

# Commonwealth of Pennsylvania



**pennsylvania**

DEPARTMENT OF ENVIRONMENTAL PROTECTION

## **DESIGNATION RECOMMENDATIONS FOR THE 2008 LEAD NATIONAL AMBIENT AIR QUALITY STANDARD**

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Bureau of Air Quality  
Pennsylvania Department of Environmental Protection  
P.O. Box 8468  
Harrisburg, PA 17105-8468  
717-787-9495

**[www.depweb.state.pa.us](http://www.depweb.state.pa.us)**

John Hanger  
Secretary

Edward G. Rendell  
Governor

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**Designation Recommendations**  
**For the 2008 Lead**  
**National Ambient Air Quality Standard**

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## **What is this document?**

The federal Clean Air Act (CAA) provides a mechanism for states to make recommendations to the United States Environmental Protection Agency (EPA) on the designation of areas meeting and not meeting the National Ambient Air Quality Standards (NAAQS). Section 107(d)(1) of the Clean Air Act (CAA) establishes requirements and procedures for designating areas as “attainment,” “nonattainment” or “unclassifiable” (if adequate data is not available) following the U.S. Environmental Protection Agency’s (EPA) promulgation of National Ambient Air Quality Standards (NAAQS). 42 U.S.C. § 7409(d) (1).

On November 12, 2008, EPA promulgated a more protective lead NAAQS (73 FR 66,964). The primary and secondary standards were lowered from 1.5 micrograms per cubic meter to 0.15 micrograms per cubic meter. Following the promulgation of a NAAQS, each State must submit proposed NAAQS designations to EPA for all areas within its borders one year after the promulgation of the revised NAAQS; designation recommendations for the lead NAAQS were due to EPA by October 15, 2009. The CAA authorizes the EPA Administrator to modify the designation recommendations and to provide an opportunity for states to demonstrate why the proposed modification is not appropriate.

In this document, the Commonwealth of Pennsylvania (Commonwealth or Pennsylvania) is making recommendations to EPA concerning the designation of attainment and nonattainment areas in Pennsylvania for the revised 2008 lead NAAQS. The designation recommendations are based on air quality monitoring data for 2006-2008, point source emission data for 2007 and other available information, including meteorology and demographics. Appendix A contains Table 1, which is a full list of the recommendations by area and county.

EPA anticipates making final designations by October 2010, to be effective in January 2011 for areas with existing monitoring networks and sufficient data. EPA anticipates making final designations by October 2011, to be effective in January 2012 for areas currently without monitoring networks and sufficient data. The Pennsylvania Department of Environmental Protection (DEP or Department) will continue to work with EPA during the lead NAAQS designation process.

## **What is lead?**

Lead is a metal found naturally in the environment and present in some manufactured products. The major sources of lead air emissions have historically been motor vehicles (such as cars and trucks) and industrial sources.

Motor vehicle emissions have been dramatically reduced with the phase-out of leaded gasoline, but lead is still used as an additive in general aviation gasoline used in piston-engine aircraft and remains a trace contaminant in other fuels.

Larger industrial sources of lead emissions currently include metals processing, particularly primary and secondary lead smelters. Lead is also emitted from industries such as: iron and steel foundries; primary and secondary copper smelting; industrial, commercial, and institutional boilers; waste incinerators; glass manufacturing; and cement manufacturing.

### **Health effects**

Lead that is emitted into the air can be inhaled or, after it settles out of the air, can be ingested. Ingestion of lead that has settled onto surfaces is the main route of human exposure to lead originally released into the air. Once in the body, lead is rapidly absorbed into the bloodstream and results in a broad range of health effects.

Children are most vulnerable to the damaging effects of lead because they are more likely to ingest lead due to hand-to-mouth activity and their bodies are developing rapidly. No safe level of lead in the blood has been identified.

Effects in children include:

- Effects on the developing nervous system including the brain. This can lead to IQ loss, poor academic achievement, permanent learning disabilities, and delinquent behavior. The effects can generally persist into early adulthood and can affect lifetime education and achievement.
- Damage to red blood cells
- Weakened immune system

Effects in adults include:

- Increased blood pressure
- Cardiovascular disease
- Decreased kidney function

### **What is the 2008 lead NAAQS?**

EPA sets the NAAQS based on its review of existing scientific knowledge about the adverse health and welfare effects. The CAA requires EPA to review and update periodically, if necessary, the NAAQS to “protect public health with an adequate margin of safety” based on the latest, best-available science. CAA § 109(d), 42 U.S.C. § 7409(d).

On October 15, 2008, EPA substantially strengthened the NAAQS for lead. The revised standards are 10 times tighter than the previous 1978 standards. EPA has revised the level of the primary (health-based) standard from 1.5 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ), to  $0.15 \mu\text{g}/\text{m}^3$ , measured as total suspended particles (TSP). EPA has revised the secondary (welfare-based) standard to be identical in all respects to the primary standard. Welfare effects are defined in the CAA to include, “effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility and climate,

damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.’’ CAA § 302(h), 42 U.S.C. 7602(h).

In conjunction with strengthening the lead NAAQS, EPA is requiring states to improve the existing lead monitoring network. Monitors are to be placed by January 2010 near sources such as industrial facilities that emit one ton per year of lead or more and in urban areas with more than 500,000 people by January 2011. On July 22, 2009, as a result of a January 12, 2009 petition from the Natural Resources Defense Council, EPA agreed to reconsider the emissions threshold for source-oriented and non-source oriented monitoring. The recommendations in this document are based on the requirements of November 2008 lead NAAQS final rule. Following reconsideration of the lead monitoring provisions, DEP would revise its recommendations at a later date if appropriate in light of any future rulemaking.

### **What is the process for designating areas?**

Section 107(d)(1)(B) of the CAA requires EPA to designate areas as nonattainment, attainment or unclassifiable after promulgating a new NAAQS. 42 U.S.C. § 7407(d)(1)(B). Following promulgation of new or revised air standards, governors are required to submit recommendations for attainment and nonattainment areas, supported by the most recent quality-assured monitoring data. EPA provides criteria for states’ recommendations for designating areas.

Governors’ recommendations for lead attainment and nonattainment designations must be submitted to EPA by October 15, 2009, one year after the promulgation of the revised NAAQS. EPA may make modifications and promulgate all or part of a Governor’s recommendations. If EPA determines that a modification to the recommendation is necessary, EPA will notify the state no later than 120 days prior to promulgating the designation, and must give the state an opportunity to demonstrate why the potential modification is inappropriate.

The CAA requires EPA to make final lead designations within two years of promulgation unless there is insufficient information, in which case EPA may access a one-year deadline extension. Therefore, the anticipated schedule for the recommendations of designation, EPA’s designations and states’ development of State Implementation Plans (SIPs) is as follows:

October 2009	DEP holds public meetings and comment period on lead designation recommendations
October 15, 2009	State recommendations due to EPA
June 2010	EPA notifies Pennsylvania if EPA intends to modify recommendations for areas with existing monitoring networks and sufficient data
October 2010	Final designations for areas with existing monitoring networks and sufficient data

January 2011	Effective date for EPA’s final designations for areas with existing monitoring networks and sufficient data
June 2011	EPA notifies Pennsylvania if EPA intends to modify recommendations for areas without existing monitoring networks or sufficient data
October 2011	Final designations for areas without existing monitoring networks or sufficient data
October 2011	Infrastructure SIPs due
January 2012	Effective date for EPA’s final designations for areas without existing monitoring networks or sufficient data
July 2012	Attainment demonstration SIPs due for areas with existing monitoring networks and sufficient data
July 2013	Attainment demonstration SIPs due for areas without existing monitoring networks or sufficient data
January 2016	Attainment date for areas with existing monitoring networks and sufficient data
January 2017	Attainment date for areas without existing monitoring networks or sufficient data.

The Department held public informational meetings on October 21, 2009 in Pittsburgh and Reading to explain the proposed lead designation recommendations. The Department also accepted public comment on the proposed lead designation recommendations through October 30, 2009. Notice of the public meetings and comment period was published in newspapers of general circulation and the Pennsylvania Bulletin.

