# COMMONWEALTH OF PENNSYLVANIA
# DEPARTMENT OF ENVIRONMENTAL PROTECTION
# BUREAU OF AIR QUALITY

## 1996

# AMBIENT AIR QUALITY ANNUAL REPORT

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# EXECUTIVE SUMMARY

## PENNSYLVANIA'S AIR QUALITY REPORT - 1996

The Department of Environmental Protection (DEP) has a constitutional obligation to protect the right to clean air for all Pennsylvanians. DEP's Bureau of Air Quality fulfills this obligation by regulating emissions from thousands of sources, like factories and power plants. Monitoring air quality statewide, assisting companies with compliance, investigating complaints and taking enforcement action against violators are all part of DEP's work.

As DEP implements the Federal Clean Air Act Amendments of 1990, the study of past and present air quality data will be a crucial component of program planning and air pollution reduction strategies. The following is a brief outline of DEP's Bureau of Air Quality 1996 annual report.

### Ambient Air Monitoring

The goals of Pennsylvania's ambient air monitoring program are to evaluate compliance with federal and state air quality standards, provide real-time monitoring of air pollution episodes, develop data for trend analysis, develop and implement air quality regulations and provide information to the public on daily air quality conditions in their area.

DEP monitors air quality in areas having high population density, high levels of expected contaminants or a combination of the two. The majority of the monitoring takes place in the 13 air basins of the Commonwealth. Air basins are geographic areas, usually valleys, where air tends to stagnate. The air basins were designated by the state legislature and written into the state code. DEP does not monitor in Allegheny or Philadelphia counties. Monitoring in these areas is performed by independent health agencies.

### Pollutant Standards Index

A Pollutant Standards Index (PSI) is published daily for 17 areas in Pennsylvania as a means of reporting daily air quality to the general public. The PSI records levels of five common air contaminants - carbon monoxide, sulfur dioxide, particulate matter ($PM_{10}$), ozone and nitrogen dioxide. It was developed by the U.S. Environmental Protection Agency to standardize air pollution ratings. Real time monitoring and current PSI information is also available on DEP's web site at http://www.dep.state.pa.us (Choose Information by Subject / Air Quality).

### Precision and Accuracy

DEP's Bureau of Air Quality conducts regularly scheduled performance audits and precision checks. Quarterly performance audits are conducted for the purpose of assessing data accuracy on carbon monoxide, sulfur dioxide, ozone, total suspended particulate matter (TSP), $PM_{10}$ suspended particulate matter and lead monitoring systems.

## Overview of Air Quality Data

Data collected by DEP can generally be divided into two groups: particulate matter and gaseous pollutants. The department uses health-based National Ambient Air Quality Standards (NAAQS) as well as several standards of its own, such as sulfates.

### 1. Total Suspended Particulate and $PM_{10}$ Suspended Particulate Matter

Particulate matter are the solid or liquid matter in the air from smoke, dust, fly ash or condensing vapors that can be suspended in the air for long periods of time. Particulate emissions result primarily from industrial processes and fuel combustion. The smaller of these particles are breathed into the lungs where they can aggravate or cause respiratory ailments or carry other pollutants into the lungs.

All areas of the Commonwealth have demonstrated relatively little improvement in TSP levels over the last 10 years. Although TSP levels decreased at most sites in 1996 as compared to 1995, TSP levels remain on average 7 percent higher than levels five years ago.

$PM_{10}$ is small particulate matter in the air that measures less than 10 micrometers in diameter. $PM_{10}$ measurements have replaced the TSP standard because many of the larger particles included in the TSP measurement do not penetrate into the lungs and have little health effect. $PM_{10}$ measurements appear to represent essentially all of the particulate emissions from transportation sources and most of the emissions in the other traditional categories.

$PM_{10}$ monitoring began in the Commonwealth in 1985, with all sites continuing to meet the air quality standards. DEP completed a major commitment to install continuous $PM_{10}$ instrumentation in all air basins in 1996. $PM_{10}$ particulate levels have remained fairly constant over the last 10 years with slight decreases in levels in 1996 as compared to 1995. Average $PM_{10}$ levels have improved 17 percent since 1989, when monitoring became established in all areas of the Commonwealth.

### 2. Sulfates

Sulfates in the atmosphere are of two types: primary and secondary. Primary sulfates are emitted directly into the atmosphere from industrial processes. Secondary sulfates are formed in sunlight. Studies have shown significant correlation between high sulfate levels and illness. Sulfates also reduce visibility and contribute to acid rain.

Sulfates continue to be a problem in Pennsylvania. The Commonwealth's 30-day air quality standard was violated in 1996 at all monitoring stations with the exception of a background surveillance site in Perry county. The number of sites that exceeded the Commonwealth's 24-hour air quality standard increased to six when compared to a single site in 1995, but still a dramatic improvement from 22 sites in 1994. The high level of sulfates during the summer is due to sulfate formation in sunlight.

## 3. Lead

Lead is a metal that is highly toxic when ingested or inhaled. It is a suspected carcinogen of the lungs and kidneys, and it has adverse effects on blood-forming, nervous and renal systems. Lead is emitted into the atmosphere by industrial processes.

Lead levels in the Commonwealth have met the federal standards for the past 10 years and have improved by 46 percent. Relatively little improvements are now seen between years across the Commonwealth in most of the air basins that have no lead industrial sources since the removal of lead from gasoline.

## 4. Nitrates

Nitrates are particulate compounds that form in the atmosphere from the oxidation of nitrogen gases. They represent a significant portion of the finer particulate that can be inhaled into the lungs and which affect visibility.

Levels of nitrates are relatively constant across the Commonwealth. There are no long- or short-term air quality standards for nitrates.

## 5. Sulfur Dioxide

Sulfur dioxide is a gaseous pollutant that is emitted primarily by industrial furnaces or power plants burning coal or oil containing sulfur. Health problems caused by high exposures to sulfur dioxide include impairment of breathing and respiratory illnesses. Sulfur dioxide damages trees, plants and agricultural crops and is a precursor to acid rain.

All sites met the air quality standards. Sulfur dioxide levels have improved slightly or remained the same over the last 10-year period. The 1996 averages continue to be below 50 percent of the annual ambient air quality standard. The sulfur dioxide seasonal trend is directly related to space heating requirements.

## 6. Ozone

Ozone, or photochemical smog, is not emitted into the atmosphere but is formed by reactions of other pollutants. The primary pollutants entering into this reaction -- volatile organic compounds and oxides of nitrogen -- create ozone in the presence of sunlight. Ozone is a strong irritant to the eyes and upper respiratory system, and it also damages crops.

Ozone is erratic by nature and levels fluctuate depending on weather conditions. Ozone levels are consistently higher during the summer months. The only exceedance of the air quality standard during 1996 recorded by DEP the monitoring site in Bristol, which is downwind of Philadelphia in the Southeast Pennsylvania air basin. The improved levels of ozone can be attributed in part to controls on volatile organic compounds (VOC) and gasoline volatility.

## 7. Oxides of Nitrogen

Oxides of nitrogen ($NO_x$) is a class of pollutants formed when fuel is burned at a very high temperature. It is predominately emitted from vehicles. Although there is no air quality standard for $NO_x$ , the level of this pollutant is of concern due to its role in the formation of ozone and acid rain.

## 8. Nitrogen Dioxide

Nitrogen dioxide is a highly toxic, reddish brown gas that is created primarily from fuel combustion in industrial sources and vehicles. It creates an odorous haze that causes eye and sinus irritation, blocks natural sunlight and reduces visibility. It can severely irritate respiratory illnesses. Nitrogen dioxide contributes to the creation of acid rain and adversely impacts forests and other ecosystems.

No sites in Pennsylvania exceeded the annual air quality standard in 1996. Nitrogen dioxide levels have remained relatively constant over the last 10 years.

## 9. Carbon Monoxide

Carbon monoxide is a poisonous gas that, when introduced into the bloodstream, inhibits the delivery of oxygen to body tissue. Exposure creates a severe health risk to individuals with cardiovascular disease. The largest man-made source of carbon monoxide is vehicle emissions. This pollutant is only a health concern in areas of high traffic density or near industrial sources.

All DEP sites in the Commonwealth have met the federal air quality standards for the last 10 years. Carbon monoxide levels have seen a long-term improvement of 26 percent from levels in 1987.

Additional information on Pennsylvania's air quality programs is available on the DEP web site at http://www.dep.state.pa.us (choose Information by Subject / Air Quality).

# INTRODUCTION

The goals of the ambient air monitoring program in Pennsylvania are to judge compliance with federal and state air quality standards, provide real-time monitoring of air pollution episodes, provide data for trend analysis, regulation evaluation and planning, and provide public information daily on air quality.

Air quality monitoring in Pennsylvania is conducted by three agencies: the Pennsylvania Department of Environmental Protection, Bureau of Air Quality; the Allegheny County Health Department; and Philadelphia Air Management Services. This report contains summaries of the air quality data collected by the Pennsylvania Bureau of Air Quality in calendar year 1996. Data from Philadelphia or Allegheny counties can be obtained by contacting those agencies directly. Mailing addresses and telephone numbers for all three agencies are given in Appendix A.

The monitoring strategy of DEP is to place monitors in areas having high population density, high levels of contaminants or a combination of the two. The majority of all monitoring efforts take place in the "air basins" of the Commonwealth. These "air basins" have been defined in the bureau's regulations and consist of the following 13 areas:

Allegheny County Air Basin
Allentown - Bethlehem - Easton Air Basin
Erie Air Basin
Harrisburg Air Basin
Johnstown Air Basin
Lancaster Air Basin
Lower Beaver Valley Air Basin
Monongahela Valley Air Basin
Reading Air Basin
Scranton - Wilkes-Barre Air Basin
Southeast Pennsylvania Air Basin
Upper Beaver Valley Air Basin
York Air Basin

Of these 13 air basins, DEP conducts surveillance in 12. Allegheny County conducts its own monitoring program; and Philadelphia, which also conducts its own monitoring program, is part of the Southeast Pennsylvania Air Basin. In addition to the 12 air basins in which the bureau conducts surveillance, there are three additional non-air basin areas which have historically significant monitoring programs: Altoona, Williamsport and the Shenango Valley.

DEP operates two air monitoring networks in the Commonwealth: the Pennsylvania Air Quality Surveillance System (PAQSS), which conducts discrete high volume particulate sampling, and the Commonwealth of Pennsylvania Air Monitoring System (COPAMS) for continuous pollutant sampling.

The discrete total suspended particulate network consisted of 28 monitoring sites in 1996. Each site sampled TSP on a schedule of once every six days. Selected filters were also analyzed for sulfates, nitrates, lead and benzo(α)pyrene. In addition, discrete sampling was also conducted at 19 sites for suspended particulate matter of 10 microns or less in size ($PM_{10}$) in 1996. No additional analysis was performed on the $PM_{10}$ sample filters.

The COPAMS network is a totally automatic, microprocessor controlled system which consisted of 39 remote stations throughout the Commonwealth. These remote stations are connected by dedicated or dial-up telephone lines to a central computer system in Harrisburg which collects the raw data. Each station measures selected parameters such as: sulfur dioxide, hydrogen sulfide, ozone, carbon monoxide, nitrogen dioxide, oxides of nitrogen, particulate matter of 10 microns or less in size ($PM_{10}$), wind speed, wind direction (vector averaged and sigma theta), ambient temperature and solar radiation.

The pollutants measured and the sampling methods used by DEP are shown in Appendix B.

The sampling locations for the various parameters are listed in Appendix C.

# AIR QUALITY STANDARDS

One of the primary goals of the ambient air monitoring program is to obtain data to compare against air quality standards. The Commonwealth of Pennsylvania has adopted all of the National Ambient Air Quality Standards (NAAQS), as well as several standards of its own. These standards, designed to protect the public health and welfare, are shown in Tables 1 and 2.

TABLE 1. National Ambient Air Quality Standards (NAAQS)

| Pollutant (units) | Averaging Times | | | | | |
|---|---|---|---|---|---|---|
| | 1-Hour | 3-Hour | 8-Hour | 24-Hour | 1-Quarter | 1-Year |
| Carbon Monoxide (ppm) | 35 | | 9 | | | |
| Nitrogen Dioxide (ppm) | | | | | | 0.053 |
| Ozone (ppm) | 0.12 | | | | | |
| PM-10 Suspended Particulate ($\mu g/m^3$) | | | | 150<br>(150)* | | 50<br>(50)* |
| Sulfur Dioxide (ppm) | | (0.5)* | | 0.14 | | 0.03 |
| Lead ($\mu g/m^3$) | | | | | 1.5 | |

* Values represent secondary standards

TABLE 2. Pennsylvania Ambient Air Quality Standards

| Pollutant (units) | Averaging Times | | | |
|---|---|---|---|---|
| | 1-Hour | 24-Hour | 30-Days | 1-Year |
| Settleable Particulate (tons/$mile^2$/month) | | | 43 | 23 |
| Beryllium ($\mu g/m^3$) | | | 0.01 | |
| Sulfates ($\mu g/m^3$) | | 30 | 10 | |
| Fluorides ($\mu g/m^3$)<br>(Total soluble as HF) | | 5 | | |
| Hydrogen Sulfide (ppm) | 0.1 | 0.005 | | |

# AIR QUALITY TRENDS AND COMPARISONS

Total suspended particulate (TSP) matter average concentrations for the 12 air basins and 3 non-air basin areas are shown graphically in Figure 1. This graph shows the annual geometric mean in each area for 1996 and allows a quick comparison to the former air quality standard of 75 micrograms per cubic meter ($\mu g/m^3$). Although no longer an air quality standard pollutant since July 1987, TSP is used as a guide in determining $PM_{10}$ monitoring efforts. $PM_{10}$ particulate matter for 1996 is shown graphically in Figure 2 for the 12 air basins and 3 non-air basin areas where monitoring is conducted. Figure 2 shows the annual arithmetic mean for 1996 in each area for comparison to the primary air quality standard of 50 $\mu g/m^3$. No area in the state exceeded the $PM_{10}$ annual air quality standard.

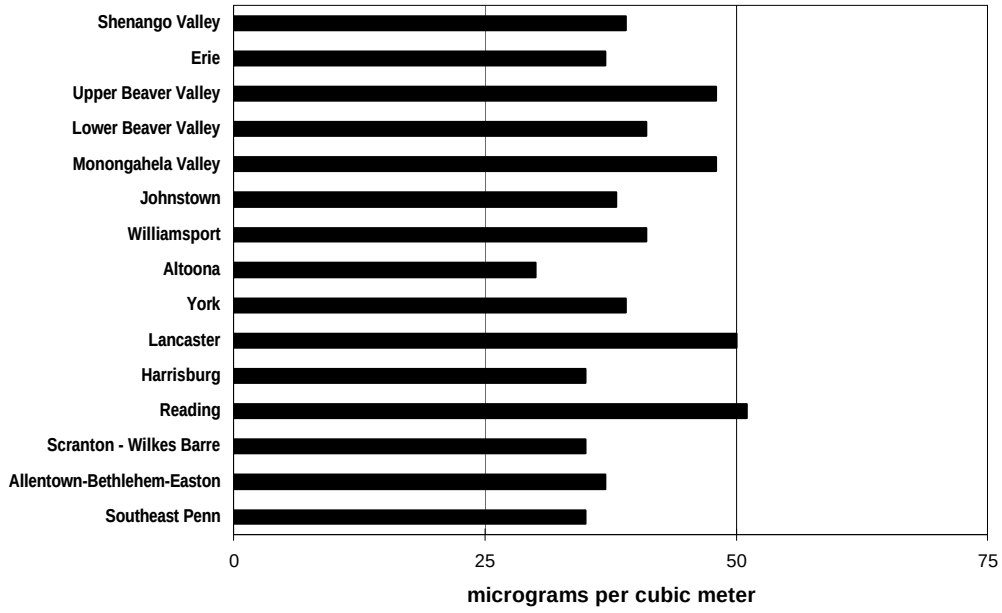
Figures 3 through 5 show the relationships of gaseous pollutant levels in the different areas of the Commonwealth in 1996. All areas monitored by DEP are in attainment of the air quality standard for sulfur dioxide, nitrogen dioxide and carbon monoxide. For comparative purposes the longest term applicable air quality standard is utilized as the full-scale value of the graph. Figure 6 shows the $4^{th}$ maximum daily 1-hour value recorded during the last 3 years (1994-96) during the ozone season of April 1 to October 31. The $4^{th}$ maximum ozone value is used to determine whether an area is meeting the air quality standard. An area is allowed an average of one exceedance per year of the standard over a consecutive three year period. Therefore, if the $4^{th}$ maximum reading is greater than the air quality standard, that area would have averaged more than one exceedance over a three year period. The only DEP monitored area of the Commonwealth not in attainment of the ozone standard is the Southeast Pennsylvania air basin. DEP recorded an ozone exceedance in the Southeast Pennsylvania air basin in 1996.

The trends of various pollutants throughout the Commonwealth of Pennsylvania are shown graphically in Figure 7 for the years 1987 to 1996. The data points were calculated using all sites that were operating for at least half the year. The solid line on each graph indicates the air quality standard for the pollutant (except for ozone which shows the number of days exceeding the air quality standard).

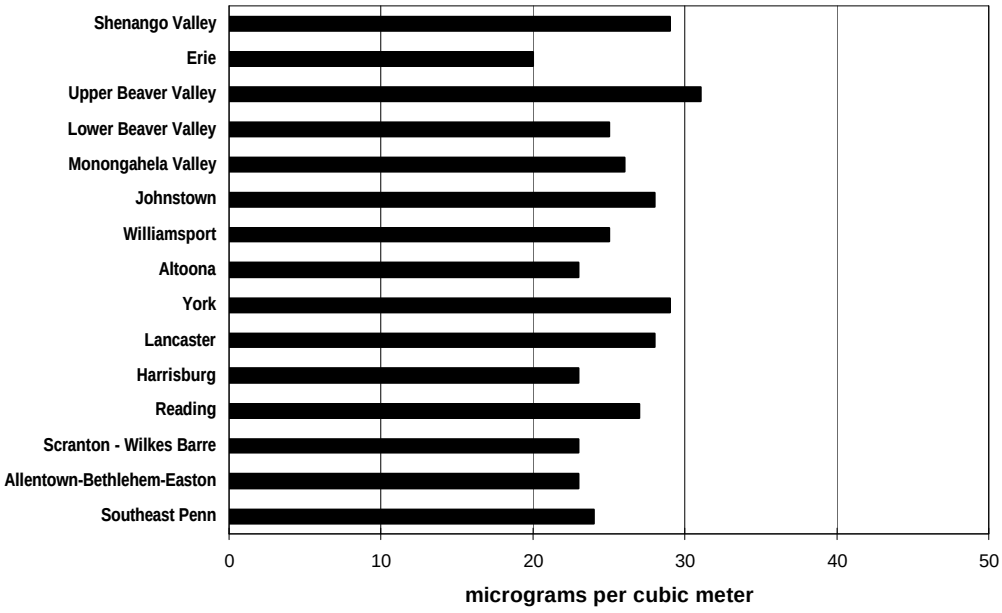
Total suspended particulate matter (TSP) is represented by annual geometric means for the years 1987 to 1996. TSP levels have decreased over the last three years, with an 11% improvement in the last 10 years. $PM_{10}$ particulate matter is represented by the annual arithmetic means for the years 1987 to 1996. There was a major increase in the number of discrete $PM_{10}$ monitoring sites in 1989 and the addition of continuous monitoring sites in 1996 to provide better coverage across the Commonwealth. Monitored levels of $PM_{10}$ levels in 1996 have improved 17% from levels observed in 1989. $PM_{10}$ levels have shown little improvement over the last 5 years. Sulfates are represented by the maximum monthly mean during the year. Sulfate levels have shown little long-term improvement over the last 10 years and have continually exceeded the 30-day air quality standard. Lead, for the years 1987 to 1996, are represented by the maximum quarter during the year. Lead concentrations have leveled off in the last 10 years after dramatic reductions seen in the late 1970s to early 1980s due to the implementation of lead-free gasoline. Lead levels have improved by 46% over the last ten years.

Sulfur dioxide and nitrogen dioxide for the years 1987 to 1996 are represented by annual means. These two pollutants have shown slight improvements over the last 10 years. Sulfur dioxide levels are 25% lower than 1987 and nitrogen dioxide levels are 9% lower than 1987. The ozone trend is shown for 1987 to 1996 as the number of days on which a DEP site in the Commonwealth reported an hourly value greater than 0.12 parts per million. Ozone is erratic by nature and levels fluctuate depending on weather conditions. Ozone exceedance days have improved dramatically since 1988, in part because of controls in the release of volatile organic compounds which are a main component of the atmospheric chemistry that creates ozone. The Southeast Pennsylvania air basin, located in the Philadelphia area, continues to consistently have days in which the ozone standard is exceeded. Carbon monoxide is shown as the second maximum 8-hour running average in the Commonwealth for the years 1987 to 1996. The large increase shown in 1994 was due to an industrial process malfunction in the Bethlehem area. Carbon monoxide levels have decreased over the last two years, with an average long-term improvement of 26% from levels in 1987.

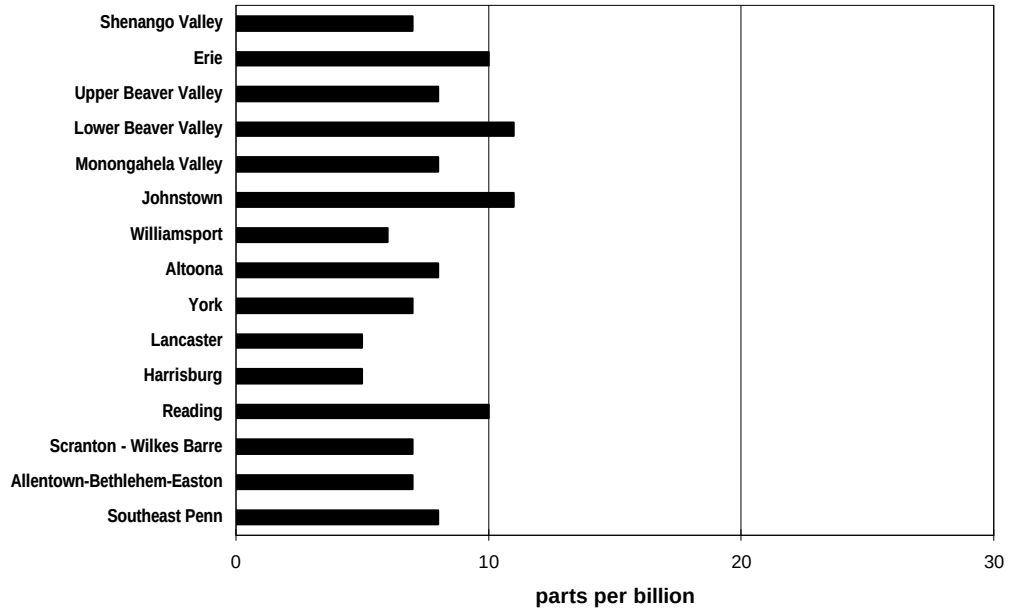
## FIGURE 1. TSP GEOMETRIC ANNUAL MEANS - 1996




## FIGURE 2. PM-10 ARITHMETIC ANNUAL MEANS - 1996



## FIGURE 3. SULFUR DIOXIDE ANNUAL MEANS - 1996




## FIGURE 4. NITROGEN DIOXIDE ANNUAL MEANS - 1996

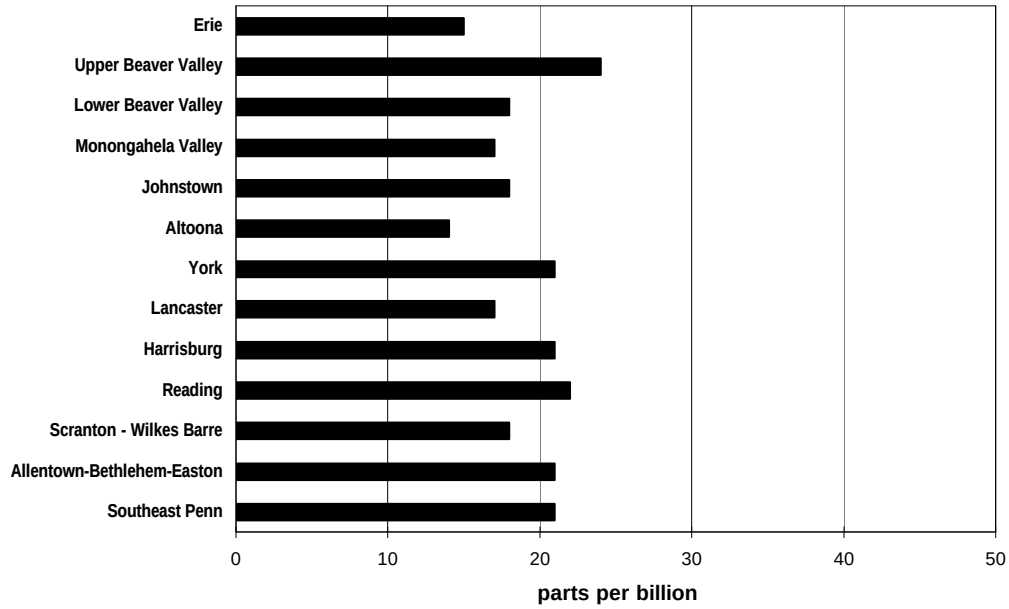


**FIGURE 5. CARBON MONOXIDE 2nd MAXIMUM 8-HOUR MEANS - 1996**

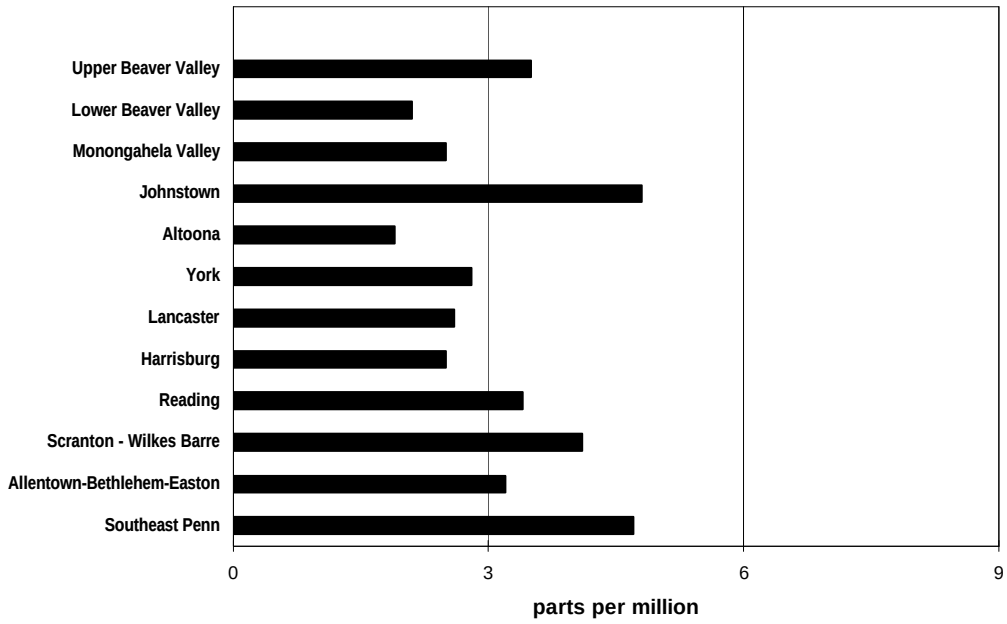



**FIGURE 6. OZONE 4th MAXIMUM 1-HOUR DAILY MEAN - 1994-1996**

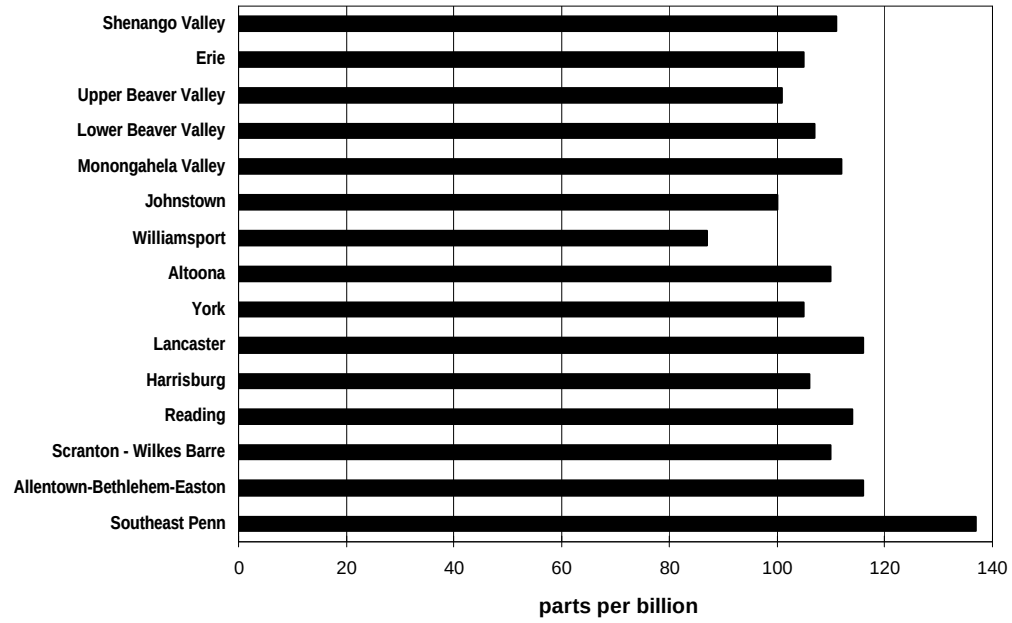
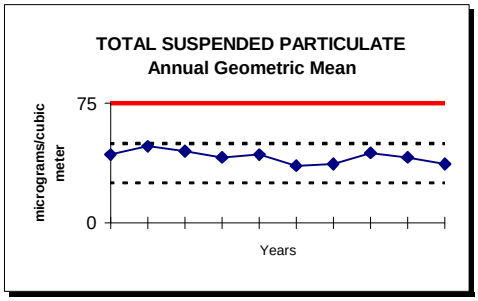
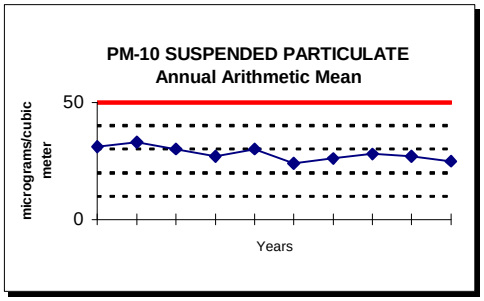
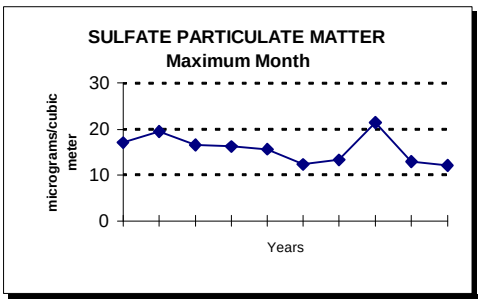
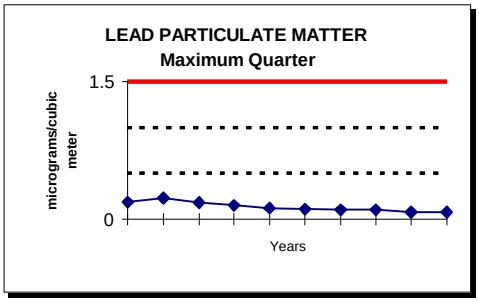


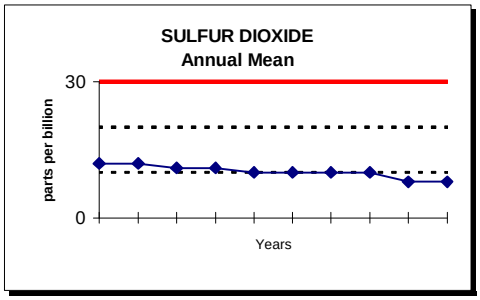
FIGURE 7. OVERVIEW OF STATEWIDE AIR QUALITY TRENDS
1987 to 1996

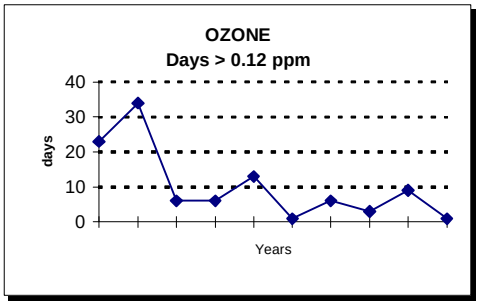


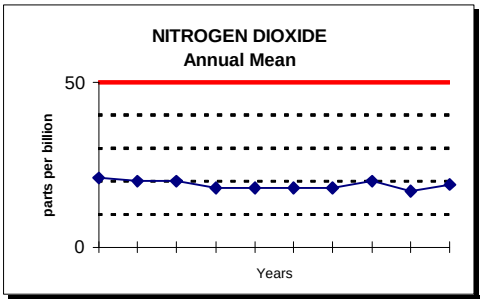



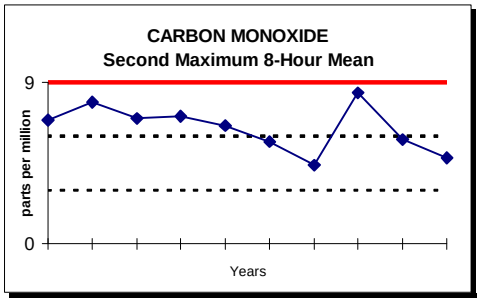



# TOTAL SUSPENDED PARTICULATE

Total suspended particulate (TSP) are the solid or liquid matter in air. Particles vary in size and may remain suspended in the air for periods ranging from seconds to months. Particulate emissions come from coal-burning power plants, industrial processes, mining operations, municipal waste incinerators and fuel combustion. They also are produced by natural sources such as forest fires and volcanoes. The smaller of these particles are breathed into the lungs where they can aggravate or cause respiratory ailments. These smaller particles can also carry other pollutants into the lungs.

