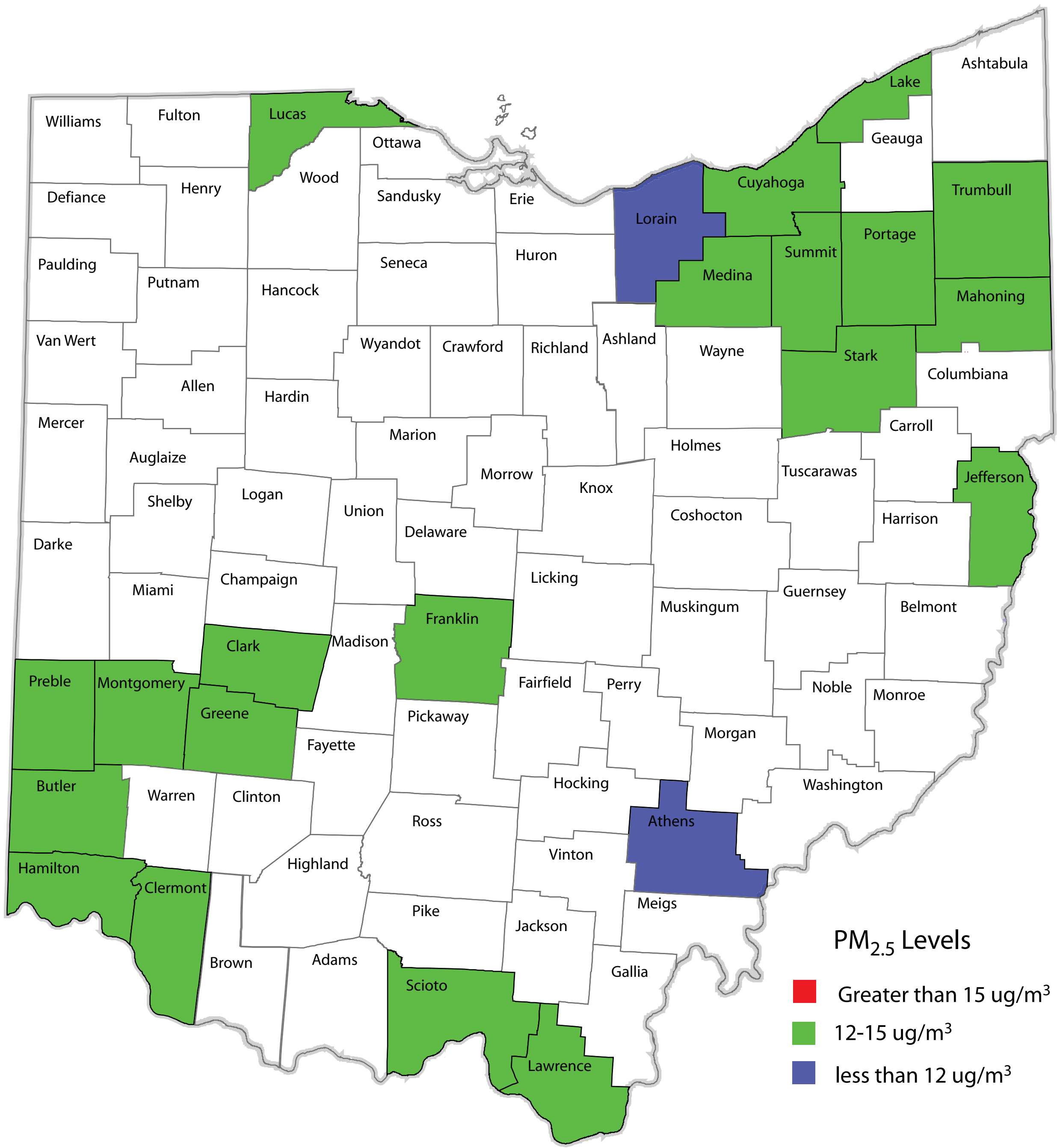


Figure 7

2007-2009 Average of Annual Averages
Highest Site in the County used

Sulfur Dioxide

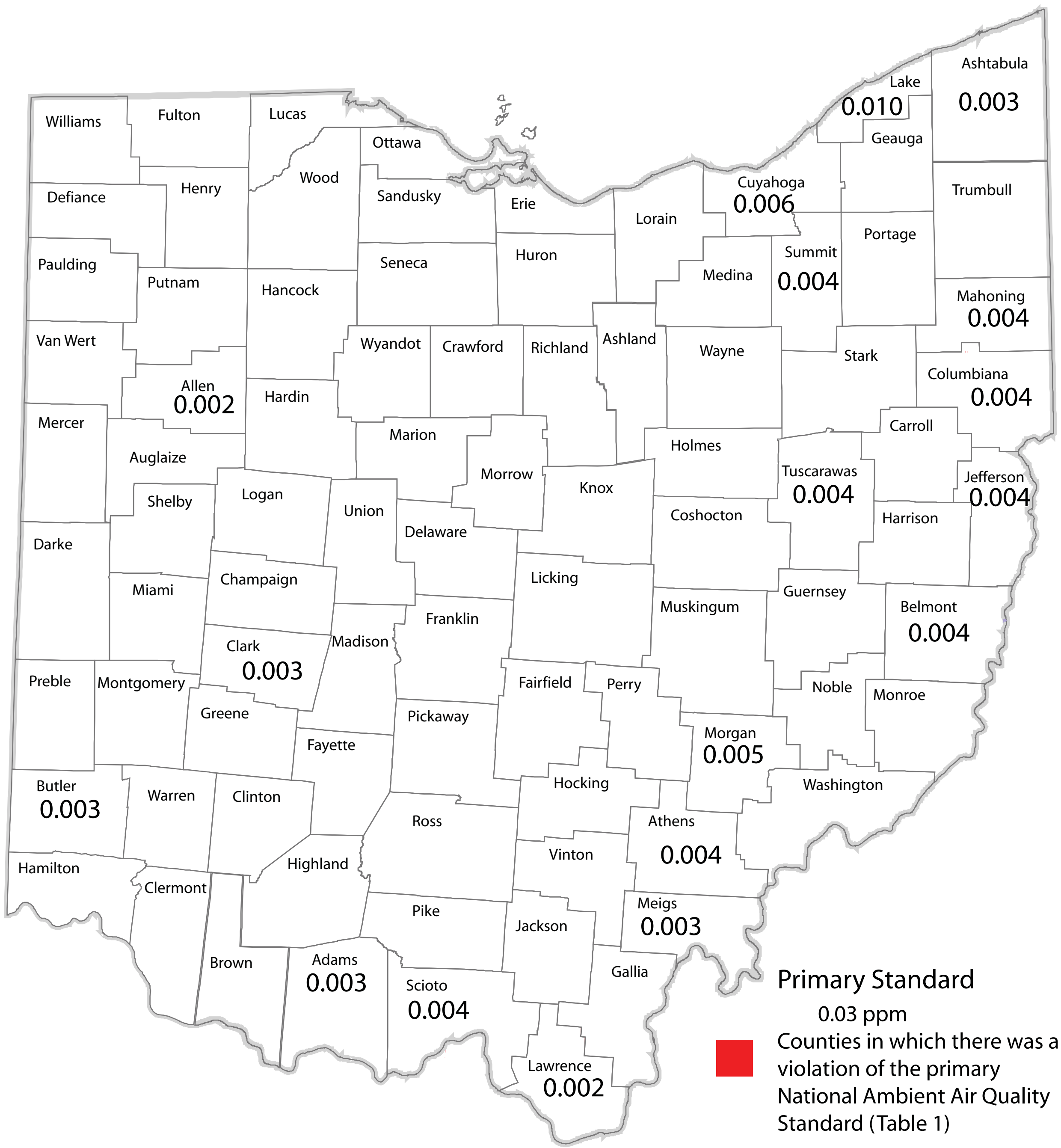


Figure 8

2009 SO_2 Highest Annual Arithmetic Mean Concentration
(In counties were data were collected-values in ppm)

Sulfur Dioxide

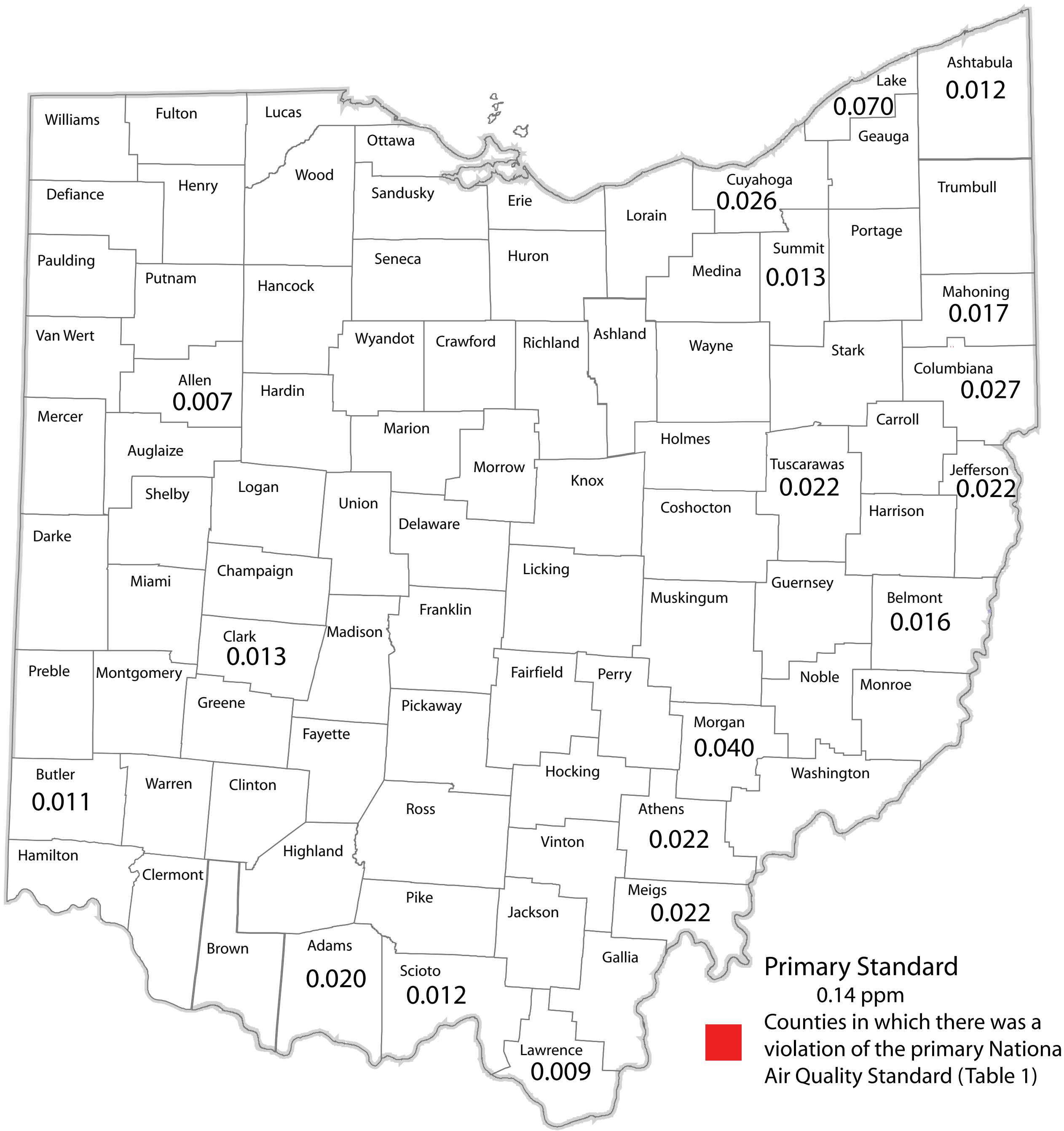


Figure 9

2009 SO_2 2nd Highest 24-Hour Concentration
(In counties where data were collected-values in ppm)

Sulfur Dioxide

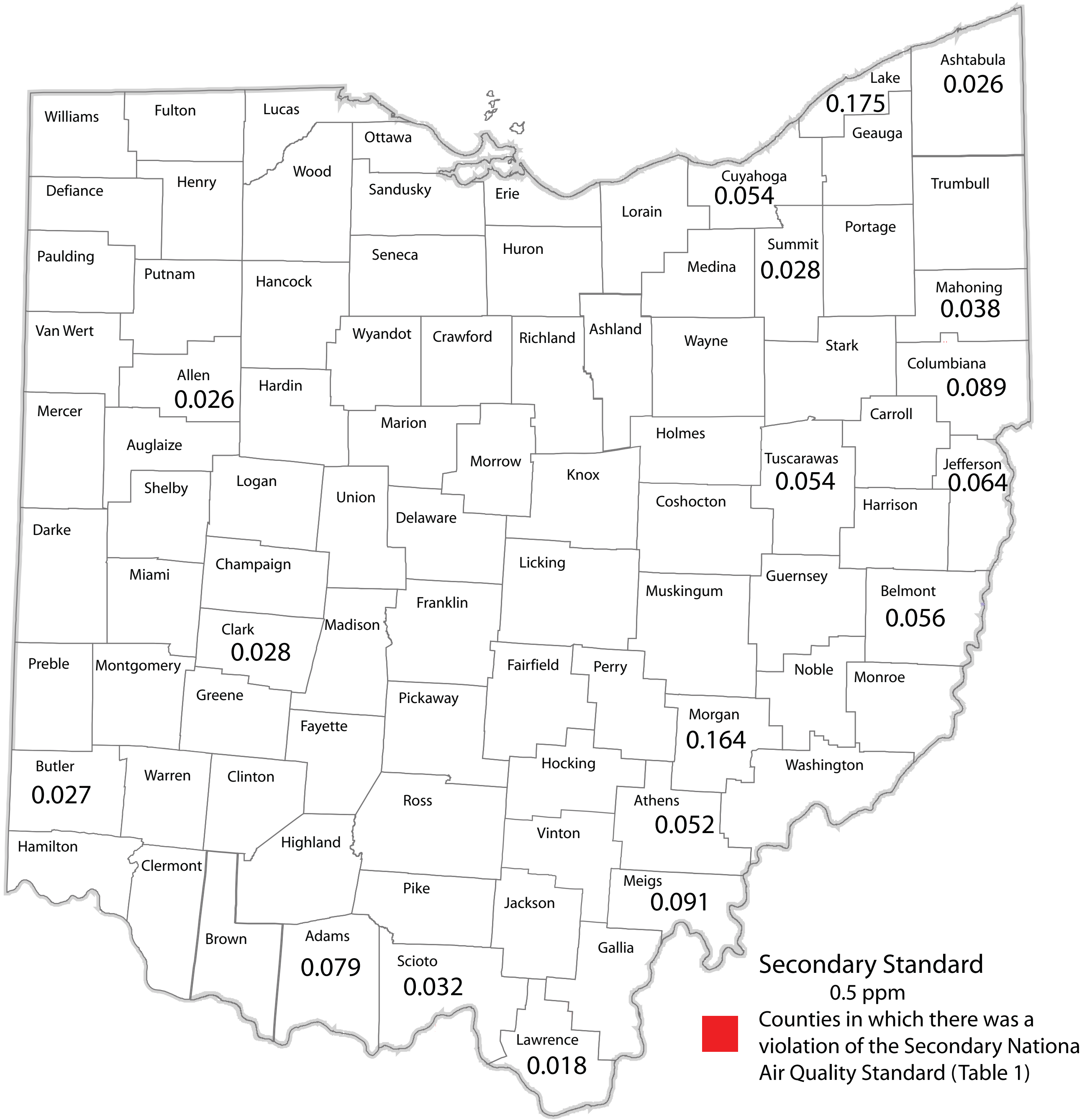


Figure 10

2009 SO_2 2nd Highest 3-Hour Concentration
(In counties where data were collected-values in ppm)

Carbon Monoxide

Figure 11

2009 Carbon Monoxide 2nd Highest 8-Hour Concentration
(In counties where data were collected-values in ppm)

Carbon Monoxide

Figure 12

2009 Carbon Monoxide 2nd Highest 1-Hour Concentraton
(In counties where data were collected-values in ppm)

Nitrogen Dioxide

Figure 13

2009 NO_2 Highest Annual Arithmetic Mean Concentration
(In counties where data were collected-values in ppm)

Ozone

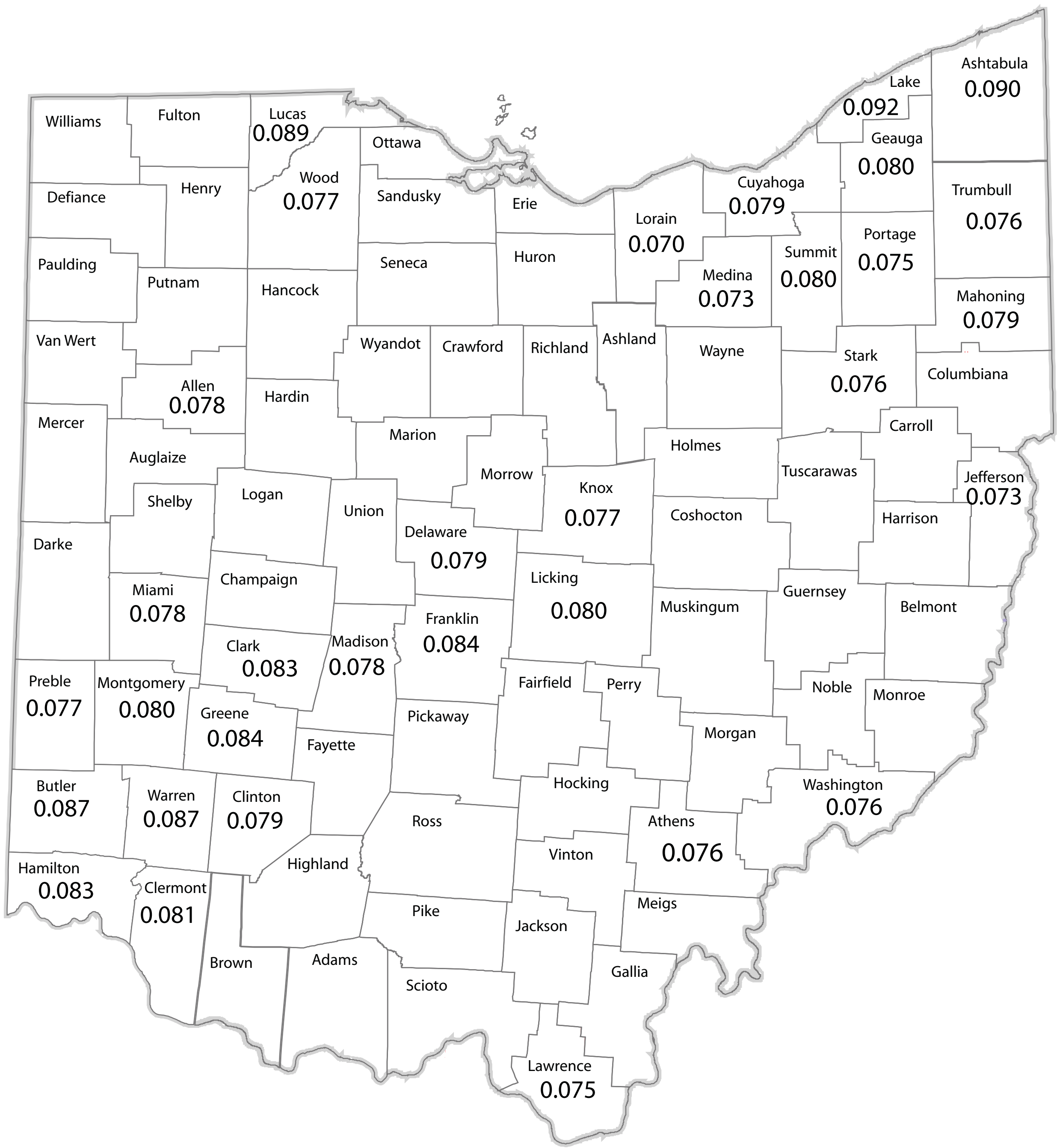


Figure 14

2009 Ozone 2nd Highest 1-Hour Concentration
(In counties where data were collected-values in ppm)

Ozone

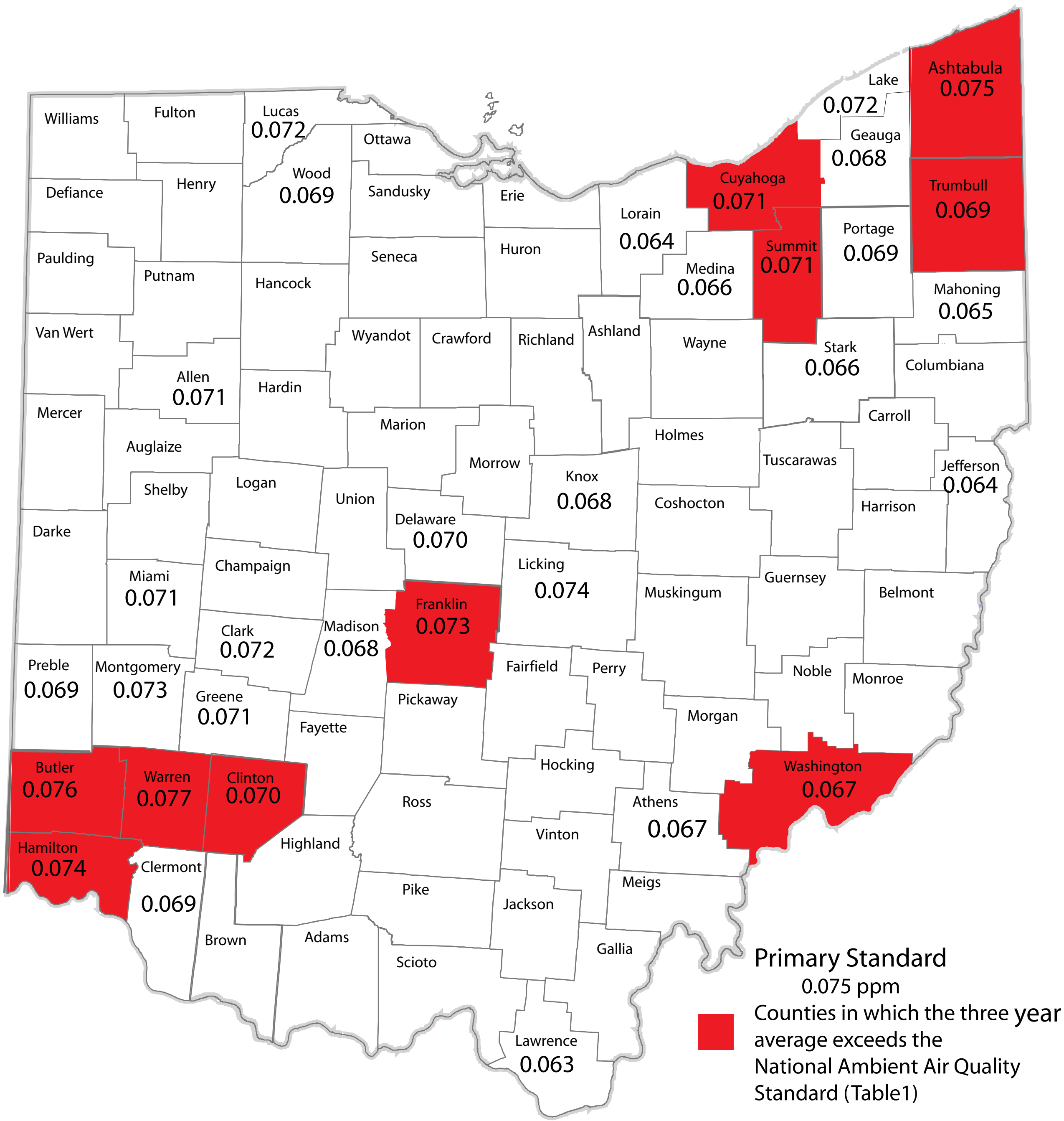


Figure 15

2009 Ozone 4th Highest 8-Hour Concentration
(In counties where data were collected-values in ppm)

Ozone

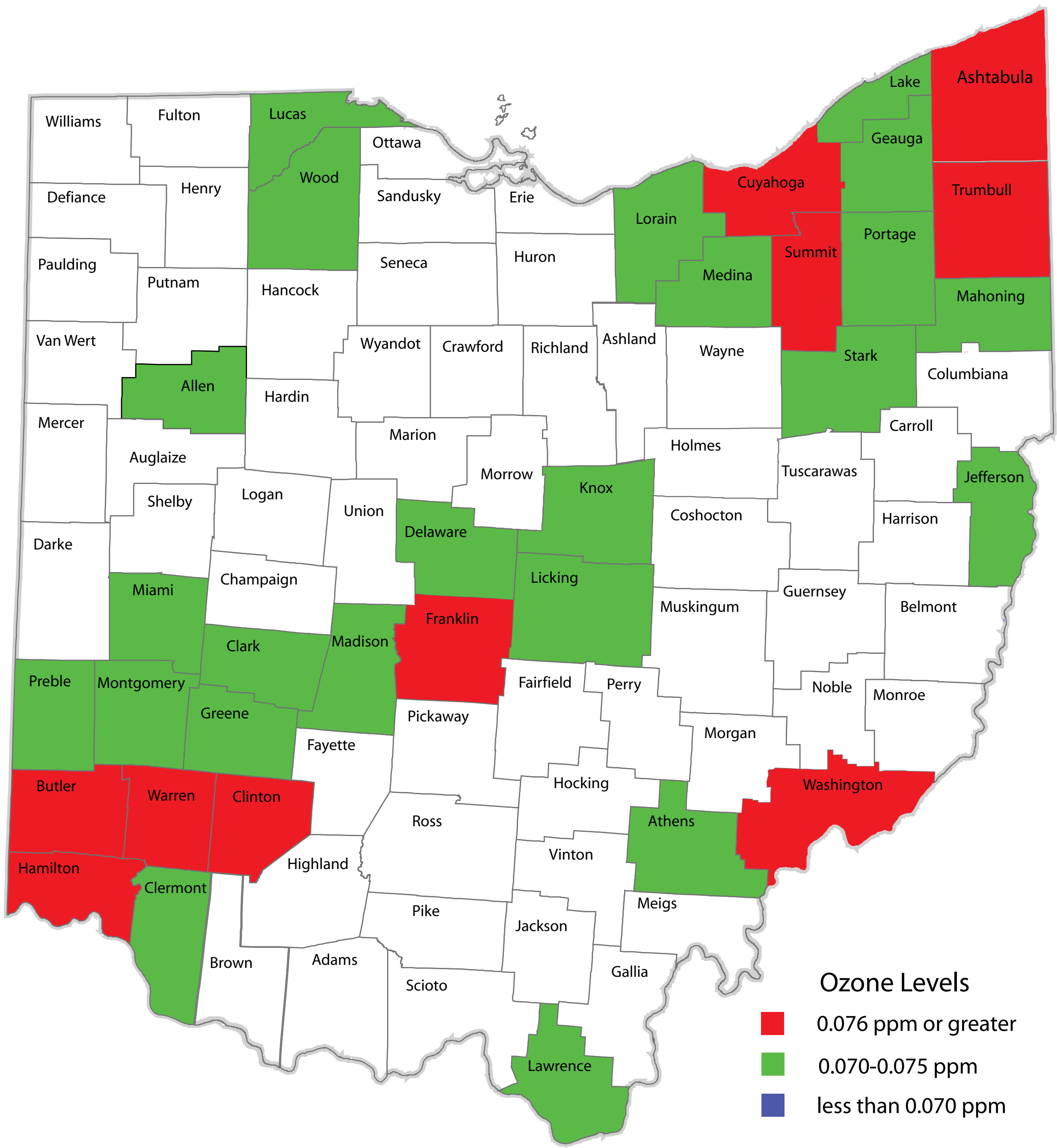


Figure 16

2007-2009 Average of the Fourth High 8-Hour Averages
using the highest reading site in each county

Lead

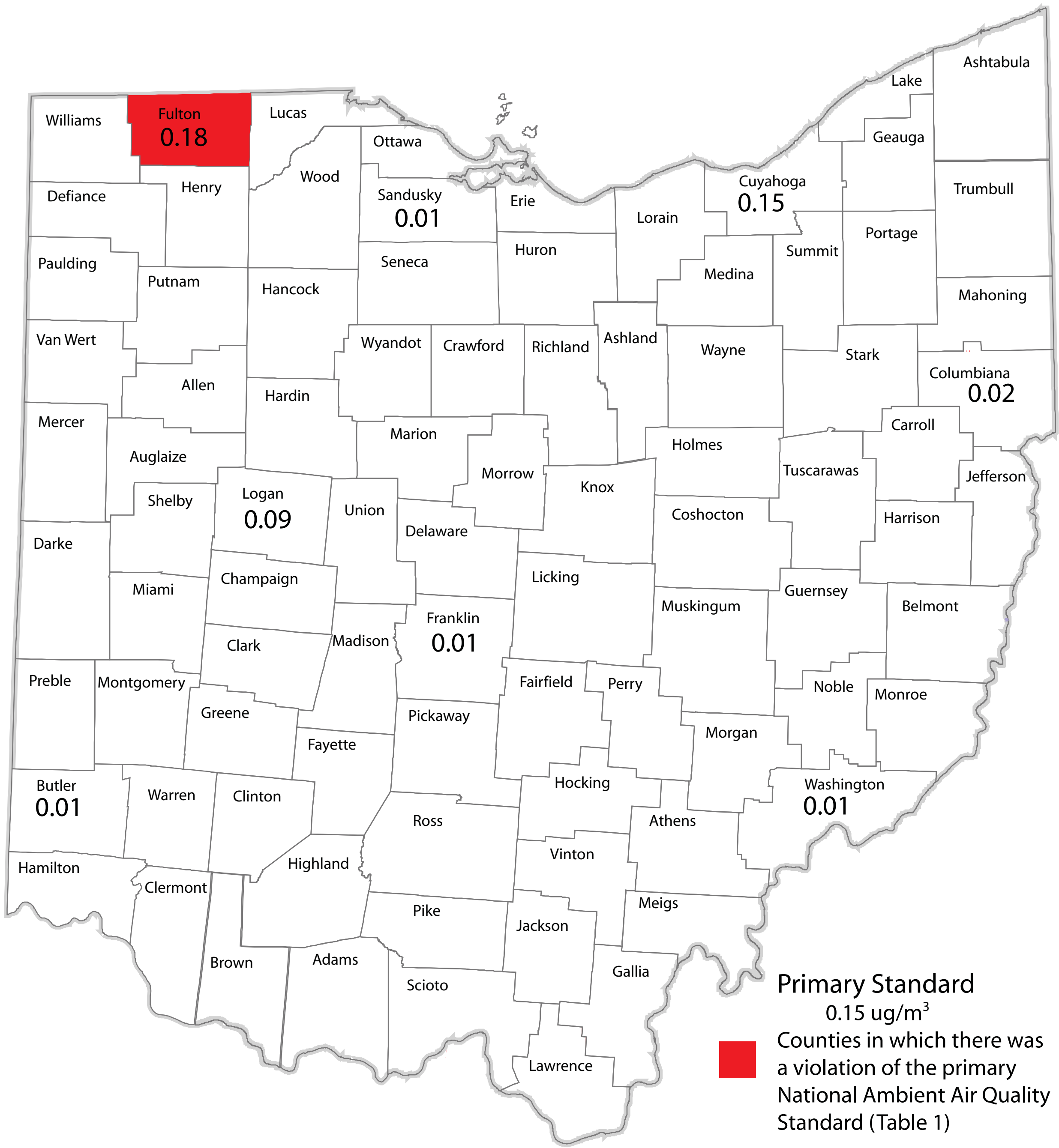


Figure 17

2009 Lead, Highest Quarterly Mean
(In counties where data were collected-values in ug/m3)

TABLE 3
VIOLATIONS OF AIR QUALITY STANDARDS BY COUNTY
2009

There were no violations of the PM_{10}, NO_2, SO_2 or CO standards

$PM_{2.5}$ Annual 2007-2009	$PM_{2.5}$ 24-Hour 2007-2009	Ozone 8-Hour 2007-2009	Lead 3-Month 2009
None	Cuyahoga	Ashtabula	Fulton
		Butler	
		Clinton	
		Cuyahoga	
		Franklin	
		Hamilton	
		Summit	
		Trumbull	
		Warren	
		Washington	

III. Air Quality Trends

Federal regulations promulgated in 1980 established a number of urban sites in Ohio as part of a national network for determining trends of the criteria pollutants. This network, called National Air Monitoring Stations (NAMS), required the exclusion (for purposes of trend studies only) of those urban sites not designated as NAMS. This requirement permits a more accurate comparison of trends in different areas of the nation. The NAMS group was easily integrated into Ohio's monitoring system starting with the 1980 data.

