# STATE OF OHIO
# AIR QUALITY
# CALENDAR YEAR 2008

PREPARED BY

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# EXECUTIVE SUMMARY

## A. General Review

2008 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 2008 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 38 $PM_{10}$ monitoring sites and 66 $PM_{2.5}$ monitoring sites with 101 monitors 60 of which are Federal Reference Monitors, 24 continuous, and 17 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 2008, 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 35.2% in the last ten years. There were no violations of $SO_2$ air quality standards in 2008.

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 and Logan Counties are the result of industrial source monitoring. Monitors are located near lead processing sources in those counties to determine compliance with the standard.

5. Twelve counties are monitoring attainment of the eight hour ozone standard. There are twenty counties with monitored non-attainment based on data for 2006 through 2008. This report uses the ozone standard in effect during 2008.

6. No violations of air quality standards for nitrogen dioxide were recorded in 2008.

7. No air pollution alerts were declared in 2008.

D. The Ohio Network

In 2008 there were a total of 259 monitors at 133 sites reporting data. There were 13 carbon monoxide, 26 sulfur dioxide, 4 nitrogen dioxide, 49 ozone, 41 10 micron particulate ($PM_{10}$), 101 2.5 micron particulate monitors ($PM_{2.5}$) and 17 lead monitors.

The only states with comparable or more monitors are California with 816, Texas with 320 and Pennsylvania with 270 sites.

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# 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 ≤10 microns ($PM_{10}$) and Particulate Matter ≤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 2008.

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, 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 US 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 inhaleable 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 the annual fourth high 8-Hour averages. The summary tables in this report use the new standard.

During 2008, more than 250 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.

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, still being developed, 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 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 $\mu g/m^3$ | 15.0 $\mu g/m^3$ |
| | 24-Hour concentration | Not to be exceeded Three year average of $98^{th}$ percentile | 35 $\mu g/m^3$ | 35 $\mu g/m^3$ |
| $PM_{10}$ | 24-Hr concentration | Not to be exceeded more than once per year averaged over three years | 150 $\mu g/m^3$ | 150 $\mu g/m^3$ |
| SULFUR DIOXIDE | Annual Mean | Not to be exceeded | 0.03 ppm (80 $\mu g/m^3$) | |
| | 24-Hr mean concentration | Not to be exceeded more than once per year | 0.14 ppm (365 $\mu g/m^3$) | |
| | 3-Hr mean concentration | Not to be exceeded more than once per year | | 0.5 ppm (1300 $\mu g/m^3$) |
| 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 $\mu g/m^3$) | 0.12 ppm (244 $\mu g/m^3$) |
| NITROGEN DIOXIDE | Annual mean | Not to be exceeded | 0.053 ppm (100 $\mu g/m^3$) | |
| LEAD | 3-Month mean concentration | Not to be exceeded | 0.15 $\mu g/m^3$ | |

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

$\mu g/m^3$ = micrograms per cubic meter
ppm = parts per million
$mg/m^3$ = milligrams per cubic meter

# Figure 1


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

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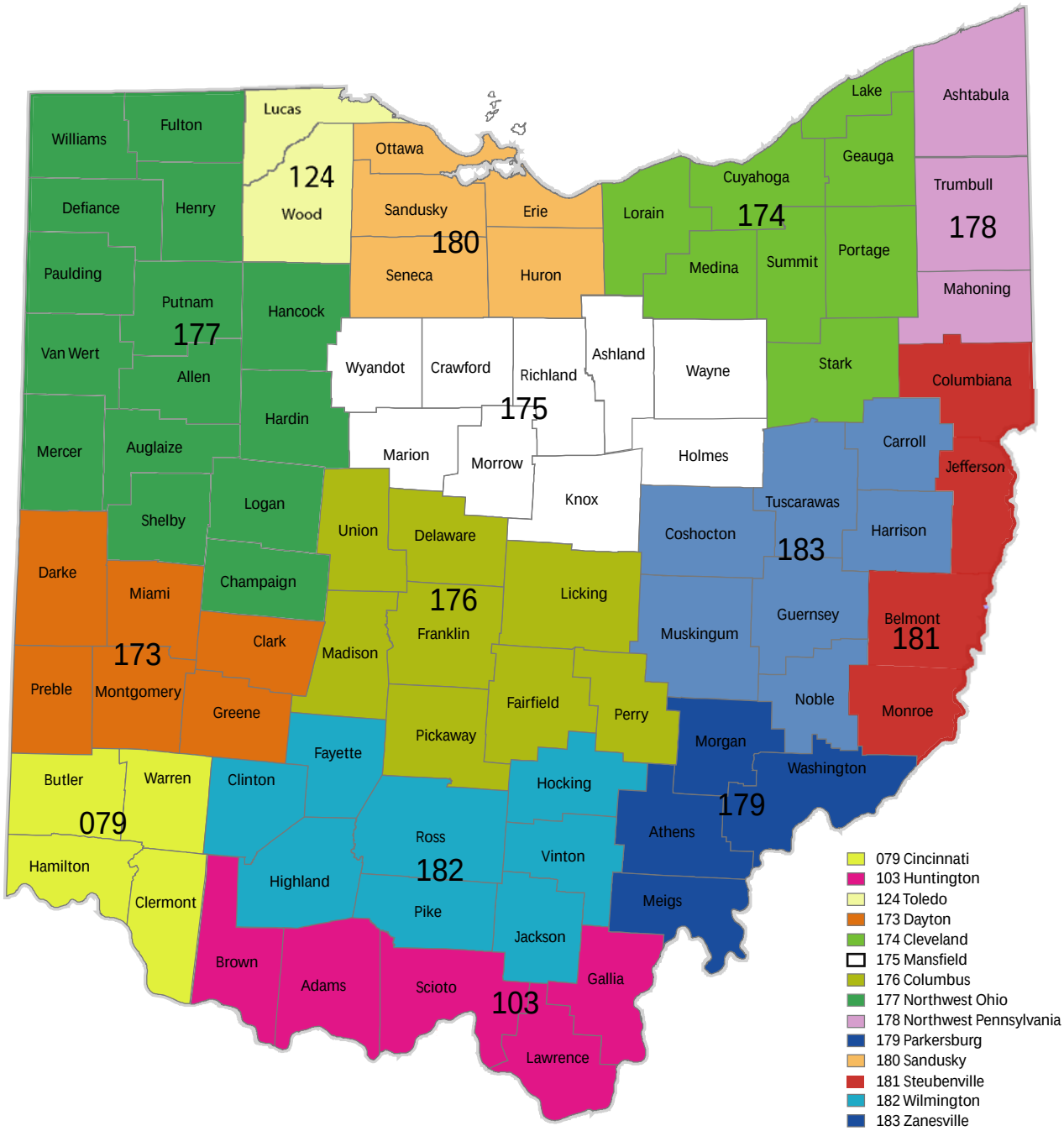


Figure 2

Air Quality Control Regions in Ohio

TABLE 2

AMBIENT AIR MONITORING SITES IN OHIO (2008)

| 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 | 4 | 0 | 2 | 3 | 2 | 0 | 0 | 11 |
| Canton | 2 | 0 | 0 | 3 | 1 | 0 | 0 | 6 |
| Cincinnati (HC-DOES) | 11 | 5 | 1 | 7 | 1 | 1 | 1 | 27 |
| Cleveland | 7 | 6 | 4 | 3 | 4 | 2 | 5 | 31 |
| Lake Co. Health District | 1 | 1 | 2 | 3 | 1 | 0 | 0 | 8 |
| Warren-Youngstown (M-TAPCA) | 3 | 4 | 1 | 3 | 0 | 0 | 0 | 11 |
| 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 | 8 | 1 | 0 | 1 | 15 |
| NEDO | 1 | 3 | 2 | 2 | 0 | 0 | 3 | 11 |
| NWDO | 0 | 0/6 | 1 | 2 | 0 | 0 | 1 | 4/6 |
| SEDO | 3 | 2 | 6 | 2 | 1 | 1 | 2 | 17 |
| SWDO | 0 | 0 | 0 | 1 | 0 | 0 | 1/3 | 2/3 |
| Totals | 44 | 28/9 | 24/2 | 48 | 13 | 4 | 14/3 | 175/14 |

Sites required by Ohio EPA: Government Operated/Industry Operated

## II. Summary of 2008 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.

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[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

2008 $PM_{10}$ Highest Annual Mean Concentration
(in counties where data were collected-values in ug/$m^3$)

# $PM_{10}$

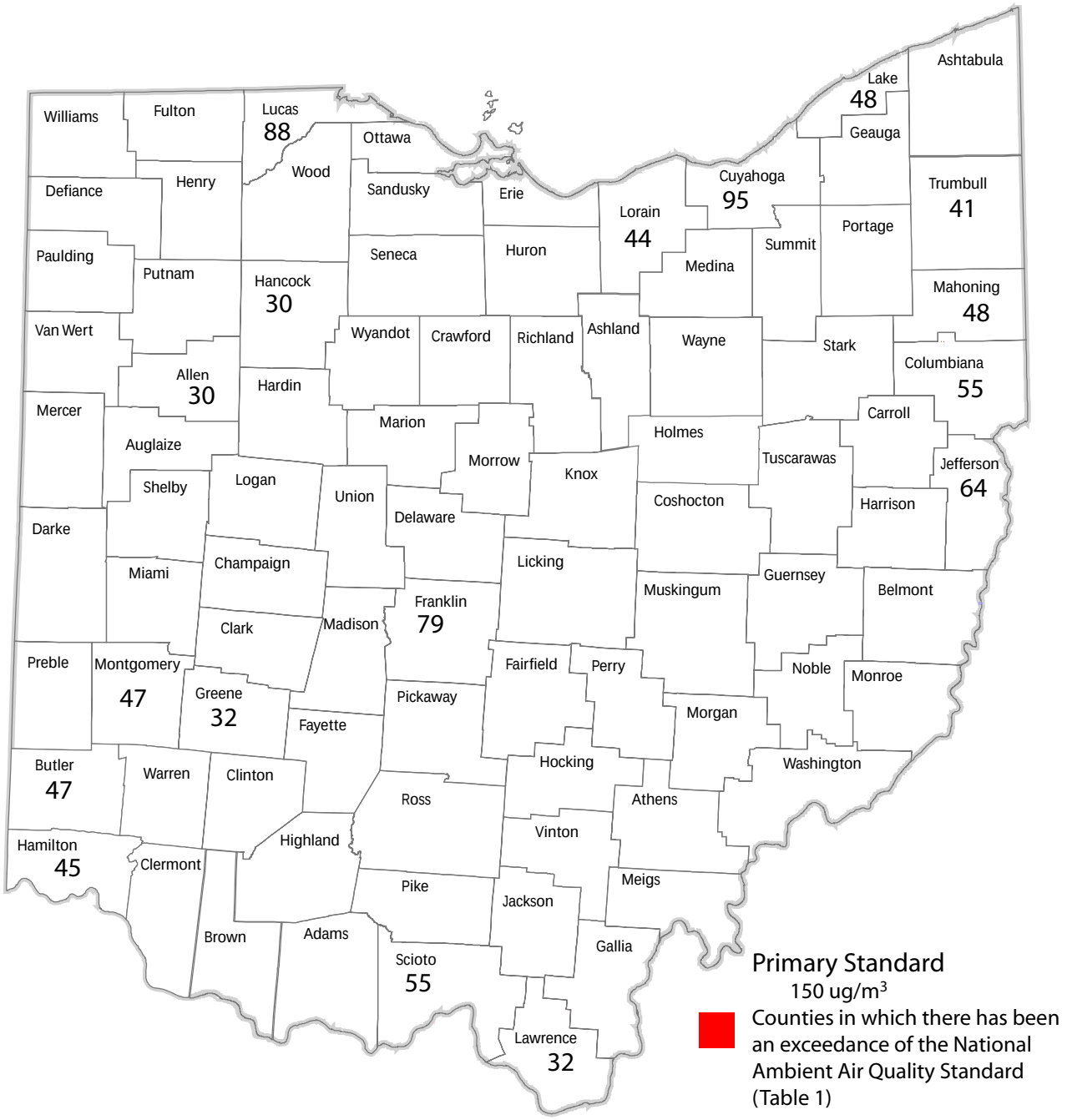
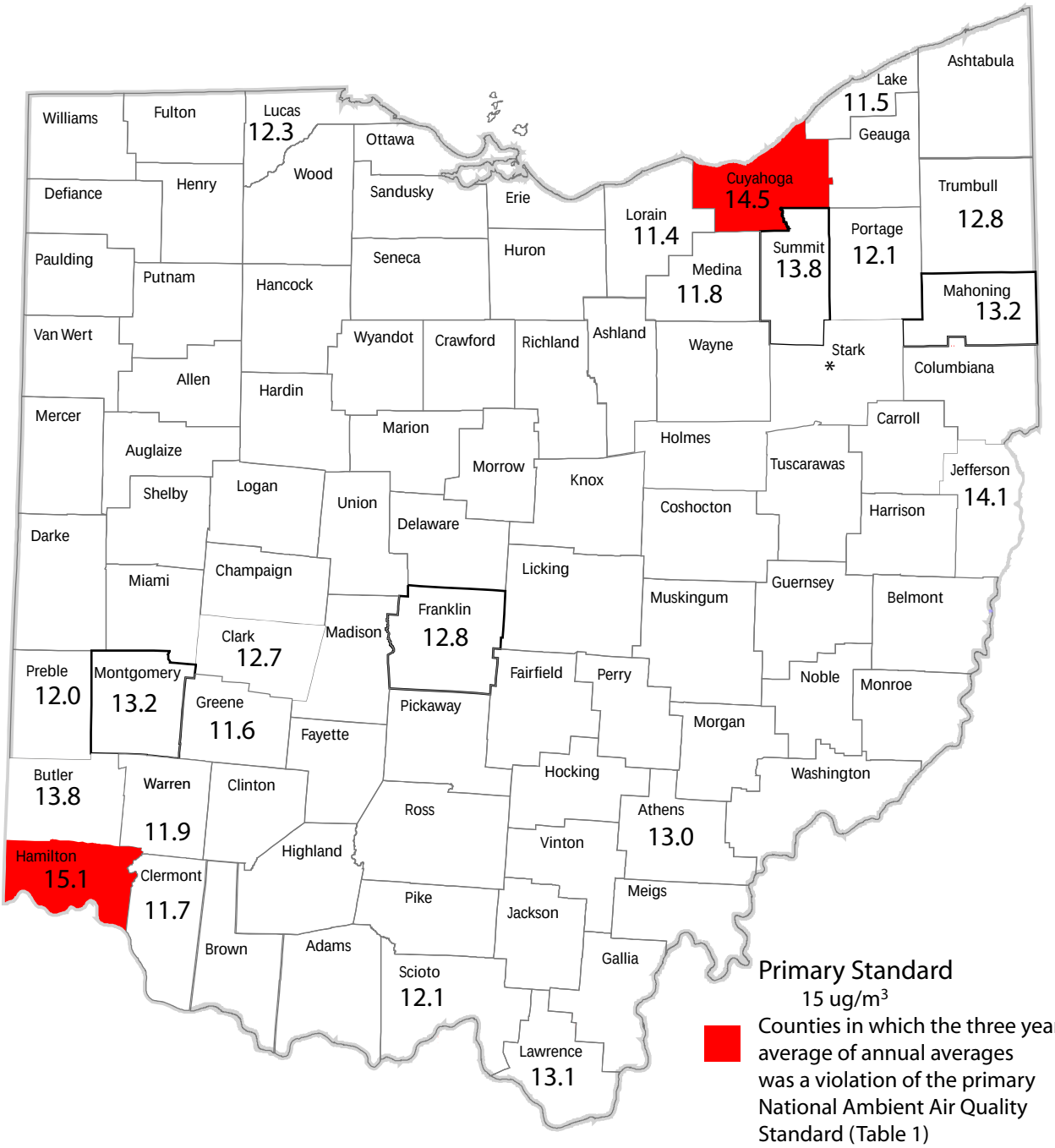



Figure 4

2008 $PM_{10}$ 2nd High 24-Hour Concentration
(In counties where data were collected-values in ug/m3)

# $PM_{2.5}$




Primary Standard
15 ug/m$^3$
Counties in which the three year average of annual averages was a violation of the primary National Ambient Air Quality Standard (Table 1)

* insufficient data in 2008 for a valid year.

Figure 5

2008 $PM_{2.5}$ Highest Annual Concentration
(In counties where data were collected-values in ug/m$^3$)

# $PM_{2.5}$

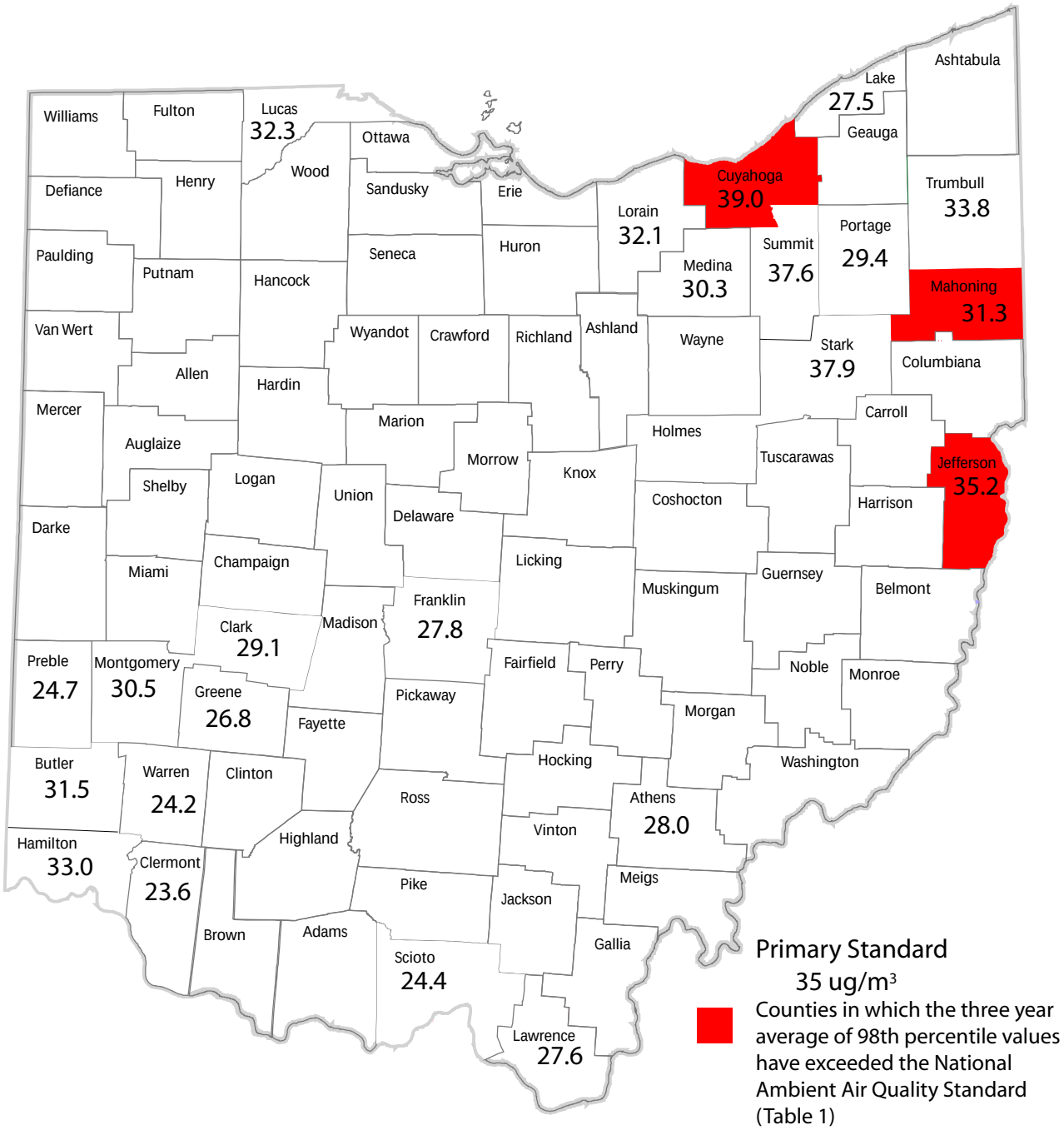



Figure 6

2008 $PM_{2.5}$ 98th Percentile 24-Hour Concentration
(In counties where data were collected-values in ug/m³)

# $PM_{2.5}$

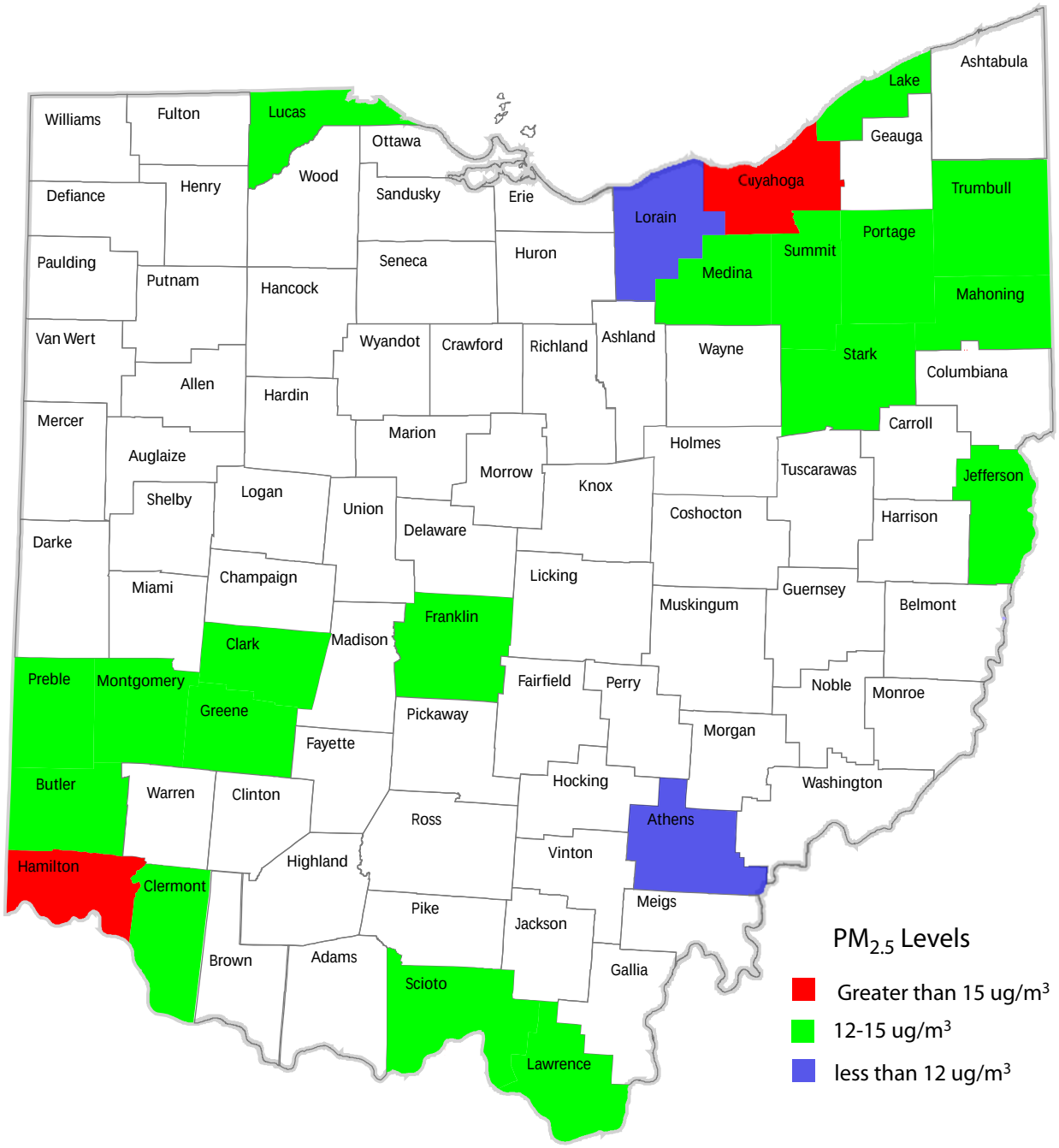



Figure 7

2006-2008 Average of Annual Averages
Highest Site in the County used

# Sulfur Dioxide


Figure 8

2008 $SO_2$ Highest Annual Arithmetic Mean Concentration
(In counties were data were collected-values in ppm)

# Sulfur Dioxide

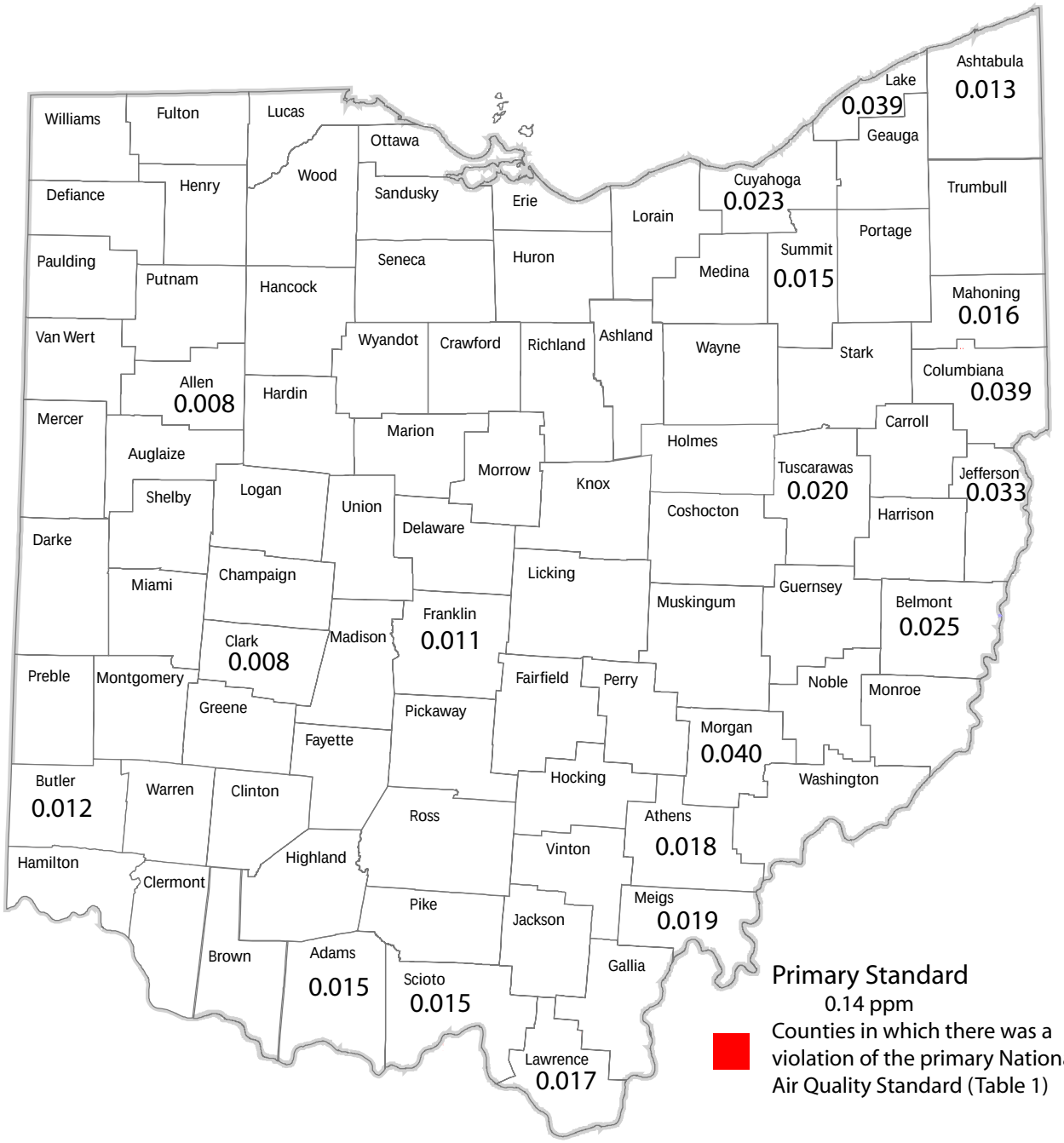



Figure 9

2008 $SO_2$ 2nd Highest 24-Hour Concentration
(In counties where data were collected-values in ppm)

# Sulfur Dioxide

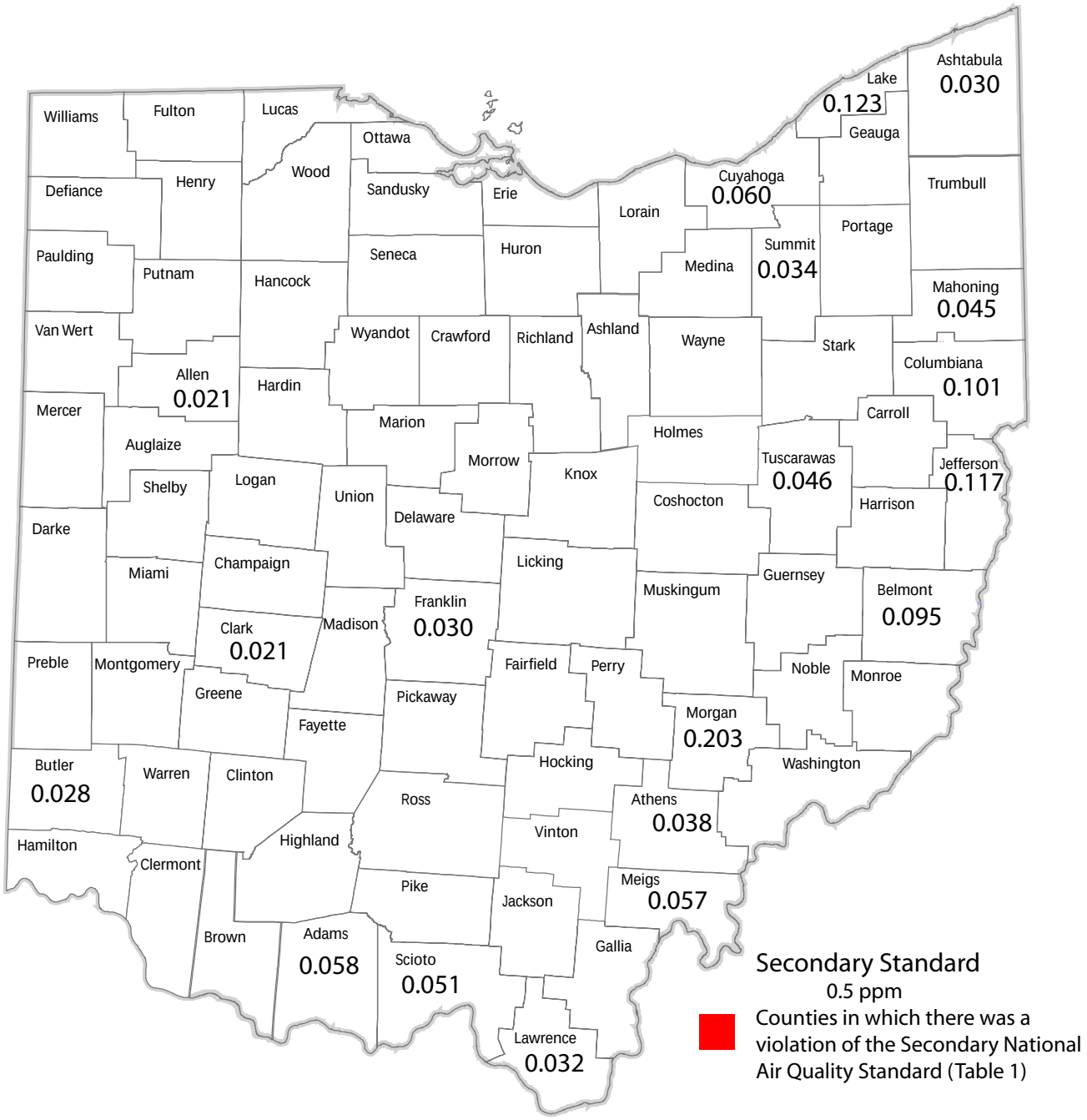



Figure 10

2008 $SO_2$ 2nd Highest 3-Hour Concentration
(In counties where data were collected-values in ppm)