Suspended particle samples are collected by drawing a large volume of air through a pre-weighed filter over a continuous 24-hour period (midnight to midnight). The exposed filter is then re-weighed to determine the amount of matter (by weight) which was collected per cubic meter of air, drawn through the filter. The particulate matter is also analyzed for sulfate, nitrates and lead at selected stations.

In July 1987, the federal ambient air quality standard for particulate matter was qualified to include only particles whose size is equal to or less than 10 micrometers ($PM_{10}$).

Figure A-1 shows the 10-year trend, from 1987 to 1996, of the annual geometric means for TSP in the Commonwealth. The solid line represents the former annual primary air quality standard of 75 micrograms per cubic meter ($\mu g/m^3$). Most areas of the Commonwealth have demonstrated relatively little improvement in TSP levels over the last 10 years. The Shenango Valley area has shown the greatest improvement, 29% lower than 1987 levels. Three areas have demonstrated increases of at least 25% in the last five years: Reading, Lancaster and the Monogahela Valley air basins. The air basin and area's annual geometric means plotted consist of all stations which were operated during that year and which had at least 30 samples taken. Thus, stations which were moved or discontinued in the past are still included in the 10-year trend.

The 1996 TSP summary (Table A-1) shows the number of 24-hour samples collected, the annual geometric mean, the geometric standard deviation, the annual arithmetic mean, the three maximum 24-hour values with date of occurrence, the number of times the 24-hour values exceeded the former air quality standards, the minimum value and the number of 24-hour values in the indicated ranges. There were no sites in the Commonwealth which exceeded the former annual or 24-hour primary air quality standards in 1996. Only one site in Chester, Delaware County, exceeded the former 24-hour secondary air quality standard. For comparison to the $PM_{10}$ annual air quality standard, the TSP annual arithmetic mean was calculated by averaging the four quarterly arithmetic means.

Table A-2 lists the annual geometric means over the last 10 years for each site that was monitored in 1996. The annual mean is shown if there were at least 30 samples collected that year. Although TSP levels decreased at most sites in 1996 as compared to 1995, TSP levels remain on average 7 percent higher than levels five years ago.

FIGURE A-1. TSP PARTICULATE TRENDS IN PENNSYLVANIA 1987 to 1996
ANNUAL GEOMETRIC MEANS (micrograms per cubic meter)

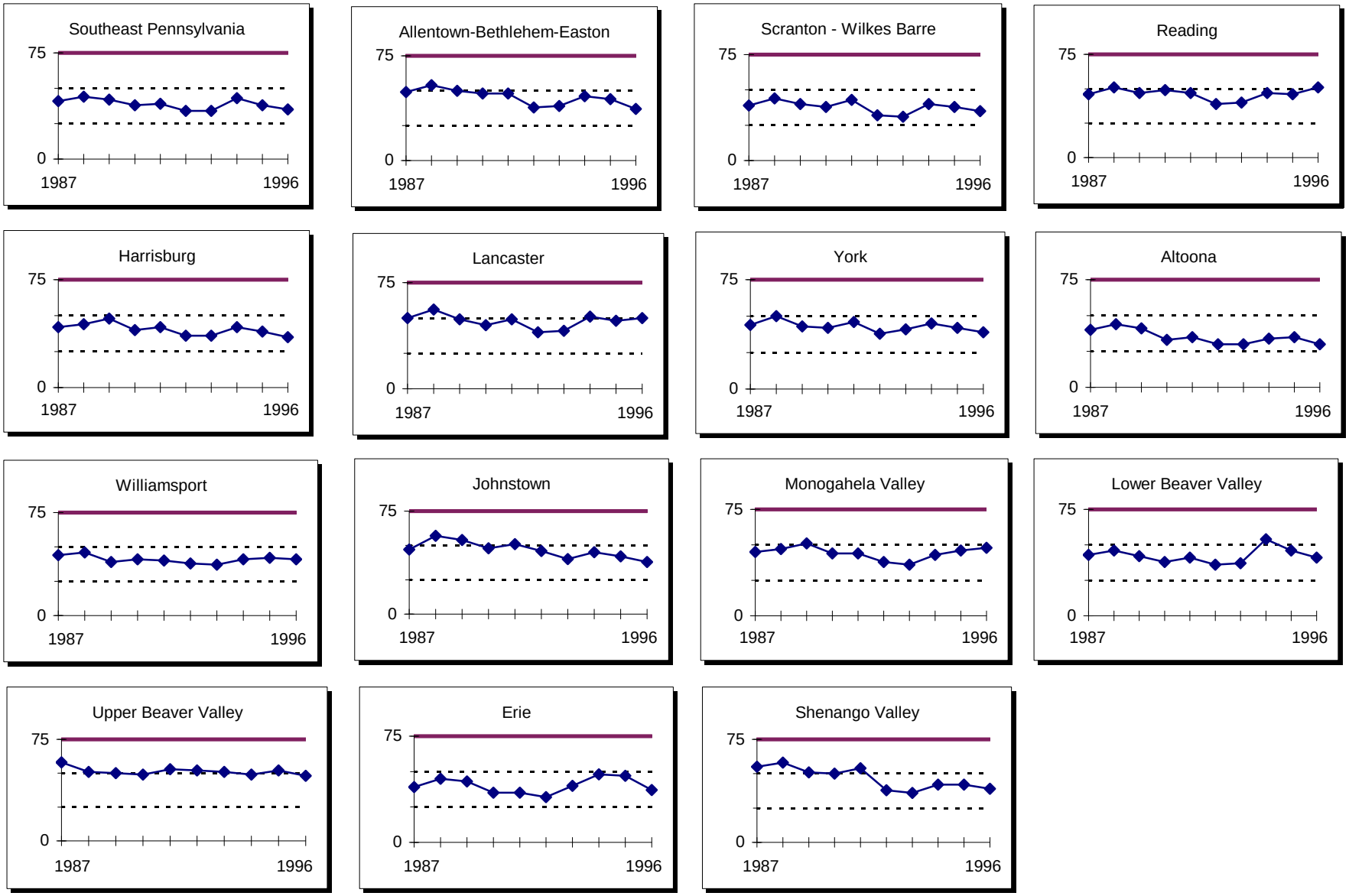


TABLE A-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## TOTAL SUSPENDED PARTICULATE MATTER SUMMARY

(Units: micrograms per cubic meter)

YEAR: 1996

| Site Name | PA Site Code | Geometric Annual Mean | Geometric Standard Deviation | Arithmetic Annual Mean | Number Obs. | 1st Max 24HR Mean | 1st Max Date MM/DD | 2nd Max 24HR Mean | 2nd Max Date MM/DD | 3nd Max 24HR Mean | 3nd Max Date MM/DD | Number Obs. >260 | Number Obs. >150 | Minimum 24 Hour Mean | Number of 24 Hour Values In Ranges: 0 to 65 | 66 to 130 | 131 to 195 | 196 to 260 | 261 to 325 | 326 to 390 | 391 to 455 | > 455 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Southeast Pennsylvania Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Bristol | P01 | 31 | 1.45 | 33 | 59 | 59 | 08/07 | 58 | 11/17 | 55 | 01/16 | 0 | 0 | 14 | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chester | P11 | 43 | 1.56 | 47 | 53 | 185 | 09/06 | 108 | 08/07 | 90 | 05/21 | 0 | 1 | 16 | 46 | 6 | 1 | 0 | 0 | 0 | 0 | 0 |
| Conshohocken | P12 | 33 | 1.43 | 35 | 55 | 72 | 08/07 | 57 | 12/23 | 53 | 04/21 | 0 | 0 | 15 | 54 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Allentown-Bethlehem-Easton Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Bethlehem East | A12 | 39 | 1.47 | 41 | 53 | 100 | 05/21 | 91 | 08/07 | 65 | 05/15 | 0 | 0 | 15 | 51 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Northampton | A17 | 43 | 1.66 | 49 | 9 | 122 | 01/16 | 56 | 03/04 | 55 | 01/22 | 0 | 0 | 20 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nazareth | A22 | 38 | 1.51 | 41 | 18 | 82 | 05/15 | 74 | 05/21 | 67 | 01/22 | 0 | 0 | 22 | 22 | 15 | 3 | 0 | 0 | 0 | 0 | 0 |
| Northampton | A23 | 38 | 1.52 | 38 | 48 | 81 | 09/06 | 72 | 05/21 | 69 | 08/07 | 0 | 0 | 17 | 43 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nazareth | A24 | 32 | 1.63 | 37 | 34 | 76 | 08/07 | 62 | 12/23 | 56 | 11/05 | 0 | 0 | 10 | 33 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Scranton-Wilkes-Barre Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Wilkes-Barre | S07 | 35 | 1.43 | 38 | 59 | 69 | 10/18 | 68 | 05/21 | 64 | 08/07 | 0 | 0 | 16 | 57 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 2 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Palmerton | 205 | 32 | 1.47 | 34 | 55 | 62 | 08/07 | 56 | 05/21 | 54 | 05/03 | 0 | 0 | 13 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Reading Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Laureldale South | R10 | 51 | 1.56 | 57 | 60 | 136 | 01/16 | 125 | 02/27 | 120 | 11/05 | 0 | 0 | 18 | 43 | 16 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***Harrisburg Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Harrisburg | H06 | 40 | 1.41 | 42 | 57 | 79 | 01/22 | 70 | 11/17 | 67 | 05/21 | 0 | 0 | 19 | 53 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lemoyne | H15 | 31 | 1.51 | 34 | 58 | 76 | 01/22 | 68 | 05/03 | 61 | 11/05 | 0 | 0 | 10 | 56 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

**** No Long-Term or Short-Term Air Quality Standards *****

TABLE A-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## TOTAL SUSPENDED PARTICULATE MATTER SUMMARY

(Units: micrograms per cubic meter)

### YEAR: 1996

| Site Name | PA Site Code | Geometric Annual Mean | Geometric Standard Deviation | Arithmetic Annual Mean | Number Obs. | 1st Max 24HR Mean | 1st Max Date MM/DD | 2nd Max 24HR Mean | 2nd Max Date MM/DD | 3nd Max 24HR Mean | 3nd Max Date MM/DD | Number Obs. >260 | Number Obs. >150 | Minimum 24 Hour Mean | Number of 24 Hour Values In Ranges: 0 to 65 | 66 to 130 | 131 to 195 | 196 to 260 | 261 to 325 | 326 to 390 | 391 to 455 | > 455 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Lancaster Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Lancaster North | L04 | 47 | 1.41 | 50 | 60 | 112 | 01/22 | 90 | 11/17 | 88 | 05/21 | 0 | 0 | 16 | 50 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lancaster West | L05 | 53 | 1.41 | 56 | 59 | 122 | 01/16 | 99 | 02/27 | 95 | 02/15 | 0 | 0 | 19 | 43 | 16 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***York Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| York Central | Y02 | 39 | 1.44 | 42 | 57 | 89 | 01/22 | 82 | 01/16 | 69 | 08/07 | 0 | 0 | 15 | 52 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 3 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Lyons East | 301 | 34 | 1.53 | 37 | 58 | 124 | 07/08 | 82 | 11/05 | 74 | 01/16 | 0 | 0 | 15 | 54 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Perry County | 305 | 21 | 1.46 | 22 | 54 | 41 | 05/21 | 37 | 10/30 | 36 | 05/03 | 0 | 0 | 8 | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lyons South | 370 | 29 | 1.45 | 31 | 59 | 58 | 01/16 | 54 | 01/22 | 49 | 08/07 | 0 | 0 | 14 | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Altoona Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Altoona East | 308 | 30 | 1.51 | 32 | 58 | 66 | 04/03 | 60 | 01/22 | 55 | 05/21 | 0 | 0 | 12 | 57 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Williamsport Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Williamsport Central | 401 | 41 | 1.44 | 43 | 59 | 94 | 10/18 | 87 | 05/21 | 74 | 02/27 | 0 | 0 | 18 | 54 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 4 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| State College | 408 | 33 | 1.38 | 35 | 53 | 58 | 10/18 | 57 | 05/21 | 56 | 11/05 | 0 | 0 | 16 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**** No Long-Term or Short-Term Air Quality Standards *****

TABLE A-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## TOTAL SUSPENDED PARTICULATE MATTER SUMMARY

(Units: micrograms per cubic meter)

### YEAR: 1996

| Site Name | PA Site Code | Geometric Annual Mean | Geometric Standard Deviation | Arithmetic Annual Mean | Number Obs. | 1st Max 24HR Mean | 1st Max Date MM/DD | 2nd Max 24HR Mean | 2nd Max Date MM/DD | 3nd Max 24HR Mean | 3nd Max Date MM/DD | Number Obs. >260 | Number Obs. >150 | Minimum 24 Hour Mean | Number of 24 Hour Values In Ranges: 0 to 65 | 66 to 130 | 131 to 195 | 196 to 260 | 261 to 325 | 326 to 390 | 391 to 455 | > 455 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Johnstown Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| East Conemaugh | J04 | 43 | 1.48 | 46 | 12 | 71 | 02/27 | 69 | 01/16 | 64 | 01/22 | 0 | 0 | 23 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| East Conemaugh | J08 | 37 | 1.43 | 39 | 44 | 68 | 11/05 | 63 | 12/11 | 62 | 11/17 | 0 | 0 | 13 | 43 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Monongahela Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Monessen | M02 | 52 | 1.43 | 53 | 18 | 86 | 03/10 | 76 | 03/04 | 73 | 04/03 | 0 | 0 | 26 | 12 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Monessen | M16 | 45 | 1.55 | 50 | 19 | 112 | 11/05 | 106 | 08/07 | 69 | 10/06 | 0 | 0 | 18 | 16 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Lower Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Vanport | B05 | 35 | 1.41 | 37 | 54 | 83 | 08/07 | 74 | 11/05 | 63 | 04/03 | 0 | 0 | 13 | 52 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ambridge | B07 | 47 | 1.44 | 50 | 56 | 119 | 11/05 | 105 | 08/07 | 89 | 04/09 | 0 | 0 | 18 | 47 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 5 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Washington | 503 | 41 | 1.44 | 49 | 23 | 75 | 01/16 | 72 | 11/05 | 65 | 03/10 | 0 | 0 | 22 | 21 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Upper Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Ellwood City | B16 | 48 | 1.61 | 54 | 51 | 143 | 07/02 | 116 | 08/19 | 111 | 04/03 | 0 | 0 | 14 | 40 | 10 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***Erie Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Erie Central | E07 | 37 | 1.55 | 41 | 52 | 114 | 06/14 | 89 | 05/09 | 86 | 08/07 | 0 | 0 | 14 | 46 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Shenango Valley Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | | |
| Farrell | 602 | 39 | 1.39 | 41 | 51 | 86 | 08/07 | 75 | 04/03 | 69 | 05/09 | 0 | 0 | 18 | 47 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |

**** No Long-Term or Short-Term Air Quality Standards *****

TABLE A-2. TOTAL SUSPENDED PARTICULATE MATTER
HISTORICAL TREND
ANNUAL GEOMETRIC MEANS
(Units: micrograms/cubic meter)

| STATION & SITE CODE | | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Southeast Pennsylvania Air Basin* | | | | | | | | | | | |
| BRISTOL | (P01) | 37 | 41 | 34 | ** | ** | ** | ** | ** | 33 | 31 |
| CHESTER | (P11) | 44 | 51 | 48 | 39 | 40 | 34 | 36 | 44 | 43 | 43 |
| CONSHOHOCKEN | (P12) | 45 | 46 | 42 | 40 | 39 | 36 | 32 | 44 | 36 | 33 |
| *Allentown-Bethlehem-Easton Air Basin* | | | | | | | | | | | |
| BETHLEHEM EAST | (A12) | 48 | 55 | 49 | 55 | 48 | 34 | 38 | 46 | 45 | 39 |
| NORTHAMPTON | (A17) | 69 | 74 | 67 | 62 | 64 | 49 | 54 | 64 | 54 | ** |
| NAZARETH | (A22) | ** | 52 | 49 | 44 | 47 | 40 | 38 | 40 | 39 | ** |
| NORTHAMPTON | (A23) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 38 |
| NAZARETH | (A24) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 32 |
| *Scranton-Wilkes Barre Air Basin* | | | | | | | | | | | |
| WILKES BARRE | (S07) | 39 | 40 | 40 | 38 | 45 | 35 | 33 | 42 | 37 | 35 |
| *DEP Region 2 Non-Air Basin* | | | | | | | | | | | |
| PALMERTON | (205) | 47 | 44 | 48 | 40 | 37 | 32 | 29 | 34 | 29 | 32 |
| *Reading Air Basin* | | | | | | | | | | | |
| LAURELDALE SOUTH | (R10) | 52 | 49 | 47 | 47 | 48 | 41 | 41 | 48 | 50 | 51 |
| *Harrisburg Air Basin* | | | | | | | | | | | |
| HARRISBURG | (H06) | 44 | 46 | 47 | 42 | 42 | 35 | 35 | 43 | 43 | 40 |
| LEMOYNE | (H15) | ** | ** | ** | ** | ** | ** | ** | ** | 36 | 31 |
| *Lancaster Air Basin* | | | | | | | | | | | |
| LANCASTER NORTH | (L04) | 53 | 56 | 47 | 47 | 50 | 42 | 45 | 58 | 45 | 47 |
| LANCASTER WEST | (L05) | 61 | 62 | 57 | 50 | 53 | 43 | 43 | 51 | 53 | 53 |
| *York Air Basin* | | | | | | | | | | | |
| YORK CENTRAL | (Y02) | 42 | 47 | 43 | 39 | 43 | 37 | 39 | 46 | 39 | 39 |
| *DEP Region 3 Non-Air Basin* | | | | | | | | | | | |
| LYONS EAST | (301) | 32 | ** | 32 | 33 | 32 | 28 | 27 | 37 | 36 | 34 |
| PERRY COUNTY | (305) | 23 | 25 | 25 | 21 | 25 | 19 | 21 | 26 | 25 | 21 |
| LYONS SOUTH | (370) | ** | ** | ** | ** | ** | 29 | 28 | 35 | 31 | 29 |
| *Altoona Non-Air Basin* | | | | | | | | | | | |
| ALTOONA | (308) | 44 | 45 | 41 | 33 | 35 | 30 | 30 | 34 | 35 | 30 |

TABLE A-2. TOTAL SUSPENDED PARTICULATE MATTER
HISTORICAL TREND
ANNUAL GEOMETRIC MEANS
(Units: micrograms/cubic meter)

| STATION & SITE CODE | | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Williamsport Non-Air Basin* | | | | | | | | | | | |
| WILLIAMSPORT | (401) | 46 | 46 | 39 | 41 | 40 | 38 | 37 | 41 | 42 | 41 |
| *DEP Region 4 Non-Air Basin* | | | | | | | | | | | |
| STATE COLLEGE | (408) | 46 | 41 | 39 | 34 | 41 | 32 | 32 | 41 | 38 | 33 |
| *Johnstown Air Basin* | | | | | | | | | | | |
| EAST CONEMAUGH | (J04) | 60 | 58 | 54 | 48 | 51 | 46 | 40 | 45 | 42 | ** |
| EAST CONEMAUGH | (J08 | ** | ** | ** | ** | ** | ** | ** | ** | ** | 37 |
| *Monongahela Valley Air Basin* | | | | | | | | | | | |
| MONESSEN | (M02) | 46 | 47 | 56 | 46 | 46 | 40 | 34 | 43 | 45 | ** |
| MONESSEN | (M16) | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| *Lower Beaver Valley Air Basin* | | | | | | | | | | | |
| VANPORT | (B05) | 44 | 44 | 44 | 38 | 40 | 31 | 32 | 50 | ** | 35 |
| AMBRIDGE | (B07) | 45 | 50 | 45 | 44 | 42 | 37 | 40 | 57 | ** | 47 |
| *DEP Region 5 Non-Air Basin* | | | | | | | | | | | |
| WASHINGTON | (503) | 51 | 54 | 49 | 45 | 43 | 41 | 41 | 51 | 46 | ** |
| *Upper Beaver Valley Air Basin* | | | | | | | | | | | |
| ELLWOOD CITY | (B16) | 52 | 55 | 50 | ** | 56 | 48 | 46 | 57 | 59 | 48 |
| *Erie Air Basin* | | | | | | | | | | | |
| ERIE CENTRAL | (E07) | 50 | 50 | 50 | 40 | 39 | 32 | 40 | 48 | 47 | 37 |
| *Shenango Valley Non-Air Basin* | | | | | | | | | | | |
| FARRELL | (602) | 54 | 58 | 51 | 50 | 54 | 38 | 36 | 42 | 42 | 39 |

# SULFATES

Sulfate particulate matter in the atmosphere is composed of two types: primary and secondary. Primary sulfates are emitted directly into the atmosphere from industrial processes. Secondary sulfates are formed in the atmosphere from other sulfur-containing compounds under mechanisms which involve photochemical processes. Studies have shown significant correlation between high sulfate levels and increased illness absences. Sulfates are also of interest due to their effects of reducing visibility and contributing to acid rain.

In 1996, sulfates continue to be a problem with the 30-day state air quality standard being exceeded at all monitoring stations with the exception of a background monitoring site in Perry county.

The sulfate trends, which are represented by the maximum 30-day (monthly) mean, are shown in Figure B-1 for the years 1987 to 1996. The solid line represents the 30-day state air quality standard of 10 micrograms per cubic meter ($\mu g/m^3$) on those graphs. Sulfate levels in all areas of the Commonwealth have shown no major improvement over the last 10 years with all areas exceeding the state air quality standard. Most areas, with the exception of the Upper Beaver Valley and Shenango Valley, continued to improve in 1996 as compared to 1994. This decrease, which returned sulfate levels back to pre-1994 levels, demonstrated that the hot temperatures experienced during the summer of 1994 were responsible for the excessive sulfate levels.

The 1996 sulfate summary (Table B-1) shows the annual arithmetic mean, the number of 24-hour samples collected, the number of 30-day means greater than the air quality standard, the two maximum 30-day means and months of occurrence, the number of 24-hour values greater than the air quality standard and the two maximum 24-hour values with dates of occurrence. The large number of high sulfate levels during the summer is caused by the relationship between sulfate formation and photochemical processes. The maximum values will occur at the majority of sites during the period from May to September. There were six sites that had one exceedance each of the 24-hour air quality standard, which is an increase from the one exceedance site in 1995.

Table B-2 presents the historical trend for sulfates for the 10-year period of 1987 to 1996 for each site that monitored in 1996. The maximum 30-day mean and 24-hour mean are shown if there were at least 30 samples collected for the year.

FIGURE B-1. SULFATE PARTICULATE TRENDS IN PENNSYLVANIA 1987 to 1996
MAXIMUM MONTHLY MEANS (micrograms per cubic meter)

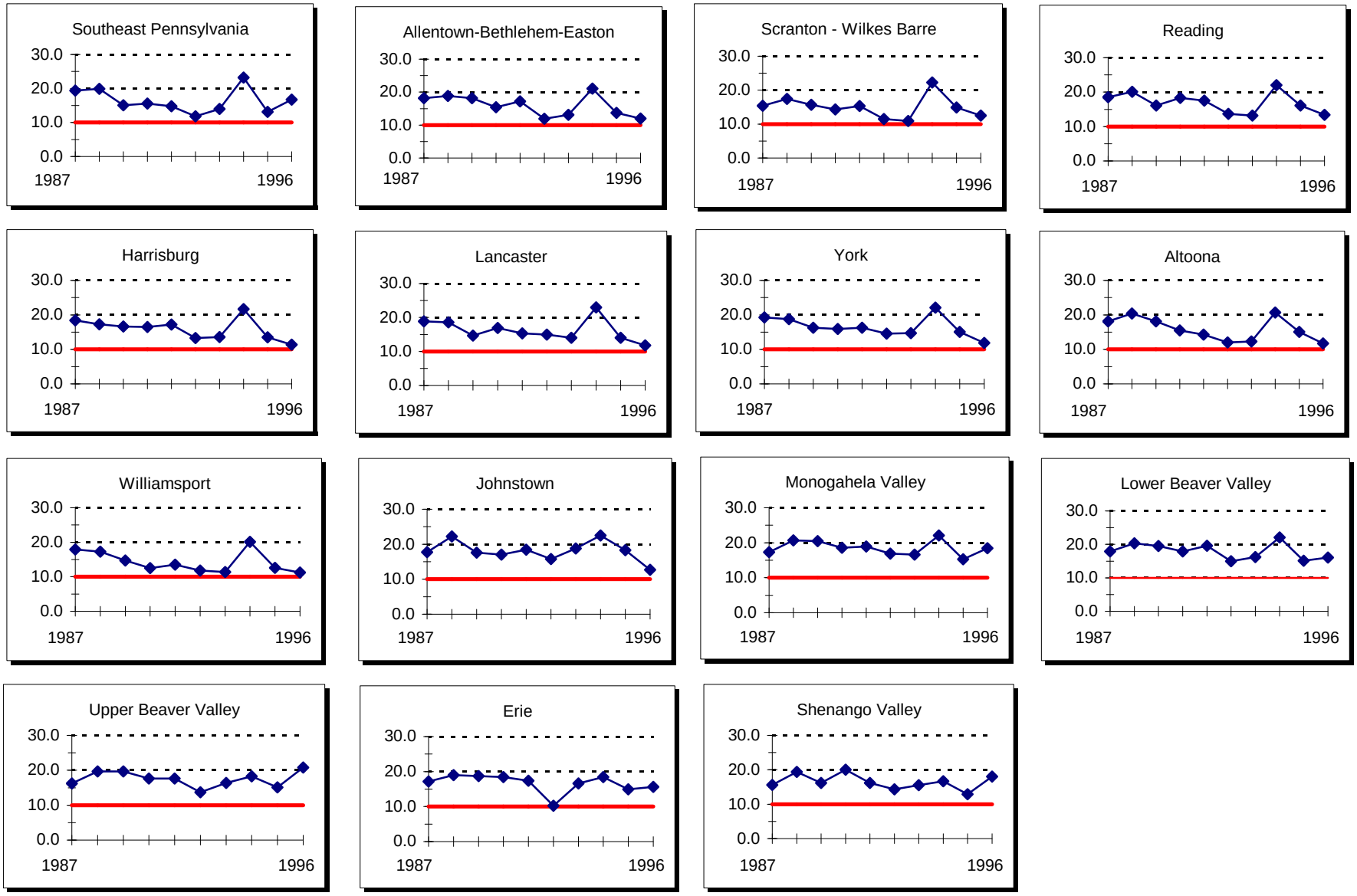


TABLE B-1

COMMWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## SULFATE SUSPENDED PARTICULATE MATTER SUMMARY

(UNITS: micrograms per cubic meter)

YEAR: 1996

| Site Name | PA Site Code | Annual Mean | Number Obs. | Number 30 Day > 10 | 1st Max 30 Day Mean | 1st Max 30 Day MM | 2nd Max 30 Day Mean | 2nd Max 30 Day MM | Number 24 Hour > 30 | 1st Max 24 Hour Mean | 1st Max 24 Hour MM/DD | 2nd Max 24 Hour Mean | 2nd Max 24 Hour MM/DD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Southeast Pennsylvania Air Basin*** | | | | | | | | | | | | | |
| Conshohocken | P12 | 9.3 | 55 | 3 | 16.7 | 7 | 14.1 | 8 | 1 | 36.3 | 08/07 | 22.1 | 07/14 |
| ***Allentown-Bethlehem-Easton Air Basin*** | | | | | | | | | | | | | |
| Bethlehem East | A12 | 8.2 | 53 | 4 | 11.2 | 2 | 11.1 | 1 | 0 | 27.8 | 08/07 | 16.8 | 07/08 |
| ***Scranton-Wilkes-Barre Air Basin*** | | | | | | | | | | | | | |
| Wilkes-Barre | S07 | 9.0 | 59 | 4 | 12.5 | 7 | 10.4 | 2 | 0 | 25.5 | 07/08 | 23.7 | 08/07 |
| ***DEP Region 2 Non-Air Basin*** | | | | | | | | | | | | | |
| Palmerton | 205 | 8.8 | 55 | 2 | 11.2 | 2 | 10.2 | 6 | 0 | 25.9 | 08/07 | 16.7 | 07/08 |
| ***Reading Air Basin*** | | | | | | | | | | | | | |
| Laureldale South | R10 | 9.9 | 60 | 5 | 13.4 | 7 | 12.3 | 1 | 0 | 25.8 | 08/07 | 20.4 | 07/08 |
| ***Harrisburg Air Basin*** | | | | | | | | | | | | | |
| Harrisburg | H06 | 8.6 | 57 | 4 | 11.4 | 7 | 10.6 | 1 | 0 | 22.6 | 08/07 | 16.8 | 07/08 |
| ***Lancaster Air Basin*** | | | | | | | | | | | | | |
| Lancaster West | L05 | 9.4 | 59 | 5 | 11.8 | 7 | 11.4 | 8 | 0 | 24.3 | 08/07 | 19.6 | 10/18 |
| ***York Air Basin*** | | | | | | | | | | | | | |
| York Central | Y02 | 9.2 | 59 | 4 | 11.9 | 2 | 11.8 | 8 | 0 | 22.6 | 08/07 | 20.0 | 02/21 |
| ***DEP Region 3 Non-Air Basin*** | | | | | | | | | | | | | |
| Perry County | 305 | 6.7 | 55 | 0 | 8.6 | 7 | 8.0 | 2 | 0 | 14.7 | 07/14 | 14.3 | 05/09 |
| ***Altoona Non-Air Basin*** | | | | | | | | | | | | | |
| Altoona East | 308 | 8.5 | 59 | 2 | 11.7 | 1 | 11.3 | 7 | 0 | 18.9 | 07/08 | 17.3 | 08/07 |

***** Air Quality Standards *****
24 Hour Mean = 30 micrograms per cubic meter
30 Day Mean = 10 micrograms per cubic meter

TABLE B-1

COMMWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## SULFATE SUSPENDED PARTICULATE MATTER SUMMARY

(UNITS: micrograms per cubic meter)

YEAR: 1996

| Site Name | PA Site Code | Annual Mean | Number Obs. | Number 30 Day > 10 | 1st Max 30 Day Mean | 1st Max 30 Day MM | 2nd Max 30 Day Mean | 2nd Max 30 Day MM | Number 24 Hour > 30 | 1st Max 24 Hour Mean | 1st Max 24 Hour MM/DD | 2nd Max 24 Hour Mean | 2nd Max 24 Hour MM/DD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Williamsport Non-Air Basin*** | | | | | | | | | | | | | |
| Williamsport Central | 401 | 8.6 | 59 | 2 | 11.2 | 2 | 10.2 | 1 | 0 | 17.4 | 02/21 | 16.6 | 08/07 |
| ***DEP Region 4 Non-Air Basin*** | | | | | | | | | | | | | |
| State College | 408 | 9.4 | 53 | 4 | 13.3 | 6 | 11.9 | 7 | 0 | 22.2 | 07/14 | 17.6 | 08/07 |
| ***Johnstown Air Basin*** | | | | | | | | | | | | | |
| East Conemaugh | J04 | 12.1 | 12 | 2 | 12.4 | 1 | 12.0 | 2 | 0 | 13.9 | 01/16 | 13.6 | 01/22 |
| East Conemaugh | J08 | 9.9 | 44 | 4 | 12.7 | 7 | 12.5 | 6 | 0 | 19.5 | 06/20 | 18.1 | 08/07 |
| ***Monongahela Valley Air Basin*** | | | | | | | | | | | | | |
| Monessen | M02 | 11.8 | 18 | 3 | 12.5 | 3 | 12.4 | 2 | 0 | 19.5 | 03/10 | 16.5 | 02/15 |
| Monessen | M16 | 11.8 | 19 | 2 | 18.4 | 8 | 13.1 | 7 | 1 | 41.1 | 08/07 | 17.5 | 08/19 |
| ***Lower Beaver Valley Air Basin*** | | | | | | | | | | | | | |
| Ambridge | B07 | 10.8 | 56 | 6 | 16.1 | 8 | 13.1 | 7 | 1 | 46.9 | 08/07 | 21.5 | 07/08 |
| ***DEP Region 5 Non-Air Basin*** | | | | | | | | | | | | | |
| Washingon | 503 | 8.3 | 23 | 2 | 14.4 | 3 | 11.0 | 1 | 0 | 14.1 | 03/10 | 13.4 | 01/16 |
| ***Upper Beaver Valley Air Basin*** | | | | | | | | | | | | | |
| Ellwood City | B16 | 10.4 | 51 | 5 | 20.8 | 8 | 12.4 | 5 | 1 | 41.6 | 08/07 | 21.0 | 08/19 |
| ***Erie Air Basin*** | | | | | | | | | | | | | |
| Erie Central | E07 | 9.8 | 52 | 5 | 15.6 | 8 | 13.4 | 6 | 1 | 41.5 | 08/07 | 19.7 | 06/14 |
| ***Shenango Valley Non-Air Basin*** | | | | | | | | | | | | | |
| Farrell | 602 | 9.3 | 51 | 5 | 18.0 | 8 | 11.3 | 5 | 1 | 39.4 | 08/07 | 22.1 | 05/09 |