The Department received comments from eight commentators. Commentators supported the Department’s recommendations for designating areas comprising less than a full county. The recommendation for the Beaver County nonattainment area was revised as a result of comments and the Department’s reanalysis of the Bruce Mansfield power plant’s contribution to the violation at the existing monitor. For Berks County, commentators were also supportive of the concept of recommending two separate areas associated with the point sources of lead pollution, but commentators differed on the specifics of how those areas should be defined and whether both areas should be recommended as nonattainment. While the Department is not changing its recommendations from those proposed, the Department will continue to work with interested parties and EPA to refine its recommendations for Berks County, if necessary.

**What would be the effects of designation as nonattainment?**

The CAA contains different requirements for new and modified stationary sources in areas designated as nonattainment. In addition, the “conformity” provisions of the CAA apply only in nonattainment and maintenance areas; transportation plans and federally funded actions and projects must conform to the SIP in order not to interfere with NAAQS attainment and maintenance.

The lead SIP revisions will outline how each nonattainment area will reduce pollution to meet the 2008 lead NAAQS. For example, a SIP revision could include additional control measures for stationary lead sources. To the extent additional state measures are



required to attain the standard, they will be developed by Pennsylvania through a public process as the SIP revision is developed.

## **Pennsylvania's lead designation methodology**

### **EPA guidance for lead designation boundaries**

Section 107(d)(1) of the CAA defines an area as nonattainment if it does not meet the NAAQS or if it is contributing to ambient air quality in a nearby area that does not meet the NAAQS. 42 U.S.C. § 7407(d)(1).

The EPA states in the revised lead NAAQS rule that EPA will presumptively define the nonattainment area boundary as the perimeter of the county associated with the air quality monitor(s) which records a violation of the standard as proposed (73 Fed. Reg. at p. 67,033). This presumption was also EPA's recommendation for defining the nonattainment area boundaries for the 1978 lead NAAQS and is described in EPA's 1992 publication, "*State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990*," 57 Fed. Reg. 13,549 (Apr. 16, 1992), known simply as the "General Preamble". The state and/or EPA may conduct additional area-specific analyses that could lead EPA to depart from the presumptive county boundary.

For the 2008 lead NAAQS, EPA indicated that nonattainment area boundaries that deviate from presumptive county boundaries be supported by an assessment of several factors, which are discussed below. The factors for determining nonattainment area boundaries for the 2008 lead NAAQS closely resemble the factors identified in recent EPA guidance for the 1997 8-hour ozone NAAQS, the 1997 fine particle (PM<sub>2.5</sub>) NAAQS, and the 2006 PM<sub>2.5</sub> NAAQS nonattainment area boundaries. EPA suggests considering the following eight factors in assessing whether to exclude portions of a county and whether to include additional nearby areas outside the county as part of the designated nonattainment area:

1. Emissions in areas potentially included versus excluded from the nonattainment area.
2. Air quality in potentially included versus excluded areas.
3. Population density and degree of urbanization including commercial development in included versus excluded areas.
4. Expected growth (including extent, pattern and rate of growth).
5. Geography/topography (mountain ranges or other air basin boundaries).
6. Meteorology (weather/transport patterns).
7. Jurisdictional boundaries (e.g., counties, air districts, reservations, etc.).
8. Level of control of emission sources.

The state may, in addition to basing its recommendations for boundaries on the eight factor analysis, also choose to use any one, or a combination, of the following techniques, the results of which EPA would consider when making a decision as to whether and how to modify the Governor's recommendations: (1) qualitative analysis; (2) spatial interpolation of air quality monitoring data; or (3) air quality simulation by dispersion modeling, as described more fully in, "*Procedures for Estimating Probability of*

*Nonattainment of a PM<sub>10</sub>NAAQS Using Total Suspended Particulate or PM<sub>10</sub>Data,*” December 1986. (See also the General Preamble, 57 Fed. Reg. 13,549).

The analyses of these factors may suggest nonattainment area boundaries that are either larger or smaller than the county boundary. A demonstration supporting the designation of boundaries that are less than the full county would be required to show both that violation(s) are not occurring in the excluded portions of the county and that the excluded portions are not source areas that contribute to the observed violations.

### **Discussion by factor**

The Department, on behalf of the Commonwealth, has considered the eight factors identified by EPA. A general discussion of each factor follows below, with the specific area information included in each nonattainment designation section. Of the additional three techniques available for consideration of designation area recommendations, the Department only looked at air quality dispersion modeling as a general reference in recommending two nonattainment areas with boundaries smaller than a county.

### **1. Emissions data**

EPA expects active “stationary sources” (or “point” sources) to be the primary contributor to violations of the NAAQS. It is possible that aviation gas or fugitive dust emissions from area sources containing deposited lead could contribute to violations of the revised standard. However, the Department does not have current information on such sources on a county basis. Additional information on non-point sources is discussed, where available, in the sections on recommended designations.

An emission inventory is an estimate of the emissions in a particular area. The lead inventory used to make the designation recommendations consists of estimates of lead emissions from stationary sources for which the Department collects individual emissions-related information. Generally, stationary sources are “major” stationary sources for purposes of permitting, but may also include some smaller stationary sources. Table 2 in Appendix B shows the 2007 point source inventory of lead emissions by county.

To improve the point source lead inventory, the Department compared lead emissions reported to the Department and lead emissions reported to the Toxics Release Inventory (TRI). The TRI is a publicly available EPA database that contains information on toxic chemical releases and waste management activities reported annually by certain industries as well as federal facilities. In cases where the two inventories did not agree, the Department contacted the facility to investigate. In some cases the discrepancy was explained by the fact that the TRI includes pollutant releases to the water and soil, in addition to releases to the air. In other cases, errors were identified and corrections made to the 2007 inventory. Some errors were determined to be simple calculation errors. Several facilities overestimated their lead emissions by reporting the lead content of their ash as air emissions although most of that material is not emitted to the air. Other

facilities included non-air releases, such as releases to water, soil, or materials being shipped off-site, in their estimates of lead air emissions. Another common error was the use of the uncontrolled emission factor instead of the controlled emission factor for a source with a particulate control device. Table 2 indicates facilities in Pennsylvania emitting one ton or more of lead in 2007.

## **2. Air quality**

### **A. Current monitoring network.**

The Commonwealth's recommendations are based on the 2008 lead design values<sup>1</sup> (using the 2006, 2007, and 2008 monitored data). There are currently three state-operated air monitors in the state that exceed the revised standard: one in Beaver County and two in Berks County. Table 1 in Appendix A displays the 2008 lead design values for all of the lead monitors in Pennsylvania. Figure B-1 in Appendix B is a map of all the lead design values in Pennsylvania.

### **B. Proposed monitoring network.**

The DEP's "*Ambient Air Monitoring Network Plan – 2010*" (June 18, 2009), the Philadelphia Air Management Services' (AMS) "*2009/2010 Air Monitoring Network Plan*" (July 1, 2009) and the Allegheny County Health Department's (ACHD) "*Monitoring Network Review*" (May 31, 2009) describe the Commonwealth's plans for enhanced lead monitoring. These documents are available on each of the respective agencies' websites as listed in the reference section.

The following is a list of facilities emitting one ton per year of lead or more in 2007, around which source-oriented lead monitors (operational by January 1, 2010) may be required:

1. ATI Allegheny Ludlum Corporation, Brackenridge (Allegheny County)
2. GE Consumer Product Lighting Bridgeville Glass, Bridgeville (Allegheny County)
3. Hussey Copper LTD, Leetsdale, (Allegheny County)
4. Reliant Energy Northeast – Keystone Power Plant (Armstrong County)
5. FirstEnergy Generation Corp – Bruce Mansfield Plant (Beaver County)
6. Horsehead Corporation – Monaca Smelter (Beaver County)
7. East Penn Manufacturing Company – Lyons (Berks County)
8. Exide Technologies – Laureldale (Berks County)
9. Exelon Generation Company – Eddystone (Delaware County)
10. U.S. Dept of Defense – Letterkenny Army Depot (Franklin County)
11. Reliant Energy Northeast – Conemaugh (Indiana County)
12. Inmetco – Ellwood City (Lawrence County)
13. Schott North America Inc – Duryea (Luzerne County)

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<sup>1</sup> The design value for lead is the maximum running 3-month average concentration over a three-year period.