# Carbon Monoxide


Figure 11

2008 Carbon Monoxide 2nd Highest 8-Hour Concentration
(In counties where data were collected-values in ppm)

# Carbon Monoxide


Figure 12

2008 Carbon Monoxide 2nd Highest 1-Hour Concentraton
(In counties where data were collected-values in ppm)

# Nitrogen Dioxide


Figure 13

2008 $NO_2$ Highest Annual Arithmetic Mean Concentration
(In counties where data were collected-values in ppm)

# Ozone


Figure 14

2008 Ozone 2nd Highest 1-Hour Concentration
(In counties where data were collected-values in ppm)

# Ozone

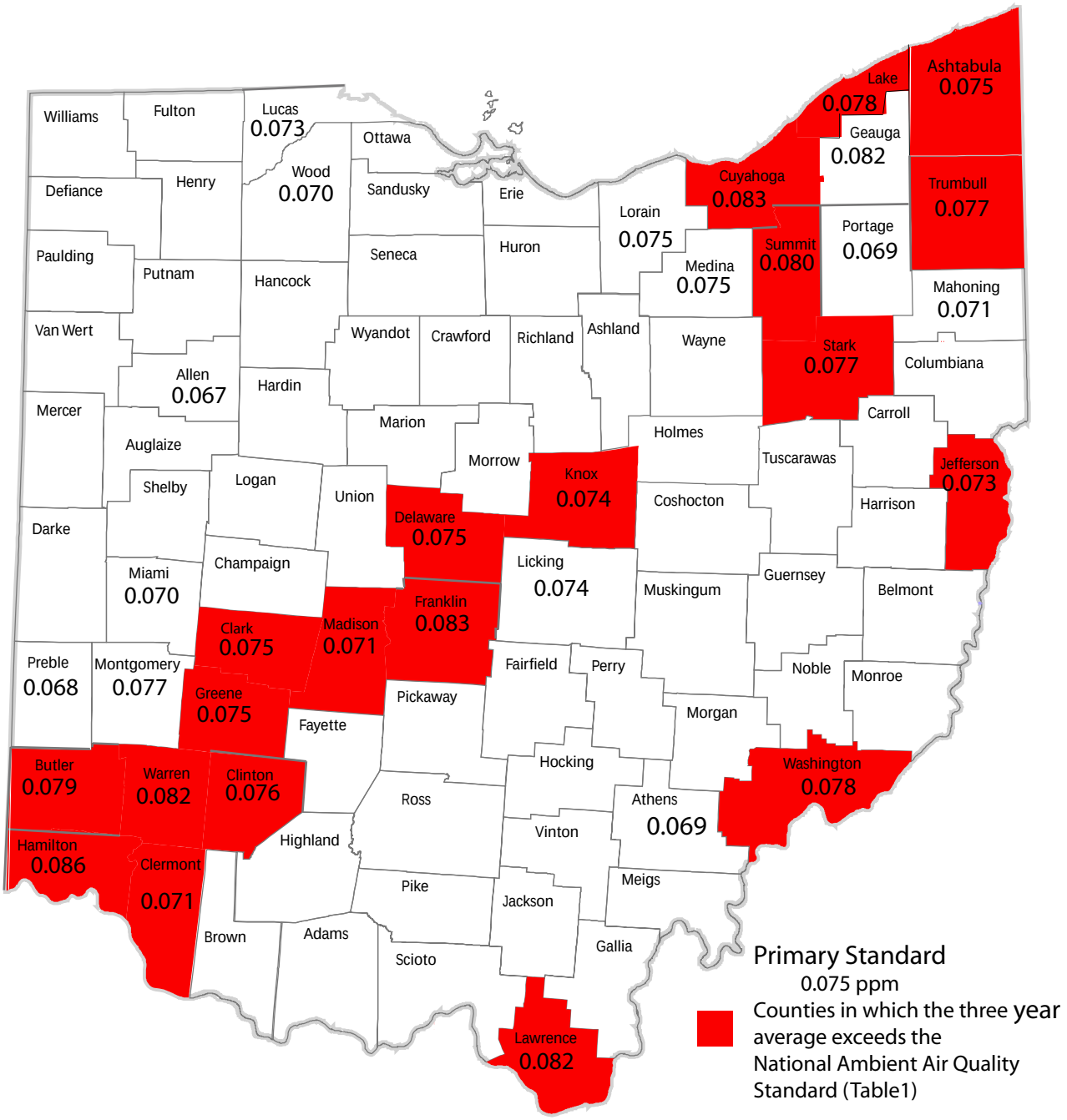



Figure 15

2008 Ozone 4th Highest 8-Hour Concentration
(In counties where data were collected-values in ppm)

# Ozone

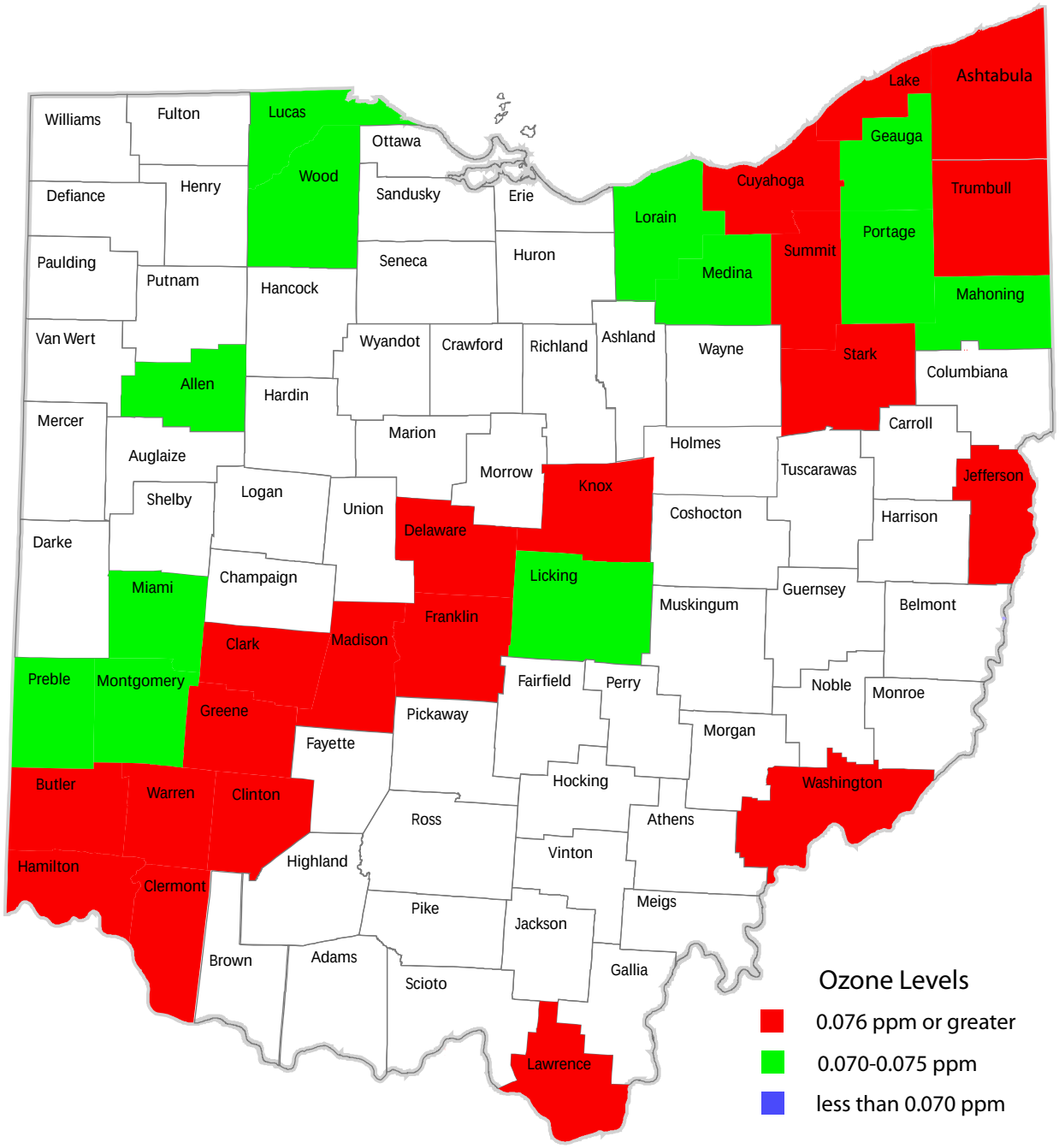



Figure 16

2006-2008 Average of the Fourth High 8-Hour Averages
using the highest reading site in each county

# Lead


Figure 17

2008 Lead, Highest Quarterly Mean
(In counties where data were collected-values in ug/m3)

TABLE 3
VIOLATIONS OF AIR QUALITY STANDARDS BY COUNTY
2008

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

| $PM_{2.5}$ Annual 2006-2008 | $PM_{2.5}$ 24-Hour 2006-2008 | Ozone 8-Hour 2006-2008 | Lead 3-Month 2008 |
|---|---|---|---|
| Hamilton | Cuyahoga | Ashtabula | Fulton |
| Jefferson | Franklin | Butler | Cuyahoga |
| Stark | Jefferson | Clark | |
| | Lake | Clermont | |
| | Montgomery | Clinton | |
| | | Cuyahoga | |
| | | Delaware | |
| | | Franklin | |
| | | Greene | |
| | | Hamilton | |
| | | Jefferson | |
| | | Knox | |
| | | Lake | |
| | | Lawrence | |
| | | Madison | |
| | | Stark | |
| | | 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), requires 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 1999 through 2008. 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 1999-2008

| SITE CATEGORY | IMPROVEMENT |
|---|---|
| Urban Area NAMS | 35.2% |

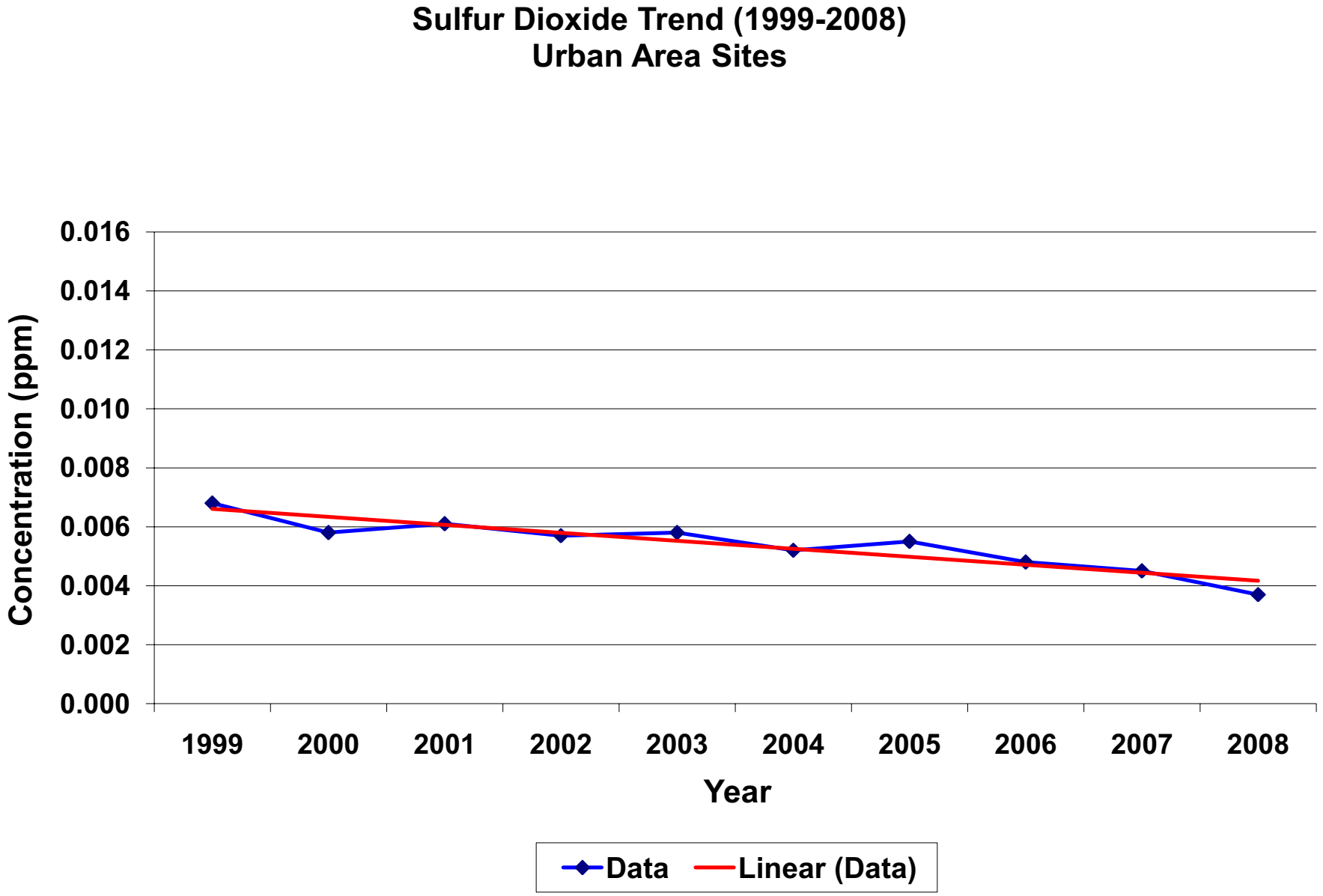

Sulfur Dioxide Trend (1999-2008)
Urban Area Sites
Concentration (ppm)
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year
Data
Linear (Data)

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.

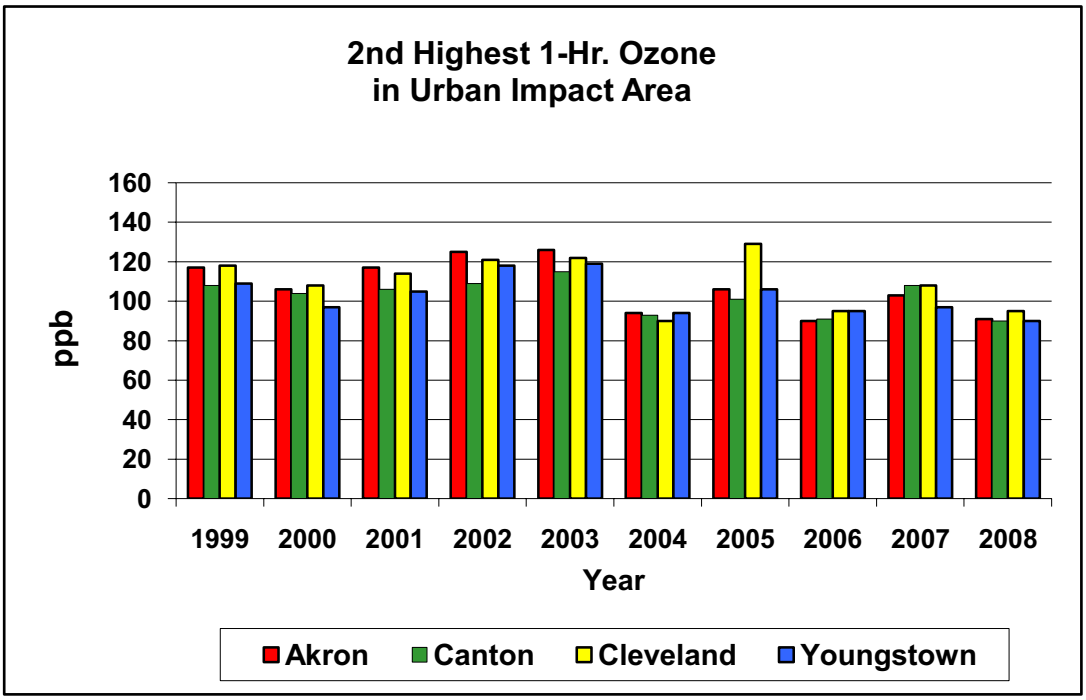
One Hour Data:

Information is presented from eight metropolitan areas in Ohio for the period of 1999 through 2008. 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 1999 through 2008. 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 2008.


2nd Highest 1-Hr. Ozone
in Urban Impact Area
ppb
160
140
120
100
80
60
40
20
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year
Akron
Canton
Cleveland
Youngstown

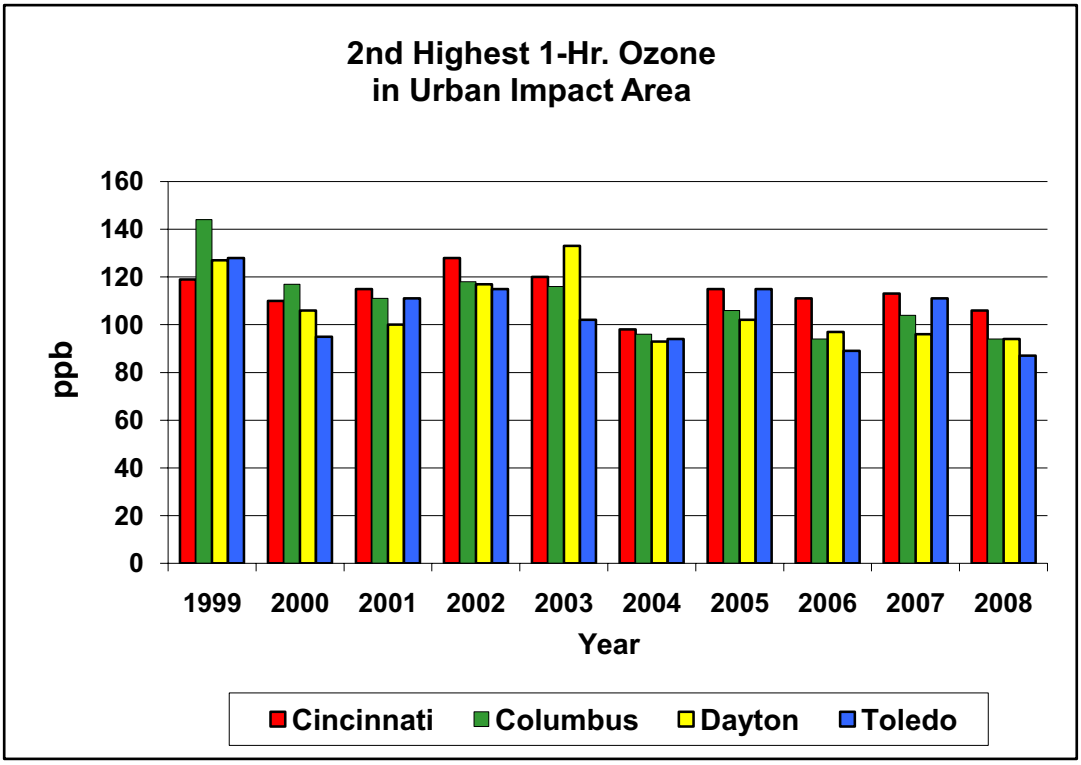
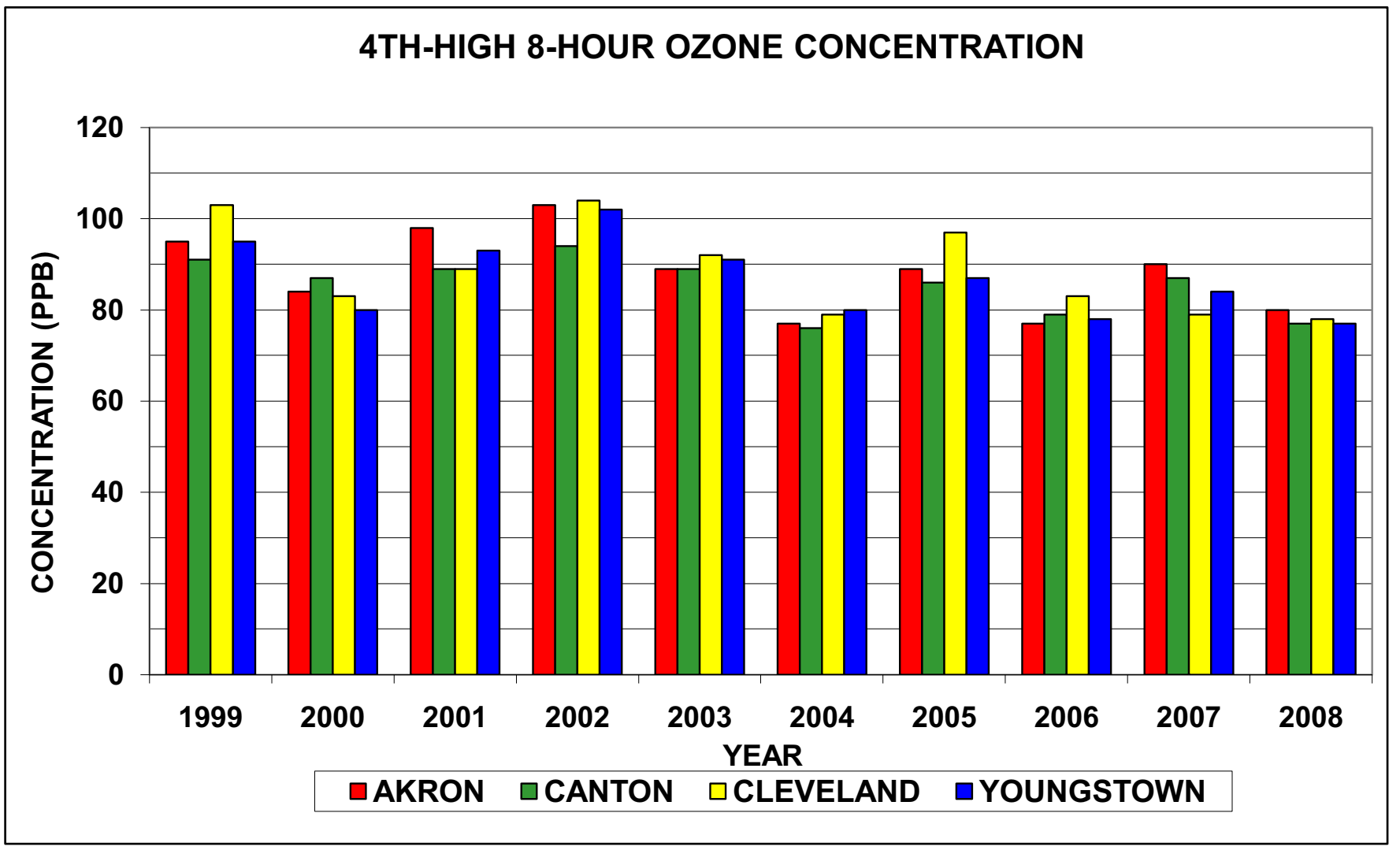

2nd Highest 1-Hr. Ozone
in Urban Impact Area
ppb
160
140
120
100
80
60
40
20
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year
Cincinnati
Columbus
Dayton
Toledo

Figure 19


4TH-HIGH 8-HOUR OZONE CONCENTRATION
CONCENTRATION (PPB)
120
100
80
60
40
20
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
YEAR
AKRON
CANTON
CLEVELAND
YOUNGSTOWN

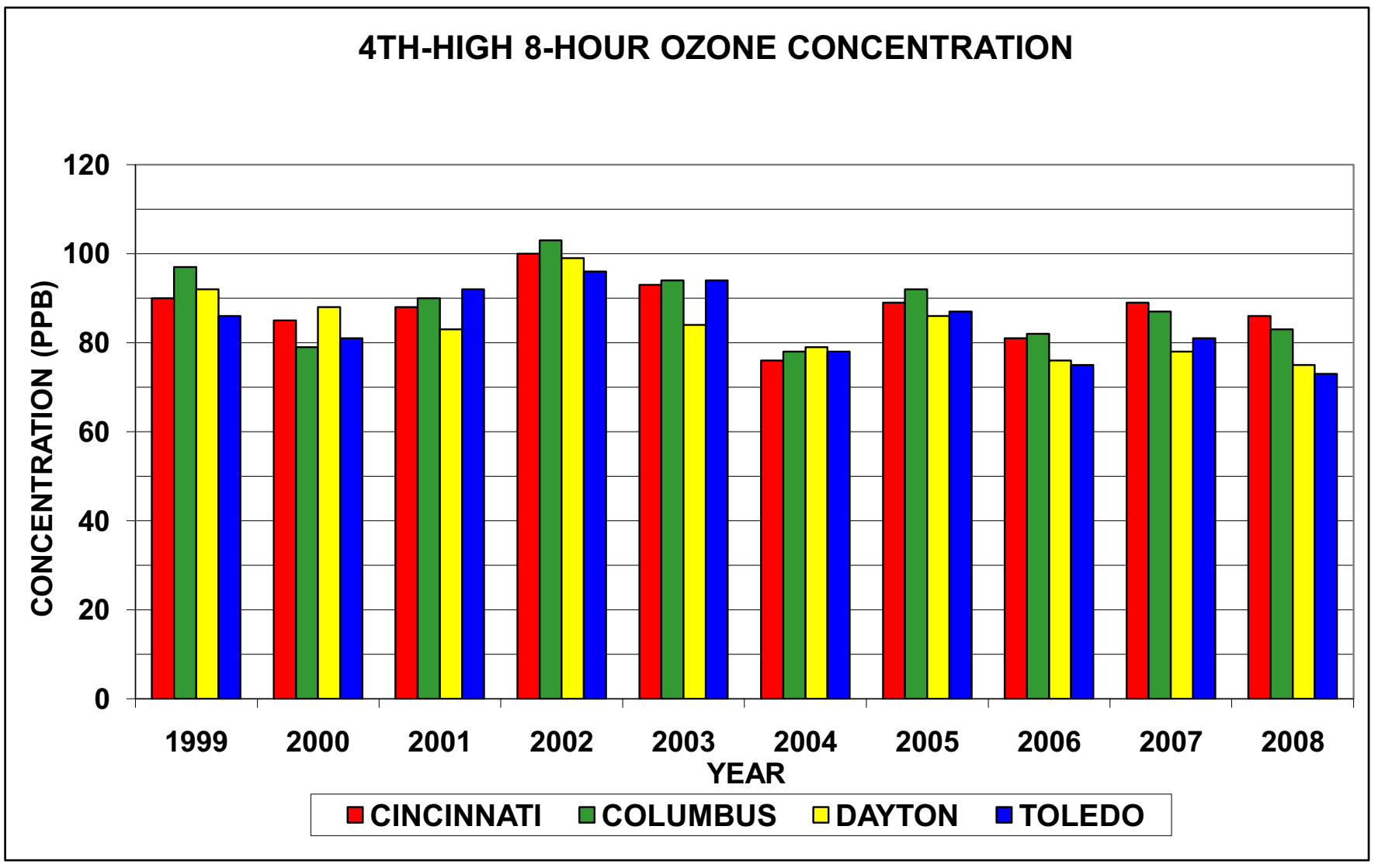
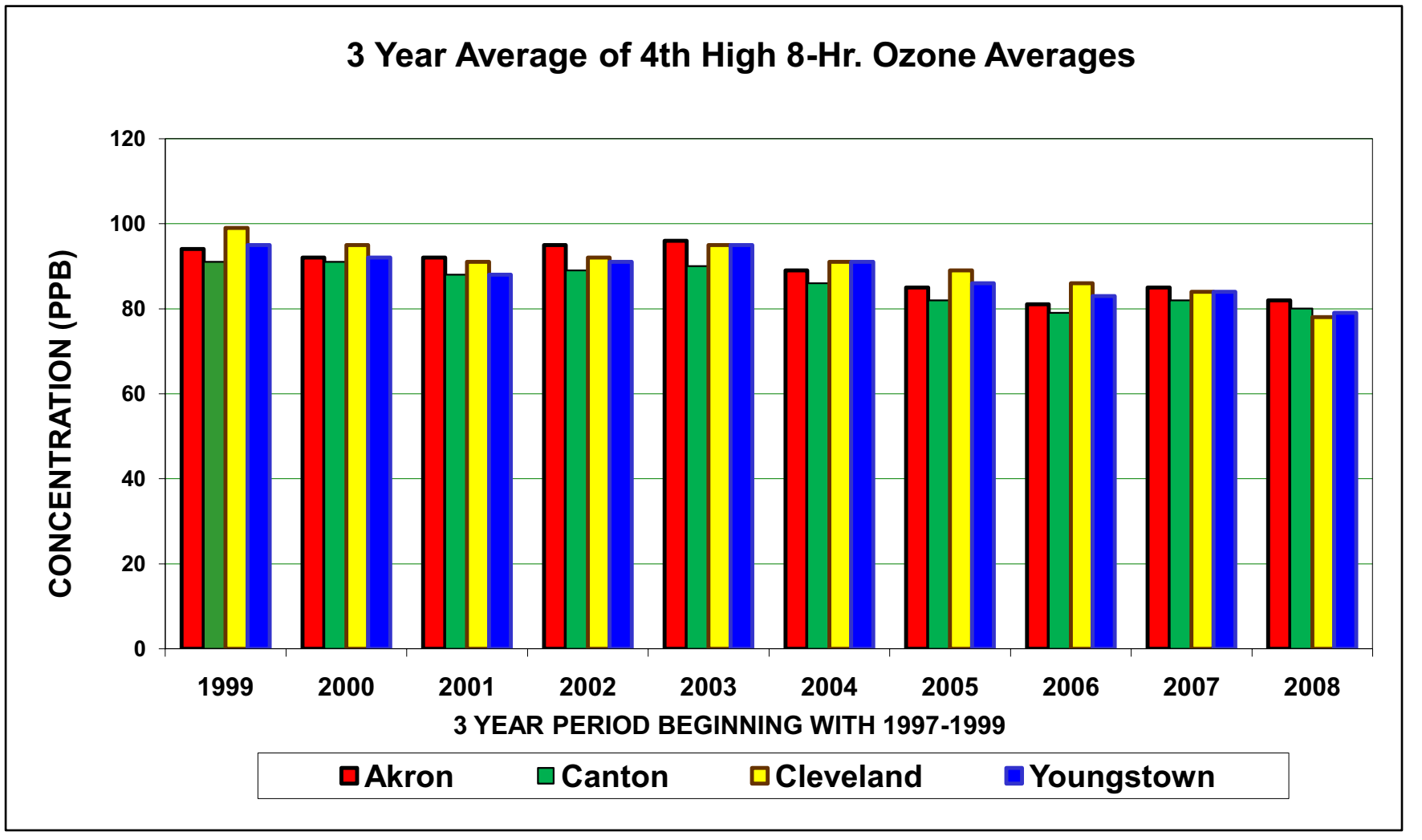