***** Air Quality Standards *****
24 Hour Mean = 30 micrograms per cubic meter
30 Day Mean = 10 micrograms per cubic meter

TABLE B-2
SULFATE PARTICULATE MATTER HISTORICAL TREND
(Units: micrograms/cubic meter)

| STATION & SITE CODE | | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Southeast Pennsylvania Air Basin* | | | | | | | | | | | | |
| CONSHOHOCKEN | (P12) | 21.1 | 20.9 | 16.4 | 16.0 | 25.3 | 17.1 | 23.1 | 21.1 | 16.3 | 16.7 | Max 30-Day Mean |
| | | 28.3 | 38.7 | 33.8 | 28.6 | 25.3 | 18.2 | 26.8 | 41.8 | 19.8 | 36.3 | Max 24-Hour Mean |
| *Allentown-Bethlehem-Easton Air Basin* | | | | | | | | | | | | |
| BETHLEHEM EAST | (A12) | 19.5 | 18.6 | 18.5 | 15.0 | 21.2 | 11.3 | 13.7 | 21.3 | 12.8 | 11.2 | Max 30-Day Mean |
| | | 30.0 | 39.0 | 32.2 | 23.1 | 35.9 | 21.6 | 29.6 | 32.9 | 19.7 | 27.8 | Max 24-Hour Mean |
| *Scranton-Wilkes-Barre Air Basin* | | | | | | | | | | | | |
| WILKES-BARRE | (S07) | 15.7 | 17.4 | 15.5 | 15.4 | 16.4 | 12.7 | 29.2 | 24.6 | 16.1 | 12.5 | Max 30-Day Mean |
| | | 22.9 | 32.0 | 28.8 | 24.0 | 32.5 | 20.6 | 29.3 | 31.5 | 26.1 | 25.5 | Max 24-Hour Mean |
| *DEP Region 2 Non-Air Basin* | | | | | | | | | | | | |
| PALMERTON | (205) | 17.7 | 19.2 | 16.9 | 14.7 | 16.1 | 12.0 | 16.3 | 20.1 | 13.8 | 11.2 | Max 30-Day Mean |
| | | 30.1 | 36.4 | 25.0 | 22.6 | 33.1 | 18.9 | 23.4 | 26.7 | 18.7 | 25.9 | Max 24-Hour Mean |
| *Reading Air Basin* | | | | | | | | | | | | |
| LAURELDALE SOUTH | (R10) | 21.0 | 20.1 | 17.0 | 18.6 | 18.4 | 14.6 | 13.0 | 22.4 | 19.1 | 13.4 | Max 30-Day Mean |
| | | 27.9 | 36.3 | 32.6 | 31.3 | 36.7 | 21.5 | 28.5 | 35.1 | 22.6 | 25.8 | Max 24-Hour Mean |
| *Harrisburg Air Basin* | | | | | | | | | | | | |
| HARRISBURG | (H06) | 19.4 | 18.2 | 16.3 | 17.0 | 18.3 | 13.3 | 13.6 | 21.7 | 13.5 | 11.4 | Max 30-Day Mean |
| | | 26.7 | 46.7 | 32.4 | 30.8 | 33.3 | 19.7 | 26.1 | 32.7 | 22.0 | 22.6 | Max 24-Hour Mean |
| *Lancaster Air Basin* | | | | | | | | | | | | |
| LANCASTER WEST | (L05) | 18.7 | 16.8 | 15.6 | 16.5 | 16.7 | 18.7 | 13.4 | 21.2 | 14.7 | 11.8 | Max 30-Day Mean |
| | | 29.4 | 26.8 | 36.4 | 31.3 | 26.4 | 18.7 | 25.3 | 32.2 | 21.0 | 24.3 | Max 24-Hour Mean |
| *York Air Basin* | | | | | | | | | | | | |
| YORK CENTRAL | (Y02) | 18.5 | 18.6 | 16.3 | 16.2 | 16.1 | 15.0 | 16.0 | 23.1 | 14.9 | 11.9 | Max 30-Day Mean |
| | | 27.6 | 34.6 | 36.3 | 28.5 | 30.3 | 18.3 | 30.4 | 40.5 | 19.0 | 22.6 | Max 24-Hour Mean |
| *DEP Region 3 Non-Air Basin* | | | | | | | | | | | | |
| PERRY COUNTY | (305) | 14.6 | 14.3 | 13.8 | 14.0 | 12.6 | 9.9 | 21.7 | 17.9 | 12.9 | 8.6 | Max 30-Day Mean |
| | | 27.8 | 29.8 | 29.1 | 22.7 | 25.6 | 18.9 | 23.0 | 33.3 | 17.7 | 14.7 | Max 24-Hour Mean |
| *Altoona Non-Air Basin* | | | | | | | | | | | | |
| ALTOONA | (308) | 17.4 | 18.5 | ** | 15.5 | 14.3 | 12.0 | 14.3 | 20.7 | 15.1 | 11.7 | Max 30-Day Mean |
| | | 27.3 | 45.0 | ** | 27.8 | 32.1 | 16.6 | 23.2 | 35.0 | 23.7 | 18.9 | Max 24-Hour Mean |

TABLE B-2
SULFATE PARTICULATE MATTER HISTORICAL TREND
(Units: micrograms/cubic meter)

| STATION & SITE CODE | | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Williamsport Non-Air Basin* | | | | | | | | | | | | |
| WILLIAMSPORT | (401) | 19.0 | 17.3 | 14.7 | 12.5 | 16.3 | 11.8 | 12.4 | 20.1 | 14.7 | 11.2 | Max 30-Day Mean |
| | | 32.7 | 34.7 | 25.7 | 23.4 | 28.8 | 16.4 | 26.7 | 30.4 | 20.1 | 17.4 | Max 24-Hour Mean |
| *DEP Region 4 Non-Air Basin* | | | | | | | | | | | | |
| STATE COLLEGE | (408) | 19.9 | 24.0 | 18.6 | 16.5 | 16.6 | 12.5 | 15.2 | 23.0 | 17.0 | 13.3 | Max 30-Day Mean |
| | | 36.5 | 46.3 | 32.5 | 26.9 | 36.9 | 18.4 | 24.1 | 30.3 | 28.4 | 22.2 | Max 24-Hour Mean |
| *Johnstown Air Basin* | | | | | | | | | | | | |
| EAST CONEMAUGH | (J04) | 19.4 | 21.8 | 18.0 | 17.9 | 18.4 | 15.8 | 21.0 | 22.5 | 20.9 | ** | Max 30-Day Mean |
| | | 31.8 | 62.0 | 35.3 | 38.8 | 37.7 | 27.2 | 33.2 | 33.5 | 25.9 | ** | Max 24-Hour Mean |
| EAST CONEMAUGH | (J08) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 12.7 | Max 30-Day Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 19.5 | Max 24-Hour Mean |
| *Monongahela Valley Air Basin* | | | | | | | | | | | | |
| MONESSEN | (M02) | 18.9 | 21.5 | 22.5 | 18.7 | 19.8 | 16.9 | 20.6 | 22.1 | 15.5 | ** | Max 30-Day Mean |
| | | 34.8 | 55.8 | 42.5 | 38.0 | 38.2 | 39.2 | 32.2 | 32.6 | 26.9 | ** | Max 24-Hour Mean |
| MONESSEN | (M16) | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | Max 30-Day Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | Max 24-Hour Mean |
| *Lower Beaver Valley Air Basin* | | | | | | | | | | | | |
| AMBRIDGE | (B07) | 16.1 | 18.4 | 19.1 | 18.6 | 21.0 | 13.9 | 19.7 | 23.9 | ** | 16.1 | Max 30-Day Mean |
| | | 27.5 | 41.6 | 29.5 | 33.5 | 31.6 | 25.6 | 33.1 | 36.5 | ** | 46.9 | Max 24-Hour Mean |
| *DEP Region 5 Non-Air Basin* | | | | | | | | | | | | |
| WASHINGTON | (503) | 15.3 | 24.6 | 20.4 | 18.9 | 18.7 | 16.5 | 19.3 | 28.8 | 15.3 | ** | Max 30-Day Mean |
| | | 25.0 | 52.9 | 39.8 | 34.9 | 29.5 | 27.2 | 26.4 | 37.1 | 22.2 | ** | Max 24-Hour Mean |
| *Upper Beaver Valley Air Basin* | | | | | | | | | | | | |
| ELLWOOD CITY | (B16) | 16.6 | 20.4 | 19.7 | ** | 27.4 | 16.2 | 23.1 | 30.9 | 19.6 | 20.8 | Max 30-Day Mean |
| | | 24.4 | 41.5 | 45.9 | ** | 36.1 | 21.3 | 30.7 | 31.3 | 35.5 | 41.6 | Max 24-Hour Mean |
| *Erie Air Basin* | | | | | | | | | | | | |
| ERIE CENTRAL | (E07) | 17.0 | 19.5 | 17.8 | 17.6 | 16.5 | 10.1 | 17.7 | 18.4 | 14.9 | 15.6 | Max 30-Day Mean |
| | | 33.4 | 43.1 | 39.8 | 31.8 | 26.7 | 18.9 | 25.9 | 27.1 | 17.0 | 41.5 | Max 24-Hour Mean |
| *Shenango Valley Non-Air Basin* | | | | | | | | | | | | |
| FARRELL | (602) | 16.4 | 19.4 | 16.2 | 20.0 | 16.2 | 14.3 | 15.5 | 16.7 | 12.9 | 18.0 | Max 30-Day Mean |
| | | 24.1 | 44.2 | 34.2 | 39.2 | 28.5 | 28.5 | 25.9 | 27.0 | 23.0 | 39.4 | Max 24-Hour Mean |

# LEAD

Lead is a highly toxic metal when ingested or inhaled. It is a suspected carcinogen of the lungs and kidneys. It has adverse effects on the blood-forming system, the nervous system and the renal system. Lead is emitted to the atmosphere by vehicles burning leaded fuel and from certain industrial processes, primarily battery manufacturers and lead smelters.

Lead trends are shown in Figure C-1 for the years 1987 to 1996. The solid line represents the quarterly mean air quality standard of 1.5 micrograms per cubic meter ($\mu g/m^3$) on these graphs. Lead levels have remained relatively constant over the last 10 years after initial dramatic improvements due to the use of lead-free gasoline and industrial emission controls. The Johnstown air basin has shown the most improvement over the last 10 years with a 86% reduction in levels as compared to 1987.

The particulate lead standard was not exceeded at any monitoring site in 1996. Quarterly averages for all stations that monitored lead in 1996 are shown in Table C-1, along with the number of samples taken in each quarter, the annual arithmetic mean and the total number of samples for the year.

Lead historical trend data is presented in Table C-2 for the years 1987 to 1996. The table contains the maximum quarterly mean for each year. Trend data is shown for all sites which operated in 1996. No current monitoring site has exceeded the air quality standard in the last 10 years. The most dramatic reduction in lead levels can be seen in Palmerton, Carbon County, which has improved 94% from levels in 1988. Relatively high 1996 lead levels experienced at sites located in Laureldale and Lyons are due to the influence of lead point sources close to the monitoring sites, although these sites are well below the air quality standard.

FIGURE C-1. LEAD PARTICULATE TRENDS IN PENNSYLVANIA 1987 to 1996
MAXIMUM QUARTERLY MEANS (micrograms per cubic meter)

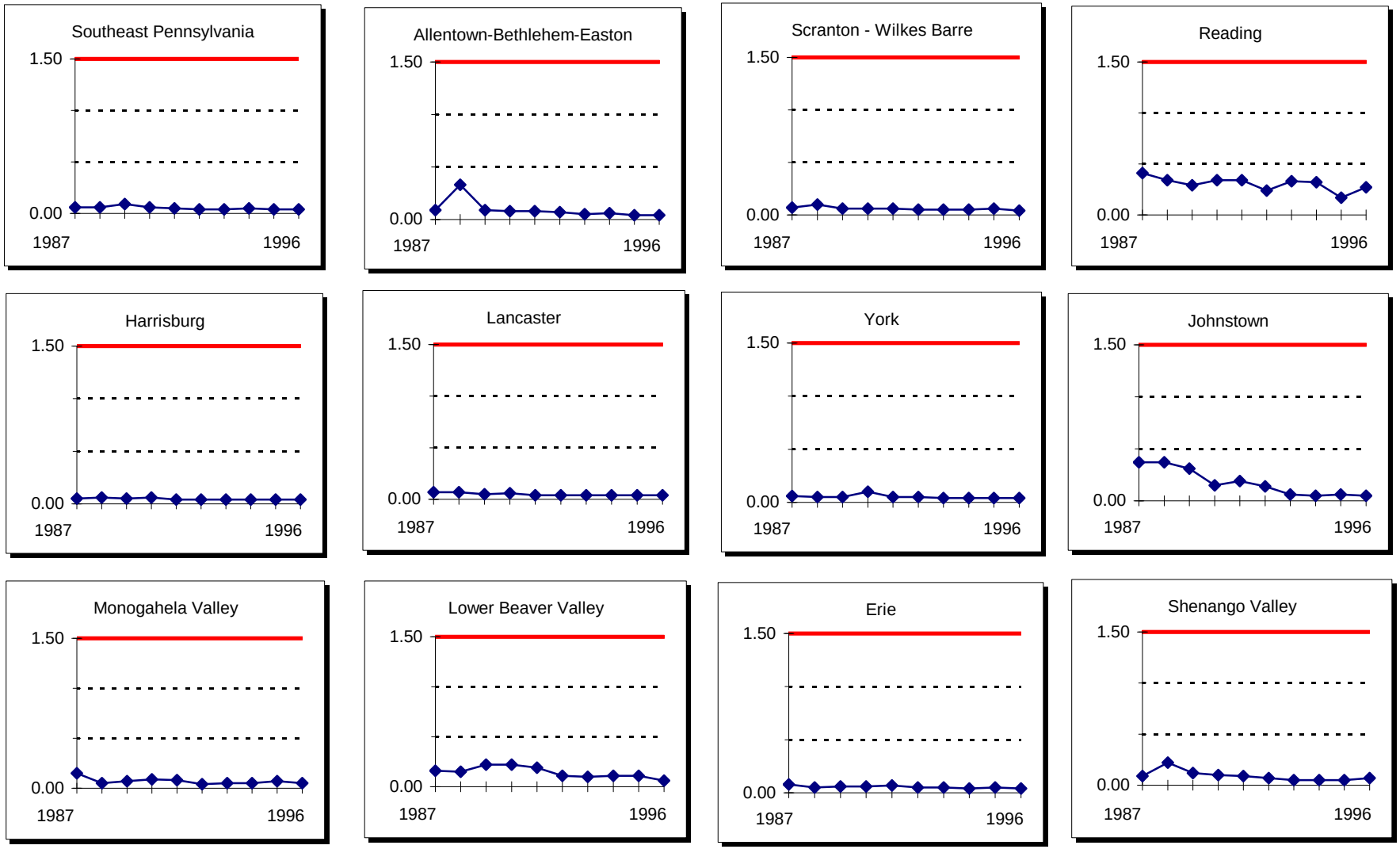


TABLE C-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

# LEAD SUSPENDED PARTICULATE MATTER SUMMARY

(Units: micrograms per cubic meter)

## YEAR: 1996

| Site Name | PA Site Code | 1st Quarter Arithmetic Mean | 1st Quarter Num. Obs. | 2nd Quarter Arithmetic Mean | 2nd Quarter Num. Obs. | 3rd Quarter Arithmetic Mean | 3rd Quarter Num. Obs. | 4th Quarter Arithmetic Mean | 4th Quarter Num. Obs. | Number Quarters > 1.5 | Arithmetic Annual Mean | Arithmetic Num. Obs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Southeast Pennsylvania Air Basin*** | | | | | | | | | | | | |
| Chester | P11 | 0.03 | 9 | 0.04 | 14 | 0.04 | 16 | 0.03 | 14 | 0 | 0.04 | 53 |
| Conshohocken | P12 | 0.03 | 11 | 0.04 | 14 | 0.04 | 15 | 0.04 | 15 | 0 | 0.04 | 55 |
| ***Allentown-Bethlehem-Easton Air Basin*** | | | | | | | | | | | | |
| Bethlehem East | A12 | 0.03 | 10 | 0.04 | 15 | 0.04 | 15 | 0.03 | 13 | 0 | 0.03 | 53 |
| Northampton | A17 | 0.04 | 9 | *** | 0 | *** | 0 | *** | 0 | 0 | 0.04 | 9 |
| Northampton | A23 | *** | 2 | 0.04 | 15 | 0.04 | 16 | 0.04 | 15 | 0 | 0.04 | 48 |
| ***Scranton-Wilkes-Barre Air Basin*** | | | | | | | | | | | | |
| Wilkes-Barre | S07 | 0.04 | 13 | 0.04 | 15 | 0.04 | 16 | 0.04 | 15 | 0 | 0.04 | 59 |
| ***DEP Region 2 Non-Air Basin*** | | | | | | | | | | | | |
| Palmerton | 205 | 0.06 | 9 | 0.07 | 15 | 0.08 | 16 | 0.07 | 15 | 0 | 0.07 | 55 |
| ***Reading Air Basin*** | | | | | | | | | | | | |
| Laureldale South | R10 | 0.23 | 14 | 0.22 | 13 | 0.27 | 16 | 0.17 | 15 | 0 | 0.22 | 58 |
| ***Harrisburg Air Basin*** | | | | | | | | | | | | |
| Harrisburg | H06 | 0.03 | 12 | 0.04 | 15 | 0.04 | 16 | 0.04 | 14 | 0 | 0.04 | 57 |
| ***Lancaster Air Basin*** | | | | | | | | | | | | |
| Lancaster West | L05 | 0.04 | 15 | 0.04 | 14 | 0.04 | 16 | 0.04 | 14 | 0 | 0.04 | 59 |
| ***York Air Basin*** | | | | | | | | | | | | |
| York Central | Y02 | 0.07 | 13 | 0.04 | 15 | 0.04 | 16 | 0.04 | 15 | 0 | 0.05 | 59 |
| ***DEP Region 3 Non-Air Basin*** | | | | | | | | | | | | |
| Lyons East | 301 | 0.17 | 14 | 0.11 | 15 | 0.08 | 15 | 0.11 | 15 | 0 | 0.12 | 59 |
| Lyons South | 370 | 0.20 | 14 | 0.09 | 14 | 0.17 | 16 | 0.06 | 15 | 0 | 0.13 | 59 |
| ***Johnstown Air Basin*** | | | | | | | | | | | | |
| East Conemaugh | J04 | 0.04 | 12 | *** | 0 | *** | 0 | *** | 0 | 0 | 0.05 | 12 |
| East Conemaugh | J08 | *** | 0 | 0.04 | 15 | 0.04 | 16 | 0.04 | 13 | 0 | 0.04 | 44 |
| ***Monongahela Valley Air Basin*** | | | | | | | | | | | | |
| Monessen | M02 | 0.04 | 14 | *** | 4 | *** | 0 | *** | 0 | 0 | 0.04 | 18 |
| Monessen | M16 | *** | 0 | *** | 0 | 0.04 | 8 | 0.05 | 11 | 0 | 0.05 | 19 |
| ***Lower Beaver Valley Air Basin*** | | | | | | | | | | | | |
| Vanport | B05 | 0.05 | 12 | 0.06 | 11 | 0.06 | 15 | 0.05 | 15 | 0 | 0.05 | 53 |
| ***Erie Air Basin*** | | | | | | | | | | | | |
| Erie Central | E07 | 0.04 | 11 | 0.04 | 15 | 0.04 | 12 | 0.03 | 14 | 0 | 0.04 | 52 |
| ***Shenango Valley Non-Air Basin*** | | | | | | | | | | | | |
| Farrell | 602 | 0.05 | 14 | 0.07 | 12 | 0.04 | 13 | 0.04 | 12 | 0 | 0.05 | 51 |

***** Primary Quarterly Standard = 1.5 micrograms per cubic meter *****

TABLE C-2
LEAD PARTICULATE MATTER HISTORICAL TREND
MAXIMUM QUARTERLY MEANS
(Units: micrograms/cubic meter)

| STATION & SITE CODE | | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Southeast Pennsylvania Air Basin* | | | | | | | | | | | |
| CHESTER | (P11) | ** | ** | ** | ** | ** | ** | ** | 0.05 | 0.05 | 0.04 |
| CONSHOHOCKEN | (P12) | ** | ** | ** | ** | ** | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| *Allentown-Bethlehem-Easton Air Basin* | | | | | | | | | | | |
| BETHLEHEM EAST | (A12) | ** | ** | ** | ** | ** | 0.04 | 0.03 | 0.04 | 0.04 | 0.04 |
| NORTHAMPTON | (A17) | 0.11 | 0.37 | 0.11 | 0.08 | 0.08 | 0.07 | 0.06 | 0.09 | 0.04 | 0.04 |
| NORTHAMPTON | (A23) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 0.04 |
| *Scranton-Wilkes-Barre Air Basin* | | | | | | | | | | | |
| WILKES-BARRE | (S07) | 0.06 | 0.10 | 0.06 | 0.06 | 0.06 | 0.05 | 0.05 | 0.05 | 0.06 | 0.04 |
| *DEP Region 2 Non-Air Basin* | | | | | | | | | | | |
| PALMERTON | (205) | 0.76 | 1.30 | 0.78 | 0.40 | 0.46 | 0.28 | 0.18 | 0.13 | 0.07 | 0.08 |
| *Reading Air Basin* | | | | | | | | | | | |
| LAURELDALE | (R10) | 0.96 | 0.57 | 0.50 | 0.59 | 0.60 | 0.43 | 0.59 | 0.56 | 0.29 | 0.27 |
| *Harrisburg Air Basin* | | | | | | | | | | | |
| HARRISBURG | (H06) | 0.05 | 0.07 | 0.05 | 0.06 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| *Lancaster Air Basin* | | | | | | | | | | | |
| LANCASTER | (L05) | 0.09 | 0.07 | 0.05 | 0.06 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| *York Air Basin* | | | | | | | | | | | |
| YORK | (Y02) | 0.05 | 0.05 | 0.05 | 0.10 | 0.05 | 0.05 | 0.04 | 0.04 | 0.04 | 0.07 |
| *DEP Region 3 Non-Air Basin* | | | | | | | | | | | |
| LYONS EAST | (301) | 0.21 | ** | 0.31 | 0.32 | 0.33 | 0.17 | 0.14 | 0.12 | 0.17 | 0.17 |
| LYONS SOUTH | (370) | ** | ** | ** | ** | ** | 0.21 | 0.19 | 0.18 | 0.20 | 0.20 |
| *Johnstown Air Basin* | | | | | | | | | | | |
| EAST CONEMAUGH | (J04) | 0.52 | 0.30 | 0.31 | 0.15 | 0.19 | 0.14 | 0.06 | 0.05 | 0.06 | 0.04 |
| EAST CONEMAUGH | (J08) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 0.04 |
| *Monongahela Valley Air Basin* | | | | | | | | | | | |
| MONESSEN | (M02) | 0.06 | 0.05 | 0.06 | 0.09 | 0.08 | 0.04 | 0.05 | 0.05 | 0.07 | 0.04 |
| MONESSEN | (M16) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 0.05 |
| *Lower Beaver Valley Air Basin* | | | | | | | | | | | |
| VANPORT | (B05) | 0.24 | 0.21 | 0.27 | 0.22 | 0.19 | 0.15 | 0.13 | 0.17 | 0.15 | 0.06 |
| *Erie Air Basin* | | | | | | | | | | | |
| ERIE CENTRAL | (E07) | 0.09 | 0.06 | 0.07 | 0.06 | 0.07 | 0.05 | 0.05 | 0.04 | 0.05 | 0.04 |
| *Shenango Valley Non-Air Basin* | | | | | | | | | | | |
| FARRELL | (602) | 0.09 | 0.22 | 0.12 | 0.10 | 0.09 | 0.07 | 0.05 | 0.05 | 0.05 | 0.07 |

# NITRATES

Nitrates are particulate compounds which are usually formed in the atmosphere from the oxidation of oxides of nitrogen gases. They are of interest since they represent a significant portion of the finer particulate which can be inhaled into the lungs and which have a great impact on visibility. Nitrates are also being studied to determine their impact on acid precipitation.

Table D-1 summarizes nitrate data collected during 1996. The table contains the annual mean, the number of samples collected, the 3 maximum 24-hour values and the minimum value recorded. As seen from the annual means, the levels of nitrates in the Commonwealth are relatively constant from area to area. There are no long-term or short-term air quality standards for nitrates.

TABLE D-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

# NITRATE SUSPENDED PARTICULATE MATTER SUMMARY

(Units: micrograms per cubic meter)

YEAR: 1996

| Site Name | PA Site Code | Arithmetic Annual Mean | Num. Obs. | 1st Max 24 Hour Mean | 1st Max 24 Hour MM/DD | 2nd Max 24 Hour Mean | 2nd Max 24 Hour MM/DD | 3nd Max 24 Hour Mean | 3nd Max 24 Hour MM/DD | Minimum 24 Hour Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Southeast Pennsylvania Air Basin*** | | | | | | | | | | |
| Conshohocken | P12 | 4.77 | 55 | 10.44 | 11/29 | 9.79 | 02/15 | 9.72 | 08/01 | 0.96 |
| ***Allentown-Bethlehem-Easton Air Basin*** | | | | | | | | | | |
| Bethlehem East | A12 | 3.71 | 53 | 9.08 | 01/22 | 7.62 | 08/01 | 7.41 | 02/15 | 0.23 |
| ***Scranton-Wilkes-Barre Air Basin*** | | | | | | | | | | |
| Wilkes-Barre | S07 | 4.06 | 59 | 11.96 | 01/22 | 8.57 | 12/23 | 8.54 | 12/11 | 1.03 |
| ***DEP Region 2 Non-Air Basin*** | | | | | | | | | | |
| Palmerton | 205 | 3.99 | 55 | 15.69 | 10/30 | 8.60 | 06/20 | 8.23 | 05/03 | 0.73 |
| ***Reading Air Basin*** | | | | | | | | | | |
| Laureldale South | R10 | 5.45 | 60 | 17.79 | 01/22 | 13.24 | 02/15 | 12.80 | 01/16 | 1.06 |
| ***Harrisburg Air Basin*** | | | | | | | | | | |
| Harrisburg | H06 | 5.43 | 57 | 16.14 | 01/22 | 12.75 | 11/17 | 10.42 | 05/03 | 0.98 |
| ***Lancaster Air Basin*** | | | | | | | | | | |
| Lancaster West | L05 | 6.42 | 59 | 16.99 | 11/17 | 15.13 | 02/15 | 13.98 | 01/22 | 1.08 |
| ***York Air Basin*** | | | | | | | | | | |
| York Central | Y02 | 6.00 | 59 | 16.50 | 01/22 | 14.10 | 11/17 | 12.93 | 02/15 | 1.37 |
| ***DEP Region 3 Non-Air Basin*** | | | | | | | | | | |
| Perry County | 305 | 2.76 | 55 | 7.86 | 11/17 | 7.52 | 02/15 | 6.30 | 12/23 | 0.43 |

***** No Long-Term or Short-Term Air Quality Standards *****

TABLE D-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## NITRATE SUSPENDED PARTICULATE MATTER SUMMARY

(Units: micrograms per cubic meter)

YEAR: 1996

| Site Name | PA Site Code | Arithmetic Annual Mean | Num. Obs. | 1st Max 24 Hour Mean | 1st Max 24 Hour MM/DD | 2nd Max 24 Hour Mean | 2nd Max 24 Hour MM/DD | 3nd Max 24 Hour Mean | 3nd Max 24 Hour MM/DD | Minimum 24 Hour Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Altoona Non-Air Basin*** | | | | | | | | | | |
| Altoona East | 308 | 3.47 | 59 | 8.98 | 12/23 | 7.61 | 02/15 | 7.00 | 01/22 | 0.77 |
| ***Williamsport Non-Air Basin*** | | | | | | | | | | |
| Williamsport Central | 401 | 3.79 | 59 | 9.15 | 12/23 | 8.13 | 11/17 | 7.47 | 02/15 | 0.73 |
| ***DEP Region 4 Non-Air Basin*** | | | | | | | | | | |
| State College | 408 | 4.72 | 53 | 11.41 | 11/17 | 11.13 | 12/23 | 11.01 | 02/15 | 1.02 |
| ***Johnstown Air Basin*** | | | | | | | | | | |
| East Conemaugh | J04 | 4.14 | 12 | 6.29 | 02/15 | 5.37 | 02/09 | 5.16 | 01/04 | 1.00 |
| East Conemaugh | J08 | 2.73 | 44 | 5.01 | 04/09 | 4.88 | 07/26 | 4.68 | 06/20 | 0.98 |
| ***Monongahela Valley Air Basin*** | | | | | | | | | | |
| Monessen | M02 | 5.46 | 18 | 11.96 | 02/15 | 9.41 | 02/09 | 9.30 | 04/09 | 2.77 |
| Monessen | M16 | 3.43 | 19 | 5.32 | 08/13 | 5.00 | 08/19 | 4.73 | 12/11 | 1.59 |
| ***Lower Beaver Valley Air Basin*** | | | | | | | | | | |
| Ambridge | B07 | 4.39 | 56 | 11.42 | 02/15 | 10.51 | 02/09 | 9.15 | 01/04 | 0.75 |
| ***DEP Region 5 Non-Air Basin*** | | | | | | | | | | |
| Washington | 503 | 4.24 | 23 | 9.83 | 02/09 | 8.10 | 01/04 | 7.68 | 03/10 | 2.03 |
| ***Erie Air Basin*** | | | | | | | | | | |
| Erie Central | E07 | 5.34 | 52 | 11.01 | 06/14 | 10.11 | 05/27 | 9.86 | 04/21 | 0.49 |
| ***Shenango Valley Non-Air Basin*** | | | | | | | | | | |
| Farrell | 602 | 4.27 | 51 | 9.99 | 02/09 | 9.58 | 01/04 | 9.21 | 02/15 | 0.84 |

***** No Long-Term or Short-Term Air Quality Standards *****

# $PM_{10}$ SUSPENDED PARTICULATE MATTER

Particulate matter is solid matter or liquid droplets from smoke, dust, fly ash or condensing vapors that can be suspended in the air for long periods of time. $PM_{10}$ is the particulate matter in air with aerodynamic diameters less than 10 micrometers. It has replaced the total suspended particulate (TSP) standards in recognition of the fact that many of the larger particles included in TSP measurement (up to 45 micrometers) do not penetrate into the lungs and have very little effect on health. Consequently, the $PM_{10}$ measurement is believed to be a better indicator of actual health risks. $PM_{10}$ appears to represent essentially all of the particulate emissions from transportation sources and most of the emissions in the other traditional categories. The standard for $PM_{10}$ particulate matter was adopted in July 1987.