SO_2 TRENDS

Data for SO_2 continuous instruments in urban areas which met the NAMS siting requirements were used to generate an Ohio SO_2 trend study for years 2000 through 2009. The resulting data, based on annual average SO_2 concentrations, are plotted in Figure 18. Percent improvement is calculated using values derived from the method of "least squares".

Table 4

SO_2 TRENDS FOR 2000-2009

SITE CATEGORY	IMPROVEMENT
Urban Area NAMS	39.4%

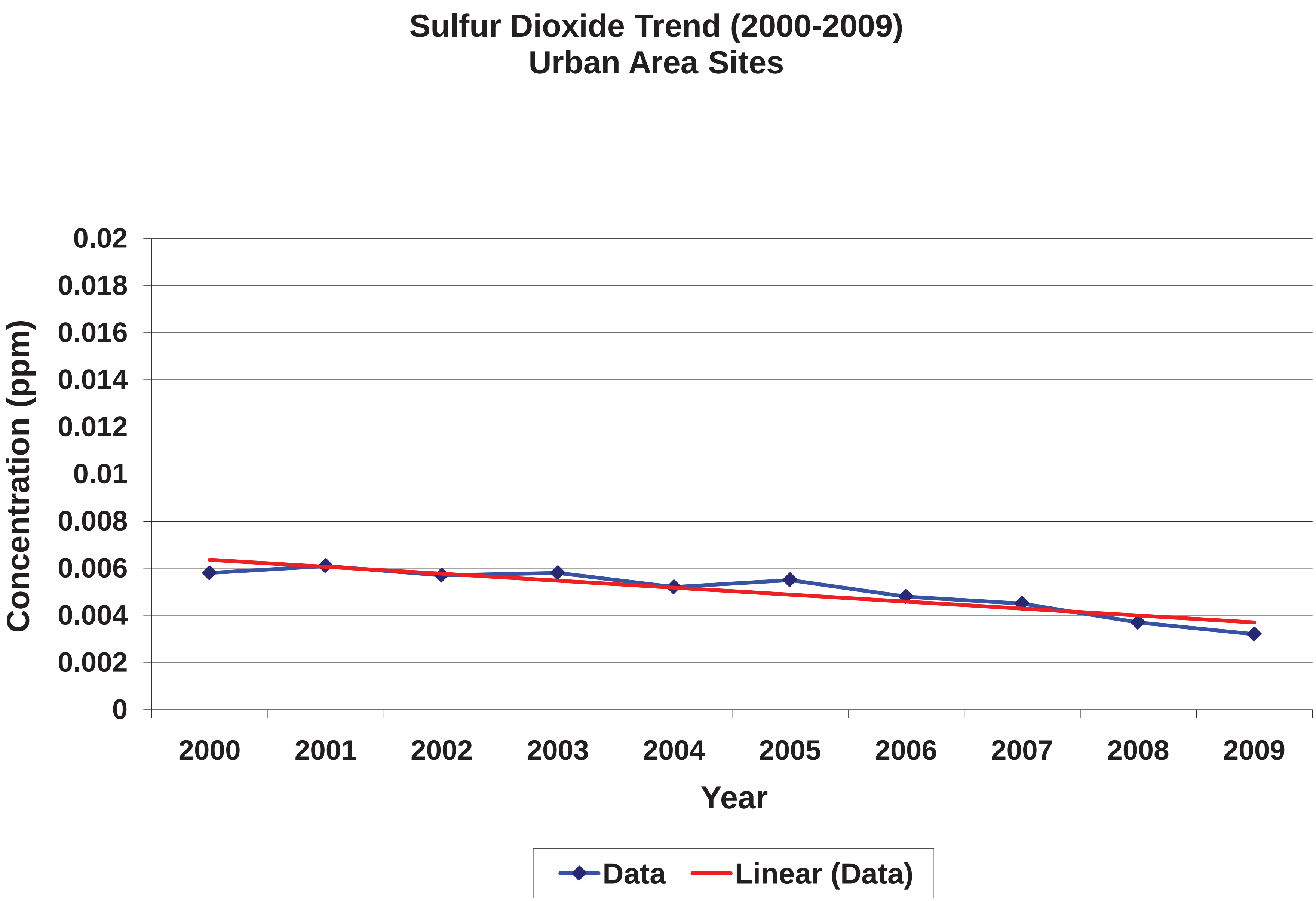

Sulfur Dioxide Trend (2000-2009)
Urban Area Sites
Concentration (ppm)
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Year
Data
Linear (Data)

Figure 18

Ozone Trends

Assessing progress towards the attainment of the ozone air quality standards is difficult because of the influence of meteorology on ozone levels. Differences in weather conditions can cause variations from year to year in both the NAAQS exceedances and the second highest 1-Hour ozone levels.

High temperatures, brilliant sunshine and stagnant air contribute to high levels of evaporation from fuel storage tanks, fuel systems and auto refueling activities emitted by millions of cars and trucks. Also daily emissions of nitrogen oxides and hydrocarbons by millions of cars and trucks are a major contributor to low level ozone pollution during these atmospheric conditions. In the presence of sunlight, hydrocarbons and nitrogen oxides create high levels of ground-level ozone.

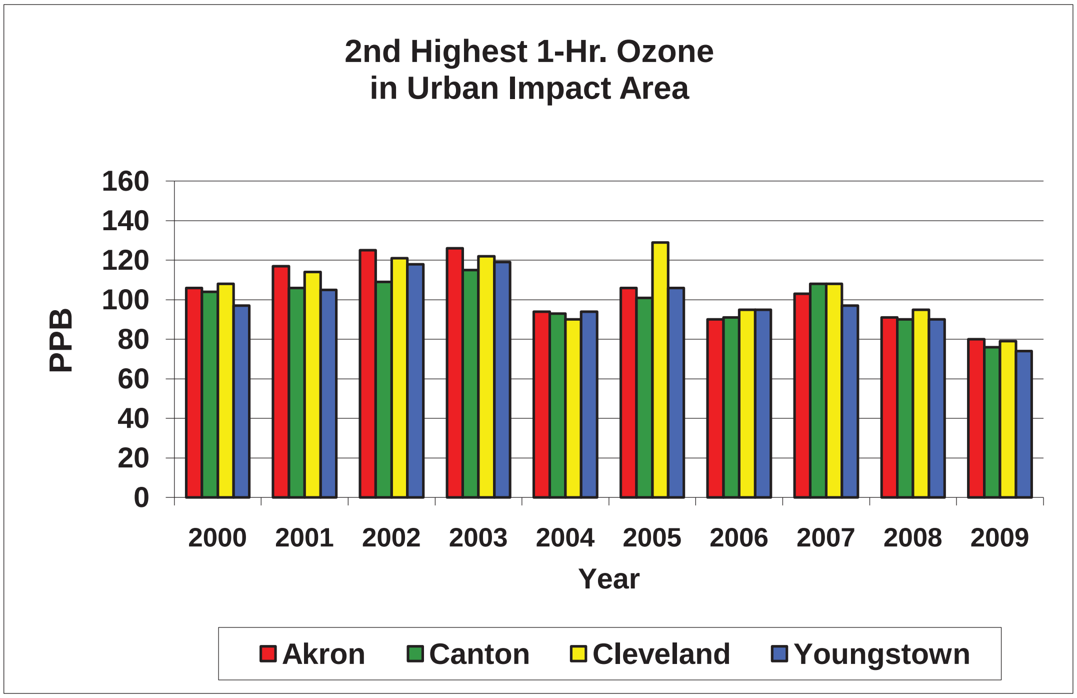
One Hour Data:

Information is presented from eight metropolitan areas in Ohio for the period of 2000 through 2009. Figure 19 is a bar chart which shows, for each year, the second highest 1-Hour average. In an area where ozone is monitored at several sites, the site with the highest second high for each year was used which may be a different site from year to year.

Eight Hour Standard:

Eight metropolitan areas are presented with the three year average of the 4^{th} highest 8-Hour daily ozone averages for the years 2000 through 2009. The year listed is the last year of the three year period. Figure 20 is a bar chart with those concentrations. The ambient air quality standard is a three year average of the fourth high 8-Hour averages, that concentration must be less than or equal to 0.075 parts per million (76 parts per billion) for an area to be in compliance with the standard. The monitor with the highest 4^{th} high in each three year period was used, not necessarily the same monitor for all years.

The three year averages for each site in Ohio are listed in the ozone portion of Section V. AIR QUALITY DATA 2009.


2nd Highest 1-Hr. Ozone
in Urban Impact Area
PPB
160
140
120
100
80
60
40
20
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Year
Akron
Canton
Cleveland
Youngstown

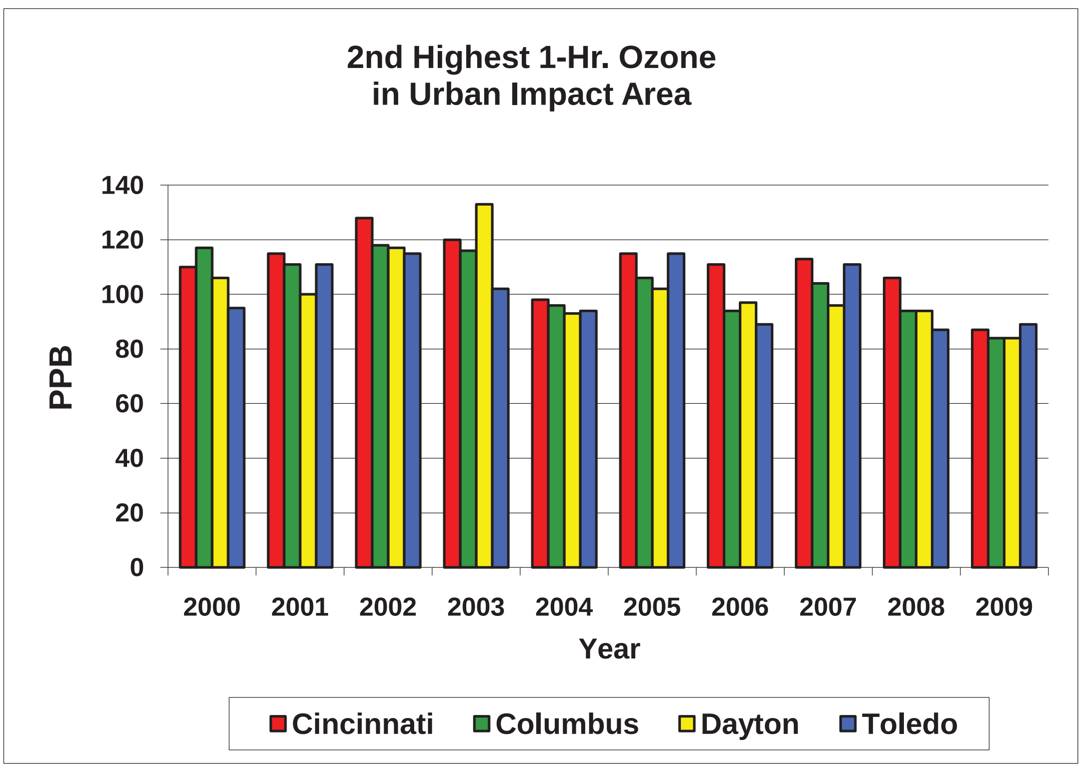
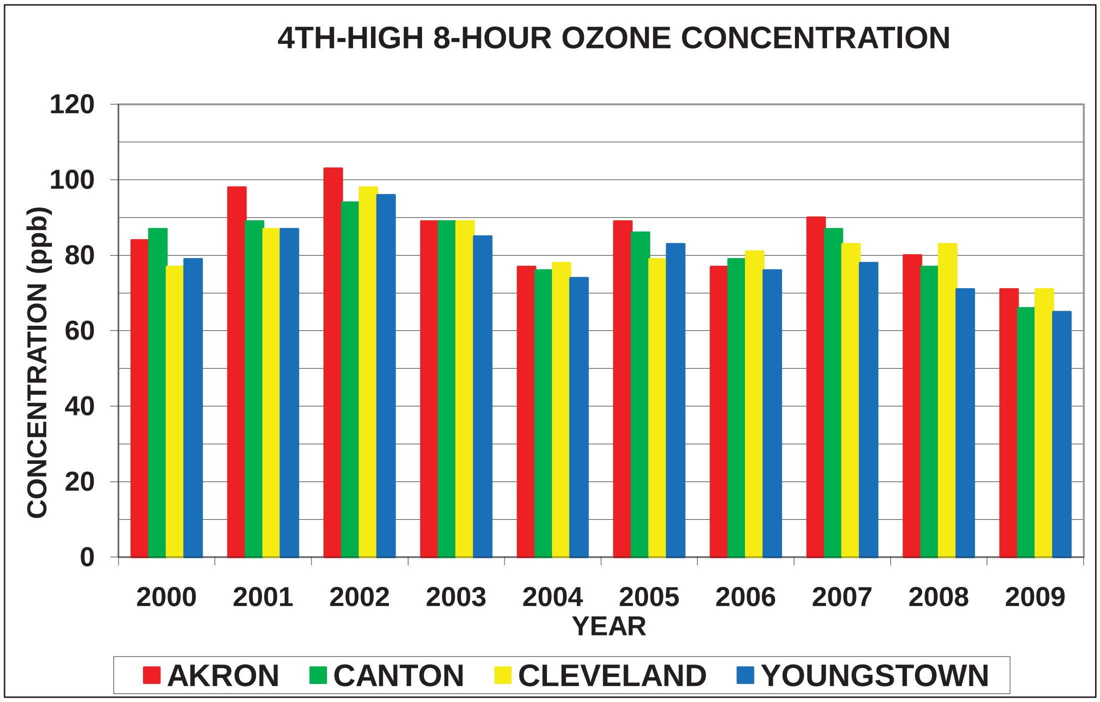

2nd Highest 1-Hr. Ozone
in Urban Impact Area
PPB
140
120
100
80
60
40
20
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Year
Cincinnati
Columbus
Dayton
Toledo

Figure 19


4TH-HIGH 8-HOUR OZONE CONCENTRATION
CONCENTRATION (ppb)
0
20
40
60
80
100
120
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
YEAR
AKRON
CANTON
CLEVELAND
YOUNGSTOWN

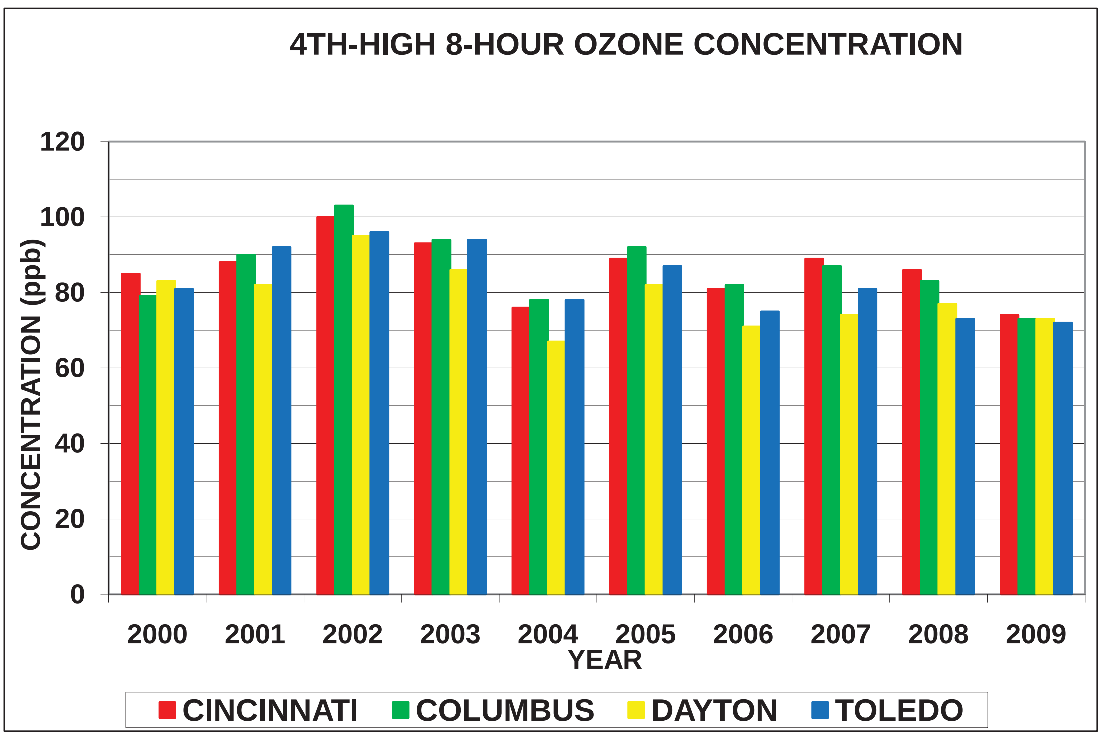
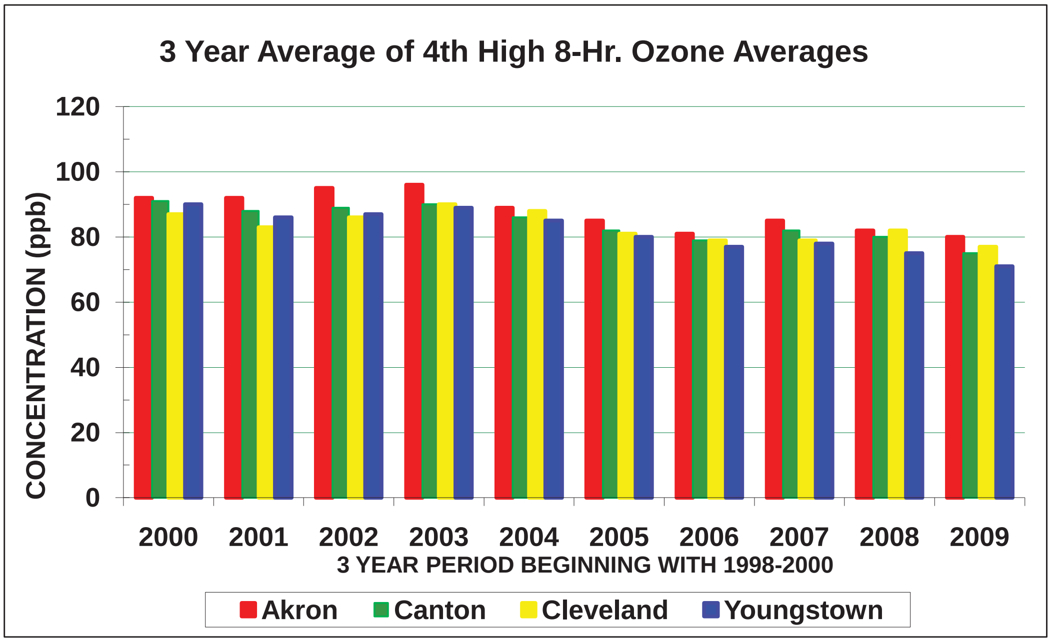

4TH-HIGH 8-HOUR OZONE CONCENTRATION
CONCENTRATION (ppb)
0
20
40
60
80
100
120
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
YEAR
CINCINNATI
COLUMBUS
DAYTON
TOLEDO

Figure 20


3 Year Average of 4th High 8-Hr. Ozone Averages
CONCENTRATION (ppb)
120
100
80
60
40
20
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
3 YEAR PERIOD BEGINNING WITH 1998-2000
Akron
Canton
Cleveland
Youngstown

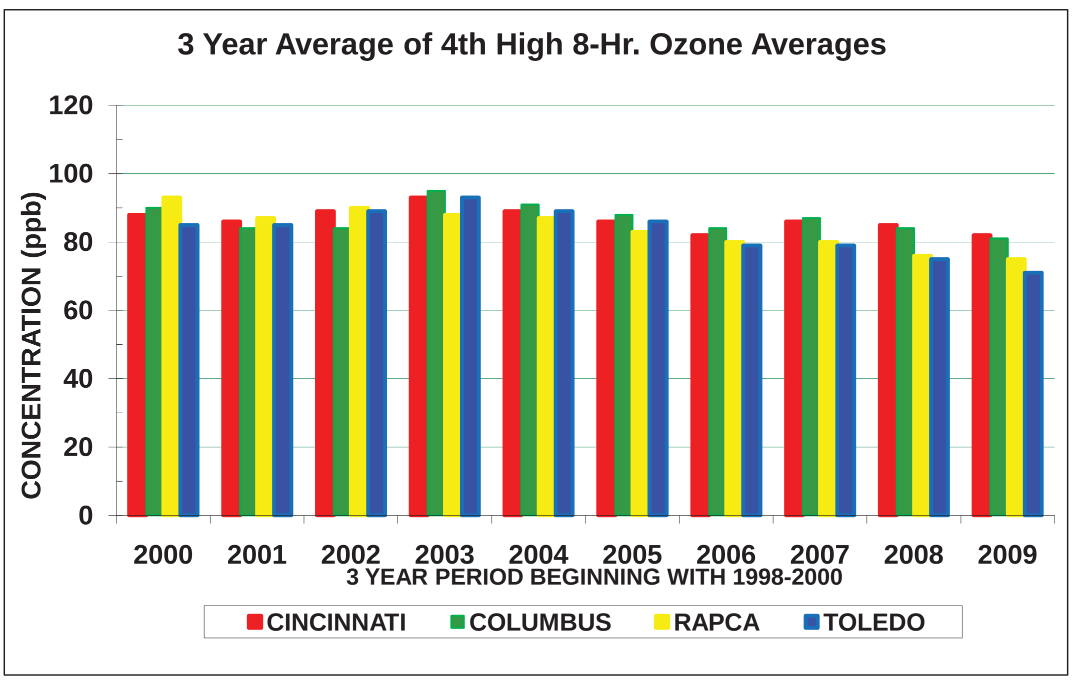
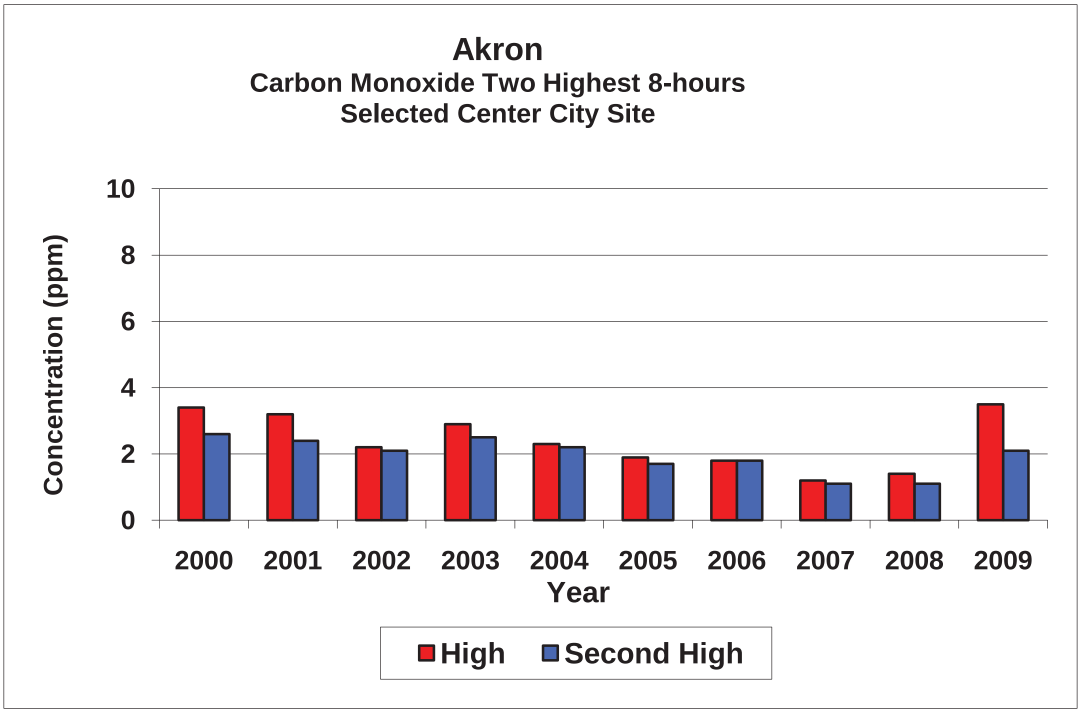

3 Year Average of 4th High 8-Hr. Ozone Averages
CONCENTRATION (ppb)
120
100
80
60
40
20
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
3 YEAR PERIOD BEGINNING WITH 1998-2000
CINCINNATI
COLUMBUS
RAPCA
TOLEDO

Figure 21

CO Trends

The database for carbon monoxide (CO) is less extensive than for sulfur dioxide or ozone. A comparative plot of changes in CO in past years for ten major Ohio cities is presented. One central-city monitor in each urban area was selected to yield data for a study of 8-hour average CO concentrations. Data for the years 2000-2009 are used in the graphs. See Figure 22 for the results of this study.