4TH-HIGH 8-HOUR OZONE CONCENTRATION
CONCENTRATION (PPB)
120
100
80
60
40
20
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
YEAR
CINCINNATI
COLUMBUS
DAYTON
TOLEDO

Figure 20


3 Year Average of 4th High 8-Hr. Ozone Averages
CONCENTRATION (PPB)
120
100
80
60
40
20
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
3 YEAR PERIOD BEGINNING WITH 1997-1999
Akron
Canton
Cleveland
Youngstown

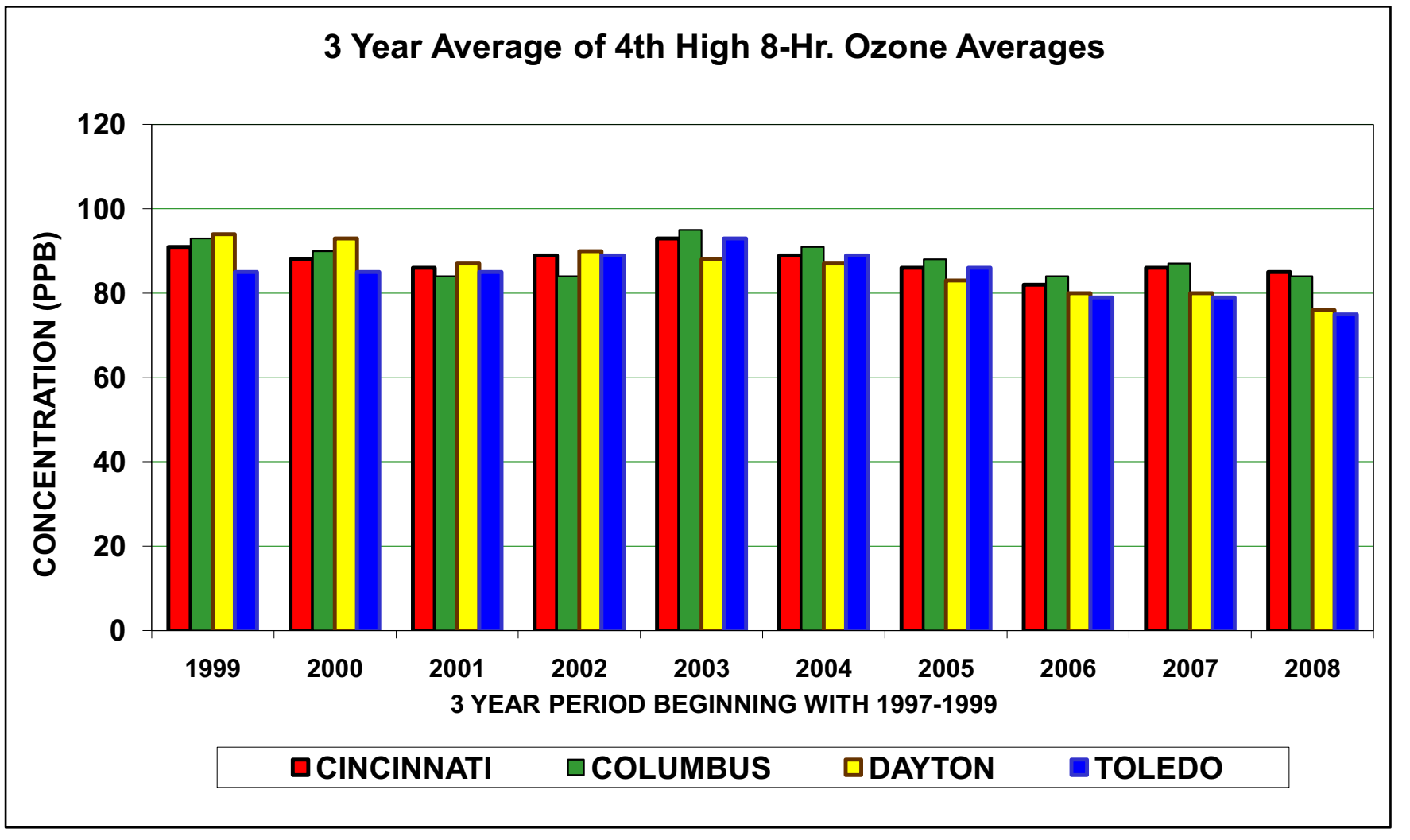
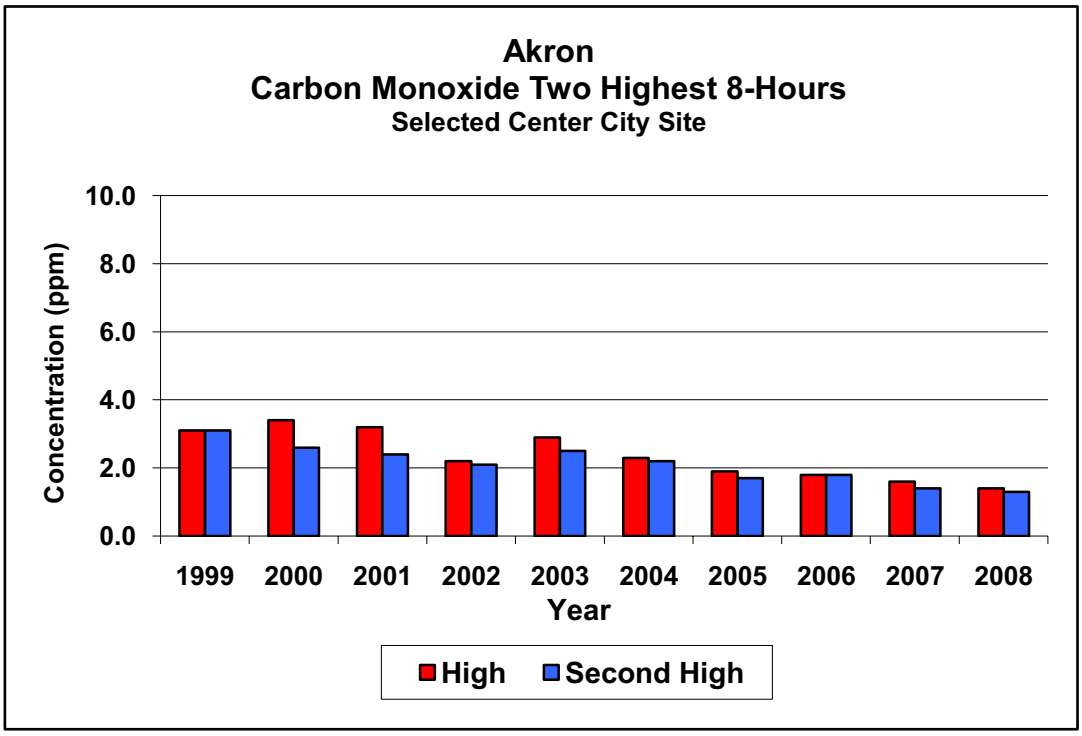

3 Year Average of 4th High 8-Hr. Ozone Averages
CONCENTRATION (PPB)
120
100
80
60
40
20
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
3 YEAR PERIOD BEGINNING WITH 1997-1999
CINCINNATI
COLUMBUS
DAYTON
TOLEDO

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 1999-2008 are used in the graphs. See Figure 21 for the results of this study.


Akron
Carbon Monoxide Two Highest 8-Hours
Selected Center City Site
Concentration (ppm)
10.0
8.0
6.0
4.0
2.0
0.0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year
High
Second High

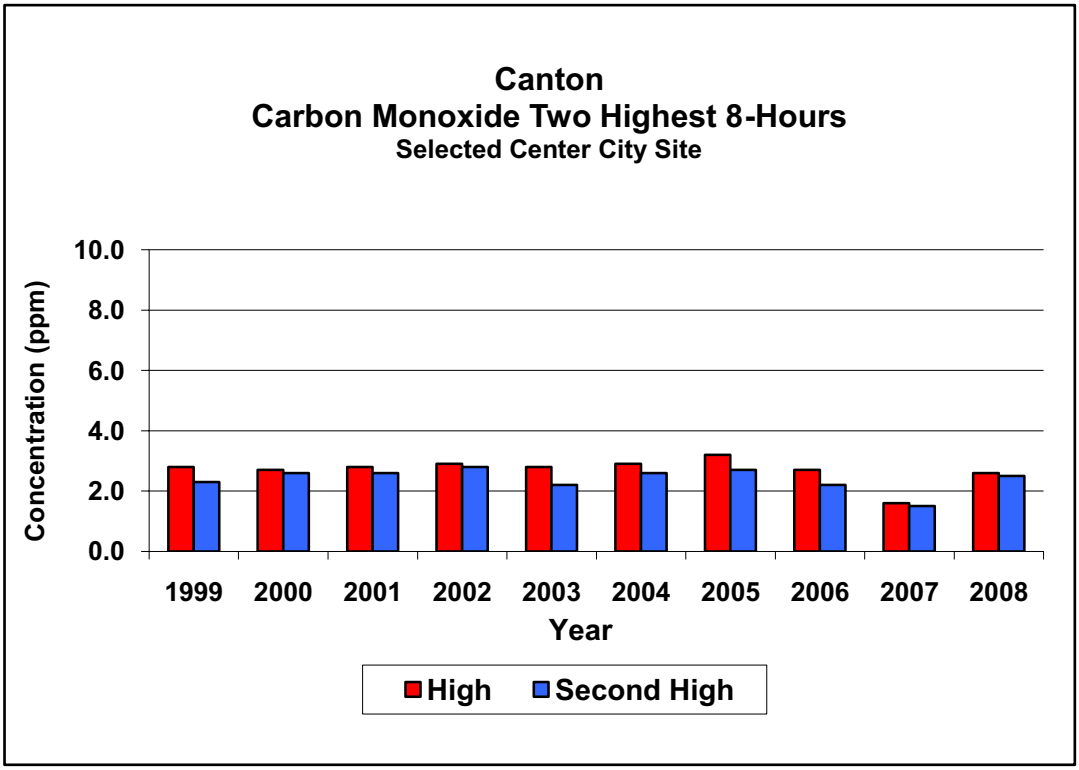
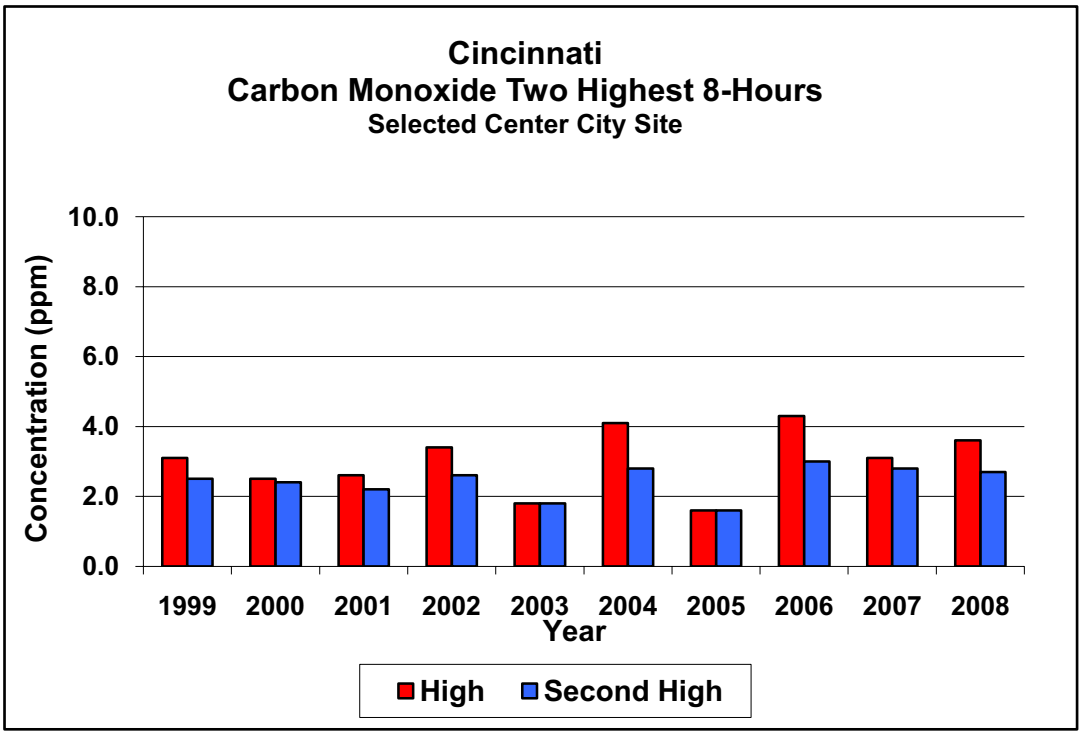

Canton
Carbon Monoxide Two Highest 8-Hours
Selected Center City Site
Concentration (ppm)
10.0
8.0
6.0
4.0
2.0
0.0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year
High
Second High

Figure 22



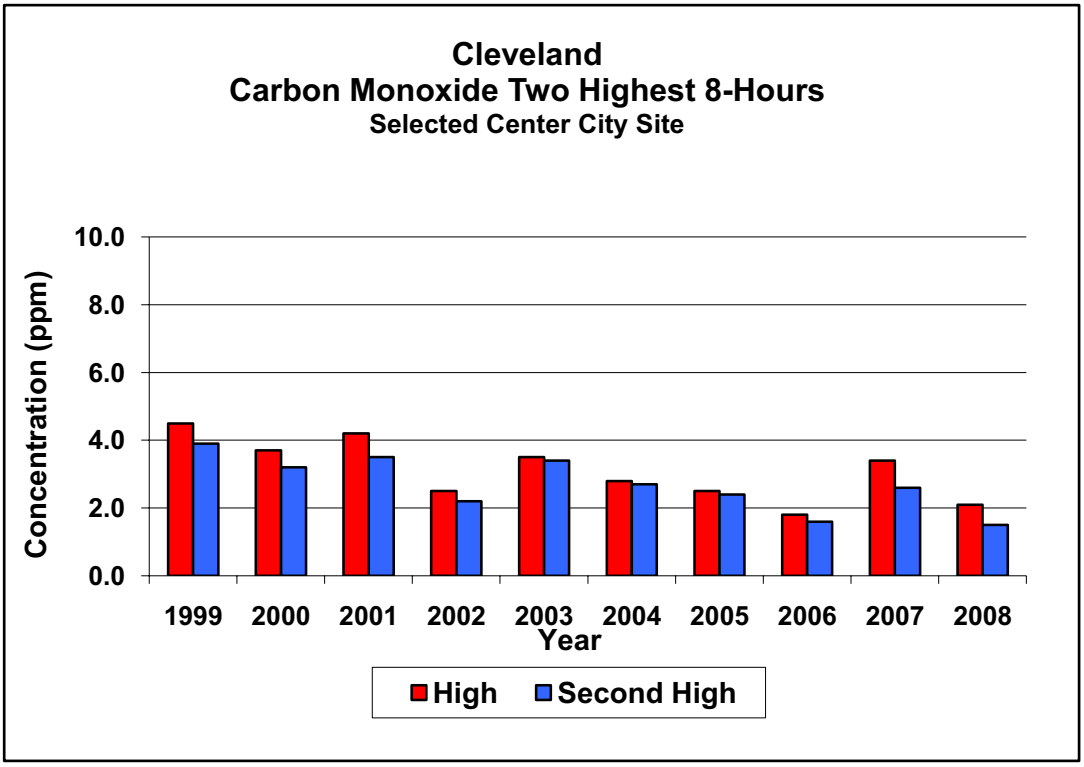
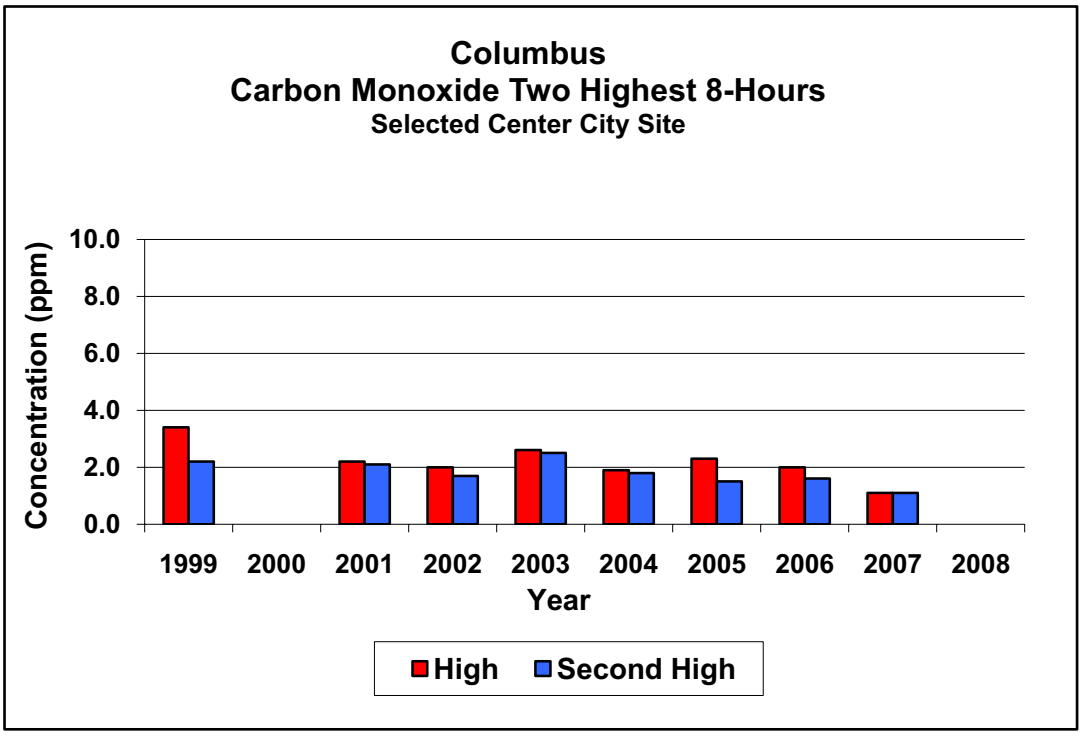




Figure 22 (continued)



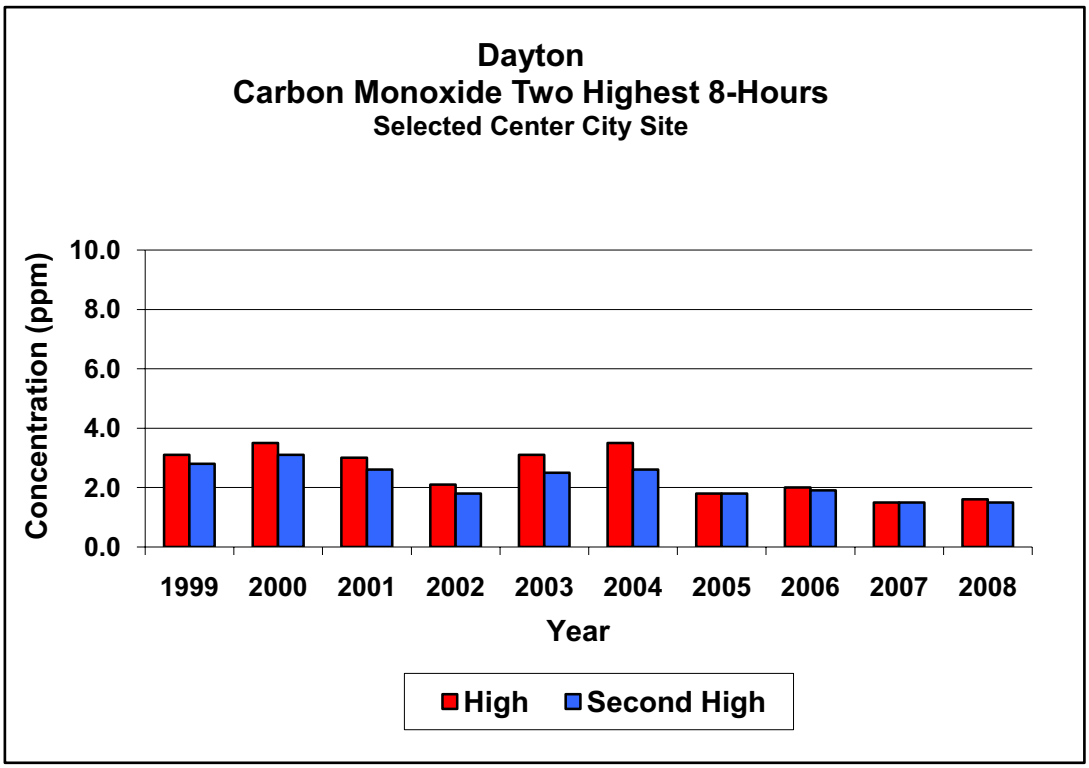
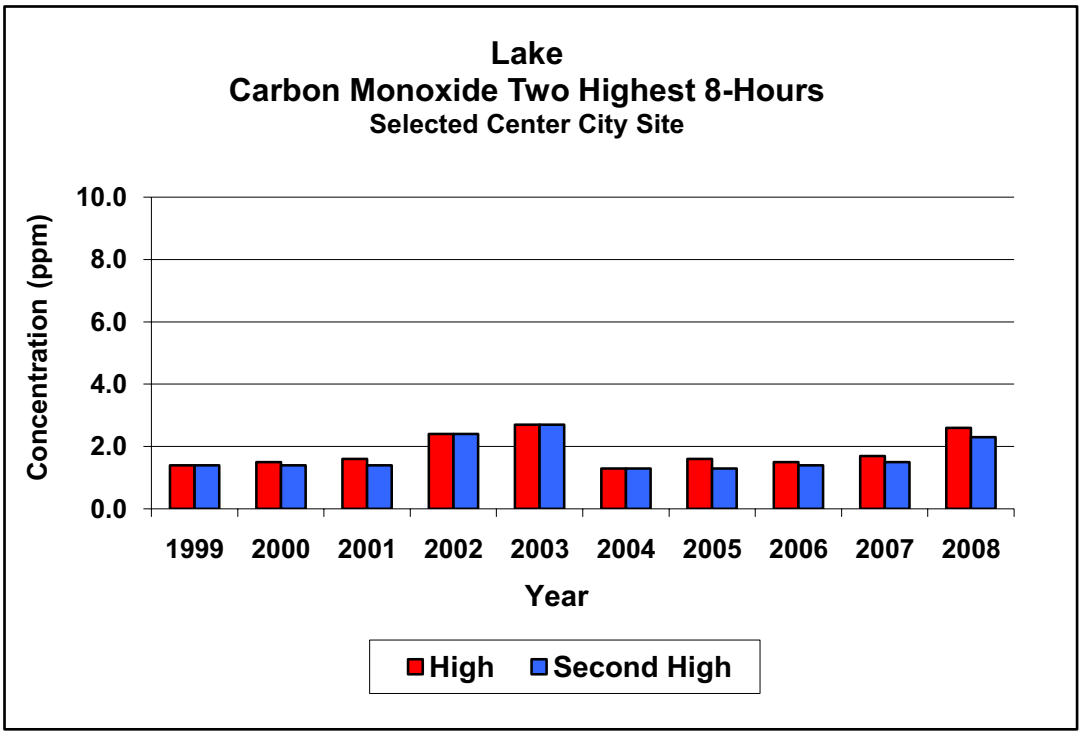




Figure 22 (continued)



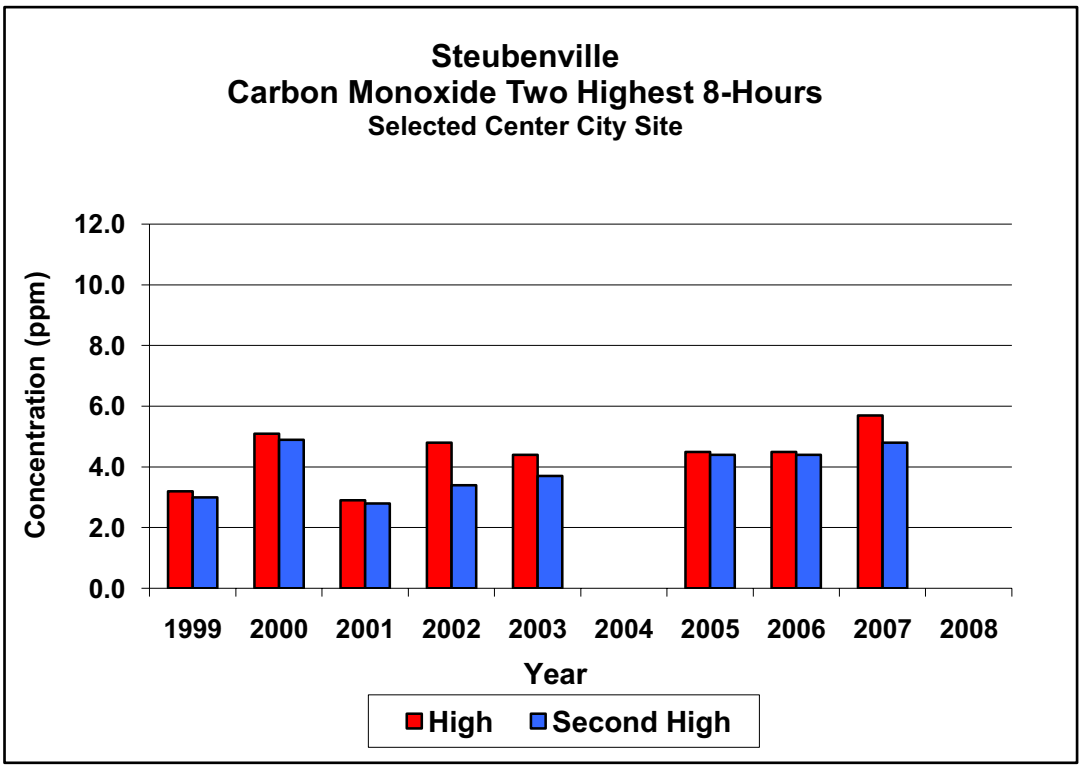




Figure 22 (continued)

# IV. QUALITY ASSURANCE PROGRAM

## A. GENERAL

In 1981, Ohio established a quality assurance program to detect, evaluate and correct problems in acquiring valid data. This program, which follows the requirements of Appendix A of 40 CFR Part 58, stresses control and assessment of errors in the monitoring process.

Control requirements are met by implementing quality control policies, procedures, and corrective actions. Assessment requirements are met by measuring, calculating and reporting the accuracy and precision of the data.

Quality control starts with the instruments in the network and the organizations which run them. A determination of the precision and accuracy of the instruments is the means by which this is done.

Precision and accuracy measurements are made on all NAMS and SLAMS instruments operated by a local air agency (LAA) or district office (DO). Individual precision and accuracy values are then determined for each LAA or DO and for each pollutant being monitored.

## B. Discussion of Accuracy and Precision Procedures

Accuracy requirements for TSP, $PM_{10}$ and Lead samplers include quarterly audits of the flow rate of 25% of the monitoring sites against a known flow rate. Each sampler is audited at least once per year. For $SO_2$, $NO_2$, $O_3$, and CO, quarterly audits of at least 25% of the analyzers are done. During the audits the analyzers are tested with a gas in three specific concentration ranges. Accuracy for $PM_{2.5}$ is determined by collocating samplers at 25% of the sites each calendar quarter.

Precision requirements for TSP, $PM_{10}$, $PM_{2.5}$ and Lead are met by selecting two sites in an area of expected highest concentration for side-by-side (collocation) sampling. The determination for $SO_2$, $NO_2$, $O_3$, and CO includes a one point precision check against a gas of known concentration at least once every two weeks for each automated analyzer. The analyzers are operated in the normal sampling mode during this check.

A series of calculations is performed to determine the precision and accuracy of each analyzer and reporting organization. Precision values are calculated from the results of individual precision checks, and accuracy estimates are calculated from the results of individual audits. Both precision results and

accuracy results are reported at the end of the calendar quarter.

The precision of the reporting organization is determined from the average of the percentage differences between monitors, the pooled standard deviation and the 95% probability limits. The accuracy of the reporting organization is determined from the average of percentage differences, the standard deviation and the 95% probability limits.

C. The Statistics of Accuracy and Precision

Precision is a determination of the repeatability of a measurement. For intermittent samplers this is measured with replicate monitors. For continuous monitors it is measured by challenging the monitor with a known concentration of gas. This concentration is in the range of 0.08-0.10ppm for all monitored pollutants except carbon monoxide (CO), which has a precision concentration range of 8-10ppm. Precision is reported as a percent error in the data reported from the monitor. The precision is reported as a range with a lower (LO) and upper (UP) probability limit. The probability limits have a 95% confidence interval, i.e., the true value of the data will be in the stated probability limit range 95% of the time.

Accuracy is the amount of variation that can be determined between the normal operator with his monitor and an independent auditor using completely independent instrumentation. Accuracy for continuous monitors measured at three different levels or concentration ranges:

| | |
|---|---|
| Level 1 | 0.030 to 0.080ppm<br>Carbon Monoxide 3 to 8ppm |
| Level 2 | 0.150 to 0.200ppm<br>Carbon Monoxide 15 to 20ppm |
| Level 3 | 0.350 to 0.450ppm<br>Carbon Monoxide 35 to 45ppm |

Accuracy is reported as a percent error in the data reported from the monitor in each of the calibration ranges. The probability limits have a 95% confidence interval. The interpretation of the confidence intervals is the same as that for precision as stated above.

Tables 5-10 give the probability limits for accuracy and precision for each reporting organization in the state, for each criteria pollutant being measured except lead.