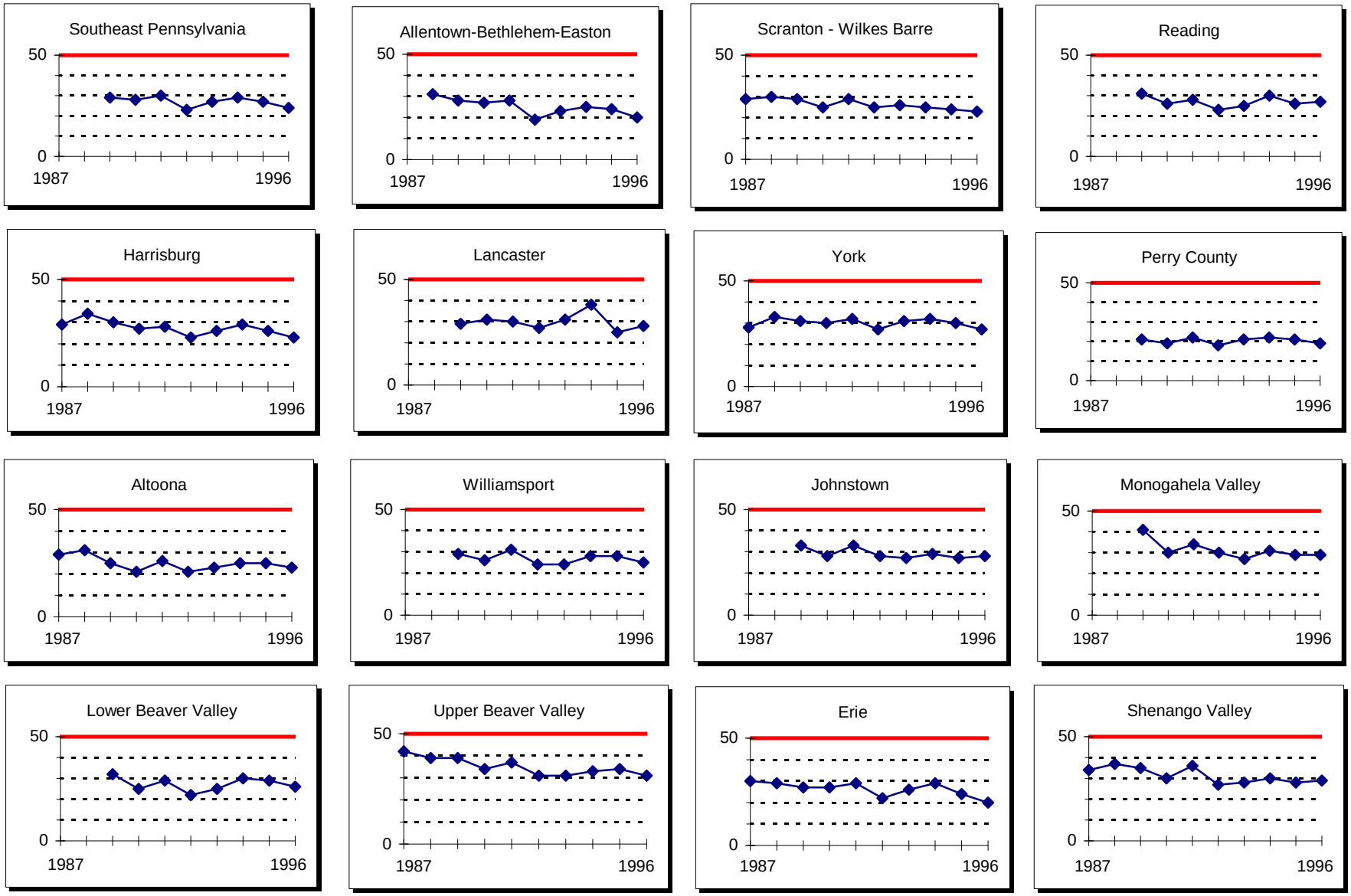
The Commonwealth completed the task of replacing the soiling (coefficient of haze) monitors with a real-time instrument for measuring the $PM_{10}$ particulate concentration. The tapered element oscillating microbalance (TEOM) is a gravimetric instrument that draws ambient air through a filter, constantly weighing the filter and calculating real-time $PM_{10}$ concentrations. The analyzer reports 1-hour data which are then used to calculate daily 24-hour averages (midnight to midnight) for comparison to the ambient air quality standard.

Figure E-1 graphically represents the historical $PM_{10}$ trend for the years 1987 to 1996. The air basin or area averages consist of all stations which were operated during that year and had at least 30 discrete samples or one quarter continuous data. $PM_{10}$ levels have remained fairly constant over this period with a slight decrease in levels in 1996 as compared to 1995. Average $PM_{10}$ levels have improved by 17% since 1989, when monitoring became established in all areas of the Commonwealth. The solid line represents the annual air quality standard of 50 micrograms per cubic meter ($\mu g/m^3$).

Table E-1 summarizes $PM_{10}$ data collected from the discrete and continuous samplers during 1996. The table contains the arithmetic annual mean (formed from the average of the quarterly means), the number of 24-hour samples collected (or calculated), the 4 maximum 24-hour values, the number of values greater than 150 $\mu g/m^3$, the minimum 24-hour value and the number of 24-hour values in the specified ranges. There were no sites in the Commonwealth which violated the annual or 24-hour ambient air quality $PM_{10}$ standard in 1996.

Table E-2 lists the annual arithmetic means and second maximum 24-hour mean over the last ten years for each site that monitored in 1996.

FIGURE E-1. PM-10 PARTICULATE TRENDS IN PENNSYLVANIA 1987 to 1996
ANNUAL ARITHMETIC MEANS (micrograms per cubic meter)



# TABLE E-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## PM-10 SUSPENDED PARTICULATE MATTER SUMMARY

(Units: micrograms per cubic meter)

YEAR: 1996

| | | | | | | | | | | | | | | Number of 24 Hour Values In Ranges | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PA | Arithmetic | | 1st Max | | 2nd Max | | 3rd Max | | 4th Max | | Number | Minimum | 0 | 26 | 51 | 76 | 101 | 126 | 151 | |
| | Site | Annual | Number | 24HR | Date | 24HR | Date | 24HR | Date | 24HR | Date | Obs. | 24 Hour | to | to | to | to | to | to | to | > |
| Site Name | Code | Mean | Obs. | Mean | MM/DD | Mean | MM/DD | Mean | MM/DD | Mean | MM/DD | >150 | Mean | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| ***Southeast Pennsylvania Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Bristol (TEOM) | P01 | 21 | 356 | 61 | 08/06 | 58 | 08/23 | 55 | 08/05 | 55 | 08/07 | 0 | 4 | 262 | 87 | 7 | 0 | 0 | 0 | 0 | 0 |
| Chester (TEOM) | P11 | 24 | 345 | 108 | 02/26 | 69 | 08/07 | 65 | 08/27 | 65 | 08/28 | 0 | 5 | 217 | 112 | 15 | 0 | 1 | 0 | 0 | 0 |
| Norristown (TEOM) | P21 | 22 | 352 | 86 | 04/23 | 64 | 08/23 | 58 | 08/07 | 54 | 05/18 | 0 | 5 | 245 | 99 | 7 | 1 | 0 | 0 | 0 | 0 |
| Coatesville | P26 | 28 | 54 | 79 | 11/05 | 69 | 08/07 | 63 | 05/03 | 56 | 12/23 | 0 | 5 | 24 | 25 | 4 | 1 | 0 | 0 | 0 | 0 |
| ***Allentown-Bethlehem-Easton Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Allentown | A19 | 18 | 17 | 37 | 01/22 | 37 | 05/21 | 35 | 01/16 | 27 | 02/15 | 0 | 6 | 13 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Allentown (TEOM) | A19 | 20 | 217 | 56 | 08/07 | 54 | 08/06 | 52 | 08/23 | 51 | 08/05 | 0 | 5 | 161 | 51 | 5 | 0 | 0 | 0 | 0 | 0 |
| Bethlehem Central (TEOM) | A21 | 24 | 238 | 68 | 08/06 | 65 | 03/15 | 65 | 08/07 | 62 | 03/14 | 0 | 5 | 154 | 73 | 11 | 0 | 0 | 0 | 0 | 0 |
| Nazareth | A22 | 17 | 20 | 37 | 01/22 | 37 | 05/21 | 34 | 05/15 | 27 | 04/21 | 0 | 4 | 15 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nazareth | A24 | 26 | 32 | 67 | 08/07 | 44 | 07/08 | 44 | 12/23 | 36 | 06/14 | 0 | 11 | 15 | 16 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***Scranton-Wilkes-Barre Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Scranton (TEOM) | S01 | 21 | 354 | 72 | 10/17 | 61 | 03/14 | 61 | 08/06 | 59 | 05/20 | 0 | 4 | 257 | 88 | 9 | 0 | 0 | 0 | 0 | 0 |
| Pittston | S04 | 25 | 52 | 56 | 07/08 | 44 | 01/22 | 43 | 06/08 | 43 | 07/14 | 0 | 11 | 31 | 20 | 1 | 0 | 0 | 0 | 0 | 0 |
| Wilkes-Barre | S07 | 23 | 59 | 58 | 07/08 | 57 | 08/07 | 43 | 06/08 | 42 | 07/14 | 0 | 7 | 41 | 16 | 2 | 0 | 0 | 0 | 0 | 0 |
| Scranton Central | S15 | 24 | 59 | 57 | 08/07 | 49 | 07/08 | 47 | 12/23 | 43 | 09/06 | 0 | 7 | 36 | 22 | 1 | 0 | 0 | 0 | 0 | 0 |
| Wilkes-Barre (TEOM) | S28 | 21 | 354 | 84 | 11/04 | 60 | 08/06 | 60 | 11/05 | 57 | 10/17 | 0 | 3 | 250 | 93 | 10 | 1 | 0 | 0 | 0 | 0 |
| ***Reading Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Reading (TEOM) | R01 | 22 | 194 | 53 | 08/23 | 52 | 07/25 | 52 | 10/17 | 49 | 07/24 | 0 | 5 | 133 | 58 | 3 | 0 | 0 | 0 | 0 | 0 |
| Temple | R09 | 30 | 60 | 66 | 01/22 | 57 | 12/23 | 55 | 07/08 | 53 | 08/07 | 0 | 10 | 26 | 30 | 4 | 0 | 0 | 0 | 0 | 0 |
| Reading Central | R15 | 29 | 57 | 81 | 01/16 | 66 | 01/22 | 57 | 11/05 | 54 | 05/03 | 0 | 13 | 30 | 22 | 4 | 1 | 0 | 0 | 0 | 0 |

**** Primary and Secondary Air Quality Standards ****
**** Annual Mean = 50 micrograms per cubic meter ****
**** 24 Hour Mean = 150 micrograms per cubic meter ****

# TABLE E-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## PM-10 SUSPENDED PARTICULATE MATTER SUMMARY

(Units: micrograms per cubic meter)

YEAR: 1996

| | | | | 1st Max | | 2nd Max | | 3rd Max | | 4th Max | | | | Number of 24 Hour Values In Ranges | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site Name | PA Site Code | Arithmetic Annual Mean | Number Obs. | 24HR Mean | Date MM/DD | 24HR Mean | Date MM/DD | 24HR Mean | Date MM/DD | 24HR Mean | Date MM/DD | Number Obs. >150 | Minimum 24 Hour Mean | 0 to 25 | 26 to 50 | 51 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 151 to 175 | > 200 |
| ***Harrisburg Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Harrisburg (TEOM) | H11 | 23 | 354 | 74 | 03/14 | 63 | 01/17 | 60 | 08/23 | 58 | 08/08 | 0 | 5 | 234 | 108 | 12 | 0 | 0 | 0 | 0 | 0 |
| ***Lancaster Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Lancaster (TEOM) | L01 | 24 | 352 | 73 | 01/17 | 69 | 02/06 | 69 | 03/14 | 64 | 01/22 | 0 | 4 | 217 | 122 | 13 | 0 | 0 | 0 | 0 | 0 |
| Lancaster West | L05 | 31 | 56 | 92 | 01/22 | 63 | 11/17 | 50 | 08/07 | 49 | 05/03 | 0 | 14 | 20 | 34 | 1 | 1 | 0 | 0 | 0 | 0 |
| ***York Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| York (TEOM) | Y01 | 24 | 155 | 64 | 08/23 | 53 | 08/08 | 53 | 10/17 | 51 | 07/24 | 0 | 4 | 103 | 46 | 6 | 0 | 0 | 0 | 0 | 0 |
| West York | Y07 | 29 | 56 | 63 | 01/22 | 51 | 08/07 | 50 | 02/27 | 50 | 11/17 | 0 | 7 | 23 | 31 | 2 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 3 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Perry County | 305 | 19 | 56 | 41 | 07/08 | 39 | 07/14 | 39 | 08/07 | 32 | 06/14 | 0 | 5 | 44 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Altoona Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Altoona East (TEOM) | 308 | 23 | 359 | 60 | 06/30 | 60 | 10/11 | 56 | 11/18 | 53 | 04/12 | 0 | 5 | 239 | 110 | 10 | 0 | 0 | 0 | 0 | 0 |
| ***Williamsport Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Williamsport Central | 401 | 25 | 58 | 64 | 03/04 | 46 | 10/18 | 43 | 08/07 | 38 | 05/21 | 0 | 10 | 34 | 23 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***Johnstown Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Johnstown (TEOM) | J01 | 28 | 248 | 65 | 06/29 | 63 | 06/30 | 60 | 06/07 | 60 | 08/15 | 0 | 3 | 120 | 108 | 20 | 0 | 0 | 0 | 0 | 0 |
| Johnstown Central | J03 | 30 | 15 | 53 | 04/03 | 51 | 02/21 | 48 | 01/22 | 40 | 01/16 | 0 | 12 | 8 | 5 | 2 | 0 | 0 | 0 | 0 | 0 |

**** Primary and Secondary Air Quality Standards ****
**** Annual Mean = 50 micrograms per cubic meter ****
**** 24 Hour Mean = 150 micrograms per cubic meter ****

# TABLE E-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## PM-10 SUSPENDED PARTICULATE MATTER SUMMARY

(Units: micrograms per cubic meter)

YEAR: 1996

| | | | | | | | | | | | | | | Number of 24 Hour Values In Ranges | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PA | Arithmetic | | 1st Max | | 2nd Max | | 3rd Max | | 4th Max | | Number | Minimum | 0 | 26 | 51 | 76 | 101 | 126 | 151 | |
| | Site | Annual | Number | 24HR | Date | 24HR | Date | 24HR | Date | 24HR | Date | Obs. | 24 Hour | to | to | to | to | to | to | to | > |
| Site Name | Code | Mean | Obs. | Mean | MM/DD | Mean | MM/DD | Mean | MM/DD | Mean | MM/DD | >150 | Mean | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| ***Monongahela Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Charleroi (TEOM) | M01 | 26 | 364 | 80 | 08/07 | 72 | 08/27 | 71 | 06/18 | 69 | 06/29 | 0 | 4 | 206 | 131 | 26 | 1 | 0 | 0 | 0 | 0 |
| Monessen | M02 | 31 | 16 | 59 | 01/16 | 43 | 02/21 | 43 | 03/10 | 38 | 03/04 | 0 | 13 | 5 | 10 | 1 | 0 | 0 | 0 | 0 | 0 |
| Monessen | M16 | 32 | 19 | 85 | 11/05 | 46 | 08/19 | 39 | 10/06 | 38 | 10/18 | 0 | 19 | 6 | 12 | 0 | 1 | 0 | 0 | 0 | 0 |
| ***Lower Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Baden (TEOM) | B01 | 29 | 138 | 63 | 08/20 | 60 | 09/03 | 58 | 08/23 | 57 | 08/27 | 0 | 7 | 74 | 56 | 8 | 0 | 0 | 0 | 0 | 0 |
| Beaver Falls (TEOM) | B11 | 26 | 363 | 94 | 08/07 | 76 | 08/08 | 65 | 08/20 | 64 | 06/17 | 0 | 4 | 207 | 130 | 24 | 2 | 0 | 0 | 0 | 0 |
| Baden | B17 | 22 | 45 | 64 | 08/07 | 50 | 02/27 | 38 | 11/05 | 36 | 07/08 | 0 | 9 | 35 | 9 | 1 | 0 | 0 | 0 | 0 | 0 |
| Beaver Falls | B18 | 28 | 46 | 89 | 08/07 | 52 | 11/05 | 51 | 11/29 | 47 | 11/17 | 0 | 12 | 22 | 21 | 2 | 1 | 0 | 0 | 0 | 0 |
| ***Upper Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| New Castle | B21 | 32 | 53 | 97 | 08/07 | 67 | 11/05 | 48 | 02/15 | 48 | 05/09 | 0 | 11 | 17 | 34 | 1 | 1 | 0 | 0 | 0 | 0 |
| New Castle (TEOM) | B21 | 33 | 365 | 111 | 08/07 | 91 | 03/14 | 89 | 07/16 | 87 | 03/13 | 0 | 4 | 152 | 155 | 48 | 9 | 1 | 0 | 0 | 0 |
| Bessemer | B26 | 27 | 49 | 80 | 08/07 | 43 | 09/12 | 39 | 02/21 | 39 | 07/14 | 0 | 11 | 27 | 21 | 0 | 1 | 0 | 0 | 0 | 0 |
| ***Erie Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Erie East (TEOM) | E10 | 20 | 327 | 67 | 08/20 | 61 | 06/29 | 56 | 04/11 | 56 | 08/08 | 0 | 3 | 246 | 75 | 6 | 0 | 0 | 0 | 0 | 0 |
| ***Shenango Valley Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Farrell | 602 | 29 | 54 | 101 | 08/07 | 52 | 05/09 | 45 | 08/19 | 44 | 07/02 | 0 | 5 | 19 | 33 | 1 | 0 | 1 | 0 | 0 | 0 |

**** Primary and Secondary Air Quality Standards ****
**** Annual Mean = 50 micrograms per cubic meter ****
**** 24 Hour Mean = 150 micrograms per cubic meter ****

TABLE E-2
PM-10 PARTICULATE MATTER HISTORICAL TREND
(Units: micrograms/cubic meter)

| STATION & SITE CODE | | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Southeast Pennsylvania Air Basin* | | | | | | | | | | | | |
| BRISTOL | (P01) | ** | ** | 28 | 25 | 30 | 24 | 24 | 26 | 23 | ** | Annual Mean |
| | | ** | ** | 65 | 49 | 60 | 53 | 71 | 60 | 52 | ** | 2nd Max 24-Hour Mean |
| BRISTOL (TEOM) | (P01) | ** | ** | ** | ** | ** | ** | ** | ** | 21 | 21 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | 75 | 58 | 2nd Max 24-Hour Mean |
| CHESTER | (P11) | ** | ** | 30 | 26 | 26 | 18 | 27 | 26 | 30 | ** | Annual Mean |
| | | ** | ** | 71 | 57 | 55 | 37 | 60 | 55 | 61 | ** | 2nd Max 24-Hour Mean |
| CHESTER (TEOM) | (P11) | ** | ** | ** | ** | ** | ** | ** | ** | 25 | 24 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | 105 | 69 | 2nd Max 24-Hour Mean |
| NORRISTOWN | (P21) | ** | ** | 29 | 25 | 27 | 22 | 24 | 29 | 28 | ** | Annual Mean |
| | | ** | ** | 55 | 56 | 54 | 41 | 62 | 75 | 57 | ** | 2nd Max 24-Hour Mean |
| NORRISTOWN (TEOM) | (P21) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 22 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 64 | 2nd Max 24-Hour Mean |
| COATESVILLE | (P26) | ** | ** | ** | 34 | 36 | 27 | 31 | 34 | 32 | 28 | Annual Mean |
| | | ** | ** | ** | 87 | 91 | 47 | 78 | 71 | 83 | 69 | 2nd Max 24-Hour Mean |
| *Allentown-Bethlehem-Easton Air Basin* | | | | | | | | | | | | |
| ALLENTOWN | (A19) | ** | ** | 26 | 24 | 25 | 19 | 23 | 25 | 23 | ** | Annual Mean |
| | | ** | ** | 55 | 61 | 54 | 36 | 59 | 60 | 56 | ** | 2nd Max 24-Hour Mean |
| ALLENTOWN (TEOM) | (A19) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 20 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 54 | 2nd Max 24-Hour Mean |
| BETHLEHEM | (A21) | ** | ** | 28 | 26 | 28 | 20 | 23 | 26 | 26 | ** | Annual Mean |
| | | ** | ** | 61 | 71 | 52 | 41 | 63 | 70 | 51 | ** | 2nd Max 24-Hour Mean |
| BETHLEHEM (TEOM) | (A21) | ** | ** | ** | ** | ** | ** | ** | ** | 23 | 24 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | 70 | 65 | 2nd Max 24-Hour Mean |
| NAZARETH | (A22) | ** | 31 | 30 | 30 | 30 | 19 | 23 | 24 | 23 | ** | Annual Mean |
| | | ** | 78 | 73 | 91 | 80 | 37 | 59 | 63 | 65 | ** | 2nd Max 24-Hour Mean |
| NAZARETH | (A24) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 26 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 44 | 2nd Max 24-Hour Mean |

TABLE E-2
PM-10 PARTICULATE MATTER HISTORICAL TREND
(Units: micrograms/cubic meter)

| STATION & SITE CODE | | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Scranton-Wilkes Barre Air Basin* | | | | | | | | | | | | |
| SCRANTON (TEOM) | (S01) | ** | ** | ** | ** | ** | ** | ** | ** | 23 | 21 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | 76 | 61 | 2nd Max 24-Hour Mean |
| PITTSTON | (S04) | 29 | 30 | 32 | 26 | 30 | 29 | 28 | 30 | 26 | 25 | Annual Mean |
| | | 69 | 70 | 63 | 64 | 64 | 50 | 71 | 64 | 65 | 44 | 2nd Max 24-Hour Mean |
| WILKES BARRE | (S07) | ** | ** | 28 | 24 | 29 | 24 | 24 | 27 | 24 | 23 | Annual Mean |
| | | ** | ** | 61 | 63 | 66 | 44 | 57 | 60 | 64 | 57 | 2nd Max 24-Hour Mean |
| SCRANTON | (S15) | 29 | 29 | 26 | 26 | 28 | 23 | 27 | 29 | 26 | 24 | Annual Mean |
| | | 71 | 67 | 51 | 56 | 65 | 41 | 72 | 60 | 64 | 49 | 2nd Max 24-Hour Mean |
| WILKES BARRE (TEOM) | (S28) | ** | ** | ** | ** | ** | ** | ** | ** | 21 | 21 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | 60 | 60 | 2nd Max 24-Hour Mean |
| *Reading Air Basin* | | | | | | | | | | | | |
| READING (TEOM) | (R01) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 22 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 52 | 2nd Max 24-Hour Mean |
| READING | (R01) | ** | ** | 31 | 26 | 28 | 23 | 25 | 30 | 26 | ** | Annual Mean |
| | | ** | ** | 52 | 61 | 67 | 47 | 55 | 80 | 54 | ** | 2nd Max 24-Hour Mean |
| TEMPLE | (R09) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 30 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 57 | 2nd Max 24-Hour Mean |
| READING CENTRAL | (R15) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 29 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 66 | 2nd Max 24-Hour Mean |
| *Harrisburg Air Basin* | | | | | | | | | | | | |
| HARRISBURG | (H11) | 29 | 34 | 30 | 27 | 28 | 23 | 27 | 33 | 29 | ** | Annual Mean |
| | | 68 | 88 | 62 | 59 | 56 | 42 | 65 | 77 | 61 | ** | 2nd Max 24-Hour Mean |
| HARRISBURG (TEOM) | (H11) | ** | ** | ** | ** | ** | ** | 25 | 24 | 22 | 23 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | 64 | 72 | 67 | 63 | 2nd Max 24-Hour Mean |
| *Lancaster Air Basin* | | | | | | | | | | | | |
| LANCASTER (TEOM) | (L01) | ** | ** | ** | ** | ** | ** | ** | ** | 27 | 24 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | 72 | 69 | 2nd Max 24-Hour Mean |
| LANCASTER | (L05) | ** | ** | ** | 31 | 30 | 27 | 31 | 38 | 33 | 31 | Annual Mean |
| | | ** | ** | ** | 59 | 51 | 45 | 68 | 117 | 73 | 63 | 2nd Max 24-Hour Mean |

TABLE E-2
PM-10 PARTICULATE MATTER HISTORICAL TREND
(Units: micrograms/cubic meter)

| STATION & SITE CODE | | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *York Air Basin* | | | | | | | | | | | | |
| YORK (TEOM) | (Y01) | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | 2nd Max 24-Hour Mean |
| WEST YORK | (Y07) | ** | 33 | 31 | 30 | 32 | 27 | 31 | 32 | 30 | 29 | Annual Mean |
| | | ** | 81 | 57 | 63 | 69 | 47 | 77 | 80 | 66 | 51 | 2nd Max 24-Hour Mean |
| *DEP Region 3 Non-Air Basin* | | | | | | | | | | | | |
| PERRY COUNTY | (305) | ** | ** | 21 | 19 | 22 | 18 | 21 | 22 | 21 | 19 | Annual Mean |
| | | ** | ** | 60 | 45 | 48 | 30 | 58 | 59 | 59 | 39 | 2nd Max 24-Hour Mean |
| *Altoona Non-Air Basin* | | | | | | | | | | | | |
| ALTOONA | (308) | 29 | 31 | 25 | 21 | 26 | 21 | 23 | 25 | 25 | ** | Annual Mean |
| | | 73 | 75 | 60 | 53 | 65 | 38 | 62 | 72 | 57 | ** | 2nd Max 24-Hour Mean |
| ALTOONA (TEOM) | (308) | ** | ** | ** | ** | ** | ** | ** | ** | 25 | 23 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | 70 | 60 | 2nd Max 24-Hour Mean |
| *Williamsport Non-Air Basin* | | | | | | | | | | | | |
| WILLIAMSPORT | (401) | ** | ** | 29 | 26 | 31 | 24 | 24 | 28 | 28 | 25 | Annual Mean |
| | | ** | ** | 62 | 60 | 67 | 42 | 58 | 61 | 59 | 46 | 2nd Max 24-Hour Mean |
| *Johnstown Air Basin* | | | | | | | | | | | | |
| JOHNSTOWN | (J01) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 28 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 63 | 2nd Max 24-Hour Mean |
| JOHNSTOWN CENTRAL | (J03) | ** | ** | 33 | 28 | 33 | 28 | 27 | 29 | 27 | ** | Annual Mean |
| | | ** | ** | 70 | 58 | 70 | 56 | 63 | 69 | 61 | ** | 2nd Max 24-Hour Mean |
| *Monongahela Valley Air Basin* | | | | | | | | | | | | |
| CHARLEROI (TEOM) | (M01) | ** | ** | ** | ** | ** | ** | ** | ** | 26 | 26 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | 74 | 72 | 2nd Max 24-Hour Mean |
| MONESSEN | (M02) | ** | ** | 41 | 30 | 34 | 30 | 27 | 31 | 32 | ** | Annual Mean |
| | | ** | ** | 99 | 69 | 70 | 77 | 61 | 98 | 72 | ** | 2nd Max 24-Hour Mean |
| MONESSEN | (M16) | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | 2nd Max 24-Hour Mean |

TABLE E-2
PM-10 PARTICULATE MATTER HISTORICAL TREND
(Units: micrograms/cubic meter)

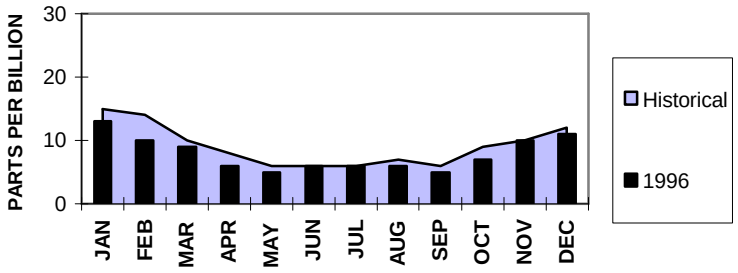
| STATION & SITE CODE | | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Lower Beaver Valley Air Basin* | | | | | | | | | | | | |
| BADEN (TEOM) | (B01) | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | 2nd Max 24-Hour Mean |
| BEAVER FALLS (TEOM) | (B11) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 26 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 76 | 2nd Max 24-Hour Mean |
| BADEN | (B17) | ** | ** | 31 | 24 | 27 | 20 | 22 | 27 | ** | 22 | Annual Mean |
| | | ** | ** | 66 | 51 | 60 | 50 | 64 | 58 | ** | 50 | 2nd Max 24-Hour Mean |
| BEAVER FALLS | (B18) | ** | ** | 33 | 26 | 30 | 24 | 28 | 32 | ** | 28 | Annual Mean |
| | | ** | ** | 64 | 55 | 66 | 61 | 57 | 67 | ** | 52 | 2nd Max 24-Hour Mean |
| *Upper Beaver Valley Air Basin* | | | | | | | | | | | | |
| NEW CASTLE | (B21) | 42 | 39 | 39 | 34 | 37 | 31 | 31 | 36 | 43 | 32 | Annual Mean |
| | | 98 | 101 | 93 | 75 | 66 | 69 | 82 | 94 | 104 | 67 | 2nd Max 24-Hour Mean |
| NEW CASTLE (TEOM) | (B21) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 33 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 91 | 2nd Max 24-Hour Mean |
| BESSEMER | (B26) | ** | ** | ** | ** | ** | ** | ** | 29 | 27 | 27 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | 61 | 58 | 43 | 2nd Max 24-Hour Mean |
| *Erie Air Basin* | | | | | | | | | | | | |
| ERIE | (E10) | ** | 35 | 27 | 27 | 29 | 22 | 26 | 29 | 29 | ** | Annual Mean |
| | | ** | 87 | 73 | 71 | 68 | 56 | 59 | 54 | 94 | ** | 2nd Max 24-Hour Mean |
| ERIE (TEOM) | (E10) | ** | ** | ** | ** | ** | ** | ** | ** | ** | 20 | Annual Mean |
| | | ** | ** | ** | ** | ** | ** | ** | ** | ** | 61 | 2nd Max 24-Hour Mean |
| *Shenango Valley Non-Air Basin* | | | | | | | | | | | | |
| FARRELL | (602) | 34 | 37 | 35 | 30 | 36 | 27 | 28 | 30 | 28 | 29 | Annual Mean |
| | | 85 | 84 | 88 | 68 | 73 | 58 | 56 | 68 | 72 | 52 | 2nd Max 24-Hour Mean |

# SULFUR DIOXIDE

Sulfur dioxide is a gaseous pollutant which is emitted primarily by industrial furnaces or power plants burning coal or oil containing sulfur. The major health effects associated with high exposures to sulfur dioxide include effects on breathing and respiratory illness symptoms. The population most sensitive to sulfur dioxide include asthmatics and individuals with chronic lung disease or cardiovascular disease. Sulfur dioxide damages trees, plants and agricultural crops and acts as a precursor to acid rain.

Figure F-1 shows the sulfur dioxide 10-year trend (1987 to 1996) of the annual arithmetic mean in the 12 air basins and the Altoona, Williamsport and Shenango Valley non-air basins. The solid line represents the annual air quality standard of 0.030 parts per million (ppm). Sulfur dioxide levels have improved slightly or remained the same over the last 10 year period. The 1996 averages continue to be below 50% of the ambient air quality standard.

**Figure F-2. SULFUR DIOXIDE SEASONAL TRENDS**
**Comparision of 1991-95 to 1996**

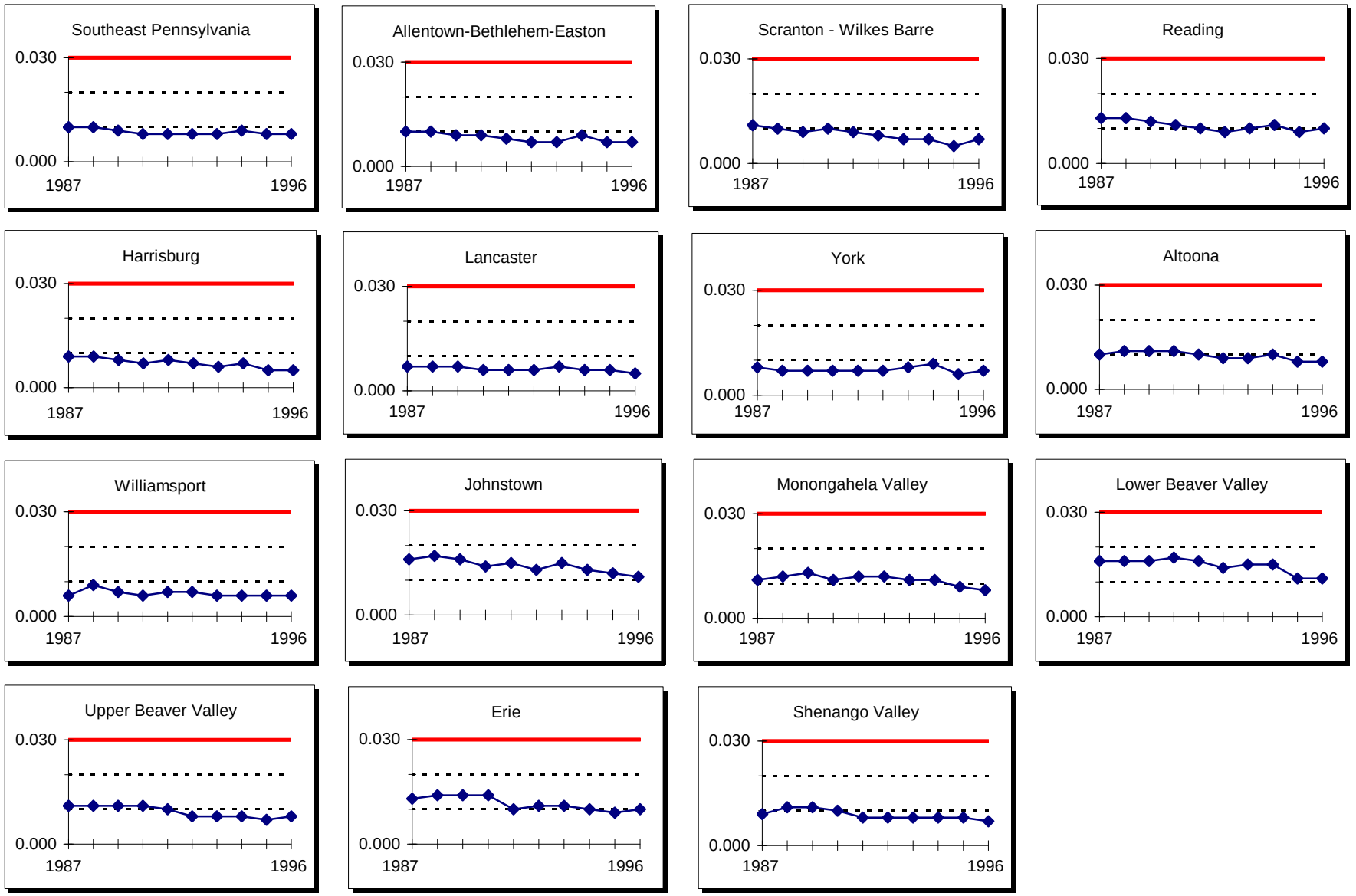



Sulfur dioxide levels correlate significantly with ambient temperatures. As temperatures go down, the space heating requirements increase resulting in additional burning of coal and oil. The seasonal trend for sulfur dioxide is shown in Figure F-2 for 1996 and the average levels for the preceding five years.