Akron
Carbon Monoxide Two Highest 8-hours
Selected Center City Site
Concentration (ppm)
10
8
6
4
2
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Year
High
Second High

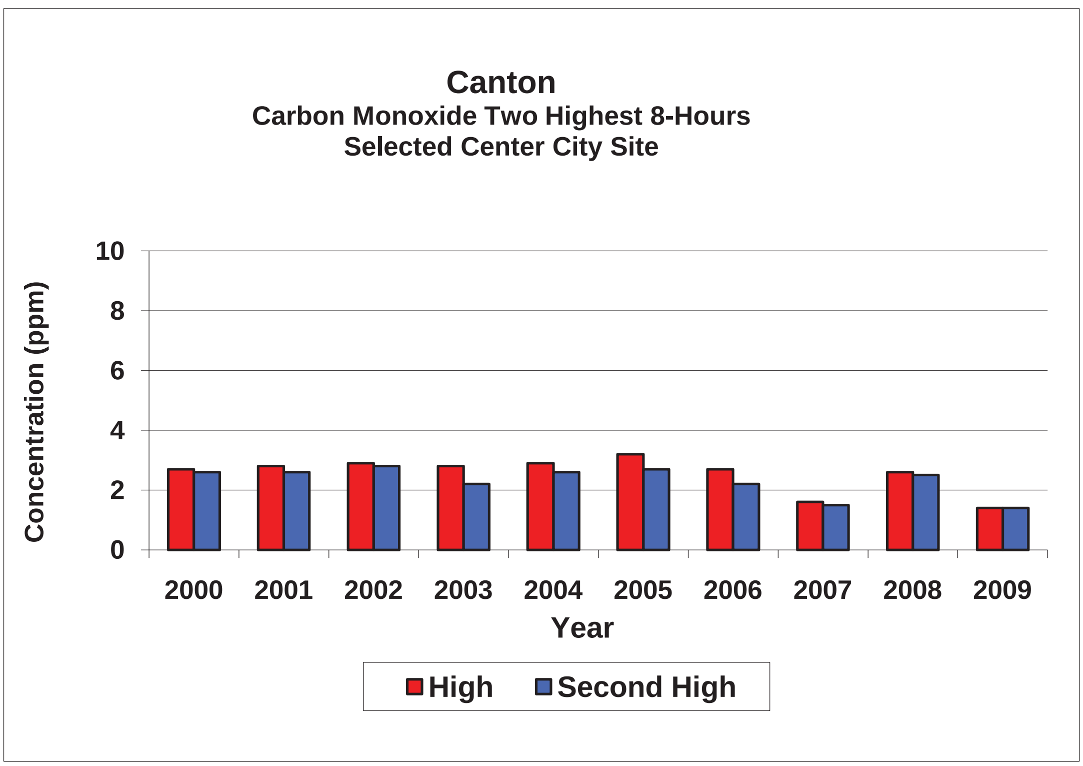
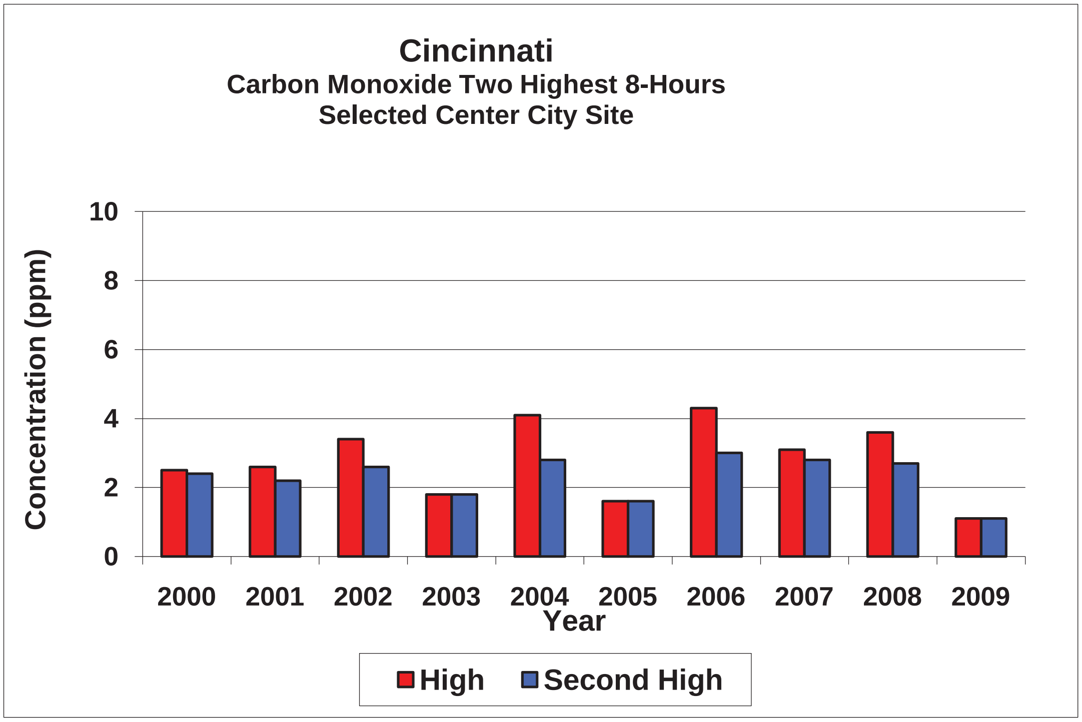

Canton
Carbon Monoxide Two Highest 8-Hours
Selected Center City Site
Concentration (ppm)
10
8
6
4
2
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Year
High
Second High

Figure 22



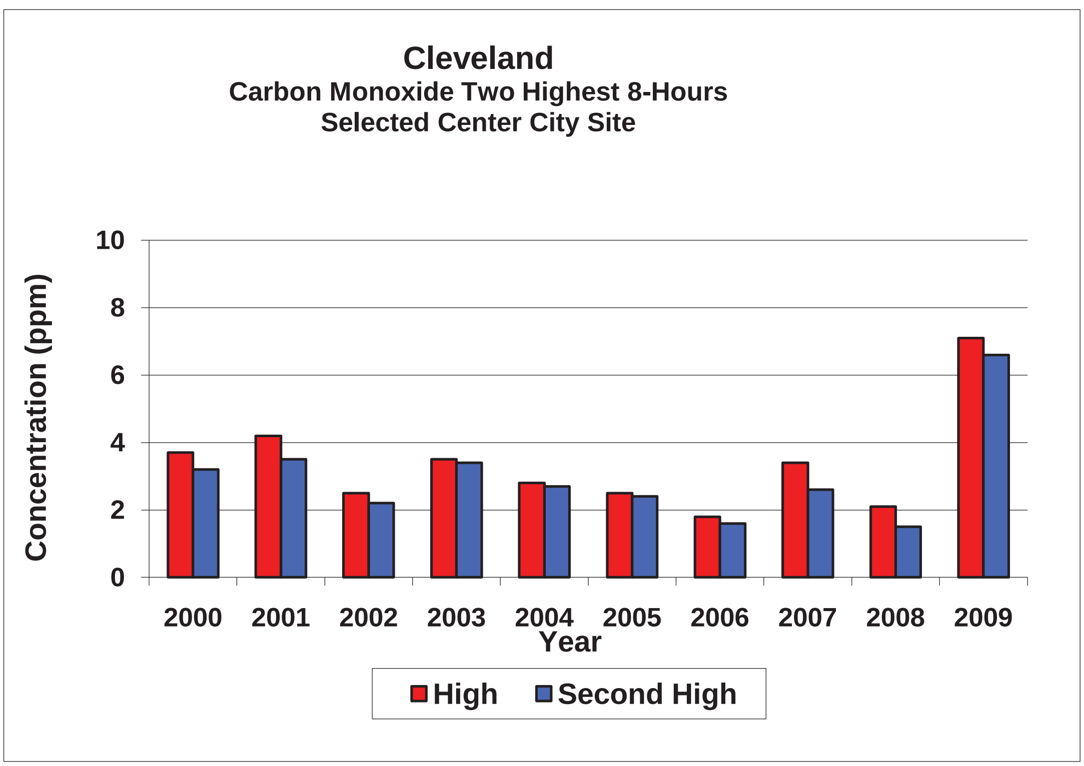
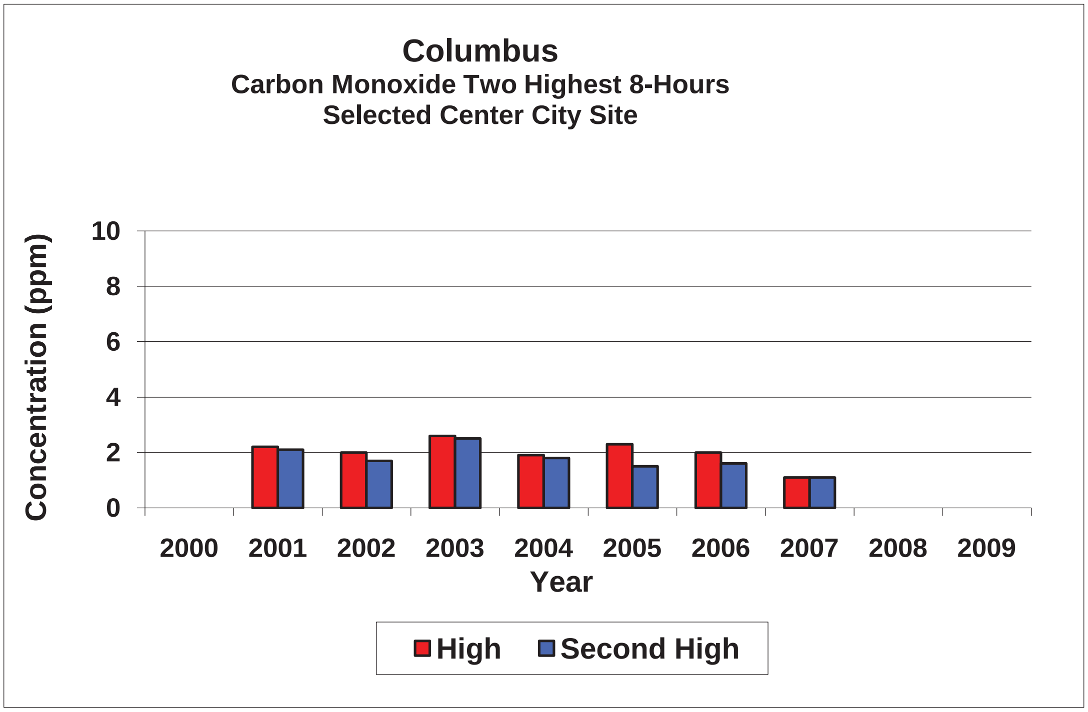


Figure 22 (continued)



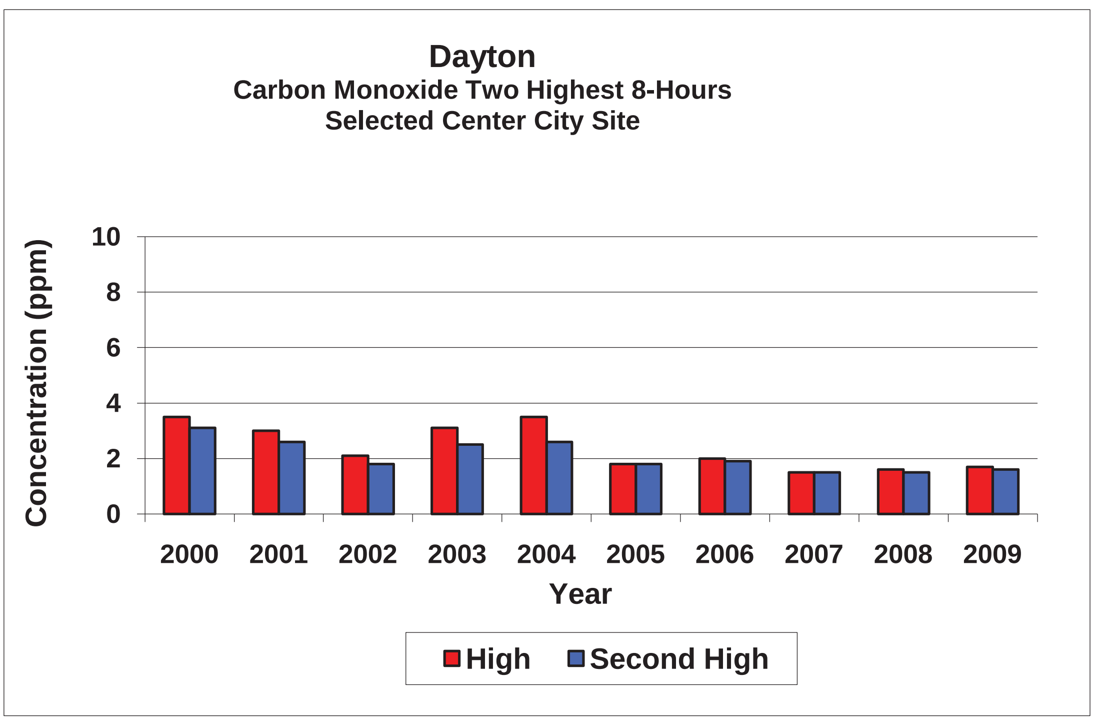
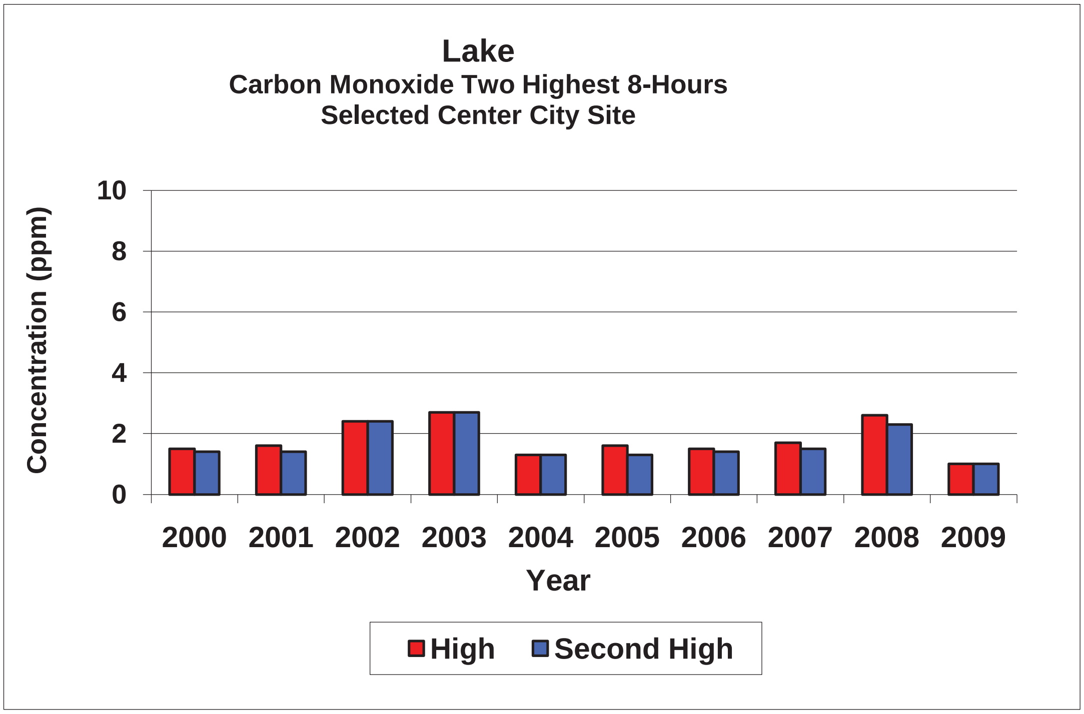


Figure 22 (continued)



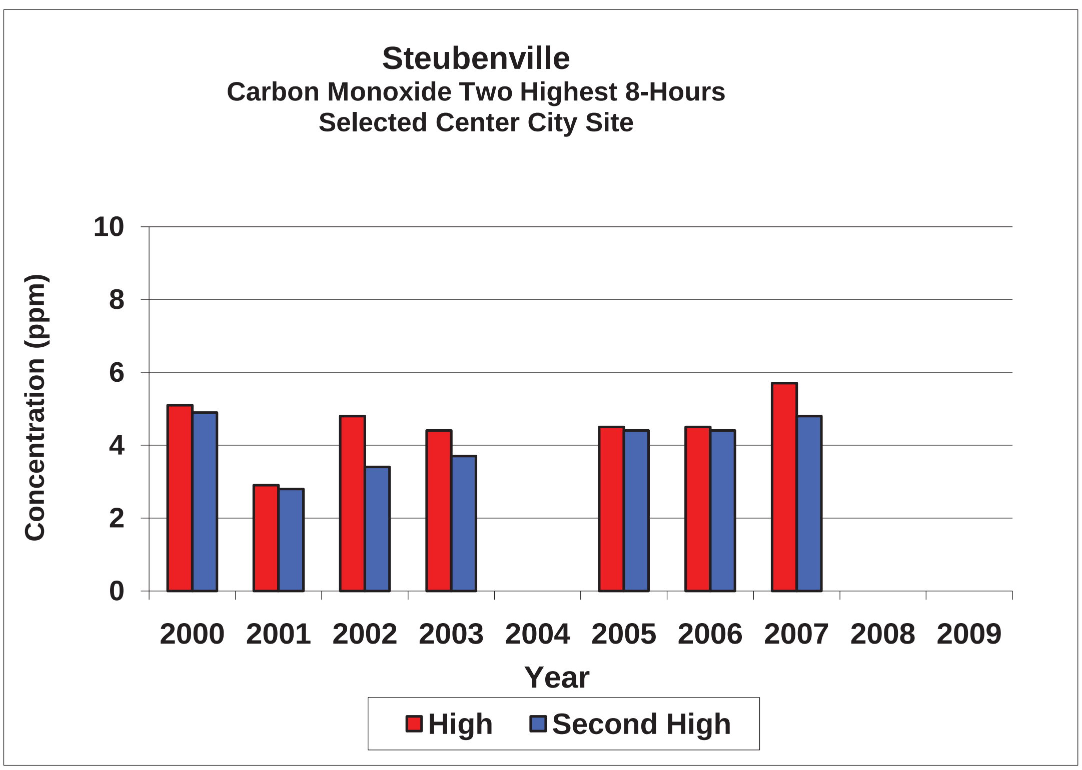


Figure 22 (continued)

IV. QUALITY ASSURANCE PROGRAM

A. GENERAL

Air monitoring data collected by State and Local Air Monitoring Stations (SLAMS)are required to meet Quality Assurance guidance in Appendix A of 40 CFR Part 58. That appendix specifies the minimum quality system requirements for SLAMS data for the pollutants SO_2, NO_2, O_3, CO, Lead, $PM_{2.5}$, and PM_{10}.

Air monitoring agencies are required to have a quality system in place. The quality system is the means by which an organization manages the quality of the monitoring data it produces in a systematic, organized manner. It provides a framework for planning, implementing, assessing and reporting work performed by an organization. It provides for required quality assurance and quality control activities. A quality system includes an overall Quality Management Plan and specific Quality Assurance Project Plans for the pollutants measured.

For air monitoring data the measurements of accuracy and precision are integral to the quality assurance and quality control of the data. Accuracy is defined as the degree the measurement is close to the true value of the parameter measured. Precision is defined as the repeatability of the measurements.

B. Accuracy and Precision Requirements

Accuracy requirements for manual Lead, PM_{10} and $PM_{2.5}$ samplers and continuous PM_{10} and $PM_{2.5}$ monitors include audits of the flow rate of each sampler compared to a known flow rate at least once every 6 months. For continuous monitors for SO_2, NO_2, O_3, and CO, quarterly audits of at least 25% of the analyzers are recommended. One audit per monitor per calendar year is required. During the audits the analyzers are tested with a gas in three specific concentration levels.

Precision requirements for Lead, PM_{10} and $PM_{2.5}$ are met by selecting sites in areas of expected highest concentration for side-by-side (collocated) sampling. Duplicate samples for comparison purposes are collected on an every 12-day schedule although it may be more frequent. Each PM2.5 sampler or continuous $PM_{2.5}$ monitor should have a quality control flow rate verification each month. Each Lead and PM_{10} sampler should have a flow rate verification every quarter. For continuous SO_2, NO_2, O_3, and CO monitors the determination of precision is by a one-point quality control check against a gas of known concentration at least once every two weeks for each analyzer. The analyzers are operated in the normal sampling mode during this check.

The accuracy audit data and the precision data are collected by local and state agencies and reported to the US EPA Air Quality System (AQS) within 90 days of the quarter when they were performed.

C. The Statistics of Accuracy and Precision

Statistical calculations are available from reports in the Air Quality System as calculated from the reported accuracy and precision data. Calculations are as shown in Appendix A of 40 CFR 58. The results of those data are available to the reporting organization that collected the data and to other AQS data users. Statistics that are available for 1-Point Quality Control include results for percent of data completeness, coefficient of variation (CV) and bias for each analyzer plus a combined summary for the reporting organization for the pollutant. Results of collocated data for PM_{10} and for $PM_{2.5}$ include the number of collocated data pairs, the percentage completeness and the coefficient of variation. For manual PM_{10} and PM2.5 accuracy the number of flow rate audits, the percent completeness and the lower and upper confidence limits are included.

For accuracy statistics the summary results that are included in the accompanying tables for SO_2, NO_2, CO and O_3 include 1-Point Confidence Limits and percentage of data between confidence limits.

In general lower numbers for the coefficient of variation are desirable because indicates more consistency of the test measurements. For SO_2, NO_2 and CO 10% is the CV upper target. For those pollutants 10% is the bias target also. For O_3 7% is the CV target and 7% for bias. For PM2.5 10% or less is the target for precision. For PM2.5 accuracy audits less than 5% for design is the upper limit. For QA statistics 100% data completeness is desired.

Tables 5-8 give summaries of the percent completeness, coefficient of variation and bias for precision and 1-point confidence limits and percent of data between confidence limits for accuracy for each reporting organization in the state, for SO_2, NO_2, CO and O_3 monitors.

Tables 9-10 give summaries of number of duplicate samples, percent completeness and coefficient of variation for precision and percent completeness and lower and upper confidence limits for accuracy for PM_{10} and $PM_{2.5}$.

TABLE 5
Continuous Sulfur Dioxide
2009 Precision and Accuracy Data

LAA/DO	Precision			Accuracy(%)		
	% Complete	CV	Bias	1-Point Confidence Limits		%Between Conf. Lim.
				Lower	Upper	
Central District	100	2.61	+/-2.15	-3.38	4.90	100
Northeast District	100	3.11	+/-2.93	-7.16	4.00	27
Northwest District	100	3.95	-2.87	-7.47	5.93	92
Southeast District	100	4.08	+/-3.39	-6.50	8.60	100
Akron	100	3.97	+/-2.82	-6.97	6.61	100
HCDOES	100	6.87	+/-4.90	10.46	12.60	100
Cleveland	100	3.72	-4.00	-9.56	4.04	92
RAPCA	100	4.99	+/-3.78	-8.28	7.74	100
Lake County	92	3.59	+/-2.97	-6.66	5.50	75
Portsmouth	100	4.85	+/-3.94	-9.49	7.83	100
Mahoning-Trumbull	81	1.55	+/-1.28	-2.70	2.10	42

TABLE 6
Continuous Nitrogen Dioxide
2009 Precision and Accuracy Data

	Precision			Accuracy(%)		
LAA/DO	% Complete	CV	Bias	1-Point Confidence Limits Lower	1-Point Confidence Limits Upper	%Between Conf. Lim.
HCDOES	100	6.96	+/- 5.71	-11.81	11.85	100
Cleveland	100	5.10	+/- 4.70	-10.79	6.09	100

TABLE 7
Continuous Carbon Monoxide
2009 Precision and Accuracy Data

LAA/DO	Precision: % Complete	Precision: CV	Precision: Bias	Accuracy(%): 1-Point Confidence Limits Lower	Accuracy(%): 1-Point Confidence Limits Upper	Accuracy(%): %Between Conf. Lim.
Central District	100	1.13	-1.52	-3.20	0.66	33
Akron	100	4.49	+/-3.88	-8.20	7.08	83
Canton	96	4.60	+5.65	-3.23	11.33	83
HCDOES	100	7.75	+/-6.11	-11.89	13.55	83
Cleveland	100	3.79	+3.33	-5.99	7.65	92
RAPCA	94	3.38	+/-2.65	-5.91	5.57	92
Lake County	92	3.14	-9.45	-13.51	-3.63	8

TABLE 8
Continuous Ozone
2009 Precision and Accuracy Data

LAA/DO	Precision			Accuracy(%)		
	% Complete	CV	Bias	1-Point Confidence Limits Lower	1-Point Confidence Limits Upper	%Between Conf. Lim.
Central District	100	2.08	+/-1.36	-3.76	3.88	86
Northeast District	100	3.97	+3.70	-4.70	8.94	100
Northwest District	100	3.42	+/-2.81	-6.13	5.61	83
Southeast District	100	2.21	+2.01	-2.66	4.66	44
Southwest District	100	1.15	+/-0.92	-1.88	1.84	22
Akron	100	3.56	+/-2.61	-6.22	5.80	96
Canton	96	10.74	+/-8.85	-21.59	14.37	85
HCDOES	100	3.38	+/-2.72	-4.97	7.35	100
Cleveland	100	2.66	+2.01	-2.63	4.35	78
RAPCA	100	1.17	+/-0.95	-2.34	1.78	100
Lake County	93	1.93	-1.47	-3.73	2.75	100
Portsmouth	100	7.39	+/-6.03	-13.06	11.34	93
Toledo	100	3.18	+1.87	-5.91	5.07	93
Mahoning-Trumbull	82	0.87	+0.86	-0.77	2.09	52

TABLE 9
PM-2.5
2009 Precision and Accuracy Data

LAA/DO	Precision Number/Checks	% Complete	Coef. of Variation CV	Audits	%Com	Accuracy LO	Accuracy UP
Central District	53	100	5.79	15	100	-1.72	1.62
Northeast District	56	100	6.08	8	100	-3.89	3.89
Southeast District	52	100	7.59	15	100	-2.55	0.07
Akron	48	100	6.21	20	100	-1.98	2.02
Canton	48	100	3.97	12	100	-4.43	3.53
HCDOES	116	100	4.99	47	100	-2.75	3.29
Cleveland	27	90	9.86	30	100	-4.16	3.16
RAPCA	29	93	4.52	20	100	-2.41	2.97
Lake County	55	100	8.79	8	100	-8.34	7.15
Portsmouth	48	100	22.95	9	100	1.94	8.73
Toledo	50	100	11.42	11	91	-3.45	3.25
Mahoning-Trumbull	59	100	4.61	12	100	-2.94	2.30

TABLE 10
PM-10
2009 Precision and Accuracy Data

LAA/DO	Precision Number/Checks	% Complete	Coef. of Variation CV	Audits	%Com	Accuracy LO	Accuracy UP
Central District	57	100	4.38	4	100	-0.16	0.16
Northeast District	59	100	9.93	12	100	-2.59	3.69
Southeast District	60	100	5.48	3	75	-5.27	10.45
HCDOES	47	100	8.82	7	79	-12.39	9.47
Cleveland	57	100	12.27	12	100	-1.71	7.75
RAPCA	57	100	4.47	3	50	-5.65	10.70
Lake County	60	100	4.49	8	100	-8.34	7.10
Portsmouth	58	100	6.50	5	50	1.94	8.73
Mahoning-Trumbull	113	100	3.86	8	50	-2.94	2.30

V. AIR QUALITY DATA 2009

Total Suspended Particulate (TSP)

Total suspended particulate matter is defined as any liquid (aerosol) or solid substance found in the atmosphere. Particles larger than approximately 100 microns in diameter settle rapidly due to gravity and are not considered suspended particulates. Fly ash, process dusts, soot and oil aerosols are all common forms of suspended particulate matter. The major sources of particulate pollution are industrial processes, electric power generation, industrial fuel combustion, and dust from plowed fields, roadways, or construction sites. Particulate pollution causes a wide range of damage to materials, as well as limiting visibility and reducing the amount of sunlight reaching the earth. Components of particulates may be harmful, such as sulfates, nitrates and metals. The major adverse health effects on humans are related to damage to the respiratory system through interference with the lung's natural cleansing process.

Such adverse health effects are dependent, in a general sense, upon (1) the concentration, size and chemical composition of the particles of which the TSP consists and (2) the concentration and composition of any pollutant gases in combination with it. Particles greater than 10 microns in diameter can rarely penetrate below the larynx and, therefore, are less likely to damage the respiratory system. Particles less than 6 microns in diameter can penetrate the bronchial passage and those of less than 1 micron in diameter can usually penetrate and be deposited in the capillaries and alveoli of the lungs. (I.M. Campbell, Energy and the Atmosphere: A Physical Chemical Approach, John Wiley & Sons, LTD., 1977).

An inhaled particle may exert a toxic effect in one or more of the following four ways: (1) the particle may be intrinsically toxic because of its inherent chemical or physical characteristics; (2) the particle may interfere with one or more of the mechanisms that normally clear the respiratory track; (3) the particle may act as a carrier of an absorbed toxic substance; or (4) the particle may act as a carrier of an absorbent toxic substance.

It is difficult to obtain direct relationships between exposures to various concentrations of TSP and resulting effects upon human health because of the problems of isolating the effects of TSP from those of other environmental pollutants and of reproducing in the laboratory the exact conditions that prevail in the ambient air. Also, it has been observed that exposure to TSP in combination with other pollutants such as sulfur dioxide (SO_2) produces more severe effects than does exposure to each pollutant separately. Nevertheless, statistical analyses of morbidity and mortality data do indicate a relationship between increased TSP concentrations and increased numbers of hospital and clinic admissions for upper respiratory infections, cardiac diseases, bronchitis, asthma, pneumonia, emphysema and the like. (Air Pollution: Its Origin and Control, Harper & Row, 1976.) TSP ceased to be a criteria pollutant on August 1, 1987, having been replaced by PM_{10}.

Starting in 1987 TSP sampling was gradually replaced by ten micron particulate sampling (PM_{10}). There were over 200 TSP monitors in 1987. In 2009 there were 8 monitors reporting TSP data, all are used for lead or other metals monitoring. In July 1997 the U.S. EPA promulgated regulations adding a National Ambient Air Quality Standard for 2.5 micron particulate matter ($PM_{2.5}$). The $PM_{2.5}$ monitors supplement and partially replace the PM_{10} network. They started collecting data in January 1999.

Sampling Method

TSP is measured by the high-volume air sampler method. This instrument draws measured volumes of air through a pre-weighed glass fiber or quartz filter for a specific time (normally 24 hours). Particulate matter in the air is trapped on the filter, which is then re-weighed to determine the mass of the particulates collected. Results are reported as micrograms of particulate matter per cubic meter of air ($\mu g/m^3$). Normal sampling is done intermittently with 24-hour samples taken once every six days.

Suspended particulate (TSP) (11101) Ohio Micrograms/cubic meter (25 C) (001)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	# OBS	1ST MAX	2ND MAX	3RD MAX	4TH MAX	ARITH MEAN	GEO. MEAN	GEO. STD	CERT	EDT
39-017-0015	2	1259	Middletown	Butler	3901 LEFFERSON	2009	091	59	77	77	74	70	36.9	32.8	1.7		0
39-029-0020	1	0807	East Liverpool	Columbiana	2220 MICHIGAN	2009	091	54	121	79	68	68	37.1	31.8	1.8		0
39-035-0038	1	0229	Cleveland	Cuyahoga	2547 ST TIKHON	2009	091	60	91	79	78	77	42.1	37.5	1.7		0
39-035-0042	1	0229	Cleveland	Cuyahoga	3136 LORAIN AVE., F.S. 4	2009	091	60	84	82	76	74	37.0	32.2	1.8		0
39-035-0049	1	0229	Cleveland	Cuyahoga	E. 56TH ST.	2009	091	60	161	121	110	109	56.0	49.5	1.7		0
39-035-0050	1	0229	Cleveland	Cuyahoga	GRANT RD.	2009	091	55	86	84	76	73	40.9	36.9	1.6		0
39-035-0061	1	0229	Cleveland	Cuyahoga	W. SIDE OF WEST 3RD.	2009	091	57	108	90	90	74	42.2	37.3	1.7		0
39-061-0001	2	1259	Cincinnati	Hamilton	800 VINE ST.	2009	091	38	64	62	61	59	32.7*	30.0	1.5		0

Note: The * indicates that the mean does not satisfy summary criteria.

Particulate Matter (<10µ, PM_{10})

On July 1, 1987, the U.S. EPA promulgated revisions to the National Ambient Air Quality Standards for particulate matter. The primary standard includes only those particles with an aerodynamic diameter smaller than or equal to a nominal 10 micrometers. This standard is referred to as the PM_{10} standard (particulate matter <10 micrometers). From July 1987 until July 18, 1997 the annual standard was 50 $\mu g/m^3$ annual arithmetic mean (average over three years' data). The 24-hour standard, not to be exceeded more than once, was 150 $\mu g/m^3$. The standard is that the 24-hour level of 150 $\mu g/m^3$ is not to be exceeded more than once per year averaged over three years.

The annual standard was retained until the changes to the particulate standards that became effective on December 18, 2006 when the 24-Hour standard was retained and the annual standard was revoked.

The standards were changed in July 1997, when the $PM_{2.5}$ standard was promulgated. Changing the standard from TSP to PM_{10} and then adding $PM_{2.5}$ was due to research findings concerning particle size. Particulate matter can harm body tissue such as the linings of the nose and throat and the lungs by simple mechanical irritation. Nasal hairs and sneezing are the body's natural defenses against some of the relatively large particles (15-100 microns). However, small particles can slip past these defenses and penetrate deep into the lungs where they can damage lung tissues.

Because of the final action to set the fine particulate standards by U.S. EPA to replace TSP, the Ohio Air Monitoring Network was expanded to include 21 PM_{10} sites in 1986, to 45 in 1988 and to a high of 91 in 1997. During the year 2009 monitors were operated at 37 sites.

Samples are taken each weekday at urban sites used in reporting the Air Quality Index (AQI).