TABLE 5
Continuous Sulfur Dioxide
2008 Precision and Accuracy Data

| LAA/DO | Precision | | Accuracy(%) | | | |
|---|---|---|---|---|---|---|
| | % Complete | CV | Bias | 1- Point Confidence Limits | | %Between Conf. Lim. |
| | | | | Lower | Upper | |
| Central District | 100 | 2.04 | +1.61 | - 3.20 | 3.76 | 50 |
| Northeast District | 100 | 7.25 | +/ - 4.83 | - 11.72 | 13.68 | 100 |
| Northwest District | 100 | 3.69 | +3.23 | - 4.98 | 7.54 | 100 |
| Southeast District | 100 | 6.35 | +/ - 5.03 | - 11.37 | 12.13 | 100 |
| Akron | 100 | 2.31 | +/ - 1.87 | - 4.18 | 3.82 | 50 |
| HCDOES | 100 | 4.30 | +/ - 3.40 | 7.36 | 7.06 | 83 |
| Cleveland | 100 | 4.39 | - 3.60 | - 8.98 | 7.06 | 83 |
| RAPCA | 73 | 4.84 | - 4.70 | - 9.70 | 5.04 | 100 |
| Lake County | 92 | 4.65 | - 3.69 | - 9.11 | 6.65 | 58 |
| Portsmouth | 100 | 4.35 | +/ - 3.39 | - 7.47 | 8.03 | 86 |
| Mahoning - Trumbull | 96 | 1.05 | - 1.52 | - 2.89 | 0.43 | 67 |

TABLE 6
Continuous Nitrogen Dioxide
2008 Precision and Accuracy Data

| | Precision | | | Accuracy (%) | | |
|---|---|---|---|---|---|---|
| LAA/DO | % Complete | CV | Bias | 1- Point Confidence Limits Lower | Upper | %Between Conf. Lim. |
| HCDOES | 100 | 10.95 | +/ - 8.24 | - 19.02 | 17.28 | 100 |
| Cleveland | 100 | 11.57 | +/ - 6.29 | - 21.24 | 19.72 | 100 |

TABLE 7
Continuous Carbon Monoxide
2008 Precision and Accuracy Data

| LAA/DO | Precision | | Accuracy(%) | | | |
|---|---|---|---|---|---|---|
| | % Complete | CV | Bias | 1- Point Confidence Limits | | %Between Conf. Lim. |
| | | | | Lower | Upper | |
| Central District | 100 | 1.14 | +1.13 | - 1.25 | 2.63 | 33 |
| Akron | 100 | 5.35 | +/ - 4.13 | - 9.00 | 9.46 | 92 |
| Can ton | 35 | 14.43 | +22.96 | - 1.62 | 35.74 | 75 |
| HCDOES | 100 | 7.06 | +/ - 5.15 | - 11.25 | 12.71 | 67 |
| Cleveland | 100 | 3.14 | +3.06 | - 3.86 | 7.62 | 83 |
| RAPCA | 98 | 2.78 | - 2.51 | - 3.31 | 6.13 | 83 |
| Lake County | 92 | 4.97 | +/ - 4.63 | - 9.77 | 5.87 | 83 |

TABLE 8
Continuous Ozone
2008 Precision and Accuracy Data

| LAA/DO | Precision | | Accuracy(%) | | | |
|---|---|---|---|---|---|---|
| | % Complete | CV | Bias | 1- Point Confidence Limits | | %Between Conf. Lim. |
| | | | | Lower | Upper | |
| Central District | 100 | 2.31 | - 1.66 | - 5.10 | 3.44 | 78 |
| Northeast District | 100 | 2.14 | +2.03 | - 2.45 | 4.77 | 83 |
| Northwest District | 100 | 2.98 | +/- 2.32 | - 4.82 | 5.40 | 73 |
| Southeast District | 100 | 5.12 | +/- 4.14 | - 7.63 | 10.07 | 100 |
| Southwest District | 100 | 3.03 | +/- 2.38 | - 5.09 | 4.21 | 78 |
| Akron | 100 | 1.83 | +1.50 | - 2.73 | 3.53 | 70 |
| Canton | 100 | 7.89 | +/- 6.30 | - 14.07 | 12.89 | 89 |
| HCDOES | 100 | 3.24 | +/-2.42 | - 5.25 | 6.59 | 100 |
| Cleveland | 100 | 1.99 | +1.54 | - 2.63 | 4.35 | 78 |
| RAPCA | 100 | 6.04 | +6.24 | - 5.62 | 15.72 | 100 |
| Lake County | 95 | 3.21 | +/- 2.03 | - 5.07 | 5.71 | 93 |
| Portsmouth | 100 | 8.14 | +/-6.53 | - 12.59 | 14.43 | 94 |
| Toledo | 100 | 13.24 | +/- 8.85 | - 19.92 | 25.02 | 100 |
| Mahoning - Trumbull | 93 | 0.70 | - 0.60 | - 1.53 | 0.79 | 22 |

TABLE 9
PM- 2.5
2008 Precision and Accuracy Data

| LAA/DO | Precision | | Coef. Of Variation | Accuracy | | | |
|---|---|---|---|---|---|---|---|
| | Number/Checks | % Complete | CV | Audits | %Com | LO | UP |
| Central District | 52 | 100 | 3.47 | 16 | 100 | - 3.18 | 6.94 |
| Northeast District | 54 | 100 | 12.32 | 8 | 100 | - 3.28 | 2.10 |
| Southeast District | 60 | 100 | 5.34 | 16 | 100 | - 2.93 | 1.75 |
| Akron | 53 | 100 | 8.40 | 20 | 100 | - 3.79 | 2.12 |
| Canton | 56 | 100 | 5.81 | 10 | 100 | 1.14 | 3.44 |
| HCDOES | 114 | 100 | 6.61 | 38 | 100 | - 2.65 | 2.05 |
| Cleveland | 80 | 100 | 6.62 | 35 | 100 | - 7.90 | 16.88 |
| RAPCA | 28 | 93 | 4.00 | 24 | 100 | - 2.74 | 3.42 |
| Lake County | 43 | 100 | 7.52 | 8 | 100 | - 2.44 | 3.14 |
| Portsmouth | 53 | 100 | 8.83 | 9 | 100 | - 3.11 | 4.92 |
| Toledo | 24 | 80 | 14.44 | 11 | 91 | - 0.77 | 2.63 |
| Mahoning - Trumbull | 57 | 100 | 3. 81 | 15 | 100 | - 2.98 | 2.42 |

TABLE 10
$PM_{10}$
2008 Precision and Accuracy Data

| LAA/DO | Precision | | Coef. Of Variation | Accuracy | | | |
|---|---|---|---|---|---|---|---|
| | Number/Checks | % Complete | CV | Audits | %Com | LO | UP |
| Central District | 57 | 100 | 3.15 | 8 | 100 | - 6.75 | 14.04 |
| Northeast District | 42 | 100 | 4.73 | 15 | 100 | - 3.40 | 6.96 |
| Southeast District | 58 | 100 | 5.36 | 6 | 100 | 1.43 | 7.11 |
| HCDOES | 44 | 100 | 3.85 | 7 | 100 | - 0.61 | 6.03 |
| Cleveland | 58 | 100 | 9.15 | 12 | 100 | - 3.79 | 13.82 |
| RAPCA | 28 | 100 | 5.45 | 3 | 50 | - 6.60 | - 0.58 |
| La ke County | 60 | 100 | 5.35 | 8 | 100 | - 12.71 | 8.17 |
| Portsmouth | 59 | 100 | 6.59 | 5 | 100 | 1.20 | 14.51 |
| Mahoning - Trumbull | 58 | 100 | 3.93 | 8 | 50 | - 6.90 | 13.31 |

# V. AIR QUALITY DATA 2008

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 $PM_{10}$.

Since 1987 TSP sampling has been gradually replaced by ten micron particulate sampling ($PM_{10}$). There were over 200 TSP monitors in 1987. In 2007 there were 10 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.

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

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 | 2008 | 091 | 54 | 144 | 101 | 100 | 83 | 45.6* | 39.0 | 1.8 | | 0 |
| 39-029-0020 | 1 | 0807 | East Liverpool | Columbiana | 2220 MICHIGAN | 2008 | 091 | 57 | 143 | 104 | 94 | 94 | 44.7 | 37.7 | 1.8 | | 0 |
| 39-035-0038 | 1 | 0229 | Cleveland | Cuyahoga | 2547 ST TIKHON | 2008 | 091 | 59 | 175 | 151 | 130 | 125 | 52.8 | 43.7 | 1.8 | | 0 |
| 39-035-0042 | 1 | 0229 | Cleveland | Cuyahoga | 3136 LORAIN AVE., F.S. 4 | 2008 | 091 | 55 | 127 | 122 | 121 | 110 | 47.3* | 38.8 | 1.9 | | 0 |
| 39-035-0049 | 1 | 0229 | Cleveland | Cuyahoga | E. 56TH ST. | 2008 | 091 | 58 | 243 | 199 | 177 | 168 | 78.4 | 64.7 | 1.9 | | 0 |
| 39-035-0050 | 1 | 0229 | Cleveland | Cuyahoga | GRANT RD. | 2008 | 091 | 59 | 130 | 121 | 120 | 114 | 51.2 | 44.4 | 1.7 | | 0 |
| 39-035-0061 | 1 | 0229 | Cleveland | Cuyahoga | W. SIDE OF WEST 3RD. | 2008 | 091 | 57 | 186 | 161 | 159 | 148 | 62.7 | 51.3 | 1.9 | | 0 |
| 39-061-0001 | 2 | 1259 | Cincinnati | Hamilton | 800 VINE ST. | 2008 | 091 | 57 | 81 | 74 | 68 | 67 | 36.6 | 33.0 | 1.6 | | 0 |

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 2008 monitors were operated at 41 sites.

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

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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-003-0006 | 1 | 0743 | Lima | Allen | 1314 FINDLAY RD. | 2008 | 062 | 49 | 61 | 49 | 80 | 32 | 30 | 30 | 28 | 0 | 0 | 20.1* | | 0 |
| 39-003-0007 | 1 | 0743 | Lima | Allen | ROUSCH RD. | 2008 | 062 | 57 | 61 | 57 | 93 | 29 | 28 | 28 | 27 | 0 | 0 | 17.3 | | 0 |
| 39-003-0008 | 1 | 0743 | Lima | Allen | NORTH STREET | 2008 | 062 | 58 | 61 | 58 | 95 | 28 | 28 | 27 | 26 | 0 | 0 | 18.9 | | 0 |
| 39-017-0003 | 1 | 1259 | Middletown | Butler | BONITA & ST JOHN | 2008 | 063 | 58 | 61 | 58 | 95 | 48 | 41 | 40 | 38 | 0 | 0 | 20.7 | | 0 |
| 39-017-0015 | 1 | 1259 | Middletown | Butler | 3901 LEFFERSON | 2008 | 063 | 55 | 61 | 55 | 90 | 62 | 47 | 44 | 42 | 0 | 0 | 23.3 | | 0 |
| 39-029-0020 | 1 | 0807 | East Liverpool | Columbiana | 2220 MICHIGAN | 2008 | 062 | 59 | 61 | 59 | 97 | 54 | 48 | 48 | 47 | 0 | 0 | 25.8 | | 0 |
| 39-029-0022 | 1 | 0807 | East Liverpool | Columbiana | 500 MARYLAND | 2008 | 062 | 58 | 61 | 58 | 95 | 70 | 55 | 44 | 43 | 0 | 0 | 26.5 | | 0 |
| 39-035-0027 | 1 | 0229 | Cleveland | Cuyahoga | 2200 W 28TH ST. | 2008 | 063 | 60 | 61 | 60 | 98 | 61 | 57 | 50 | 48 | 0 | 0 | 22.7 | | 0 |
| 39-035-0038 | 1 | 0229 | Cleveland | Cuyahoga | 2547 ST TIKHON | 2008 | 063 | 353 | 183 | 181 | 99 | 67 | 67 | 65 | 65 | 0 | 0 | 27.7 | | 0 |
| 39-035-0045 | 1 | 0229 | Cleveland | Cuyahoga | 4950 BROADWAY AVE. | 2008 | 063 | 58 | 61 | 58 | 95 | 57 | 56 | 52 | 52 | 0 | 0 | 25.8 | | 0 |
| 39-035-0060 | 1 | 0229 | Cleveland | Cuyahoga | E. 14TH & ORANGE | 2008 | 063 | 59 | 61 | 59 | 97 | 92 | 79 | 66 | 65 | 0 | 0 | 28.7 | | 0 |
| 39-035-0060 | 3 | 0229 | Cleveland | Cuyahoga | E. 14TH & ORANGE | 2008 | 079 | 8503 | 366 | 351 | 96 | 96 | 73 | 72 | 69 | 0 | 0 | 26.8 | | 0 |
| 39-035-0065 | 1 | 0229 | Newburgh Heights | Cuyahoga | 4600 HARVARD AVE. | 2008 | 063 | 57 | 61 | 57 | 93 | 110 | 95 | 85 | 83 | 0 | 0 | 36.7 | | 0 |
| 39-035-1002 | 1 | 0229 | Brook Park | Cuyahoga | 16900 HOLLAND RD. | 2008 | 063 | 57 | 61 | 57 | 93 | 58 | 43 | 43 | 38 | 0 | 0 | 18.9 | | 0 |
| 39-049-0024 | 1 | 0805 | Columbus | Franklin | STATE FAIRGROUNDS | 2008 | 063 | 59 | 61 | 59 | 97 | 82 | 79 | 61 | 58 | 0 | 0 | 31.5 | | 0 |
| 39-057-0005 | 1 | 0287 | Yellow Springs | Greene | 100 DAYTON ST. | 2008 | 062 | 58 | 61 | 58 | 95 | 32 | 32 | 30 | 29 | 0 | 0 | 15.1 | | 0 |
| 39-061-0014 | 1 | 1259 | Cincinnati | Hamilton | SEYMOUR & VINE ST. | 2008 | 063 | 58 | 61 | 58 | 95 | 48 | 45 | 45 | 42 | 0 | 0 | 23.5 | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-061-0040 | 1 | 1259 | Cincinnati | Hamilton | 250 WM. HOWARD TAFT | 2008 | 063 | 58 | 61 | 58 | 95 | 39 | 38 | 37 | 35 | 0 | 0 | 19.0 | | 0 |
| 39-061-0040 | 9 | 1259 | Cincinnati | Hamilton | 250 WM. HOWARD TAFT | 2008 | 079 | 1365 | 122 | 56 | 46 | 46 | 42 | 41 | 41 | 0 | 0 | 23.4* | | 0 |
| 39-061-5001 | 1 | 1259 | Lockland | Hamilton | 101 COOPER AVE. | 2008 | 063 | 60 | 61 | 60 | 98 | 41 | 38 | 38 | 35 | 0 | 0 | 19.8 | | 0 |
| 39-063-0002 | 1 | 0743 | Findlay | Hancock | 9860 C.R. 313 | 2008 | 062 | 59 | 61 | 59 | 97 | 33 | 30 | 29 | 29 | 0 | 0 | 20.1 | | 0 |
| 39-063-0003 | 1 | 0743 | Findlay | Hancock | 9860 CR 313 | 2008 | 062 | 58 | 61 | 58 | 95 | 30 | 30 | 30 | 28 | 0 | 0 | 20.2 | | 0 |
| 39-063-0004 | 1 | 0743 | Findlay | Hancock | C.R. 144 | 2008 | 062 | 55 | 61 | 55 | 90 | 29 | 27 | 27 | 27 | 0 | 0 | 19.0 | | 0 |
| 39-081-0001 | 1 | 0809 | Not in a city | Jefferson | 1004 THIRD ST. BRILLIANT | 2008 | 063 | 61 | 61 | 61 | 100 | 46 | 43 | 42 | 41 | 0 | 0 | 22.4 | | 0 |
| 39-081-0017 | 1 | 0809 | Steubenville | Jefferson | 618 LOGAN ST. | 2008 | 063 | 60 | 61 | 60 | 98 | 65 | 64 | 57 | 51 | 0 | 0 | 24.8 | | 0 |
| 39-085-1001 | 1 | 0595 | Not in a city | Lake | 325 VINE ST. | 2008 | 062 | 61 | 61 | 61 | 100 | 67 | 48 | 45 | 42 | 0 | 0 | 18.7 | | 0 |
| 39-087-0010 | 1 | 0880 | Ironton | Lawrence | 2128 S. 9TH | 2008 | 062 | 7 | 7 | 7 | 100 | 25 | 15 | 14 | 14 | 0 | 0 | 15.1* | | 0 |
| 39-087-0012 | 1 | 0880 | Ironton | Lawrence | 450 Commerce Drive | 2008 | 062 | 53 | 54 | 53 | 98 | 37 | 32 | 30 | 27 | 0 | 0 | 16.7 | | 0 |
| 39-093-3002 | 1 | 0807 | Sheffield | Lorain | 2180 LAKE BREEZE | 2008 | 062 | 56 | 61 | 56 | 92 | 48 | 44 | 43 | 40 | 0 | 0 | 22.6 | | 0 |
| 39-095-1003 | 2 | 0220 | Toledo | Lucas | LEE & FRONT | 2008 | 079 | 8407 | 366 | 350 | 96 | 111 | 88 | 79 | 76 | 0 | 0 | 21.2 | | 0 |
| 39-099-0005 | 1 | 0634 | Youngstown | Mahoning | 145 MADISON AVE. | 2008 | 063 | 58 | 61 | 58 | 95 | 46 | 43 | 42 | 42 | 0 | 0 | 19.4 | | 0 |
| 39-099-0006 | 1 | 0634 | Youngstown | Mahoning | 1524 OAKLAND AVE. | 2008 | 063 | 61 | 61 | 61 | 100 | 54 | 48 | 45 | 43 | 0 | 0 | 21.1 | | 0 |
| 39-113-7001 | 1 | 0287 | Moraine | Montgomery | 2728 VIKING LANE | 2008 | 063 | 59 | 61 | 59 | 97 | 47 | 45 | 45 | 43 | 0 | 0 | 22.0 | | 0 |
| 39-113-7001 | 2 | 0287 | Moraine | Montgomery | 2728 VIKING LANE | 2008 | 063 | 58 | 61 | 58 | 95 | 47 | 47 | 44 | 41 | 0 | 0 | 22.3 | | 0 |
| 39-145-0013 | 1 | 0880 | New Boston | Scioto | 4862 GALLIA | 2008 | 062 | 61 | 61 | 61 | 100 | 35 | 29 | 27 | 27 | 0 | 0 | 16.5 | | 0 |
| 39-145-0019 | 1 | 0880 | Portsmouth | Scioto | 605 WASHINGTON | 2008 | 062 | 59 | 61 | 59 | 97 | 35 | 30 | 30 | 28 | 0 | 0 | 16.6 | | 0 |
| 39-145-0020 | 1 | 1299 | Franklin Furnace | Scioto | 2840 BACK RD. | 2008 | 150 | 8743 | 366 | 364 | 99 | 61 | 45 | 45 | 41 | 0 | 0 | 17.7 | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-145-0021 | 1 | 1299 | Franklin Furnace | Scioto | 2446 GALLIA PIKE | 2008 | 150 | 8724 | 366 | 363 | 99 | 61 | 55 | 54 | 54 | 0 | 0 | 22.3 | | 0 |
| 39-145-0022 | 1 | 1299 | Franklin Furnace | Scioto | 1740 GALLIA PIKE | 2008 | 150 | 8758 | 366 | 365 | 100 | 51 | 46 | 46 | 44 | 0 | 0 | 17.5 | | 0 |
| 39-155-0005 | 1 | 0634 | Warren | Trumbull | 540 LAIRD AVE. | 2008 | 062 | 58 | 61 | 58 | 95 | 51 | 40 | 40 | 40 | 0 | 0 | 17.7 | | 0 |
| 39-155-0007 | 1 | 0634 | Warren | Trumbull | 2609 DRAPER ST. S.E. | 2008 | 062 | 52 | 54 | 52 | 96 | 62 | 41 | 40 | 40 | 0 | 0 | 17.1 | | 0 |

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 66 $PM_{2.5}$ sites in 2008. Those 66 sites have a total of 101 monitors reporting data. There are 24 continuous monitors and 17 speciation monitors in addition to the 60 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 | 2008 | 120 | 50 | 28.0 | 25.3 | 24.5 | 21.7 | 28.0 | 10.59* | Y | 0 |
| 39-017-0003 | 1 | 1259 | Middletown | Butler | BONITA & ST JOHN | 2008 | 120 | 119 | 38.4 | 31.2 | 27.1 | 26.3 | 27.1 | 13.69 | Y | 0 |
| 39-017-0003 | 2 | 1259 | Middletown | Butler | BONITA & ST JOHN | 2008 | 000 | 58 | 38.1 | 30.9 | 27.3 | 27.2 | 30.9 | 14.32 | Y | 0 |
| 39-017-0016 | 1 | 1259 | Fairfield | Butler | 400 NILLES RD. | 2008 | 120 | 118 | 39.5 | 32.7 | 31.5 | 27.6 | 31.5 | 13.75 | Y | 0 |
| 39-023-0005 | 1 | 0287 | Springfield | Clark | 350 N. FOUNTAIN AVE. | 2008 | 000 | 117 | 38.5 | 35.2 | 29.1 | 28.5 | 29.1 | 12.73 | | 0 |
| 39-025-0022 | 1 | 1259 | Batavia | Clermont | 2400 CLERMONT CENTER DR. | 2008 | 120 | 116 | 25.3 | 24.5 | 23.6 | 23.5 | 23.6 | 11.75 | Y | 0 |
| 39-035-0027 | 1 | 0229 | Cleveland | Cuyahoga | 2200 W 28TH ST. | 2008 | 120 | 106 | 38.0 | 37.8 | 37.7 | 34.1 | 37.7 | 13.17 | | 0 |
| 39-035-0034 | 1 | 0229 | Cleveland | Cuyahoga | 891 E. 152 ST. | 2008 | 120 | 114 | 35.8 | 34.3 | 31.5 | 27.0 | 31.5 | 10.90 | | 0 |
| 39-035-0038 | 1 | 0229 | Cleveland | Cuyahoga | 2547 ST TIKHON | 2008 | 120 | 119 | 41.4 | 40.1 | 39.4 | 38.5 | 39.4 | 14.08 | | 0 |
| 39-035-0038 | 2 | 0229 | Cleveland | Cuyahoga | 2547 ST TIKHON | 2008 | 120 | 39 | 36.8 | 32.1 | 31.1 | 28.0 | 36.8 | 14.02* | | 0 |
| 39-035-0045 | 1 | 0229 | Cleveland | Cuyahoga | 4950 BROADWAY AVE. | 2008 | 120 | 110 | 39.0 | 36.3 | 35.3 | 33.6 | 35.3 | 13.67 | | 0 |
| 39-035-0060 | 1 | 0229 | Cleveland | Cuyahoga | E. 14TH & ORANGE | 2008 | 120 | 106 | 40.3 | 38.1 | 36.9 | 34.2 | 36.9 | 14.37* | | 0 |
| 39-035-0060 | 2 | 0229 | Cleveland | Cuyahoga | E. 14TH & ORANGE | 2008 | 120 | 42 | 40.0 | 27.2 | 27.0 | 26.5 | 40.0 | 14.09 | | 0 |
| 39-035-0065 | 1 | 0229 | Newburgh Heights | Cuyahoga | 4600 HARVARD AVE. | 2008 | 120 | 118 | 38.4 | 36.0 | 33.8 | 32.5 | 33.8 | 14.60 | | 0 |
| 39-035-1002 | 1 | 0229 | Brook Park | Cuyahoga | 16900 HOLLAND RD. | 2008 | 120 | 109 | 34.3 | 30.2 | 30.1 | 29.0 | 30.1 | 12.03* | | 0 |
| 39-049-0024 | 1 | 0805 | Columbus | Franklin | STATE | 2008 | 120 | 115 | 33.1 | 28.2 | 27.8 | 26.5 | 27.8 | 12.78 | Y | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FAIRGROUNDS | | | | | | | | | | | |
| 39-049-0025 | 1 | 0805 | Columbus | Franklin | 1700 ANN ST. | 2008 | 120 | 111 | 32.6 | 27.1 | 26.8 | 26.4 | 26.8 | 12.20 | Y | 0 |
| 39-049-0025 | 2 | 0805 | Columbus | Franklin | 1700 ANN ST. | 2008 | 120 | 57 | 39.0 | 32.7 | 27.9 | 26.7 | 32.7 | 12.96 | | 0 |
| 39-049-0081 | 1 | 0805 | Columbus | Franklin | 5750 MAPLE CANYON | 2008 | 120 | 114 | 43.8 | 30.3 | 25.3 | 24.6 | 25.3 | 11.05 | Y | 0 |
| 39-057-0005 | 1 | 0287 | Yellow Springs | Greene | 100 DAYTON ST. | 2008 | 000 | 119 | 33.3 | 26.9 | 26.8 | 25.3 | 26.8 | 11.63 | | 0 |
| 39-061-0006 | 1 | 1259 | Cincinnati | Hamilton | 11590 GROOMS RD | 2008 | 120 | 174 | 33.9 | 28.1 | 28.1 | 27.0 | 27.0 | 12.48 | Y | 0 |
| 39-061-0014 | 1 | 1259 | Cincinnati | Hamilton | SEYMOUR & VINE ST. | 2008 | 120 | 119 | 37.7 | 33.3 | 33.0 | 31.7 | 33.0 | 15.12 | Y | 0 |
| 39-061-0014 | 2 | 1259 | Cincinnati | Hamilton | SEYMOUR & VINE ST. | 2008 | 000 | 58 | 40.1 | 34.7 | 33.0 | 32.1 | 34.7 | 15.25 | Y | 0 |
| 39-061-0040 | 1 | 1259 | Cincinnati | Hamilton | 250 WM. HOWARD TAFT | 2008 | 000 | 107 | 31.5 | 26.6 | 25.5 | 25.0 | 25.5 | 12.62 | Y | 0 |
| 39-061-0042 | 1 | 1259 | Cincinnati | Hamilton | 2101 W. 8TH ST. | 2008 | 120 | 111 | 33.5 | 32.2 | 27.5 | 27.5 | 27.5 | 14.40 | Y | 0 |
| 39-061-0043 | 1 | 1259 | Sharonville | Hamilton | 3254 E. KEMPER RD. | 2008 | 120 | 117 | 35.0 | 28.5 | 28.2 | 28.0 | 28.2 | 13.32 | Y | 0 |
| 39-061-7001 | 1 | 1259 | Norwood | Hamilton | 2059 SHERMAN AVE. | 2008 | 000 | 112 | 34.2 | 31.9 | 30.3 | 28.9 | 30.3 | 13.74 | Y | 0 |
| 39-061-8001 | 1 | 1259 | St. Bernard | Hamilton | 300 MURRAY RD. | 2008 | 120 | 115 | 37.4 | 31.8 | 31.0 | 30.8 | 31.0 | 14.40 | Y | 0 |
| 39-081-0017 | 1 | 0809 | Steubenville | Jefferson | 618 LOGAN ST. | 2008 | 120 | 106 | 45.6 | 36.4 | 35.2 | 34.8 | 35.2 | 14.28* | Y | 0 |
| 39-081-1001 | 1 | 0809 | Mingo Junction | Jefferson | 501 COMMERICAL | 2008 | 120 | 57 | 39.5 | 35.0 | 30.9 | 27.7 | 35.0 | 14.05 | Y | 0 |
| 39-081-1001 | 2 | 0809 | Mingo Junction | Jefferson | 501 COMMERICAL | 2008 | 120 | 48 | 38.2 | 33.5 | 26.6 | 26.1 | 38.2 | 13.57* | Y | 0 |
| 39-085-3002 | 1 | 0595 | Painesville | Lake | 71 E HIGH | 2008 | 120 | 110 | 32.0 | 28.0 | 27.5 | 26.7 | 27.5 | 11.36* | Y | 0 |
| 39-085-3002 | 2 | 0595 | Painesville | Lake | 71 E HIGH | 2008 | 120 | 50 | 35.5 | 31.9 | 27.7 | 26.8 | 35.5 | 12.51* | Y | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-087-0010 | 1 | 0880 | Ironton | Lawrence | 2128 S. 9TH | 2008 | 120 | 11 | 16.5 | 15.4 | 14.7 | 12.2 | 16.5 | 10.84* | Y | 0 |
| 39-087-0012 | 1 | 0880 | Ironton | Lawrence | 450 Commerce Drive | 2008 | 120 | 98 | 30.5 | 27.6 | 26.0 | 25.9 | 27.6 | 13.12 | Y | 0 |
| 39-093-3002 | 1 | 0807 | Sheffield | Lorain | 2180 LAKE BREEZE | 2008 | 120 | 117 | 35.5 | 34.3 | 32.1 | 26.6 | 32.1 | 11.51 | Y | 0 |
| 39-093-3002 | 2 | 0807 | Sheffield | Lorain | 2180 LAKE BREEZE | 2008 | 120 | 55 | 35.0 | 30.3 | 25.4 | 23.1 | 35.0 | 11.06 | Y | 0 |
| 39-095-0024 | 1 | 0220 | Toledo | Lucas | 348 S. ERIE | 2008 | 120 | 338 | 39.1 | 33.9 | 33.6 | 31.4 | 30.1 | 11.92 | Y | 0 |
| 39-095-0024 | 2 | 0220 | Toledo | Lucas | 348 S. ERIE | 2008 | 120 | 26 | 37.6 | 29.5 | 27.7 | 24.0 | 37.6 | 13.52* | Y | 0 |
| 39-095-0025 | 1 | 0220 | Toledo | Lucas | 600 COLLINS PARK | 2008 | 120 | 82 | 35.5 | 32.3 | 30.2 | 29.1 | 32.3 | 11.64* | Y | 0 |
| 39-095-0026 | 1 | 0220 | Toledo | Lucas | 4208 AIRPORT HIGHWAY | 2008 | 120 | 111 | 37.5 | 34.7 | 31.6 | 31.2 | 31.6 | 12.32 | Y | 0 |
| 39-095-0028 | 1 | 0220 | Not in a city | Lucas | 600 COLLINS PAARK | 2008 | 000 | 18 | 20.9 | 18.9 | 17.1 | 16.1 | 20.9 | 12.01* | Y | 0 |
| 39-099-0005 | 1 | 0634 | Youngstown | Mahoning | 145 MADISON AVE. | 2008 | 120 | 59 | 35.2 | 31.3 | 30.1 | 29.0 | 31.3 | 13.15 | Y | 0 |
| 39-099-0005 | 2 | 0634 | Youngstown | Mahoning | 145 MADISON AVE. | 2008 | 120 | 58 | 34.2 | 31.7 | 29.6 | 28.2 | 31.7 | 13.06 | | 0 |
| 39-099-0014 | 1 | 0634 | Youngstown | Mahoning | 345 OAKHILL AVE. | 2008 | 120 | 357 | 51.9 | 38.1 | 37.1 | 34.5 | 30.9 | 13.13 | Y | 0 |
| 39-103-0003 | 1 | 0012 | Not in a city | Medina | 6364 DEERVIEW | 2008 | 120 | 113 | 33.1 | 31.1 | 30.3 | 26.5 | 30.3 | 11.76 | Y | 0 |
| 39-113-0032 | 1 | 0287 | Dayton | Montgomery | 215 EAST THIRD ST. | 2008 | 120 | 349 | 44.5 | 35.1 | 33.6 | 31.4 | 30.5 | 13.21 | Y | 0 |
| 39-113-0032 | 2 | 0287 | Dayton | Montgomery | 215 EAST THIRD ST. | 2008 | 120 | 30 | 44.2 | 30.7 | 25.2 | 24.4 | 44.2 | 14.71* | Y | 0 |
| 39-133-0002 | 1 | 0012 | Ravenna | Portage | 531 WASHINGTON | 2008 | 120 | 116 | 35.1 | 31.7 | 29.4 | 29.2 | 29.4 | 12.12 | Y | 0 |
| 39-135-1001 | 1 | 0287 | Not in a city | Preble | NATIONAL TRAILS | 2008 | 120 | 119 | 27.8 | 26.9 | 24.7 | 24.6 | 24.7 | 11.99 | Y | 0 |
| 39-145-0013 | 1 | 0880 | New Boston | Scioto | 4862 GALLIA | 2008 | 120 | 347 | 31.7 | 30.8 | 27.8 | 26.0 | 24.4 | 12.15 | Y | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-145-0013 | 2 | 0880 | New Boston | Scioto | 4862 GALLIA | 2008 | 120 | 58 | 25.2 | 24.4 | 22.9 | 21.9 | 24.4 | 11.74 | | 0 |
| 39-151-0017 | 1 | 0151 | Canton | Stark | 1330 DUEBER | 2008 | 000 | 66 | 38.1 | 37.9 | 27.2 | 26.7 | 37.9 | 14.01* | Y | 0 |
| 39-151-0017 | 2 | 0151 | Canton | Stark | 1330 DUEBER | 2008 | 116 | 49 | 37.9 | 26.6 | 25.9 | 25.4 | 37.9 | 13.03* | Y | 0 |
| 39-151-0020 | 1 | 0151 | Canton | Stark | 420 MARKET | 2008 | 000 | 67 | 38.5 | 29.8 | 28.0 | 26.9 | 29.8 | 12.44* | Y | 0 |
| 39-153-0017 | 1 | 0012 | Akron | Summit | 80 BRITTAIN | 2008 | 120 | 118 | 43.6 | 40.3 | 37.6 | 32.6 | 37.6 | 13.83 | Y | 0 |
| 39-153-0017 | 2 | 0012 | Akron | Summit | 80 BRITTAIN | 2008 | 120 | 53 | 43.1 | 34.2 | 31.2 | 27.5 | 34.2 | 13.61* | Y | 0 |
| 39-153-0023 | 1 | 0012 | Akron | Summit | 660 W. EXCHANGE ST. | 2008 | 120 | 114 | 41.0 | 36.0 | 32.7 | 32.7 | 32.7 | 12.89 | Y | 0 |
| 39-155-0007 | 1 | 0634 | Warren | Trumbull | 2609 DRAPER ST. S.E. | 2008 | 120 | 103 | 44.5 | 41.3 | 33.8 | 30.7 | 33.8 | 12.81 | Y | 0 |
| 39-165-0007 | 1 | 1259 | Lebanon | Warren | 416 SOUTHEAST ST. | 2008 | 120 | 118 | 27.7 | 25.7 | 24.2 | 23.3 | 24.2 | 11.92 | Y | 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. | 2008 | 750 | 8751 | 53.9 | 50.4 | 50.0 | 49.9 | 11.18 |
| 39-009-0004 | 1 | 1335 | | Athens | 7760 Blackburn Rd. | 2008 | 760 | 7925 | 73.7 | 52.5 | 51.6 | 50.9 | 12.54 |
| 39-017-1004 | 3 | 1259 | Middletown | Butler | Hook Field Airport | 2008 | 731 | 8614 | 54.1 | 52.4 | 51.6 | 51.4 | 12.68 |
| 39-023-0005 | 3 | 0287 | Springfield | Clark | 350 N. Fountain Ave. | 2008 | 750 | 8766 | 84.5 | 84.2 | 82.3 | 80.4 | 12.69 |
| 39-025-0022 | 3 | 1259 | Batavia | Clermont | 2400 Clermont Center Dr. | 2008 | 760 | 8427 | 48.7 | 47.1 | 46.6 | 45.9 | 10.66 |
| 39-035-0060 | 3 | 0229 | Cleveland | Cuyahoga | E. 14th & Orange | 2008 | 760 | 8538 | 180.7 | 146.0 | 137.7 | 101.4 | 16.15 |
| 39-049-0028 | 3 | 0805 | Columbus | Franklin | 2521 Fairwood | 2008 | 711 | 4842 | 46.3 | 45.9 | 44.4 | 44.2 | 8.23 |
| 39-049-0029 | 3 | 0805 | New Albany | Franklin | 7600 Fodor Rd. | 2008 | 760 | 8653 | 68.3 | 67.8 | 65.9 | 60.6 | 14.92 |
| 39-049-0034 | 3 | 0805 | Columbus | Franklin | Korbel Ave. | 2008 | 760 | 8697 | 90.9 | 90.7 | 77.7 | 74.6 | 17.82 |
| 39-057-0005 | 3 | 0287 | Yellow Springs | Greene | 314 Dayton St. | 2008 | 750 | 8704 | 87.3 | 77.9 | 77.1 | 76.3 | 12.15 |
| 39-061-0006 | 3 | 1259 | Cincinnati | Hamilton | 11590 Grooms Rd. | 2008 | 731 | 8534 | 56.0 | 50.5 | 48.9 | 48.6 | 14.33 |
| 39-061-0040 | 3 | 1259 | Cincinnati | Hamilton | 250 Wm Howard Taft | 2008 | 760 | 8485 | 67.8 | 61.3 | 59.3 | 57.7 | 15.80 |
| 39-081-0017 | 3 | 0809 | Steubenville | Jefferson | 618 Logan St. | 2008 | 760 | 8415 | 137.9 | 119.2 | 100.5 | 99.9 | 13.36 |
| 39-085-3002 | 3 | 0595 | Painesville | Lake | 71 E High | 2008 | 760 | 8766 | 68.0 | 62.0 | 52.0 | 51.. | 11.75 |
| 39-093-3002 | 3 | 0807 | Sheffield | Lorain | 2180 Lake Breeze | 2008 | 760 | 8632 | 110.9 | 93.4 | 78.4 | 78.2 | 14.69 |
| 39-095-0024 | 3 | 0220 | Toledo | Lucas | 348 S. Erie | 2008 | 701 | 8393 | 116.5 | 79.1 | 75.4 | 72.1 | 11.51 |
| 39-099-0014 | 3 | 0634 | Youngstown | Mahoning | 345 Oakhill Ave. | 2008 | 701 | 8735 | 235.3 | 207.2 | 191.7 | 173.6 | 12.68 |
| 39-103-0003 | 3 | 0012 | | Medina | 6364 Deerview | 2008 | 760 | 8540 | 95.4 | 95.0 | 90.4 | 85.0 | 15.93 |
| 39-113-0032 | 3 | 0287 | Dayton | Montgomery | 215 East Third St. | 2008 | 750 | 8716 | 80.7 | 77.7 | 75.4 | 73.6 | 13.36 |
| 39-135-1001 | 3 | 0287 | | Preble | National Trails | 2008 | 750 | 8744 | 95.9 | 70.0 | 65.5 | 63.2 | 11.52 |
| 39-151-0020 | 3 | 0151 | Canton | Stark | 420 Market | 2008 | 711 | 7821 | 218.9 | 73.0 | 68.8 | 66.9 | 9.52 |
| 39-153-0017 | 3 | 0012 | Akron | Summit | 80 Brittain | 2008 | 760 | 4264 | 84.9 | 80.7 | 80.6 | 74.7 | 11.36 |
| 39-155-0007 | 3 | 0634 | Warren | Trumbull | 2609 Draper St. S.E. | 2008 | 701 | 7776 | 151.5 | 113.3 | 106.0 | 99.4 | 12.73 |
| 39-165-0007 | 3 | 1259 | Lebanon | Warren | 416 Southeast S. | 2008 | 731 | 8633 | 50.4 | 49.7 | 47.8 | 47.6 | 12.93 |