Dispersion modeling was used to determine the area of the maximum running 3-month average concentration for lead around each facility that emits at least one ton per year in order to determine an appropriate site for source-based monitoring. Consideration for monitor siting was also given to population exposure in the direction of the modeled maximum concentration. Should monitoring and/or emissions change, or should EPA change its thresholds for required monitoring, DEP, in consultation with EPA, would address this issue in its annual Ambient Air Monitoring Network Plan due to EPA each July after public comment.

In addition to the source-oriented monitoring sites, the Commonwealth is required to install one non-source-oriented monitor in every core-based statistical area (CBSA) with a population of 500,000 people or more. These monitors are to be placed in neighborhoods within urban areas impacted by re-entrained dust from roadways, closed industrial sources which previously were significant sources of lead, hazardous waste sites, construction and demolition projects, or other fugitive dust sources of lead. (73 Fed. Reg. 66,964 (Nov. 12, 2008)). A CBSA associated with at least one urbanized area of 50,000 population or greater is termed a Metropolitan Statistical Area (MSA). 40 CFR Part 58, Appendix D (relating to network design criteria for ambient air quality monitoring), requires the Department to monitor in MSA with populations greater than 500,000 people. These areas are: Harrisburg-Carlisle MSA<sup>2</sup>, Scranton-Wilkes Barre MSA<sup>3</sup>, Lancaster MSA<sup>4</sup>, Allentown-Bethlehem-Easton MSA<sup>5</sup>, Pittsburgh MSA<sup>6</sup> and Philadelphia-Camden-Wilmington, MSA<sup>7</sup>.

The current Avalon air monitoring site satisfies the monitoring requirements for the Pittsburgh MSA. The current Castor and Delaware Avenue site satisfies the monitoring requirements for the Philadelphia-Camden-Wilmington MSA. With the exception of the Allentown-Bethlehem-Easton MSA monitor (which is expected to be deployed in Lehigh County earlier than required), DEP plans on deploying the remaining population-oriented sites by January 1, 2011, as required by federal regulation. However, the exact locations of the monitors are not yet determined.

### **3. Population density and degree of urbanization**

Pennsylvania's population density by county is shown in Figure B-2.

The statistical areas defined by the U.S. Office of Management and Budget (OMB) are useful for assessing the degree of urbanization because the definitions are based on the population of the area's urban core. An MSA has an urban area with a population of at

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<sup>2</sup> The Harrisburg-Carlisle MSA includes: Cumberland, Dauphin and Perry Counties.

<sup>3</sup> The Scranton-WilkesBarre MSA includes: Lackawanna, Luzerne and Wyoming Counties.

<sup>4</sup> The Lancaster MSA includes only Lancaster County.

<sup>5</sup> The Allentown-Bethlehem-Easton MSA includes these portions of PA: Carbon, Lehigh and Northampton Counties.

<sup>6</sup> The Pittsburgh MSA includes Allegheny, Armstrong, Beaver, Butler, Fayette, Washington and Westmoreland Counties.

<sup>7</sup> The Philadelphia-Camden-Wilmington MSA includes these portions of PA: Bucks, Chester, Delaware, Montgomery and Philadelphia Counties.

least 50,000. It may or may not include outlying counties. A micropolitan statistical area has an urban area with a population of at least 10,000, but less than 50,000 (with or without outlying counties). Figure B-3 is a map of the metropolitan and micropolitan statistical areas in Pennsylvania based on OMB Bulletin No. 08-01 (November 2007), containing the lists of counties in each statistical area. OMB considers the factors of population density, population growth trends and degree of urbanization when defining metropolitan and micropolitan statistical areas. OMB also considers factors that are not relevant to the lead designation process, such as traffic, commuting and economic ties between counties, in defining the statistical areas. The criteria on which statistical areas are based are contained in an OMB notice of decision, *Standards for Defining Metropolitan and Micropolitan Statistical Areas* (65 Fed. Reg. 82,228 (Dec. 27, 2000)). The updated list of statistical areas is available at the following website: [www.census.gov/population/www/estimates/metrodef.html](http://www.census.gov/population/www/estimates/metrodef.html)

Emissions of lead are primarily from large stationary facilities. Emissions are not from source types that are influenced by population density. However, the population of urban areas will determine whether additional monitoring is required.

#### **4. Population growth**

Although the factor of population growth is considered in this analysis, a high rate of growth does not necessarily mean a high absolute increase in population or emissions. For example, while Pike County has a high rate of population growth, population is relatively low. As discussed above, lead is primarily emitted from large stationary facilities. Emissions from these facilities are not influenced by local population growth trends. Figure B-4 shows population growth between 2000 and 2007.

#### **5. & 6. Geography/topography and meteorology**

Unlike ground-level ozone and fine particulates, the concentration of lead is based solely on the direct emissions of lead, rather than any chemical transformation of chemical precursors in the atmosphere. Also unlike ozone, fine particulates and their precursors, lead emissions are not conveyed over long distances, so transport from other states is not a factor. Local geography and topography affect the direction of transport and the dispersion of pollutants. These factors are discussed in detail for each recommended nonattainment area in the discussion that follows.

#### **7. Jurisdictional and other boundaries**

Following county boundaries has a natural advantage in that county boundaries are also used by the Commonwealth's regional transportation planning organizations, which are often economic planning organizations as well. Inventory data for non-point sources is also more accurate and available on the county level. EPA recommends that the county boundary, rather than the larger OMB statistical areas, serve as the nonattainment area unless evidence indicates a smaller planning area is justified.

Because of the local, source-oriented nature of the lead problem, the Commonwealth is recommending partial county nonattainment areas using the municipal boundaries of the area including and affected by the lead emission source as the nonattainment area boundary. Using existing municipal jurisdictional boundaries for the boundaries of a nonattainment area (rather than, for example, a boundary based solely on estimated concentrations) ensures that the boundary is already defined. Municipal boundaries were chosen to use well-known areas to eliminate location confusion and expedite tracking permit applications and emissions for the Department, EPA, and public inquiries within these political boundaries. Furthermore, designating a less than county area will allow the Commonwealth to concentrate on effective, local control to bring the area into attainment.

Pennsylvania does not have existing nonattainment areas for the 1978 lead NAAQS for which to utilize existing nonattainment boundaries. Transportation planning area boundaries are not relevant for lead designations because lead is no longer associated with highway emissions.

## **8. Current level of emissions control**

In Pennsylvania, the sources with the highest emissions of lead include lead smelters, battery assembly, electricity generation, and munitions disposal. Some facilities have greater control at the source level than others. A brief description of the major lead emitting sources and their controls is provided in the discussion of each nonattainment area.

### **Pennsylvania recommended designations.**

#### **Recommended attainment areas:**

There are four air quality monitors that have complete, certified, 2006-2008 data with design values below the 2008 lead NAAQS. The Commonwealth is recommending that the following counties, which contain these monitors, be designated attainment based on the monitored lead levels:

Cambria County, Delaware County, Philadelphia County and Westmoreland County. Table 1 in Appendix A lists each county and its proposed designation. This table also includes the maximum design value for the county or area monitor to demonstrate it meets or exceeds the 2008 lead standard.

The Commonwealth is also recommending that certain counties be designated as attainment/unclassifiable because there are no existing lead monitors in these counties, there is no stationary point source of lead that emits one ton per year or more in these counties and the population is not large enough to require a population-based monitor in the MSA. These following counties are recommended as attainment/unclassifiable areas: Adams, Bedford, Blair, Bradford, Bucks, Cameron, Centre, Chester, Clarion, Clearfield, Clinton, Columbia, Crawford, Elk, Erie, Forest, Fulton, Greene, Huntingdon, Jefferson,

Juniata, Lebanon, Lycoming, McKean, Mercer, Mifflin, Monroe, Montgomery, Montour, Northumberland, Pike, Potter, Schuylkill, Snyder, Somerset, Sullivan, Susquehanna, Tioga, Union, Venango, Warren, Wayne and York counties. The Department may revise this recommendation based on any changes to EPA's requirements for monitoring as a result of the reconsideration of the lead NAAQS final rule.

**Recommended unclassifiable areas:**

The Department is recommending that the following counties and portions of counties be designated as unclassifiable because they contain either a one-ton source potentially requiring a source-based monitor and/or the population is large enough to require a population-based monitor within the MSA: Allegheny, Armstrong, Beaver (partial), Berks (partial), Butler, Carbon, Cumberland, Dauphin, Fayette, Franklin, Indiana, Lackawanna, Lancaster, Lawrence, Lehigh, Luzerne, Northampton, Perry, Washington and Wyoming counties. Additional monitoring information obtained from lead monitors installed by the DEP or local air pollution agencies will assist the Department and EPA in the implementation of the lead NAAQS.