PM10 Total 0-10um STP (81102) Ohio Micrograms/cubic meter (25 C) (001)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	#OBS	NUM REQ	VALID DAYS	%OBS	1ST MAX	2ND MAX	3RD MAX	4TH MAX	DAY MAX >150	EST DAYS >150	WTD ARITH MEAN	CERT	EDT
39-003-0006	1	0743	Lima	Allen	1314 FINDLAY RD.	2009	062	54	61	54	89	38	36	32	32	0	0	20.2*		0
39-003-0007	1	0743	Lima	Allen	ROUSCH RD.	2009	062	54	61	54	89	37	31	30	28	0	0	14.2*		0
39-003-0008	1	0743	Lima	Allen	NORTH STREET	2009	062	54	61	54	89	39	32	23	22	0	0	13.3*		0
39-017-0003	1	1259	Middletown	Butler	BONITA & ST JOHN	2009	063	57	61	57	93	39	33	33	32	0	0	18.0		0
39-017-0015	1	1259	Middletown	Butler	3901 LEFFERSON	2009	063	59	61	59	97	36	36	31	30	0	0	18.7		0
39-029-0020	1	0807	East Liverpool	Columbiana	2220 MICHIGAN	2009	062	60	61	60	98	68	45	41	41	0	0	24.7		0
39-029-0022	1	0807	East Liverpool	Columbiana	500 MARYLAND	2009	062	60	61	60	98	59	47	45	43	0	0	24.3		0
39-035-0027	1	0229	Cleveland	Cuyahoga	2200 W 28TH ST.	2009	063	32	61	32	52	33	33	30	29	0	0	19.2*		0
39-035-0038	1	0229	Cleveland	Cuyahoga	2547 ST TIKHON	2009	063	360	183	182	99	72	59	57	53	0	0	24.2		0
39-035-0045	1	0229	Cleveland	Cuyahoga	4950 BROADWAY AVE.	2009	063	60	61	60	98	58	44	42	40	0	0	23.7		0
39-035-0060	1	0229	Cleveland	Cuyahoga	E. 14TH & ORANGE	2009	063	22	61	22	36	46	43	40	37	0	0	22.6*		0
39-035-0060	3	0229	Cleveland	Cuyahoga	E. 14TH & ORANGE	2009	079	6642	365	277	76	64	56	54	51	0	0	21.1*		0
39-035-0065	1	0229	Newburgh Heights	Cuyahoga	4600 HARVARD AVE.	2009	063	56	61	56	92	118	74	73	63	0	0	34.3		0
39-035-1002	1	0229	Brook Park	Cuyahoga	16900 HOLLAND RD.	2009	063	60	61	60	98	37	32	32	29	0	0	16.5		0
39-049-0024	1	0805	Columbus	Franklin	STATE FAIRGROUNDS	2009	063	58	61	58	95	62	49	47	46	0	0	25.2		0
39-049-0024	2	0805	Columbus	Franklin	STATE FAIRGROUNDS	2009	063	58	61	58	95	64	56	46	46	0	0	25.7		0
39-057-0005	1	0287	Yellow Springs	Greene	100 DAYTON ST.	2009	062	60	61	60	98	34	33	25	24	0	0	14.7		0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

PM10 Total 0-10um STP (81102) — Ohio — Micrograms/cubic meter (25 C) (001)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	#OBS	NUM REQ	VALID DAYS	%OBS	1ST MAX	2ND MAX	3RD MAX	4TH MAX	DAY MAX >150	EST DAYS >150	WTD ARITH MEAN	CERT	EDT
39-061-0014	1	1259	Cincinnati	Hamilton	SEYMOUR & VINE ST.	2009	063	58	61	58	95	50	42	39	38	0	0	20.4		0
39-061-0040	1	1259	Cincinnati	Hamilton	250 WM. HOWARD TAFT	2009	063	57	61	57	93	33	31	30	28	0	0	16.6		0
39-061-0040	9	1259	Cincinnati	Hamilton	250 WM. HOWARD TAFT	2009	079	7902	365	329	90	50	48	48	44	0	0	21.9*		0
39-061-5001	1	1259	Lockland	Hamilton	101 COOPER AVE.	2009	063	55	61	55	90	66	40	38	32	0	0	19.1		0
39-061-5001	2	1259	Lockland	Hamilton	101 COOPER AVE.	2009	063	50	61	50	82	50	39	37	30	0	0	17.7*		0
39-063-0002	1	0743	Findlay	Hancock	9860 C.R. 313	2009	062	54	61	54	89	32	27	26	23	0	0	16.1		0
39-063-0003	1	0743	Findlay	Hancock	9860 CR 313	2009	062	54	61	54	89	42	36	35	30	0	0	16.7		0
39-063-0004	1	0743	Findlay	Hancock	C.R. 144	2009	062	54	61	54	89	34	33	31	30	0	0	18.0		0
39-081-0001	1	0809	Not in a city	Jefferson	1004 THIRD ST. BRILLIANT	2009	063	61	61	61	100	52	45	44	41	0	0	23.1		0
39-081-0017	1	0809	Steubenville	Jefferson	618 LOGAN ST.	2009	063	61	61	61	100	56	48	46	43	0	0	22.9		0
39-085-1001	1	0595	Fairport Harbor (Fairport)	Lake	325 VINE ST.	2009	062	60	61	60	98	33	32	28	27	0	0	13.9		0
39-087-0012	1	0880	Ironton	Lawrence	450 Commerce Drive	2009	062	59	61	59	97	26	25	23	22	0	0	16.0		0
39-093-3002	1	0807	Sheffield	Lorain	2180 LAKE BREEZE	2009	062	59	61	58	95	37	35	32	30	0	0	19.2		0
39-095-1003	2	0220	Toledo	Lucas	LEE & FRONT	2009	079	8382	365	348	95	75	66	66	65	0	0	21.0		0
39-099-0005	1	0634	Youngstown	Mahoning	145 MADISON AVE.	2009	063	61	61	61	100	48	42	39	38	0	0	18.4		0
39-099-0006	1	0634	Youngstown	Mahoning	1524 OAKLAND AVE.	2009	063	58	61	58	95	45	38	38	36	0	0	19.0		0
39-113-7001	1	0287	Moraine	Montgomery	2728 VIKING LANE	2009	063	58	61	58	95	44	43	35	31	0	0	20.5		0
39-113-7001	2	0287	Moraine	Montgomery	2728 VIKING LANE	2009	063	60	61	60	98	44	44	33	32	0	0	19.8		0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

PM10 Total 0-10um STP (81102) Ohio Micrograms/cubic meter (25 C) (001)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	#OBS	NUM REQ	VALID DAYS	%OBS	1ST MAX	2ND MAX	3RD MAX	4TH MAX	DAY MAX >150	EST DAYS >150	WTD ARITH MEAN	CERT	EDT
39-145-0013	1	0880	New Boston	Scioto	4862 GALLIA	2009	062	61	61	61	100	25	22	21	21	0	0	15.1		0
39-145-0019	1	0880	Portsmouth	Scioto	605 WASHINGTON	2009	062	60	61	60	98	27	24	24	23	0	0	15.8		0
39-145-0020	1	1299	Franklin Furnace	Scioto	2840 BACK RD.	2009	150	8746	365	365	100	77	54	41	38	0	0	15.8		0
39-145-0021	1	1299	Franklin Furnace	Scioto	2446 GALLIA PIKE	2009	150	8700	365	363	99	62	49	46	45	0	0	20.2		0
39-145-0022	1	1299	Franklin Furnace	Scioto	1740 GALLIA PIKE	2009	150	8741	365	365	100	48	46	41	40	0	0	16.6		0
39-155-0005	1	0634	Warren	Trumbull	540 LAIRD AVE.	2009	062	59	61	59	97	32	31	29	29	0	0	15.0		0
39-155-0006	1	0634	Warren	Trumbull	2323 MAIN AVE.	2009	062	34	61	34	56	33	31	29	28	0	0	15.8*		0

Note: The * indicates that the mean does not satisfy summary criteria.

Particulate Matter <2.5µ ($PM_{2.5}$)

On July 18, 1997, the U.S. EPA promulgated revisions to the National Ambient Air Quality Standards for particulate matter. The primary standard includes only those particles with an aerodynamic diameter smaller than or equal to a nominal 2.5 micrometers. This new standard is referred to as the $PM_{2.5}$ standard (particulate matter <2.5 micrometers).

The annual standard is 15µg/m^3 annual arithmetic mean (average over three consecutive years' data). The 24-hour standard is met when the 98^{th} percentile concentration averaged over three consecutive years, is less than or equal to 35µg/m^3.

The 24-Hour standard was changed from 65µg/m^3 to 35µg/m^3 effective in December 2006.

This revision to the particulate matter program is due to research findings concerning particle size. Particulate matter can harm body tissue such as the linings of the nose and throat and the lungs by simple mechanical irritation. Nasal hairs and sneezing are the body's natural defenses against some of the relatively large particles (15-100 microns). However, small particles can slip past these defenses and penetrate deep into the lungs where they can damage lung tissues.

Because of the final action to set the fine particulate standards by U.S. EPA to supplement PM_{10}, the Ohio Air Monitoring Network had a peak of 52 sites in 2008. There were 49 $PM_{2.5}$ sites in 2009. Those 49 sites have a total of 96 monitors reporting data. There are 26 continuous monitors and 14 speciation monitors in addition to the 44 Federal Reference monitors.

The Federal Reference Monitors are used to determine compliance with the National Ambient Air Quality Standards, the speciation monitors are used for analysis to determine the composition of the particulate and the continuous monitors are primarily used for the Air Quality Index and for "real time" reporting of particulate data to the public.

Since the continuous and speciation analysis monitors are not Federal Reference Methods those data are not used to determine compliance with the National Ambient Air Quality Standards.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

PM2.5 - Local Conditions (88101) | Ohio | Micrograms/cubic meter (LC) (105)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	#OBS	1ST MAX	2ND MAX	3RD MAX	4TH MAX	98TH PERCENTILE VALUE	WTD ARITH MEAN	CERT	EDT
39-009-0003	1	0809	Not in a city	Athens	S.R. 377 GIFFORD STATE FOREST	2009	120	60	18.8	17.6	17.2	17.1	17.6	9.14		0
39-017-0003	1	1259	Middletown	Butler	BONITA & ST JOHN	2009	000	116	31.5	27.4	25.3	24.3	25.3	12.68		0
39-017-0003	2	1259	Middletown	Butler	BONITA & ST JOHN	2009	000	59	29.9	22.8	22.2	21.9	22.8	12.49		0
39-017-0016	1	1259	Fairfield	Butler	400 NILLES RD.	2009	000	113	33.0	29.5	27.2	25.5	27.2	13.08		0
39-023-0005	1	0287	Springfield	Clark	350 N. FOUNTAIN AVE.	2009	142	121	37.0	32.7	26.3	24.1	26.3	12.41		0
39-025-0022	1	1259	Batavia	Clermont	2400 CLERMONT CENTER DR.	2009	120	121	23.5	22.4	22.0	21.8	22.0	11.01		0
39-035-0027	1	0229	Cleveland	Cuyahoga	2200 W 28TH ST.	2009	120	54	28.7	23.0	22.8	20.1	23.0	10.61*		0
39-035-0034	1	0229	Cleveland	Cuyahoga	891 E. 152 ST.	2009	120	118	27.7	25.8	24.7	22.0	24.7	10.20		0
39-035-0038	1	0229	Cleveland	Cuyahoga	2547 ST TIKHON	2009	120	118	37.0	30.4	29.9	29.8	29.9	12.86		0
39-035-0038	2	0229	Cleveland	Cuyahoga	2547 ST TIKHON	2009	120	29	29.6	25.2	23.1	21.5	29.6	12.66		0
39-035-0045	1	0229	Cleveland	Cuyahoga	4950 BROADWAY AVE.	2009	120	118	30.8	26.2	23.5	22.3	23.5	11.85		0
39-035-0060	1	0229	Cleveland	Cuyahoga	E. 14TH & ORANGE	2009	120	91	33.1	28.9	27.0	24.5	28.9	12.28*		0
39-035-0060	2	0229	Cleveland	Cuyahoga	E. 14TH & ORANGE	2009	120	2	22.1	10.6			22.1	16.35*		0
39-035-0065	1	0229	Newburgh Heights	Cuyahoga	4600 HARVARD AVE.	2009	120	118	32.8	30.3	28.9	26.6	28.9	12.39		0
39-035-1002	1	0229	Brook Park	Cuyahoga	16900 HOLLAND RD.	2009	120	107	26.9	24.7	20.5	20.2	20.5	10.89*		0
39-049-0024	1	0805	Columbus	Franklin	STATE	2009	120	114	26.2	24.3	23.2	23.0	23.2	11.54		0

Note: The * indicates that the mean does not satisfy summary criteria.

PM2.5 - Local Conditions (88101) | Ohio | Micrograms/cubic meter (LC) (105)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	#OBS	1ST MAX	2ND MAX	3RD MAX	4TH MAX	98TH PERCENTILE VALUE	WTD ARITH MEAN	CERT	EDT
					FAIRGROUNDS											
39-049-0025	1	0805	Columbus	Franklin	1700 ANN ST.	2009	120	116	30.5	26.9	23.6	22.0	23.6	11.33		0
39-049-0025	2	0805	Columbus	Franklin	1700 ANN ST.	2009	120	55	31.4	22.6	20.5	19.5	22.6	11.09		0
39-049-0081	1	0805	Columbus	Franklin	5750 MAPLE CANYON	2009	120	118	32.7	28.3	25.7	23.1	25.7	10.83		0
39-057-0005	1	0287	Yellow Springs	Greene	100 DAYTON ST.	2009	142	121	32.6	28.2	25.2	23.0	25.2	11.51		0
39-061-0006	1	1259	Cincinnati	Hamilton	11590 GROOMS RD	2009	120	122	29.7	26.3	24.2	23.9	24.2	12.11		0
39-061-0014	1	1259	Cincinnati	Hamilton	SEYMOUR & VINE ST.	2009	120	355	34.3	33.9	29.5	29.1	27.1	13.40		0
39-061-0014	2	1259	Cincinnati	Hamilton	SEYMOUR & VINE ST.	2009	119	62	35.3	31.1	30.4	25.1	31.1	13.89		0
39-061-0040	1	1259	Cincinnati	Hamilton	250 WM. HOWARD TAFT	2009	142	116	28.5	25.7	24.8	24.8	24.8	12.73		0
39-061-0042	1	1259	Cincinnati	Hamilton	2101 W. 8TH ST.	2009	000	109	36.5	28.2	27.0	26.3	27.0	13.71		0
39-061-7001	1	1259	Norwood	Hamilton	2059 SHERMAN AVE.	2009	142	119	30.5	27.8	25.7	25.7	25.7	12.97		0
39-061-8001	1	1259	St. Bernard	Hamilton	300 MURRAY RD.	2009	120	117	30.8	30.8	28.7	28.5	28.7	13.44		0
39-081-0017	1	0809	Steubenville	Jefferson	618 LOGAN ST.	2009	120	112	38.6	25.1	24.7	24.0	24.7	12.11		0
39-081-1001	1	0809	Mingo Junction	Jefferson	501 COMMERICAL	2009	120	58	23.5	23.3	22.9	22.5	23.3	11.22		0
39-081-1001	2	0809	Mingo Junction	Jefferson	501 COMMERICAL	2009	120	52	23.1	22.5	22.4	21.1	22.5	10.69*		0
39-085-0007	1	0595	Painesville	Lake	177 MAIN STREET	2009	120	112	27.0	21.7	19.8	19.7	19.8	10.49		0
39-085-0007	2	0595	Painesville	Lake	177 MAIN STREET	2009	120	58	28.4	19.4	19.3	19.0	19.4	9.99		0
39-087-0012	1	0880	Ironton	Lawrence	450 Commerce	2009	120	116	28.8	21.9	21.4	20.2	21.4	11.33		0

Note: The * indicates that the mean does not satisfy summary criteria.

PM2.5 - Local Conditions (88101) | Ohio | Micrograms/cubic meter (LC) (105)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	#OBS	1ST MAX	2ND MAX	3RD MAX	4TH MAX	98TH PERCENTILE VALUE	WTD ARITH MEAN	CERT	EDT
					Drive											
39-093-3002	1	0807	Sheffield	Lorain	2180 LAKE BREEZE	2009	120	118	28.9	24.5	21.5	21.5	21.5	9.89		0
39-093-3002	2	0807	Sheffield	Lorain	2180 LAKE BREEZE	2009	120	64	23.0	19.9	18.2	18.2	19.9	9.32		0
39-095-0024	1	0220	Toledo	Lucas	348 S. ERIE	2009	120	150	37.9	33.3	27.3	27.3	27.3	11.22		0
39-095-0024	2	0220	Toledo	Lucas	348 S. ERIE	2009	120	53	26.7	25.7	25.7	24.3	25.7	10.81		0
39-095-0026	1	0220	Toledo	Lucas	4208 AIRPORT HIGHWAY	2009	000	113	27.2	24.3	23.5	22.6	23.5	10.92		0
39-095-0028	1	0220	Toledo	Lucas	600 COLLINS PARK	2009	000	109	40.0	30.1	28.8	27.0	28.8	11.43		0
39-099-0005	1	0634	Youngstown	Mahoning	145 MADISON AVE.	2009	120	60	29.7	26.6	26.0	25.3	26.6	11.27		0
39-099-0005	2	0634	Youngstown	Mahoning	145 MADISON AVE.	2009	120	59	30.4	26.3	25.0	24.7	26.3	10.97		0
39-099-0014	1	0634	Youngstown	Mahoning	345 OAKHILL AVE.	2009	120	150	34.8	29.0	28.1	27.3	28.1	11.75		0
39-103-0003	1	0012	Not in a city	Medina	6364 DEERVIEW	2009	120	116	27.2	25.7	25.7	25.3	25.7	10.83		0
39-103-0004	3	0012	Not in a city	Medina	BALLASH ROAD	2009	182	2924	28.2	26.4	22.4	21.6	22.4	11.46*		0
39-113-0032	1	0287	Dayton	Montgomery	215 EAST THIRD ST.	2009	000	174	32.7	29.8	27.3	26.8	26.8	12.43		0
39-113-0032	2	0287	Dayton	Montgomery	215 EAST THIRD ST.	2009	000	59	29.7	25.1	22.4	21.8	25.1	12.02		0
39-133-0002	1	0012	Ravenna	Portage	531 WASHINGTON	2009	120	115	26.1	25.0	23.8	23.2	23.8	11.13		0
39-135-1001	1	0287	Not in a city	Preble	NATIONAL TRAILS	2009	000	117	24.6	23.8	21.1	20.3	21.1	11.10		0
39-145-0013	1	0880	New Boston	Scioto	4862 GALLIA	2009	120	115	24.0	23.5	21.8	21.0	21.8	10.88		0
39-145-0013	2	0880	New Boston	Scioto	4862 GALLIA	2009	120	59	21.8	21.0	20.0	16.9	21.0	10.33		0
39-151-0017	1	0151	Canton	Stark	1330 DUEBER	2009	116	314	45.7	35.6	32.5	30.7	30.0	13.15*		0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

PM2.5 - Local Conditions (88101) | Ohio | Micrograms/cubic meter (LC) (105)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	#OBS	1ST MAX	2ND MAX	3RD MAX	4TH MAX	98TH PERCENTILE VALUE	WTD ARITH MEAN	CERT	EDT
39-151-0017	2	0151	Canton	Stark	1330 DUEBER	2009	116	54	31.9	28.4	25.6	25.1	31.9	12.38*		0
39-151-0020	1	0151	Canton	Stark	420 MARKET	2009	116	108	28.4	27.6	27.5	26.1	27.5	11.92		0
39-153-0017	1	0012	Akron	Summit	80 BRITTAIN	2009	000	327	32.5	32.0	31.8	31.7	25.2	12.56*		0
39-153-0017	2	0012	Akron	Summit	80 BRITTAIN	2009	000	60	30.7	25.9	25.0	24.9	25.9	11.57		0
39-153-0023	1	0012	Akron	Summit	660 W. EXCHANGE ST.	2009	000	114	32.8	27.9	24.8	24.4	24.8	11.41		0
39-165-0007	1	1259	Lebanon	Warren	416 SOUTHEAST ST.	2009	120	119	26.5	25.6	23.6	22.4	23.6	11.70		0

Note: The * indicates that the mean does not satisfy summary criteria.

PM-2.5 Continuous Monitor Data

Site ID	POC	Rep Org	City	County	Address	Year	Method	#OBS	1st Max	2nd Max	3rd Max	4th Max	Arith Mean
39-001-0001	3	0880	West Union	Adams	210 N. Wilson Dr.	2009	750	8137	73.8	65.2	60.5	55.2	11.22
39-003-0009	3	0808		Allen	2850 Bible Rd.	2009	760	4991	71.0	56.8	52.2	44.5	11.25
39-009-0004	1	1335		Athens	7760 Blackburn Rd.	2009	760	8714	57.2	55.7	55.3	55.2	14.23
39-017-1004	3	1259	Middletown	Butler	Hook Field Airport	2009	731	8064	54.0	53.1	50.8	50.4	12.83
39-023-0005	3	0287	Springfield	Clark	350 N. Fountain Ave.	2009	750	8744	65.1	61.4	60.9	57.0	11.65
39-025-0022	3	1259	Batavia	Clermont	2400 Clermont Center Dr.	2009	760	8484	55.7	54.3	51.7	50.6	10.27
39-035-0038	3	229	Cleveland	Cuyahoga	2547 St. Tikhon	2009	760	4286	97.3	97.1	96.3	90.6	16.58
39-035-0060	3	0229	Cleveland	Cuyahoga	E. 14th & Orange	2009	760	4742	193.7	170.7	109.0	105.9	17.06
39-049-0029	3	0805	New Albany	Franklin	7600 Fodor Rd.	2009	760	8614	55.2	54.3	53.7	52.8	17.13
39-049-0034	3	0805	Columbus	Franklin	Korbel Ave.	2009	760	6465	64.0	62.2	59.5	57.4	18.21
39-049-0034	3	0805	Columbus	Franklin	Korbel Ave.	2009	701	2195	36.5	36.4	35.3	34.0	10.08
39-057-0005	3	0287	Yellow Springs	Greene	314 Dayton St.	2009	750	6537	88.5	80.8	64.7	62.8	11.16
39-061-0006	3	1259	Cincinnati	Hamilton	11590 Grooms Rd.	2009	000	8559	61.5	61.3	60.9	60.1	13.52
39-061-0040	3	1259	Cincinnati	Hamilton	250 Wm Howard Taft	2009	760	8532	57.0	56.1	53.2	52.3	17.62
39-081-0017	3	0809	Steubenville	Jefferson	618 Logan St.	2009	760	8718	108.9	94.6	92.8	75.3	14.32
39-085-0007	3	0595	Painesville	Lake	177 Main St.	2009	760	8368	57.0	56.0	55.0	54.0	11.94
39-093-3002	3	0807	Sheffield	Lorain	2180 Lake Breeze	2009	760	8702	76.7	66.8	60.2	55.5	13.90
39-095-0024	3	0220	Toledo	Lucas	348 S. Erie	2009	701	5229	324.5	153.0	140.8	124.0	11.44
39-099-0014	3	0634	Youngstown	Mahoning	345 Oakhill Ave.	2009	701	8735	123.1	102.9	100.1	81.3	11.61
39-103-0003	3	0012		Medina	6364 Deerview	2009	760	8557	66.6	60.0	59.0	57.1	15.65
39-113-0032	3	0287	Dayton	Montgomery	215 East Third St.	2009	750	8709	84.2	82.9	79.9	65.8	12.04
39-135-1001	3	0287		Preble	National Trails	2009	750	8704	61.5	58.1	57.4	56.3	10.97
39-151-0020	3	0151	Canton	Stark	420 Market	2009	711	8180	71.9	55.0	49.0	47.4	10.95
39-153-0017	3	0012	Akron	Summit	80 Brittain	2009	760	1803	55.1	54.5	48.4	47.4	8.90
39-165-0007	3	1259	Lebanon	Warren	416 Southeast S.	2009	731	8169	57.0	55.3	48.7	48.2	12.57

Hourly data, not to be compared to the National Ambient Air Quality Standards

PM-2.5 Speciation Monitor Data

Site ID	POC	Rep Org	City	County	Address	Year	Method	#OBS	1st Max	2nd Max	3rd Max	4th Max	Arith Mean
39-017-1004	5	1217	Middletown	Butler	Hook Field Airport	2009	810	55	30.2	24.2	23.2	21.0	12.02
39-035-0038	6	1217	Cleveland	Cuyahoga	2547 St. Tikhon	2009	810	56	28.4	25.5	25.5	24.8	11.82
39-035-0060	5	1217	Cleveland	Cuyahoga	E. 14th & Orange	2009	810	78	27.0	26.5	26.2	25.4	12.49
39-035-0060	6	1217	Cleveland	Cuyahoga	E. 14th & Orange	2009	810	40	27.2	25.9	25.2	23.8	12.55
39-049-0081	6	1217	Columbus	Franklin	5750 Maple Canyon	2009	810	58	32.4	24.2	22.2	20.6	11.61
39-061-0040	5	1217	Cincinnati	Hamilton	250 Wm Howard Taft	2009	810	57	24.1	23.5	22.7	20.6	12.33
39-081-1001	5	1217	Mingo Junction	Jefferson	501 Commercial	2009	810	54	56.4	33.6	31.7	31.3	15.73
39-087-0012	5	1217	Ironton	Lawrence	450 Commerce Dr.	2009	810	57	36.1	27.5	26.0	24.9	13.98
39-093-3002	5	1217	Sheffield	Lorain	2180 Lake Breeze	2009	810	52	44.5	23.4	22.9	21.8	10.78
39-095-0026	5	1217	Toledo	Lucas	4208 Airport Highway	2009	810	50	23.8	23.5	21.3	20.8	10.74
39-099-0014	5	1217	Youngstown	Mahoning	345 Oakhill Ave.	2009	810	57	30.7	28.0	26.6	25.5	11.86
39-113-0032	5	1217	Dayton	Montgomery	215 East Third St.	2009	810	56	28.6	23.7	23.1	23.0	12.32
39-151-0017	5	1217	Canton	Stark	1330 Dueber	2009	810	53	28.3	27.6	25.9	23.7	12.35
39-153-0023	5	1217	Akron	Summit	660 W. Exchange St.	2009	810	57	27.5	25.8	22.6	21.8	10.68

PM-2.5 Averages of Annual Averages

Site	County	2007	2008	2009	Average 2007-2009
39-009-0003	Athens	13.0	10.6	9.1	10.9
39-017-0003	Butler	15.4	13.8	12.8	14.0
39-017-0016		14.9	13.8	13.1	13.9
39-017-1004		14.6			
39-023-0005	Clark	14.6	12.7	12.4	13.2
39-025-0022	Clermont	14.0	11.7	11.0	12.2
39-035-0027	Cuyahoga	14.5	13.2	10.6	
39-035-0034		13.6	10.9	10.2	11.6
39-035-0038		16.2	14.1	12.8	
39-035-0045		15.3	13.7	11.8	13.6
39-035-0060		15.9	14.1	12.3	
39-035-0065		15.8	14.6	12.4	14.3
39-035-1002		13.4	12.0	10.9	
39-049-0024	Franklin	14.6	12.8	11.5	13.0
39-049-0025		14.7	12.4	11.5	12.9
39-049-0081		13.1	11.1	10.8	11.7
39-057-0005	Greene	13.3	11.6	11.5	12.1
39-061-0006	Hamilton	14.6	12.5	12.1	13.1
39-061-0014		16.6	15.1	13.4	15.0
39-061-0040		15.1	12.6	12.7	13.5
39-061-0042		15.9	14.4	13.7	14.7
39-061-0043		14.8	13.3		
39-061-7001		15.1	13.7	13.0	13.9
39-061-8001		16.1	14.4	13.4	14.6
39-081-0017	Jefferson	16.2	14.3	12.1	
39-081-1001		15.6	14.1	11.2	13.6
39-085-0007	Lake			10.4	
39-085-3002		13.9	11.5		12.7
39-087-0010	Lawrence	15.0	10.8		
39-087-0012			13.1	11.3	
39-093-0016	Lorain	10.1			
39-093-3002		12.9	11.4	9.9	11.4
39-095-0024	Lucas	14.8	11.9	11.4	12.7
39-095-0025		14.2	12.3		
39-095-0026		14.3	12.3	10.9	12.5
39-095-0028				11.4	
39-099-0005	Mahoning	14.2	13.2	11.3	12.9
39-099-0014		14.1	13.1	11.7	13.0
39-103-0003	Medina	12.7	11.8	10.8	11.8
39-113-0032	Montgomery	15.6	13.2	12.4	13.7
39-133-0002	Portage	13.7	12.1	11.1	12.3
39-135-1001	Preble	13.6	12.0	11.1	12.2
39-145-0013	Scioto	14.0	12.2	10.9	12.4
39-151-0017	Stark	15.9	13.9	13.1	
39-151-0020		14.4	12.4	11.9	
39-153-0017	Summit	14.8	13.8	12.6	13.7
39-153-0023		13.7	12.9	11.4	12.7
39-155-0007	Trumbull	14.2	12.8		
39-165-0007	Warren	14.0	11.9	11.7	12.5

Less than 75% capture

Data for 2007-2009 corrected to consolidate POC 1 and POC 2 data with AMP-355

PM-2.5 98th Percentile Averages

Site	County	2007	2008	2009	Average 2007-2009
39-009-0003	Athens	37	28	18	
39-017-0003	Butler	37	27	27	30
39-017-0016		35	32	27	31
39-017-1004		36			
39-023-0005	Clark	37	29	26	31
39-025-0022	Clermont	34	24	22	26
39-035-0027	Cuyahoga	39	38	23	
39-035-0034		38	32	25	32
39-035-0038		40	39	30	
39-035-0045		35	35	24	31
39-035-0060		39	37	29	
39-035-0065		39	34	29	34
39-035-1002		35	30	21	
39-049-0024	Franklin	34	28	23	28
39-049-0025		36	27	27	30
39-049-0081		34	25	26	28
39-057-0005	Greene	33	27	25	28
39-061-0006	Hamilton	35	27	24	29
39-061-0014		38	33	27	33
39-061-0040		35	26	25	28
39-061-0042		36	28	27	30
39-061-0043		34	28		31
39-061-7001		34	30	26	30
39-061-8001		35	31	29	32
39-081-0017	Jefferson	44	35	25	
39-081-1001		35	35	23	31
39-085-0007	Lake			20	
39-085-3002		39	28		
39-087-0010	Lawrence	35	17		
39-087-0012			28	21	
39-093-0016	Lorain	21			
39-093-3002		34	32	22	29
39-095-0024	Lucas	34	30	27	30
39-095-0025		35	32		33
39-095-0026		33	32	24	30
39-095-0028				29	
39-099-0005	Mahoning	34	31	27	31
39-099-0014		34	31	28	31
39-103-0003	Medina	29	30	26	28
39-113-0032	Montgomery	37	31	27	31
39-133-0002	Portage	31	29	24	28
39-135-1001	Preble	34	25	21	27
39-145-0013	Scioto	38	24	22	28
39-151-0017	Stark	33	38	30	
39-151-0020		33	30	28	
39-153-0017	Summit	33	38	29	33
39-153-0023		28	33	25	29
39-155-0007	Trumbull	32	34		33
39-165-0007	Warren	34	24	24	27

Less than75% capture (green shading)

Combination of two adjacent site's data (yellow shading)

Data for 2007-2009 corrected to consolidate POC 1 and POC 2 data with AMP-355

Sulfur Dioxide (SO_2)

Sulfur dioxide is a colorless gas formed through the combination of sulfur and oxygen during combustion. The major sources of SO_2 are the burning of sulfur-containing fossil fuels (mainly coal), with lesser amounts caused by industrial processes such as smelting. Over 40% of the SO_2 found in the ambient air is the result of human activities.

The control of SO_2 emissions from these sources is accomplished primarily by burning coal or oil with a relatively low sulfur content. Newer boilers may be equipped with flue gas desulfurization (FGD) systems that use a caustic solution to scrub SO_2 from the exhaust gas stream.