Sulfur dioxide data for all sites that operated in 1996 is summarized in Table F-1. The summary includes the annual arithmetic mean, the percentage of valid 1-hour data collected, the number of running 3-hour and 24-hour air quality standard exceedances, the two maximum running 3-hour and 24-hour means with dates of occurrence and the number of 24-hour running averages in the indicated ranges. All sites in the Commonwealth met the annual mean, 3-hour and 24-hour ambient air quality standards.

Sulfur dioxide historical data over the last ten years is presented in Table F-2 for all stations that operated in 1996 with at least 50 percent valid data. The data includes the annual arithmetic mean, the second maximum 24-hour and 3-hour running averages. Sulfur dioxide levels for all standard levels improved slightly at the majority of monitoring sites in 1996 as compared to 1995.

FIGURE F-1. SULFUR DIOXIDE TRENDS IN PENNSYLVANIA 1987 to 1996
ANNUAL ARITHMETIC MEANS (PARTS PER MILLION)



# TABLE F-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## SULFUR DIOXIDE SUMMARY

(Units: parts per million)

## YEAR: 1996

| Site Name | PA Site Code | Percent Valid Data | Annual Mean | Number 3 HR > 0.50 | 1st Max 3 HR Mean | 1st Max 3 HR Date MM/DD/HH | 2nd Max 3 HR Mean | 2nd Max 3 HR Date MM/DD/HH | Number 24 HR > 0.14 | 1st Max 24 HR Mean | 1st Max 24 HR Date MM/DD/HH | 2nd Max 24 HR Mean | 2nd Max 24 HR Date MM/DD/HH | Number of 24 Hour Values In Ranges .00 to .04 | .05 to .08 | .09 to .12 | .13 to .16 | .17 to .20 | .21 to .24 | .25 to .28 | > .28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Southeast Pennsylvania Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Bristol | P01 | 98.5 | 0.007 | 0 | 0.056 | 01/17/15 | 0.048 | 01/17/17 | 0 | 0.029 | 01/18/03 | 0.028 | 01/15/00 | 8701 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chester | P11 | 97.3 | 0.008 | 0 | 0.085 | 01/22/17 | 0.052 | 01/30/12 | 0 | 0.030 | 01/14/17 | 0.026 | 12/21/18 | 8634 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Norristown | P21 | 96.4 | 0.008 | 0 | 0.057 | 02/06/10 | 0.043 | 01/17/20 | 0 | 0.031 | 02/07/07 | 0.030 | 01/14/17 | 8622 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Allentown-Bethlehem-Easton Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Allentown | A19 | 95.3 | 0.006 | 0 | 0.060 | 01/07/06 | 0.055 | 01/16/15 | 0 | 0.041 | 01/03/11 | 0.040 | 01/07/23 | 8414 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bethlehem | A21 | 64.8 | 0.010 | 0 | 0.059 | 01/16/14 | 0.055 | 01/22/13 | 0 | 0.040 | 03/12/11 | 0.039 | 01/17/10 | 5733 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Easton | A41 | 98.9 | 0.006 | 0 | 0.072 | 03/11/12 | 0.054 | 08/31/12 | 0 | 0.030 | 03/12/07 | 0.023 | 02/06/12 | 8742 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Scranton-Wilkes-Barre Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Scranton | S01 | 99.4 | 0.007 | 0 | 0.043 | 01/01/02 | 0.043 | 02/06/08 | 0 | 0.037 | 01/10/08 | 0.033 | 01/01/23 | 8761 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wilkes-Barre | S28 | 97.6 | 0.006 | 0 | 0.057 | 01/09/14 | 0.046 | 12/21/13 | 0 | 0.039 | 01/10/08 | 0.025 | 01/10/17 | 8614 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Reading Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Reading | R01 | 94.6 | 0.009 | 0 | 0.166 | 06/28/05 | 0.104 | 06/28/07 | 0 | 0.049 | 01/17/13 | 0.039 | 06/28/11 | 8421 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reading | R20 | 96.2 | 0.010 | 0 | 0.070 | 10/07/11 | 0.069 | 08/06/11 | 0 | 0.051 | 01/17/11 | 0.038 | 01/17/01 | 8473 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Harrisburg Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Harrisburg | H11 | 98.0 | 0.005 | 0 | 0.053 | 08/19/19 | 0.050 | 03/12/08 | 0 | 0.029 | 03/12/22 | 0.024 | 01/14/11 | 8686 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Lancaster Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Lancaster | L01 | 97.2 | 0.005 | 0 | 0.042 | 08/23/14 | 0.041 | 08/02/16 | 0 | 0.024 | 12/21/12 | 0.023 | 01/14/14 | 8582 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**** Primary Annual Mean = 0.03 parts per million ****
**** Primary 24 Hour Running Mean = 0.14 parts per million ****
**** Seconday 3 Hour Running Mean = 0.50 parts per million ****

# TABLE F-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## SULFUR DIOXIDE SUMMARY

(Units: parts per million)

## YEAR: 1996

| Site Name | PA Site Code | Percent Valid Data | Annual Mean | Number 3 HR > 0.50 | 1st Max 3 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 3 HR Mean | 2nd Max Date MM/DD/HH | Number 24 HR > 0.14 | 1st Max 24 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 24 HR Mean | 2nd Max Date MM/DD/HH | Number of 24 Hour Values In Ranges .00 to .04 | .05 to .08 | .09 to .12 | .13 to .16 | .17 to .20 | .21 to .24 | .25 to .28 | > .28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***York Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| York | Y01 | 97.8 | 0.007 | 0 | 0.061 | 05/24/11 | 0.061 | 03/12/10 | 0 | 0.026 | 03/13/02 | 0.022 | 01/23/01 | 8653 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 3 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Perry County | 305 | 96.6 | 0.005 | 0 | 0.050 | 02/27/10 | 0.048 | 03/12/11 | 0 | 0.024 | 01/14/07 | 0.021 | 01/16/21 | 8573 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Altoona Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Altoona East | 308 | 98.7 | 0.008 | 0 | 0.079 | 03/13/14 | 0.073 | 02/02/04 | 0 | 0.049 | 01/14/02 | 0.036 | 03/04/13 | 8720 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Williamsport Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Williamsport | 407 | 97.4 | 0.006 | 0 | 0.104 | 02/27/13 | 0.058 | 02/27/15 | 0 | 0.035 | 01/18/07 | 0.031 | 01/17/13 | 8580 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Johnstown Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Johnstown | J01 | 96.0 | 0.011 | 0 | 0.106 | 06/27/17 | 0.085 | 09/19/12 | 0 | 0.037 | 01/09/17 | 0.035 | 01/13/20 | 8494 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Monongahela Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Charleroi | M01 | 98.7 | 0.008 | 0 | 0.098 | 11/29/14 | 0.086 | 11/28/18 | 0 | 0.043 | 11/29/14 | 0.033 | 12/20/23 | 8698 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Lower Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Baden | B01 | 98.1 | 0.010 | 0 | 0.060 | 09/20/17 | 0.059 | 02/01/16 | 0 | 0.032 | 11/24/17 | 0.028 | 01/10/02 | 8678 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Beaver Falls | B11 | 98.0 | 0.007 | 0 | 0.086 | 03/13/13 | 0.078 | 01/14/08 | 0 | 0.045 | 01/14/16 | 0.038 | 01/09/21 | 8677 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hookstown | B23 | 95.0 | 0.011 | 0 | 0.129 | 01/22/15 | 0.113 | 03/13/12 | 0 | 0.056 | 01/22/22 | 0.051 | 09/21/11 | 8388 | 33 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brighton Township | B27 | 97.9 | 0.015 | 0 | 0.255 | 06/16/03 | 0.217 | 09/21/00 | 0 | 0.081 | 03/14/06 | 0.071 | 10/16/21 | 8413 | 275 | 0 | 0 | 0 | 0 | 0 | 0 |

**** Primary Annual Mean = 0.03 parts per million ****
**** Primary 24 Hour Running Mean = 0.14 parts per million ****
**** Seconday 3 Hour Running Mean = 0.50 parts per million ****

# TABLE F-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## SULFUR DIOXIDE SUMMARY

(Units: parts per million)

## YEAR: 1996

| Site Name | PA Site Code | Percent Valid Data | Annual Mean | Number 3 HR > 0.50 | 1st Max 3 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 3 HR Mean | 2nd Max Date MM/DD/HH | Number 24 HR > 0.14 | 1st Max 24 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 24 HR Mean | 2nd Max Date MM/DD/HH | Number of 24 Hour Values In Ranges .00 to .04 | .05 to .08 | .09 to .12 | .13 to .16 | .17 to .20 | .21 to .24 | .25 to .28 | > .28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***DEP Region 5 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Florence | 504 | 99.0 | 0.010 | 0 | 0.125 | 03/18/12 | 0.101 | 02/05/11 | 0 | 0.050 | 01/09/22 | 0.038 | 11/05/09 | 8700 | 16 | 0 | 0 | 0 | 0 | 0 | 0 |
| Washington | 508 | 99.5 | 0.008 | 0 | 0.096 | 03/10/16 | 0.095 | 02/01/15 | 0 | 0.048 | 01/14/03 | 0.037 | 01/14/11 | 8746 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Upper Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| New Castle | B21 | 99.2 | 0.008 | 0 | 0.079 | 03/13/13 | 0.064 | 02/10/11 | 0 | 0.042 | 01/23/04 | 0.038 | 02/07/19 | 8747 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Erie Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Erie | E10 | 93.1 | 0.010 | 0 | 0.182 | 12/11/17 | 0.179 | 01/02/22 | 0 | 0.130 | 01/03/05 | 0.080 | 12/12/06 | 8153 | 69 | 16 | 5 | 0 | 0 | 0 | 0 |
| ***Shenango Valley Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Farrell | 606 | 99.4 | 0.007 | 0 | 0.070 | 01/22/19 | 0.064 | 11/29/13 | 0 | 0.034 | 01/23/02 | 0.031 | 10/16/13 | 8739 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 6 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Warren | 611 | 98.5 | 0.008 | 0 | 0.109 | 09/11/11 | 0.096 | 09/20/11 | 0 | 0.036 | 01/22/21 | 0.029 | 09/12/03 | 8670 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Warren | 612 | 7.7 | 0.014 | 0 | 0.096 | 12/11/01 | 0.095 | 12/08/03 | 0 | 0.046 | 12/21/00 | 0.044 | 12/11/08 | 664 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |

**** Primary Annual Mean = 0.03 parts per million ****
**** Primary 24 Hour Running Mean = 0.14 parts per million ****
**** Seconday 3 Hour Running Mean = 0.50 parts per million ****

TABLE F-2
SULFUR DIOXIDE
HISTORICAL TREND
(Units: parts per million)

| STATION & CODE | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Southeast Pennsylvania Air Basin* | | | | | | | | | | | |
| BRISTOL | 0.009 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.006 | 0.007 | Annual Mean |
| P01 | 0.041 | 0.051 | 0.036 | 0.040 | 0.034 | 0.038 | 0.029 | 0.043 | 0.034 | 0.028 | 2nd Max 24-Hour Mean |
| | 0.063 | 0.084 | 0.055 | 0.063 | 0.068 | 0.061 | 0.050 | 0.083 | 0.048 | 0.043 | 2nd Max 3-Hour Mean |
| CHESTER | 0.011 | 0.012 | 0.010 | 0.009 | 0.008 | 0.008 | 0.009 | 0.010 | 0.008 | 0.008 | Annual Mean |
| P11 | 0.047 | 0.061 | 0.042 | 0.031 | 0.029 | 0.036 | 0.028 | 0.039 | 0.028 | 0.026 | 2nd Max 24-Hour Mean |
| | 0.078 | 0.122 | 0.087 | 0.075 | 0.068 | 0.060 | 0.053 | 0.074 | 0.055 | 0.052 | 2nd Max 3-Hour Mean |
| NORRISTOWN | 0.010 | 0.010 | 0.009 | 0.008 | 0.008 | 0.008 | 0.008 | 0.010 | 0.009 | 0.008 | Annual Mean |
| P21 | 0.042 | 0.045 | 0.044 | 0.032 | 0.031 | 0.037 | 0.031 | 0.049 | 0.025 | 0.030 | 2nd Max 24-Hour Mean |
| | 0.065 | 0.070 | 0.070 | 0.066 | 0.062 | 0.058 | 0.056 | 0.066 | 0.037 | 0.043 | 2nd Max 3-Hour Mean |
| *Allentown-Bethlehem-Easton Air Basin* | | | | | | | | | | | |
| ALLENTOWN | 0.010 | 0.010 | 0.010 | 0.008 | 0.007 | 0.006 | 0.007 | 0.008 | 0.006 | 0.006 | Annual Mean |
| A19 | 0.047 | 0.052 | 0.055 | 0.041 | 0.045 | 0.030 | 0.034 | 0.057 | 0.030 | 0.040 | 2nd Max 24-Hour Mean |
| | 0.071 | 0.085 | 0.087 | 0.064 | 0.082 | 0.049 | 0.058 | 0.088 | 0.054 | 0.055 | 2nd Max 3-Hour Mean |
| BETHLEHEM | 0.012 | 0.012 | 0.010 | 0.010 | 0.008 | 0.008 | 0.009 | 0.010 | 0.010 | 0.010 | Annual Mean |
| A21 | 0.037 | 0.054 | 0.049 | 0.044 | 0.034 | 0.033 | 0.028 | 0.049 | 0.029 | 0.039 | 2nd Max 24-Hour Mean |
| | 0.066 | 0.077 | 0.082 | 0.079 | 0.060 | 0.051 | 0.056 | 0.071 | 0.050 | 0.055 | 2nd Max 3-Hour Mean |
| EASTON | 0.008 | 0.009 | 0.008 | 0.008 | 0.009 | 0.008 | 0.006 | 0.008 | 0.006 | 0.006 | Annual Mean |
| A41 | 0.042 | 0.049 | 0.036 | 0.040 | 0.033 | 0.036 | 0.028 | 0.043 | 0.027 | 0.023 | 2nd Max 24-Hour Mean |
| | 0.089 | 0.094 | 0.084 | 0.086 | 0.062 | 0.047 | 0.062 | 0.068 | 0.049 | 0.054 | 2nd Max 3-Hour Mean |
| *Scranton-Wilkes Barre Air Basin* | | | | | | | | | | | |
| SCRANTON | 0.011 | 0.010 | 0.009 | 0.010 | 0.011 | 0.009 | 0.008 | 0.007 | 0.005 | 0.007 | Annual Mean |
| S01 | 0.058 | 0.058 | 0.049 | 0.047 | 0.046 | 0.049 | 0.028 | 0.042 | 0.045 | 0.033 | 2nd Max 24-Hour Mean |
| | 0.092 | 0.080 | 0.072 | 0.064 | 0.125 | 0.095 | 0.047 | 0.087 | 0.068 | 0.043 | 2nd Max 3-Hour Mean |
| WILKES BARRE | 0.010 | 0.010 | 0.009 | 0.010 | 0.006 | 0.006 | 0.006 | 0.007 | 0.005 | 0.006 | Annual Mean |
| S28 | 0.048 | 0.053 | 0.049 | 0.057 | 0.033 | 0.044 | 0.026 | 0.038 | 0.030 | 0.025 | 2nd Max 24-Hour Mean |
| | 0.079 | 0.086 | 0.079 | 0.076 | 0.047 | 0.076 | 0.047 | 0.063 | 0.064 | 0.046 | 2nd Max 3-Hour Mean |
| *Reading Air Basin* | | | | | | | | | | | |
| READING | 0.011 | 0.011 | 0.010 | 0.009 | 0.008 | 0.008 | 0.009 | 0.010 | 0.009 | 0.009 | Annual Mean |
| R01 | 0.043 | 0.049 | 0.046 | 0.034 | 0.029 | 0.028 | 0.033 | 0.042 | 0.041 | 0.039 | 2nd Max 24-Hour Mean |
| | 0.098 | 0.085 | 0.103 | 0.077 | 0.073 | 0.072 | 0.100 | 0.092 | 0.087 | 0.104 | 2nd Max 3-Hour Mean |
| READING CBD | 0.014 | 0.014 | 0.014 | 0.012 | 0.011 | 0.009 | 0.010 | 0.012 | 0.009 | 0.010 | Annual Mean |
| R20 | 0.052 | 0.063 | 0.055 | 0.058 | 0.041 | 0.038 | 0.038 | 0.053 | 0.033 | 0.038 | 2nd Max 24-Hour Mean |
| | 0.090 | 0.100 | 0.112 | 0.090 | 0.076 | 0.062 | 0.074 | 0.081 | 0.075 | 0.069 | 2nd Max 3-Hour Mean |

TABLE F-2
SULFUR DIOXIDE
HISTORICAL TREND
(Units: parts per million)

| STATION & CODE | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Harrisburg Air Basin* | | | | | | | | | | | |
| HARRISBURG | 0.009 | 0.009 | 0.008 | 0.007 | 0.008 | 0.007 | 0.006 | 0.007 | 0.005 | 0.005 | Annual Mean |
| H11 | 0.038 | 0.032 | 0.041 | 0.026 | 0.027 | 0.031 | 0.029 | 0.043 | 0.020 | 0.024 | 2nd Max 24-Hour Mean |
| | 0.069 | 0.065 | 0.067 | 0.052 | 0.065 | 0.071 | 0.050 | 0.055 | 0.066 | 0.050 | 2nd Max 3-Hour Mean |
| *Lancaster Air Basin* | | | | | | | | | | | |
| LANCASTER | 0.007 | 0.007 | 0.007 | 0.006 | 0.006 | 0.006 | 0.007 | 0.006 | 0.006 | 0.005 | Annual Mean |
| L01 | 0.033 | 0.029 | 0.037 | 0.029 | 0.024 | 0.025 | 0.029 | 0.032 | 0.019 | 0.023 | 2nd Max 24-Hour Mean |
| | 0.063 | 0.062 | 0.074 | 0.075 | 0.063 | 0.053 | 0.059 | 0.049 | 0.044 | 0.041 | 2nd Max 3-Hour Mean |
| *York Air Basin* | | | | | | | | | | | |
| YORK | 0.008 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.008 | 0.009 | 0.006 | 0.007 | Annual Mean |
| Y01 | 0.036 | 0.031 | 0.038 | 0.025 | 0.023 | 0.035 | 0.035 | 0.044 | 0.021 | 0.022 | 2nd Max 24-Hour Mean |
| | 0.105 | 0.071 | 0.087 | 0.080 | 0.070 | 0.086 | 0.090 | 0.086 | 0.062 | 0.061 | 2nd Max 3-Hour Mean |
| *DEP Region 3 Non-Air Basin* | | | | | | | | | | | |
| PERRY COUNTY | 0.006 | 0.006 | 0.007 | 0.007 | 0.008 | 0.007 | 0.008 | 0.008 | 0.004 | 0.005 | Annual Mean |
| 305 | 0.027 | 0.021 | 0.021 | 0.018 | 0.016 | 0.017 | 0.018 | 0.030 | 0.019 | 0.021 | 2nd Max 24-Hour Mean |
| | 0.042 | 0.040 | 0.046 | 0.032 | 0.036 | 0.043 | 0.042 | 0.045 | 0.052 | 0.048 | 2nd Max 3-Hour Mean |
| *Altoona Non-Air Basin* | | | | | | | | | | | |
| ALTOONA | 0.010 | 0.011 | 0.011 | 0.011 | 0.010 | 0.009 | 0.009 | 0.010 | 0.008 | 0.008 | Annual Mean |
| 308 | 0.061 | 0.060 | 0.066 | 0.070 | 0.050 | 0.056 | 0.053 | 0.070 | 0.039 | 0.036 | 2nd Max 24-Hour Mean |
| | 0.117 | 0.101 | 0.104 | 0.125 | 0.085 | 0.100 | 0.077 | 0.108 | 0.067 | 0.073 | 2nd Max 3-Hour Mean |
| *Williamsport Non-Air Basin* | | | | | | | | | | | |
| WILLIAMSPORT | 0.006 | 0.009 | 0.007 | 0.006 | 0.007 | 0.007 | 0.006 | 0.006 | 0.006 | 0.006 | Annual Mean |
| 407 | 0.028 | 0.037 | 0.042 | 0.029 | 0.026 | 0.047 | 0.026 | 0.048 | 0.028 | 0.031 | 2nd Max 24-Hour Mean |
| | 0.044 | 0.062 | 0.074 | 0.049 | 0.052 | 0.075 | 0.047 | 0.080 | 0.051 | 0.058 | 2nd Max 3-Hour Mean |
| *Johnstown Air Basin* | | | | | | | | | | | |
| JOHNSTOWN | 0.016 | 0.017 | 0.016 | 0.014 | 0.015 | 0.013 | 0.015 | 0.013 | 0.012 | 0.011 | Annual Mean |
| J01 | 0.065 | 0.061 | 0.094 | 0.052 | 0.055 | 0.067 | 0.050 | 0.081 | 0.046 | 0.035 | 2nd Max 24-Hour Mean |
| | 0.130 | 0.166 | 0.129 | 0.144 | 0.154 | 0.142 | 0.153 | 0.141 | 0.162 | 0.085 | 2nd Max 3-Hour Mean |
| *Monongahela Valley Air Basin* | | | | | | | | | | | |
| CHARLEROI | 0.011 | 0.012 | 0.013 | 0.011 | 0.012 | 0.012 | 0.011 | 0.011 | 0.009 | 0.008 | Annual Mean |
| M01 | 0.051 | 0.053 | 0.075 | 0.047 | 0.039 | 0.048 | 0.042 | 0.071 | 0.033 | 0.033 | 2nd Max 24-Hour Mean |
| | 0.101 | 0.146 | 0.115 | 0.105 | 0.094 | 0.140 | 0.084 | 0.194 | 0.097 | 0.086 | 2nd Max 3-Hour Mean |

TABLE F-2
SULFUR DIOXIDE
HISTORICAL TREND
(Units: parts per million)

| STATION & CODE | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Lower Beaver Valley Air Basin* | | | | | | | | | | | |
| BADEN | 0.012 | 0.013 | 0.012 | 0.012 | 0.012 | 0.013 | 0.013 | 0.012 | 0.009 | 0.010 | Annual Mean |
| B01 | 0.043 | 0.045 | 0.052 | 0.050 | 0.051 | 0.062 | 0.055 | 0.071 | 0.033 | 0.028 | 2nd Max 24-Hour Mean |
| | 0.101 | 0.104 | 0.149 | 0.096 | 0.112 | 0.112 | 0.114 | 0.132 | 0.076 | 0.059 | 2nd Max 3-Hour Mean |
| BEAVER FALLS | 0.012 | 0.013 | 0.013 | 0.013 | 0.013 | 0.012 | 0.012 | 0.012 | 0.009 | 0.007 | Annual Mean |
| B11 | 0.054 | 0.059 | 0.065 | 0.055 | 0.057 | 0.069 | 0.043 | 0.069 | 0.037 | 0.038 | 2nd Max 24-Hour Mean |
| | 0.105 | 0.123 | 0.130 | 0.126 | 0.122 | 0.125 | 0.099 | 0.129 | 0.075 | 0.078 | 2nd Max 3-Hour Mean |
| HOOKSTOWN | 0.019 | 0.018 | 0.014 | 0.020 | 0.020 | 0.012 | 0.017 | 0.018 | 0.012 | 0.011 | Annual Mean |
| B23 | 0.097 | 0.106 | 0.125 | 0.118 | 0.085 | 0.088 | 0.085 | 0.091 | 0.059 | 0.051 | 2nd Max 24-Hour Mean |
| | 0.238 | 0.331 | 0.394 | 0.243 | 0.191 | 0.181 | 0.218 | 0.175 | 0.127 | 0.113 | 2nd Max 3-Hour Mean |
| BRIGHTON TWP | *** | *** | *** | *** | *** | *** | *** | 0.015 | 0.015 | 0.015 | Annual Mean |
| B27 | *** | *** | *** | *** | *** | *** | *** | 0.095 | 0.094 | 0.071 | 2nd Max 24-Hour Mean |
| | *** | *** | *** | *** | *** | *** | *** | 0.235 | 0.221 | 0.217 | 2nd Max 3-Hour Mean |
| *DEP Region 5 Non-Air Basin* | | | | | | | | | | | |
| FLORENCE | 0.014 | 0.012 | 0.015 | 0.014 | 0.013 | 0.015 | 0.013 | 0.012 | 0.009 | 0.010 | Annual Mean |
| 504 | 0.089 | 0.057 | 0.085 | 0.071 | 0.057 | 0.080 | 0.058 | 0.090 | 0.039 | 0.038 | 2nd Max 24-Hour Mean |
| | 0.387 | 0.175 | 0.213 | 0.152 | 0.130 | 0.137 | 0.156 | 0.161 | 0.106 | 0.101 | 2nd Max 3-Hour Mean |
| WASHINGTON | 0.014 | 0.013 | 0.013 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.009 | 0.008 | Annual Mean |
| 508 | 0.053 | 0.054 | 0.080 | 0.050 | 0.045 | 0.056 | 0.062 | 0.060 | 0.049 | 0.037 | 2nd Max 24-Hour Mean |
| | 0.094 | 0.112 | 0.117 | 0.119 | 0.106 | 0.124 | 0.144 | 0.127 | 0.095 | 0.095 | 2nd Max 3-Hour Mean |
| *Upper Beaver Valley Air Basin* | | | | | | | | | | | |
| NEW CASTLE | 0.011 | 0.011 | 0.011 | 0.011 | 0.010 | 0.008 | 0.008 | 0.008 | 0.007 | 0.008 | Annual Mean |
| B21 | 0.044 | 0.071 | 0.055 | 0.061 | 0.053 | 0.054 | 0.043 | 0.044 | 0.037 | 0.038 | 2nd Max 24-Hour Mean |
| | 0.097 | 0.123 | 0.116 | 0.129 | 0.123 | 0.118 | 0.105 | 0.095 | 0.076 | 0.064 | 2nd Max 3-Hour Mean |
| *Erie Air Basin* | | | | | | | | | | | |
| ERIE | *** | 0.014 | 0.014 | 0.014 | 0.010 | 0.011 | 0.011 | 0.010 | 0.009 | 0.010 | Annual Mean |
| E10 | *** | 0.072 | 0.076 | 0.078 | 0.049 | 0.067 | 0.081 | 0.079 | 0.066 | 0.080 | 2nd Max 24-Hour Mean |
| | *** | 0.201 | 0.153 | 0.193 | 0.129 | 0.148 | 0.190 | 0.161 | 0.115 | 0.179 | 2nd Max 3-Hour Mean |
| *Shenango Valley Non-Air Basin* | | | | | | | | | | | |
| FARRELL | 0.009 | 0.011 | 0.011 | 0.010 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.007 | Annual Mean |
| 606 | 0.050 | 0.062 | 0.055 | 0.051 | 0.045 | 0.033 | 0.038 | 0.050 | 0.042 | 0.031 | 2nd Max 24-Hour Mean |
| | 0.106 | 0.112 | 0.119 | 0.166 | 0.108 | 0.080 | 0.085 | 0.093 | 0.069 | 0.064 | 2nd Max 3-Hour Mean |

TABLE F-2
SULFUR DIOXIDE
HISTORICAL TREND
(Units: parts per million)

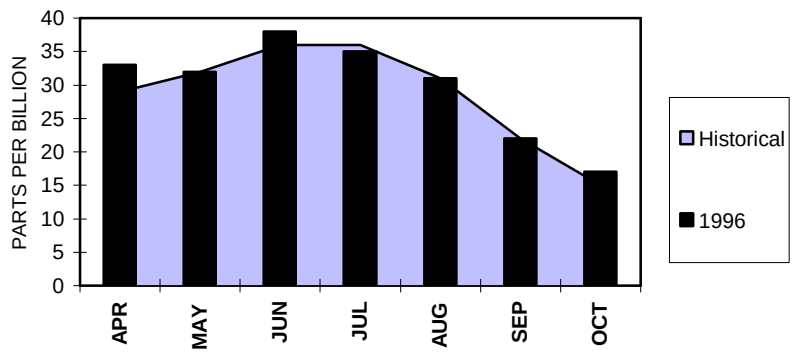
| STATION & CODE | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *DEP Region 6 Non-Air Basin* | | | | | | | | | | | |
| WARREN | *** | *** | *** | *** | *** | *** | *** | *** | 0.010 | 0.008 | Annual Mean |
| 611 | *** | *** | *** | *** | *** | *** | *** | *** | 0.028 | 0.029 | 2nd Max 24-Hour Mean |
| | *** | *** | *** | *** | *** | *** | *** | *** | 0.049 | 0.096 | 2nd Max 3-Hour Mean |
| WARREN | *** | *** | *** | *** | *** | *** | *** | *** | *** | *** | Annual Mean |
| 612 | *** | *** | *** | *** | *** | *** | *** | *** | *** | *** | 2nd Max 24-Hour Mean |
| | *** | *** | *** | *** | *** | *** | *** | *** | *** | *** | 2nd Max 3-Hour Mean |

# OZONE

Ozone, or photochemical smog, is a secondary pollutant in that it is not emitted directly to the atmosphere but rather formed in the atmosphere by the reactions of other pollutants. Ozone is formed during the summer months, when nitrogen oxides and volatile organic compounds combine and react in the presence of sunlight and warm temperatures. Nitrogen oxides come from burning fossil fuels at power plants, industrial boilers and motor vehicles. They combine with volatile organic compounds like evaporated gasoline and dry cleaning solvents to create ozone. Ozone is a strong irritant to the eyes and upper respiratory system. It hampers breathing and also damages crops and materials.

Ozone is erratic by nature, depending on the weather conditions that exist during the ozone season which is defined to be from April 1 to October 31 in Pennsylvania. For the 12 airs basins and the Altoona and Shenango Valley non-air basins, Figure G-1 shows the 10-year trend (1987 to 1996) of the number of days, during the ozone season, in which there was a daily 1-hour value greater than 0.12 parts per million (ppm).