As a point of clarification for Allegheny County, there is a lead monitor located within the county; however, it does not have sufficient data to calculate a design value for the 2006-2008 time period. EPA has indicated that based on previous data (2005-2007) the county met the lead 2008 NAAQS. Therefore, Pennsylvania recommends a lead designation of unclassifiable for Allegheny County and all counties in the Pittsburgh MSA and will consider future data, once a complete data set has been certified, to decide whether a designation recommendation of attainment is appropriate.

As a point of clarification for Carbon County, EPA has indicated that based on 2005 data the county exceeded the 2008 NAAQS with a design value of  $0.33 \mu\text{g}/\text{m}^3$ . The Department removed the Palmerton, Carbon County lead monitor in 2005 due to staffing issues and because at that time the county was meeting the 1978 lead standard. There are no sources emitting greater than 1 ton of lead per year; therefore, at the current time the Department is not required to install an air quality source-based monitor for lead in Carbon County. However, Carbon County is part of the Allentown-Bethlehem-Easton MSA where a population monitor is required. The Commonwealth may revise its recommendation for Carbon County once monitoring data is available..

**Recommended nonattainment areas:**

The Commonwealth is making the following lead nonattainment area designation recommendations based upon air quality monitoring data for 2006-2008, other information regarding the factors EPA suggests considering, and additional information described below. Appendix A contains Figure A-1 which is a map of the proposed lead nonattainment areas in Pennsylvania.

## **1. Central Berks County- two Nonattainment Areas**

The Commonwealth recommends that two areas within Berks County, namely North Reading and Lyons, be designated as lead nonattainment areas as described below. The Commonwealth recommends the remainder of Berks County be designated unclassifiable. Figure A-2 in Appendix A visually demonstrates the municipalities and areas of Berks County included in each proposed nonattainment area.

EPA has indicated that facilities that emit greater than one ton of lead per year could potentially cause lead NAAQS violations. There are two facilities that are significant sources of lead in Berks County: Exide Technologies (Exide) in Laureldale which emitted 1.47 tons in 2007 and East Penn Manufacturing Company (East Penn) in Richmond Township which emitted 2.59 tons in 2007. The two recommended nonattainment areas include the municipalities containing and impacted by the two facilities in Berks County that are significant sources of lead emissions.

Preliminary dispersion modeling performed for the purposes of analyzing the siting of lead monitors indicates that the area potentially affected by these sources is small compared to the size of the county. Note that this modeling was performed using actual emissions rather than permitted limits. The recommendation for these nonattainment areas includes the municipalities that this modeling indicates could experience concentrations of at least half the NAAQS. Appendix B contains two maps that visually demonstrate the contours of lead concentrations resulting from the preliminary modeling runs. Figure B-5 is for the North Reading Nonattainment Area and Figure B-6 is for the Lyons Nonattainment Area.

Monitoring for total suspended particulates and metals by the Kutztown University Foundation at the Kutztown University site, and DEP personnel at the Reading Airport site, consistently shows low levels of lead. Note that these monitors are not operated as part of the Commonwealth's monitoring network for criteria pollutants and the results are not derived from either the Federal Reference Method or Equivalent Method. However, the low lead concentrations measured at these monitors demonstrate the local nature of lead and also lend support to the very small nonattainment boundary recommendation. The Berks County airport site is located approximately 2.5 miles west of Exide in Bern Township. The Kutztown University site is located approximately 3 miles north of East Penn.

### **A. North Reading Nonattainment Area**

The Commonwealth recommends that the following municipalities in Berks County be designated as the North Reading nonattainment area for the 2008 lead NAAQS: Laureldale Borough, Muhlenberg Township and Alsace Township. This area contains a lead source, Exide, which emits more than one ton of lead annually, an ambient air quality monitor in Muhlenberg Township that violates the 2008 lead NAAQS.

There is a lead monitor in Muhlenberg Township near Exide that violates the 2008 lead NAAQS with a design value of  $0.38 \mu\text{g}/\text{m}^3$ .



### **B. Lyons Nonattainment Area**

The Commonwealth recommends that the following municipalities in Berks County be designated as the Lyons nonattainment area: Lyons Borough, Maxatawny Township and Richmond Township. This area contains a lead source, East Penn, which emits more than one ton of lead annually and an ambient air quality monitor in Lyons Borough that exceeds the 2008 lead NAAQS.

There are two lead monitors near East Penn. The Lyons East monitor is located in Lyons Borough, and the Lyons South monitor is located in Rockland Township. The Lyons East monitor violates the NAAQS with a design value of  $0.22 \mu\text{g}/\text{m}^3$ . The Lyons South monitor has a design value of  $0.11 \mu\text{g}/\text{m}^3$  which meets the NAAQS.

## Meteorology and geography/topography

### *Berks County, in General*

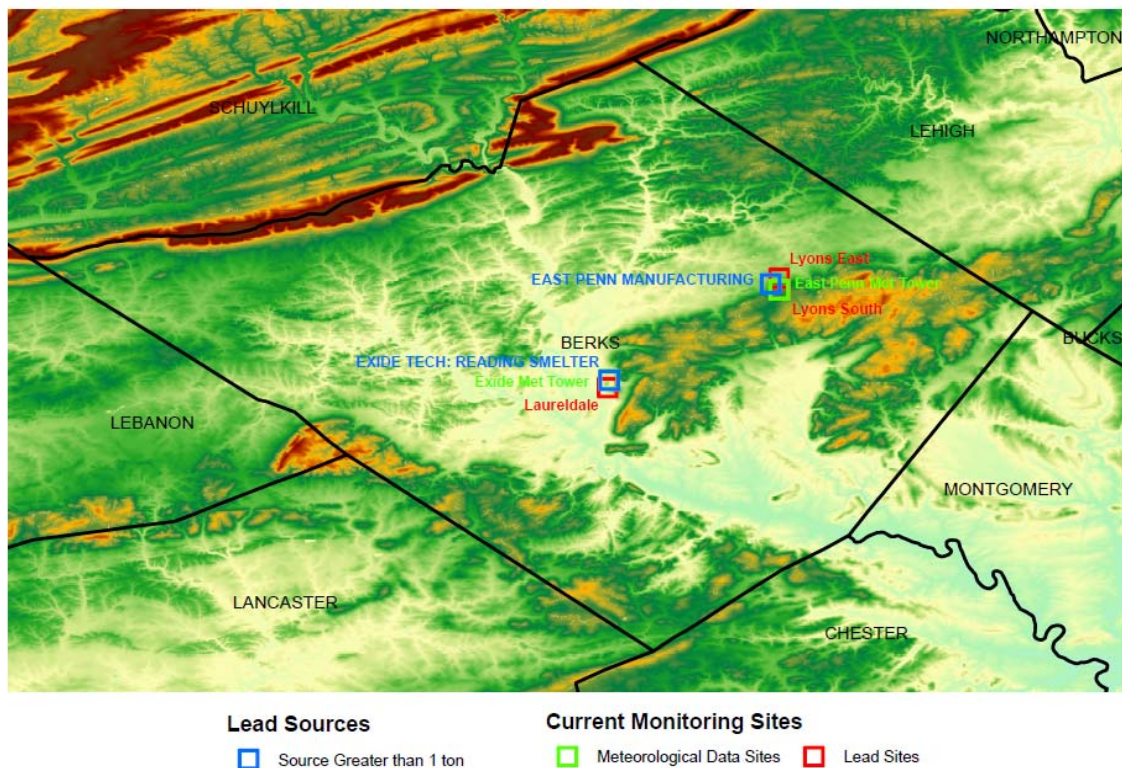
Berks County is situated to the east of the Appalachian Mountain chain. Figure 1 below displays a topographical overview of all of Berks County. There are several topographical features within Berks County:

- 1.) a mountain chain that divides the northwestern border of Berks County with Schuylkill County,
- 2.) higher terrain along the southern Lebanon and Lancaster County lines and
- 3.) higher terrain that runs through the center of the county and then off to the east.

These types of steep gradients, especially when combined with the rivers that run through the county, drive the meteorological conditions witnessed within the county.