Sulfur dioxide is harmful because it can be converted to sulfuric acid (H_2SO_4) when it comes in contact with moisture, either in the atmosphere, on plants, materials, or in the lungs. Sulfur Dioxide can also be converted to a sulfate (SO_4^{2-}) which as a particulate (aerosol) helps form acid rain and can also be a lung irritant.

The presence of increased levels of SO_2 in the atmosphere has been associated with a higher incidence of respiratory diseases, higher death rates, and property damage.

Sampling Methods

Sulfur dioxide is measured continuously by instruments using pulsed fluorescent techniques.

Fluorescent analyzers irradiate an ambient air sample with ultraviolet light. Sulfur dioxide gas molecules absorb a portion of this energy, and then re-emit the energy at a characteristic wavelength of light. This light energy emitted by SO_2 molecules is sensed by a photomultiplier tube and converted to an electronic signal proportional to the concentration of SO_2 present.

All concentrations for SO_2 are given in parts per million (ppm). Reports for 1995 and earlier used the units 'micrograms per cubic meter' ($\mu g/m^3$) to report data. The primary units to report data were changed by U.S. EPA in May of 1996.

Sulfur dioxide (42401) Ohio Parts per million (007)

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	# OBS	1ST MAX 24-HR	2ND MAX 24-HR	#OBS >0.14	1ST MAX 3-HR	2ND MAX 3-HR	#OBS >0.5	1ST MAX 1-HR	2ND MAX 1-HR	ARITH MEAN	CERT	EDT
39-001-0001	1	0880	West Union	Adams	210 N. WILSON DR.	2009	061	7985	.022	.020	0	.087	.079	0	.145	.125	.0026		0
39-003-0002	1	0808	Not in a city	Allen	2650 BIBLE RD.	2009	061	3666	.008	.006	0	.026	.010	0	.032	.029	.0023*		0
39-003-0009	1	0808	Not in a city	Allen	2850 BIBLE ROAD	2009	061	4596	.007	.005	0	.032	.013	0	.070	.033	.0016*		0
39-007-1001	1	0807	Conneaut	Ashtabula	770 LAKE RD.	2009	060	8366	.016	.012	0	.035	.026	0	.039	.036	.0028		0
39-009-0004	1	1335	Athens	Athens	7760 BLACKBURN ROAD	2009	100	8303	.023	.022	0	.053	.052	0	.117	.070	.0039		0
39-013-3002	2	0809	Shadyside	Belmont	EAST 40 ST.	2009	060	8381	.030	.016	0	.062	.056	0	.106	.091	.0040		0
39-017-1004	1	1259	Middletown	Butler	HOOK FIELD AIRPORT	2009	060	7870	.011	.011	0	.027	.027	0	.037	.034	.0027		0
39-023-0003	1	0287	Not in a city	Clark	5400 SPANGLER	2009	060	8725	.013	.013	0	.029	.028	0	.035	.035	.0028		0
39-029-0022	1	0807	East Liverpool	Columbiana	500 MARYLAND	2009	061	8364	.030	.027	0	.098	.089	0	.170	.143	.0043		0
39-035-0038	2	0229	Cleveland	Cuyahoga	2547 ST TIKHON	2009	060	8613	.021	.019	0	.053	.044	0	.070	.068	.0042		0
39-035-0045	1	0229	Cleveland	Cuyahoga	4950 BROADWAY AVE.	2009	060	8661	.013	.013	0	.053	.051	0	.075	.075	.0025		0
39-035-0060	1	0229	Cleveland	Cuyahoga	E. 14TH & ORANGE	2009	100	6715	.029	.026	0	.073	.054	0	.086	.085	.0064		0
39-035-0065	1	0229	Newburgh Heights	Cuyahoga	4600 HARVARD AVE.	2009	100	8424	.009	.007	0	.020	.017	0	.043	.030	.0016		0
39-049-0034	1	0805	Columbus	Franklin	KORBEL AVE.	2009	000	4076	.012	.010	0	.034	.023	0	.036	.036	.0022*		0
39-081-0017	1	0809	Steubenville	Jefferson	618 LOGAN ST.	2009	100	8333	.029	.022	0	.071	.064	0	.154	.098	.0040		0
39-085-0003	1	0595	Eastlake	Lake	36010 LAKESHORE	2009	000	8714	.016	.013	0	.036	.030	0	.063	.046	.0043		0
39-085-0007	1	0595	Painesville	Lake	177 MAIN	2009	000	8713	.073	.070	0	.194	.175	0	.246	.232	.0097		0

Note: The * indicates that the mean does not satisfy summary criteria.

Sulfur dioxide (42401) Ohio Parts per million (007)

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	# OBS	1ST MAX 24-HR	2ND MAX 24-HR	#OBS >0.14	1ST MAX 3-HR	2ND MAX 3-HR	#OBS >0.5	1ST MAX 1-HR	2ND MAX 1-HR	ARITH MEAN	CERT	EDT
					STREET														
39-087-0006	2	0880	Ironton	Lawrence	2120 S. 8TH	2009	061	8303	.010	.009	0	.020	.018	0	.029	.026	.0022		0
39-099-0013	1	0634	Youngstown	Mahoning	345 OAKHILL	2009	061	8346	.020	.017	0	.041	.038	0	.069	.062	.0039		0
39-103-0004	1	0012	Not in a city	Medina	BALLASH ROAD	2009	060	2906	.014	.009	0	.021	.021	0	.046	.034	.0021*		0
39-105-1001	1	0809	Pomeroy	Meigs	MULBERRY AVE.	2009	060	8376	.026	.022	0	.128	.091	0	.180	.152	.0031		0
39-115-0004	1	0809	Not in a city	Morgan	S.R. 83	2009	100	8359	.043	.040	0	.226	.164	0	.438	.234	.0053		0
39-145-0013	1	0880	New Boston	Scioto	4862 GALLIA	2009	061	8300	.012	.011	0	.030	.021	0	.039	.038	.0017		0
39-145-0020	1	1299	Franklin Furnace	Scioto	2840 BACK RD.	2009	060	8717	.014	.012	0	.029	.027	0	.043	.040	.0037		0
39-145-0022	1	1299	Franklin Furnace	Scioto	1740 GALLIA PIKE	2009	060	8716	.013	.011	0	.038	.032	0	.077	.045	.0030		0
39-153-0017	1	0012	Akron	Summit	80 BRITTAIN	2009	100	8283	.011	.010	0	.024	.023	0	.040	.035	.0027		0
39-153-0022	1	0012	Akron	Summit	177 S. BROADWAY	2009	100	8308	.015	.013	0	.031	.028	0	.065	.042	.0023		0
39-157-0006	1	0809	Sugarcreek	Tuscarawas	527 CRESCENT DR.	2009	100	8380	.032	.022	0	.072	.054	0	.081	.072	.0040		0

Note: The * indicates that the mean does not satisfy summary criteria.

Nitrogen Dioxide (NO_2)

Nitrogen dioxide is a toxic gas formed in high temperature combustion processes, when nitrogen in the air is oxidized to nitric oxide (NO) or nitrogen dioxide (NO_2). The major sources of NO_2 are high temperature fuel combustion, motor vehicles, and certain chemical processes.

Nitrogen dioxide has been associated with a variety of respiratory diseases through its ability to reduce cell immunity or resistance to bacteria and viruses. Nitrogen dioxide is also harmful due to its involvement in the production of photochemical oxidants such as ozone (O_3).

Sampling Methods

Continuous monitoring of nitrogen dioxide is based on a chemiluminescent reaction between NO and O_3. When these two gases react, light energy at a specific wavelength is produced. In the monitor, ambient air is drawn along two paths. In the first path, the air is reacted directly with ozone, and the light energy produced is proportional to the amount of nitric oxide in the air. In the second path, the air is reacted with ozone after it passes through a catalytic reduction surface. The reduction surface converts NO_2 to NO and the light energy produced is a measure of the total oxides of nitrogen in the air sample. The electronic difference of these two signals yields the concentration of nitrogen dioxide.

All concentrations for NO_2 are given in parts per million (ppm).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Nitrogen dioxide (42602) | Ohio | Parts per million (007)

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	# OBS	1ST MAX 1-HR	2ND MAX 1-HR	ARITH MEAN	CERT	EDT
39-009-0004	1	1335	Athens	Athens	7760 BLACKBURN ROAD	2009	099	8185	.036	.036	.0042		0
39-035-0060	1	0229	Cleveland	Cuyahoga	E. 14TH & ORANGE	2009	000	6764	.083	.075	.0171		0
39-061-0040	1	1259	Cincinnati	Hamilton	250 WM. HOWARD TAFT	2009	000	8680	.056	.055	.0143		0
39-103-0004	1	0012	Not in a city	Medina	BALLASH ROAD	2009	074	2908	.039	.039	.0063*		0

Note: The * indicates that the mean does not satisfy summary criteria.

Carbon Monoxide (CO)

Carbon monoxide, a colorless and odorless gas, is the most abundant and widely distributed pollutant found in the lower atmosphere. It is produced by the incomplete combustion of carbon containing fuels, primarily in the internal combustion engine. About 95 to 98% of urban carbon monoxide comes from manmade sources, with transportation vehicles ranking as the largest source.

The main effect of CO on human health involves its tendency to reduce the oxygen carrying capacity of the blood by binding chemically to hemoglobin, the substance that carries oxygen to the cells. This may lead to short-term impairment of mental processes. Exposure to concentrations as low as 10-15 ppm for several hours has affected time interval discrimination in test subjects, while exposures of 31 ppm under similar conditions have temporarily altered the function of the brain.

Sampling Method

Carbon monoxide is monitored continuously by analyzers that operate on the infrared absorption principle. Ambient air is drawn into a sample chamber and a beam of infrared light is passed through it. CO absorbs infrared radiation, and any decrease in the intensity of the beam is due to the presence of CO molecules. This decrease is directly related to the concentration of CO in the ambient air. A special detector measures the difference in the radiation between this beam and a duplicate beam passing through a reference chamber with no CO present. This difference in intensity is electronically translated into a reading of the CO present in the ambient air, measured in parts per million.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Carbon monoxide (42101) | Ohio | Parts per million (007)

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	# OBS	1ST MAX 1-HR	2ND MAX 1-HR	OBS >35	1ST MAX 8-HR	2ND MAX 8-HR	OBS >9	CERT	EDT
39-009-0004	1	1335	Athens	Athens	7760 BLACKBURN ROAD	2009	093	8283	1.3	1.3	0	1.2	1.2	0		0
39-035-0051	1	0229	Cleveland	Cuyahoga	1301 E. 9TH ST.	2009	000	8258	18.8	17.3	0	7.1	6.6	0		0
39-035-0053	1	0229	Cleveland	Cuyahoga	4169 PEARL RD.	2009	093	8635	5.0	2.0	0	1.2	1.0	0		0
39-035-0070	1	0229	Cleveland	Cuyahoga	13013 CORLETT AVE.	2009	093	6196	2.6	2.4	0	1.9	1.7	0		0
39-049-0005	1	0805	Columbus	Franklin	1585 MORSE RD.	2009	093	8419	3.1	2.2	0	1.6	1.5	0		0
39-061-0021	1	1259	Cincinnati	Hamilton	100 E. 5TH ST.	2009	093	8508	2.3	1.9	0	1.1	1.1	0		0
39-085-0006	1	0595	Mentor	Lake	8443 MENTOR AVE.	2009	051	8682	1.2	1.2	0	1.0	1.0	0		0
39-103-0004	1	0012	Not in a city	Medina	BALLASH ROAD	2009	054	2917	1.8	1.6	0	.9	.8	0		0
39-113-0028	1	0287	Dayton	Montgomery	901 WEST FAIRVIEW AVE.	2009	054	7713	2.2	2.2	0	1.5	1.2	0		0
39-113-0034	1	0287	Dayton	Montgomery	117 SOUTH MAIN ST.	2009	054	8728	2.4	2.3	0	1.7	1.6	0		0
39-151-0020	1	0151	Canton	Stark	420 MARKET	2009	054	8598	1.9	1.8	0	1.4	1.4	0		0
39-153-0020	1	0012	Akron	Summit	800 PATTERSON AVE.	2009	000	8430	2.0	2.0	0	2.0	1.8	0		0
39-153-0022	1	0012	Akron	Summit	177 S. BROADWAY	2009	093	8187	6.0	5.8	0	3.5	2.1	0		0

Ozone (O_3)

Ozone differs from other pollutants in that it is not directly emitted into the atmosphere from sources. Rather, it is created photochemically in the lower atmosphere by the reaction of volatile organic compounds and oxides of nitrogen in the presence of sunlight. For this reason, it is referred to as a secondary pollutant. Ozone is the predominant oxidant component of photochemical smog.

In urban areas, emissions of nitrogen oxides and volatile organic compounds lead to the formation of ozone and other photochemical oxidants in the lower atmosphere. Nitrogen oxides, important in triggering the sequence of photochemical reactions, are emitted primarily from combustion sources such as the internal combustion engine, electric power generation units, and gas and oil-fired space heaters. Volatile organic compounds, important in sustaining the reactions, are emitted in the exhausts of gasoline, diesel and jet engines, through the evaporation of gasoline and solvents such as dry-cleaning fluids, and from industrial and non-industrial surface coating operations such as paint booths, from open burning, and other combustion sources.

Although ozone is beneficial in the upper atmosphere, where it screens out ultraviolet rays from the sun, it is harmful in the lower atmosphere. Due to the role of temperature and sunlight in its formation, the largest concentrations occur during the summer months. Ozone irritates mucous membranes of the nose and throat, causes eye irritation, reduces resistance to respiratory infections, damages plants and contributes to the deterioration of materials. Individuals with asthma or disease of the heart or circulatory system experience symptoms when concentrations are above the air quality standards.

Prior to July 1997 there was a one hour standard of 0.12 ppm with more than three exceedances being a violation of the standard. The one hour standard was revoked in 2006.

The standard from July 1997 to May 27, 2008 was an eight hour average of 0.08 ppm with the fourth high eight hour average averaged in each year over three consecutive years.

The current (2009) standard is a three year average of the fourth highest eight hour averages at each monitoring site. If that three year average is greater than 0.075 ppm (76 ppb or greater) a violation of the standard has occurred

In 2001 The United States Supreme Court found U.S. EPA's previously proposed implementation plan for ozone unlawful and further held that, in the setting of a standard for ozone pursuant to Section 109 of the Clean Air Act U.S. EPA must set air quality standards at the level that is "requisite"-no higher or lower than is necessary-to protect the public health with an adequate margin of safety. The Supreme Court then sent the case back to the D.C. Circuit Court of Appeals to review U.S. EPA's subsequent actions. On March 26, 2002, that court upheld U.S. EPA's revision of the ozone NAAQS, which had been published in the Federal Register by U.S. EPA as a proposal on November 14, 2001.

This report contains a printout of the one hour data and eight hour average data, as in previous reports, and printouts of the three year average of the fourth high eight hour averages calculated for each site in Ohio for the years 2007 through 2009 and the four highest eight hour averages during 2009. A three year average was not calculated if one or more years had insufficient data.

Sampling Methods

Ozone is monitored continuously using analyzers that operate on ultraviolet absorption techniques.

Ozone absorbs ultraviolet light. Analyzers designed to measure ozone by ultraviolet photometry use this property. An air sample is drawn into the analyzer and irradiated with an ultraviolet light of 253.7 nanometers wavelength. The amount of light absorbed is related to the amount of ozone present. This is the type of monitor used by Ohio EPA and our Local Air Agencies.

All concentrations for ozone are given in parts per million (ppm).

On the following pages are tables of ozone sites with the:

- Highest through fourth highest 1-Hour ozone values
- Highest through fourth highest 8-Hour ozone values
- Three year average of fourth highest 8-Hour ozone values (see NAAQS TABLE 1)
- First day in each year from 1992 that recorded an exceedance of the 1-Hour or 8-Hour standard with the number of sites and the total number of exceedances
- Last day in the year upon which an exceedance of the 1-Hour or 8-Hour standard occurred with the number of sites and values listed

Ozone (44201) Ohio Parts per million (007)

1-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 1-HR	2ND MAX 1-HR	3RD MAX 1-HR	4TH MAX 1-HR	DAY MAX>/= 0.125	EST DAYS>/= .125	MISS DAYS< 0.125	CERT	EDT
39-003-0002	1	0808	Not in a city	Allen	2650 BIBLE RD.	2009	047	66	214	.076	.075	.075	.074	0	0.0	0		0
39-003-0009	1	0808	Not in a city	Allen	2850 BIBLE ROAD	2009	047	143	214	.078	.077	.074	.074	0	0.0	1		0
39-007-1001	1	0807	Conneaut	Ashtabula	770 LAKE RD.	2009	047	212	214	.099	.090	.089	.085	0	0.0	2		0
39-009-0004	1	1335	Athens	Athens	7760 BLACKBURN ROAD	2009	056	204	214	.078	.076	.075	.072	0	0.0	2		0
39-017-0004	1	1259	Hamilton	Butler	SCHULER AND BENDER	2009	087	212	214	.088	.087	.084	.080	0	0.0	2		0
39-017-1004	3	1259	Middletown	Butler	HOOK FIELD AIRPORT	2009	087	214	214	.095	.085	.083	.083	0	0.0	0		0
39-023-0001	1	0287	Springfield	Clark	5171 URBANA	2009	047	214	214	.084	.081	.079	.077	0	0.0	0		0
39-023-0003	1	0287	Not in a city	Clark	5400 SPANGLER	2009	047	214	214	.084	.083	.079	.078	0	0.0	0		0
39-025-0022	1	1259	Batavia	Clermont	2400 CLERMONT CENTER DR.	2009	087	214	214	.082	.081	.080	.074	0	0.0	0		0
39-027-1002	1	0810	Wilmington	Clinton	62 LAUREL DR.	2009	047	209	214	.090	.079	.078	.076	0	0.0	2		0
39-035-0034	1	0229	Cleveland	Cuyahoga	891 E. 152 ST.	2009	087	213	214	.088	.079	.079	.078	0	0.0	1		0
39-035-0064	1	0229	Berea	Cuyahoga	390 FAIR ST.	2009	000	213	214	.078	.075	.069	.068	0	0.0	1		0
39-035-5002	1	0229	Mayfield	Cuyahoga	6116 WILSON MILLS	2009	019	214	214	.088	.078	.075	.075	0	0.0	0		0
39-041-0002	1	0805	Delaware	Delaware	359 MAIN RD.	2009	047	214	214	.080	.079	.076	.076	0	0.0	0		0
39-049-0029	1	0805	New Albany	Franklin	7600 FODOR RD.	2009	047	214	214	.086	.084	.077	.077	0	0.0	0		0
39-049-0037	1	0805	Columbus	Franklin	1777 E. BROAD	2009	047	214	214	.086	.076	.075	.075	0	0.0	0		0
39-049-0081	1	0805	Columbus	Franklin	5750 MAPLE CANYON	2009	047	213	214	.083	.081	.076	.075	0	0.0	1		0
39-055-0004	1	0595	Not in a city	Geauga	13000 AUBURN	2009	000	211	214	.088	.080	.076	.075	0	0.0	0		0
39-057-0006	1	0287	Xenia	Greene	541 LEDBETTER RD.,	2009	047	214	214	.086	.084	.081	.080	0	0.0	0		0
39-061-0006	1	1259	Cincinnati	Hamilton	11590 GROOMS RD	2009	087	211	214	.085	.082	.081	.081	0	0.0	1		0
39-061-0010	1	1259	Cleves	Hamilton	6950 RIPPLE RD.	2009	087	175	214	.079	.073	.071	.070	0	0.0	3		0
39-061-0040	1	1259	Cincinnati	Hamilton	250 WM. HOWARD TAFT	2009	087	211	214	.084	.083	.081	.081	0	0.0	0		0

Ozone (44201) Ohio Parts per million (007)

1-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 1-HR	2ND MAX 1-HR	3RD MAX 1-HR	4TH MAX 1-HR	DAY MAX>/= 0.125	EST DAYS>/= .125	MISS DAYS< 0.125	CERT	EDT
39-081-0017	1	0809	Steubenville	Jefferson	618 LOGAN ST.	2009	047	214	214	.076	.073	.072	.072	0	0.0	0		0
39-083-0002	1	0805	Centerburg	Knox	WATER PLT, SR. 314	2009	047	212	214	.078	.077	.073	.073	0	0.0	0		0
39-085-0003	1	0595	Eastlake	Lake	36010 LAKESHORE	2009	000	206	214	.101	.092	.086	.084	0	0.0	1		0
39-085-0007	1	0595	Painesville	Lake	177 MAIN STREET	2009	000	211	214	.087	.082	.079	.078	0	0.0	1		0
39-087-0006	1	0880	Ironton	Lawrence	2120 S. 8TH	2009	019	213	214	.077	.075	.075	.074	0	0.0	1		0
39-087-0011	1	0880	Not in a city	Lawrence	S.R. 141, WILGUS	2009	019	213	214	.078	.073	.071	.071	0	0.0	1		0
39-089-0005	1	0805	Heath (Fourmile Lock)	Licking	300 LICKING VIEW DR.	2009	047	214	214	.089	.080	.078	.076	0	0.0	0		0
39-093-0018	1	0807	Sheffield	Lorain	4706 DETROIT RD.	2009	047	212	214	.078	.070	.070	.068	0	0.0	2		0
39-095-0024	1	0220	Toledo	Lucas	348 S. ERIE	2009	056	213	214	.079	.077	.072	.072	0	0.0	1		0
39-095-0027	1	0220	Waterville	Lucas	200 SOUTH RIVER RD.	2009	019	212	214	.080	.078	.078	.074	0	0.0	0		0
39-095-0034	1	0220	Not in a city	Lucas	306 N. YONDOTA	2009	056	207	214	.095	.089	.089	.083	0	0.0	3		0
39-097-0007	1	0805	Not in a city	Madison	940 SR 38 SW	2009	047	214	214	.079	.078	.077	.076	0	0.0	0		0
39-099-0013	1	0634	Youngstown	Mahoning	345 OAKHILL	2009	087	214	214	.075	.074	.072	.072	0	0.0	0		0
39-103-0003	1	0012	Not in a city	Medina	6364 DEERVIEW	2009	087	213	214	.075	.073	.073	.072	0	0.0	1		0
39-103-0004	1	0012	Not in a city	Medina	BALLASH ROAD	2009	047	61	214	.077	.073	.072	.065	0	0.0	0		0
39-109-0005	1	0287	Not in a city	Miami	3825 NORTH S. R. 589	2009	047	214	214	.084	.078	.075	.075	0	0.0	0		0
39-113-0037	1	0287	Dayton	Montgomery	1401 Harshman Road	2009	047	210	214	.086	.080	.080	.080	0	0.0	0		0
39-133-1001	1	0012	Not in a city	Portage	1570 RAVENNA RD.	2009	000	210	214	.079	.075	.072	.071	0	0.0	1		0
39-135-1001	1	0287	Not in a city	Preble	NATIONAL TRAILS	2009	047	214	214	.084	.077	.074	.074	0	0.0	0		0
39-151-0016	1	0151	Canton	Stark	515 25TH. ST.	2009	047	203	214	.077	.076	.073	.072	0	0.0	4		0
39-151-0023	1	0151	Wilmot	Stark	9877 ALABAMA AVE. SW	2009	047	141	214	.072	.071	.070	.069	0	0.0	4		0
39-151-4005	1	0151	Alliance	Stark	1175 WEST VINE	2009	047	185	214	.072	.069	.067	.066	0	0.0	6		0

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Ozone (44201) | Ohio | Parts per million (007)

1-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 1-HR	2ND MAX 1-HR	3RD MAX 1-HR	4TH MAX 1-HR	DAY MAX>/= 0.125	EST DAYS>/= .125	MISS DAYS< 0.125	CERT	EDT
39-153-0020	1	0012	Akron	Summit	800 PATTERSON AVE.	2009	087	212	214	.081	.080	.079	.078	0	0.0	0		0
39-155-0009	1	0634	Not in a city	Trumbull	6346 KINSMAN-BLOOMFIELD RD.	2009	056	214	214	.086	.076	.076	.074	0	0.0	0		0
39-155-0011	1	0634	Vienna Center	Trumbull	842 YOUNGSTOWN-KINGSVILLE RD.	2009	087	214	214	.080	.074	.074	.072	0	0.0	0		0
39-165-0007	1	1259	Lebanon	Warren	416 SOUTHEAST ST.	2009	087	214	214	.089	.087	.084	.083	0	0.0	0		0
39-167-0004	1	0809	Marietta	Washington	2000 4TH STREET	2009	047	214	214	.075	.074	.073	.072	0	0.0	0		0
39-173-0003	1	0808	Bowling Green	Wood	347 N DUNBRIDGE	2009	047	214	214	.077	.077	.075	.074	0	0.0	0		0

Ozone (44201) | Ohio | Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX > 0.075	CERT	EDT
39-003-0002	1	0808	Not in a city	Allen	2650 BIBLE RD.	2009	047	30	64	214	.072	.071	.068	.067	0		0
39-003-0009	1	0808	Not in a city	Allen	2850 BIBLE ROAD	2009	047	66	142	214	.072	.071	.070	.069	0		0
39-007-1001	1	0807	Conneaut	Ashtabula	770 LAKE RD.	2009	047	97	208	214	.085	.078	.076	.075	3		0
39-009-0004	1	1335	Athens	Athens	7760 BLACKBURN ROAD	2009	056	95	204	214	.073	.069	.068	.067	0		0
39-017-0004	1	1259	Hamilton	Butler	SCHULER AND BENDER	2009	087	98	210	214	.079	.078	.074	.073	2		0
39-017-1004	3	1259	Middletown	Butler	HOOK FIELD AIRPORT	2009	087	100	214	214	.078	.076	.076	.076	4		0
39-023-0001	1	0287	Springfield	Clark	5171 URBANA	2009	047	100	214	214	.076	.074	.072	.071	1		0
39-023-0003	1	0287	Not in a city	Clark	5400 SPANGLER	2009	047	100	214	214	.075	.075	.072	.072	0		0
39-025-0022	1	1259	Batavia	Clermont	2400 CLERMONT CENTER DR.	2009	087	99	212	214	.071	.071	.069	.069	0		0
39-027-1002	1	0810	Wilmington	Clinton	62 LAUREL DR.	2009	047	96	205	214	.073	.072	.071	.070	0		0
39-035-0034	1	0229	Cleveland	Cuyahoga	891 E. 152 ST.	2009	087	99	212	214	.082	.073	.071	.071	1		0
39-035-0064	1	0229	Berea	Cuyahoga	390 FAIR ST.	2009	000	99	212	214	.063	.063	.062	.062	0		0
39-035-5002	1	0229	Mayfield	Cuyahoga	6116 WILSON MILLS	2009	019	99	211	214	.075	.073	.069	.069	0		0
39-041-0002	1	0805	Delaware	Delaware	359 MAIN RD.	2009	047	99	211	214	.075	.071	.070	.070	0		0
39-049-0029	1	0805	New Albany	Franklin	7600 FODOR RD.	2009	047	100	214	214	.079	.074	.074	.073	1		0
39-049-0037	1	0805	Columbus	Franklin	1777 E. BROAD	2009	047	100	213	214	.074	.071	.070	.070	0		0
39-049-0081	1	0805	Columbus	Franklin	5750 MAPLE CANYON	2009	047	98	210	214	.073	.073	.069	.069	0		0
39-055-0004	1	0595	Not in a city	Geauga	13000 AUBURN	2009	000	99	211	214	.075	.071	.071	.068	0		0
39-057-0006	1	0287	Xenia	Greene	541 LEDBETTER RD.,	2009	047	100	214	214	.076	.075	.074	.071	1		0
39-061-0006	1	1259	Cincinnati	Hamilton	11590 GROOMS RD	2009	087	98	209	214	.080	.076	.075	.072	2		0
39-061-0010	1	1259	Cleves	Hamilton	6950 RIPPLE RD.	2009	087	80	172	214	.069	.066	.065	.065	0		0
39-061-0040	1	1259	Cincinnati	Hamilton	250 WM. HOWARD TAFT	2009	087	99	211	214	.077	.076	.074	.074	2		0

Ozone (44201) — Ohio — Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX > 0.075	CERT	EDT
39-081-0017	1	0809	Steubenville	Jefferson	618 LOGAN ST.	2009	047	99	212	214	.068	.067	.066	.064	0		0
39-083-0002	1	0805	Centerburg	Knox	WATER PLT, SR. 314	2009	047	99	211	214	.070	.070	.069	.068	0		0
39-085-0003	1	0595	Eastlake	Lake	36010 LAKESHORE	2009	000	94	202	214	.088	.086	.079	.072	3		0
39-085-0007	1	0595	Painesville	Lake	177 MAIN STREET	2009	000	99	211	214	.078	.076	.074	.072	2		0
39-087-0006	1	0880	Ironton	Lawrence	2120 S. 8TH	2009	019	99	212	214	.065	.064	.064	.063	0		0
39-087-0011	1	0880	Not in a city	Lawrence	S.R. 141, WILGUS	2009	019	100	213	214	.073	.067	.064	.062	0		0
39-089-0005	1	0805	Heath (Fourmile Lock)	Licking	300 LICKING VIEW DR.	2009	047	100	213	214	.076	.072	.071	.069	1		0
39-093-0018	1	0807	Sheffield	Lorain	4706 DETROIT RD.	2009	047	99	211	214	.068	.065	.064	.064	0		0
39-095-0024	1	0220	Toledo	Lucas	348 S. ERIE	2009	056	100	213	214	.068	.067	.066	.065	0		0
39-095-0027	1	0220	Waterville	Lucas	200 SOUTH RIVER RD.	2009	019	97	208	214	.071	.071	.069	.068	0		0
39-095-0034	1	0220	Not in a city	Lucas	306 N. YONDOTA	2009	056	96	205	214	.087	.080	.073	.072	2		0
39-097-0007	1	0805	Not in a city	Madison	940 SR 38 SW	2009	047	100	213	214	.074	.070	.068	.068	0		0
39-099-0013	1	0634	Youngstown	Mahoning	345 OAKHILL	2009	087	100	214	214	.070	.069	.068	.065	0		0
39-103-0003	1	0012	Not in a city	Medina	6364 DEERVIEW	2009	087	100	213	214	.071	.068	.066	.066	0		0
39-103-0004	1	0012	Not in a city	Medina	BALLASH ROAD	2009	047	29	61	214	.071	.068	.066	.062	0		0
39-109-0005	1	0287	Not in a city	Miami	3825 NORTH S. R. 589	2009	047	100	214	214	.072	.072	.072	.071	0		0
39-113-0037	1	0287	Dayton	Montgomery	1401 Harshman Road	2009	047	98	210	214	.079	.073	.073	.073	1		0
39-133-1001	1	0012	Not in a city	Portage	1570 RAVENNA RD.	2009	000	97	208	214	.069	.066	.063	.063	0		0
39-135-1001	1	0287	Not in a city	Preble	NATIONAL TRAILS	2009	047	100	214	214	.076	.073	.070	.069	1		0
39-151-0016	1	0151	Canton	Stark	515 25TH. ST.	2009	047	93	200	214	.069	.067	.066	.066	0		0
39-151-0023	1	0151	Wilmot	Stark	9877 ALABAMA AVE. SW	2009	047	63	135	214	.067	.066	.064	.063	0		0