# 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 | 2008 | 810 | 46 | 31.2 | 31.0 | 27.9 | 27.0 | 14.39 |
| 39-035-0038 | 6 | 1217 | Cleveland | Cuyahoga | 2547 St. Tikhon | 2008 | 810 | 46 | 44.0 | 40.2 | 35.4 | 34.9 | 15.88 |
| 39-035-0060 | 5 | 1217 | Cleveland | Cuyahoga | E. 14th & Orange | 2008 | 810 | 73 | 41.9 | 37.7 | 37.0 | 36.8 | 14.53 |
| 39-035-0060 | 6 | 1217 | Cleveland | Cuyahoga | E. 14th & Orange | 2008 | 810 | 47 | 45.0 | 38.0 | 37.2 | 35.6 | 15.89 |
| 39-049-0081 | 6 | 1217 | Columbus | Franklin | 5750 Maple Canyon | 2008 | 810 | 46 | 39.9 | 38.5 | 32.6 | 25.6 | 14.00 |
| 39-061-0040 | 5 | 1217 | Cincinnati | Hamilton | 250 Wm Howard Taft | 2008 | 810 | 47 | 32.2 | 29.1 | 27.6 | 27.2 | 14.02 |
| 39-061-8001 | 5 | 1217 | St. Bernard | Hamilton | 300 Murray Rd. | 2008 | 810 | 35 | 41.0 | 34.5 | 31.0 | 28.0 | 16.20 |
| 39-081-1001 | 5 | 1217 | Mingo Junction | Jefferson | 501 Commercial | 2008 | 810 | 46 | 46.7 | 40.2 | 39.6 | 35.8 | 19.65 |
| 39-087-0010 | 5 | 1217 | Ironton | Lawrence | 2128 S 9th | 2008 | 810 | 7 | 31.2 | 27.0 | 21.9 | 20.1 | 19.41 |
| 39-087-0012 | 5 | 1217 | Ironton | Lawrence | 450 Commerce Dr. | 2008 | 810 | 39 | 37.1 | 30.9 | 29.5 | 25.9 | 15.92 |
| 39-093-3002 | 5 | 1217 | Sheffield | Lorain | 2180 Lake Breeze | 2008 | 810 | 33 | 36.9 | 33.8 | 25.7 | 25.6 | 13.84 |
| 39-095-0026 | 5 | 1217 | Toledo | Lucas | 4208 Airport Highway | 2008 | 810 | 45 | 37.8 | 32.4 | 30.9 | 27.8 | 14.01 |
| 39-099-0014 | 5 | 1217 | Youngstown | Mahoning | 345 Oakhill Ave. | 2008 | 810 | 47 | 51.9 | 37.7 | 34.0 | 33.1 | 15.88 |
| 39-113-0032 | 5 | 1217 | Dayton | Montgomery | 215 East Third St. | 2008 | 810 | 45 | 41.2 | 40.6 | 33.8 | 31.5 | 15.65 |
| 39-151-0017 | 5 | 1217 | Canton | Stark | 1330 Dueber | 2008 | 810 | 12 | 38.1 | 24.9 | 19.3 | 18.2 | 15.05 |
| 39-151-0020 | 5 | 1217 | Canton | Stark | 420 Market | 2008 | 810 | 29 | 43.4 | 39.1 | 36.9 | 31.7 | 16.80 |
| 39-153-0023 | 5 | 1217 | Akron | Summit | 660 W. Exchange St. | 2008 | 810 | 45 | 39.1 | 38.9 | 37.3 | 34.1 | 15.64 |

PM-2.5 Averages of Annual Averages

| Site | County | 2006 | 2007 | 2008 | Average '06-'08 |
|---|---|---|---|---|---|
| 39-009-0003 | Athens | 11.8 | 13.0 | 10.6 | 11.8 |
| 39-017-0003 | Butler | 14.0 | 15.4 | 13.8 | 14.4 |
| 39-017-0016 | | 14.0 | 14.9 | 13.8 | 14.2 |
| 39-017-1004 | | 13.4 | 14.6 | | |
| 39-023-0005 | Clark | 13.1 | 14.6 | 12.7 | 13.5 |
| 39-025-0022 | Clermont | 12.7 | 14.0 | 11.7 | 12.8 |
| 39-035-0027 | Cuyahoga | 13.0 | 14.5 | 13.2 | 13.6 |
| 39-035-0034 | | 11.5 | 13.6 | 10.9 | 12.0 |
| 39-035-0038 | | 14.9 | 16.2 | 14.1 | 15.1 |
| 39-035-0045 | | 14.1 | 15.3 | 13.7 | 14.4 |
| 39-035-0060 | | 15.0 | 15.9 | 14.1 | 15.0 |
| 39-035-0065 | | 13.1 | 15.8 | 14.6 | 14.5 |
| 39-035-1002 | | 11.6 | 13.4 | 12.0 | 12.3 |
| 39-049-0024 | Franklin | 13.6 | 14.6 | 12.8 | 13.7 |
| 39-049-0025 | | 13.6 | 14.7 | 12.4 | 13.6 |
| 39-049-0081 | | 12.9 | 13.1 | 11.1 | 12.4 |
| 39-057-0005 | Greene | 11.9 | 13.3 | 11.6 | 12.3 |
| 39-061-0006 | Hamilton | 13.3 | 14.6 | 12.5 | 13.5 |
| 39-061-0014 | | 15.5 | 16.6 | 15.1 | 15.7 |
| 39-061-0040 | | 13.6 | 15.1 | 12.6 | 13.8 |
| 39-061-0042 | | 14.9 | 15.9 | 14.4 | 15.1 |
| 39-061-0043 | | 14.5 | 14.8 | 13.3 | 14.2 |
| 39-061-7001 | | 14.4 | 15.1 | 13.7 | 14.4 |
| 39-061-8001 | | 15.9 | 16.1 | 14.4 | 15.5 |
| 39-081-0017 | Jefferson | 13.8 | 16.2 | 14.3 | 14.8 |
| 39-081-1001 | | 14.6 | 15.6 | 14.1 | 14.8 |
| 39-085-3002 | Lake | 11.5 | 13.9 | 11.5 | 12.3 |
| 39-087-0010 | Lawrence | 14.4 | 15.0 | 10.8 | |
| 39-087-0012 | | | | 13.1 | |
| 39-093-0016 | Lorain | 11.5 | 10.1 | | 10.8 |
| 39-093-3002 | | 11.4 | 12.9 | 11.4 | 11.9 |
| 39-095-0024 | Lucas | 12.7 | 14.8 | 11.9 | 13.1 |
| 39-095-0025 | | 11.9 | 14.2 | 12.3 | 12.8 |
| 39-095-0026 | | 12.6 | 14.3 | 12.3 | 13.1 |
| 39-099-0005 | Mahoning | 12.9 | 14.2 | 13.2 | 13.4 |
| 39-099-0014 | | 13.5 | 14.1 | 13.1 | 13.6 |
| 39-103-0003 | Medina | 11.9 | 12.7 | 11.8 | 12.1 |
| 39-113-0031 | Montgomery | 13.1 | | | |
| 39-113-0032 | | 13.6 | 15.6 | 13.2 | 14.1 |
| 39-133-0002 | Portage | 12.0 | 13.7 | 12.1 | 12.6 |
| 39-135-1001 | Preble | 12.5 | 13.6 | 12.0 | 12.7 |
| 39-145-0013 | Scioto | 14.3 | 14.0 | 12.2 | 13.5 |
| 39-151-0017 | Stark | 14.6 | 15.9 | 13.9 | 14.8 |
| 39-151-0020 | | 11.9 | 14.4 | 12.4 | 12.9 |
| 39-153-0017 | Summit | 13.5 | 14.8 | 13.8 | 14.0 |
| 39-153-0023 | | 12.8 | 13.7 | 12.9 | 13.1 |
| 39-155-0007 | Trumbull | 12.9 | 14.2 | 12.8 | 13.3 |
| 39-165-0007 | Warren | | 14.0 | 11.9 | |

Less than 75% capture

Combined data from two adjacent sites, data in the first site

PM-2.5 98th Percentile Averages

| Site | County | 2006 | 2007 | 2008 | Average '06-'08 |
|---|---|---|---|---|---|
| 39-009-0003 | Athens | 30 | 37 | 28 | 32 |
| 39-017-0003 | Butler | 30 | 37 | 27 | 31 |
| 39-017-0016 | | 35 | 35 | 32 | 34 |
| 39-017-1004 | | 33 | 36 | | |
| 39-023-0005 | Clark | 31 | 37 | 29 | 32 |
| 39-025-0022 | Clermont | 32 | 34 | 24 | 30 |
| 39-035-0027 | Cuyahoga | 32 | 39 | 38 | 36 |
| 39-035-0034 | | 29 | 38 | 32 | 33 |
| 39-035-0038 | | 36 | 40 | 39 | 38 |
| 39-035-0045 | | 30 | 35 | 35 | 33 |
| 39-035-0060 | | 31 | 39 | 37 | 36 |
| 39-035-0065 | | 28 | 39 | 34 | 34 |
| 39-035-1002 | | 28 | 35 | 30 | 31 |
| 39-049-0024 | Franklin | 34 | 34 | 28 | 32 |
| 39-049-0025 | | 34 | 36 | 27 | 32 |
| 39-049-0081 | | 31 | 34 | 25 | 30 |
| 39-057-0005 | Greene | 27 | 33 | 27 | 29 |
| 39-061-0006 | Hamilton | 33 | 35 | 27 | 32 |
| 39-061-0014 | | 35 | 38 | 33 | 35 |
| 39-061-0040 | | 33 | 35 | 26 | 31 |
| 39-061-0042 | | 35 | 36 | 28 | 33 |
| 39-061-0043 | | 35 | 34 | 28 | 32 |
| 39-061-7001 | | 34 | 34 | 30 | 33 |
| 39-061-8001 | | 36 | 35 | 31 | 34 |
| 39-081-0017 | Jefferson | 32 | 44 | 35 | 37 |
| 39-081-1001 | | 33 | 35 | 35 | 34 |
| 39-085-3002 | Lake | 28 | 39 | 28 | 32 |
| 39-087-0010 | Lawrence | 31 | 35 | 17 | |
| 39-087-0012 | | | | 28 | |
| 39-093-0016 | Lorain | 25 | 21 | | |
| 39-093-3002 | | 27 | 34 | 32 | 31 |
| 39-095-0024 | Lucas | 26 | 34 | 30 | 30 |
| 39-095-0025 | | 25 | 35 | 32 | 31 |
| 39-095-0026 | | 27 | 33 | 32 | 31 |
| 39-099-0005 | Mahoning | 29 | 34 | 31 | 31 |
| 39-099-0014 | | 31 | 34 | 31 | 32 |
| 39-103-0003 | Medina | 29 | 29 | 30 | 29 |
| 39-113-0031 | Montgomery | 29 | | | |
| 39-113-0032 | | 30 | 37 | 31 | 33 |
| 39-133-0002 | Portage | 31 | 31 | 29 | 30 |
| 39-135-1001 | Preble | 29 | 34 | 25 | 29 |
| 39-145-0013 | Scioto | 31 | 38 | 24 | 31 |
| 39-151-0017 | Stark | 32 | 33 | 38 | 34 |
| 39-151-0020 | | 26 | 33 | 30 | 30 |
| 39-153-0017 | Summit | 32 | 33 | 38 | 34 |
| 39-153-0023 | | 30 | 28 | 33 | 30 |
| 39-155-0007 | Trumbull | 29 | 32 | 34 | 31 |
| 39-165-0007 | Warren | | 34 | 24 | |

Less than 75% capture

Combination of two adjacent site's data

Data for 2006-2008 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. 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 flame photometric detectors or pulsed fluorescent techniques.

Flame photometric analyzers draw ambient air through selective scrubbers that remove all sulfur compounds except $SO_2$. The sample is then burned in a hydrogen flame, and a photodetector senses the number of sulfur atoms present.

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.

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

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. | 2008 | 061 | 8380 | .016 | .015 | 0 | .071 | .058 | 0 | .101 | .074 | .0038 | | 0 |
| 39-003-0002 | 1 | 0808 | Not in a city | Allen | 2650 BIBLE RD. | 2008 | 061 | 8409 | .011 | .008 | 0 | .027 | .021 | 0 | .034 | .026 | .0022 | | 0 |
| 39-007-1001 | 1 | 0807 | Conneaut | Ashtabula | 770 LAKE RD. | 2008 | 060 | 8385 | .016 | .013 | 0 | .033 | .030 | 0 | .039 | .037 | .0033 | | 0 |
| 39-009-0004 | 1 | 1335 | Athens | Athens | 7760 BLACKBURN ROAD | 2008 | 100 | 8389 | .018 | .018 | 0 | .109 | .038 | 0 | .277 | .089 | .0043 | | 0 |
| 39-013-3002 | 2 | 0809 | Shadyside | Belmont | EAST 40 ST. | 2008 | 060 | 8395 | .032 | .025 | 0 | .115 | .095 | 0 | .141 | .138 | .0056 | | 0 |
| 39-017-1004 | 1 | 1259 | Middletown | Butler | HOOK FIELD AIRPORT | 2008 | 060 | 8623 | .015 | .012 | 0 | .029 | .028 | 0 | .037 | .036 | .0034 | | 0 |
| 39-023-0003 | 1 | 0287 | Not in a city | Clark | 5400 SPANGLER | 2008 | 060 | 8693 | .011 | .008 | 0 | .026 | .021 | 0 | .035 | .027 | .0021 | | 0 |
| 39-029-0022 | 1 | 0807 | East Liverpool | Columbiana | 500 MARYLAND | 2008 | 000 | 8159 | .050 | .039 | 0 | .107 | .101 | 0 | .155 | .118 | .0048 | | 0 |
| 39-035-0038 | 2 | 0229 | Cleveland | Cuyahoga | 2547 ST TIKHON | 2008 | 060 | 8640 | .025 | .023 | 0 | .064 | .060 | 0 | .108 | .087 | .0056 | | 0 |
| 39-035-0045 | 1 | 0229 | Cleveland | Cuyahoga | 4950 BROADWAY AVE. | 2008 | 060 | 8433 | .013 | .011 | 0 | .037 | .031 | 0 | .055 | .048 | .0027 | | 0 |
| 39-035-0060 | 1 | 0229 | Cleveland | Cuyahoga | E. 14TH & ORANGE | 2008 | 100 | 8550 | .027 | .021 | 0 | .067 | .056 | 0 | .113 | .093 | .0064 | | 0 |
| 39-035-0065 | 1 | 0229 | Newburgh Heights | Cuyahoga | 4600 HARVARD AVE. | 2008 | 100 | 8464 | .011 | .010 | 0 | .081 | .043 | 0 | .105 | .095 | .0018 | | 0 |
| 39-049-0034 | 1 | 0805 | Columbus | Franklin | KORBEL AVE. | 2008 | 000 | 8297 | .013 | .011 | 0 | .030 | .030 | 0 | .038 | .033 | .0021 | | 0 |
| 39-081-0017 | 1 | 0809 | Steubenville | Jefferson | 618 LOGAN ST. | 2008 | 000 | 8344 | .036 | .033 | 0 | .137 | .117 | 0 | .179 | .175 | .0052 | | 0 |
| 39-085-0003 | 1 | 0595 | Eastlake | Lake | 36010 LAKESHORE | 2008 | 061 | 8684 | .018 | .012 | 0 | .034 | .033 | 0 | .097 | .049 | .0042 | | 0 |
| 39-085-3002 | 1 | 0595 | Painesville | Lake | 71 E HIGH | 2008 | 061 | 8509 | .045 | .039 | 0 | .123 | .123 | 0 | .173 | .166 | .0076 | | 0 |
| 39-087-0006 | 2 | 0880 | Ironton | Lawrence | 2120 S. 8TH | 2008 | 061 | 8316 | .020 | .017 | 0 | .043 | .032 | 0 | .074 | .043 | .0030 | | 0 |

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

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 MEANCERT | EDT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-099-0013 | 1 | 0634 | Youngstown | Mahoning | 345 OAKHILL | 2008 | 061 | 8380 | .017 | .016 | 0 | .056 | .045 | 0 | .069 | .064 | .0042 | 0 |
| 39-105-1001 | 1 | 0809 | Pomeroy | Meigs | MULBERRY AVE. | 2008 | 060 | 8396 | .019 | .019 | 0 | .058 | .057 | 0 | .110 | .107 | .0035 | 0 |
| 39-115-0004 | 1 | 0809 | Not in a city | Morgan | S.R. 83 | 2008 | 000 | 8393 | .065 | .040 | 0 | .368 | .203 | 0 | .464 | .347 | .0069 | 0 |
| 39-145-0013 | 1 | 0880 | New Boston | Scioto | 4862 GALLIA | 2008 | 061 | 8397 | .024 | .010 | 0 | .055 | .051 | 0 | .097 | .071 | .0016 | 0 |
| 39-145-0020 | 1 | 1299 | Franklin Furnace | Scioto | 2840 BACK RD. | 2008 | 060 | 8738 | .017 | .015 | 0 | .040 | .033 | 0 | .062 | .045 | .0054 | 0 |
| 39-145-0022 | 1 | 1299 | Franklin Furnace | Scioto | 1740 GALLIA PIKE | 2008 | 060 | 8745 | .017 | .014 | 0 | .052 | .048 | 0 | .066 | .057 | .0030 | 0 |
| 39-153-0017 | 1 | 0012 | Akron | Summit | 80 BRITTAIN | 2008 | 000 | 8363 | .012 | .012 | 0 | .023 | .022 | 0 | .042 | .035 | .0035 | 0 |
| 39-153-0022 | 1 | 0012 | Akron | Summit | 177 S. BROADWAY | 2008 | 100 | 8389 | .023 | .015 | 0 | .041 | .034 | 0 | .048 | .044 | .0030 | 0 |
| 39-157-0006 | 1 | 0809 | Sugarcreek | Tuscarawas | 527 CRESCENT DR. | 2008 | 000 | 8397 | .021 | .020 | 0 | .050 | .046 | 0 | .067 | .066 | .0050 | 0 |

## 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 | 2008 | 099 | 8341 | .064 | .053 | .0049 | | 0 |
| 39-035-0060 | 1 | 0229 | Cleveland | Cuyahoga | E. 14TH & ORANGE | 2008 | 099 | 8525 | .075 | .073 | .0166 | | 0 |
| 39-035-0070 | 1 | 0229 | Cleveland | Cuyahoga | 13013 CORLETT AVE. | 2008 | 099 | 7748 | .074 | .069 | .0139 | | 0 |
| 39-061-0040 | 1 | 1259 | Cincinnati | Hamilton | 250 WM. HOWARD TAFT | 2008 | 074 | 8716 | .079 | .073 | .0159 | | 0 |