**Figure 1**

**Berks County Topographical Map**



*North Reading Nonattainment Area - Laureldale Lead Monitoring Location*

Locally, the topography in and around the Laureldale monitor is driven by the hillside to the east of the monitor. Figure 2 displays the location of the Laureldale monitor in relation to Exide's Reading Smelter facility and Exide's meteorological tower. In addition, Figure 2 highlights the terrain above the anemometer of height on the Exide meteorological tower (anemometer is at 60 feet plus base elevation of tower at 382 feet). Therefore, the measurements being taken by the Exide meteorological tower are significantly influenced by the hillside to its east and the lack of higher terrain to its immediate west.

**Figure 2**

**Laureldale (Berks County) Topographic Map**

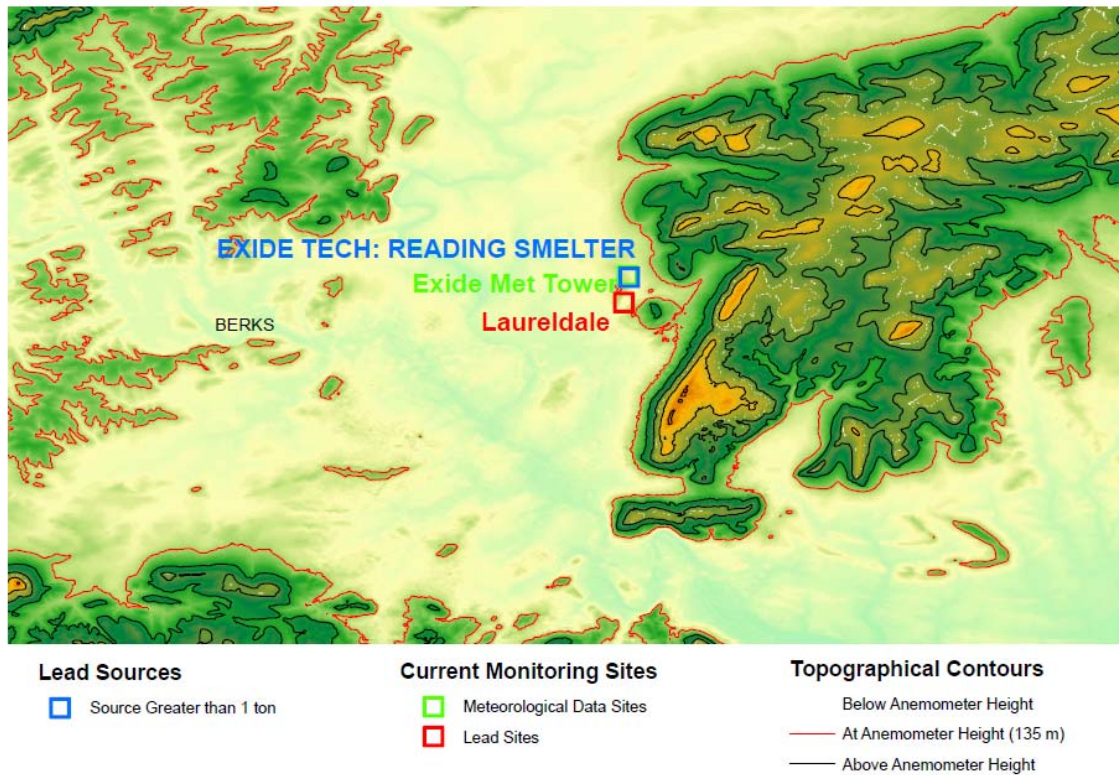
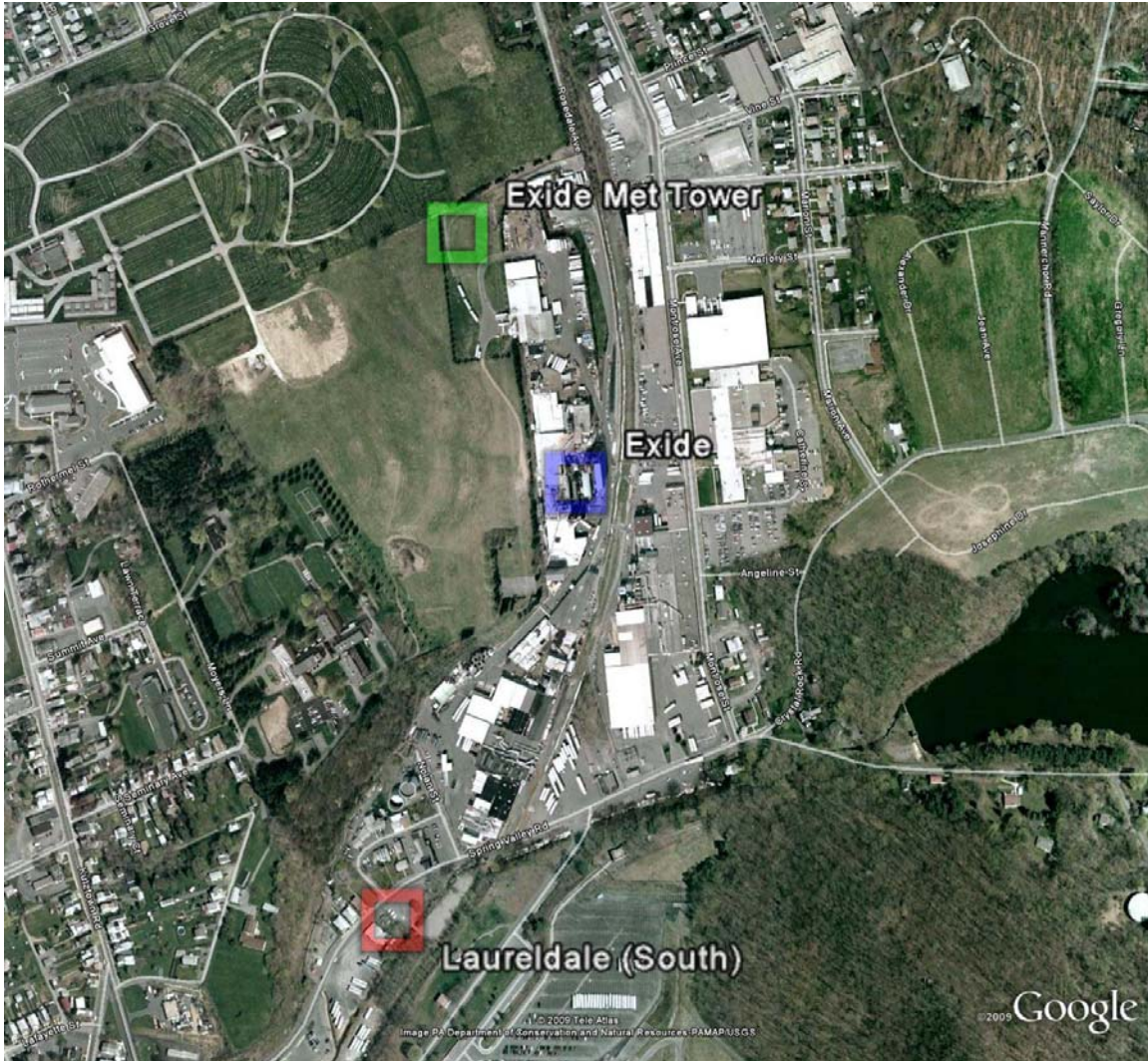




Figure 3 (courtesy of Google Earth) shows the Laurelale monitoring location with respect to the Exide facility and its meteorological tower.