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Ozone (44201) | Ohio | Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX > 0.075	CERT	EDT
39-151-4005	1	0151	Alliance	Stark	1175 WEST VINE	2009	047	82	175	214	.063	.062	.062	.061	0		0
39-153-0020	1	0012	Akron	Summit	800 PATTERSON AVE.	2009	087	99	211	214	.072	.071	.071	.071	0		0
39-155-0009	1	0634	Not in a city	Trumbull	6346 KINSMAN-BLOOMFIELD RD.	2009	056	100	213	214	.073	.071	.070	.069	0		0
39-155-0011	1	0634	Vienna Center	Trumbull	842 YOUNGSTOWN-KINGSVILLE RD.	2009	087	100	214	214	.073	.071	.071	.069	0		0
39-165-0007	1	1259	Lebanon	Warren	416 SOUTHEAST ST.	2009	087	100	213	214	.080	.080	.078	.077	4		0
39-167-0004	1	0809	Marietta	Washington	2000 4TH STREET	2009	047	100	213	214	.070	.068	.067	.067	0		0
39-173-0003	1	0808	Bowling Green	Wood	347 N DUNBRIDGE	2009	047	100	214	214	.071	.070	.070	.069	0		0

Three Year Average of Fourth High 8-Hr Averages

Site ID	City	County	Address	4th high in Year			3 Year
				2007	2008	2009	Average
39-003-0002		Allen	2650 Bible Rd.	0.078	0.067		
39-003-0009		Allen	2650 Bible Rd.			0.071	
39-007-1001	Conneaut	Ashtabula	JQ Conneaut Water Plant	0.092	0.075	0.075	0.080
39-017-0004	Hamilton	Butler	Schuler & Bender Rds.	0.091	0.071	0.073	0.078
39-017-1004	Middletown	Butler	Hook Field Municipal Airport	0.091	0.079	0.076	0.082
39-023-0001		Clark	5171 Urbana Rd.	0.078	0.075	0.071	0.074
39-023-0003		Clark	5400 Spangler Rd.	0.078	0.075	0.072	0.075
39-025-0022		Clermont	2400 Claremont Center Dr.	0.086	0.071	0.069	0.075
39-027-1002		Clinton	62 Laurel Rd.	0.082	0.076	0.070	0.076
39-035-0034	Cleveland	Cuyahoga	891 E. 152nd St.	0.080	0.081	0.071	0.077
39-035-0064	Berea	Cuyahoga	390 Fair St.	0.083	0.072	0.062	0.072
39-035-5002	Mayfield	Cuyahoga	6116 Wilson Mill Rd.	0.080	0.083	0.069	0.077
39-041-0002		Delaware	359 Main Rd.	0.080	0.075	0.070	0.075
39-049-0028	Columbus	Franklin	2521 Fairwood Ave.	0.078	0.069		
39-049-0029	New Albany	Franklin	7600 Fodor Rd.	0.087	0.083	0.073	0.081
39-049-0037	Columbus	Franklin	1777 E. Broad St.	0.079	0.071	0.070	0.073
39-049-0081	Columbus	Franklin	5750 Maple Canyon	0.079	0.066	0.069	0.071
39-055-0004		Geauga	13000 Auburn Rd.	0.068	0.082	0.068	0.072
39-057-0006	Xenia	Greene	541 Ledbetter Rd.	0.077	0.075	0.071	0.074
39-061-0006		Hamilton	11590 Grooms Rd.	0.089	0.086	0.072	0.082
39-061-0010		Hamilton	6950 Ripple Rd.	0.086	0.077	0.065	0.076
39-061-0040	Cincinnati	Hamilton	250 Wm. Howard Taft	0.086	0.080	0.074	0.080
39-081-0017	Steubenville	Jefferson	618 Logan	0.079	0.073	0.064	0.072
39-083-0002		Knox	Water Plant SR 3	0.080	0.074	0.068	0.074
39-085-0003	Eastlake	Lake	Jefferson Elementary	0.074	0.078	0.072	0.074
39-085-0007	Painesville	Lake	177 Main St.			0.072	
39-085-3002	Painesville	Lake	71 E. High St.	0.079	0.076		
39-087-0006	Ironton	Lawrence	2120 S. 8th St.	0.076	0.082	0.063	0.073
39-087-0011		Lawrence	SR 775 & SR	0.082	0.074	0.062	0.072
39-089-0005	Heath	Licking	300 Licking View	0.078	0.074	0.069	0.073
39-093-0018	Lorain	Lorain	4706 Detroit Rd.	0.078	0.075	0.064	0.072
39-095-0024	Toledo	Lucas	348 S. Erie St.	0.081	0.071	0.065	0.072
39-095-0027	Waterville	Lucas	200 S. Byrne	0.075	0.073	0.068	0.072
39-095-0034	Toledo	Lucas	306 N. Yondota	0.078	0.073	0.072	0.074

Three Year Average of Fourth High 8-Hr Averages

Site ID	City	County	Address	4th high in Year			3 Year
				2007	2008	2009	Average
39-095-0081	Toledo	Lucas	Friendship Park	0.077			
39-097-0007		Madison	9940 SR 38 SW	0.083	0.071	0.068	0.074
39-099-0013	Youngstown	Mahoning	345 Oakhill Ave.	0.079	0.071	0.065	0.071
39-103-0003		Medina	6364 Deerview	0.069	0.075	0.066	0.070
39-109-0005		Miami	3825 North State	0.073	0.070	0.071	0.071
39-113-0033	Dayton	Montgomery	1404 Webster	0.074	0.077		
39-113-0037	Dayton	Montgomery	1401 Harshman Rd.			0.073	
39-133-1001		Portage	1570 Ravenna Rd.	0.084	0.069	0.063	0.072
39-135-1001		Preble	National Trails	0.073	0.068	0.069	0.070
39-151-0016	Canton	Stark	Malone College	0.084	0.077	0.066	0.075
39-151-0021		Stark	245 W. 5th St.	0.085	0.076		
39-151-0023	Wilmot	Stark	9877 Alabama Ave. SW			0.063	
39-151-4005	Alliance	Stark	1175 West Vine St.	0.087	0.077	0.061	0.075
39-153-0020	Akron	Summit	800 Patterson Av.	0.090	0.080	0.071	0.080
39-155-0009		Trumbull	Community Hall	0.081	0.076	0.069	0.075
39-155-0011		Trumbull	Trumbull Co. Sanitary Engineers	0.080	0.077	0.069	0.075
39-165-0007	Lebanon	Warren	416 Southeast St.	0.088	0.082	0.077	0.082
39-167-0004	Marietta	Washington	2000 Fourth St.	0.086	0.078	0.067	0.077
39-173-0003	Bowling Green	Wood	347 N. Dunbridge	0.083	0.070	0.069	0.074

Count of Ozone Exceedances in Each Year
And the Date Upon Which the First Occurred
The 8-Hour exceedance value used is 0.075 ppm

Year	1-Hr Data Date	Exceedances/Sites	8-Hr Data Date	Exceedances/Sites
1992	30 June	4/43	11 May	302/43
1993	17 June	9/44	29 April	610/44
1994	16 June	13/45	14 April	697/45
1995	19 June	15/45	23 May	832/45
1996	28 June	5/45	18 May	782/45
1997	24 June	5/50	4 April	614/50
1998	13 May	15/49	13 April	1155/49
1999	30 May	14/50	8 April	1121/50
2000	9 June	1/48	29 April	326/48
2001	14 June	2/50	8 April	738/50
2002	20 June	22/50	23 May	1436/50
2003	23 June	22/50	15 April	458/50
2004	None	0/50	8 April	178/50
2005	8 June	5/49	10 April	688/49
2006	None	0/49	27 May	236/49
2007	None	0/49	22 April	541/49
2008	None	0/49	17 April	171/49
2009	None	0/49	20 May	31/49

Last Ozone Exceedance Dates
1984-2009
One Hour Standard

Year	Date	Sites	Maximum Value
1984	9/21	1	135 ppb
1985	9/22	1	127
1986	9/14	1	127
1987	9/29	1	125
1988	8/18	3	159
1989	8/14	1	129
1990	8/27	2	155
1991	8/29	1	125
1992	7/09	1	218
1993	8/27	1	137
1994	8/25	1	153
1995	8/26	1	125
1996	8/04	1	131
1997	8/01	1	125
1998	9/14	2	139
1999	7/30	1	130
2000	6/09	1	126
2001	8/06	1	125
2002	9/07	1	127
2003	6/25	4	136
2004	none	0	107
2005	8/02	1	161
2006	none	0	112
2007	none	0	112
2008	none	0	112
2009	none	0	101

Last Ozone Exceedance Dates
1984-2009
Eight Hour Standard (0.075 ppm)

Year	Date	Sites	Maximum Value
1984	9/22	10	92 ppb
1985	9/22	6	108
1986	9/14	1	87
1987	9/29	1	87
1988	9/11	1	80
1989	10/14	1	78
1990	10/17	1	84
1991	10/09	1	78
1992	9/17	6	89
1993	9/13	7	78
1994	10/07	1	77
1995	10/13	1	78
1996	10/16	1	76
1997	10/08	11	83
1998	10/17	3	77
1999	10/30	5	80
2000	9/20	1	78
2001	9/23	1	78
2002	9/13	10	87
2003	9/17	1	76
2004	9/24	2	78
2005	10/04	1	81
2006	8/26	4	80
2007	10/08	3	80
2008	9/21	1	78
2009	6/27	1	76

Lead

Airborne lead in urban areas was once primarily caused by vehicles using leaded fuels. Sources of airborne lead now include lead smelting facilities, lead-acid storage battery manufacturing plants and other manufacturing operations.

In the period 1978-1991 lead concentrations at traffic oriented sites dropped by over 90%, reflecting the removal of lead from gasoline. In March 1999 the U.S. EPA promulgated new rules for lead monitoring that eliminated the requirement for traffic oriented sites and emphasizes monitoring at industrial sources. We discontinued monitoring at traffic oriented sites after the first calendar quarter of 1999.

In September 2008 the U.S. EPA changed the National Ambient Air Quality Standard for lead from 1.5 $\mu g/m^3$ as a calendar quarter average "not to be exceeded" to 0.15 $\mu g/m^3$ as a running three month average. This much stricter standard is designed to provide increased protection to the public, particularly children.

The new lead standard also requires increased monitoring at presumed lead sources that have emissions of greater than 1.0 ton per year. These source oriented sites are required to be in place and operating as of January 1, 2010. One site is also required in each Core Based Statistical Area (CBSA), essentially large urban areas, of over 500,000 persons. The population oriented sites are to be in place and operating no later than January 1, 2011.

Lead is a stable compound that can accumulate in the human body. Its health related effects include interference with the blood forming process and the normal functions of nervous and renal systems. Young children are the age group most susceptible to the adverse effects of lead.

Sampling Method

Lead concentrations in ambient air are determined by the reference method promulgated by U.S. EPA. The lead sample is collected on a filter using a high-volume air sampler and the TSP method. In this method, one ¾"×8" portion of the TSP filter is washed with hot, dilute nitric acid. The lead compounds are dissolved into the acid solution. The solution is then analyzed by the inductively coupled plasma-mass spectrometry (ICP-MS) technique to determine the amount of lead. Sample solutions are introduced by pneumatic nebulization into a plasma, in which desolvation, atomization and ionization occurs. Ions are extracted from the plasma through a differentially pumped vacuum interface and separated on the basis of their mass-to-charge ratio by a quadrupole mass spectrometer.

In the past a month's collection of filters was analyzed as a composite sample. Most sites collect so little lead that individual sampling days' analysis would have lead concentrations below the detection limit of the methods used at the time. Some sites' filters are still analyzed this way. Newer sites and sites that are being used to meet the new monitoring network requirements have individual sampling events (days) analyzed.

Sites that are reporting more than 12 observations (#OBS) in a year are having the individual samples analyzed.

Concentrations are reported in micrograms per cubic meter of air (µg/m^3).

Lead (TSP) STP (12128) — Ohio — Micrograms/cubic meter (25 C) (001)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	# OBS	QTR1 ARITH MEAN	QTR2 ARITH MEAN	QTR3 ARITH MEAN	QTR4 ARITH MEAN	# MEANS > 1.5	1ST MAX	2ND MAX	CERT	EDT
39-017-0015	2	1259	Middletown	Butler	3901 LEFFERSON	2009	110	12	.0036	.0037	.0049	.0069	0	.0082	.0067		0
39-029-0019	1	0807	East Liverpool	Columbiana	1250 GEORGE, COLUMBIANA PORT AUTHORITY	2009	110	12	.0099	.0162	.0121	.0137	0	.0230	.0190		0
39-029-0020	1	0807	East Liverpool	Columbiana	2220 MICHIGAN	2009	110	12	.0063	.0140	.0086	.0088	0	.0220	.0130		0
39-029-0022	1	0807	East Liverpool	Columbiana	500 MARYLAND	2009	110	12	.0055	.0117	.0107	.0184	0	.0330	.0180		0
39-035-0038	1	0229	Cleveland	Cuyahoga	2547 ST TIKHON	2009	110	12	.0078	.0100	.0135	.0100	0	.0160	.0150		0
39-035-0042	1	0229	Cleveland	Cuyahoga	3136 LORAIN AVE., F.S. 4	2009	110	12	.0064	.0085	.0105	.0096	0	.0130	.0130		0
39-035-0049	1	0229	Cleveland	Cuyahoga	E. 56TH ST.	2009	110	12	.1167	.0600	.0750	.1077	0	.2000	.1900		0
39-035-0049	2	0229	Cleveland	Cuyahoga	E. 56TH ST.	2009	110	30			.0826	.1296	0	.6600	.3500		0
39-035-0049	3	0229	Cleveland	Cuyahoga	E. 56TH ST.	2009	110	10				.1253*	0	.6800	.2700		0
39-035-0050	1	0229	Cleveland	Cuyahoga	GRANT RD.	2009	110	12	.0226	.0288	.0183	.0313	0	.0620	.0610		0
39-035-0061	2	0229	Cleveland	Cuyahoga	W. SIDE OF WEST 3RD.	2009	110	12	.0067	.0107	.0131	.0097	0	.0180	.0130		0
39-049-0025	1	0805	Columbus	Franklin	1700 ANN ST.	2009	110	12	.0069	.0109	.0097	.0091	0	.0160	.0140		0
39-051-0001	1	0808	Delta	Fulton	200 VAN BUREN	2009	110	12	.1033	.0807	.0883	.0813	0	.1700	.1400		0
39-051-0001	2	0808	Delta	Fulton	200 VAN BUREN	2009	110	26			.0884	.0924*	0	.5500	.4400		0
39-051-0001	3	0808	Delta	Fulton	200 VAN BUREN	2009	110	25			.0864	.0905*	0	.4700	.4400		0
39-091-0003	1	0810	Bellefontaine	Logan	1222 SUPERIOR	2009	110	12	.0102	.0099	.0606	.0417	0	.1700	.0680		0
39-091-0003	2	0810	Bellefontaine	Logan	1222 SUPERIOR	2009	110	28			.0694	.0371	0	.7900	.2000		0
39-091-0003	3	0810	Bellefontaine	Logan	1222 SUPERIOR	2009	110	28			.0707	.0309	0	.7900	.1100		0
39-091-0006	1	0810	Bellefontaine	Logan	320 RICHARD	2009	045	10	.0633	.0467	.0267	.0400*	0	.0900	.0800		0
39-091-0007	1	0443	Bellefontaine	Logan	1205 SUPERIOR	2009	045	10	.0400	.0400	.0433	.0300*	0	.0500	.0500		0
39-091-0008	1	0443	Bellefontaine	Logan	1215 GREENWOOD ST.	2009	045	10	.0633	.0400	.0333	.0200*	0	.0900	.0600		0
39-143-0019	1	0808	Clyde	Sandusky	615 VINE STREET	2009	110	12	.0038	.0053	.0056	.0047	0	.0065	.0063		0

Note: The * indicates that the mean does not satisfy summary criteria.

Lead (TSP) STP (12128) Ohio Micrograms/cubic meter (25 C) (001)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	# OBS	QTR1 ARITH MEAN	QTR2 ARITH MEAN	QTR3 ARITH MEAN	QTR4 ARITH MEAN	# MEANS > 1.5	1ST MAX	2ND MAX	CERT	EDT
39-167-0008	1	0809	Marietta	Washington	S.R. 676 WASHINGTON CAREER CENTER	2009	110	11	.0021	.0037	.0041	.0059	0	.0100	.0063		0
39-167-0010	1	0809	Marietta	Washington	115 VICTORY PLACE	2009	110	10	.0025	.0040	.0051	.0060	0	.0082	.0065		0

Note: The * indicates that the mean does not satisfy summary criteria.

VI. Air Toxics Monitoring 2009

AIR TOXICS MONITORING

INTRODUCTION

As part of its air quality monitoring program, Ohio EPA, Division of Air Pollution Control (DAPC) operates a network of air toxics monitors as part of a state wide Air Toxics Monitoring Program (ATMP). This Air Toxic sampling network is modeled after programs and methodologies recommended by U.S. EPA. The emphasis has been on urban toxics monitoring for volatile organic compounds and heavy metals. Brief sections describing the sampling and analytical procedures for the pollutants follow the introduction.

1.) Main focus of the ATMP is on urban monitoring, looking for major risk areas where people live. In this effort sampling has concentrated on groups of compounds.

volatile organic compounds (VOC), examples:
 benzene, chloroform, styrene, toluene etc.
heavy metals, examples:
 arsenic, cadmium

The majority of the sampling has been conducted at semi-permanent monitoring sites where monitoring extends beyond a 6 month period. The intermittent sampling stations at these types of sites have been dedicated to VOCs and heavy metals monitoring. See the list following the description of the volatile organic analysis method for the VOC target compounds. The list of target metals is included in the metals description section.

Semi-permanent monitoring projects have been conducted in:

- Cleveland - VOC - Urban, Metals - Urban
- Middletown - VOC - Source, Metals - Source
- Columbus - Metals - Urban, VOC - Urban
- Marietta - Metals - Source
- Delta - Metals - Source
- East Liverpool - Metals - Source
- Steubenville - VOC - Urban
- Marion - Metals - Urban
- Bellefontaine - Metals - Urban
- Elmore - Metals - Urban

2.) Throughout 2009 DAPC has worked to expand sampling at semi-permanent sites with an emphasis on smaller urban areas. Future sampling projects will involve additional sampling locations or reallocation of current resources to other locations. Expanded air toxics sampling will involve adding other parameters to existing sites. DAPC's efforts will also include more efficient use of short term sampling.

In the past sampling efforts have included:

Cross Media pollution monitoring	Urban air toxics
Great Lakes deposition monitoring	Source monitoring
Emissions verification	Complaint investigation
Emergency Episode Monitoring	Post-remediation Monitoring

During 2009 DAPC was involved in several minor monitoring projects throughout the state. However, due to the limited scope of these short term and grab sampling projects they are not included in the data summaries for this year.

The main project of this nature was the U.S. EPA sponsored the School Air Toxics Initiative, an effort developed to implement U.S. EPA Administrator Lisa Jackson's commitment to assess potentially elevated air toxics levels at some of our nation's schools. This initiative, involved sampling the air around 62 schools nationally, and 6 in Ohio communities. The parameters of interest included volatile organic compounds, metals, polyaromatic hydrocarbons and Diisocyanates over a 60 – 90 day period to allow for the collection at least 10 samples at each location. U.S. EPA will produce a full report for each of the schools involved in the sampling studies, results can be found at http://www.epa.gov/schoolair/ .

Ohio EPA DAPC's main special project for 2009 involved an environmental sampling project in the Clyde, Ohio area where a cancer cluster had been identified.

DAPC will compile a separate Clyde Air Sampling Report for the VOC sampling portion of the project. However, since the metals sampling part of that project only included one site that data summary is included in this report.

The sampling and analytical methods for VOCs and heavy metals are described below.

VOLATILE ORGANIC COMPOUND SAMPLING AND ANALYSIS

SAMPLING

A major component of the Air Toxics Monitoring Program is ambient sampling for volatile organic compounds (VOCs). These are compounds that are generally found in the vapor state. Some organic compounds can be chlorinated, (contain chlorine) or just hydrocarbons, (contain just hydrogen and carbon atoms). Most of the VOC samples were collected using a whole air sampling system that pumped ambient air into a stainless steel canister. The canister, which is evacuated prior to use, is a storage container which allows an air sample to be maintained virtually unchanged until it is analyzed. In addition to the pumped sampling method, a number of samples were collected using the vacuum of the canister to draw in an air sample. These, vacuum-filled "grab" samples usually take only a few minutes to collect and were useful for collecting transient odors or potentially high concentration samples. DAPC is now capable of collecting specific samples for 1, 3, 8 and 24 hours using this grab sampling method.

Initially samples were collected sporadically, however as semi-permanent sites were established the sampling program has become more routine. With that, an attempt has been made to collect samples at least twice a month, with a sampling frequency consistent with the national air toxics monitoring schedule of once every 12th day, over a 24 hour period. The specific procedures for this type of sampling can be found in the U.S. EPA Compendium of Methods for the Determination of Toxic Organic Compound in Ambient Air in the section TO-14

ANALYSIS

The volatile tendency of VOCs allows them to be vaporized when heated, (if not already in that form) and to be injected into an analytical device called a gas chromatograph (GC). As a sample passes through a GC column, the various compounds separate out of the sample mixture. As the individual compounds exit the column, a detector records a response. That response is illustrated on a chromatogram as a peak. The area of each peak indicates the concentration of the compound. Compound identification is accomplished by comparing the retention times of the peaks on a chromatogram with those from a chromatogram of a known mixture of compounds. Retention time is the time it takes for a particular compound to reach the detector. As long as the analytical conditions remain the same, a compound from one analysis to the next will have the same retention time.

The typical analytical system used for this study utilized a GC with a special detector called a mass spectrometer (MS). The combination, a GC/MS, can be used to analyze a sample by separating it into its individual components which are then broken down into mass fragments which form a fingerprint by which a compound can be identified.

All of DAPC's canister analyses were conducted at the Ohio EPA Division of Environmental Services (DES). The analytical procedures performed by the laboratory targeted an expanded list of 71 VOCs for identification and quantitation. The following list includes the current 71 parameters of the analytical target compounds list. Most of the target compounds have a detection limit of 0.2 ppbv. The Exceptions are Acetone, 2-Butanone, Carbon Disulfide, total m&p-Xylenes, which have limits 0.4 ppbv or higher depending of the sample concentration.

DES VOC Target Compound List for TO-14A Analysis

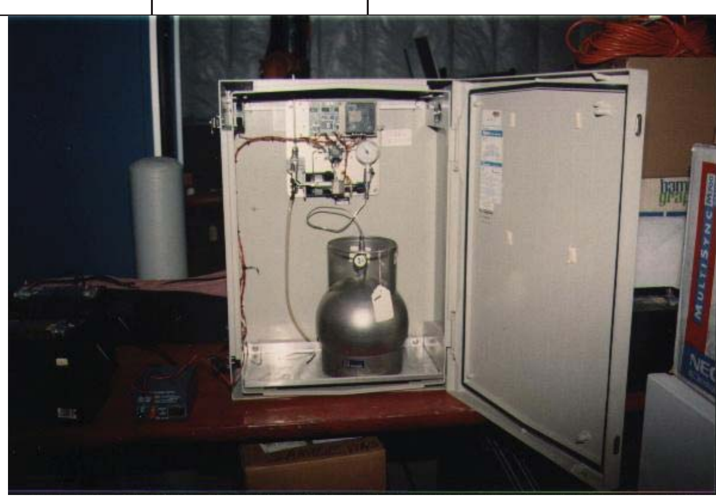
1 Acetone
2 Acetonitrile
3 Acrylonitrile
4 Benzene
5 Benzyl chloride
6 Bromodichloromethane
7 Bromoform
8 Bromomethane
9 1,3-Butadiene
10 n-Butane
11 2-Butanone
12 Carbon disulfide
13 Carbon tetrachloride
14 Chlorobenzene
15 Chlorodifluoromethane
16 Chloroethane
17 Chloroform
18 Chloromethane
19 3-Chloropropene
20 Cumene
21 Cyclohexane
22 Decane
23 Dibromochloromethane
24 1,2-Dibromoethane
25 Dibromomethane
26 1,2-Dichlorobenzene
27 1,3-Dichlorobenzene
28 1,4-Dichlorobenzene
29 Dichlorodifluoromethane
30 1,1-Dichloroethane
31 1,2-Dichloroethane
32 1,1-Dichloroethene
33 cis-1,2-Dichloroethene
34 trans-1,2-Dichloroethene
35 1,2-Dichloropropane
36 cis-1,3-Dichloropropene
37 trans-1,3-Dichloropropene
38 1,2-Dichloro-1,1,2,2-Tetrafluoroethane
39 n-Dodecane
40 Ethylbenzene
41 4-Ethyltoluene
42 n-Heptane
43 Hexachlorobutadiene
44 Hexane
45 Methyl-butyl ether
46 Methylene chloride
47 4-Methyl-2-pentanone
48 a-Methylstyrene
49 Naphthalene
50 n-Nonane
51 n-Octane
52 n-Pentane
53 Propylene
54 n-Propylbenzene
55 Styrene
56 1,1,2,2-Tetrachloroethane
57 Tetrachloroethylene
58 Toluene
59 1,2,4-Trichlorobenzene
60 1,1,1-Trichloroethane
61 1,1,2-Trichloroethane
62 Trichloroethene
63 Trichlorofluoromethane
64 1,1,2-Trichloro-1,2,2-Trifluoroethane
65 1,2,4-Trimethylbenzene
66 1,3,5-Trimethylbenzene
67 n-Undecane
68 Vinyl acetate
69 Vinyl chloride
70 o-Xylene
71 Total m&p-xylenes

Beyond this list of compounds, additional compounds can be detected and tentatively identified during the analysis of VOC samples. If during the analysis, an unidentified compound of significant quantity, (greater than 0.2 ppb) exist in a sample it can be identified during the MS analysis. However, due to the uncertainty involved with the identification of these additional, non-target compounds and the vast number of them detected they are not included in this report.

As the technology and the methods improve and new techniques are developed, it is expected that the target compounds list will be periodically modified. It is also expected that the list will change as U.S. EPA’s emphasis on air toxics compounds changes. The following tables summarize the data from the routine canister samples collected during 2009. Throughout 2009 over 200, 24-hour samples were collected at 9 permanent VOC monitoring sites.

SITE IDENTIFICATION AND LOCATION

AQS # 39-	CITY	COUNTY	ADDRESS	TABLE
-017-0003	Middletown	Butler	Verity school 1900 St. John’s Road	A
-035-0038	Cleveland	Cuyahoga	2547 St. Tikhon Ave.	B
-035-0068	Cleveland	Cuyahoga	7629 Broadway Ave.	C
-035-0069	Cleveland	Cuyahoga	7300 Superior Ave.	D
-049-0034	Columbus	Franklin	Korbel Ave.	E
-081-0017	Steubenville	Jefferson	618 Logan Street	F



2009 SUMMARY TABLE

VOLATILE ORGANIC COMPOUNDS DETECTED IN 2009 Summary Data of 177 Canister Samples				
COMPOUND LIST	Maximum	Average	Minimum	Frequency Detected
Acetone	950.00	10.44	1.50	177
Acetonitrile	0.99	0.34	0.20	92
Acrylonitrile	1.00	0.36	0.20	29
Benzene	28.00	1.62	0.20	121
1,3-Butadiene	0.28	0.25	0.23	4
n-Butane	11.00	1.80	0.25	177
2-Butanone	2.30	0.76	0.50	67
Carbon disulfide	0.70	0.64	0.58	4
Chlorodifluoromethane	9.80	0.43	0.20	174
Chloromethane	1.00	0.64	0.48	177
Cumene	0.21	0.21	0.21	1
Decane	8.80	4.33	0.50	20
1,4-Dichlorobenzene	0.44	0.38	0.31	3
Dichlorodifluoromethane	0.81	0.61	0.41	174
1,2-Dichloroethane	0.27	0.27	0.27	1
Ethylbenzene	0.37	0.26	0.20	7
4-Ethyltoluene	0.58	0.33	0.22	12
n-Heptane	1.80	0.51	0.21	17
Hexane	1.10	0.40	0.20	60
Methylene chloride	2.30	0.33	0.20	63
4-Methyl-2-pentanone	0.72	0.57	0.32	8
Naphthalene	31.00	2.70	0.23	20
n-Nonane	8.50	4.48	0.85	19
n-Octane	0.97	0.55	0.21	13
n-Pentane	3.10	0.74	0.21	166
n-Propylbenzene	0.69	0.34	0.21	13
Styrene	0.35	0.30	0.24	2
Toluene	5.70	0.79	0.20	133
Trichloroethene	0.33	0.27	0.21	2
Trichlorofluoromethane	2.20	0.35	0.25	174
1,2,4-Trimethylbenzene	2.70	1.15	0.27	19
1,3,5-Trimethylbenzene	0.87	0.45	0.23	14
n-Undecane	2.70	1.35	0.22	20
Vinyl acetate	2.20	0.50	0.21	111
o-Xylene	0.86	0.38	0.21	18
Total m&p-xylenes	2.10	0.81	0.42	27

Table A.

Butler County (AQS: 39-017-0003) Summary Data of 25 Canister Samples				
COMPOUND LIST	Maximum	Average	Minimum	Frequency Detected
Acetone	5.30	3.74	1.50	25
Acetonitrile	0.27	0.23	0.21	9
Acrylonitrile	0.27	0.26	0.25	2
Benzene	0.71	0.35	0.21	14
1,3-Butadiene				
n-Butane	5.10	1.11	0.25	25
2-Butanone	0.79	0.65	0.57	7
Carbon disulfide				
Chlorodifluoromethane	0.92	0.44	0.24	24
Chloromethane	0.76	0.61	0.51	25
Cumene				
Decane				
1,4-Dichlorobenzene				
Dichlorodifluoromethane	0.67	0.60	0.52	25
1,2-Dichloroethane				
Ethylbenzene				
4-Ethyltoluene				
n-Heptane				
Hexane	0.43	0.39	0.35	2
Methylene chloride	0.41	0.25	0.20	7
4-Methyl-2-pentanone				
Naphthalene				
n-Nonane				
n-Octane				
n-Pentane	1.50	0.52	0.21	23
n-Propylbenzene				
Styrene				
Toluene	1.30	0.49	0.20	14
Trichloroethene				
Trichlorofluoromethane	0.44	0.31	0.26	25
1,2,4-Trimethylbenzene				
1,3,5-Trimethylbenzene				
n-Undecane				
Vinyl acetate	0.81	0.42	0.21	19
o-Xylene				
Total m&p-xylenes	0.44	0.44	0.44	1

Table B.