## 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
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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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-035-0048 | 1 | 0229 | Cleveland | Cuyahoga | 2026 EAST 9TH ST. | 2008 | 093 | 7089 | 4.8 | 4.8 | 0 | 2.1 | 1.5 | 0 | | 0 |
| 39-035-0051 | 1 | 0229 | Cleveland | Cuyahoga | 1301 E. 9TH ST. | 2008 | 000 | 8433 | 7.8 | 7.5 | 0 | 5.3 | 4.8 | 0 | | 0 |
| 39-035-0053 | 1 | 0229 | Cleveland | Cuyahoga | 4169 PEARL RD. | 2008 | 093 | 8703 | 2.5 | 2.3 | 0 | 1.7 | 1.2 | 0 | | 0 |
| 39-035-0070 | 1 | 0229 | Cleveland | Cuyahoga | 13013 CORLETT AVE. | 2008 | 093 | 8680 | 2.1 | 2.0 | 0 | 1.5 | 1.3 | 0 | | 0 |
| 39-049-0005 | 1 | 0805 | Columbus | Franklin | 1585 MORSE RD. | 2008 | 093 | 8635 | 2.7 | 2.5 | 0 | 1.7 | 1.6 | 0 | | 0 |
| 39-061-0021 | 1 | 1259 | Cincinnati | Hamilton | 100 E. 5TH ST. | 2008 | 093 | 7815 | 5.9 | 5.1 | 0 | 3.6 | 2.7 | 0 | | 0 |
| 39-081-1001 | 1 | 0809 | Mingo Junction | Jefferson | 501 COMMERICAL | 2008 | 067 | 535 | 6.4 | 2.3 | 0 | 1.6 | .8 | 0 | | 0 |
| 39-085-0006 | 1 | 0595 | Mentor | Lake | 8443 MENTOR AVE. | 2008 | 051 | 8713 | 2.6 | 2.6 | 0 | 2.6 | 2.3 | 0 | | 0 |
| 39-113-0028 | 1 | 0287 | Dayton | Montgomery | 901 WEST FAIRVIEW AVE. | 2008 | 054 | 8720 | 1.5 | 1.4 | 0 | 1.1 | 1.0 | 0 | | 0 |
| 39-113-0034 | 1 | 0287 | Dayton | Montgomery | 117 SOUTH MAIN ST. | 2008 | 054 | 8739 | 2.3 | 2.3 | 0 | 1.6 | 1.5 | 0 | | 0 |
| 39-151-0020 | 1 | 0151 | Canton | Stark | 420 MARKET | 2008 | 054 | 7529 | 2.9 | 2.9 | 0 | 2.6 | 2.5 | 0 | | 0 |
| 39-153-0020 | 1 | 0012 | Akron | Summit | 800 PATTERSON AVE. | 2008 | 054 | 8405 | 1.7 | 1.6 | 0 | 1.4 | 1.3 | 0 | | 0 |
| 39-153-0022 | 1 | 0012 | Akron | Summit | 177 S. BROADWAY | 2008 | 093 | 8348 | 2.0 | 1.9 | 0 | 1.4 | 1.1 | 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 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 2006 through 2008 and the four highest eight hour averages during 2008. 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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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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. | 2008 | 047 | 214 | 214 | .082 | .078 | .076 | .073 | 0 | 0.0 | 0 | Y | 0 |
| 39-007-1001 | 1 | 0807 | Conneaut | Ashtabula | 770 LAKE RD. | 2008 | 047 | 213 | 214 | .089 | .087 | .087 | .083 | 0 | 0.0 | 1 | Y | 0 |
| 39-009-0004 | 1 | 1335 | Athens | Athens | 7760 BLACKBURN ROAD | 2008 | 056 | 210 | 214 | .083 | .078 | .078 | .077 | 0 | 0.0 | 2 | | 0 |
| 39-017-0004 | 1 | 1259 | Hamilton | Butler | SCHULER AND BENDER | 2008 | 087 | 211 | 214 | .099 | .085 | .083 | .081 | 0 | 0.0 | 3 | Y | 0 |
| 39-017-1004 | 3 | 1259 | Middletown | Butler | HOOK FIELD AIRPORT | 2008 | 000 | 205 | 214 | .102 | .098 | .096 | .092 | 0 | 0.0 | 1 | Y | 0 |
| 39-023-0001 | 1 | 0287 | Springfield | Clark | 5171 URBANA | 2008 | 047 | 213 | 214 | .103 | .094 | .089 | .084 | 0 | 0.0 | 1 | Y | 0 |
| 39-023-0003 | 1 | 0287 | Not in a city | Clark | 5400 SPANGLER | 2008 | 047 | 211 | 214 | .108 | .091 | .091 | .090 | 0 | 0.0 | 1 | Y | 0 |
| 39-025-0022 | 1 | 1259 | Batavia | Clermont | 2400 CLERMONT CENTER DR. | 2008 | 087 | 208 | 214 | .082 | .077 | .077 | .076 | 0 | 0.0 | 0 | Y | 0 |
| 39-027-1002 | 1 | 0810 | Wilmington | Clinton | 62 LAUREL DR. | 2008 | 047 | 210 | 214 | .098 | .097 | .092 | .086 | 0 | 0.0 | 0 | Y | 0 |
| 39-035-0034 | 1 | 0229 | Cleveland | Cuyahoga | 891 E. 152 ST. | 2008 | 087 | 214 | 214 | .100 | .095 | .090 | .089 | 0 | 0.0 | 0 | Y | 0 |
| 39-035-0064 | 1 | 0229 | Berea | Cuyahoga | 390 FAIR ST. | 2008 | 000 | 212 | 214 | .104 | .091 | .090 | .080 | 0 | 0.0 | 2 | Y | 0 |
| 39-035-5002 | 1 | 0229 | Mayfield | Cuyahoga | 6116 WILSON MILLS | 2008 | 019 | 212 | 214 | .098 | .095 | .093 | .093 | 0 | 0.0 | 2 | Y | 0 |
| 39-041-0002 | 1 | 0805 | Delaware | Delaware | 359 MAIN RD. | 2008 | 047 | 213 | 214 | .091 | .085 | .085 | .083 | 0 | 0.0 | 1 | Y | 0 |
| 39-049-0028 | 1 | 0805 | Columbus | Franklin | 2521 FAIRWOOD | 2008 | 047 | 111 | 112 | .090 | .078 | .076 | .076 | 0 | 0.0 | 0 | Y | 0 |
| 39-049-0029 | 1 | 0805 | New Albany | Franklin | 7600 FODOR RD. | 2008 | 047 | 212 | 214 | .108 | .094 | .092 | .088 | 0 | 0.0 | 0 | Y | 0 |
| 39-049-0037 | 1 | 0805 | Columbus | Franklin | 1777 E. BROAD | 2008 | 047 | 214 | 214 | .100 | .094 | .080 | .079 | 0 | 0.0 | 0 | Y | 0 |
| 39-049-0081 | 1 | 0805 | Columbus | Franklin | 5750 MAPLE CANYON | 2008 | 047 | 214 | 214 | .099 | .083 | .075 | .074 | 0 | 0.0 | 0 | Y | 0 |
| 39-055-0004 | 1 | 0595 | Not in a city | Geauga | 13000 AUBURN | 2008 | 019 | 214 | 214 | .098 | .093 | .091 | .088 | 0 | 0.0 | 0 | Y | 0 |
| 39-057-0006 | 1 | 0287 | Xenia | Greene | 541 LEDBETTER RD., | 2008 | 047 | 212 | 214 | .094 | .093 | .089 | .086 | 0 | 0.0 | 0 | Y | 0 |
| 39-061-0006 | 1 | 1259 | Cincinnati | Hamilton | 11590 GROOMS RD | 2008 | 087 | 210 | 214 | .112 | .106 | .095 | .095 | 0 | 0.0 | 2 | Y | 0 |
| 39-061-0010 | 1 | 1259 | Cleves | Hamilton | 6950 RIPPLE RD. | 2008 | 087 | 206 | 214 | .094 | .092 | .091 | .090 | 0 | 0.0 | 2 | Y | 0 |
| 39-061-0040 | 1 | 1259 | Cincinnati | Hamilton | 250 WM. HOWARD TAFT | 2008 | 087 | 213 | 214 | .101 | .094 | .091 | .087 | 0 | 0.0 | 1 | Y | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-081-0017 | 1 | 0809 | Steubenville | Jefferson | 618 LOGAN ST. | 2008 | 047 | 212 | 214 | .087 | .086 | .083 | .083 | 0 | 0.0 | 2 | Y | 0 |
| 39-083-0002 | 1 | 0805 | Centerburg | Knox | WATER PLT, SR. 314 | 2008 | 047 | 214 | 214 | .092 | .085 | .084 | .080 | 0 | 0.0 | 0 | Y | 0 |
| 39-085-0003 | 1 | 0595 | Eastlake | Lake | 36010 LAKESHORE | 2008 | 019 | 213 | 214 | .095 | .093 | .092 | .089 | 0 | 0.0 | 1 | Y | 0 |
| 39-085-3002 | 1 | 0595 | Painesville | Lake | 71 E HIGH | 2008 | 019 | 214 | 214 | .100 | .089 | .089 | .084 | 0 | 0.0 | 0 | Y | 0 |
| 39-087-0006 | 1 | 0880 | Ironton | Lawrence | 2120 S. 8TH | 2008 | 019 | 212 | 214 | .104 | .097 | .093 | .091 | 0 | 0.0 | 2 | Y | 0 |
| 39-087-0011 | 1 | 0880 | Not in a city | Lawrence | S.R. 141, WILGUS | 2008 | 019 | 212 | 214 | .093 | .090 | .087 | .083 | 0 | 0.0 | 2 | Y | 0 |
| 39-089-0005 | 1 | 0805 | Heath (Fourmile Lock) | Licking | 300 LICKING VIEW DR. | 2008 | 047 | 213 | 214 | .082 | .082 | .080 | .079 | 0 | 0.0 | 1 | Y | 0 |
| 39-093-0018 | 1 | 0807 | Sheffield | Lorain | 4706 DETROIT RD. | 2008 | 047 | 214 | 214 | .104 | .085 | .083 | .082 | 0 | 0.0 | 0 | Y | 0 |
| 39-095-0024 | 1 | 0220 | Toledo | Lucas | 348 S. ERIE | 2008 | 056 | 208 | 214 | .089 | .087 | .085 | .081 | 0 | 0.0 | 0 | Y | 0 |
| 39-095-0027 | 1 | 0220 | Waterville | Lucas | 200 SOUTH RIVER RD. | 2008 | 019 | 211 | 214 | .085 | .084 | .081 | .081 | 0 | 0.0 | 1 | Y | 0 |
| 39-095-0034 | 1 | 0220 | Not in a city | Lucas | 306 N. YONDOTA | 2008 | 056 | 205 | 214 | .084 | .082 | .081 | .081 | 0 | 0.0 | 4 | Y | 0 |
| 39-097-0007 | 1 | 0805 | Not in a city | Madison | 940 SR 38 SW | 2008 | 047 | 213 | 214 | .085 | .081 | .081 | .079 | 0 | 0.0 | 1 | Y | 0 |
| 39-099-0013 | 1 | 0634 | Youngstown | Mahoning | 345 OAKHILL | 2008 | 087 | 214 | 214 | .085 | .079 | .079 | .079 | 0 | 0.0 | 0 | Y | 0 |
| 39-103-0003 | 1 | 0012 | Not in a city | Medina | 6364 DEERVIEW | 2008 | 087 | 213 | 214 | .097 | .091 | .085 | .083 | 0 | 0.0 | 1 | Y | 0 |
| 39-109-0005 | 1 | 0287 | Not in a city | Miami | 3825 NORTH S. R. 589 | 2008 | 047 | 214 | 214 | .088 | .086 | .083 | .079 | 0 | 0.0 | 0 | Y | 0 |
| 39-113-0037 | 1 | 0287 | Dayton | Montgomery | 1401 Harshman Road | 2008 | 047 | 183 | 184 | .112 | .091 | .091 | .089 | 0 | 0.0 | 1 | Y | 0 |
| 39-133-1001 | 1 | 0012 | Not in a city | Portage | 1570 RAVENNA RD. | 2008 | 047 | 212 | 214 | .092 | .075 | .074 | .073 | 0 | 0.0 | 0 | Y | 0 |
| 39-135-1001 | 1 | 0287 | Not in a city | Preble | NATIONAL TRAILS | 2008 | 047 | 213 | 214 | .076 | .076 | .076 | .076 | 0 | 0.0 | 1 | Y | 0 |
| 39-151-0016 | 1 | 0151 | Canton | Stark | 515 25TH. ST. | 2008 | 047 | 206 | 214 | .088 | .088 | .086 | .082 | 0 | 0.0 | 2 | Y | 0 |
| 39-151-0022 | 1 | 0151 | Brewster | Stark | 45 S. WABASH AVENUE, S.R 93 | 2008 | 047 | 208 | 214 | .099 | .090 | .083 | .081 | 0 | 0.0 | 3 | Y | 0 |
| 39-151-4005 | 1 | 0151 | Alliance | Stark | 1175 WEST VINE | 2008 | 047 | 198 | 214 | .092 | .087 | .084 | .083 | 0 | 0.0 | 4 | Y | 0 |
| 39-153-0020 | 1 | 0012 | Akron | Summit | 800 PATTERSON | 2008 | 087 | 214 | 214 | .106 | .091 | .091 | .087 | 0 | 0.0 | 0 | Y | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | AVE. | | | | | | | | | | | | | |
| 39-155-0009 | 1 | 0634 | Not in a city | Trumbull | 6346 KINSMAN-BLOOMFIELD RD. | 2008 | 056 | 214 | 214 | .091 | .084 | .083 | .082 | 0 | 0.0 | 0 | Y | 0 |
| 39-155-0011 | 1 | 0634 | Not in a city | Trumbull | 842 YOUNGSTOWN-KINGSVILLE RD. | 2008 | 087 | 214 | 214 | .096 | .090 | .090 | .089 | 0 | 0.0 | 0 | Y | 0 |
| 39-165-0007 | 1 | 1259 | Lebanon | Warren | 416 SOUTHEAST ST. | 2008 | 000 | 208 | 214 | .099 | .096 | .093 | .092 | 0 | 0.0 | 0 | Y | 0 |
| 39-167-0004 | 1 | 0809 | Marietta | Washington | 2000 4TH STREET | 2008 | 047 | 214 | 214 | .105 | .093 | .092 | .087 | 0 | 0.0 | 0 | Y | 0 |
| 39-173-0003 | 1 | 0808 | Bowling Green | Wood | 347 N DUNBRIDGE | 2008 | 047 | 214 | 214 | .088 | .079 | .079 | .076 | 0 | 0.0 | 0 | Y | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-003-0002 | 1 | 0808 | Not in a city | Allen | 2650 BIBLE RD. | 2008 | 047 | 100 | 213 | 214 | .072 | .068 | .068 | .067 | 0 | Y | 0 |
| 39-007-1001 | 1 | 0807 | Conneaut | Ashtabula | 770 LAKE RD. | 2008 | 047 | 97 | 208 | 214 | .081 | .081 | .078 | .075 | 3 | Y | 0 |
| 39-009-0004 | 1 | 1335 | Athens | Athens | 7760 BLACKBURN ROAD | 2008 | 056 | 98 | 209 | 214 | .075 | .074 | .073 | .069 | 0 | | 0 |
| 39-017-0004 | 1 | 1259 | Hamilton | Butler | SCHULER AND BENDER | 2008 | 087 | 99 | 211 | 214 | .089 | .075 | .072 | .071 | 1 | Y | 0 |
| 39-017-1004 | 3 | 1259 | Middletown | Butler | HOOK FIELD AIRPORT | 2008 | 000 | 96 | 205 | 214 | .091 | .087 | .082 | .079 | 7 | Y | 0 |
| 39-023-0001 | 1 | 0287 | Springfield | Clark | 5171 URBANA | 2008 | 047 | 100 | 213 | 214 | .090 | .084 | .078 | .075 | 3 | Y | 0 |
| 39-023-0003 | 1 | 0287 | Not in a city | Clark | 5400 SPANGLER | 2008 | 047 | 98 | 210 | 214 | .089 | .077 | .076 | .075 | 3 | Y | 0 |
| 39-025-0022 | 1 | 1259 | Batavia | Clermont | 2400 CLERMONT CENTER DR. | 2008 | 087 | 97 | 207 | 214 | .072 | .071 | .071 | .071 | 0 | Y | 0 |
| 39-027-1002 | 1 | 0810 | Wilmington | Clinton | 62 LAUREL DR. | 2008 | 047 | 96 | 206 | 214 | .087 | .080 | .077 | .076 | 4 | Y | 0 |
| 39-035-0034 | 1 | 0229 | Cleveland | Cuyahoga | 891 E. 152 ST. | 2008 | 087 | 98 | 209 | 214 | .088 | .085 | .084 | .081 | 5 | Y | 0 |
| 39-035-0064 | 1 | 0229 | Berea | Cuyahoga | 390 FAIR ST. | 2008 | 000 | 98 | 209 | 214 | .087 | .081 | .077 | .072 | 3 | Y | 0 |
| 39-035-5002 | 1 | 0229 | Mayfield | Cuyahoga | 6116 WILSON MILLS | 2008 | 019 | 98 | 210 | 214 | .090 | .087 | .086 | .083 | 8 | Y | 0 |
| 39-041-0002 | 1 | 0805 | Delaware | Delaware | 359 MAIN RD. | 2008 | 047 | 99 | 211 | 214 | .080 | .076 | .075 | .075 | 2 | Y | 0 |
| 39-049-0028 | 1 | 0805 | Columbus | Franklin | 2521 FAIRWOOD | 2008 | 047 | 99 | 111 | 112 | .078 | .070 | .069 | .069 | 1 | Y | 0 |
| 39-049-0029 | 1 | 0805 | New Albany | Franklin | 7600 FODOR RD. | 2008 | 047 | 99 | 211 | 214 | .095 | .085 | .083 | .083 | 7 | Y | 0 |
| 39-049-0037 | 1 | 0805 | Columbus | Franklin | 1777 E. BROAD | 2008 | 047 | 99 | 211 | 214 | .087 | .081 | .072 | .071 | 2 | Y | 0 |
| 39-049-0081 | 1 | 0805 | Columbus | Franklin | 5750 MAPLE CANYON | 2008 | 047 | 100 | 214 | 214 | .088 | .073 | .066 | .066 | 1 | Y | 0 |
| 39-055-0004 | 1 | 0595 | Not in a city | Geauga | 13000 AUBURN | 2008 | 019 | 100 | 214 | 214 | .088 | .083 | .082 | .082 | 6 | Y | 0 |
| 39-057-0006 | 1 | 0287 | Xenia | Greene | 541 LEDBETTER RD., | 2008 | 047 | 99 | 211 | 214 | .083 | .078 | .076 | .075 | 3 | Y | 0 |
| 39-061-0006 | 1 | 1259 | Cincinnati | Hamilton | 11590 GROOMS RD | 2008 | 087 | 97 | 208 | 214 | .093 | .089 | .087 | .086 | 12 | Y | 0 |
| 39-061-0010 | 1 | 1259 | Cleves | Hamilton | 6950 RIPPLE RD. | 2008 | 087 | 96 | 205 | 214 | .085 | .079 | .078 | .077 | 7 | Y | 0 |
| 39-061-0040 | 1 | 1259 | Cincinnati | Hamilton | 250 WM. HOWARD TAFT | 2008 | 087 | 100 | 213 | 214 | .086 | .083 | .081 | .080 | 7 | Y | 0 |

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-081-0017 | 1 | 0809 | Steubenville | Jefferson | 618 LOGAN ST. | 2008 | 047 | 99 | 211 | 214 | .081 | .078 | .074 | .073 | 2 | Y | 0 |
| 39-083-0002 | 1 | 0805 | Centerburg | Knox | WATER PLT, SR. 314 | 2008 | 047 | 100 | 214 | 214 | .077 | .075 | .075 | .074 | 1 | Y | 0 |
| 39-085-0003 | 1 | 0595 | Eastlake | Lake | 36010 LAKESHORE | 2008 | 019 | 99 | 212 | 214 | .084 | .084 | .084 | .078 | 8 | Y | 0 |
| 39-085-3002 | 1 | 0595 | Painesville | Lake | 71 E HIGH | 2008 | 019 | 100 | 214 | 214 | .081 | .077 | .077 | .076 | 4 | Y | 0 |
| 39-087-0006 | 1 | 0880 | Ironton | Lawrence | 2120 S. 8TH | 2008 | 019 | 99 | 212 | 214 | .092 | .086 | .083 | .082 | 5 | Y | 0 |
| 39-087-0011 | 1 | 0880 | Not in a city | Lawrence | S.R. 141, WILGUS | 2008 | 019 | 99 | 212 | 214 | .087 | .081 | .077 | .074 | 3 | Y | 0 |
| 39-089-0005 | 1 | 0805 | Heath (Fourmile Lock) | Licking | 300 LICKING VIEW DR. | 2008 | 047 | 99 | 211 | 214 | .078 | .076 | .075 | .074 | 2 | Y | 0 |
| 39-093-0018 | 1 | 0807 | Sheffield | Lorain | 4706 DETROIT RD. | 2008 | 047 | 99 | 212 | 214 | .088 | .076 | .076 | .075 | 3 | Y | 0 |
| 39-095-0024 | 1 | 0220 | Toledo | Lucas | 348 S. ERIE | 2008 | 056 | 97 | 208 | 214 | .078 | .073 | .073 | .071 | 1 | Y | 0 |
| 39-095-0027 | 1 | 0220 | Waterville | Lucas | 200 SOUTH RIVER RD. | 2008 | 019 | 98 | 210 | 214 | .079 | .074 | .073 | .073 | 1 | Y | 0 |
| 39-095-0034 | 1 | 0220 | Not in a city | Lucas | 306 N. YONDOTA | 2008 | 056 | 95 | 204 | 214 | .077 | .074 | .074 | .073 | 1 | Y | 0 |
| 39-097-0007 | 1 | 0805 | Not in a city | Madison | 940 SR 38 SW | 2008 | 047 | 99 | 211 | 214 | .077 | .075 | .073 | .071 | 1 | Y | 0 |
| 39-099-0013 | 1 | 0634 | Youngstown | Mahoning | 345 OAKHILL | 2008 | 087 | 100 | 213 | 214 | .075 | .073 | .071 | .071 | 0 | Y | 0 |
| 39-103-0003 | 1 | 0012 | Not in a city | Medina | 6364 DEERVIEW | 2008 | 087 | 99 | 211 | 214 | .080 | .079 | .077 | .075 | 3 | Y | 0 |
| 39-109-0005 | 1 | 0287 | Not in a city | Miami | 3825 NORTH S. R. 589 | 2008 | 047 | 100 | 213 | 214 | .074 | .074 | .071 | .070 | 0 | Y | 0 |
| 39-113-0037 | 1 | 0287 | Dayton | Montgomery | 1401 Harshman Road | 2008 | 047 | 99 | 183 | 184 | .095 | .081 | .080 | .077 | 6 | Y | 0 |
| 39-133-1001 | 1 | 0012 | Not in a city | Portage | 1570 RAVENNA RD. | 2008 | 047 | 99 | 212 | 214 | .075 | .071 | .069 | .069 | 0 | Y | 0 |
| 39-135-1001 | 1 | 0287 | Not in a city | Preble | NATIONAL TRAILS | 2008 | 047 | 99 | 212 | 214 | .072 | .069 | .068 | .068 | 0 | Y | 0 |
| 39-151-0016 | 1 | 0151 | Canton | Stark | 515 25TH. ST. | 2008 | 047 | 95 | 204 | 214 | .082 | .080 | .078 | .077 | 4 | Y | 0 |
| 39-151-0022 | 1 | 0151 | Brewster | Stark | 45 S. WABASH AVENUE, S.R 93 | 2008 | 047 | 95 | 204 | 214 | .081 | .079 | .077 | .076 | 5 | Y | 0 |
| 39-151-4005 | 1 | 0151 | Alliance | Stark | 1175 WEST VINE | 2008 | 047 | 92 | 196 | 214 | .079 | .079 | .077 | .077 | 5 | Y | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39-153-0020 | 1 | 0012 | Akron | Summit | 800 PATTERSON AVE. | 2008 | 087 | 100 | 213 | 214 | .091 | .081 | .080 | .080 | 7 | Y | 0 |
| 39-155-0009 | 1 | 0634 | Not in a city | Trumbull | 6346 KINSMAN-BLOOMFIELD RD. | 2008 | 056 | 100 | 214 | 214 | .082 | .077 | .076 | .076 | 4 | Y | 0 |
| 39-155-0011 | 1 | 0634 | Not in a city | Trumbull | 842 YOUNGSTOWN-KINGSVILLE RD. | 2008 | 087 | 100 | 214 | 214 | .080 | .078 | .078 | .077 | 4 | Y | 0 |
| 39-165-0007 | 1 | 1259 | Lebanon | Warren | 416 SOUTHEAST ST. | 2008 | 000 | 95 | 204 | 214 | .092 | .087 | .084 | .082 | 11 | Y | 0 |
| 39-167-0004 | 1 | 0809 | Marietta | Washington | 2000 4TH STREET | 2008 | 047 | 100 | 213 | 214 | .095 | .082 | .079 | .078 | 4 | Y | 0 |
| 39-173-0003 | 1 | 0808 | Bowling Green | Wood | 347 N DUNBRIDGE | 2008 | 047 | 100 | 213 | 214 | .077 | .072 | .071 | .070 | 1 | Y | 0 |

Three Year Average of Fourth High 8-Hr Averages

| Site ID | City | County | Address | 4th high in Year | | | 3 Year |
|---|---|---|---|---|---|---|---|
| | | | | 2006 | 2007 | 2008 | Average |
| 39-003-0002 | | Allen | 2650 Bible Rd. | 0.075 | 0.078 | 0.067 | 0.073 |
| 39-007-1001 | Conneaut | Ashtabula | JQ Conneaut Water Plant | 0.086 | 0.092 | 0.075 | 0.084 |
| 39-017-0004 | Hamilton | Butler | Schuler & Bender Rds. | 0.079 | 0.091 | 0.071 | 0.080 |
| 39-017-1004 | Middletown | Butler | Hook Field Municipal Airport | 0.076 | 0.091 | 0.079 | 0.082 |
| 39-023-0001 | | Clark | 5171 Urbana Rd. | 0.076 | 0.078 | 0.075 | 0.076 |
| 39-023-0003 | | Clark | 5400 Spangler Rd. | 0.074 | 0.078 | 0.075 | 0.075 |
| 39-025-0022 | | Clermont | 2400 Claremont Center Dr. | 0.077 | 0.086 | 0.071 | 0.078 |
| 39-027-1002 | | Clinton | 62 Laurel Rd. | 0.081 | 0.082 | 0.076 | 0.079 |
| 39-035-0034 | Cleveland | Cuyahoga | 891 E. 152nd St. | 0.074 | 0.080 | 0.081 | 0.078 |
| 39-035-0064 | Berea | Cuyahoga | 390 Fair St. | 0.068 | 0.083 | 0.072 | 0.074 |
| 39-035-5002 | Mayfield | Cuyahoga | 6116 Wilson Mill Rd. | 0.081 | 0.080 | 0.083 | 0.081 |
| 39-041-0002 | | Delaware | 359 Main Rd. | 0.075 | 0.080 | 0.075 | 0.076 |
| 39-049-0028 | Columbus | Franklin | 2521 Fairwood Ave. | 0.076 | 0.078 | 0.069 | 0.074 |
| 39-049-0029 | New Albany | Franklin | 7600 Fodor Rd. | 0.082 | 0.087 | 0.083 | 0.084 |
| 39-049-0037 | Columbus | Franklin | 1777 E. Broad St. | 0.079 | 0.079 | 0.071 | 0.076 |
| 39-049-0081 | Columbus | Franklin | 5750 Maple Canyon | 0.077 | 0.079 | 0.066 | 0.074 |
| 39-055-0004 | | Geauga | 13000 Auburn Rd. | 0.070 | 0.068 | 0.082 | 0.073 |
| 39-057-0006 | Xenia | Greene | 541 Ledbetter Rd. | 0.079 | 0.077 | 0.075 | 0.077 |
| 39-061-0006 | | Hamilton | 11590 Grooms Rd. | 0.081 | 0.089 | 0.086 | 0.085 |
| 39-061-0010 | | Hamilton | 6950 Ripple Rd. | 0.081 | 0.086 | 0.077 | 0.081 |
| 39-061-0040 | Cincinnati | Hamilton | 250 Wm. Howard Taft | 0.078 | 0.086 | 0.080 | 0.081 |
| 39-081-0017 | Steubenville | Jefferson | 618 Logan | 0.080 | 0.079 | 0.073 | 0.077 |
| 39-083-0002 | | Knox | Water Plant SR 3 | 0.075 | 0.080 | 0.074 | 0.076 |
| 39-085-0003 | Eastlake | Lake | Jefferson Elementary | 0.083 | 0.074 | 0.078 | 0.078 |
| 39-085-3002 | Painesville | Lake | 71 E. High St. | 0.075 | 0.079 | 0.076 | 0.076 |
| 39-087-0006 | Ironton | Lawrence | 2120 S. 8th St. | 0.072 | 0.076 | 0.082 | 0.076 |
| 39-087-0011 | | Lawrence | SR 775 & SR | 0.067 | 0.082 | 0.074 | 0.074 |
| 39-089-0005 | Heath | Licking | 300 Licking View | 0.072 | 0.078 | 0.074 | 0.074 |
| 39-093-0018 | Lorain | Lorain | 4706 Detroit Rd. | 0.069 | 0.078 | 0.075 | 0.074 |
| 39-095-0024 | Toledo | Lucas | 348 S. Erie St. | 0.075 | 0.081 | 0.071 | 0.075 |
| 39-095-0027 | Waterville | Lucas | 200 S. Byrne | 0.069 | 0.075 | 0.073 | 0.072 |
| 39-095-0034 | Toledo | Lucas | 306 N. Yondota | 0.074 | 0.078 | 0.073 | 0.075 |
| 39-095-0081 | Toledo | Lucas | Friendship Park | 0.074 | 0.077 | | |
| 39-097-0007 | | Madison | 9940 SR 38 SW | 0.076 | 0.083 | 0.071 | 0.076 |

Three Year Average of Fourth High 8-Hr Averages

| Site ID | City | County | Address | 4th high in Year | | | 3 Year |
|---|---|---|---|---|---|---|---|
| | | | | 2006 | 2007 | 2008 | Average |
| 39-099-0013 | Youngstown | Mahoning | 345 Oakhill Ave. | 0.076 | 0.079 | 0.071 | 0.075 |
| 39-103-0003 | | Medina | 6364 Deerview | 0.073 | 0.069 | 0.075 | 0.072 |
| 39-109-0005 | | Miami | 3825 North State | 0.073 | 0.073 | 0.070 | 0.072 |
| 39-113-0033 | Dayton | Montgomery | 1404 Webster | 0.071 | 0.074 | 0.077 | 0.074 |
| 39-133-1001 | | Portage | 1570 Ravenna Rd. | 0.070 | 0.084 | 0.069 | 0.074 |
| 39-135-1001 | | Preble | National Trails | 0.072 | 0.073 | 0.068 | 0.071 |
| 39-151-0016 | Canton | Stark | Malone College | 0.078 | 0.084 | 0.077 | 0.079 |
| 39-151-0021 | | Stark | 245 W. 5th St. | 0.079 | 0.085 | 0.076 | 0.080 |
| 39-151-4005 | Alliance | Stark | 1175 West Vine St. | 0.075 | 0.087 | 0.077 | 0.079 |
| 39-153-0020 | Akron | Summit | 800 Patterson Av. | 0.077 | 0.090 | 0.080 | 0.082 |
| 39-155-0009 | | Trumbull | Community Hall | 0.074 | 0.081 | 0.076 | 0.077 |
| 39-155-0011 | | Trumbull | Trumbull Co. Sanitary Engineers | 0.082 | 0.080 | 0.077 | 0.079 |
| 39-165-0007 | Lebanon | Warren | 416 Southeast St. | 0.086 | 0.088 | 0.082 | 0.085 |
| 39-167-0004 | Marietta | Washington | 2000 Fourth St. | 0.081 | 0.086 | 0.078 | 0.081 |
| 39-173-0003 | Bowling Green | Wood | 347 N. Dunbridge | 0.073 | 0.083 | 0.070 | 0.075 |

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 | | 8-Hr Data | |
|---|---|---|---|---|
| | Date | Exceedances/Sites | 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 |

Last Ozone Exceedance Dates
1984-2008
One Hour Standard

| Year | Date | Sites | Maximum Value |
|---|---|---|---|
| 1984 | 9/21 | 1 | 135 |
| 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 |

Last Ozone Exceedance Dates
1984-2008
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 |

## 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, two ¾"×8" portions of the TSP filter

are washed with hot, dilute nitric acid. The lead compounds are dissolved into the acid solution. The solution is then analyzed by the atomic absorption technique to determine the amount of lead.

Normally a month's collection of filters is analyzed as a composite sample. Most sites collect so little lead that individual sampling days would have lead levels below the detection limit of available methods.

Concentrations are reported in micrograms per cubic meter of air ($\mu g/m^3$).

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

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 | 2008 | 045 | 12 | .0042 | .0067 | .0063 | .0086 | 0 | .0150 | .0091 | | 0 |
| 39-029-0019 | 1 | 0807 | East Liverpool | Columbiana | 1250 GEORGE, COLUMBIANA PORT AUTHORITY | 2008 | 045 | 12 | .0100 | .0290 | .0177 | .0093 | 0 | .0500 | .0290 | | 0 |
| 39-029-0020 | 1 | 0807 | East Liverpool | Columbiana | 2220 MICHIGAN | 2008 | 045 | 12 | .0129 | .0186 | .0102 | .0079 | 0 | .0280 | .0200 | | 0 |
| 39-029-0022 | 1 | 0807 | East Liverpool | Columbiana | 500 MARYLAND | 2008 | 045 | 12 | .0116 | .0247 | .0126 | .0096 | 0 | .0350 | .0330 | | 0 |
| 39-035-0038 | 1 | 0229 | Cleveland | Cuyahoga | 2547 ST TIKHON | 2008 | 045 | 12 | .0129 | .0270 | .0190 | .0066 | 0 | .0410 | .0220 | | 0 |
| 39-035-0042 | 1 | 0229 | Cleveland | Cuyahoga | 3136 LORAIN AVE., F.S. 4 | 2008 | 045 | 12 | .0080 | .0233 | .0157 | .0094 | 0 | .0330 | .0210 | | 0 |
| 39-035-0049 | 1 | 0229 | Cleveland | Cuyahoga | E. 56TH ST. | 2008 | 045 | 12 | .0777 | .1150 | .1500 | .1017 | 0 | .2100 | .2000 | | 0 |
| 39-035-0050 | 1 | 0229 | Cleveland | Cuyahoga | GRANT RD. | 2008 | 045 | 12 | .0116 | .0260 | .0380 | .0137 | 0 | .0590 | .0420 | | 0 |
| 39-035-0061 | 2 | 0229 | Cleveland | Cuyahoga | W. SIDE OF WEST 3RD. | 2008 | 045 | 12 | .0123 | .0260 | .0347 | .0099 | 0 | .0410 | .0410 | | 0 |
| 39-049-0025 | 1 | 0805 | Columbus | Franklin | 1700 ANN ST. | 2008 | 045 | 12 | .0052 | .0106 | .0120 | .0078 | 0 | .0140 | .0130 | | 0 |
| 39-051-0001 | 1 | 0808 | Delta | Fulton | 200 VAN BUREN | 2008 | 045 | 12 | .3867 | .2673 | .1700 | .2913 | 0 | .5100 | .4900 | | 0 |
| 39-091-0003 | 1 | 0810 | Bellefontaine | Logan | 1222 SUPERIOR | 2008 | 045 | 12 | .0453 | .0627 | .0230 | .0227 | 0 | .0760 | .0640 | | 0 |
| 39-091-0006 | 1 | 0443 | Bellefontaine | Logan | 320 RICHARD | 2008 | 045 | 12 | .0967 | .0600 | .0967 | .0733 | 0 | .1200 | .1100 | | 0 |
| 39-091-0007 | 1 | 0443 | Bellefontaine | Logan | 1205 SUPERIOR | 2008 | 045 | 12 | .0500 | .0633 | .1000 | .0633 | 0 | .1100 | .1000 | | 0 |
| 39-091-0008 | 1 | 0443 | Bellefontaine | Logan | 1215 GREENWOOD ST. | 2008 | 045 | 12 | .0800 | .0600 | .0733 | .0933 | 0 | .1100 | .1000 | | 0 |
| 39-167-0008 | 1 | 0809 | Marietta | Washington | S.R. 676 WASHINGTON CAREER CENTER | 2008 | 045 | 12 | .0035 | .0041 | .0039 | .0038 | 0 | .0050 | .0047 | | 0 |
| 39-167-0010 | 1 | 0809 | Marietta | Washington | 115 VICTORY PLACE | 2008 | 045 | 2 | | | | .0030 | 0 | .0039 | .0021 | | 0 |

# VI. Air Toxics Monitoring 2008

# 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 2008 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 2008 DAPC was involved in several minor monitoring projects throughout the state, however due to the emphasis on semi-permanent effort these short term and grab sampling projects were limited in scope and are not included in the data summaries for this year.

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 time 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.

**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 2008. Throughout 2008 over 200, 24-hour samples were collected at 9 permanent VOC monitoring sites operating.