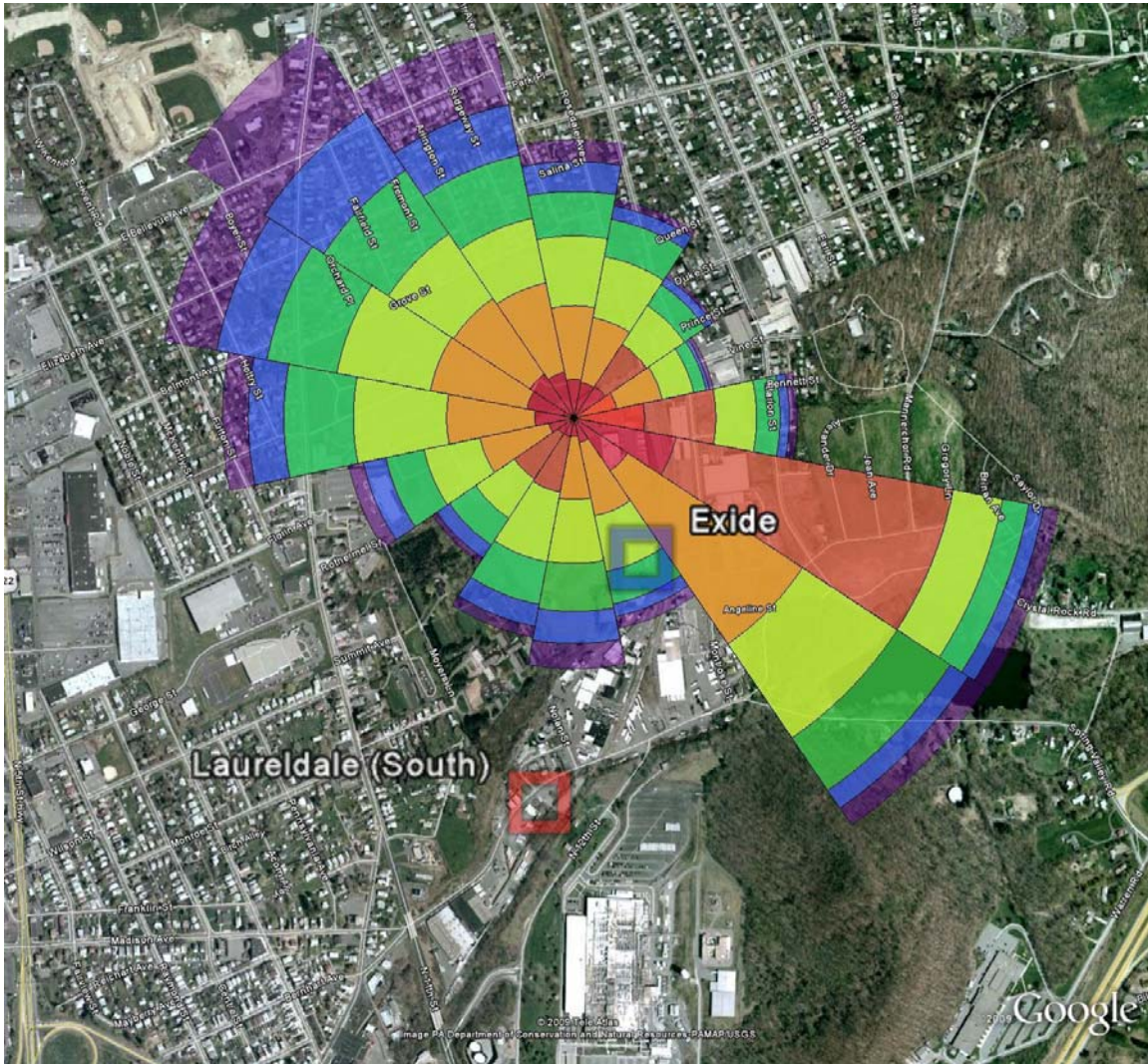
**Figure 3**





The impact of the hillside to the east of the Laureldale can also be seen by looking at the wind measurements that were collected at the Exide meteorological tower. Figure 4 (courtesy of Google Earth) displays the wind data measured at Exide's meteorological tower from late May 2003 to mid August 2008 (approximately a five-year dataset).

**Figure 4**



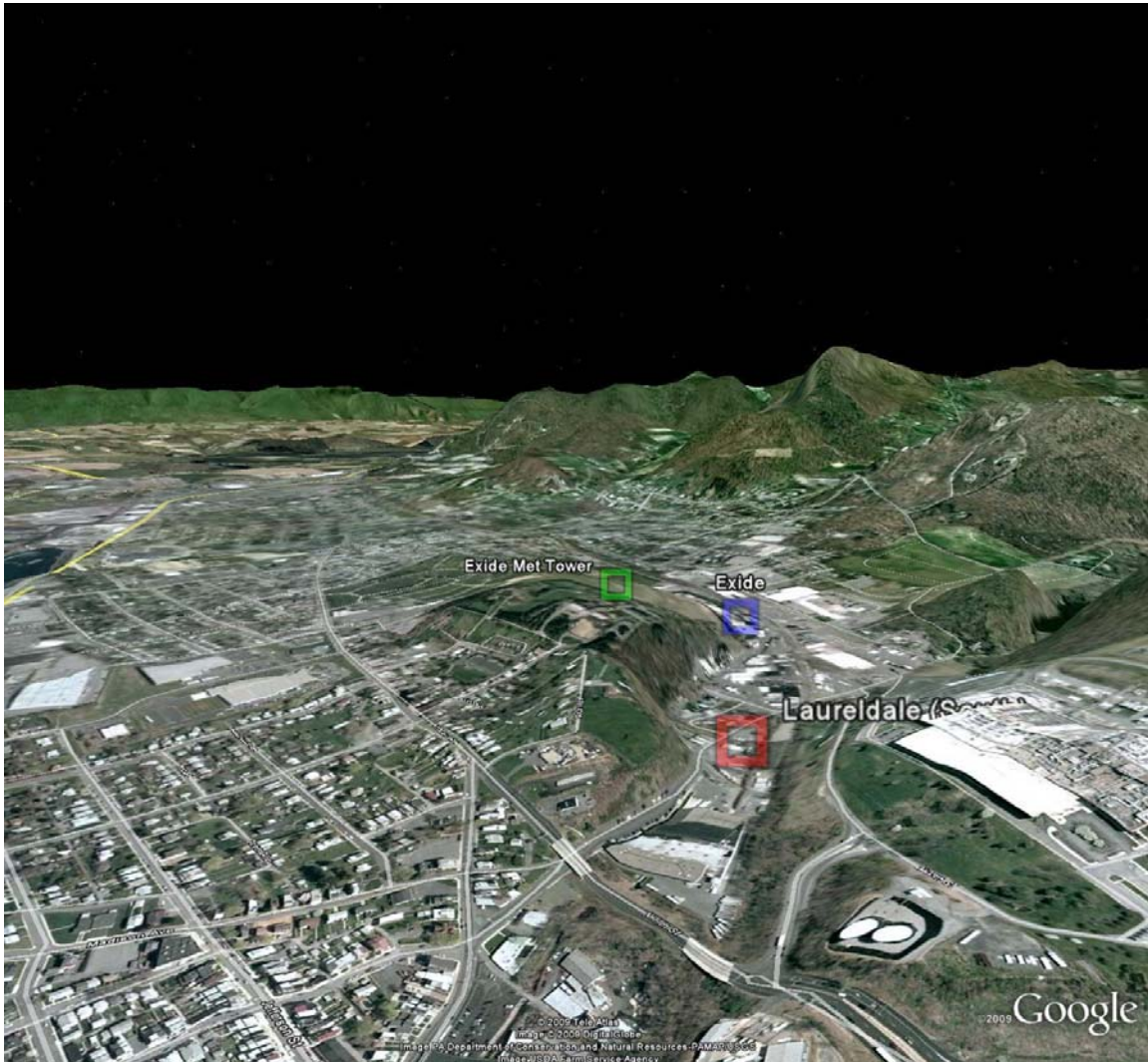
**Wind Rose Legend**



The wind is primarily out of the northwest and southeast. However, there are stronger winds coming from the northwest than the southeast, primarily because of the terrain to the east of the meteorological tower location (see Figure 2 above). By traveling from the southeast, the wind is undergoing more friction (from its impact with the hillside), which is resulting in the slower wind speeds.

Taking a cross section look (in three dimensions within Google Earth) at the local area in Figure 5 below, one can see the relationship of the local terrain with respect to the Exide facility, its meteorological tower and the Laureldale monitor. Figure 5 looks southwest to northeast.