Cuyahoga #1 (AQS: 39-035-0038) Summary Data of 20 Canister Samples				
COMPOUND LIST	Maximum	Average	Minimum	Frequency Detected
Acetone	950.00	56.97	2.30	20
Acetonitrile	0.98	0.50	0.27	18
Acrylonitrile	0.28	0.25	0.21	2
Benzene	0.44	0.30	0.21	12
1,3-Butadiene	0.28	0.26	0.23	3
n-Butane	5.40	2.38	0.52	20
2-Butanone	1.50	0.94	0.51	11
Carbon disulfide				
Chlorodifluoromethane	0.44	0.30	0.22	20
Chloromethane	0.86	0.65	0.53	20
Cumene	0.21	0.21	0.21	1
Decane	8.80	4.33	0.50	20
1,4-Dichlorobenzene				
Dichlorodifluoromethane	0.70	0.58	0.41	20
1,2-Dichloroethane				
Ethylbenzene	0.37	0.29	0.23	4
4-Ethyltoluene	0.58	0.33	0.22	12
n-Heptane	1.80	0.67	0.22	9
Hexane	1.10	0.58	0.22	15
Methylene chloride	2.30	0.62	0.20	8
4-Methyl-2-pentanone	0.72	0.57	0.32	8
Naphthalene				
n-Nonane	8.50	4.48	0.85	19
n-Octane	0.97	0.55	0.21	13
n-Pentane	3.10	1.03	0.41	17
n-Propylbenzene	0.69	0.34	0.21	13
Styrene				
Toluene	2.20	0.92	0.21	19
Trichloroethene	0.21	0.21	0.21	1
Trichlorofluoromethane	0.43	0.30	0.25	18
1,2,4-Trimethylbenzene	2.70	1.15	0.27	19
1,3,5-Trimethylbenzene	0.87	0.45	0.23	14
n-Undecane	2.70	1.35	0.22	20
Vinyl acetate	1.50	0.58	0.26	14
o-Xylene	0.86	0.44	0.23	13
Total m&p-xylenes	2.10	0.98	0.45	14

Table C.

Cuyahoga #2 (AQS: 39-035-0068) Summary Data of 23 Canister Samples				
COMPOUND LIST	Maximum	Average	Minimum	Frequency Detected
Acetone	6.90	4.10	1.50	23
Acetonitrile	0.99	0.36	0.21	13
Acrylonitrile				
Benzene	0.63	0.34	0.22	12
1,3-Butadiene				
n-Butane	6.10	1.77	0.43	23
2-Butanone	0.99	0.70	0.51	9
Carbon disulfide				
Chlorodifluoromethane	9.80	0.84	0.24	23
Chloromethane	0.81	0.63	0.52	23
Cumene				
Decane				
1,4-Dichlorobenzene				
Dichlorodifluoromethane	0.81	0.63	0.49	23
1,2-Dichloroethane				
Ethylbenzene				
4-Ethyltoluene				
n-Heptane				
Hexane	0.56	0.30	0.20	10
Methylene chloride	1.20	0.41	0.20	17
4-Methyl-2-pentanone				
Naphthalene				
n-Nonane				
n-Octane				
n-Pentane	1.80	0.74	0.26	23
n-Propylbenzene				
Styrene				
Toluene	1.30	0.53	0.21	19
Trichloroethene				
Trichlorofluoromethane	0.78	0.38	0.25	23
1,2,4-Trimethylbenzene				
1,3,5-Trimethylbenzene				
n-Undecane				
Vinyl acetate	0.50	0.40	0.21	11
o-Xylene				
Total m&p-xylenes	0.48	0.48	0.48	1

Table D.

Cuyahoga #3 (AQS: 39-035-0069) Summary Data of 24 Canister Samples				
COMPOUND LIST	Maximum	Average	Minimum	Frequency Detected
Acetone	17.00	6.92	1.60	24
Acetonitrile	0.54	0.30	0.21	11
Acrylonitrile	0.50	0.29	0.22	12
Benzene	0.91	0.42	0.21	24
1,3-Butadiene				
n-Butane	10.00	2.46	0.46	24
2-Butanone	0.98	0.68	0.52	7
Carbon disulfide				
Chlorodifluoromethane	0.49	0.33	0.22	22
Chloromethane	0.82	0.63	0.48	24
Cumene				
Decane				
1,4-Dichlorobenzene				
Dichlorodifluoromethane	0.74	0.60	0.55	24
1,2-Dichloroethane				
Ethylbenzene				
4-Ethyltoluene				
n-Heptane				
Hexane	0.51	0.32	0.21	12
Methylene chloride	0.31	0.24	0.20	10
4-Methyl-2-pentanone				
Naphthalene				
n-Nonane				
n-Octane				
n-Pentane	2.80	0.96	0.39	23
n-Propylbenzene				
Styrene				
Toluene	1.00	0.47	0.24	20
Trichloroethene				
Trichlorofluoromethane	0.36	0.30	0.25	23
1,2,4-Trimethylbenzene				
1,3,5-Trimethylbenzene				
n-Undecane				
Vinyl acetate	0.69	0.39	0.24	8
o-Xylene				
Total m&p-xylenes				

Table E.

Franklin County (AQS: 39-049-0034) Summary Data of 29 Canister Samples				
COMPOUND LIST	Maximum	Average	Minimum	Frequency Detected
Acetone	7.80	4.36	2.20	29
Acetonitrile	0.59	0.28	0.21	12
Acrylonitrile	0.39	0.26	0.20	4
Benzene	0.94	0.42	0.22	13
1,3-Butadiene				
n-Butane	7.20	1.39	0.27	29
2-Butanone	2.30	0.87	0.51	12
Carbon disulfide				
Chlorodifluoromethane	1.10	0.41	0.25	29
Chloromethane	1.00	0.66	0.56	29
Cumene				
Decane				
1,4-Dichlorobenzene	0.44	0.44	0.44	1
Dichlorodifluoromethane	0.73	0.63	0.57	27
1,2-Dichloroethane				
Ethylbenzene	0.20	0.20	0.20	1
4-Ethyltoluene				
n-Heptane				
Hexane	0.61	0.43	0.26	6
Methylene chloride	0.28	0.24	0.21	9
4-Methyl-2-pentanone				
Naphthalene				
n-Nonane				
n-Octane				
n-Pentane	2.10	0.66	0.24	27
n-Propylbenzene				
Styrene				
Toluene	2.90	0.71	0.21	18
Trichloroethene				
Trichlorofluoromethane	0.36	0.30	0.26	29
1,2,4-Trimethylbenzene				
1,3,5-Trimethylbenzene				
n-Undecane				
Vinyl acetate	0.94	0.47	0.23	20
o-Xylene	0.22	0.22	0.21	2
Total m&p-xylenes	0.72	0.60	0.44	3

Table F.

Jefferson County (AQS: 39-081-0017) Summary Data of 56 Canister Samples				
COMPOUND LIST	Maximum	Average	Minimum	Frequency Detected
Acetone	12.00	4.07	1.50	56
Acetonitrile	0.69	0.30	0.20	29
Acrylonitrile	1.00	0.54	0.22	9
Benzene	28.00	3.66	0.20	46
1,3-Butadiene	0.23	0.23	0.23	1
n-Butane	11.00	1.86	0.40	56
2-Butanone	1.20	0.70	0.50	21
Carbon disulfide	0.70	0.64	0.58	4
Chlorodifluoromethane	1.10	0.35	0.20	56
Chloromethane	0.98	0.65	0.49	56
Cumene				
Decane				
1,4-Dichlorobenzene	0.38	0.35	0.31	2
Dichlorodifluoromethane	0.72	0.62	0.54	55
1,2-Dichloroethane	0.27	0.27	0.27	1
Ethylbenzene	0.27	0.24	0.20	2
4-Ethyltoluene				
n-Heptane	0.59	0.34	0.21	8
Hexane	0.60	0.32	0.20	15
Methylene chloride	0.22	0.21	0.20	12
4-Methyl-2-pentanone				
Naphthalene	31.00	2.70	0.23	20
n-Nonane				
n-Octane				
n-Pentane	2.30	0.68	0.24	53
n-Propylbenzene				
Styrene	0.35	0.30	0.24	2
Toluene	5.70	1.12	0.20	43
Trichloroethene	0.33	0.33	0.33	1
Trichlorofluoromethane	2.20	0.41	0.26	56
1,2,4-Trimethylbenzene				
1,3,5-Trimethylbenzene				
n-Undecane				
Vinyl acetate	2.20	0.59	0.21	39
o-Xylene	0.29	0.24	0.21	3
Total m&p-xylenes	1.30	0.68	0.42	8

HEAVY METALS SAMPLING AND ANALYSIS

SAMPLING

Ambient air toxic monitoring on a routine basis for heavy metals (other than lead), by Ohio EPA DAPC, was initiated in 1989 and has continued. Since that time all of DAPC's air filter samples have been analyzed by the Ohio EPA Division of Environmental Services (DES). A summary of the results can be found in the following tables. Sampling for heavy metals is conducted using a high volume total suspended particulate (TSP) sampler. With this sampler, particulate matter in the air is collected on a glass fiber filter. Sampling is done intermittently with 24-hour samples collected once every six days. The operating procedures for lead can be found in the Code of Federal Regulations, 40 CFR, Part 50, Appendix G. These basic procedures are also used for the other metals.

ANALYSIS

Filters collected at each site were analyzed as a monthly composite. Typically there are 5 sampling days in which a filter is collected. From these individual filters one strip is cut and combined from strips from all the filters collected that month and analyzed as one sample for the month. The acid extracted samples are analyzed by the inductively coupled plasma-mass spectrometry (ICP-MS) technique to determine the amount of lead.

SUMMARY OF ICP METHOD:

Sample solutions are introduced by pneumatic nebulization into a plasma, in which desolvation occurs. Ions are extracted from the plasma through a differentially pumped vacuum interface and separated on the basis of their mass-to-charge ratio by a quadrupole mass spectrometer. The ions transmitted through the quadrupole are detected by an electron multiplier or Faraday detector. Ion intensities at each mass are recorded and compared to those obtained from external calibration standards to generate concentration values for the samples. Results are corrected for instrument drift and matrix effects using internal standards. Additional corrections are applied as necessary to correct for isobaric and polyatomic elemental interferences.

HEAVY METALS PARAMETERS

Historically lead was the NAAQS Criteria pollutant released from gasoline into the ambient air. Monitoring for it established the lead filter analysis monitoring program. Over the years DAPC added other metals to the filter analysis program. As lead was phased out of gasoline other metals have risen to greater concern. At one time it was cadmium and from one particular industry it was beryllium. But now Ohio is focused on manganese in several communities. However, trends continue to change and lead has once again become the driving pollutant for filter analysis. As the only metal that is Criteria Pollutant lead is the pollutant that drives the metals monitoring program. With the establishment of a new NAAQS for lead, 0.15 $\mu g/m^3$ from the previous standard of 1.5 $\mu g/m^3$ and the requirement to monitor near specific sources, lead has been re-established as a pollutant of concern. In 2009 DAPC established a program to analyze each filter collected from a required lead TSP sampler for lead. In 2010 DAPC will have every TSP sampler operating at a required site submit each filter collected for lead analysis.

For this particular section the data collected is from the monthly composite samples collected and analyzed. All monthly composite particulate filter samples collected by DAPC are routinely analyzed for eight metals.

arsenic	cadmium	chromium	beryllium
lead[1]	nickel	zinc	manganese

From each sample, most parameters are analyzed using a very sensitive ICPMS analytical system which significantly lowers the detection limit from the standard ICP instrument. The following parameters, which are typically detected in higher concentrations, are still analyzed with the older ICP method.

Iron	potassium	zinc	manganese

Particulate mercury that can be detected from a glass or quartz fiber filter has been added to the parameter list for a number of samples from sites in communities with specific concerns about potential mercury sources. Mercury analysis for each sample is performed separately from the other metals. Total mercury is determined using a cold vapor method developed by DES.

The following locations identify the sites that were used for the routine metals monitoring program.

[1]Lead is the only parameter being monitored in the ATMP that has a National Ambient Air Quality Standard. See Section V, page 86, Lead.

SITE IDENTIFICATION AND LOCATION

AQS #	CITY	COUNTY	ADDRESS	TABLE
39-017-0015	Middletown	Butler	3901 Lefferson Rd.	G
39-029-0019	E. Liverpool	Columbiana	1250 St. George St.	H
39-029-0020	E. Liverpool	Columbiana	2220 Michigan Ave.	I
39-029-0022	E. Liverpool	Columbiana	500 Maryland Ave.	J
39-035-0038	Cleveland	Cuyahoga	2547 Tikhon Ave.	K
39-035-0042	Cleveland	Cuyahoga	3136 Lorain Ave.	L
39-035-0049	Cleveland	Cuyahoga	4150 East 56th St.	M
39-035-0050	Cleveland	Cuyahoga	5777 Grant Ave.	N
39-035-0061	Cleveland	Cuyahoga	West 3rd. St.	O
39-049-0025	Columbus	Franklin	1700 Ann St.	P
39-051-0001	Delta	Fulton	200 Van Buren St.	Q
39-091-0003	Bellefontaine	Logan	1222 Superior Ave.	R
39-123-0012	Elmore	Ottawa		S
39-143-0019	Clyde	Sandusky	615 vine St.	T
39-167-0008	Marietta	Washington	Lancaster Rd.	U
39-167-0010	Marietta	Washington	115 Victory Place	V
	Marion	Marion	441 Whitmore St. #1 & #2	W-1 W-2

Table G.

Middletown Heavy Metals Data - 2009 Ohio Bell 3901 Lefferson Rd. AQS: 39-017-0015									
	units -- ng/m³								
Butler	Parameters/ AQS#								
MONTH	arsenic	beryllium	cadmium	chromium	lead	nickel	iron	manganese	zinc
	12103	12105	12110	12112	12128	12136	12126	12132	12167
JANUARY	0.60	0.03	0.21	1.61	3.30	0.69	120.0	17.0	29.0
FEBRUARY	1.00	0.04	0.14	2.04	3.50	0.97	260.0	28.0	29.0
MARCH	0.69	<0.029	0.18	2.81	4.10	0.87	310.0	30.0	37.0
APRIL	0.88	0.08	0.11	1.62	3.50	0.71	230.0	35.0	28.0
MAY	0.78	0.07	0.11	1.12	2.30	0.75	140.0	26.0	26.0
JUNE	2.40	0.03	0.16	1.70	5.20	0.93	320.0	24.0	29.0
JULY	1.80	<0.057	0.20	4.51	5.70	1.03	400.0	49.0	48.0
AUGUST	1.30	0.06	0.19	3.40	4.60	1.41	300.0	42.0	39.0
SEPTEMBER	<0.72	<0.072	0.14	2.39	4.50	1.25	260.0	34.0	41.0
OCTOBER	1.20	<0.056	0.17	3.38	6.70	0.89	310.0	45.0	47.0
NOVEMBER	2.50	0.07	0.32	3.97	8.20	1.28	550.0	54.0	71.0
DECEMBER	1.00	<0.056	0.34	4.92	5.80	1.71	370.0	68.0	68.0

Table H.

East Liverpool Heavy Metals Data - 2009 Port Authority 1250 St. George St. AQS: 39-029-0019											
	units -- ng/m³										
Columbiana	Parameters/ AQS#										
MONTH	arsenic	beryllium	cadmium	chromium	lead	nickel	iron	manganese	potassium	zinc	mercury
	12103	12105	12110	12112	12128	12136	12126	12132	12180	12167	12142
JANUARY	1.30	<0.019	0.26	0.78	3.70	0.47	75.0	18.0	200.0	22.0	0.066
FEBRUARY	1.80	0.05	0.35	2.72	12.00	1.39	390.0	130.0	310.0	46.0	0.077
MARCH	1.60	0.07	0.86	2.41	14.00	2.18	370.0	110.0	330.0	82.0	0.120
APRIL	2.90	0.17	1.20	4.28	23.00	2.25	820.0	180.0	450.0	170.0	0.140
MAY	2.70	0.15	0.72	3.06	16.00	1.93	540.0	130.0	380.0	120.0	0.110
JUNE	3.10	0.08	0.48	2.32	9.50	1.86	380.0	63.0	340.0	80.0	<0.005
JULY	2.90	0.13	0.74	3.46	11.00	1.84	450.0	130.0	<550.0	79.0	0.090
AUGUST	2.40	0.16	0.55	3.68	9.20	2.11	470.0	220.0	<440.0	57.0	0.068
SEPTEMBER	2.00	0.19	0.78	4.77	16.00	2.65	630.0	430.0	450.0	110.0	0.085
OCTOBER	2.20	0.06	0.66	2.90	15.00	1.33	260.0	71.0	<420.0	62.0	0.045
NOVEMBER	2.90	0.07	1.40	3.41	19.00	1.82	430.0	89.0	420.0	65.0	0.052
DECEMBER	0.91	0.06	0.43	1.69	7.10	1.04	190.0	50.0	<540.0	53.0	0.060

Table I.

East Liverpool Heavy Metals Data - 2009 Waterplant 2220 Michigan Ave. AQS: 39-029-0020											
	units -- ng/m³										
Columbiana	Parameters/ AQS#										
MONTH	arsenic 12103	beryllium 12105	cadmium 12110	chromium 12112	lead 12128	nickel 12136	iron 12126	manganese 12132	potassium 12180	zinc 12167	mercury 12142
JANUARY	0.90	<0.024	1.20	1.31	4.80	3.22	130.0	100.0	<240.0	21.0	0.040
FEBRUARY	0.88	0.03	0.27	13.00	4.10	13.40	750.0	1800.0	<270.0	34.0	0.065
MARCH	1.50	<0.021	0.61	3.15	10.00	3.14	320.0	730.0	280.0	78.0	0.078
APRIL	2.10	<0.035	1.50	22.20	22.00	12.10	690.0	1300.0	<350.0	280.0	0.015
MAY	1.80	0.02	0.66	2.25	12.00	3.58	270.0	240.0	310.0	95.0	0.080
JUNE	1.60	<0.028	0.43	3.30	8.00	3.96	260.0	190.0	370.0	38.0	0.038
JULY	2.10	<0.044	0.54	4.36	6.10	4.99	270.0	340.0	490.0	40.0	0.087
AUGUST	1.50	<0.054	0.49	12.70	6.60	9.53	420.0	760.0	<540.0	44.0	0.064
SEPTEMBER	2.10	<0.042	0.79	13.20	13.00	6.57	780.0	2900.0	<420.0	100.0	0.066
OCTOBER	2.10	<0.041	1.30	9.81	9.90	6.49	400.0	690.0	<410.0	63.0	0.059
NOVEMBER	3.40	<0.052	1.70	5.13	16.00	15.50	680.0	800.0	<520.0	65.0	0.058
DECEMBER	0.94	<0.04	0.53	1.86	6.60	2.53	170.0	200.0	<400.0	40.0	0.036

Table J.

East Liverpool Heavy Metals Data - 2009 East Elementary 500 Maryland Ave. AQS: 39-029-0022											
	units -- ng/m³										
Columbiana	Parameters/ AQS#										
MONTH	arsenic 12103	beryllium 12105	cadmium 12110	chromium 12112	lead 12128	nickel 12136	iron 12126	manganese 12132	potassium 12180	zinc 12167	mercury 12142
JANUARY	0.90	<0.017	0.69	0.69	3.50	0.33	46.0	9.0	180.0	19.0	0.038
FEBRUARY	1.10	<0.032	0.30	3.03	5.30	1.31	330.0	75.0	350.0	34.0	0.066
MARCH	0.89	<0.033	0.28	2.59	7.60	1.07	260.0	69.0	380.0	38.0	0.038
APRIL	2.10	0.05	0.95	3.55	18.00	1.60	370.0	79.0	500.0	160.0	0.045
MAY	1.60	0.04	0.52	2.82	9.40	1.15	280.0	55.0	390.0	74.0	0.023
JUNE	3.80	0.03	0.39	2.25	7.80	1.34	270.0	39.0	420.0	70.0	0.022
JULY	2.40	<0.071	0.48	3.47	9.60	1.63	310.0	81.0	<710.0	70.0	0.037
AUGUST	3.00	<0.057	0.47	3.00	8.40	1.56	240.0	66.0	<570.0	50.0	0.030
SEPTEMBER	1.70	<0.069	0.63	3.81	14.00	2.17	350.0	260.0	<690.0	130.0	0.046
OCTOBER	1.70	<0.057	0.60	2.92	33.00	1.06	190.0	54.0	<570.0	76.0	0.029
NOVEMBER	2.20	<0.055	1.10	3.43	15.00	1.31	350.0	67.0	<550.0	60.0	0.039
DECEMBER	<1.3	<0.13	0.37	1.78	7.10	<1.32	120.0	47.0	<1300	74.0	0.028

Table K.

Cleveland Heavy Metals Data - 2009 St. Theodosius Church 2547 St. Tikhon Ave. AQS: 39-035-0038								
	units -- ng/m³							
Cuyahoga	Parameters/ AQS#							
MONTH	arsenic	beryllium	cadmium	chromium	lead	nickel	manganese	zinc
	12103	12105	12110	12112	12128	12136	12132	12167
JANUARY	0.59	<0.021	0.20	0.94	3.80	1.17	5.8	25.0
FEBRUARY	0.77	<0.042	0.42	6.87	9.80	2.25	20.0	52.0
MARCH	0.80	0.06	0.38	1.68	9.70	2.10	16.0	38.0
APRIL	1.10	<0.025	0.30	1.64	8.60	2.53	18.0	41.0
MAY	0.79	<0.021	0.30	2.51	9.30	4.29	32.0	72.0
JUNE	1.30	<0.026	0.39	3.30	12.00	2.97	19.0	45.0
JULY	1.30	<0.052	0.33	1.95	9.40	2.23	14.0	40.0
AUGUST	0.81	<0.052	0.37	4.19	15.00	3.25	17.0	56.0
SEPTEMBER	1.60	<0.051	0.57	2.96	16.00	4.35	33.0	69.0
OCTOBER	1.10	<0.051	0.15	1.53	8.50	1.27	16.0	35.0
NOVEMBER	1.60	<0.051	0.49	2.18	14.00	1.64	24.0	57.0
DECEMBER	0.55	<0.051	0.21	1.26	7.50	1.18	14.0	32.0

Table L.

Cleveland Heavy Metals Data - 2009 Fire "4A" 3136 Lorain Ave. AQS: 39-035-0042								
	units -- ng/m³							
Cuyahoga	Parameters/ AQS#							
MONTH	arsenic	beryllium	cadmium	chromium	lead	nickel	manganese	zinc
	12103	12105	12110	12112	12128	12136	12132	12167
JANUARY	0.58	<0.022	0.13	0.83	3.70	1.16	3.1	19.0
FEBRUARY	0.62	<0.034	0.31	1.36	9.60	1.29	10.0	38.0
MARCH	0.63	<0.026	0.28	1.15	6.00	1.46	9.6	26.0
APRIL	1.40	0.03	0.24	1.95	11.00	4.31	23.0	40.0
MAY	0.86	<0.023	0.35	1.56	8.40	2.98	15.0	36.0
JUNE	1.10	<0.028	0.22	1.51	6.10	2.04	11.0	32.0
JULY	2.00	<0.07	0.22	1.55	10.00	2.09	11.0	44.0
AUGUST	0.68	<0.056	0.20	1.40	8.50	2.00	11.0	49.0
SEPTEMBER	1.60	<0.056	0.40	3.44	13.00	4.68	18.0	66.0
OCTOBER	1.30	<0.055	0.23	1.46	13.00	1.68	12.0	35.0
NOVEMBER	1.30	<0.068	0.19	1.43	8.10	1.62	11.0	35.0
DECEMBER	<0.54	<0.054	0.34	1.19	7.60	1.19	9.2	26.0

Table M.

Cleveland Heavy Metals Data - 2009 Ferro "A" 4150 East 56th St. AQS: 39-035-0049								
	units -- ng/m³							
Cuyahoga	Parameters/ AQS#							
MONTH	arsenic	beryllium	cadmium	chromium	lead	nickel	manganese	zinc
	12103	12105	12110	12112	12128	12136	12132	12167
JANUARY	0.93	<0.022	0.24	2.10	130.00	43.80	60.0	76.0
FEBRUARY	0.75	<0.032	0.19	2.59	190.00	16.20	39.0	77.0
MARCH	0.72	0.03	0.18	3.29	30.00	6.09	68.0	55.0
APRIL	1.50	0.03	0.25	3.29	16.00	167.00	150.0	52.0
MAY	1.60	0.04	0.33	4.43	94.00	67.20	140.0	110.0
JUNE	1.70	0.04	0.26	4.69	70.00	14.80	96.0	72.0
JULY	1.80	<0.056	0.38	5.70	43.00	79.50	120.0	85.0
AUGUST	1.30	0.06	0.41	7.53	52.00	142.00	180.0	110.0
SEPTEMBER	1.40	<0.055	0.46	8.08	130.00	24.30	140.0	210.0
OCTOBER	1.20	<0.055	0.30	3.39	38.00	9.21	72.0	66.0
NOVEMBER	2.00	<0.054	0.51	5.91	200.00	16.10	120.0	110.0
DECEMBER	0.93	<0.054	0.31	10.90	85.00	63.70	180.0	160.0

Table N.

Cleveland Heavy Metals Data - 2009 Fortran Printing Inc. 5777 Grant Ave. AQS: 39-035-0050								
	units -- ng/m³							
Cuyahoga	Parameters/ AQS#							
MONTH	arsenic	beryllium	cadmium	chromium	lead	nickel	manganese	zinc
	12103	12105	12110	12112	12128	12136	12132	12167
JANUARY	0.72	<0.021	0.26	1.12	7.90	6.90	10.0	24.0
FEBRUARY	0.81	<0.032	0.20	1.69	5.90	3.03	25.0	33.0
MARCH	1.60	<0.043	0.45	3.31	54.00	26.90	47.0	75.0
APRIL	1.50	<0.033	0.33	2.13	9.50	3.36	24.0	45.0
MAY	1.80	0.02	0.45	2.29	16.00	38.50	51.0	39.0
JUNE	2.50	0.04	0.73	4.07	61.00	53.50	96.0	82.0
JULY	1.90	<0.069	0.33	2.59	10.00	24.20	36.0	39.0
AUGUST	2.20	<0.055	0.37	4.48	21.00	21.40	79.0	88.0
SEPTEMBER	1.90	<0.055	0.52	6.29	24.00	10.80	95.0	100.0
OCTOBER	1.90	<0.054	0.31	2.21	62.00	5.43	28.0	55.0
NOVEMBER	2.10	<0.067	0.54	4.37	22.00	6.39	52.0	65.0
DECEMBER	1.20	<0.053	0.38	7.51	10.00	2.38	82.0	110.0

Table O.

Cleveland Heavy Metals Data - 2009 Asphalt Plant "A" West 3rd St. AQS: 39-035-0061								
	units -- ng/m³							
Cuyahoga	Parameters/ AQS#							
MONTH	arsenic	beryllium	cadmium	chromium	lead	nickel	manganese	zinc
	12103	12105	12110	12112	12128	12136	12132	12167
JANUARY	0.66	<0.02	0.15	1.16	4.20	1.28	6.7	25.0
FEBRUARY	0.90	<0.04	0.33	6.30	7.60	3.66	23.0	50.0
MARCH	0.69	<0.025	0.23	1.44	8.40	1.78	18.0	34.0
APRIL	1.10	<0.025	0.16	1.66	8.10	2.54	25.0	33.0
MAY	1.10	0.03	0.26	2.95	11.00	5.07	45.0	76.0
JUNE	2.10	0.04	0.55	8.00	13.00	3.96	35.0	65.0
JULY	1.30	<0.052	0.32	3.89	18.00	2.19	24.0	40.0
AUGUST	0.71	<0.053	0.18	3.37	8.40	2.23	32.0	49.0
SEPTEMBER	1.70	0.10	0.56	3.16	13.00	4.22	66.0	63.0
OCTOBER	1.10	<0.051	0.17	1.85	8.10	1.23	26.0	38.0
NOVEMBER	1.40	<0.051	0.40	2.56	11.00	1.84	42.0	51.0
DECEMBER	<0.63	<0.063	0.15	1.52	10.00	1.34	24.0	40.0

Table P.

Columbus Heavy Metals Data - 2009 Woodrow 1700 Ann St. AQS: 39-049-0025									
	units -- ng/m³								
Franklin	Parameters/ AQS#								
MONTH	arsenic	beryllium	cadmium	chromium	lead	nickel	iron	manganese	zinc
	12103	12105	12110	12112	12128	12136	12126	12132	12167
JANUARY	1.20	<0.022	0.18	0.79	3.50	0.53	80.0	4.1	24.0
FEBRUARY	0.97	<0.044	0.44	1.47	7.60	1.49	230.0	12.0	200.0
MARCH	0.76	<0.027	0.14	1.82	9.50	0.81	160.0	11.0	25.0
APRIL	1.10	<0.028	0.26	1.56	8.30	1.34	250.0	12.0	58.0
MAY	1.10	<0.024	0.20	1.13	8.50	0.70	160.0	11.0	41.0
JUNE	1.30	<0.029	0.20	1.56	16.00	0.73	200.0	11.0	39.0
JULY	1.60	<0.06	0.18	1.31	6.90	1.65	160.0	7.9	36.0
AUGUST	0.90	<0.061	0.19	1.89	14.00	1.05	230.0	13.0	69.0
SEPTEMBER	1.50	<0.059	0.33	1.25	8.10	0.77	140.0	11.0	53.0
OCTOBER	1.90	<0.057	0.34	1.68	10.00	1.35	260.0	11.0	63.0
NOVEMBER	2.10	<0.056	0.37	1.84	11.00	1.41	400.0	15.0	110.0
DECEMBER	<0.54	<0.054	0.15	1.06	6.40	0.69	110.0	6.7	31.0

Table Q.

NWDO Heavy Metals Data - 2009 **Delta** **200 Van Buren St.** **AQS: 39-051-0001**		units -- ng/m³						
Fulton		Parameters/ AQS#						
MONTH	arsenic 12103	beryllium 12105	cadmium 12110	chromium 12112	lead 12128	nickel 12136	manganese 12132	zinc 12167
JANUARY	0.33	<0.02	0.61	0.62	93.00	0.43	4.3	490.0
FEBRUARY	0.44	<0.026	0.99	0.76	140.00	1.19	7.5	950.0
MARCH	0.62	<0.022	0.84	0.81	77.00	0.67	4.8	520.0
APRIL	0.49	<0.039	0.78	1.07	170.00	0.96	8.9	670.0
MAY	0.55	<0.02	0.34	0.73	57.00	0.53	6.1	340.0
JUNE	1.50	<0.039	0.12	1.10	15.00	0.75	9.3	61.0
JULY	0.79	<0.047	0.76	1.33	80.00	1.03	9.8	490.0
AUGUST	0.58	<0.052	0.24	1.40	55.00	0.76	9.3	240.0
SEPTEMBER	1.30	<0.05	0.69	1.86	130.00	1.10	17.0	570.0
OCTOBER	<1.2	<0.12	0.20	1.57	35.00	<1.2	10.0	180.0
NOVEMBER	1.60	<0.058	0.51	1.62	89.00	0.85	15.0	390.0
DECEMBER	<0.44	<0.044	0.64	1.18	120.00	0.67	9.7	610.0

Table R.