**Figure G-2. OZONE SEASONAL TRENDS**
**Comparison of 1991-95 to 1996**

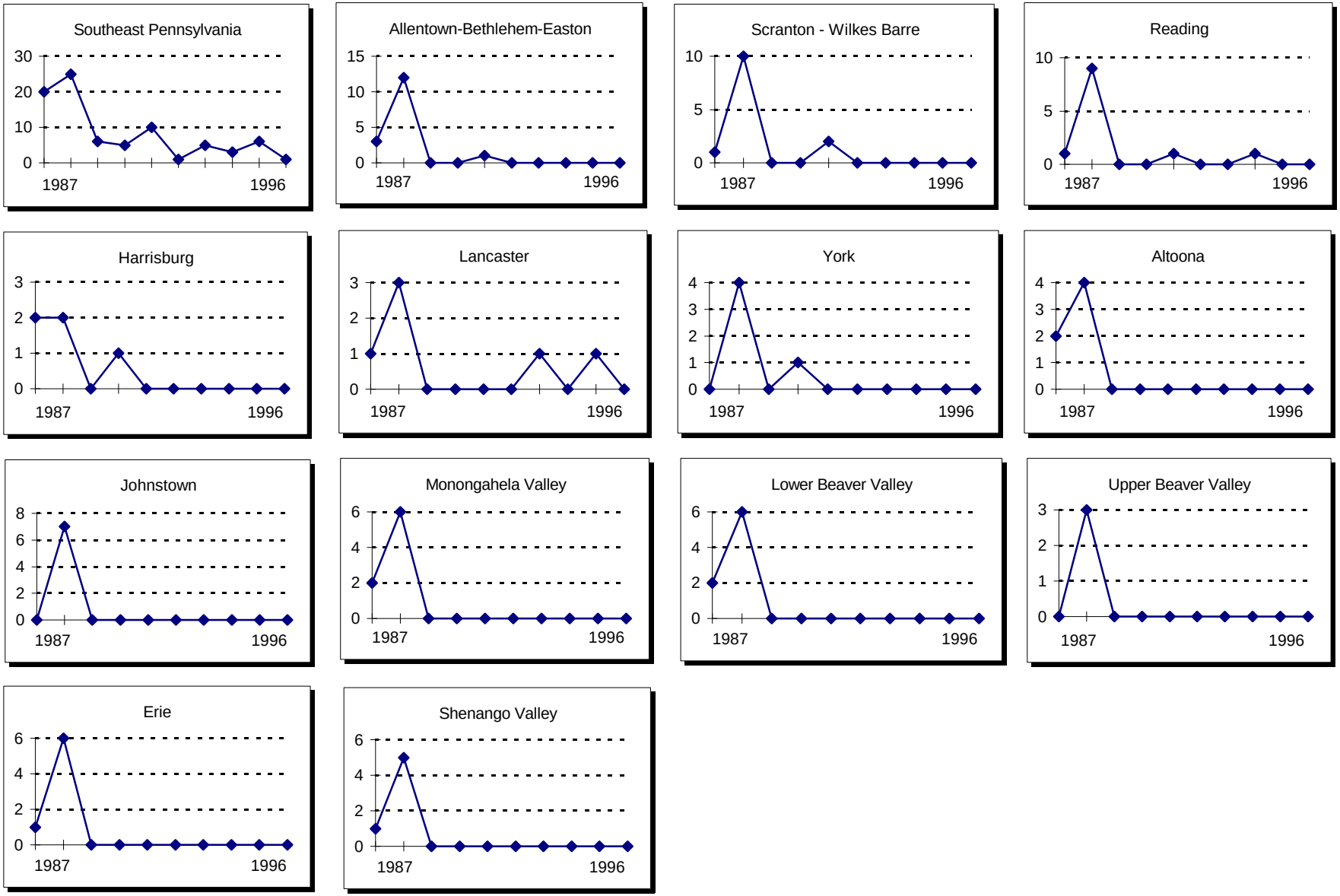



Ozone levels correlate significantly with ambient temperatures and the longer days present during the summer months. The seasonal trend for ozone is shown in Figure G-2 for 1996 and the average levels for the preceding five years.

Table G-1 summarizes ozone data during the ozone season of 1996. The data includes the annual mean, the percentage of 1-hour valid data values collected, the four highest daily 1-hour maximum values with dates of occurrence, the number of days exceeding the 0.12 ppm daily air quality standard and the number of daily 1-hour maximum values in the indicated ranges. Exceedances of the ambient air quality standard for ozone were only observed by DEP monitors in the Southeast Pennsylvania Air Basin at the Bristol monitoring site.

Historical data for ozone from 1987 to 1996 is contained in Table G-2 for all sites that operated during the ozone season in 1996. The data includes the second maximum daily 1-hour value, which is on a day different from the maximum daily 1-hour value, and the number of exceedances of the air quality standard for the year. To attain compliance with the air quality standard, a site can have no more than three exceedances of the 0.12 ppm standard over the last three years. Only the monitoring sites located in the Southeast Pennsylvania Air Basin have more than three exceedances in the last three years.

FIGURE G-1. OZONE TRENDS IN PENNSYLVANIA 1987 to 1996
NUMBER OF DAYS WITH MAXIMUM DAILY 1-HOUR VALUE > 0.12 PPM



# TABLE G-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## OZONE SUMMARY

(Units: parts per million)

## YEAR: 1996 (APRIL-OCTOBER)

| | | | | | | | | | | | | Number of 1 Hour Values In Ranges | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PA | Percent | Number | 1st Daily Max | | 2nd Daily Max | | 3nd Daily Max | | 4th Daily Max | | .00 | .05 | .09 | .13 | .17 | .21 | .25 | |
| | Site | Valid | Daily 1 HR | 1 HR | Date | 1 HR | Date | 1 HR | Date | 1 HR | Date | to | to | to | to | to | to | to | > |
| Site Name | Code | Data | >= 0.125 | Mean | MM/DD/HH | Mean | MM/DD/HH | Mean | MM/DD/HH | Mean | MM/DD/HH | .04 | .08 | .12 | .16 | .20 | .24 | .28 | .28 |
| ***Southeast Pennsylvania Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Bristol | P01 | 98.1 | 1 | 0.139 | 07/07/13 | 0.120 | 08/06/15 | 0.118 | 07/14/13 | 0.113 | 08/02/16 | 70 | 113 | 26 | 1 | 0 | 0 | 0 | 0 |
| Chester | P11 | 97.6 | 0 | 0.123 | 08/04/16 | 0.117 | 07/06/19 | 0.114 | 08/06/16 | 0.112 | 07/08/16 | 60 | 124 | 27 | 0 | 0 | 0 | 0 | 0 |
| Norristown | P21 | 96.2 | 0 | 0.120 | 08/06/16 | 0.118 | 07/01/17 | 0.111 | 07/07/12 | 0.109 | 06/22/17 | 71 | 113 | 22 | 0 | 0 | 0 | 0 | 0 |
| ***Allentown-Bethlehem-Easton Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Allentown | A19 | 95.5 | 0 | 0.116 | 08/15/17 | 0.114 | 08/06/14 | 0.111 | 07/07/16 | 0.105 | 08/07/20 | 78 | 107 | 20 | 0 | 0 | 0 | 0 | 0 |
| Bethlehem | A21 | 68.7 | 0 | 0.110 | 07/07/17 | 0.110 | 08/15/16 | 0.107 | 08/06/14 | 0.098 | 07/06/17 | 34 | 91 | 23 | 0 | 0 | 0 | 0 | 0 |
| Easton | A41 | 97.6 | 0 | 0.102 | 07/07/17 | 0.099 | 08/06/15 | 0.097 | 08/05/15 | 0.096 | 07/06/17 | 80 | 115 | 13 | 0 | 0 | 0 | 0 | 0 |
| ***Scranton-Wilkes-Barre Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Scranton | S01 | 97.8 | 0 | 0.111 | 08/07/13 | 0.108 | 08/06/14 | 0.106 | 07/07/17 | 0.093 | 08/05/14 | 73 | 125 | 12 | 0 | 0 | 0 | 0 | 0 |
| Nanticoke | S26 | 98.4 | 0 | 0.099 | 07/07/15 | 0.087 | 07/08/13 | 0.086 | 06/07/18 | 0.086 | 07/06/18 | 87 | 120 | 5 | 0 | 0 | 0 | 0 | 0 |
| Wilkes-Barre | S28 | 98.3 | 0 | 0.106 | 08/06/14 | 0.105 | 07/07/16 | 0.102 | 08/07/14 | 0.093 | 07/08/14 | 72 | 127 | 12 | 0 | 0 | 0 | 0 | 0 |
| Peckville | S29 | 99.6 | 0 | 0.114 | 08/06/15 | 0.113 | 08/07/13 | 0.107 | 07/07/17 | 0.092 | 07/18/14 | 73 | 131 | 10 | 0 | 0 | 0 | 0 | 0 |
| ***Reading Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Reading | R01 | 96.7 | 0 | 0.112 | 07/07/15 | 0.110 | 07/08/15 | 0.105 | 07/06/16 | 0.105 | 08/23/16 | 87 | 110 | 11 | 0 | 0 | 0 | 0 | 0 |
| ***Harrisburg Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Harrisburg | H11 | 99.0 | 0 | 0.104 | 06/07/17 | 0.096 | 07/07/12 | 0.090 | 07/06/16 | 0.087 | 06/22/14 | 79 | 126 | 6 | 0 | 0 | 0 | 0 | 0 |

**** Primary Daily 1 Hour Air Quality Standard of 0.12 parts per million ****

# TABLE G-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## OZONE SUMMARY

(Units: parts per million)

## YEAR: 1996 (APRIL-OCTOBER)

| | | | | | | | | | | | | Number of 1 Hour Values In Ranges | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PA | Percent | Number | 1st Daily Max | | 2nd Daily Max | | 3nd Daily Max | | 4th Daily Max | | .00 | .05 | .09 | .13 | .17 | .21 | .25 | |
| | Site | Valid | Daily 1 HR | 1 HR | Date | 1 HR | Date | 1 HR | Date | 1 HR | Date | to | to | to | to | to | to | to | > |
| Site Name | Code | Data | >= 0.125 | Mean | MM/DD/HH | Mean | MM/DD/HH | Mean | MM/DD/HH | Mean | MM/DD/HH | .04 | .08 | .12 | .16 | .20 | .24 | .28 | .28 |
| ***Lancaster Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Lancaster | L01 | 98.7 | 0 | 0.104 | 07/07/12 | 0.101 | 06/08/15 | 0.101 | 08/26/17 | 0.100 | 07/06/17 | 59 | 133 | 19 | 0 | 0 | 0 | 0 | 0 |
| ***York Air Basin*** | | | | | | | | | | | | | | | | | | | |
| York | Y01 | 97.6 | 0 | 0.105 | 08/07/18 | 0.098 | 08/08/18 | 0.095 | 06/07/16 | 0.094 | 07/07/12 | 79 | 122 | 9 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 3 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Perry County | 305 | 97.6 | 0 | 0.096 | 06/07/15 | 0.090 | 08/07/14 | 0.086 | 04/12/17 | 0.085 | 06/01/17 | 66 | 137 | 4 | 0 | 0 | 0 | 0 | 0 |
| Hershey | 306 | 99.6 | 0 | 0.104 | 06/07/16 | 0.104 | 07/07/12 | 0.099 | 07/06/15 | 0.097 | 08/05/16 | 72 | 124 | 17 | 0 | 0 | 0 | 0 | 0 |
| Kutztown | 310 | 99.6 | 0 | 0.103 | 07/07/15 | 0.100 | 07/08/16 | 0.099 | 06/17/13 | 0.098 | 08/07/15 | 75 | 129 | 10 | 0 | 0 | 0 | 0 | 0 |
| Methodist Hill | 313 | 55.4 | 0 | 0.113 | 08/07/21 | 0.096 | 07/07/05 | 0.092 | 08/08/00 | 0.088 | 08/23/13 | 30 | 84 | 6 | 0 | 0 | 0 | 0 | 0 |
| ***Altoona Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Altoona East | 308 | 98.2 | 0 | 0.118 | 07/06/18 | 0.101 | 06/17/14 | 0.097 | 07/07/13 | 0.094 | 06/30/14 | 63 | 139 | 8 | 0 | 0 | 0 | 0 | 0 |
| ***Williamsport Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Williamsport | 407 | 97.8 | 0 | 0.111 | 07/07/16 | 0.082 | 07/08/12 | 0.081 | 07/06/12 | 0.078 | 05/20/18 | 96 | 114 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***Johnstown Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Johnstown | J01 | 92.1 | 0 | 0.100 | 06/17/14 | 0.098 | 07/06/17 | 0.095 | 06/29/15 | 0.092 | 06/16/14 | 76 | 113 | 6 | 0 | 0 | 0 | 0 | 0 |
| ***Monongahela Valley Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Charleroi | M01 | 99.4 | 0 | 0.108 | 06/29/15 | 0.102 | 07/06/17 | 0.101 | 06/28/17 | 0.100 | 06/16/17 | 58 | 139 | 17 | 0 | 0 | 0 | 0 | 0 |

**** Primary Daily 1 Hour Air Quality Standard of 0.12 parts per million ****

# TABLE G-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## OZONE SUMMARY

(Units: parts per million)

## YEAR: 1996 (APRIL-OCTOBER)

| | | | | | | | | | | | | Number of 1 Hour Values In Ranges | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PA | Percent | Number | 1st Daily Max | | 2nd Daily Max | | 3nd Daily Max | | 4th Daily Max | | .00 | .05 | .09 | .13 | .17 | .21 | .25 | |
| | Site | Valid | Daily 1 HR | 1 HR | Date | 1 HR | Date | 1 HR | Date | 1 HR | Date | to | to | to | to | to | to | to | > |
| Site Name | Code | Data | >= 0.125 | Mean | MM/DD/HH | Mean | MM/DD/HH | Mean | MM/DD/HH | Mean | MM/DD/HH | .04 | .08 | .12 | .16 | .20 | .24 | .28 | .28 |
| ***Lower Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Beaver Falls | B11 | 95.1 | 0 | 0.112 | 08/04/16 | 0.105 | 08/07/16 | 0.103 | 08/06/16 | 0.096 | 06/01/16 | 72 | 111 | 19 | 0 | 0 | 0 | 0 | 0 |
| Hookstown | B23 | 98.4 | 0 | 0.104 | 07/02/19 | 0.104 | 08/07/15 | 0.101 | 07/07/20 | 0.099 | 06/29/22 | 53 | 142 | 16 | 0 | 0 | 0 | 0 | 0 |
| Brighton Township | B27 | 97.4 | 0 | 0.104 | 08/04/16 | 0.099 | 06/29/23 | 0.099 | 07/02/17 | 0.094 | 08/07/17 | 61 | 135 | 14 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 5 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Florence | 504 | 97.5 | 0 | 0.105 | 07/06/16 | 0.092 | 06/17/12 | 0.091 | 08/04/15 | 0.091 | 08/06/16 | 66 | 128 | 12 | 0 | 0 | 0 | 0 | 0 |
| Washington | 508 | 98.7 | 0 | 0.109 | 06/29/19 | 0.103 | 07/06/18 | 0.097 | 06/30/00 | 0.093 | 06/17/12 | 65 | 132 | 16 | 0 | 0 | 0 | 0 | 0 |
| Murrysville | 510 | 98.7 | 0 | 0.109 | 07/06/17 | 0.104 | 08/06/17 | 0.100 | 08/07/15 | 0.096 | 06/28/16 | 89 | 114 | 8 | 0 | 0 | 0 | 0 | 0 |
| ***Upper Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | |
| New Castle | B21 | 96.9 | 0 | 0.098 | 07/02/18 | 0.097 | 06/01/17 | 0.096 | 08/06/19 | 0.096 | 08/07/18 | 74 | 123 | 11 | 0 | 0 | 0 | 0 | 0 |
| ***Erie Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Erie | E10 | 96.5 | 0 | 0.105 | 07/07/18 | 0.100 | 08/07/18 | 0.097 | 06/28/17 | 0.093 | 08/06/18 | 74 | 125 | 5 | 0 | 0 | 0 | 0 | 0 |
| ***Shenango Valley Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Farrell | 606 | 99.3 | 0 | 0.105 | 06/29/14 | 0.103 | 06/28/19 | 0.101 | 06/01/18 | 0.101 | 07/12/16 | 67 | 126 | 21 | 0 | 0 | 0 | 0 | 0 |

**** Primary Daily 1 Hour Air Quality Standard of 0.12 parts per million ****

TABLE G-2
OZONE HISTORICAL TREND
(Units: parts per million)

| STATION | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Southeast Pennsylvania Air Basin* | | | | | | | | | | | |
| BRISTOL | 0.156 | 0.183 | 0.135 | 0.132 | 0.138 | 0.117 | 0.129 | 0.128 | 0.137 | 0.120 | 2nd Max Daily 1 Hour Average |
| P01 | 13 | 13 | 5 | 4 | 9 | 0 | 2 | 2 | 5 | 1 | Number Standard Exceedances |
| CHESTER | 0.137 | 0.193 | 0.126 | 0.138 | 0.125 | 0.109 | 0.123 | 0.118 | 0.126 | 0.117 | 2nd Max Daily 1 Hour Average |
| P11 | 7 | 17 | 2 | 2 | 3 | 0 | 1 | 1 | 2 | 0 | Number Standard Exceedances |
| NORRISTOWN | 0.147 | 0.159 | 0.121 | 0.116 | 0.125 | 0.114 | 0.130 | 0.115 | 0.114 | 0.118 | 2nd Max Daily 1 Hour Average |
| P21 | 9 | 15 | 0 | 1 | 2 | 1 | 3 | 0 | 1 | 0 | Number Standard Exceedances |
| *Allentown-Bethlehem-Easton Air Basin* | | | | | | | | | | | |
| ALLENTOWN | 0.127 | 0.138 | 0.102 | 0.109 | 0.118 | 0.095 | 0.104 | 0.105 | 0.109 | 0.114 | 2nd Max Daily 1 Hour Average |
| A19 | 3 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| BETHLEHEM | 0.112 | 0.145 | 0.099 | 0.094 | 0.107 | 0.096 | 0.105 | 0.119 | 0.116 | 0.110 | 2nd Max Daily 1 Hour Average |
| A21 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| EASTON | 0.013 | 0.163 | 0.098 | 0.111 | 0.120 | 0.096 | 0.110 | 0.105 | 0.108 | 0.099 | 2nd Max Daily 1 Hour Average |
| A41 | 3 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| *Scranton-Wilkes Barre Air Basin* | | | | | | | | | | | |
| SCRANTON | 0.109 | 0.146 | 0.105 | 0.10 | 0.126 | 0.096 | 0.111 | 0.106 | 0.105 | 0.108 | 2nd Max Daily 1 Hour Average |
| S01 | 1 | 8 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| NANTICOKE | 0.115 | 0.128 | 0.085 | 0.088 | 0.108 | 0.094 | 0.105 | 0.083 | 0.100 | 0.087 | 2nd Max Daily 1 Hour Average |
| S26 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| WILKES BARRE | 0.095 | 0.119 | 0.097 | 0.114 | 0.114 | 0.097 | 0.112 | 0.100 | 0.105 | 0.105 | 2nd Max Daily 1 Hour Average |
| S28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| PECKVILLE | *** | *** | *** | *** | 0.123 | 0.093 | 0.111 | 0.102 | 0.110 | 0.113 | 2nd Max Daily 1 Hour Average |
| S29 | * | * | * | * | 1 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| *Reading Air Basin* | | | | | | | | | | | |
| READING | 0.123 | 0.148 | 0.106 | 0.113 | 0.123 | 0.098 | 0.105 | 0.102 | 0.116 | 0.110 | 2nd Max Daily 1 Hour Average |
| R01 | 1 | 9 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | Number Standard Exceedances |

TABLE G-2
OZONE HISTORICAL TREND
(Units: parts per million)

| STATION | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Harrisburg Air Basin* | | | | | | | | | | | |
| HARRISBURG | 0.128 | 0.129 | 0.102 | 0.108 | 0.110 | 0.094 | 0.118 | 0.118 | 0.099 | 0.096 | 2nd Max Daily 1 Hour Average |
| H11 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| *Lancaster Air Basin* | | | | | | | | | | | |
| LANCASTER | 0.123 | 0.127 | 0.101 | 0.101 | 0.119 | 0.106 | 0.118 | 0.111 | 0.124 | 0.101 | 2nd Max Daily 1 Hour Average |
| L01 | 1 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | Number Standard Exceedances |
| *York Air Basin* | | | | | | | | | | | |
| YORK | 0.120 | 0.142 | 0.102 | 0.121 | 0.114 | 0.101 | 0.112 | 0.115 | 0.097 | 0.098 | 2nd Max Daily 1 Hour Average |
| Y01 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| *DEP Region 3 Non-Air Basin* | | | | | | | | | | | |
| PERRY COUNTY | 0.110 | 0.139 | 0.096 | 0.100 | 0.103 | 0.088 | 0.110 | 0.106 | 0.103 | 0.090 | 2nd Max Daily 1 Hour Average |
| 305 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| HERSHEY | 0.129 | 0.138 | 0.113 | 0.122 | 0.113 | 0.097 | 0.110 | 0.122 | 0.113 | 0.104 | 2nd Max Daily 1 Hour Average |
| 306 | 2 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| KUTZTOWN | 0.123 | 0.143 | 0.105 | 0.108 | 0.119 | 0.100 | 0.110 | 0.106 | 0.107 | 0.100 | 2nd Max Daily 1 Hour Average |
| 310 | 1 | 7 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | Number Standard Exceedances |
| METHODIST HILL | *** | *** | *** | *** | *** | *** | *** | *** | *** | 0.096 | 2nd Max Daily 1 Hour Average |
| 313 | * | * | * | * | * | * | * | * | * | 0 | Number Standard Exceedances |
| *Altoona Non-Air Basin* | | | | | | | | | | | |
| ALTOONA | 0.125 | 0.136 | 0.099 | 0.097 | 0.106 | 0.095 | 0.100 | 0.106 | 0.112 | 0.101 | 2nd Max Daily 1 Hour Average |
| 308 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| *Williamsport Non-Air Basin* | | | | | | | | | | | |
| WILLIAMSPORT | 0.091 | 0.116 | 0.080 | 0.088 | 0.101 | 0.092 | 0.088 | 0.079 | 0.091 | 0.082 | 2nd Max Daily 1 Hour Average |
| 407 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| *Johnstown Air Basin* | | | | | | | | | | | |
| JOHNSTOWN | 0.118 | 0.144 | 0.098 | 0.103 | 0.113 | 0.089 | 0.099 | 0.094 | 0.101 | 0.098 | 2nd Max Daily 1 Hour Average |
| J01 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |

TABLE G-2
OZONE HISTORICAL TREND
(Units: parts per million)

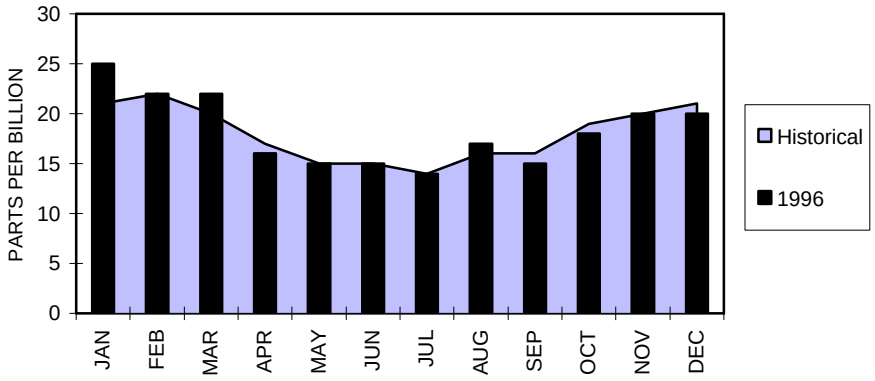
| STATION | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Monongahela Valley Air Basin* | | | | | | | | | | | |
| CHARLEROI | 0.128 | 0.128 | 0.102 | 0.102 | 0.119 | 0.085 | 0.115 | 0.112 | 0.116 | 0.102 | 2nd Max Daily 1 Hour Average |
| M01 | 2 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| *Lower Beaver Valley Air Basin* | | | | | | | | | | | |
| BEAVER FALLS | 0.110 | 0.128 | 0.104 | 0.104 | 0.108 | 0.101 | 0.099 | 0.107 | 0.106 | 0.105 | 2nd Max Daily 1 Hour Average |
| B11 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| HOOKSTOWN | *** | *** | *** | *** | *** | *** | *** | *** | 0.102 | 0.104 | 2nd Max Daily 1 Hour Average |
| B23 | * | * | * | * | * | * | * | * | 0 | 0 | Number Standard Exceedances |
| BRIGHTON TWP | *** | *** | *** | *** | *** | *** | *** | 0.104 | 0.098 | 0.099 | 2nd Max Daily 1 Hour Average |
| B27 | * | * | * | * | * | * | * | 0 | 0 | 0 | Number Standard Exceedances |
| *DEP Region 5 Non-Air Basin* | | | | | | | | | | | |
| FLORENCE | *** | *** | *** | *** | *** | *** | *** | *** | 0.104 | 0.092 | 2nd Max Daily 1 Hour Average |
| 504 | * | * | * | * | * | * | * | * | 0 | 0 | Number Standard Exceedances |
| WASHINGTON | 0.118 | 0.140 | 0.104 | 0.104 | 0.106 | 0.092 | 0.104 | 0.115 | 0.111 | 0.103 | 2nd Max Daily 1 Hour Average |
| 508 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| MURRYSVILLE | *** | *** | 0.081 | 0.103 | 0.105 | 0.073 | 0.120 | 0.118 | 0.127 | 0.104 | 2nd Max Daily 1 Hour Average |
| 510 | * | * | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | Number Standard Exceedances |
| *Upper Beaver Valley Air Basin* | | | | | | | | | | | |
| NEW CASTLE | 0.106 | 0.137 | 0.101 | 0.097 | 0.101 | 0.094 | 0.095 | 0.102 | 0.101 | 0.097 | 2nd Max Daily 1 Hour Average |
| B21 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| *Erie Air Basin* | | | | | | | | | | | |
| ERIE | *** | 0.148 | 0.116 | 0.100 | 0.113 | 0.098 | 0.107 | 0.101 | 0.105 | 0.100 | 2nd Max Daily 1 Hour Average |
| E10 | * | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |
| *Shenango Valley Non-Air Basin* | | | | | | | | | | | |
| FARRELL | 0.121 | 0.143 | 0.105 | 0.103 | 0.107 | 0.100 | 0.105 | 0.111 | 0.113 | 0.103 | 2nd Max Daily 1 Hour Average |
| 606 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Number Standard Exceedances |

# NITROGEN DIOXIDE

Nitrogen dioxide is a highly toxic reddish brown gas that is emitted primarily from the combustion of fuels in stationary or transportation sources. It can cause an odorous brown haze that irritates the eyes and nose, shuts out sunlight and reduces visibility. Nitrogen dioxide acts as a precursor to acidic precipitation and plays a key role in nitrogen loading of forests and ecosystems. Nitrogen dioxide has been associated with acute effects in sufferers of respiratory disease.

Figure H-1 indicates the 10-year trend of nitrogen dioxide annual mean levels from 1987 to 1996 in 12 air basins and the Altoona non-air basin. Nitrogen dioxide levels have remained relatively constant over the last 10 years. The solid line represents the air quality standard for an annual mean of 0.050 parts per million (ppm). All areas are at or below 50% of the annual air quality standard.

**Figure H-2. NITROGEN DIOXIDE SEASONAL TRENDS**
**Comparision of 1990-94 to 1995**

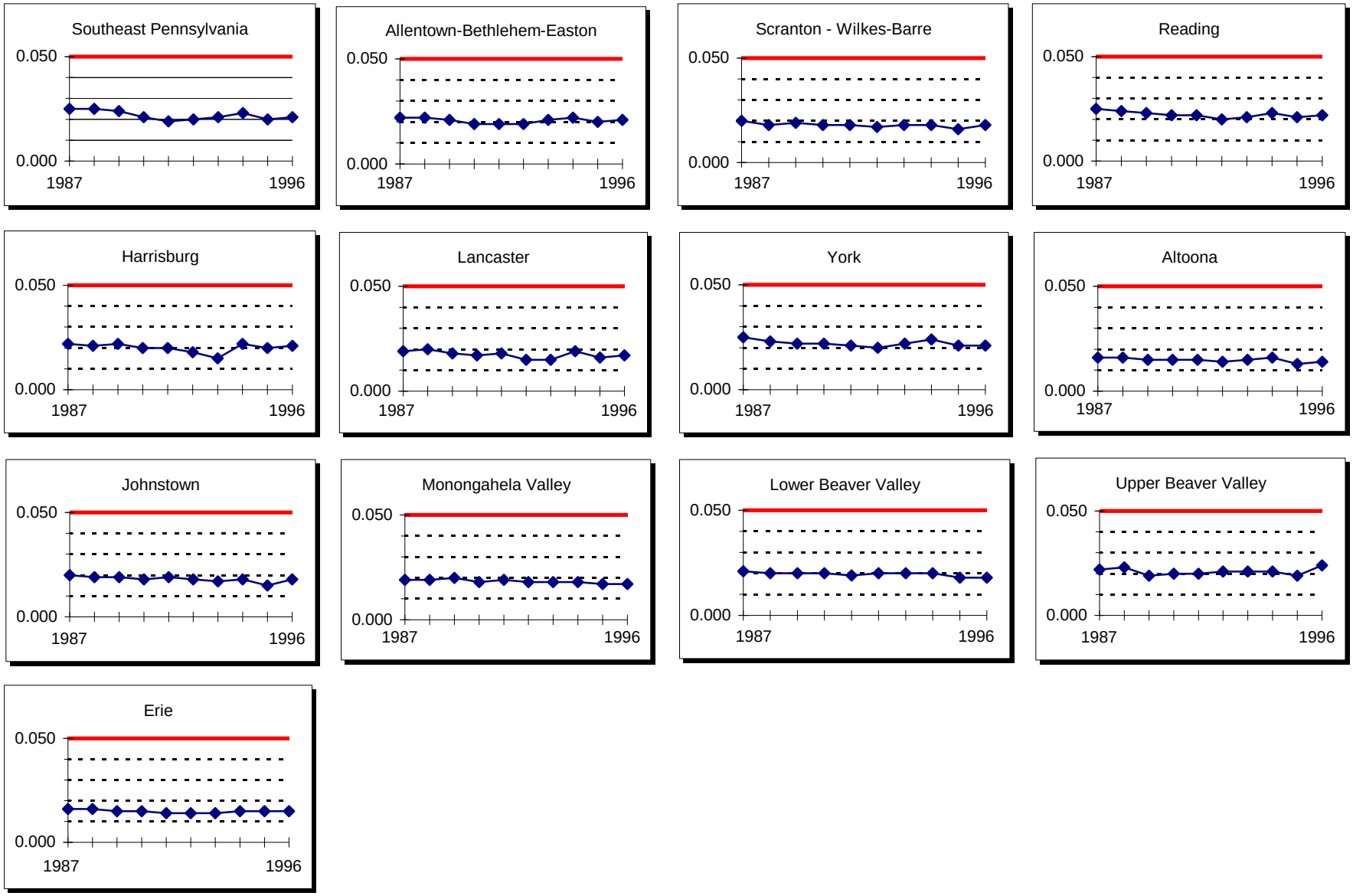



Nitrogen dioxide levels correlate significantly with ambient temperature levels, although not as high a statistical significance as do ozone and sulfur dioxide. The seasonal trend for nitrogen dioxide is shown in Figure H-2 for 1996 and for the average of the preceding five years.

Table H-1 summarizes nitrogen dioxide data for 1996. The table contains the annual arithmetic mean, the percent of valid 1-hour data values collected over the calendar year, the two maximum 1-hour and 24-hour daily means with dates of occurrence and the number of 1-hour values in the indicated ranges. No site exceeded the annual primary air quality standard for nitrogen dioxide in Pennsylvania in 1996

Historical trend data for those sites which monitored nitrogen dioxide in 1996 is presented in Table H-2 for the years 1987 to 1996. The annual arithmetic mean is shown so that comparison to the air quality standard can be made for the individual sites.