**Figure 5**



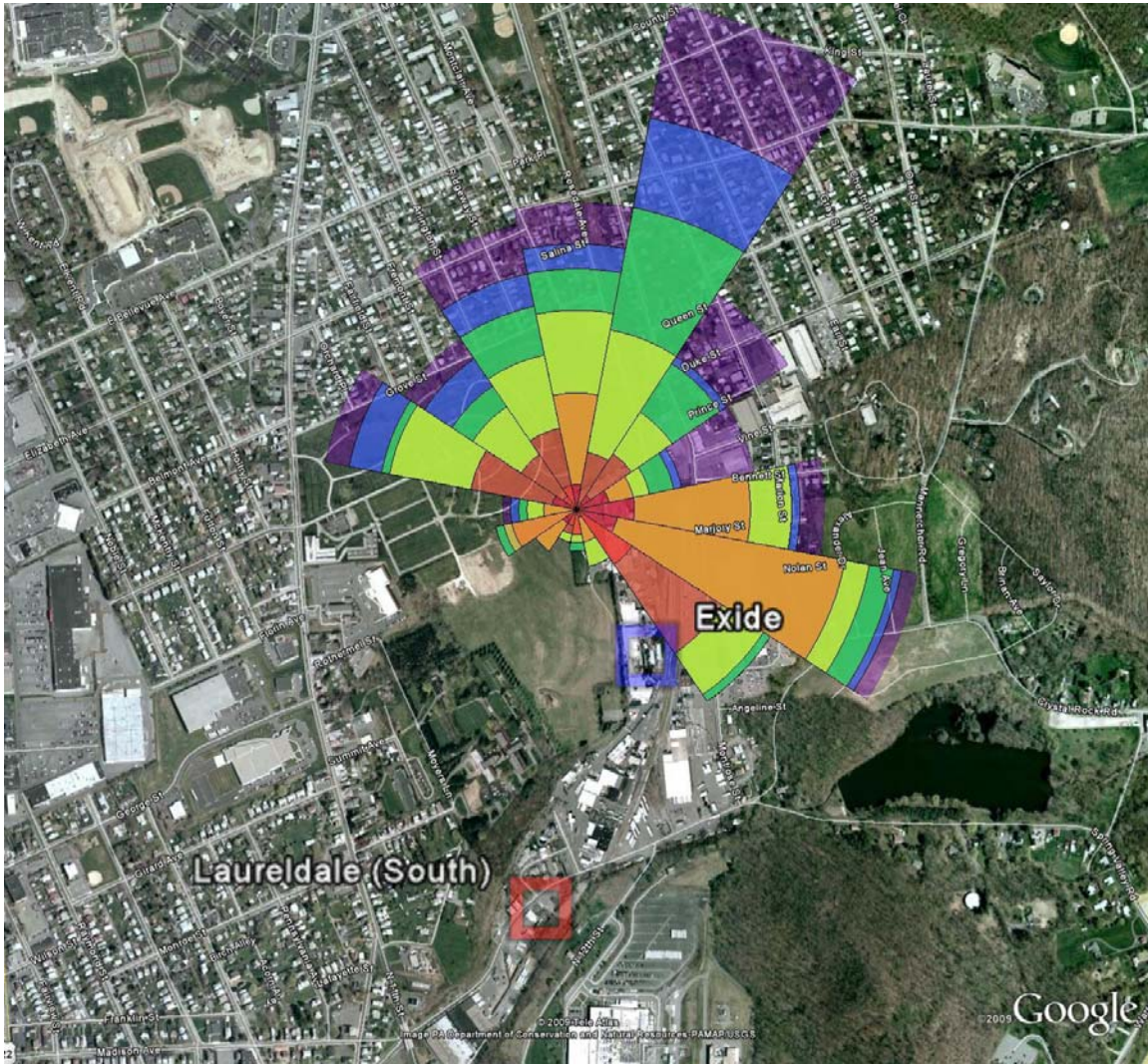
The Exide meteorological tower sits on top of a local hill, with much of the Exide facility and the Laureldale monitor sitting in a valley between that local hill and the higher terrain to the east.

The Laureldale monitor lies to the south southeast of the Exide facility. The Laureldale monitor acquires lead samples from the air on every sixth day, which results in the monitor capturing approximately 60 samples per year. The design value for 2008 (which is based on data from 2006 to 2008), for the Laureldale monitor exceeded the 2008 lead standard with a concentration of  $0.38 \mu\text{g}/\text{m}^3$ . Since higher daily concentrations are driving the high 3-month averages, the Department analyzed the data for the days in



which the lead concentrations were at least one standard deviation higher than the 2008 lead standard. Monitor readings on nineteen days were found to exceed this threshold. Then, the Department analyzed the wind data and created a wind rose to coincide with the meteorological data collected on those nineteen days. Figure 6 shows the results.

**Figure 6**



When comparing this figure with Figure 4 above (for all days), one will notice that the primary wind direction has changed. There is a very prominent northerly flow, along with a southeasterly one. In addition, wind speeds are generally slower, indicating that a much more stable air mass is in place over the region when the concentrations rise. A stable boundary layer would limit vertical mixing, thus allowing concentrations to build near the surface. Overall, the prominent northerly winds and lighter wind speeds are

indicating that the driving source of the higher lead concentrations is coming from the area in and around the Exide facility.

Due to the nature of the high lead concentrations around the Laureldale monitor (light flow along with northerly flow driving concentrations up from the local facility) and low concentrations of lead at a monitor at the Reading airport south of this location, the Department is recommending a nonattainment area smaller than the county.

*Lyons Nonattainment Area - Lyons (East and South) Lead Monitoring Locations*

Locally, the topography in and around the Lyons monitors is driven by the hillside to the south and east of both monitoring locations. Figure 7 displays the location of the Lyons monitors in relation to the East Penn facility and East Penn's meteorological tower. In addition, Figure 7 highlights the terrain above the anemometer of height on the East Penn meteorological tower (anemometer is at 33 feet (10 meters) plus base elevation of tower at 770 feet). Therefore, the measurements being taken by the East Penn meteorological tower are significantly influenced by the hillside to its south and east and the lack of higher terrain to its southwest and northeast.