SWDO Heavy Metals Data - 2009 **Bellefontaine** **1222 Superior Ave.** **AQS: 39-091-0003**		units -- ng/m³							
Logan		Parameters/ AQS#							
MONTH	arsenic 12103	beryllium 12105	cadmium 12110	chromium 12112	lead 12128	nickel 12136	iron 12126	manganese 12132	zinc 12167
JANUARY	0.47	<0.019	0.11	1.20	21.00	1.15	65.0	2.4	17.0
FEBRUARY	0.36	<0.029	0.08	2.46	5.70	0.73	84.0	2.7	15.0
MARCH	0.46	<0.023	0.07	1.23	4.00	0.75	69.0	3.2	13.0
APRIL	0.70	<0.023	0.08	0.92	11.00	0.81	93.0	5.0	13.0
MAY	0.56	<0.02	0.07	0.79	3.70	0.52	72.0	5.3	12.0
JUNE	0.83	<0.03	0.16	2.05	15.00	1.24	120.0	5.5	28.0
JULY	<0.89	<0.089	<0.089	1.40	5.80	0.94	70.0	<4.4	27.0
AUGUST	0.93	<0.05	0.10	1.24	6.00	0.90	75.0	4.1	28.0
SEPTEMBER	0.66	<0.058	0.12	4.46	170.00	1.19	140.0	8.3	29.0
OCTOBER	1.30	<0.056	0.16	2.56	31.00	1.17	130.0	4.2	39.0
NOVEMBER	1.50	<0.056	0.22	1.94	68.00	1.18	180.0	7.4	44.0
DECEMBER	<0.46	<0.046	0.11	2.09	26.00	1.14	120.0	4.2	25.0

Table S.

NWDO Heavy Metals Data - 2009 Brush Wellman 32 Route 105 AQS: 39-123-0012								
	units -- ng/m³							
Ottawa	Parameters/ AQS#							
MONTH	arsenic 12103	beryllium 12105	cadmium 12110	chromium 12112	lead 12128	nickel 12136	manganese 12132	zinc 12167
JANUARY	0.26	0.05	0.07	0.18	2.00	0.21	1.3	9.2
FEBRUARY	0.28	0.01	0.06	0.22	1.60	0.24	1.7	7.5
MARCH	0.34	0.07	0.07	0.21	2.10	0.22	2.2	8.0
APRIL	0.30	0.03	0.04	0.17	1.40	0.18	1.8	5.5
MAY	0.73	0.11	0.14	0.34	3.90	0.64	11.0	14.0
JUNE	0.61	0.05	0.08	0.27	2.50	0.46	4.4	11.0
JULY	0.58	0.02	0.08	0.28	2.80	0.32	2.9	8.4
AUGUST	0.57	0.03	0.07	0.27	5.60	0.44	2.5	9.0
SEPTEMBER	0.78	0.03	0.09	0.26	3.10	0.46	2.8	11.0
OCTOBER	0.44	0.02	0.07	0.24	2.50	0.30	2.2	8.9
NOVEMBER	0.57	0.09	0.10	0.31	3.40	0.35	3.1	14.0
DECEMBER	0.43	0.03	0.09	0.25	2.90	0.63	2.7	11.0

Table T.

NWDO Heavy Metals Data - 2009 St. Mary's Elementary School 615 Vine St. AQS: 39-143-0019										
	units -- ng/m³									
Sandusky	Parameters/ AQS#									
MONTH	arsenic 12103	beryllium 12105	cadmium 12110	chromium 12112	lead 12128	nickel 12136	barium 12107	manganese 12132	zinc 12167	mercury 12142
JANUARY	0.40	<0.024	0.14	0.50	3.20	0.67	4.3	5.9	20.0	NA
FEBRUARY	0.33	<0.026	0.12	0.63	4.10	0.41	5.5	5.5	17.0	0.014
MARCH	0.63	<0.021	0.12	0.66	4.00	0.43	6.2	4.2	16.0	0.025
APRIL	0.57	<0.025	0.11	0.63	3.50	0.42	5.3	5.5	14.0	0.011
MAY	0.58	<0.026	0.13	0.79	6.20	0.42	6.7	8.0	18.0	0.018
JUNE	1.70	<0.026	0.12	0.94	6.10	0.66	8.9	7.2	27.0	0.016
JULY	0.90	<0.052	0.10	1.02	6.10	0.57	7.9	6.1	22.0	0.015
AUGUST	0.65	0.064	0.08	0.86	4.30	<0.5	7.3	4.4	23.0	0.011
SEPTEMBER	4.60	<0.05	0.20	1.00	6.50	0.61	9.1	7.4	26.0	0.016
OCTOBER	1.10	<0.047	0.14	0.97	4.80	0.72	8.7	4.4	26.0	0.015
NOVEMBER	1.10	<0.044	0.16	0.98	6.30	0.71	8.9	6.5	30.0	0.014
DECEMBER	<0.43	<0.043	0.25	0.59	2.90	<0.43	4.9	6.0	17.0	0.009

Table U.

SEDO Heavy Metals Data - 2009 Washington Co. Career Center Lancaster Rd. AQS: 39-167-0008									
	units -- ng/m³								
Washington	Parameters/ AQS#								
MONTH	arsenic 12103	beryllium 12105	cadmium 12110	chromium 12112	lead 12128	nickel 12136	manganese 12132	zinc 12167	mercury 12142
JANUARY	0.22	<0.018	0.16	0.66	1.70	0.18	62.0	10.0	0.021
FEBRUARY	0.35	<0.026	0.21	1.28	2.80	0.29	140.0	19.0	0.022
MARCH	0.41	<0.02	0.09	0.56	1.90	0.32	12.0	9.4	0.014
APRIL	1.50	<0.037	0.31	2.03	6.30	0.69	140.0	33.0	0.019
MAY	0.48	<0.023	0.10	0.79	2.40	0.23	52.0	14.0	0.016
JUNE	0.69	<0.023	0.19	0.87	2.40	0.25	35.0	13.0	0.010
JULY	<1.2	<0.12	0.15	<1.2	4.40	<1.2	19.0	16.0	0.035
AUGUST			no sample – roof repair						
SEPTEMBER	0.51	<0.04	0.11	0.71	3.70	0.40	23.0	18.0	0.012
OCTOBER	0.98	<0.037	0.14	0.60	4.80	<0.37	92.0	18.0	0.011
NOVEMBER	1.20	<0.042	0.40	0.84	10.00	0.48	310.0	35.0	0.014
DECEMBER	<0.51	<0.051	0.05	0.65	3.00	1.01	25.0	14.0	0.013

Table V.

SEDO Heavy Metals Data - 2009 Washington Co. Educational Service Center 115 Victory Place AQS: 39-167-0010								
	units -- ng/m³							
Washington	Parameters/ AQS#							
MONTH	arsenic 12103	beryllium 12105	cadmium 12110	chromium 12112	lead 12128	nickel 12136	manganese 12132	zinc 12167
JANUARY	0.45	<0.021	0.21	0.89	2.20	0.29	45.0	20.0
FEBRUARY	0.46	<0.026	0.15	1.00	2.70	0.39	47.0	17.0
MARCH	0.46	<0.021	0.14	0.81	2.70	0.46	39.0	15.0
APRIL	1.20	<0.027	0.35	1.75	6.50	0.67	98.0	31.0
MAY	0.54	<0.018	0.14	0.64	2.60	0.24	33.0	14.0
JUNE	1.30	<0.028	0.22	0.99	2.90	0.32	26.0	14.0
JULY	0.91	<0.053	0.28	0.99	5.30	0.06	160.0	28.0
AUGUST	1.70	<0.1	0.26	1.07	4.80	<1.3	210.0	41.0
SEPTEMBER			no sample - SAT					
OCTOBER			no sample - SAT					
NOVEMBER	1.70	<0.05	0.28	1.02	8.20	0.67	180.0	32.0
DECEMBER	0.44	<0.04	0.09	0.67	3.80	<0.41	79.0	19.0

Note SAT = U.S. EPA School Air Toxics Program, Ohio EPA sampler was not operated during those months.

Table W - 1.

NWDO Heavy Metals Data - 2009 **Marion Steel** **441 Whitmore St. #1** **AQS:**									
	units -- ng/m³								
Marion County	Parameters/ AQS#								
MONTH	arsenic 12103	beryllium 12105	cadmium 12110	chromium 12112	lead 12128	nickel 12136	manganese 12132	zinc 12167	mercury 12142
JANUARY	1.90	0.03	1.50	3.51	40.00	2.60	110.0	240.0	0.190
FEBRUARY	0.60	<0.031	0.16	1.97	6.10	1.00	38.0	39.0	0.039
MARCH	1.80	0.02	0.80	5.47	40.00	2.98	160.0	200.0	0.390
APRIL	0.89	<0.024	0.20	3.32	11.00	1.16	53.0	91.0	0.071
MAY	1.30	<0.025	1.20	6.05	140.00	2.27	150.0	360.0	0.490
JUNE	1.30	<0.026	0.14	2.10	7.20	0.88	25.0	45.0	0.024
JULY	1.50	<0.052	0.51	5.93	28.00	3.19	100.0	130.0	0.076
AUGUST	2.70	<0.14	2.00	14.10	140.00	4.40	250.0	710.0	0.610
SEPTEMBER		site discontinue for change over to new Lead sampling site							
OCTOBER									
NOVEMBER									
DECEMBER									

Table W - 2.

NWDO Heavy Metals Data - 2009 **Marion Steel** **441 Whitmore St. #2** **AQS:**									
	units --ng/m³								
Marion County	Parameters/ AQS#								
MONTH	arsenic 12103	beryllium 12105	cadmium 12110	chromium 12112	lead 12128	nickel 12136	manganese 12132	zinc 12167	mercury 12142
JANUARY	1.50	0.03	1.30	4.41	47.00	3.16	150.0	250.0	0.260
FEBRUARY	1.40	0.04	0.65	5.74	65.00	2.81	190.0	190.0	0.290
MARCH	1.50	<0.023	0.44	4.54	25.00	2.92	97.0	170.0	0.390
APRIL	1.80	0.03	1.10	8.69	70.00	4.27	200.0	310.0	0.360
MAY	1.60	0.04	0.83	7.51	42.00	2.33	170.0	160.0	0.230
JUNE	1.10	<0.026	0.34	4.94	18.00	1.63	85.0	91.0	0.016
JULY	1.80	<0.051	0.31	6.30	18.00	1.69	89.0	100.0	0.060
AUGUST	<2.6	<0.26	<0.26	4.05	6.90	<2.59	51.0	59.0	0.062
SEPTEMBER		site discontinue for change over to new Lead sampling site							
OCTOBER									
NOVEMBER									
DECEMBER									

FUTURE

The long term air toxics monitoring goals of DAPC will focus on the requirements of the Clean Air Act (CAA), particularly Section 112, and will support the development of EPA's Integrated Urban Air Toxics Strategy. In addition the air toxics monitoring efforts will incorporate relative elements of the mission and goals of DAPC to protect the environment for the benefit of all and to develop improved air toxics information.

The current strategy of urban based monitoring has evolved over the years and the number of sites and locations have changed depending on resources and priorities. The major emphasis of existing sampling projects is to develop and establish cost effective, routine sampling and analysis procedures. U.S. EPA has provided the Compendium of Recommended Methods for the Determination of Toxic Organic Compounds in Ambient Air. Methods have been updated to allow for more uniform approaches for sampling and analyzing various groups of compounds. New methods have been developed and added for compounds not previously targeted. There is even a Compendium of Methods for the Determination of Air Pollutants In Indoor Air. Ohio EPA's own air toxics monitoring capacity has been enhanced with the expansion of the air canister sample analysis capability by the Division of Environmental Services (DES).

Future Goals of the division will be modified to be compatible with the National Air Toxics Assessment Network activities. The intent of this network is to provide measurements of ambient concentrations of air toxics at monitoring sites throughout the nation for the estimation of human and environmental exposure to air toxics, and the assessment of risk due to air toxics.

As part of the current grant commitment to U.S. EPA, DAPC will continue its effort to submit future Air Toxics Data to the AQS Database. As part of that effort DAPC will compile all air toxics data collected in previous years so that it may eventually be submitted to AQS. DAPC has already made an effort to have all metals data submitted to AQS.

An intermediate effort of DAPC will be to conduct follow-up sampling efforts for the U.S. EPA School Air Toxics Program. Some of these areas were a high priority before the EPA study and will continue to be until the situation is mitigated. One development of this program was the expanded role of district and local air agencies into air toxics sampling.

Modernization:

DAPC will pursue information on new technology such as:

- Continuous gas chromatography, mass spectrometry
- ICP/MS - to be utilized at DES for metals analysis – analysis for some parameters started in 2007
- Updates of the Compendium of Recommended Methods are available at the following: http://www.epa.gov/ttn/amtic/airtox.html and http://www.epa.gov/ttn/amtic/inorg.html and
- Modernizing the Stainless Steel Canister inventory
- Evaluate future training needs for Air Toxics Monitoring:
- sampling methods,
- analytical procedures,
- equipment

VII. AIR QUALITY INDEX (AQI)

There has been a daily reporting of ambient air quality in Ohio's major metropolitan areas in some form since 1971. A national Pollution Standards Index (PSI) was established in 1977 to report air quality. This index was adopted by Ohio EPA's District Offices and the local air agencies (LAA's) to inform the public of daily air quality.

In the summer of 1999 the PSI scale was revised and renamed the Air Quality Index (AQI). It was modified to add 2.5 micron particulate matter ($PM_{2.5}$) and to accommodate the 8-Hour ozone standard.

The U.S. EPA has started the regulatory process of changing the AQI for $PM_{2.5}$ because of the change in the 24-Hour standard which took place in late 2006. That process had not been completed by the end of 2009.

The AQI (see Table 12) is a uniform "scaling" of five pollutants: particulate (PM_{10} and $PM_{2.5}$), sulfur dioxide, ozone, nitrogen dioxide, and carbon monoxide. The concentration level of each of these is calculated every day to determine the AQI. The pollutant with the highest AQI is reported to the media.

When the AQI exceeds, or is expected to exceed, 100 in a major city, the agency concerned issues a "health advisory". When pollution levels exceed an AQI of 200 and are projected to persist, an "air pollution episode" exists and the Governor declares an "alert". This initiates mandatory cutbacks of emissions from specified facilities to alleviate the situation. If the AQI were to surpass 300, 400 or 500, progressively greater cutbacks would be implemented to reduce pollutants to an acceptable level.

The AQI trend shows that Ohio's air quality has improved significantly. Although alerts were commonplace in the early 1970's, none have happened in over twenty years, and the number of health advisories has been greatly reduced.

TABLE 12

Comparison Of AQI Values With Pollutant Concentrations, Descriptor Words And Associated Colors

INDEX VALUE	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	CO ppm	SO_2 ppm	Ozone ppm[1]		NO_2 ppm	Color	Category
	24-Hour	24-Hour	8-Hour	24-Hour	8-Hour	1-Hour	1-Hour		
0-50	0-54	0.0-15.4	0.0-4.4	0-0.035	0.000-0.059		0-0.053	Green	Good
51-100	55-154	15.5-40.4	4.5-9.4	0.036-0.075	0.060-0.075		0.054-0.100	Yellow	Moderate
101-150	155-254	40.5-65.4	9.5-12.4	0.076-0.185	0.076-0.095	0.125-0.164	0.101-0.360	Orange	Unhealthy for Sensitive Groups
151-200	255-354	65.5-150.4[2]	12.5-15.4	0.186-0.304	0.096-0.115	0.165-0.204	0.361-0.64	Red	Unhealthy
201-300	355-424	150.5-250.4[2]	15.5-30.4	0.305-0.604	0.116-0.374	0.205-0.404	0.65-1.24	Purple	Very Unhealthy
301-	425-	250.5[2]-	30.5-	0.605	(3)	0.405-	1.25-	Maroon	Hazardous

[1] Areas are generally required to report the AQI based on 8-Hr ozone values. The maximum of the 8-Hr or 1-Hr is used.

[2] If a different Significant Harm Level for $PM_{2.5}$ is promulgated, these numbers will be changed.

[3] 8-Hr Ozone values do not define higher AQI values ($301). AQI values of 301 or higher are calculated with 1-Hr ozone concentrations.

AQI Chart

The accompanying table shows the AQI values for selected counties. It should be noted that the daily AQI values that are calculated and reported on a daily basis for cities in these counties may differ from those in the table. The daily AQI is based on a limited number of monitors (particularly PM_{10} and $PM_{2.5}$). This table uses data from all Federal Reference Monitors in the county. From those data the highest AQI value is chosen for each day.

The data in TABLE 13 is for the AQI in effect during 2009, after the ozone National Ambient Air Quality Standard was changed.

The table gives a general representation of the relative air quality in these counties. There were no readings in the "very unhealthy" or "hazardous" categories.

TABLE 13

County	Highest AQI Value	Days in each category:			
		Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy
Butler	109	285	64	4	0
Clark	101	310	54	1	0
Cuyahoga	116	281	83	1	0
Franklin	109	308	56	1	0
Hamilton	111	232	129	4	0
Jefferson	132	304	58	1	0
Lake	132	309	53	3	0
Lawrence	93	317	46	0	0
Lucas	129	278	85	2	0
Mahoning	89	304	61	0	0
Montgomery	109	292	72	1	0
Stark	111	261	103	1	0
Summit	90	260	105	0	0
Trumbull	93	219	21	0	0

VIII. MONITORING SITES 2009

Explanation of AQS codes:

The first column is the AQS number which consists of:

39-the state code
NNN-the county code, alphabetical, odd numbers only
NNNN-the site code

The second column is the county in which the monitoring site is located

The third column is a street address or city name

The fourth column lists the pollutants monitored at the site.

The main parameters monitored at sites are:

PB	Lead
PM10	Ten Micron Particulate Matter (PM_{10})
LC25	2.5 Micron Particulate Matter ($PM_{2.5}$)
PM25C	2.5 Micron Particulate Matter ($PM_{2.5}$) Continuous
PMSP	2.5 Micron Particulate Matter ($PM_{2.5}$) Speciation
PT	Total Suspended Particulate (TSP)
O3	Ozone (O_3)
SO2	Sulfur Dioxide
CO	Carbon Monoxide
NO2	Nitrogen Dioxide

Monitoring Network in 2009

AQS Number	County	Site Location	Parameter(s)
39-001-0001	Adams	210 N. Wilson	SO2, PM25C
39-003-0002	Allen	2650 Bible Rd.	O3, SO2
39-003-0006	Allen	1314 Findlay Rd	PM10
39-003-0007	Allen	Rousch Rd.	PM10
39-003-0008	Allen	North St.	PM10
39-003-0009	Allen	2850 Bible Rd.	SO2, O3, PM25C
39-007-1001	Ashtabula	Conneaut	O3, SO2
39-009-0003	Athens	Gifford State Forest	LC25
39-009-0004	Athens	7760 Blackburn Rd.	CO, SO2, NO2, O3, PM25C
39-013-3002	Belmont	E 40 St., Shadyside	SO2
39-017-0003	Butler	Bonita & St. John	PM10, LC25
39-017-0004	Butler	Schuler & Bender	O3
39-017-0015	Butler	3901 Lefferson	PM10, PB
39-017-0016	Butler	400 Nilles Rd.	LC25
39-017-1004	Butler	Hook Field	O3, SO2, PM25C, PMSP
39-023-0001	Clark	5171 Urbana Rd.	O3
39-023-0003	Clark	5400 Spangler Rd.	O3, SO2
39-023-0005	Clark	350 N. Fountain Ave.	LC25, PM25C
39-025-0022	Clermont	2400 Clermont Center Dr.	O3, LC25, PM25C
39-027-1002	Clinton	62 Laurel Dr., Career Cntr	O3
39-029-0019	Columbiana	1250 George St.	PB
39-029-0020	Columbiana	2220 Michigan Ave	PM10, PB
39-029-0022	Columbiana	500 Maryland Ave.	SO2, PM10, PB
39-035-0027	Cuyahoga	2200 W. 28th St.	PM10, LC25
39-035-0034	Cuyahoga	891 E 152 St.	O3, LC25
39-035-0038	Cuyahoga	2547 St. Tikhon Ave.	PB, SO2, PM10, LC25, PMSP, PM25C
39-035-0042	Cuyahoga	3136 Lorain	PB
39-035-0045	Cuyahoga	45950 Broadway Ave.	SO2, PM10, LC25
39-035-0049	Cuyahoga	E. 56th St.	PB
39-035-0050	Cuyahoga	Grant Rd.	PB
39-035-0051	Cuyahoga	E. 9th & St. Clair	CO
39-035-0053	Cuyahoga	4160 Pearl Rd.	CO
39-035-0060	Cuyahoga	E. 14th & Orange	NO2, SO2, PM10, LC25, PM25C, PMSP
39-035-0061	Cuyahoga	West 3rd St.	PB
39-035-0064	Cuyahoga	Berea	O3
39-035-0065	Cuyahoga	4600 Harvard Ave.	SO2, PM10, LC25
39-035-0070	Cuyahoga	13013 Cortlett Ave.	CO, NO2
39-035-1002	Cuyahoga	16900 Holland Rd.	PM10, LC25
39-035-5002	Cuyahoga	6116 Wilson Mills Rd.	O3

AQS Number	County	Site Location	Parameter(s)
39-041-0002	Delaware	359 Main St.	O3
39-049-0005	Franklin	Morse & Karl Rds	CO
39-049-0024	Franklin	Ohio State Fairgrounds	PM10, LC25
39-049-0025	Franklin	580 Woodrow Ave.	PB, LC25
39-049-0029	Franklin	7600 Fodor Rd., New Albany	O3, PM25C
39-049-0034	Franklin	Korbel Ave.	SO2, PM25C
39-049-0037	Franklin	1777 E. Broad St.	O3
39-049-0081	Franklin	5750 Maple Canyon Dr.	O3, LC25, PMSP
39-051-0001	Fulton	200 Van Buren St.	PB
39-055-0004	Geauga	13000 Auburn Rd.	O3
39-057-0005	Greene	100 Dayton St.	PM10, LC25, PM25C
39-057-0006	Greene	541 Ledbetter Rd.	O3
39-061-0006	Hamilton	11590 Grooms Rd.	O3, LC25, PM25C
39-061-0010	Hamilton	6950 Ripple Rd.	O3
39-061-0014	Hamilton	18 E. Seymour	PM10, LC25
39-061-0021	Hamilton	100 E. Fifth Ave.	CO
39-061-0040	Hamilton	250 Wm. Howard Taft Rd.	O3, NO2, PM10, LC25, PM25C, PMSP
39-061-0042	Hamilton	2101 W. Eighth St.	LC25
39-061-5001	Hamilton	101 Cooper Ave	PM10
39-061-7001	Hamilton	2059 Sherman Ave.	LC25
39-061-8001	Hamilton	300 Murray Rd.	LC25
39-063-0002	Hancock	9860 CR 313	PM10
39-063-0003	Hancock	9860 CR 313	PM10
39-063-0004	Hancock	CR 144	PM10
39-081-0001	Jefferson	1004 3rd St, Brilliant	PM10
39-081-0017	Jefferson	618 Logan	O3, SO2, PM10, LC25, PM25C
39-081-1001	Jefferson	Mingo Junction City Hall	CO, LC25, PMSP
39-083-0002	Knox	Water Plant, SR 314	O3
39-085-0003	Lake	Jefferson Elementary School	O3, SO2
39-085-0006	Lake	8443 Mentor Ave.	CO
39-085-0007	Lake	177 Main	SO2, O3, LC25, PM25C
39-085-1001	Lake	325 Vine St.	PM10
39-087-0006	Lawrence	2120 S. 8th St.	O3, SO2
39-087-0011	Lawrence	SR 775 & SR 141	O3
39-087-0012	Lawrence	450 Commerce Dr.	PM10, LC25, PMSP
39-089-0005	Licking	300 Licking View Dr., Heath	O3
39-091-0003	Logan	1222 Superior Ave.	PB
39-091-0006	Logan	320 Richard Ave.	PB
39-091-0007	Logan	1205 Superior Ave.	PB
39-091-0008	Logan	1215 Greenwood St.	PB

AQS Number	County	Site Location	Parameter(s)
39-093-0018	Lorain	4706 Detroit Rd.	O3
39-093-3002	Lorain	2180 Lake Breeze	PM10, LC25, PM25C, PMSP
39-095-0024	Lucas	348 S. Erie St.	O3, LC25, PM25C
39-095-0026	Lucas	4208 Airport Highway	LC25, PMSP
39-095-0027	Lucas	200 S. Byrne Rd., Waterville	O3
39-095-0028	Lucas	600 Collins Park	LC25
39-095-0034	Lucas	306 Yondota	O3
39-095-1003	Lucas	Lee & Front	PM10
39-097-0007	Madison	9940 SR 38 SW	O3
39-099-0005	Mahoning	Fire Station 7	PM10, LC25
39-099-0006	Mahoning	Fire Station 5	PM10
39-099-0013	Mahoning	345 Oakhill Ave.	O3, SO2
39-099-0014	Mahoning	Oakhill	LC25, PM25C, PMSP
39-103-0003	Medina	6364 Deerview	O3, LC25, PM25C
39-103-0004	Medina	Ballash Rd.	CO, SO2, NO2, O3, LC25
39-105-1001	Meigs	Mulberry Ave., Pomeroy	SO2
39-109-0005	Miami	3825 N. SR 589	O3
39-113-0028	Montgomery	901 W. Fairview Ave.	CO
39-113-0032	Montgomery	215 E. Third St.	LC25, PM25C, PMSP
39-113-0034	Montgomery	117 South Main St.	CO
39-113-0037	Montgomery	1401 Harshman Rd.	O3
39-113-7001	Montgomery	2728 Viking Lane	PM10
39-115-0004	Morgan	SR 83	SO2
39-133-0002	Portage	531 Washington Ave.	LC25
39-133-1001	Portage	1570 Ravenna Rd.	O3
39-135-1001	Preble	National Trails School	O3, LC25, PM25C
39-143-0019	Sandusky	615 Vine Street	PB
39-145-0013	Scioto	4862 Gallia St.,	SO2, PM10, LC25
39-145-0019	Scioto	605 Washington St.	PM10
39-145-0020	Scioto	2840 Back Rd.	SO2, PM10
39-145-0021	Scioto	2446 Gallia Pike	PM10
39-145-0022	Scioto	1740 Gallia Pike	SO2, PM10
39-151-0016	Stark	Malone College	O3
39-151-0017	Stark	1330 Dueber Ave	LC25, PMSP
39-151-0020	Stark	420 Market Ave.	CO, LC25, PM25C
39-151-0023	Stark	9877 Alabama Ave.	O3
39-151-4005	Stark	1175 W. Vine St., Alliance	O3

AQS Number	County	Site Location	Parameter(s)
39-153-0017	Summit	80 Brittain Rd.	SO2, LC25, PM25C
39-153-0020	Summit	800 Patterson Ave	O3, CO
39-153-0022	Summit	177 S. Broadway	CO, SO2
39-153-0023	Summit	660 W. Exchange St.	LC25, PM25SP
39-155-0005	Trumbull	540 Laird Ave. SE Warren	PM10
39-155-0006	Trumbull	2323 Main Ave.	PM10
39-155-0009	Trumbull	Community Hall, Kinsman	O3
39-155-0011	Trumbull	Vienna	O3
39-157-0006	Tuscarawas	527 Crescent St.	SO2
39-165-0007	Warren	416 Southeast St.	O3, LC25, PM25C
39-167-0004	Washington	2000 Fourth St., Marietta	O3
39-167-0008	Washington	Washington Career Center	PB
39-167-0010	Washington	115 Victory Place	PB
39-173-0003	Wood	347 Dunbridge Rd.	O3

Acronyms and Abbreviations

AA	Atomic Absorption
AIRS-AQS	Aerometric Information Retrieval System-Air Quality Subsystem (no longer used)
AQCR	Air Quality Control Region
AQI	Air Quality Index (replaced Pollutant Standard Index, PSI)
AQS	Air Quality System (replaced AIRS-AQS)
ATMP	Air Toxics Monitoring Program
CBSA	Core Based Statistical Area
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DAPC	Division of Air Pollution Control
DES	Division of Environmental Services
DO	District Office
EDT	Exceptional Data Type
FR	Federal Register
GC	Gas Chromatograph or Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LAA	Local Air Agency
NAAQS	National Ambient Air Quality Standards
NADB	National Aerometric Databank
NAMS	National Ambient Monitoring Stations
NCore	National Core Monitoring Network
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
O_3	Ozone
OAQPS	Office of Air Quality Planning and Standards
OASN	Ohio Air Sampling Network
Org Type	Organization Type
Pb	Lead
POC	Parameter Occurrence Code
ppb	parts per billion
ppm	parts per million
PQAO	Primary Quality Assurance Organization
PM_{10} also PM-10	ten micron particulate matter
$PM_{2.5}$ also PM-2.5	2.5 micron particulate matter
PSI	Pollutant Standard Index (replaced by Air Quality Index, AQI)
RADS	Remote Ambient-Air Data System
SLAMS	State/Local Ambient Monitoring Stations
SO_2	Sulfur Dioxide
TO-14A	Toxics analysis methods descriptions
TSP	Total Suspended Particulate
VOC	Volatile Organic Carbon
$\mu g/m^3$ also ug/m^3	micrograms per cubic meter
mg/m^3	milligrams per cubic meter
ng/m^3	nanograms per cubic meter
# Obs	Number of observations/samples

Reporting Organizations

Reporting Organization Code	Agency Description
0012	Akron Regional Air Pollution Control Agency
0151	Canton City Health Department Air Pollution Control
0220	City of Toledo, Environmental Services Division
0229	Cleveland Air Pollution Control Agency
0287	Dayton Regional Air Pollution Control Agency
0443	Glacier Daido America
0595	Lake County Health Department Division Air Pollution
0634	Mahoning-Trumbull Air Pollution Control Agency
0743	National Lime and Stone Company
0805	Ohio EPA, Central District Office
0807	Ohio EPA, Northeast District Office
0808	Ohio EPA, Northwest District Office
0809	Ohio EPA, Southeast District Office
0810	Ohio EPA, Southwest District Office
0880	Portsmouth City Health Department Division of Air Pollution Control
1108	US EPA/OAQPS
1217	Research Triangle Institute RTP, NC
1259	Hamilton County Department of Environmental Services
1299	URS Corp, TX
1335	Ohio University, Athens, Ohio