FIGURE H-1. NITROGEN DIOXIDE TRENDS IN PENNSYLVANIA 1987 to 1996
ANNUAL ARITHMETIC MEANS (PARTS PER MILLION)



# TABLE H-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## NITROGEN DIOXIDE SUMMARY

(Units: parts per million)

## YEAR: 1996

| Site Name | PA Site Code | Percent Valid Data | Annual Mean | 1st Max 1 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 1 HR Mean | 2nd Max Date MM/DD/HH | 1st Max 24 HR Mean | 1st Max Date MM/DD | 2nd Max 24 HR Mean | 2nd Max Date MM/DD | Number of 1 Hour Values In Ranges 0.00 to 0.04 | 0.05 to 0.08 | 0.09 to 0.12 | 0.13 to 0.16 | 0.17 to 0.20 | 0.21 to 0.24 | 0.25 to 0.28 | > 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Southeast Pennsylvania Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Bristol | P01 | 98.5 | 0.021 | 0.096 | 01/01/15 | 0.095 | 02/07/01 | 0.055 | 01/17 | 0.053 | 11/18 | 8194 | 447 | 8 | 0 | 0 | 0 | 0 | 0 |
| Chester | P11 | 98.5 | 0.021 | 0.091 | 10/01/10 | 0.078 | 01/18/16 | 0.049 | 01/16 | 0.049 | 01/18 | 8204 | 443 | 1 | 0 | 0 | 0 | 0 | 0 |
| Norristown | P21 | 95.8 | 0.021 | 0.084 | 01/01/18 | 0.080 | 01/01/17 | 0.052 | 01/17 | 0.050 | 03/14 | 8090 | 327 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Allentown-Bethlehem-Easton Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Allentown | A19 | 95.0 | 0.018 | 0.075 | 01/17/23 | 0.073 | 01/18/01 | 0.056 | 01/18 | 0.042 | 01/01 | 8197 | 144 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bethlehem | A21 | 64.8 | 0.024 | 0.095 | 01/08/17 | 0.094 | 01/18/18 | 0.069 | 01/18 | 0.066 | 01/17 | 5206 | 481 | 3 | 0 | 0 | 0 | 0 | 0 |
| ***Scranton-Wilkes-Barre Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Scranton | S01 | 98.7 | 0.018 | 0.073 | 10/17/19 | 0.067 | 03/14/19 | 0.041 | 01/17 | 0.041 | 02/08 | 8462 | 207 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wilkes-Barre | S28 | 95.2 | 0.018 | 0.219 | 03/15/10 | 0.208 | 03/15/11 | 0.101 | 03/14 | 0.086 | 03/13 | 8062 | 187 | 75 | 27 | 5 | 2 | 0 | 0 |
| ***Reading Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Reading | R01 | 95.2 | 0.022 | 0.095 | 01/17/10 | 0.092 | 01/17/11 | 0.067 | 01/17 | 0.054 | 01/18 | 7985 | 375 | 2 | 0 | 0 | 0 | 0 | 0 |
| ***Harrisburg Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Harrisburg | H11 | 98.0 | 0.021 | 0.080 | 03/14/02 | 0.079 | 03/13/23 | 0.059 | 01/17 | 0.055 | 03/14 | 8246 | 366 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Lancaster Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Lancaster | L01 | 97.3 | 0.017 | 0.094 | 10/17/12 | 0.074 | 01/22/11 | 0.052 | 01/17 | 0.043 | 01/22 | 8425 | 119 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***York Air Basin*** | | | | | | | | | | | | | | | | | | | |
| York | Y01 | 97.0 | 0.021 | 0.101 | 01/15/06 | 0.090 | 01/22/10 | 0.063 | 01/17 | 0.049 | 02/06 | 8259 | 258 | 3 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 3 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Perry County | 305 | 97.9 | 0.009 | 0.054 | 01/17/17 | 0.051 | 01/17/05 | 0.047 | 01/17 | 0.036 | 01/23 | 8573 | 26 | 0 | 0 | 0 | 0 | 0 | 0 |

**** Primary Annual Air Quality Standard of 0.053 parts per million ****

# TABLE H-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## NITROGEN DIOXIDE SUMMARY

(Units: parts per million)

## YEAR: 1996

| Site Name | PA Site Code | Percent Valid Data | Annual Mean | 1st Max 1 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 1 HR Mean | 2nd Max Date MM/DD/HH | 1st Max 24 HR Mean | 1st Max Date MM/DD | 2nd Max 24 HR Mean | 2nd Max Date MM/DD | Number of 1 Hour Values In Ranges 0.00 to 0.04 | 0.05 to 0.08 | 0.09 to 0.12 | 0.13 to 0.16 | 0.17 to 0.20 | 0.21 to 0.24 | 0.25 to 0.28 | > 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Altoona Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Altoona East | 308 | 98.3 | 0.014 | 0.058 | 10/16/20 | 0.057 | 10/16/21 | 0.038 | 01/17 | 0.034 | 03/13 | 8615 | 23 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Johnstown Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Johnstown | J01 | 90.3 | 0.018 | 0.089 | 01/17/13 | 0.084 | 01/18/11 | 0.046 | 01/17 | 0.039 | 11/05 | 7853 | 81 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***Monongahela Valley Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Charleroi | M01 | 97.4 | 0.017 | 0.086 | 01/16/14 | 0.082 | 01/16/15 | 0.055 | 01/16 | 0.040 | 03/12 | 8487 | 71 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***Lower Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Beaver Falls | B11 | 99.0 | 0.018 | 0.069 | 03/13/10 | 0.068 | 03/14/10 | 0.053 | 01/16 | 0.040 | 03/05 | 8560 | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***DEP Region 5 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Washington | 508 | 93.2 | 0.015 | 0.080 | 03/11/07 | 0.079 | 03/11/06 | 0.050 | 03/12 | 0.045 | 03/11 | 8103 | 88 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Upper Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | |
| New Castle | B21 | 65.8 | 0.024 | 0.494 | 01/17/19 | 0.385 | 01/17/17 | 0.167 | 01/17 | 0.117 | 01/16 | 5370 | 288 | 81 | 21 | 5 | 2 | 4 | 8 |
| ***Erie Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Erie | E10 | 91.7 | 0.015 | 0.070 | 06/28/23 | 0.068 | 06/28/22 | 0.041 | 03/12 | 0.038 | 03/13 | 7991 | 61 | 0 | 0 | 0 | 0 | 0 | 0 |

**** Primary Annual Air Quality Standard of 0.053 parts per million ****

TABLE H-2
NITROGEN DIOXIDE HISTORICAL TREND
ANNUAL MEANS
(Units: parts per million)

| STATION & SITE CODE | | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Southeast Pennsylvania Air Basin* | | | | | | | | | | | |
| BRISTOL | (P01) | 0.025 | 0.026 | 0.024 | 0.022 | 0.022 | 0.021 | 0.019 | 0.023 | 0.020 | 0.021 |
| CHESTER | (P11) | 0.024 | 0.023 | 0.023 | 0.021 | 0.021 | 0.021 | 0.021 | 0.022 | 0.020 | 0.021 |
| NORRISTOWN | (P21) | 0.026 | 0.026 | 0.024 | 0.018 | 0.015 | 0.017 | 0.022 | 0.023 | 0.020 | 0.021 |
| *Allentown-Bethlehem-Easton Air Basin* | | | | | | | | | | | |
| ALLENTOWN | (A19) | 0.019 | 0.020 | 0.020 | 0.017 | 0.018 | 0.018 | 0.020 | 0.021 | 0.018 | 0.018 |
| BETHLEHEM | (A21) | 0.024 | 0.024 | 0.022 | 0.020 | 0.020 | 0.020 | 0.021 | 0.023 | 0.022 | 0.024 |
| *Scranton-Wilkes Barre Air Basin* | | | | | | | | | | | |
| SCRANTON | (S01) | 0.020 | 0.017 | 0.021 | 0.020 | 0.018 | 0.017 | 0.018 | 0.020 | 0.018 | 0.018 |
| WILKES BARRE | (S28) | 0.019 | 0.019 | 0.016 | 0.016 | 0.017 | 0.016 | 0.018 | 0.016 | 0.014 | 0.018 |
| *Reading Air Basin* | | | | | | | | | | | |
| READING | (R01) | 0.025 | 0.024 | 0.023 | 0.022 | 0.022 | 0.020 | 0.021 | 0.023 | 0.021 | 0.022 |
| *Harrisburg Air Basin* | | | | | | | | | | | |
| HARRISBURG | (H11) | 0.022 | 0.021 | 0.022 | 0.020 | 0.020 | 0.018 | 0.015 | 0.022 | 0.020 | 0.021 |
| *Lancaster Air Basin* | | | | | | | | | | | |
| LANCASTER | (L01) | 0.019 | 0.020 | 0.018 | 0.017 | 0.018 | 0.015 | 0.015 | 0.019 | 0.016 | 0.017 |
| *York Air Basin* | | | | | | | | | | | |
| YORK | (Y01) | 0.025 | 0.023 | 0.022 | 0.022 | 0.021 | 0.020 | 0.022 | 0.024 | 0.021 | 0.021 |
| *DEP Region 3 Non-Air Basin* | | | | | | | | | | | |
| PERRY COUNTY | (305) | 0.006 | 0.006 | 0.007 | 0.007 | 0.008 | 0.007 | 0.008 | 0.008 | 0.007 | 0.009 |
| *Altoona Non-Air Basin* | | | | | | | | | | | |
| ALTOONA | (308) | 0.016 | 0.016 | 0.015 | 0.015 | 0.015 | 0.014 | 0.015 | 0.016 | 0.013 | 0.014 |
| *Johnstown Air Basin* | | | | | | | | | | | |
| JOHNSTOWN | (J01) | 0.020 | 0.019 | 0.019 | 0.018 | 0.019 | 0.018 | 0.017 | 0.018 | 0.015 | 0.018 |
| *Monongahela Valley Air Basin* | | | | | | | | | | | |
| CHARLEROI | (M01) | 0.019 | 0.019 | 0.020 | 0.018 | 0.019 | 0.018 | 0.018 | 0.018 | 0.017 | 0.017 |
| *Lower Beaver Valley Air Basin* | | | | | | | | | | | |
| BEAVER FALLS | (B11) | 0.021 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.020 | 0.018 | 0.018 |
| *DEP Region 5 Non-Air Basin* | | | | | | | | | | | |
| WASHINGTON | (508) | 0.022 | 0.020 | 0.021 | 0.018 | 0.019 | 0.019 | 0.019 | 0.019 | 0.016 | 0.015 |
| *Upper Beaver Valley Air Basin* | | | | | | | | | | | |
| NEW CASTLE | (B21) | 0.022 | 0.023 | 0.019 | 0.020 | 0.020 | 0.021 | 0.021 | 0.021 | 0.019 | 0.024 |
| *Erie Air Basin* | | | | | | | | | | | |
| ERIE | (E10) | *** | 0.016 | 0.015 | 0.015 | 0.014 | 0.014 | 0.014 | 0.015 | 0.015 | 0.015 |

# OXIDES OF NITROGEN

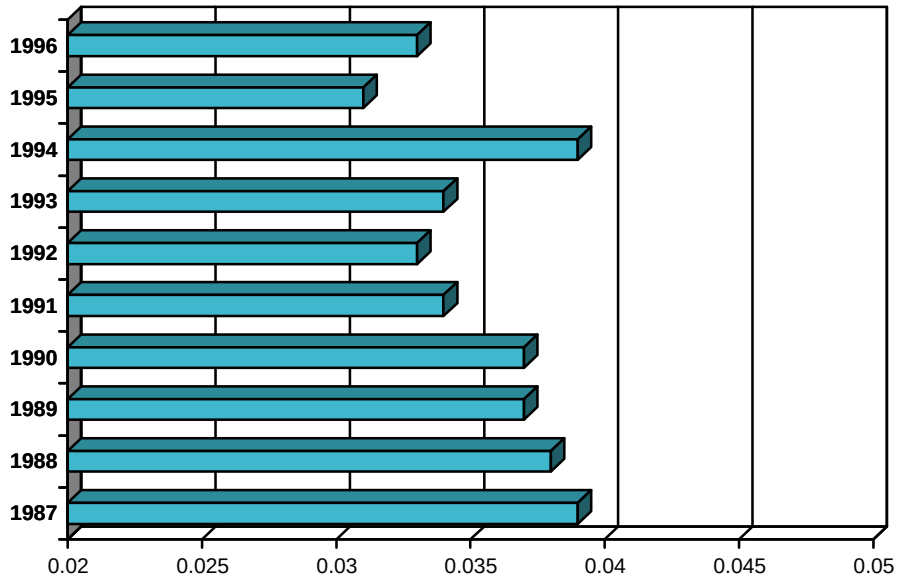
Oxides of nitrogen ($NO_x$) is a class of pollutants formed when fuel is burned at a very high temperature (above 1200° F). For air pollution purposes it is composed primarily of nitric oxide (NO) and nitrogen dioxide ($NO_2$).

Although there is no air quality standard for oxides of nitrogen, the level of this pollutant is of concern due to its role in contributing to the formation of ozone. Oxides of nitrogen are continuously monitored in Pennsylvania by the same instrument used for $NO_2$, which is based on a chemiluminescent reaction.

Table I-1 summarizes data for oxides of nitrogen in 1996. This table includes the annual arithmetic mean, the percent of valid data collected during the year, the two maximum 1-hour and 24-hour daily means with dates of occurrence, and the number of 1-hour values in the indicated ranges.

Figure I-1 represents the overall trend of oxides of nitrogen by using the arithmetic mean from all monitoring sites over the last ten years.

**Figure I-1. Oxides of Nitrogen Annual Means**



# TABLE I-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## OXIDES OF NITROGEN SUMMARY

(Units: parts per million)

## YEAR: 1996

| Site Name | PA Site Code | Percent Valid Data | Annual Mean | 1st Max 1 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 1 HR Mean | 2nd Max Date MM/DD/HH | 1st Max 24 HR Mean | 1st Max Date MM/DD | 2nd Max 24 HR Mean | 2nd Max Date MM/DD | Number of 1 Hour Values In Ranges 0.00 to 0.04 | 0.05 to 0.08 | 0.09 to 0.12 | 0.13 to 0.16 | 0.17 to 0.20 | 0.21 to 0.24 | 0.25 to 0.28 | > 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Southeast Pennsylvania Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Bristol | P01 | 98.5 | 0.045 | 0.686 | 12/03/07 | 0.644 | 12/27/23 | 0.256 | 11/17 | 0.256 | 11/18 | 6252 | 1206 | 516 | 258 | 137 | 86 | 48 | 146 |
| Chester | P11 | 98.3 | 0.037 | 0.447 | 01/17/23 | 0.410 | 10/25/07 | 0.204 | 01/18 | 0.139 | 03/06 | 6465 | 1387 | 457 | 139 | 87 | 60 | 33 | 20 |
| Norristown | P21 | 95.6 | 0.039 | 0.503 | 12/03/08 | 0.486 | 12/05/08 | 0.223 | 01/17 | 0.219 | 01/18 | 6148 | 1310 | 471 | 229 | 113 | 59 | 39 | 32 |
| ***Allentown-Bethlehem-Easton Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Allentown | A19 | 95.0 | 0.027 | 0.362 | 01/17/23 | 0.356 | 01/18/03 | 0.192 | 01/18 | 0.119 | 02/22 | 6987 | 929 | 278 | 93 | 37 | 14 | 1 | 9 |
| Bethlehem | A21 | 64.0 | 0.033 | 0.436 | 01/17/19 | 0.400 | 01/18/07 | 0.222 | 01/18 | 0.217 | 01/17 | 4444 | 750 | 217 | 84 | 53 | 28 | 18 | 27 |
| ***Scranton-Wilkes-Barre Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Scranton | S01 | 98.1 | 0.029 | 0.338 | 01/17/18 | 0.337 | 01/17/19 | 0.127 | 11/18 | 0.111 | 01/17 | 6995 | 1125 | 308 | 134 | 39 | 10 | 4 | 6 |
| Wilkes-Barre | S28 | 95.7 | 0.030 | 0.386 | 01/18/08 | 0.369 | 01/18/07 | 0.154 | 01/01 | 0.150 | 11/18 | 6680 | 1084 | 377 | 174 | 62 | 16 | 9 | 6 |
| ***Reading Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Reading | R01 | 94.9 | 0.047 | 0.499 | 02/06/07 | 0.492 | 01/15/07 | 0.271 | 01/17 | 0.177 | 01/18 | 5418 | 1772 | 598 | 287 | 120 | 65 | 36 | 39 |
| ***Harrisburg Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Harrisburg | H11 | 98.1 | 0.036 | 0.442 | 10/25/08 | 0.428 | 01/15/01 | 0.200 | 11/18 | 0.193 | 02/22 | 6673 | 1117 | 456 | 197 | 84 | 40 | 11 | 36 |
| ***Lancaster Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Lancaster | L01 | 97.5 | 0.032 | 0.384 | 01/15/04 | 0.344 | 10/25/07 | 0.151 | 11/17 | 0.136 | 01/17 | 6889 | 1054 | 342 | 152 | 72 | 35 | 12 | 6 |
| ***York Air Basin*** | | | | | | | | | | | | | | | | | | | |
| York | Y01 | 96.0 | 0.038 | 0.511 | 01/15/06 | 0.470 | 01/15/07 | 0.185 | 01/17 | 0.168 | 02/06 | 6325 | 1263 | 484 | 181 | 87 | 37 | 22 | 32 |
| ***DEP Region 3 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Perry County | 305 | 98.1 | 0.010 | 0.104 | 01/17/09 | 0.101 | 01/17/06 | 0.077 | 01/17 | 0.065 | 01/23 | 8396 | 211 | 8 | 0 | 0 | 0 | 0 | 0 |

**** No Long- or Short-Term Air Quality Standards ****

# TABLE I-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## OXIDES OF NITROGEN SUMMARY

(Units: parts per million)

## YEAR: 1996

| Site Name | PA Site Code | Percent Valid Data | Annual Mean | 1st Max 1 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 1 HR Mean | 2nd Max Date MM/DD/HH | 1st Max 24 HR Mean | 1st Max Date MM/DD | 2nd Max 24 HR Mean | 2nd Max Date MM/DD | Number of 1 Hour Values In Ranges 0.00 to 0.04 | 0.05 to 0.08 | 0.09 to 0.12 | 0.13 to 0.16 | 0.17 to 0.20 | 0.21 to 0.24 | 0.25 to 0.28 | > 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Altoona Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Altoona East | 308 | 98.3 | 0.022 | 0.239 | 02/22/09 | 0.235 | 11/18/15 | 0.148 | 11/18 | 0.098 | 01/23 | 7557 | 750 | 223 | 82 | 19 | 7 | 0 | 0 |
| ***Johnstown Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Johnstown | J01 | 89.6 | 0.031 | 0.499 | 01/17/15 | 0.499 | 01/17/16 | 0.250 | 01/17 | 0.188 | 12/11 | 6439 | 920 | 285 | 108 | 52 | 30 | 18 | 19 |
| ***Monongahela Valley Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Charleroi | M01 | 97.4 | 0.035 | 0.384 | 01/16/14 | 0.343 | 01/16/11 | 0.223 | 01/16 | 0.165 | 01/18 | 6606 | 1053 | 468 | 241 | 102 | 46 | 26 | 10 |
| ***Lower Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Beaver Falls | B11 | 99.0 | 0.038 | 0.440 | 01/18/07 | 0.392 | 01/18/08 | 0.231 | 12/11 | 0.185 | 01/16 | 6355 | 1435 | 456 | 194 | 117 | 76 | 34 | 26 |
| ***DEP Region 5 Non-Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Washington | 508 | 96.6 | 0.031 | 0.422 | 01/11/08 | 0.397 | 03/12/07 | 0.202 | 03/12 | 0.171 | 03/11 | 7014 | 924 | 257 | 127 | 78 | 36 | 28 | 21 |
| ***Upper Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | |
| New Castle | B21 | 95.4 | 0.039 | 0.517 | 01/16/08 | 0.514 | 01/16/07 | 0.167 | 01/16 | 0.162 | 12/11 | 6075 | 1572 | 456 | 166 | 58 | 32 | 8 | 17 |
| ***Erie Air Basin*** | | | | | | | | | | | | | | | | | | | |
| Erie | E10 | 91.7 | 0.021 | 0.258 | 10/25/21 | 0.254 | 10/25/20 | 0.117 | 12/11 | 0.087 | 03/12 | 7366 | 510 | 121 | 35 | 19 | 3 | 2 | 0 |

**** No Long- or Short-Term Air Quality Standards ****

# CARBON MONOXIDE

Carbon monoxide is a poisonous gas that has an affinity for hemoglobin, 210 times that of oxygen. By combining with the hemoglobin in the blood, it inhibits the delivery of oxygen to the body's tissue, thereby causing asphyxia or shortness of breath. The health threat from carbon monoxide is serious for those who suffer from cardiovascular disease.

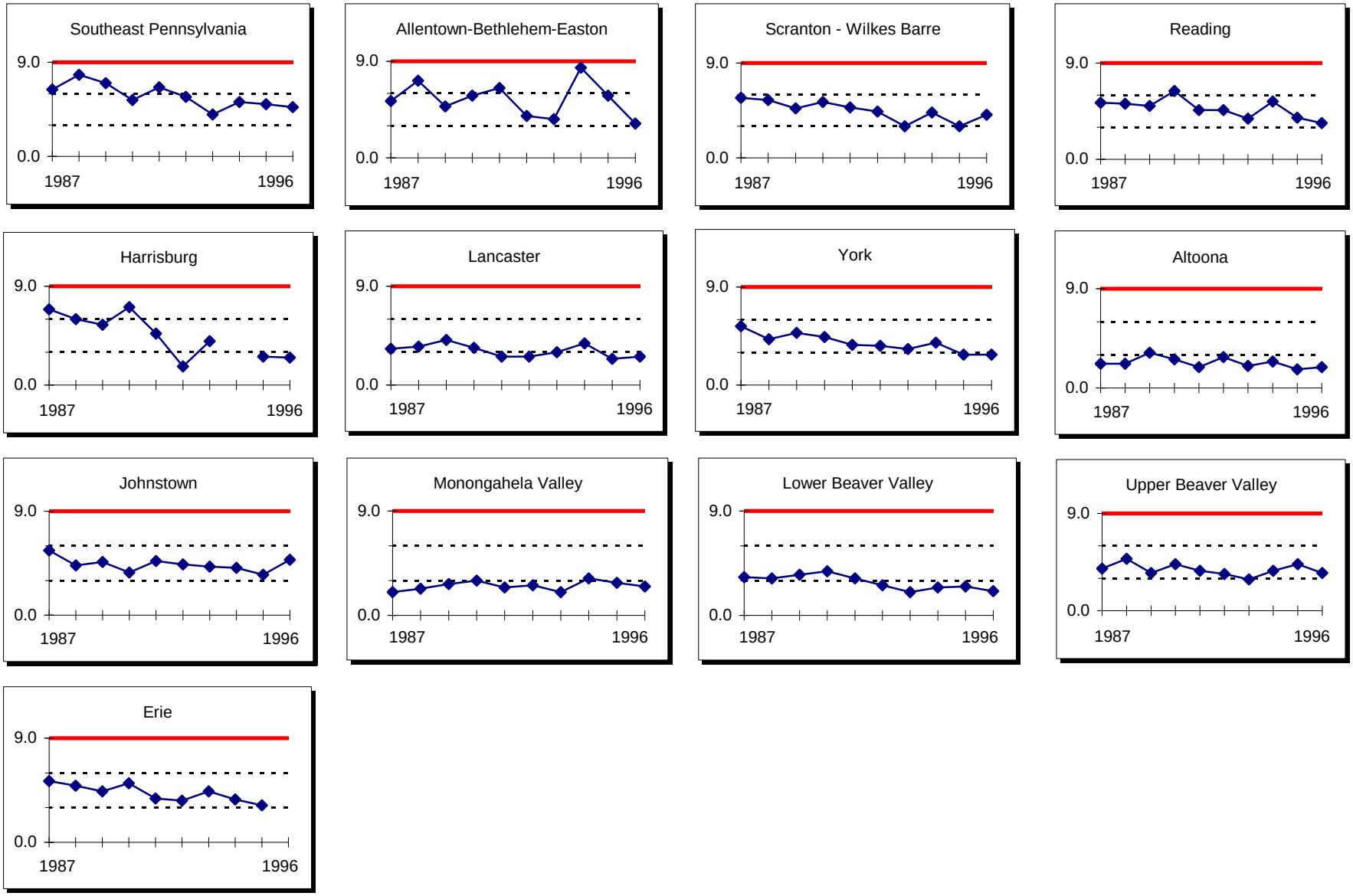
Carbon monoxide is a by-product of the incomplete burning of fuels. Industrial processes contribute to carbon monoxide pollution levels, but the principal source of carbon monoxide in most large urban areas is vehicular emissions.

The carbon monoxide 10-year historical trend is shown in Figure J-1 for 1987 to 1996 using the second maximum 8-hour non-overlapping running averages. A majority of the monitoring areas show little or no improvement in levels from 1995 to 1996. The largest improvement was seen in the Allentown-Bethlehem-Easton air basin which experienced a 45% improvement in 1995 levels. Carbon monoxide levels have improved overall by 26% from those seen in 1987. The solid line on the graphs represent the 8-hour ambient air quality standard.

Carbon monoxide data for 1996 has been summarized in Table J-1. This table includes the annual arithmetic mean, the percent of valid 1-hour data collected, the two maximum 1-hour means and 8-hour non-overlapping running means with dates of occurrence, the number of 1-hour and 8-hour air quality standard exceedances and the number of 8-hour running means in the indicated ranges. There were no exceedances of the 1- or 8-hour air quality standard observed in 1996.

Historical trend data for carbon monoxide is shown in Table J-2 for the years 1987 to 1996 for all air monitoring sites that operated in 1995. The data in the table includes the second maximum 1-hour average and the second maximum 8-hour non-overlapping running average. The second maximum value is presented to indicate whether the site is attaining the air quality standard. The 1994 levels were abnormally elevated due to two significant air stagnation events that occurred during morning rush hours which trapped vehicular emissions.

FIGURE J-1. CARBON MONOXIDE TRENDS IN PENNSYLVANIA 1987 to 1996
SECOND MAXIMUM 8-HOUR RUNNING MEAN (PARTS PER MILLION)



# TABLE J-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## CARBON MONOXIDE SUMMARY

(Units: parts per million)

## YEAR: 1996

| Site Name | PA Site Code | Percent Valid Data | Annual Mean | Number 1 HR > 35 | 1st Max 1 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 1 HR Mean | 2nd Max Date MM/DD/HH | Number 8 HR > 9 | 1st Max 8 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 8 HR Mean | 2nd Max Date MM/DD/HH | Number of 8 Hour Values In Ranges 0 to 4 | 5 to 8 | 9 to 12 | 13 to 16 | 17 to 20 | 21 to 24 | 25 to 28 | > 28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Southeast Pennsylvania Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Bristol | P01 | 96.9 | 0.6 | 0 | 8.8 | 12/03/07 | 6.3 | 12/28/00 | 0 | 4.7 | 12/28/01 | 4.7 | 01/18/03 | 8560 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Norristown | P21 | 96.3 | 0.6 | 0 | 3.6 | 12/28/02 | 3.5 | 12/28/01 | 0 | 3.2 | 12/28/03 | 2.9 | 01/18/07 | 8590 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Allentown-Bethlehem-Easton Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Bethlehem | A21 | 64.3 | 0.7 | 0 | 4.9 | 02/06/07 | 4.7 | 01/17/19 | 0 | 3.4 | 01/18/01 | 3.1 | 03/12/07 | 5670 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Allentown | A51 | 99.9 | 0.9 | 0 | 5.8 | 01/17/22 | 5.3 | 12/03/08 | 0 | 4.2 | 01/18/01 | 3.2 | 01/18/06 | 8777 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Scranton-Wilkes-Barre Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Scranton | S01 | 97.3 | 0.7 | 0 | 19.4 | 04/25/09 | 7.0 | 04/25/10 | 0 | 4.3 | 04/25/12 | 3.5 | 01/18/00 | 8580 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wilkes-Barre | S27 | 99.5 | 0.7 | 0 | 8.0 | 01/17/17 | 7.4 | 01/17/16 | 0 | 6.4 | 01/17/22 | 4.1 | 01/18/03 | 8750 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Reading Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Reading | R20 | 95.9 | 0.8 | 0 | 5.6 | 10/25/08 | 4.9 | 10/17/08 | 0 | 3.7 | 01/17/23 | 3.4 | 11/18/00 | 8468 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Harrisburg Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Harrisburg | H16 | 98.9 | 0.9 | 0 | 5.5 | 11/16/22 | 4.2 | 02/05/20 | 0 | 2.6 | 03/14/11 | 2.5 | 02/22/16 | 8713 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Lancaster Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Lancaster | L01 | 95.8 | 0.8 | 0 | 3.6 | 01/22/07 | 3.6 | 03/13/07 | 0 | 3.0 | 11/18/13 | 2.6 | 11/18/01 | 8472 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***York Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| York | Y01 | 97.3 | 0.6 | 0 | 5.1 | 10/17/08 | 5.0 | 01/15/07 | 0 | 2.9 | 10/17/11 | 2.8 | 01/15/09 | 8591 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**** Primary Air Quality Standards ****
**** 1 Hour Mean = 35 parts per million ****
**** 8 Hour Running Mean = 9 parts per million ****

TABLE J-1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

## CARBON MONOXIDE SUMMARY

(Units: parts per million)

YEAR: 1996

| Site Name | PA Site Code | Percent Valid Data | Annual Mean | Number 1 HR > 35 | 1st Max 1 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 1 HR Mean | 2nd Max Date MM/DD/HH | Number 8 HR > 9 | 1st Max 8 HR Mean | 1st Max Date MM/DD/HH | 2nd Max 8 HR Mean | 2nd Max Date MM/DD/HH | Number of 8 Hour Values In Ranges 0 to 4 | 5 to 8 | 9 to 12 | 13 to 16 | 17 to 20 | 21 to 24 | 25 to 28 | > 28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Altoona Non-Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Altoona East | 308 | 96.8 | 0.5 | 0 | 2.7 | 02/22/09 | 2.7 | 11/18/15 | 0 | 2.1 | 11/18/16 | 1.9 | 11/18/23 | 8561 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Johnstown Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Johnstown | J01 | 95.5 | 0.7 | 0 | 7.3 | 01/17/16 | 7.0 | 01/17/17 | 0 | 6.1 | 01/17/18 | 4.8 | 01/17/23 | 8437 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Monongahela Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Charleroi | M01 | 98.5 | 0.5 | 0 | 3.3 | 01/17/11 | 2.8 | 01/16/18 | 0 | 2.5 | 01/16/19 | 2.5 | 02/23/01 | 8664 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Lower Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| Beaver Falls | B11 | 98.9 | 0.6 | 0 | 4.0 | 01/18/07 | 3.2 | 01/18/08 | 0 | 2.3 | 01/18/08 | 2.1 | 11/05/13 | 8740 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Upper Beaver Valley Air Basin*** | | | | | | | | | | | | | | | | | | | | | |
| New Castle | B21 | 95.5 | 0.8 | 0 | 7.7 | 01/17/19 | 6.5 | 01/16/07 | 0 | 5.3 | 01/17/23 | 3.5 | 02/27/20 | 8430 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |

**** Primary Air Quality Standards ****
**** 1 Hour Mean = 35 parts per million ****
**** 8 Hour Running Mean = 9 parts per million ****

TABLE J-2
CARBON MONOXIDE HISTORICAL TREND
(Units: parts per million)

| STATION | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Southeast Pennsylvania Air Basin* | | | | | | | | | | | |
| BRISTOL | 11.7 | 11.0 | 14.1 | 12.6 | 9.6 | 8.6 | 6.2 | 7.9 | 9.2 | 6.3 | 2nd Maximum 1 Hour Average |
| P01 | 6.4 | 7.8 | 7.0 | 5.4 | 6.6 | 5.7 | 4.0 | 5.2 | 5.0 | 4.7 | 2nd Maximum 8 Hour Average |
| NORRISTOWN | 6.3 | 7.1 | 6.6 | 6.7 | 6.1 | 4.5 | 3.9 | 5.0 | 4.8 | 3.5 | 2nd Maximum 1 Hour Average |
| P21 | 3.9 | 4.3 | 4.0 | 4.7 | 3.8 | 3.1 | 2.8 | 3.9 | 4.1 | 2.9 | 2nd Maximum 8 Hour Average |
| *Allentown-Bethlehem-Easton Air Basin* | | | | | | | | | | | |
| BETHLEHEM | 5.9 | 10.4 | 7.5 | 7.2 | 6.0 | 4.7 | 6.3 | 22.8 | 6.4 | 4.7 | 2nd Maximum 1 Hour Average |
| A21 | 4.1 | 6.3 | 4.8 | 4.8 | 4.0 | 3.6 | 3.6 | 8.4 | 5.8 | 3.1 | 2nd Maximum 8 Hour Average |
| ALLENTOWN CBD | 8.9 | 14.8 | 8.1 | 8.3 | 13.4 | 6.1 | 5.6 | 7.5 | 7.3 | 5.3 | 2nd Maximum 1 Hour Average |
| A51 | 5.3 | 7.2 | 4.7 | 5.8 | 6.5 | 3.9 | 3.5 | 4.7 | 4.8 | 3.2 | 2nd Maximum 8 Hour Average |
| *Scranton-Wilkes Barre Air Basin* | | | | | | | | | | | |
| SCRANTON | 6.4 | 7.8 | 6.3 | 6.2 | 5.3 | 5.5 | 4.3 | 4.6 | 5.2 | 7.0 | 2nd Maximum 1 Hour Average |
| S01 | 4.1 | 4.6 | 3.4 | 3.7 | 3.5 | 3.0 | 2.7 | 2.8 | 2.6 | 3.5 | 2nd Maximum 8 Hour Average |
| WILKES BARRE CBD | 11.0 | 7.9 | 7.5 | 8.0 | 13.7 | 7.0 | 3.7 | 6.9 | 5.7 | 7.4 | 2nd Maximum 1 Hour Average |
| S27 | 5.7 | 5.5 | 4.7 | 5.3 | 4.8 | 4.4 | 3.0 | 4.3 | 3.0 | 4.1 | 2nd Maximum 8 Hour Average |
| *Reading Air Basin* | | | | | | | | | | | |
| READING CBD | 8.4 | 11.5 | 11.6 | 12.4 | 7.7 | 6.8 | 6.0 | 9.5 | 6.3 | 4.9 | 2nd Maximum 1 Hour Average |
| R20 | 5.3 | 5.2 | 5.0 | 6.4 | 4.6 | 4.6 | 3.8 | 5.4 | 3.9 | 3.4 | 2nd Maximum 8 Hour Average |
| *Harrisburg Air Basin* | | | | | | | | | | | |
| HARRISBURG CBD | *** | *** | *** | *** | *** | *** | *** | *** | 5.5 | 4.2 | 2nd Maximum 1 Hour Average |
| H16 | *** | *** | *** | *** | *** | *** | *** | *** | 2.6 | 2.5 | 2nd Maximum 8 Hour Average |
| *Lancaster Air Basin* | | | | | | | | | | | |
| LANCASTER | 4.9 | 5.5 | 5.3 | 5.0 | 4.2 | 3.9 | 4.7 | 5.2 | 4.4 | 3.6 | 2nd Maximum 1 Hour Average |
| L01 | 3.3 | 3.5 | 4.1 | 3.4 | 2.6 | 2.6 | 3.0 | 3.8 | 2.4 | 2.6 | 2nd Maximum 8 Hour Average |
| *York Air Basin* | | | | | | | | | | | |
| YORK | 9.2 | 6.8 | 12.1 | 9.6 | 7.2 | 6.8 | 5.4 | 6.3 | 5.5 | 5.0 | 2nd Maximum 1 Hour Average |
| Y01 | 5.4 | 4.2 | 4.8 | 4.4 | 3.7 | 3.6 | 3.3 | 3.9 | 2.8 | 2.8 | 2nd Maximum 8 Hour Average |

TABLE J-2
CARBON MONOXIDE HISTORICAL TREND
(Units: parts per million)

| STATION | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Altoona Non-Air Basin* | | | | | | | | | | | |
| ALTOONA | 3.6 | 5.3 | 5.5 | 3.7 | 3.5 | 4.7 | 3.2 | 3.5 | 3.1 | 2.7 | 2nd Maximum 1 Hour Average |
| 308 | 2.2 | 2.2 | 3.2 | 2.6 | 1.9 | 2.8 | 2.0 | 2.4 | 1.7 | 1.9 | 2nd Maximum 8 Hour Average |
| *Johnstown Air Basin* | | | | | | | | | | | |
| JOHNSTOWN | 10.6 | 7.5 | 6.2 | 5.9 | 8.4 | 8.5 | 5.8 | 5.4 | 5.4 | 7.0 | 2nd Maximum 1 Hour Average |
| J01 | 5.6 | 4.3 | 4.6 | 3.7 | 4.7 | 4.4 | 4.2 | 4.1 | 3.5 | 4.8 | 2nd Maximum 8 Hour Average |
| *Monongahela Valley Air Basin* | | | | | | | | | | | |
| CHARLEROI | 2.6 | 3.3 | 3.0 | 3.9 | 4.0 | 3.1 | 2.4 | 3.5 | 3.5 | 2.8 | 2nd Maximum 1 Hour Average |
| M01 | 2.0 | 2.3 | 2.7 | 3.0 | 2.4 | 2.6 | 2.0 | 3.2 | 2.8 | 2.5 | 2nd Maximum 8 Hour Average |
| *Lower Beaver Valley Air Basin* | | | | | | | | | | | |
| BEAVER FALLS | 4.8 | 4.3 | 4.2 | 5.0 | 4.8 | 3.4 | 2.7 | 3.4 | 3.2 | 3.2 | 2nd Maximum 1 Hour Average |
| B11 | 3.3 | 3.2 | 3.5 | 3.8 | 3.2 | 2.6 | 2.0 | 2.4 | 2.5 | 2.1 | 2nd Maximum 8 Hour Average |
| *Upper Beaver Valley Air Basin* | | | | | | | | | | | |
| NEW CASTLE | 8.5 | 10.0 | 7.3 | 7.0 | 8.2 | 7.6 | 5.9 | 6.7 | 6.1 | 6.5 | 2nd Maximum 1 Hour Average |
| B21 | 3.9 | 4.8 | 3.5 | 4.3 | 3.7 | 3.4 | 2.9 | 3.7 | 4.3 | 3.5 | 2nd Maximum 8 Hour Average |
| *Erie Air Basin* | | | | | | | | | | | |
| No sites operated in 199( | | | | | | | | | | | |

# POLLUTANT STANDARDS INDEX

A Pollutant Standards Index (PSI) is published daily for 17 areas in Pennsylvania. The Pollutant Standards Index incorporates recorded levels of five common air contaminants - carbon monoxide (CO), sulfur dioxide ($SO_2$), suspended particulate matter 10 microns or less in size ($PM_{10}$), ozone ($O_3$) and nitrogen dioxide ($NO_2$).