**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 |
| -035-0071 | Cleveland | Cuyahoga | Tri-C College | E |
| -049-0034 | Columbus | Franklin | Korbel Ave. | F |
| -081-0017 | Steubenville | Jefferson | 618 Logan Street | G |
| -167-0008 | Marietta | Washington | Washington County Career Center | H |

| VOLATILE ORGANIC COMPOUNDS DETECTED IN 2008<br>Summary Data of 201 Canister Samples | | | | Frequency |
|---|---|---|---|---|
| COMPOUND LIST | Maximum | Average | Minimum | Detected |
| | | | | |
| Acetone | 88.00 | 5.42 | 0.82 | 200 |
| Acetonitrile | 1.30 | 0.43 | 0.20 | 68 |
| Acrylonitrile | 1.70 | 0.52 | 0.20 | 54 |
| Benzene | 17.00 | 0.84 | 0.10 | 141 |
| 1,3-Butadiene | 0.80 | 0.35 | 0.14 | 19 |
| n-Butane | 27.00 | 2.19 | 0.25 | 199 |
| 2-Butanone | 5.80 | 1.06 | 0.50 | 91 |
| Carbon disulfide | 3.50 | 1.08 | 0.50 | 25 |
| Carbon tetrachloride | 0.17 | 0.12 | 0.10 | 11 |
| Chlorobenzene | 1.40 | 0.61 | 0.22 | 6 |
| Chlorodifluoromethane | 2.40 | 0.43 | 0.12 | 180 |
| Chloromethane | 1.60 | 0.59 | 0.33 | 200 |
| Cyclohexane | 0.97 | 0.38 | 0.11 | 18 |
| Decane | 0.67 | 0.29 | 0.10 | 12 |
| 1,4-Dichlorobenzene | 1.80 | 0.67 | 0.10 | 9 |
| Dichlorodifluoromethane | 7.00 | 0.60 | 0.24 | 201 |
| 1,2-Dichloroethane | 0.48 | 0.38 | 0.26 | 4 |
| Ethylbenzene | 3.40 | 0.51 | 0.10 | 15 |
| 4-Ethyltoluene | 0.23 | 0.20 | 0.16 | 2 |
| n-Heptane | 0.97 | 0.36 | 0.10 | 32 |
| Hexachlorobutadiene | 0.33 | 0.33 | 0.33 | 1 |
| Hexane | 2.00 | 0.49 | 0.20 | 70 |
| Methyl-butyl ether | 0.26 | 0.26 | 0.26 | 1 |
| Methylene chloride | 2.40 | 0.35 | 0.10 | 72 |
| 4-Methyl-2-pentanone | 2.40 | 1.04 | 0.18 | 28 |
| Naphthalene | 5.80 | 1.26 | 0.16 | 24 |
| n-Nonane | 0.36 | 0.22 | 0.11 | 6 |
| n-Octane | 0.19 | 0.15 | 0.12 | 3 |
| n-Pentane | 24.00 | 1.34 | 0.15 | 197 |
| Propylene | 7.00 | 2.08 | 0.17 | 60 |
| n-Propylbenzene | 0.28 | 0.28 | 0.28 | 1 |
| Styrene | 0.48 | 0.36 | 0.11 | 5 |
| Tetrachloroethylene | 0.43 | 0.31 | 0.16 | 5 |
| Toluene | 5.50 | 0.93 | 0.10 | 141 |
| Trichloroethene | 2.10 | 0.59 | 0.16 | 6 |
| Trichlorofluoromethane | 6.20 | 0.50 | 0.17 | 196 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.11 | 0.11 | 0.10 | 8 |
| 1,2,4-Trimethylbenzene | 0.53 | 0.30 | 0.21 | 12 |
| 1,3,5-Trimethylbenzene | 0.16 | 0.15 | 0.13 | 2 |
| n-Undecane | 0.71 | 0.40 | 0.10 | 9 |
| Vinylacetate | 1.70 | 0.53 | 0.20 | 95 |
| o-Xylene | 2.80 | 0.45 | 0.11 | 16 |
| Total m & p-xylenes | 11.00 | 1.15 | 0.22 | 27 |

# Table A.

| Butler County (AQS - 39-017-0003)<br>Summary Data of Canister Samples | | | | Frequency |
|---|---|---|---|---|
| COMPOUND LIST | Maximum | Average | Minimum | Detected |
| | | | | |
| Acetone | 6.40 | 3.59 | 0.92 | 23 |
| Acetonitrile | 0.28 | 0.26 | 0.21 | 4 |
| Acrylonitrile | 0.29 | 0.29 | 0.29 | 1 |
| Benzene | 0.54 | 0.31 | 0.11 | 12 |
| 1,3-Butadiene | | | | |
| n-Butane | 2.80 | 0.91 | 0.36 | 22 |
| 2-Butanone | 0.82 | 0.67 | 0.51 | 9 |
| Carbon disulfide | | | | |
| Carbon tetrachloride | | | | |
| Chlorobenzene | | | | |
| Chlorodifluoromethane | 1.60 | 0.43 | 0.12 | 22 |
| Chloromethane | 0.76 | 0.56 | 0.34 | 23 |
| Cyclohexane | | | | |
| Decane | | | | |
| 1,4-Dichlorobenzene | 0.22 | 0.22 | 0.22 | 1 |
| Dichlorodifluoromethane | 0.81 | 0.54 | 0.34 | 23 |
| 1,2-Dichloroethane | | | | |
| Ethylbenzene | | | | |
| 4-Ethyltoluene | | | | |
| n-Heptane | | | | |
| Hexachlorobutadiene | | | | |
| Hexane | 0.33 | 0.29 | 0.24 | 2 |
| Methyl-butyl ether | | | | |
| Methylene chloride | 0.31 | 0.22 | 0.19 | 7 |
| 4-Methyl-2-pentanone | | | | |
| Naphthalene | | | | |
| n-Nonane | | | | |
| n-Octane | | | | |
| n-Pentane | 1.10 | 0.45 | 0.15 | 22 |
| Propylene | 2.80 | 1.08 | 0.17 | 7 |
| n-Propylbenzene | | | | |
| Styrene | | | | |
| Tetrachloroethylene | | | | |
| Toluene | 0.96 | 0.52 | 0.23 | 9 |
| Trichloroethene | | | | |
| Trichlorofluoromethane | 6.20 | 0.56 | 0.17 | 23 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | | | |
| 1,2,4-Trimethylbenzene | | | | |
| 1,3,5-Trimethylbenzene | | | | |
| n-Undecane | | | | |
| Vinylacetate | 0.89 | 0.51 | 0.22 | 12 |
| o-Xylene | | | | |
| Total m & p-xylenes | | | | |

# Table B.

| Cuyahoga #1 (AQS - 39-035-0038)<br>Summary Data of Canister Samples | | | | Frequency |
|---|---|---|---|---|
| COMPOUND LIST | Maximum | Average | Minimum | Detected |
| | | | | |
| Acetone | 7.20 | 7.20 | 0.82 | 16 |
| Acetonitrile | 0.22 | 0.22 | 0.22 | 1 |
| Acrylonitrile | | | | |
| Benzene | 0.48 | 0.48 | 0.11 | 14 |
| 1,3-Butadiene | | | | |
| n-Butane | 6.40 | 6.40 | 0.67 | 17 |
| 2-Butanone | 1.10 | 1.10 | 0.52 | 5 |
| Carbon disulfide | | | | |
| Carbon tetrachloride | 0.12 | 0.12 | 0.10 | 3 |
| Chlorobenzene | | | | |
| Chlorodifluoromethane | 0.99 | 0.99 | 0.19 | 15 |
| Chloromethane | 0.78 | 0.78 | 0.33 | 16 |
| Cyclohexane | | | | |
| Decane | 0.38 | 0.38 | 0.10 | 3 |
| 1,4-Dichlorobenzene | | | | |
| Dichlorodifluoromethane | 0.99 | 0.99 | 0.26 | 17 |
| 1,2-Dichloroethane | | | | |
| Ethylbenzene | 0.28 | 0.28 | 0.28 | 1 |
| 4-Ethyltoluene | | | | |
| n-Heptane | 0.22 | 0.22 | 0.22 | 1 |
| Hexachlorobutadiene | | | | |
| Hexane | 0.72 | 0.72 | 0.24 | 5 |
| Methyl-butyl ether | | | | |
| Methylene chloride | 0.77 | 0.77 | 0.10 | 9 |
| 4-Methyl-2-pentanone | | | | |
| Naphthalene | | | | |
| n-Nonane | 0.36 | 0.36 | 0.11 | 3 |
| n-Octane | | | | |
| n-Pentane | 2.90 | 2.90 | 0.24 | 17 |
| Propylene | 3.20 | 3.20 | 0.71 | 6 |
| n-Propylbenzene | | | | |
| Styrene | | | | |
| Tetrachloroethylene | | | | |
| Toluene | 1.30 | 1.30 | 0.12 | 13 |
| Trichloroethene | 0.24 | 0.24 | 0.24 | 1 |
| Trichlorofluoromethane | 0.33 | 0.33 | 0.19 | 16 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.10 | 0.10 | 0.10 | 2 |
| 1,2,4-Trimethylbenzene | | | | |
| 1,3,5-Trimethylbenzene | | | | |
| n-Undecane | | | | |
| Vinylacetate | 0.28 | 0.28 | 0.23 | 2 |
| o-Xylene | 0.11 | 0.11 | 0.11 | 1 |
| Total m & p-xylenes | 0.24 | 0.24 | 0.24 | 2 |

# Table C.

| Cuyahoga #2 (AQS - 39-035-0068)<br>Summary Data of Canister Samples | | | | Frequency |
|---|---|---|---|---|
| COMPOUND LIST | Maximum | Average | Minimum | Detected |
| | | | | |
| Acetone | 8.10 | 3.23 | 0.84 | 19 |
| Acetonitrile | 0.33 | 0.32 | 0.30 | 2 |
| Acrylonitrile | | | | |
| Benzene | 0.94 | 0.31 | 0.12 | 16 |
| 1,3-Butadiene | | | | |
| n-Butane | 3.60 | 1.58 | 0.49 | 20 |
| 2-Butanone | 1.70 | 0.97 | 0.50 | 7 |
| Carbon disulfide | | | | |
| Carbon tetrachloride | 0.16 | 0.13 | 0.10 | 2 |
| Chlorobenzene | | | | |
| Chlorodifluoromethane | 1.30 | 0.47 | 0.18 | 17 |
| Chloromethane | 0.86 | 0.59 | 0.41 | 20 |
| Cyclohexane | | | | |
| Decane | 0.13 | 0.13 | 0.13 | 1 |
| 1,4-Dichlorobenzene | | | | |
| Dichlorodifluoromethane | 1.40 | 0.63 | 0.36 | 20 |
| 1,2-Dichloroethane | | | | |
| Ethylbenzene | 0.31 | 0.29 | 0.26 | 2 |
| 4-Ethyltoluene | | | | |
| n-Heptane | 0.80 | 0.47 | 0.15 | 3 |
| Hexachlorobutadiene | | | | |
| Hexane | 1.00 | 0.46 | 0.20 | 8 |
| Methyl-butyl ether | | | | |
| Methylene chloride | 2.40 | 0.68 | 0.10 | 16 |
| 4-Methyl-2-pentanone | 0.46 | 0.46 | 0.46 | 1 |
| Naphthalene | | | | |
| n-Nonane | | | | |
| n-Octane | 0.19 | 0.19 | 0.19 | 1 |
| n-Pentane | 2.20 | 0.88 | 0.28 | 20 |
| Propylene | 5.20 | 2.75 | 1.20 | 4 |
| n-Propylbenzene | | | | |
| Styrene | | | | |
| Tetrachloroethylene | 0.43 | 0.31 | 0.19 | 2 |
| Toluene | 4.20 | 0.76 | 0.10 | 19 |
| Trichloroethene | | | | |
| Trichlorofluoromethane | 0.43 | 0.29 | 0.18 | 20 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.11 | 0.11 | 0.10 | 2 |
| 1,2,4-Trimethylbenzene | 0.27 | 0.24 | 0.21 | 3 |
| 1,3,5-Trimethylbenzene | | | | |
| n-Undecane | 0.10 | 0.10 | 0.10 | 1 |
| Vinylacetate | 0.77 | 0.49 | 0.21 | 7 |
| o-Xylene | 0.27 | 0.20 | 0.13 | 2 |
| Total m & p-xylenes | 1.20 | 0.65 | 0.34 | 4 |

# Table D.

| Cuyahoga #3 (AQS - 39-035-0069)<br>Summary Data of Canister Samples | | | | Frequency |
|---|---|---|---|---|
| COMPOUND LIST | Maximum | Average | Minimum | Detected |
| | | | | |
| Acetone | 16.00 | 4.73 | 1.10 | 27 |
| Acetonitrile | 0.85 | 0.41 | 0.22 | 11 |
| Acrylonitrile | 0.39 | 0.29 | 0.21 | 7 |
| Benzene | 1.50 | 0.38 | 0.12 | 22 |
| 1,3-Butadiene | 0.61 | 0.30 | 0.14 | 4 |
| n-Butane | 9.50 | 2.40 | 0.42 | 28 |
| 2-Butanone | 2.00 | 1.05 | 0.51 | 10 |
| Carbon disulfide | 0.60 | 0.60 | 0.60 | 1 |
| Carbon tetrachloride | 0.12 | 0.11 | 0.10 | 4 |
| Chlorobenzene | | | | |
| Chlorodifluoromethane | 1.20 | 0.43 | 0.18 | 28 |
| Chloromethane | 0.84 | 0.58 | 0.34 | 29 |
| Cyclohexane | 0.47 | 0.29 | 0.11 | 2 |
| Decane | 0.19 | 0.19 | 0.19 | 1 |
| 1,4-Dichlorobenzene | 0.10 | 0.10 | 0.10 | 1 |
| Dichlorodifluoromethane | 0.86 | 0.58 | 0.26 | 29 |
| 1,2-Dichloroethane | | | | |
| Ethylbenzene | 0.30 | 0.27 | 0.22 | 3 |
| 4-Ethyltoluene | 0.16 | 0.16 | 0.16 | 1 |
| n-Heptane | 0.68 | 0.36 | 0.10 | 4 |
| Hexachlorobutadiene | | | | |
| Hexane | 1.60 | 0.50 | 0.22 | 12 |
| Methyl-butyl ether | | | | |
| Methylene chloride | 0.53 | 0.25 | 0.11 | 11 |
| 4-Methyl-2-pentanone | 2.40 | 1.16 | 0.36 | 14 |
| Naphthalene | 0.59 | 0.51 | 0.44 | 3 |
| n-Nonane | 0.11 | 0.11 | 0.11 | 1 |
| n-Octane | 0.12 | 0.12 | 0.12 | 1 |
| n-Pentane | 3.80 | 1.16 | 0.34 | 28 |
| Propylene | 4.80 | 1.97 | 0.61 | 9 |
| n-Propylbenzene | | | | |
| Styrene | | | | |
| Tetrachloroethylene | 0.40 | 0.28 | 0.16 | 2 |
| Toluene | 3.40 | 0.76 | 0.11 | 26 |
| Trichloroethene | 0.16 | 0.16 | 0.16 | 1 |
| Trichlorofluoromethane | 0.62 | 0.27 | 0.17 | 27 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.11 | 0.11 | 0.11 | 2 |
| 1,2,4-Trimethylbenzene | 0.53 | 0.45 | 0.36 | 2 |
| 1,3,5-Trimethylbenzene | 0.13 | 0.13 | 0.13 | 1 |
| n-Undecane | 0.69 | 0.69 | 0.69 | 1 |
| Vinylacetate | 1.10 | 0.50 | 0.24 | 9 |
| o-Xylene | 0.35 | 0.27 | 0.11 | 3 |
| Total m & p-xylenes | 1.70 | 0.90 | 0.24 | 4 |

# Table E.

| Cuyahoga #4 (AQS - 39-035-0071)<br>Summary Data of Canister Samples | | | | Frequency |
|---|---|---|---|---|
| COMPOUND LIST | Maximum | Average | Minimum | Detected |
| | | | | |
| Acetone | 88.00 | 16.73 | 3.10 | 25 |
| Acetonitrile | 1.30 | 0.69 | 0.21 | 21 |
| Acrylonitrile | 0.34 | 0.25 | 0.21 | 6 |
| Benzene | 1.30 | 0.45 | 0.16 | 25 |
| 1,3-Butadiene | 0.80 | 0.41 | 0.24 | 11 |
| n-Butane | 27.00 | 6.13 | 0.91 | 25 |
| 2-Butanone | 5.80 | 1.41 | 0.50 | 23 |
| Carbon disulfide | 1.00 | 0.67 | 0.50 | 3 |
| Carbon tetrachloride | 0.17 | 0.17 | 0.17 | 1 |
| Chlorobenzene | | | | |
| Chlorodifluoromethane | 2.40 | 0.80 | 0.22 | 17 |
| Chloromethane | 0.96 | 0.65 | 0.37 | 25 |
| Cyclohexane | 0.97 | 0.40 | 0.16 | 15 |
| Decane | 0.67 | 0.35 | 0.19 | 7 |
| 1,4-Dichlorobenzene | 1.80 | 0.82 | 0.33 | 7 |
| Dichlorodifluoromethane | 7.00 | 0.88 | 0.24 | 25 |
| 1,2-Dichloroethane | 0.48 | 0.38 | 0.26 | 4 |
| Ethylbenzene | 3.40 | 0.98 | 0.15 | 5 |
| 4-Ethyltoluene | 0.23 | 0.23 | 0.23 | 1 |
| n-Heptane | 0.97 | 0.41 | 0.12 | 16 |
| Hexachlorobutadiene | | | | |
| Hexane | 2.00 | 0.67 | 0.21 | 21 |
| Methyl-butyl ether | 0.26 | 0.26 | 0.26 | 1 |
| Methylene chloride | 0.81 | 0.27 | 0.11 | 15 |
| 4-Methyl-2-pentanone | 2.40 | 1.01 | 0.18 | 12 |
| Naphthalene | 0.71 | 0.48 | 0.28 | 5 |
| n-Nonane | 0.35 | 0.25 | 0.15 | 2 |
| n-Octane | 0.14 | 0.14 | 0.14 | 1 |
| n-Pentane | 24.00 | 5.41 | 0.54 | 25 |
| Propylene | 7.00 | 3.31 | 0.99 | 13 |
| n-Propylbenzene | 0.28 | 0.28 | 0.28 | 1 |
| Styrene | 0.41 | 0.41 | 0.41 | 1 |
| Tetrachloroethylene | 0.39 | 0.39 | 0.39 | 1 |
| Toluene | 5.50 | 1.83 | 0.21 | 25 |
| Trichloroethene | 2.10 | 0.79 | 0.21 | 4 |
| Trichlorofluoromethane | 0.68 | 0.36 | 0.21 | 24 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.11 | 0.11 | 0.10 | 2 |
| 1,2,4-Trimethylbenzene | 0.35 | 0.29 | 0.23 | 4 |
| 1,3,5-Trimethylbenzene | 0.16 | 0.16 | 0.16 | 1 |
| n-Undecane | 0.71 | 0.41 | 0.20 | 6 |
| Vinylacetate | 1.70 | 0.69 | 0.38 | 12 |
| o-Xylene | 2.80 | 0.79 | 0.20 | 6 |
| Totalm & p-xylenes | 11.00 | 2.51 | 0.22 | 7 |

# Table F.

| Franklin County (AQS - 39-049-0034) Summary Data of Canister Samples | | | | Frequency |
|---|---|---|---|---|
| COMPOUND LIST | Maximum | Average | Minimum | Detected |
| | | | | |
| Acetone | 13.00 | 4.66 | 1.80 | 30 |
| Acetonitrile | 0.55 | 0.27 | 0.20 | 20 |
| Acrylonitrile | 0.77 | 0.43 | 0.22 | 5 |
| Benzene | 0.68 | 0.28 | 0.12 | 18 |
| 1,3-Butadiene | 0.26 | 0.23 | 0.20 | 2 |
| n-Butane | 4.60 | 1.21 | 0.25 | 30 |
| 2-Butanone | 3.80 | 1.46 | 0.54 | 14 |
| Carbon disulfide | | | | |
| Carbon tetrachloride | | | | |
| Chlorobenzene | | | | |
| Chlorodifluoromethane | 1.20 | 0.42 | 0.15 | 29 |
| Chloromethane | 0.76 | 0.56 | 0.35 | 30 |
| Cyclohexane | | | | |
| Decane | | | | |
| 1,4-Dichlorobenzene | | | | |
| Dichlorodifluoromethane | 0.75 | 0.56 | 0.38 | 30 |
| 1,2-Dichloroethane | | | | |
| Ethylbenzene | 0.22 | 0.22 | 0.22 | 1 |
| 4-Ethyltoluene | | | | |
| n-Heptane | | | | |
| Hexachlorobutadiene | | | | |
| Hexane | 0.42 | 0.32 | 0.23 | 8 |
| Methyl-butyl ether | | | | |
| Methylene chloride | 0.32 | 0.24 | 0.21 | 8 |
| 4-Methyl-2-pentanone | | | | |
| Naphthalene | | | | |
| n-Nonane | | | | |
| n-Octane | | | | |
| n-Pentane | 1.60 | 0.54 | 0.15 | 30 |
| Propylene | 2.10 | 1.19 | 0.55 | 7 |
| n-Propylbenzene | | | | |
| Styrene | | | | |
| Tetrachloroethylene | | | | |
| Toluene | 1.90 | 0.61 | 0.14 | 18 |
| Trichloroethene | | | | |
| Trichlorofluoromethane | 0.31 | 0.25 | 0.18 | 30 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | | | |
| 1,2,4-Trimethylbenzene | | | | |
| 1,3,5-Trimethylbenzene | | | | |
| n-Undecane | | | | |
| Vinylacetate | 1.30 | 0.55 | 0.20 | 19 |
| o-Xylene | 0.21 | 0.21 | 0.21 | 1 |
| Total m & p-xylenes | 0.78 | 0.66 | 0.54 | 2 |

# Table G.

| Jefferson County (AQS - 39-081-0017) Summary Data of Canister Samples | | | | Frequency |
|---|---|---|---|---|
| COMPOUND LIST | Maximum | Average | Minimum | Detected |
| | | | | |
| Acetone | 9.30 | 4.04 | 1.10 | 29 |
| Acetonitrile | 0.62 | 0.32 | 0.20 | 9 |
| Acrylonitrile | 0.70 | 0.43 | 0.20 | 10 |
| Benzene | 17.00 | 3.13 | 0.16 | 26 |
| 1,3-Butadiene | 0.27 | 0.25 | 0.23 | 2 |
| n-Butane | 6.80 | 1.60 | 0.27 | 29 |
| 2-Butanone | 1.60 | 0.77 | 0.52 | 12 |
| Carbon disulfide | 1.10 | 0.76 | 0.61 | 5 |
| Carbon tetrachloride | | | | |
| Chlorobenzene | | | | |
| Chlorodifluoromethane | 0.70 | 0.32 | 0.17 | 27 |
| Chloromethane | 0.75 | 0.55 | 0.37 | 29 |
| Cyclohexane | | | | |
| Decane | | | | |
| 1,4-Dichlorobenzene | | | | |
| Dichlorodifluoromethane | 0.76 | 0.53 | 0.31 | 29 |
| 1,2-Dichloroethane | | | | |
| Ethylbenzene | 0.37 | 0.27 | 0.10 | 3 |
| 4-Ethyltoluene | | | | |
| n-Heptane | 0.54 | 0.25 | 0.10 | 7 |
| Hexachlorobutadiene | 0.33 | 0.33 | 0.33 | 1 |
| Hexane | 1.60 | 0.44 | 0.21 | 8 |
| Methyl-butyl ether | | | | |
| Methylene chloride | 0.21 | 0.21 | 0.21 | 2 |
| 4-Methyl-2-pentanone | 0.29 | 0.29 | 0.29 | 1 |
| Naphthalene | 5.80 | 1.64 | 0.16 | 16 |
| n-Nonane | | | | |
| n-Octane | | | | |
| n-Pentane | 5.10 | 0.76 | 0.21 | 28 |
| Propylene | 4.10 | 1.92 | 1.10 | 9 |
| n-Propylbenzene | | | | |
| Styrene | 0.46 | 0.30 | 0.11 | 3 |
| Tetrachloroethylene | | | | |
| Toluene | 4.80 | 1.20 | 0.15 | 23 |
| Trichloroethene | | | | |
| Trichlorofluoromethane | 1.30 | 0.35 | 0.20 | 28 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | | | |
| 1,2,4-Trimethylbenzene | 0.34 | 0.29 | 0.25 | 3 |
| 1,3,5-Trimethylbenzene | | | | |
| n-Undecane | | | | |
| Vinylacetate | 1.20 | 0.55 | 0.21 | 18 |
| o-Xylene | 0.49 | 0.33 | 0.17 | 3 |
| Totalm & p-xylenes | 1.50 | 0.68 | 0.24 | 8 |

# Table H.

| Washington County (AQS - 39-167-0008) Summary Data of Canister Samples | | | | Frequency |
|---|---|---|---|---|
| COMPOUND LIST | Maximum | Average | Minimum | Detected |
| | | | | |
| Acetone | 9.30 | 3.35 | 1.20 | 28 |
| Acetonitrile | | | | |
| Acrylonitrile | 1.70 | 0.71 | 0.21 | 25 |
| Benzene | 0.23 | 0.14 | 0.10 | 8 |
| 1,3-Butadiene | | | | |
| n-Butane | 4.80 | 1.72 | 0.46 | 28 |
| 2-Butanone | 1.10 | 0.69 | 0.52 | 11 |
| Carbon disulfide | 3.50 | 1.28 | 0.62 | 16 |
| Carbon tetrachloride | 0.11 | 0.11 | 0.11 | 1 |
| Chlorobenzene | 1.40 | 0.61 | 0.22 | 6 |
| Chlorodifluoromethane | 0.40 | 0.27 | 0.12 | 25 |
| Chloromethane | 1.60 | 0.70 | 0.42 | 28 |
| Cyclohexane | 0.15 | 0.15 | 0.15 | 1 |
| Decane | | | | |
| 1,4-Dichlorobenzene | | | | |
| Dichlorodifluoromethane | 0.95 | 0.56 | 0.32 | 28 |
| 1,2-Dichloroethane | | | | |
| Ethylbenzene | | | | |
| 4-Ethyltoluene | | | | |
| n-Heptane | 0.14 | 0.14 | 0.14 | 1 |
| Hexachlorobutadiene | | | | |
| Hexane | 0.41 | 0.30 | 0.20 | 6 |
| Methyl-butyl ether | | | | |
| Methylene chloride | 0.23 | 0.21 | 0.20 | 4 |
| 4-Methyl-2-pentanone | | | | |
| Naphthalene | | | | |
| n-Nonane | | | | |
| n-Octane | | | | |
| n-Pentane | 1.50 | 0.56 | 0.19 | 27 |
| Propylene | 4.30 | 2.24 | 0.70 | 5 |
| n-Propylbenzene | | | | |
| Styrene | 0.48 | 0.48 | 0.48 | 1 |
| Tetrachloroethylene | | | | |
| Toluene | 0.36 | 0.26 | 0.20 | 8 |
| Trichloroethene | | | | |
| Trichlorofluoromethane | 5.80 | 1.49 | 0.25 | 28 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | | | |
| 1,2,4-Trimethylbenzene | | | | |
| 1,3,5-Trimethylbenzene | | | | |
| n-Undecane | 0.35 | 0.35 | 0.35 | 1 |
| Vinylacetate | 1.50 | 0.47 | 0.22 | 16 |
| o-Xylene | | | | |
| Totalm & p-xylenes | | | | |

## 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 pre-weighed 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 two strips are 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 atomic absorption (AA) spectroscopy. When an element is heated in the flame of this instrument it absorbs light at a characteristic wavelength. By measuring the amount of light absorbed at a particular wavelength the concentration of the element being analyzed can be determined. Most routine analysis are conducted by ICP (Inductively Coupled Plasma Emission Spectroscopy).

SUMMARY OF ICP METHOD: The method measures element-emitted light by optical spectrometry. Sample are nebulized into an aerosol and transported to the plasma by the nebulizer argon flow. The first function of the high temperature plasma is to remove the solvent from, or desoluate, the aerosol, usually leaving the sample as microscopic salt particles. The next steps involve decomposing the salt particles into a gas of individual molecules (vaporization) that are then dissociated into atoms (atomization). The next plasma functions are Excitation and Ionization. The light emitted by the excited atoms and ions in the plasma is measured to obtain information about the sample. The aqueous sample is digested for one hour at 248°F and 15 psi and allowed to cool. Samples may be run manually or automatically via the auto-sampler.