The PSI uses a segmented linear function to convert concentration levels of these pollutants into normalized numbers based on the National Ambient Air Quality Standards, the various episode levels and the significant harm levels for each pollutant. The actual breakpoints for the PSI values in terms of pollutant concentrations are shown in Table K-1. The highest index number calculated from the five subindices is published along with the pollutant responsible and a descriptor term of good (0-50), moderate (51-100), unhealthful (101-199), very unhealthful (200-299) or hazardous (300-500).

The Commonwealth has now installed continuous $PM_{10}$ monitors for suspended particulate matter at all of its PSI reporting sites.

Table K-2 shows the number of days the index was reported in each descriptor category, as well as showing the number of times the pollutant (subindex) was worse than moderate. Table K-3 shows the numbers and percentage of days that the PSI was based on a particular pollutant subindex. Ozone readings were used only during the ozone season of April 1 to October 31.

**TABLE K-1. BREAKPOINTS FOR THE POLLUTANT STANDARDS INDEX (PSI)**

| Breakpoints | PSI Value | $PM_{10}$ ($\mu g/m^3$) 24-Hour | $SO_2$ (ppm) 24-Hour | CO (ppm) 8-Hour | Ozone (ppm) 1-Hour | $NO_2$ (ppm) 1-Hour |
|---|---|---|---|---|---|---|
| 50% of Primary Short-Term NAAQS | 50 | 50[a] | 0.03[a] | 4.5 | 0.06 | ---[b] |
| Primary Short-Term NAAQS | 100 | 150 | 0.14 | 9.0 | 0.12 | ---[b] |
| Alert Level | 200 | 350 | 0.30 | 15.0 | 0.20 | 0.6 |
| Warning Level | 300 | 420 | 0.60 | 30.0 | 0.40 | 1.2 |
| Emergency Level | 400 | 500 | 0.80 | 40.0 | 0.50 | 1.6 |
| Significant Harm Level | 500 | 600 | 1.00 | 50.0 | 0.60 | 2.0 |

[a] Annual primary NAAQS
[b] No index value reported at concentration levels below those specified by the Alert Level Criteria

TABLE K-2. POLLUTANT STANDARDS INDEX SUMMARY BY CATEGORY
JANUARY 1996 to DECEMBER 1996

| | NUMBER OF DAYS INDEX REPORTED IN CATEGORY | | | | | NO. DAYS | NUMBER OF DAYS SUBINDEX WORSE THAN MODERATE | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| STATION | GOOD | MODERATE | UNHEALTHFUL | VERY UNHEALTHFUL | HAZARDOUS | INDEX REPORTED | PM-10 | SULFUR DIOXIDE | OZONE | CARBON MONOXIDE | NITROGEN DIOXIDE |
| BRISTOL | 279 | 85 | 1 | 0 | 0 | 365 | 0 | 0 | 1 | 0 | 0 |
| CHESTER | 273 | 92 | 1 | 0 | 0 | 366 | 0 | 0 | 1 | 0 | 0 |
| NORRISTOWN | 284 | 82 | 0 | 0 | 0 | 366 | 0 | 0 | 0 | 0 | 0 |
| ALLENTOWN | 294 | 72 | 0 | 0 | 0 | 366 | 0 | 0 | 0 | 0 | 0 |
| BETHLEHEM | 168 | 72 | 0 | 0 | 0 | 240 | 0 | 0 | 0 | 0 | 0 |
| SCRANTON | 310 | 56 | 0 | 0 | 0 | 366 | 0 | 0 | 0 | 0 | 0 |
| WILKES-BARRE | 293 | 73 | 0 | 0 | 0 | 366 | 0 | 0 | 0 | 0 | 0 |
| READING | 295 | 71 | 0 | 0 | 0 | 366 | 0 | 0 | 0 | 0 | 0 |
| HARRISBURG | 294 | 72 | 0 | 0 | 0 | 366 | 0 | 0 | 0 | 0 | 0 |
| LANCASTER | 266 | 99 | 0 | 0 | 0 | 365 | 0 | 0 | 0 | 0 | 0 |
| YORK | 294 | 71 | 0 | 0 | 0 | 365 | 0 | 0 | 0 | 0 | 0 |
| ALTOONA | 293 | 73 | 0 | 0 | 0 | 366 | 0 | 0 | 0 | 0 | 0 |
| JOHNSTOWN | 289 | 70 | 0 | 0 | 0 | 359 | 0 | 0 | 0 | 0 | 0 |
| CHARLEROI | 262 | 104 | 0 | 0 | 0 | 366 | 0 | 0 | 0 | 0 | 0 |
| BEAVER FALLS | 280 | 86 | 0 | 0 | 0 | 366 | 0 | 0 | 0 | 0 | 0 |
| NEW CASTLE | 265 | 101 | 0 | 0 | 0 | 366 | 0 | 0 | 0 | 0 | 0 |
| ERIE | 290 | 70 | 0 | 0 | 0 | 360 | 0 | 0 | 0 | 0 | 0 |

## TABLE K-3. POLLUTANT STANDARDS INDEX SUMMARY BY POLLUTANT
## JANUARY 1996 to DECEMBER 1996

| | NUMBER OF DAYS AND PERCENTAGE SUBINDEX WAS MAXIMUM | | | | |
|---|---|---|---|---|---|
| STATION | PM-10 | SULFUR DIOXIDE | OZONE | CARBON MONOXIDE | NITROGEN DIOXIDE |
| BRISTOL | 99 ( 27.1) | 35 ( 9.6) | 198 ( 54.2) | 33 ( 9.0) | 0 ( 0.0) |
| CHESTER | 121 ( 33.1) | 49 ( 13.4) | 196 ( 53.6) | 0 ( 0.0) | 0 ( 0.0) |
| NORRISTOWN | 83 ( 22.7) | 76 ( 20.8) | 192 ( 52.5) | 15 ( 4.1) | 0 ( 0.0) |
| ALLENTOWN | 20 ( 5.5) | 47 ( 12.8) | 203 ( 55.5) | 96 ( 26.2) | 0 ( 0.0) |
| BETHLEHEM | 44 ( 18.3) | 47 ( 19.6) | 141 ( 58.8) | 8 ( 3.3) | 0 ( 0.0) |
| SCRANTON | 99 ( 27.0) | 43 ( 11.7) | 205 ( 56.0) | 19 ( 5.2) | 0 ( 0.0) |
| WILKES-BARRE | 82 ( 22.4) | 33 ( 9.0) | 206 ( 56.3) | 45 ( 12.3) | 0 ( 0.0) |
| READING | 19 ( 5.2) | 125 ( 34.2) | 194 ( 53.0) | 28 ( 7.7) | 0 ( 0.0) |
| HARRISBURG | 105 ( 28.7) | 23 ( 6.3) | 196 ( 53.6) | 42 ( 11.5) | 0 ( 0.0) |
| LANCASTER | 129 ( 35.3) | 16 ( 4.4) | 200 ( 54.8) | 20 ( 5.5) | 0 ( 0.0) |
| YORK | 51 ( 14.0) | 82 ( 22.5) | 207 ( 56.7) | 25 ( 6.8) | 0 ( 0.0) |
| ALTOONA | 89 ( 24.3) | 73 ( 19.9) | 197 ( 53.8) | 7 ( 1.9) | 0 ( 0.0) |
| JOHNSTOWN | 51 ( 14.2) | 120 ( 33.4) | 172 ( 47.9) | 16 ( 4.5) | 0 ( 0.0) |
| CHARLEROI | 115 ( 31.4) | 55 ( 15.0) | 193 ( 52.7) | 3 ( 0.8) | 0 ( 0.0) |
| BEAVER FALLS | 137 ( 37.4) | 37 ( 10.1) | 186 ( 50.8) | 6 ( 1.6) | 0 ( 0.0) |
| NEW CASTLE | 181 ( 49.5) | 23 ( 6.3) | 151 ( 41.3) | 11 ( 3.0) | 0 ( 0.0) |
| ERIE | 52 ( 14.4) | 105 ( 29.2) | 200 ( 55.6) | 0 ( 0.0) | 3 ( 0.8) |

# PRECISION AND ACCURACY

DEP conducts regularly scheduled performance audits and precision checks on all air monitoring equipment. Performance audits are conducted for the purpose of assessing data accuracy on carbon monoxide (CO), sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), ozone ($O_3$), total suspended particulate (TSP), suspended particulate matter 10 microns or less in size ($PM_{10}$) and lead (Pb) monitoring equipment. Precision checks are performed biweekly on CO, $SO_2$, $NO_2$ and $O_3$ and every sampling day (once every sixth day) for selected TSP, $PM_{10}$ and lead.

Data obtained from the performance audits and precision checks are converted to 95% upper and lower probability limits using standard statistical methods. For precision, only one probability level is calculated for each parameter. However, accuracy is determined at up to three points. Acceptable 95% probability limits for accuracy are± 20% for continuous gaseous parameters and± 15% for discrete particulate parameters (TSP, $PM_{10}$ and lead). Acceptable 95% probability limits for precision are± 15% for all parameters.

Figure L-1 summarizes the 95% probability limits from all four quarterly reporting periods within the calendar year. The values presented were calculated from weighted arithmetic averages for each quarter's probability limits. Two different types of lead checks are performed; flow, which is indicated by PB(F) and analytical, which is indicated by PB(A) on the legends of each graph.

# APPENDIX A

Air Pollution Control Agencies in Pennsylvania

Allegheny County Health Department
39th Street and Penn Avenue
Pittsburgh, PA 15201
(412) 578-8140

City of Philadelphia
Air Management Services
1501 East Lycoming Street
Philadelphia, PA 19124
(215) 685-1225

Commonwealth of Pennsylvania
Department of Environmental Protection
Bureau of Air Quality
Division of Air Quality Monitoring
Rachel Carson State Office Building 12th Floor
400 Market Street
P.O. Box 8468
Harrisburg, PA 17105-8468
(717) 787-6548

Related environmental information is available electronically via the Internet. Access the DEP Web Site at http://www.dep.state.pa.us (choose information by Environmental Subject / choose Air Quality).

# APPENDIX B

Instrumental Methods Used In Commonwealth of Pennsylvania Air Monitoring System

| Parameter(s) | Method & AIRS Code | Instrument |
|---|---|---|
| Total Suspended Particulate | High-Volume Sampler - 091 | General Metal Works,Inc. GMWL-2000 |
| PM-10 Particulate | High-Volume Sampler - 063<br>High-Volume Sampler - 064<br>TEOM-Gravimetric - 079 | Sierra-Anderson/GMW 1200<br>Sierra-Anderson/GMW 321B<br>Rupprecht&Patashnick 1400 |
| Sulfur Dioxide | Pulsed Fluorescent - 009<br>Pulsed Fluorescent - 060 | Thermo Electron Model 43<br>Thermo Electron Model 43A |
| Ozone | Ultraviolet Photometric - 047 | Thermo Electron Model 49 |
| Carbon Monoxide | Gas Filter Correlation Infrared - 051 | Dasibi 3003 |
| Nitrogen Dioxide/ Oxides of Nitrogen | Chemiluminescence - 038<br>Chemiluminescence - 022 | Bendix 8101-B<br>Bendix 8101-C |
| Wind Speed | Light Chopper - 050 | Qualimetrics Model 2030 |
| Wind Direction | Potentiometer - 050 | Qualimetrics Model 2020 |
| Ambient Temperature | Composite Thermistor - 040 | Qualimetrics Model 4480-A |
| Relative Humidity | Thin Film Capacitor - 012 | Qualimetrics Model 5120-D |
| Solar Radiation | Pyranometer - 011 | Qualimetrics Model 3120 |

Analytical Methods Used In Commonwealth of Pennsylvania Air Monitoring System

| Parameter(s) | Collection Method | Analytical Method & AIRS Code |
|---|---|---|
| Sulfate | High Volume | Ion Chromatograph Conductimetric - 096 |
| Lead | High Volume | Emission Spectra ICAP - 086 |
| Nitrates | High Volume | Ion Chromatograph Conductimetric - 096 |
| Benzo($\alpha$)pyrene | High Volume | High Pressure Liquid Chromatography |

# APPENDIX C

Monitoring
Sites
and
Addresses

# SOUTHEAST PENNSYLVANIA AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| P01 | BRISTOL | 42-017-0012 | BUCKS | Roosevelt Junior High School<br>Rockview Lane | 40 06 27<br>74 52 57 |
| P11 | CHESTER | 42-045-0002 | DELAWARE | Front & Norris Streets | 39 50 08<br>75 22 22 |
| P12 | CONSHOHOCKEN | 42-091-0112 | MONTGOMERY | Bell Telephone Building | 40 04 37<br>75 18 15 |
| P21 | NORRISTOWN | 42-091-0013 | MONTGOMERY | State Armory<br>1046 Belvoir Road | 40 06 45<br>75 18 34 |
| P26 | COATESVILLE | 42-029-0116 | CHESTER | Lukens Steel Research Building<br>Modena Road & Penn Avenue | 39 58 21<br>75 48 48 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BUCKS | P01 | X | X | | | | | X | X | X | X |
| DELAWARE | P11 | X | X | | X | | | X | X | X | |
| CHESTER | P26 | X | | | | | | | | | |
| MONTGOMERY | P12 | | X | X | X | X | | | | | |
| | P21 | X | | | | | | X | X | X | X |

# ALLENTOWN - BETHLEHEM - EASTON AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| A12 | BETHLEHEM EAST | 42-095-0725 | NORTHAMPTON | Sewage Treatment Plant<br>Shimersville Road | 40 37 03<br>75 20 00 |
| A17 | NORTHAMPTON | 42-095-1003 | NORTHAMPTON | Cross County Clothes Factory<br>24 West 21st Street | 40 41 25<br>75 30 00 |
| A19 | ALLENTOWN | 42-077-0004 | LEHIGH | Allentown State Hospital<br>Rear 1600 Hanover Avenue | 40 36 43<br>75 25 58 |
| A21 | BETHLEHEM | 42-095-0017 | NORTHAMPTON | East Market & Wood Streets | 40 37 13<br>75 21 49 |
| A22 | NAZARETH | 42-095-0022 | NORTHAMPTON | Lloyd Shafer Elementary School<br>Liberty & Belvidere Streets | 40 44 26<br>75 18 04 |
| A23 | NORTHAMPTON | 42-095-1004 | NORTHAMPTON | Northampton High School<br>1619 Laubach Avenue | 40 41 18<br>75 29 32 |
| A24 | NAZARETH | 42-095-0024 | NORTHAMPTON | Holy Family School | 40 44 35<br>75 19 15 |
| A41 | EASTON | 42-095-0100 | NORTHAMPTON | School District Warehouse<br>Coal & Milton Streets | 40 40 36<br>75 13 00 |
| A51 | ALLENTOWN | 42-077-0100 | LEHIGH | 2 North Ninth Street<br>Hamilton Street Side | 40 35 57<br>75 28 28 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NORTHAMPTON | A12 | | X | X | X | X | X | | | | |
| | A17 | | X | | X | | | | | | |
| | A21 | X | | | | | | X | X | X | X |
| | A22 | X | X | | | | | | | | |
| | A23 | | X | | X | | | | | | |
| | A24 | X | X | | | | | | | | |
| | A41 | | | | | | | X | | X | |
| LEHIGH | A19 | X | | | | | | X | X | X | |
| | A51 | | | | | | | | | | X |

# SCRANTON - WILKES-BARRE AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| S01 | SCRANTON | 42-069-2006 | LACKAWANNA | Behind Penn State Campus<br>George Street | 41 26 34<br>75 37 23 |
| S04 | PITTSTON | 42-079-0204 | LUZERNE | City Hall<br>Broad Street | 41 19 19<br>75 47 22 |
| S07 | WILKES-BARRE | 42-079-1207 | LUZERNE | Kirby Health Center<br>71 North Franklin Avenue | 41 14 53<br>75 52 50 |
| S15 | SCRANTON | 42-069-0208 | LACKAWANNA | Jewish Community Center<br>601 Jefferson Avenue | 41 24 43<br>75 39 21 |
| S26 | NANTICOKE | 42-079-1100 | LACKAWANNA | 255 Lower Broadway | 41 12 33<br>76 00 13 |
| S27 | WILKES-BARRE | 42-079-2100 | LUZERNE | North River Street | 41 15 01<br>75 52 49 |
| S28 | WILKES-BARRE | 42-079-1101 | LUZERNE | Chilwick & Washington Streets | 41 15 58<br>75 50 47 |
| S29 | PECKVILLE | 42-069-0101 | LACKAWANNA | Pleasant Avenue & Erie Street<br>Wilson Fire Company No. 1 | 41 28 45<br>75 34 41 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LACKAWANNA | S01 | X | | | | | | X | X | X | X |
| | S15 | X | | | | | | | | | |
| | S29 | | | | | | | | | X | |
| LUZERNE | S04 | X | | | | | | | | | |
| | S07 | X | X | X | X | X | | | | | |
| | S26 | | | | | | | | | X | |
| | S27 | | | | | | | | | | X |
| | S28 | X | | | | | | X | X | X | |

# REGION II NON - AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| 205 | PALMERTON | 42-025-0105 | CARBON | New Jersey Zinc Research Bldg.<br>Fourth Street & Franklin Avenue | 40 48 12<br>75 36 31 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CARBON | 205 | | X | X | X | X | | | | | |

# READING AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| R01 | READING | 42-011-0009 | BERKS | UGI Property<br>234 Morgantown Road | 40 19 14<br>75 55 37 |
| R09 | TEMPLE | 42-011-0716 | BERKS | PennDOT Highway Garage<br>51 Water Street | 40 24 12<br>75 55 43 |
| R10 | LAURELDALE | 42-011-1717 | BERKS | Muhlenberg Township Authority<br>Spring Valley Road Substation | 40 22 38<br>75 54 53 |
| R15 | READING | 42-011-0015 | BERKS | Northwest Junior High School<br>North Front & West Spring Streets | 40 21 04<br>75 56 08 |
| R20 | READING | 42-011-0100 | BERKS | 700 Block of Penn Street<br>Near Eighth Street | 40 20 07<br>75 55 23 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BERKS | R01 | X | | | | | | X | X | X | |
| | R09 | X | | | | | | | | | |
| | R10 | | X | X | X | X | | | | | |
| | R15 | X | | | | | | | | | |
| | R20 | | | | | | | X | | | X |

# HARRISBURG AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| H06 | HARRISBURG | 42-043-0306 | DAUPHIN | U.S. Post Office<br>812 Martin Luther King Blvd. | 40 15 47<br>76 52 38 |
| H11 | HARRISBURG | 42-043-0401 | DAUPHIN | 1833 UPS Drive | 40 14 42<br>76 50 41 |
| H15 | LEMOYNE | 42-041-0305 | CUMBERLAND | Seventh and Walnut Streets<br>FAA Enclosure | 40 14 47<br>76 54 02 |
| H16 | HARRISBURG CBD | 42-043-0102 | DAUPHIN | PA Dept. of Agriculture Parking Lot<br>2301 North Cameron Street | 40 17 09<br>76 52 53 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CUMBERLAND | H15 | | X | | | | | | | | |
| DAUPHIN | H06 | | X | X | X | X | | | | | |
| | H11 | X | | | | | | X | X | X | |
| | H16 | | | | | | | | | | X |

# LANCASTER AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| L01 | LANCASTER | 42-071-0007 | LANCASTER | Lincoln Junior High School | 40 02 49<br>76 17 00 |
| L04 | LANCASTER | 42-071-0314 | LANCASTER | Days Inn<br>30 Keller Avenue | 40 03 22<br>76 18 26 |
| L05 | LANCASTER | 42-071-0315 | LANCASTER | Alumax Inc.<br>Manheim Pike | 40 04 22<br>76 20 08 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LANCASTER | L01 | X | | | | | | X | X | X | X |
| | L04 | | X | | | | | | | | |
| | L05 | X | X | X | X | X | | | | | |

# YORK AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| Y01 | YORK | 42-133-0008 | YORK | Davis Junior High School<br>Hill Street | 39 57 56<br>76 41 59 |
| Y02 | YORK | 42-133-0322 | YORK | J.E. Baker Company<br>232 East Market Street | 39 57 49<br>76 43 21 |
| Y07 | YORK | 42-133-0321 | YORK | West York Borough Building<br>1700 Philadelphia Street | 39 57 16<br>76 45 55 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| YORK | Y01 | X | | | | | | X | X | X | X |
| | Y02 | | X | X | X | X | | | | | |
| | Y07 | X | | | | | | | | | |

# REGION III NON - AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| 301 | LYONS EAST | 42-011-0717 | BERKS | Near State & Kemp Streets | 40 28 36<br>75 45 33 |
| 305 | PERRY COUNTY | 42-099-0301 | PERRY | Little Buffalo State Park | 40 27 26<br>77 09 57 |
| 306 | HERSHEY | 42-043-1100 | DAUPHIN | Hershey Foods Technical Center<br>Sipe Avenue & Mae Street | 40 16 21<br>76 40 53 |
| 308 | ALTOONA | 42-013-0801 | BLAIR | Ward Trucking Corporation<br>Second Avenue & Seventh Street | 40 30 54<br>78 23 20 |
| 310 | KUTZTOWN | 42-011-0001 | BERKS | Kutztown State College<br>Grim Science Building | 40 30 40<br>75 47 11 |
| 313 | METHODIST HILL | 42-055-0001 | FRANKLIN | Forest Road<br>(High Elevation Site) | 39 57 40<br>77 28 32 |
| 370 | LYONS SOUTH | 42-011-0003 | BERKS | Heffner & Deka Roads | 40 28 06<br>75 45 51 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BERKS | 301 | | X | | X | | | | | | |
| | 310 | | | | | | | | | X | |
| | 370 | | X | | X | | | | | | |
| PERRY | 305 | X | X | X | | X | | X | X | X | |
| DAUPHIN | 306 | | | | | | | | | X | |
| FRANKLIN | 313 | | | | | | | | | X | |
| BLAIR | 308 | X | X | X | | X | | X | X | X | X |

# REGION IV NON - AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| 401 | WILLIAMSPORT | 42-081-0401 | LYCOMING | Schwab Building<br>734 West Fourth Street | 41 14 24<br>77 00 55 |
| 407 | WILLIAMSPORT | 42-081-0403 | LYCOMING | East Third & Railway Streets | 41 14 46<br>76 59 24 |
| 408 | STATE COLLEGE | 42-027-0106 | CENTRE | Municipal Parking Garage<br>East Beaver Avenue & South Pugh | 40 47 38<br>77 51 35 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LYCOMING | 401 | X | X | X | | X | | | | | |
| | 407 | | | | | | | X | | X | |
| CENTRE | 408 | | X | X | | X | | | | | |

# JOHNSTOWN AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| J01 | JOHNSTOWN | 42-021-0011 | CAMBRIA | Miller Auto Body Crafts Shop<br>One Messenger Street | 40 18 35<br>78 54 57 |
| J03 | JOHNSTOWN | 42-021-0803 | CAMBRIA | Johnstown Post Office<br>Franklin & Locust Streets | 40 19 33<br>78 55 02 |
| J04 | EAST CONEMAUGH | 42-021-0804 | CAMBRIA | East Conemaugh Municipal Bldg.<br>357 First Street | 40 20 48<br>78 53 12 |
| J08 | EAST CONEMAUGH | 42-021-0808 | CAMBRIA | Recreation Field<br>Citron Alley & First Street | 40 20 53<br>78 52 58 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMBRIA | J01 | X | | | | | | X | X | X | X |
| | J03 | X | | | | | | | | | |
| | J04 | | X | X | X | X | | | | | |
| | J08 | | X | X | X | X | | | | | |

# MONONGAHELA VALLEY AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| M01 | CHARLEROI | 42-125-0005 | WASHINGTON | Borough Waste Treatment Plant<br>Front Street | 40 08 49<br>79 54 12 |
| M02 | MONESSEN | 42-129-0512 | WESTMORELAND | Monessen Municipal Building<br>Third Street & Donner Avenue | 40 09 40<br>79 52 50 |
| M16 | MONESSEN | 42-129-0007 | WESTMORELAND | Monessen Community Center<br>435 Donner Avenue | 40 10 00<br>79 52 30 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WASHINGTON | M01 | X | | | | | | X | X | X | X |
| WESTMORELAND | M02 | X | X | X | X | X | X | | | | |
| | M16 | X | X | X | X | X | X | | | | |

# LOWER BEAVER VALLEY AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| B01 | BADEN | 42-007-0004 | BEAVER | Route 65 & Holmes Avenue | 40 38 08<br>80 13 51 |
| B05 | VANPORT | 42-007-0505 | BEAVER | Vanport Water Works<br>Tamaqui Drive | 40 41 05<br>80 19 30 |
| B07 | AMBRIDGE | 42-007-0507 | BEAVER | U.S. Post Office<br>1020 Merchant Street | 40 35 30<br>80 13 40 |
| B11 | BEAVER FALLS | 42-007-0014 | BEAVER | Eighth Street & River Alley | 40 44 52<br>80 19 00 |
| B17 | BADEN | 42-007-0509 | BEAVER | Baden Elementary School<br>State Street & Harmony Road | 40 37 48<br>80 13 32 |
| B18 | BEAVER FALLS | 42-007-0518 | BEAVER | Beaver Falls Middle School<br>Eighth Avenue & Sixteenth Street | 40 45 54<br>80 19 18 |
| B23 | HOOKSTOWN | 42-007-0002 | BEAVER | FAA Microwave Relay Tower | 40 33 45<br>80 30 15 |
| B27 | BRIGHTON TOWNSHIP | 42-007-0005 | BEAVER | 1015 Sebring Road | 40 41 05<br>80 21 35 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BEAVER | B01 | X | | | | | | X | | | |
| | B05 | | X | | X | | | | | | |
| | B07 | | X | X | | X | | | | | |
| | B11 | X | | | | | | X | X | X | X |
| | B17 | X | | | | | | | | | |
| | B18 | X | | | | | | | | | |
| | B23 | | | | | | | X | | X | |
| | B27 | | | | | | | X | | X | |

# REGION V NON - AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| 503 | WASHINGTON | 42-125-0103 | WASHINGTON | Washington Post Office<br>153 Jefferson Avenue | 40 10 19<br>80 15 09 |
| 504 | FLORENCE | 42-125-5001 | WASHINGTON | Hillman State Park | 40 26 41<br>80 25 12 |
| 508 | WASHINGTON | 42-125-0200 | WASHINGTON | McCarrell & Fayette Streets | 40 10 12<br>80 15 42 |
| 510 | MURRYSVILLE | 42-129-0006 | WESTMORELAND | Murrysville Volunteer Fire Co.<br>Old William Penn Hwy & Sardis Ave. | 40 25 41<br>79 41 35 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WASHINGTON | 503 | | X | X | | X | | | | | |
| | 504 | | | | | | | X | | X | |
| | 508 | | | | | | | X | X | X | |
| WESTMORELAND | 510 | | | | | | | | | X | |

# UPPER BEAVER VALLEY AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| B16 | ELLWOOD CITY | 42-073-0016 | LAWRENCE | Municipal Building<br>525 Lawrence Avenue | 40 51 29<br>80 17 19 |
| B21 | NEW CASTLE | 42-073-0015 | LAWRENCE | Croton Avenue & Jefferson Street | 40 59 45<br>80 20 48 |
| B26 | BESSEMER | 42-073-0505 | LAWRENCE | Mohawk Area School<br>Mohawk School Road & Route 317 | 40 58 46<br>80 27 11 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LAWRENCE | B16 | | X | X | | | | | | | |
| | B21 | X | | | | | | X | X | X | X |
| | B26 | X | | | | | | | | | |

# ERIE AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| E07 | ERIE | 42-049-0602 | ERIE | Erie School Administration Building<br>1511 Peach Street | 42 07 14<br>80 04 50 |
| E10 | ERIE | 42-049-0003 | ERIE | East 10th & Marne Streets | 42 08 34<br>80 02 14 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ERIE | E07 | | X | X | X | X | X | | | | |
| | E10 | X | | | | | | X | X | X | |

# REGION VI NON - AIR BASIN SITES

## SITE LOCATIONS

| PA SITE CODE | SITE NAME | EPA-AIRS SITE CODE | COUNTY | STREET ADDRESS | LATITUDE LONGITUDE |
|---|---|---|---|---|---|
| 602 | FARRELL | 42-085-0622 | MERCER | Municipal Building | 41 12 44<br>80 30 08 |
| 606 | FARRELL | 42-085-0100 | MERCER | Farrell High School Field<br>New Castle Road & Mercer Avenue | 41 12 54<br>80 29 06 |
| 611 | WARREN | 42-123-0003 | WARREN | School District Building<br>345 East 5th Avenue | 41 51 26<br>79 08 15 |
| 612 | WARREN | 42-123-0004 | WARREN | Overlook Site near Stone Hill Road | 41 50 41<br>79 10 11 |

## PARAMETERS MONITORED

| COUNTY | PA SITE CODE | PM-10 | TSP | SULFATES | LEAD | NITRATES | BaP | SULFUR DIOXIDE | NITROGEN DIOXIDE | OZONE | CARBON MONOXIDE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MERCER | 602 | X | X | X | X | X | | | | | |
| | 606 | | | | | | | X | | X | |
| WARREN | 611 | | | | | | | X | | | |
| | 612 | | | | | | | X | | | |