HEAVY METALS PARAMETERS

All 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 typically are 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. | I |
| 39-029-0019 | E. Liverpool | Columbiana | 1250 St. George St. | J |
| 39-029-0020 | E. Liverpool | Columbiana | 2220 Michigan Ave. | K |
| 39-029-0022 | E. Liverpool | Columbiana | 500 Maryland Ave. | L |
| 39-035-0038 | Cleveland | Cuyahoga | 2547 Tikhon Ave. | M |
| 39-035-0042 | Cleveland | Cuyahoga | 3136 Lorain Ave. | N |
| 39-035-0049 | Cleveland | Cuyahoga | 4150 East 56th St. | O |
| 39-035-0050 | Cleveland | Cuyahoga | 5777 Grant Ave. | P |
| 39-035-0061 | Cleveland | Cuyahoga | West 3rd. St. | Q |
| 39-049-0025 | Columbus | Franklin | 1700 Ann St. | R |
| 39-051-0001 | Delta | Fulton | 200 Van Buren St. | S |
| 39-091-0003 | Bellefontaine | Logan | 1222 Superior Ave. | T |
| 39-123-0012 | Elmore | Ottawa | | U |
| 39-167-0008 | Marietta | Washington | Lancaster Rd. | V |
| | Marion | Marion | 441 Whitmore St. | W |

Table I.

| Middletown Heavy Metals Data - 2008<br>Ohio Bell<br>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 | 0.50 | 0.04 | 0.19 | 4.70 | 4.00 | <4.3 | 320 | 36 | 31 |
| FEBRUARY | 1.00 | <0.065 | 0.21 | <9.8 | 4.90 | <13.0 | 300 | 38 | 41 |
| MARCH | 0.59 | 0.04 | 0.19 | 2.49 | 3.80 | 0.82 | 310 | 38 | 76 |
| APRIL | 1.70 | 0.21 | 0.20 | 3.10 | 6.70 | 1.17 | 540 | 99 | 54 |
| MAY | 1.50 | 0.05 | 0.17 | 2.95 | 4.20 | 1.28 | 380 | 43 | 34 |
| JUNE | 1.00 | 0.06 | 0.29 | 5.99 | 9.10 | 2.96 | 610 | 82 | 75 |
| JULY | 1.60 | 0.08 | 0.28 | 4.62 | 9.00 | 1.53 | 0 | 71 | 60 |
| AUGUST | 1.30 | 0.05 | 0.20 | 2.15 | 4.50 | 0.97 | 240 | 33 | 29 |
| SEPTEMBER | 2.50 | 0.04 | 0.34 | 1.81 | 5.40 | 0.84 | 210 | 24 | 31 |
| OCTOBER | 2.60 | <0.069 | 0.53 | 10.20 | 15.00 | 12.90 | 1100 | 130 | 130 |
| NOVEMBER | 1.00 | 0.03 | 0.33 | 3.90 | 6.60 | 0.66 | 340 | 43 | 56 |
| DECEMBER | 0.73 | 0.07 | 0.19 | 2.47 | 4.20 | 1.01 | 280 | 40 | 49 |

Table J.

| East Liverpool Heavy Metals Data - 2008<br>Port Authority<br>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 | 2.00 | 0.04 | 1.80 | 2.60 | 12.00 | 0.00 | 270 | 440 | 210 | 170 | 0.054 |
| FEBRUARY | 2.80 | 0.00 | 0.62 | 0.00 | 7.10 | 0.00 | 230 | 120 | 0 | 62 | 0.085 |
| MARCH | 2.50 | 0.09 | 0.87 | 3.60 | 11.00 | 2.94 | 87 | 59 | 40 | 11 | 0.090 |
| APRIL | 1.60 | 0.07 | 7.00 | 3.12 | 50.00 | 2.54 | 450 | 120 | 360 | 310 | 0.100 |
| MAY | 3.40 | 0.21 | 1.40 | 4.86 | 29.00 | 3.00 | 900 | 350 | 410 | 140 | 0.110 |
| JUNE | 1.90 | 0.13 | 0.36 | 3.59 | 7.90 | 2.60 | 630 | 210 | 430 | 46 | 0.160 |
| JULY | 3.20 | 0.36 | 1.10 | 4.34 | 18.00 | 2.43 | 730 | 370 | 530 | 61 | 0.082 |
| AUGUST | 3.60 | 0.17 | 0.49 | 3.22 | 10.00 | 2.98 | 490 | 320 | 320 | 35 | 0.066 |
| SEPTEMBER | 2.20 | 0.11 | 1.00 | 2.77 | 25.00 | 2.13 | 560 | 190 | 360 | 86 | 0.110 |
| OCTOBER | 1.40 | 0.08 | 0.42 | 2.40 | 9.20 | 1.86 | 360 | 120 | 310 | 38 | 0.051 |
| NOVEMBER | 1.30 | 0.04 | 0.59 | 1.97 | 11.00 | 1.11 | 210 | 110 | 280 | 50 | 0.056 |
| DECEMBER | 1.10 | 0.03 | 0.86 | 1.27 | 7.80 | 1.46 | 130 | 80 | 210 | 63 | 0.065 |

Table K.

| East Liverpool Heavy Metals Data - 2008<br>Waterplant<br>2220 Michigan Ave. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AQS: 39-029-0020 | | 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 | 2.70 | 0.04 | 1.90 | 24.00 | 14.00 | 33.00 | 1100 | 3100 | 350 | 190 | 0.070 |
| FEBRUARY | 2.70 | 0.00 | 1.30 | 7.10 | 15.00 | 78.00 | 520 | 1100 | 380 | 130 | 0.150 |
| MARCH | 1.40 | 0.00 | 0.57 | 11.00 | 9.60 | 12.30 | 630 | 1900 | 290 | 62 | 0.096 |
| APRIL | 1.90 | 0.04 | 3.80 | 10.80 | 28.00 | 6.15 | 790 | 1700 | 350 | 210 | 0.110 |
| MAY | 2.50 | 0.03 | 1.60 | 7.42 | 20.00 | 8.32 | 760 | 2000 | 340 | 170 | 0.094 |
| JUNE | 1.70 | 0.00 | 0.44 | 7.17 | 7.90 | 5.23 | 670 | 1700 | 350 | 45 | 0.110 |
| JULY | 1.80 | 0.04 | 0.81 | 3.25 | 7.80 | 5.41 | 430 | 610 | 350 | 41 | 0.037 |
| AUGUST | 3.70 | 0.02 | 0.47 | 6.29 | 8.80 | 35.70 | 710 | 2800 | 290 | 41 | 0.078 |
| SEPTEMBER | 2.70 | 0.02 | 0.90 | 5.04 | 14.00 | 17.80 | 560 | 910 | 360 | 93 | 0.069 |
| OCTOBER | 1.30 | 0.00 | 0.67 | 5.58 | 8.00 | 9.45 | 350 | 400 | 310 | 43 | 0.042 |
| NOVEMBER | 1.40 | 0.05 | 0.78 | 14.30 | 8.30 | 8.32 | 350 | 660 | 270 | 47 | 0.056 |
| DECEMBER | 0.78 | 0.00 | 0.93 | 1.35 | 7.40 | 2.33 | 150 | 530 | 0 | 62 | 0.047 |

Table L.

| East Liverpool Heavy Metals Data - 2008<br><br>500 Maryland Ave. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AQS: 39-029-0022 | | 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 | 0.02 | 2.00 | 3.30 | 14.00 | <4.00 | 240 | 260 | 340 | 170 | 0.051 |
| FEBRUARY | 2.30 | <0.033 | 1.30 | <5.0 | 13.00 | <6.7 | 180 | 140 | 390 | 110 | 0.093 |
| MARCH | 1.40 | 0.04 | 0.64 | 3.11 | 7.80 | 1.78 | 340 | 250 | 300 | 62 | 0.046 |
| APRIL | 1.60 | 0.11 | 4.30 | 8.18 | 33.00 | 2.67 | 780 | 200 | 420 | 220 | 0.051 |
| MAY | 2.40 | 0.05 | 1.20 | 4.80 | 35.00 | 2.25 | 380 | 220 | 300 | 140 | 0.046 |
| JUNE | 1.10 | 0.04 | 0.24 | 3.39 | 6.20 | 1.47 | 280 | 140 | 320 | 31 | 0.044 |
| JULY | 2.50 | 0.06 | 0.70 | 3.34 | 14.00 | 1.50 | 280 | 220 | 410 | 49 | 0.038 |
| AUGUST | 3.40 | 0.03 | 0.37 | 3.00 | 7.70 | 2.02 | 270 | 280 | 250 | 30 | 0.030 |
| SEPTEMBER | 2.00 | 0.03 | 0.91 | 2.31 | 16.00 | 1.58 | 400 | 56 | 330 | 91 | 0.016 |
| OCTOBER | 1.00 | <0.019 | 0.32 | 1.90 | 8.80 | 1.43 | 200 | 67 | 300 | 35 | 0.024 |
| NOVEMBER | 1.70 | <0.024 | 0.59 | 1.53 | 13.00 | 0.87 | 140 | 47 | 280 | 48 | 0.034 |
| DECEMBER | 1.20 | <0.019 | 0.69 | 1.00 | 6.90 | 0.67 | 98 | 63 | 190 | 62 | 0.043 |

Table M.

| Cleveland Heavy Metals Data - 2008<br>St. Theodosius Church<br>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 | 0.77 | <0.021 | 0.25 | <3.1 | 8.90 | <4.1 | 24 | 55 |
| FEBRUARY | 0.97 | <0.031 | 0.50 | <4.7 | 9.70 | <6.2 | 30 | 67 |
| MARCH | 1.40 | 0.08 | 0.69 | 4.67 | 20.00 | 3.13 | 140 | 100 |
| APRIL | 1.50 | 0.05 | 1.40 | 5.28 | 41.00 | 9.55 | 100 | 120 |
| MAY | 1.20 | 0.04 | 0.37 | 4.74 | 20.00 | 4.20 | 80 | 68 |
| JUNE | 1.10 | 0.04 | 0.31 | 2.03 | 20.00 | 2.37 | 28 | 51 |
| JULY | 1.40 | 0.04 | 0.29 | 3.27 | 22.00 | 3.75 | 47 | 62 |
| AUGUST | 1.30 | 0.03 | 0.41 | 3.50 | 20.00 | 3.03 | 61 | 83 |
| SEPTEMBER | 2.00 | 0.05 | 0.42 | 3.69 | 15.00 | 3.65 | 59 | 60 |
| OCTOBER | 1.00 | 0.03 | 0.36 | 2.91 | 9.50 | 3.37 | 25 | 52 |
| NOVEMBER | 0.68 | <0.025 | 0.28 | 1.22 | 5.50 | 1.06 | 8.1 | 30 |
| DECEMBER | 0.59 | <0.025 | 0.27 | 1.20 | 4.90 | 1.22 | 13 | 39 |

Table N.

| Cleveland Heavy Metals Data - 2008<br>FIRE "4A"<br>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 | 0.94 | <0.044 | 0.31 | <6.6 | 6.70 | <8.9 | 8.8 | 32 |
| FEBRUARY | 0.99 | <0.066 | 0.50 | <9.9 | 7.30 | <1.3 | 8.9 | 41 |
| MARCH | 0.84 | <0.027 | 0.39 | 2.56 | 9.90 | 2.43 | 16.0 | 42 |
| APRIL | 1.30 | 0.03 | 1.00 | 3.00 | 21.00 | 3.29 | 43.0 | 74 |
| MAY | 1.30 | 0.03 | 0.43 | 2.77 | 33.00 | 3.11 | 31.0 | 56 |
| JUNE | 1.00 | <0.028 | 0.19 | 1.71 | 16.00 | 1.41 | 17.0 | 51 |
| JULY | 1.80 | <0.028 | 0.23 | 1.93 | 16.00 | 2.20 | 20.0 | 61 |
| AUGUST | 2.20 | <0.028 | 0.35 | 2.21 | 15.00 | 2.08 | 22.0 | 43 |
| SEPTEMBER | 1.60 | <0.027 | 0.36 | 2.63 | 16.00 | 3.14 | 23.0 | 45 |
| OCTOBER | 0.94 | <0.027 | 0.35 | 1.83 | 15.00 | 2.44 | 18.0 | 54 |
| NOVEMBER | 0.65 | <0.027 | 0.25 | 1.13 | 7.30 | 1.08 | 7.2 | 30 |
| DECEMBER | 0.70 | <0.026 | 0.21 | 0.97 | 5.80 | 0.92 | 7.0 | 39 |

Table O.

| Cleveland Heavy Metals Data - 2008<br>FERRO "A"<br>4150 EAST 56th STR. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 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 | 1.50 | 0.03 | 0.42 | 7.20 | 38 | 83.0 | 130 | 130 |
| FEBRUARY | 1.40 | <0.045 | 0.58 | <6.8 | 25 | 30.0 | 54 | 89 |
| MARCH | 1.30 | 0.03 | 1.90 | 5.46 | 170 | 96.3 | 130 | 110 |
| APRIL | 2.10 | 0.05 | 0.74 | 6.58 | 67 | 89.1 | 140 | 120 |
| MAY | 2.50 | 0.09 | 0.70 | 8.62 | 190 | 35.9 | 230 | 170 |
| JUNE | 1.60 | 0.08 | 0.50 | 7.87 | 88 | 107.0 | 190 | 100 |
| JULY | 3.30 | 0.10 | 0.85 | 10.10 | 130 | 103.0 | 270 | 160 |
| AUGUST | 2.80 | 0.07 | 0.59 | 6.50 | 210 | 37.3 | 170 | 130 |
| SEPTEMBER | 2.70 | 0.05 | 0.54 | 5.84 | 110 | 12.0 | 88 | 92 |
| OCTOBER | 1.30 | <0.027 | 0.95 | 4.13 | 200 | 98.0 | 120 | 130 |
| NOVEMBER | 1.50 | 0.04 | 0.41 | 2.16 | 50 | 25.5 | 72 | 62 |
| DECEMBER | 0.86 | <0.026 | 0.35 | 2.55 | 55 | 14.3 | 62 | 74 |

Table P.

| Cleveland Heavy Metals Data - 2008<br>Fortran Printing Inc.<br>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 | 0.78 | <0.022 | 0.34 | <3.3 | 6.3 | <4.4 | 23 | 36 |
| FEBRUARY | 0.82 | <0.033 | 0.20 | <4.9 | 6.6 | <6.5 | 27 | 30 |
| MARCH | 1.20 | <0.027 | 0.46 | 3.48 | 22.0 | 36.3 | 45 | 52 |
| APRIL | 1.70 | 0.03 | 0.53 | 4.15 | 20.0 | 9.0 | 56 | 66 |
| MAY | 2.00 | 0.05 | 0.55 | 5.05 | 34.0 | 24.0 | 93 | 99 |
| JUNE | 2.70 | 0.06 | 0.68 | 6.66 | 24.0 | 27.4 | 130 | 130 |
| JULY | 2.70 | 0.08 | 0.56 | 6.44 | 42.0 | 44.9 | 170 | 120 |
| AUGUST | 2.80 | 0.03 | 0.41 | 3.20 | 13.0 | 4.1 | 53 | 56 |
| SEPTEMBER | 3.40 | 0.05 | 0.55 | 6.14 | 59.0 | 20.1 | 110 | 84 |
| OCTOBER | 1.50 | <0.027 | 0.46 | 2.75 | 23.0 | 26.3 | 61 | 65 |
| NOVEMBER | 1.20 | <0.026 | 0.42 | 1.50 | 14.0 | 14.6 | 28 | 34 |
| DECEMBER | 0.80 | <0.026 | 0.32 | 1.10 | 4.1 | 1.4 | 11 | 31 |

Table Q.

| Cleveland Heavy Metals Data - 2008<br>Asphalt Plant "A"<br>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 | 0.69 | 0.03 | 0.25 | 4.10 | 12.0 | <4.1 | 62 | 58 |
| FEBRUARY | 1.20 | 0.04 | 0.57 | <6.3 | 9.8 | <8.4 | 36 | 72 |
| MARCH | 1.10 | 0.07 | 0.46 | 7.47 | 15.0 | 4.43 | 130 | 110 |
| APRIL | 1.60 | 0.05 | 1.30 | 5.55 | 39.0 | 14.40 | 120 | 100 |
| MAY | 1.30 | 0.06 | 0.28 | 5.41 | 23.0 | 5.05 | 120 | 79 |
| JUNE | 1.00 | 0.05 | 0.23 | 4.06 | 16.0 | 3.03 | 71 | 69 |
| JULY | 2.60 | 0.06 | 0.44 | 6.05 | 41.0 | 5.79 | 130 | 110 |
| AUGUST | 1.60 | 0.05 | 0.85 | 11.00 | 41.0 | 4.38 | 240 | 500 |
| SEPTEMBER | 1.90 | 0.05 | 0.37 | 4.67 | 22.0 | 4.95 | 86 | 77 |
| OCTOBER | 1.10 | <0.032 | 0.45 | 3.83 | 17.0 | 4.09 | 55 | 88 |
| NOVEMBER | 1.10 | <0.025 | 0.27 | 1.59 | 7.7 | 1.22 | 16 | 37 |
| DECEMBER | 0.60 | <0.025 | 0.25 | 1.11 | 4.9 | 1.14 | 17 | 36 |

Table R.

| Columbus Heavy Metals Data - 2008<br>Woodrow<br>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 | 0.56 | <0.022 | 0.19 | <3.3 | 5.9 | <4.5 | 140 | 8.8 | 30 |
| FEBRUARY | 0.64 | <0.034 | 0.39 | <5.0 | 4.7 | <6.7 | 90 | 5.3 | 39 |
| MARCH | 0.54 | <0.023 | 0.24 | 1.61 | 5.1 | 1.04 | 170 | 12.0 | 63 |
| APRIL | 1.20 | <0.029 | 0.44 | 1.83 | 13.0 | 1.39 | 220 | 15.0 | 65 |
| MAY | 1.20 | <0.029 | 0.32 | 2.36 | 9.3 | 1.75 | 260 | 18.0 | 85 |
| JUNE | 1.10 | <0.038 | 0.34 | 2.33 | 9.4 | 2.44 | 320 | 19.0 | 74 |
| JULY | 1.60 | <0.03 | 0.38 | 1.93 | 14.0 | 2.23 | 270 | 21.0 | 86 |
| AUGUST | 1.50 | <0.029 | 0.46 | 2.38 | 11.0 | 1.26 | 290 | 15.0 | 78 |
| SEPTEMBER | 1.90 | <0.028 | 0.62 | 1.42 | 11.0 | 1.12 | 220 | 13.0 | 100 |
| OCTOBER | 0.90 | <0.028 | 0.29 | 1.73 | 12.0 | 1.54 | 290 | 17.0 | 63 |
| NOVEMBER | 1.10 | <0.027 | 0.31 | 1.50 | 6.6 | 1.02 | 230 | 12.0 | 49 |
| DECEMBER | 0.71 | <0.026 | 0.41 | 0.94 | 4.7 | 0.60 | 110 | 6.7 | 62 |

Table S.

| NWDO Heavy Metals Data - 2008<br>Delta<br>200 Van Buren St. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AQS: 39-051-0001 | | units – ng/m³ | | | | | | |
| Fulton | | Parameters/AQS# | | | | | | |
| MONTH | arsenic | beryllium | cadmium | chromium | lead | nickel | manganese | zinc |
| | 12103 | 12105 | 12110 | 12112 | 12128 | 12136 | 12132 | 12167 |
| JANUARY | 0.53 | <0.029 | 5.20 | <4.3 | 490 | <5.8 | 12.0 | 5100 |
| FEBRUARY | 0.44 | <0.028 | 1.90 | 1.69 | 250 | 1.12 | 8.5 | 2000 |
| MARCH | 0.42 | <0.029 | 3.60 | 1.65 | 420 | 1.03 | 7.5 | 3400 |
| APRIL | 0.77 | <0.03 | 0.75 | 1.48 | 92 | 1.18 | 12.0 | 870 |
| MAY | 1.00 | <0.03 | 2.50 | 1.60 | 200 | 1.54 | 17.0 | 2100 |
| JUNE | 0.83 | <0.025 | 6.20 | 1.32 | 510 | 1.48 | 14.0 | 4500 |
| JULY | 1.80 | 0.03 | 3.10 | 1.38 | 240 | 1.17 | 14.0 | 2400 |
| AUGUST | 1.30 | <0.025 | 1.00 | 1.21 | 120 | 0.81 | 11.0 | 900 |
| SEPTEMBER | 1.40 | <0.024 | 1.20 | 1.03 | 150 | 0.85 | 7.3 | 980 |
| OCTOBER | 0.42 | <0.028 | 5.60 | 0.82 | 440 | 0.66 | 7.7 | 3500 |
| NOVEMBER | 0.39 | <0.028 | 5.50 | 1.20 | 370 | 0.98 | 6.3 | 3700 |
| DECEMBER | <0.5 | <0.051 | 0.39 | 0.85 | 64 | 0.77 | 5.0 | 410 |

Table T.

| SWDO Heavy Metals Data - 2008<br>Bellefontaine<br>1222 Superior Ave. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AQS: 39-091-0003 | | units – ng/m³ | | | | | | | |
| Logan | | Parameters/AQS# | | | | | | | |
| MONTH | arsenic | beryllium | cadmium | chromium | lead | nickel | iron | manganese | zinc |
| | 12103 | 12105 | 12110 | 12112 | 12128 | 12136 | 12126 | 12132 | 12167 |
| JANUARY | 0.52 | <0.022 | 0.11 | <3.3 | 55 | <4.4 | 89 | 3.4 | 23 |
| FEBRUARY | 0.54 | <0.032 | 0.13 | <4.8 | 58 | <6.4 | 77 | 3.1 | 23 |
| MARCH | 0.53 | <0.02 | 0.09 | 1.15 | 23 | 0.94 | 100 | 4.5 | 25 |
| APRIL | 0.74 | <0.024 | 0.14 | 1.08 | 48 | 0.86 | 140 | 6.3 | 21 |
| MAY | 0.68 | <0.024 | 0.12 | 1.42 | 64 | 0.87 | 140 | 6.7 | 47 |
| JUNE | 0.64 | <0.027 | 0.16 | 1.35 | 76 | 1.04 | 100 | 4.3 | 16 |
| JULY | 1.30 | <0.028 | 0.17 | 1.42 | 33 | 1.14 | | 7.4 | 25 |
| AUGUST | 1.10 | <0.027 | 0.10 | 1.26 | 13 | 0.91 | 110 | 4.0 | 15 |
| SEPTEMBER | 0.82 | <0.025 | 0.14 | 0.98 | 23 | 1.08 | 110 | 8.0 | 23 |
| OCTOBER | 0.55 | <0.025 | 0.09 | 1.28 | 43 | 1.39 | 130 | 6.0 | 15 |
| NOVEMBER | 0.68 | <0.024 | 0.13 | 2.31 | 14 | 1.52 | 120 | 4.5 | 16 |
| DECEMBER | 0.37 | <0.023 | 0.07 | 1.21 | 11 | 1.17 | 63 | 2.5 | 14 |

Table U.

| NWDO Heavy Metals Data - 2008<br>Brush Wellman 32<br>Route 105 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AQS: 39-123-0012 | | units - ng/m³ | | | | | | |
| Ottawa | | Parameters/AQS# | | | | | | |
| MONTH | arsenic | beryllium | cadmium | chromium | lead | nickel | manganese | zinc |
| | 12103 | 12105 | 12110 | 12112 | 12128 | 12136 | 12132 | 12167 |
| JANUARY | 0.36 | 0.34 | 0.09 | <0.5 | 3.00 | <0.7 | 2.4 | 13.0 |
| FEBRUARY | 0.67 | 0.32 | 0.12 | 0.45 | 3.60 | 0.37 | 3.3 | 16.0 |
| MARCH | 0.42 | 0.23 | 0.15 | 0.46 | 4.60 | 0.92 | 3.7 | 25.0 |
| APRIL | 0.74 | 0.08 | 0.17 | 0.51 | 5.30 | 0.92 | 12.0 | 27.0 |
| MAY | 0.70 | 0.18 | 0.24 | 0.76 | 4.00 | 0.96 | 8.3 | 21.0 |
| JUNE | 0.56 | 0.25 | 0.09 | 0.52 | 4.00 | 1.26 | 22.0 | 22.0 |
| JULY | 0.51 | 0.05 | 0.09 | 0.29 | 3.50 | 0.40 | 3.5 | 10.0 |
| AUGUST | 0.67 | 13.00 | 0.10 | 0.31 | 3.50 | 0.30 | 3.4 | 9.9 |
| SEPTEMBER | 0.49 | 0.16 | 0.09 | 0.25 | 2.90 | 0.29 | 2.8 | 8.3 |
| OCTOBER | 0.39 | 0.09 | 0.07 | 0.16 | 1.90 | 0.25 | 1.9 | 7.4 |
| NOVEMBER | 0.37 | 0.05 | 0.08 | 0.19 | 2.10 | 0.23 | 2.0 | 8.9 |
| DECEMBER | 0.28 | 0.04 | 0.06 | 0.18 | 1.60 | 0.25 | 1.6 | 8.1 |

Table V.

| SEDO Heavy Metals Data - 2008<br>Washington Co. Career Center<br>Lancaster Rd. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AQS: 39-167-0008 | | units – ng/m³ | | | | | | | |
| Washington | | Parameters/AQS# | | | | | | | |
| MONTH | arsenic | beryllium | cadmium | chromium | lead | nickel | manganese | zinc | mercury |
| | 12103 | 12105 | 12110 | 12112 | 12128 | 12136 | 12132 | 12167 | 12142 |
| JANUARY | 0.52 | <0.018 | 0.16 | <2.6 | 3.5 | <3.5 | 150 | 20 | 0.017 |
| FEBRUARY | 0.35 | <0.027 | 0.13 | <4.0 | 4.3 | <5.3 | 42 | 15 | 0.015 |
| MARCH | 0.47 | <0.018 | 0.73 | 1.08 | 2.7 | 0.37 | 100 | 14 | 0.013 |
| APRIL | 0.76 | <0.021 | 0.75 | 1.22 | 4.5 | 0.46 | 71 | 16 | 0.015 |
| MAY | 1.10 | <0.021 | 0.28 | 2.69 | 5 | 0.64 | 320 | 40 | 0.015 |
| JUNE | 0.43 | <0.022 | 0.55 | 1.24 | 2.9 | 0.43 | 120 | 13 | 0.017 |
| JULY | 1.50 | <0.022 | 1.00 | 1.85 | 4.7 | 0.45 | 210 | 25 | 0.030 |
| AUGUST | 1.00 | <0.022 | 0.58 | 1.44 | 3.7 | 0.42 | 170 | 19 | 0.027 |
| SEPTEMBER | 0.85 | <0.028 | 0.58 | 1.15 | 3.2 | 0.37 | 80 | 20 | 0.018 |
| OCTOBER | 0.62 | <0.022 | 0.27 | 1.66 | 3.9 | 0.43 | 120 | 21 | 0.019 |
| NOVEMBER | 0.83 | <0.022 | 0.41 | 1.23 | 4.7 | 0.33 | 110 | 23 | 0.019 |
| DECEMBER | 0.47 | <0.021 | 0.28 | 0.90 | 2.9 | 0.27 | 53 | 13 | 0.014 |

Table W .

| NWDO Heavy Metals Data - 2008<br>Marion Steel<br>441 Whitmore St. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AQS: | | units - ng/m³ | | | | | | | |
| Marion County | | Parameters/AQS# | | | | | | | |
| MONTH | arsenic | beryllium | cadmium | chromium | lead | nickel | manganese | zinc | mercury |
| | 12103 | 12105 | 12110 | 12112 | 12128 | 12136 | 12132 | 12167 | 12142 |
| JANUARY | 2.00 | <0.023 | 6.10 | 11.00 | 130 | <4.6 | 250 | 900 | 0.210 |
| FEBRUARY | 0.90 | <0.023 | 2.30 | 5.64 | 95 | 1.92 | 94 | 340 | 0.300 |
| MARCH | 0.87 | <0.24 | 1.00 | 3.23 | 22 | 1.33 | 52 | 120 | 0.048 |
| APRIL | 2.10 | <0.025 | 2.20 | 7.98 | 49 | 2.99 | 140 | 280 | 0.170 |
| MAY | 1.30 | <0.025 | 0.67 | 7.79 | 29 | 2.12 | 120 | 130 | 0.450 |
| JUNE | 2.50 | <0.058 | 3.10 | 9.52 | 88 | 4.38 | 190 | 390 | 0.440 |
| JULY | 4.90 | 0.04 | 5.70 | 13.10 | 250 | 5.85 | 290 | 1500 | 1.000 |
| AUGUST | 1.70 | 0.06 | 0.33 | 5.27 | 21 | 2.45 | 78 | 78 | 0.250 |
| SEPTEMBER | 2.40 | <0.024 | 0.48 | 4.61 | 33 | 2.06 | 85 | 120 | 0.240 |
| OCTOBER | 1.50 | <0.025 | 0.51 | 4.83 | 30 | 2.19 | 97 | 150 | 0.130 |
| NOVEMBER | 1.60 | <0.025 | 0.59 | 4.11 | 32 | 1.89 | 86 | 160 | 0.091 |
| DECEMBER | 0.95 | <0.038 | 0.25 | 5.34 | 12 | 1.62 | 87 | 72 | 0.022 |

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 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.

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 – online for 2008
- FTIR long-path monitoring
- Updates of the Compendium of Recommended Methods are available at the following

- ❖ Evaluate future training needs for Air Toxics Monitoring:
- ❖ sampling methods,
- ❖ analytical procedures,
- ❖ equipment

AVAILABLE REPORTS:

New Boston Coke

Columbus Dioxin Study 1995

Cleveland Air Toxics Study

Columbus Dioxin Study

Marion Air Quality Study

# 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 2008.

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 | $PM_{10}$ $\mu g/m^3$ | $PM_{2.5}$ $\mu g/m^3$ | 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 | 0.000-0.034 | 0.000-0.059 | | (4) | Green | Good |
| 51-100 | 55-154 | 15.5-40.4 | 4.5-9.4 | 0.035-0.144 | 0.060-0.075 | | (4) | Yellow | Moderate |
| 101-150 | 155-254 | 40.5-65.4 | 9.5-12.4 | 0.145-0.224 | 0.076-0.095 | 0.125-0.164 | (4) | Orange | Unhealthy for Sensitive Groups |
| 151-200 | 255-354 | 65.5-150.4[2] | 12.5-15.4 | 0.225-0.304 | 0.096-0.115 | 0.165-0.204 | (4) | 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.

[4]$NO_2$ has no short-term NAAQS and can generate an AQI only above an AQI value of 200.

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 2008, 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 | 140 | 273 | 86 | 7 | 0 |
| Clark | 137 | 301 | 62 | 3 | 0 |
| Cuyahoga | 137 | 265 | 91 | 10 | 0 |
| Franklin | 150 | 286 | 72 | 8 | 0 |
| Hamilton | 145 | 245 | 107 | 14 | 0 |
| Jefferson | 114 | 291 | 72 | 3 | 0 |
| Lake | 122 | 310 | 47 | 9 | 0 |
| Lawrence | 142 | 276 | 82 | 6 | 0 |
| Lucas | 109 | 243 | 120 | 3 | 0 |
| Mahoning | 123 | 259 | 106 | 1 | 0 |
| Montgomery | 150 | 248 | 110 | 8 | 0 |
| Stark | 116 | 273 | 67 | 12 | 0 |
| Summit | 140 | 289 | 69 | 8 | 0 |
| Trumbull | 116 | 195 | 56 | 7 | 0 |

# VIII. MONITORING SITES 2008

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 2008

| AQS Number | County | Site Location | Parameter(s) |
|---|---|---|---|
| 39-001-0001 | Adams | 210 N. Wilson | SO2, PM25C, LC25 |
| 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 |
| 39-007-1001 | Ashtabula | Conneaut | O3, SO2 |
| 39-009-0003 | Athens | Gifford State Forest | LC25 |
| 39-009-0004 | Athens | 7760 Blackburn Rd. | SO2, NO2, O3, LC25, 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 |
| 39-035-0042 | Cuyahoga | 3136 Lorain | PB |
| 39-035-0045 | Cuyahoga | 45950 Broadway Ave. | SO2, PM10, LC25 |
| 39-035-0048 | Cuyahoga | 2026 E 9th St. | CO |
| 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 | W 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 |
| 39-049-0028 | Franklin | 2521 Fairwood Ave. | O3, PM25C |
| 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 |
| 39-061-0043 | Hamilton | 3254 Kemper Rd. | 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, PMSP |
| 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 |
| 39-085-1001 | Lake | 325 Vine St. | PM10 |
| 39-085-3002 | Lake | 71 E. High St. | O3, SO2, LC25, PM25C |
| 39-087-0006 | Lawrence | 2120 S. 8th St. | O3, SO2 |
| 39-087-0010 | Lawrence | 2128 S. 9th St. | PM10, LC25, PMSP |
| 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) |
|---|---|---|---|
| 39-093-0016 | Lorain | 214 E 34th St. | LC25 |
| 39-093-0018 | Lorain | 4706 Detroit Rd. | O3 |
| 39-093-3002 | Lorain | 2180 Lake Breeze | PM10, LC25, PM25C, PMSP |
| 39-095-0008 | Lucas | 600 Collins Ave, | SO2 |
| 39-095-0024 | Lucas | 348 S Erie St. | O3, LC25, PM25C |
| 39-095-0025 | Lucas | 600 Collins Park | LC25 |
| 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 |
| 39-105-1001 | 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 |
| 39-145-0013 | 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, PMSP |
| 39-151-0022 | Stark | 45 S. Wabash | 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 |
| 39-155-0007 | Trumbull | 2609 Draper St. SE | PM10, LC25, PM25C |
| 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 |
| 39-173-0003 | 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 |
| 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 Standard |
| NADB | National Aerometric Databank |
| NAMS | National Ambient Monitoring Station |
| NO | Nitric Oxide |
| $NO_2$ | Nitrogen Dioxide |
| $O_3$ | Ozone |
| 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 Station |
| $SO_2$ | 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 |
| 1217 | Research Triangle Institute RTP, NC |
| 1259 | Hamilton County Department of Environmental Services |
| 1299 | URS Corp, TX |
| 1335 | Ohio University, Athens, Ohio |