**Figure 7**

**Lyons (Berks County) Topographic Map**

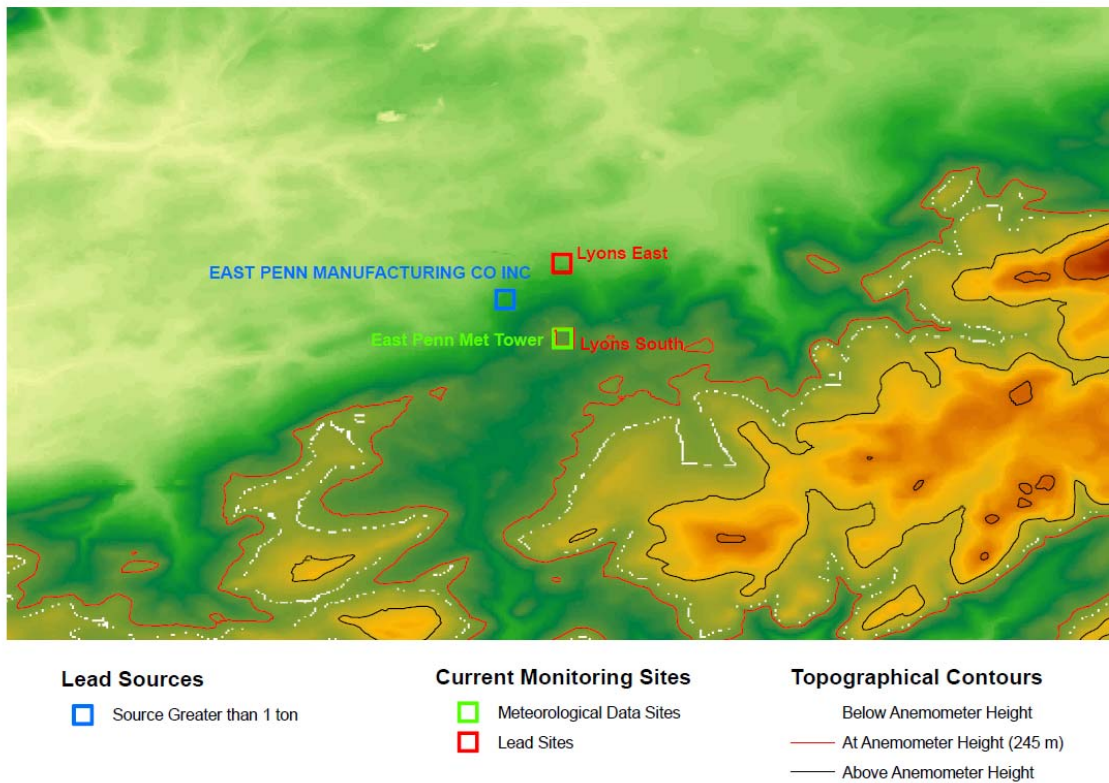
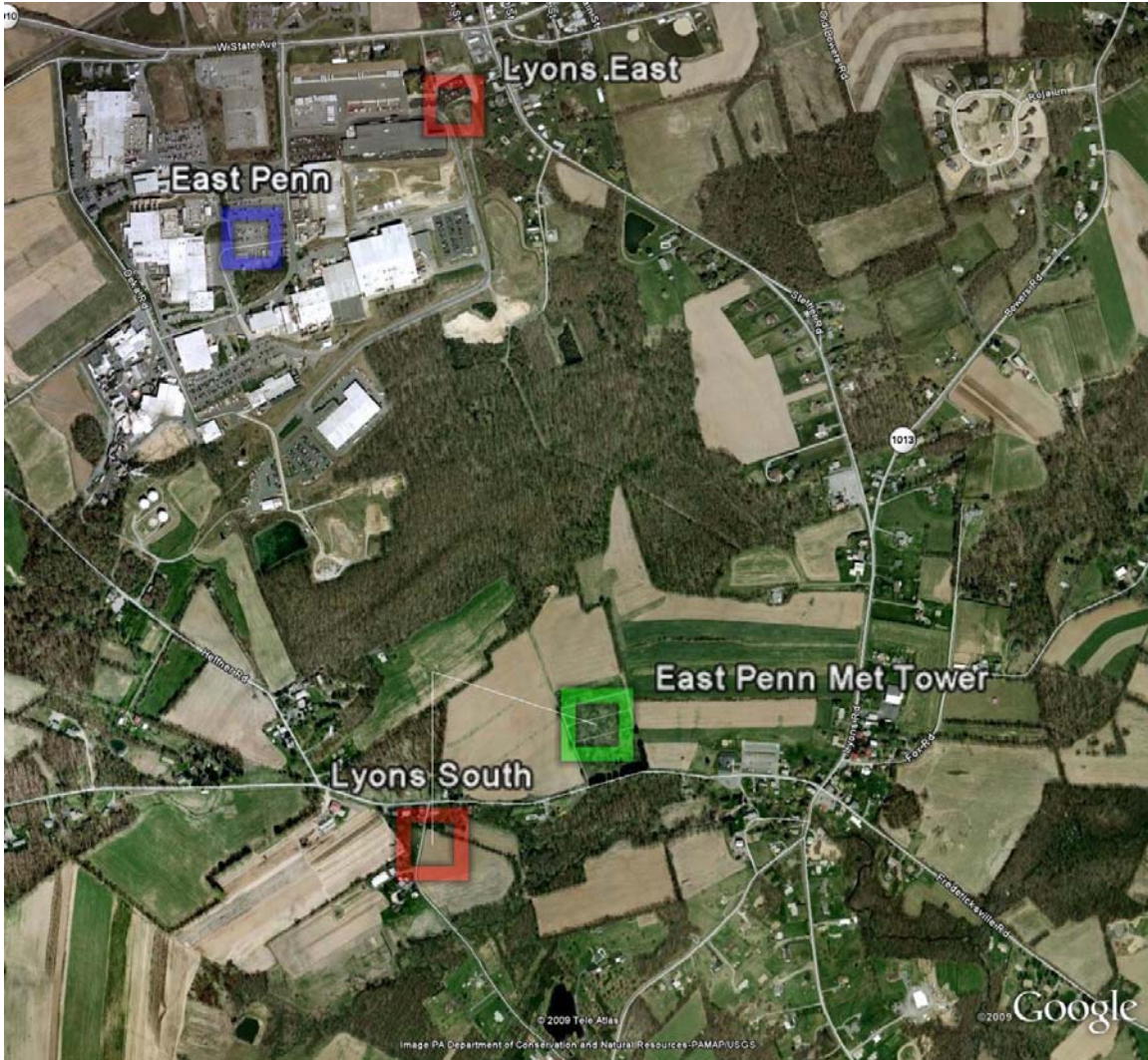




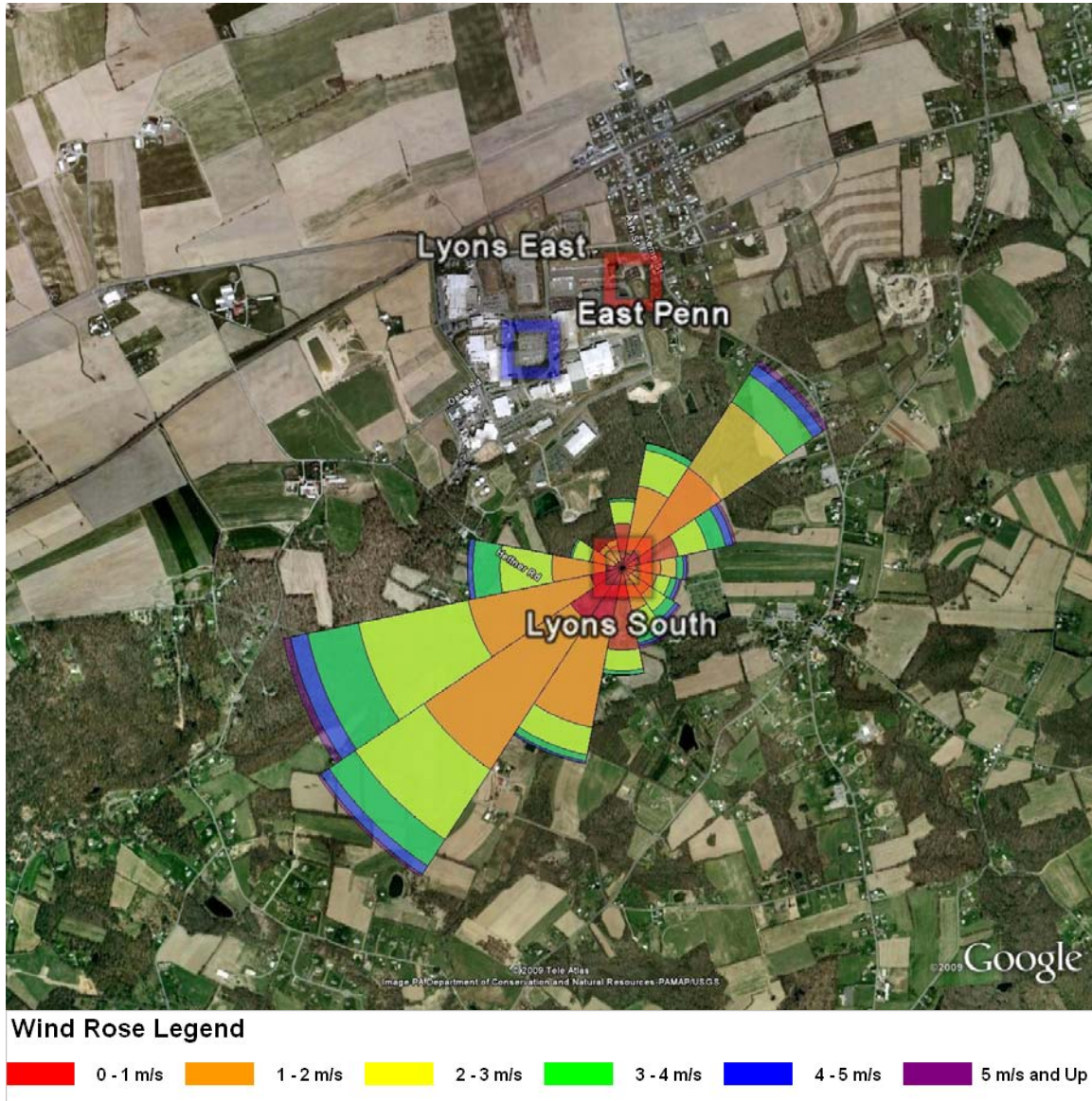
Figure 8 (courtesy of Google Earth) shows the Lyons monitoring locations with respect to the East Penn facility and their meteorological tower.

**Figure 8**



The impact of the hillside to the south and east of both Lyons monitors can also be seen by looking at the wind measurements that were collected at the East Penn meteorological tower. Figure 9 (courtesy of Google Earth) displays the wind data measured at East Penn's meteorological tower from January 2004 to December 2008 (a five-year dataset).

**Figure 9**

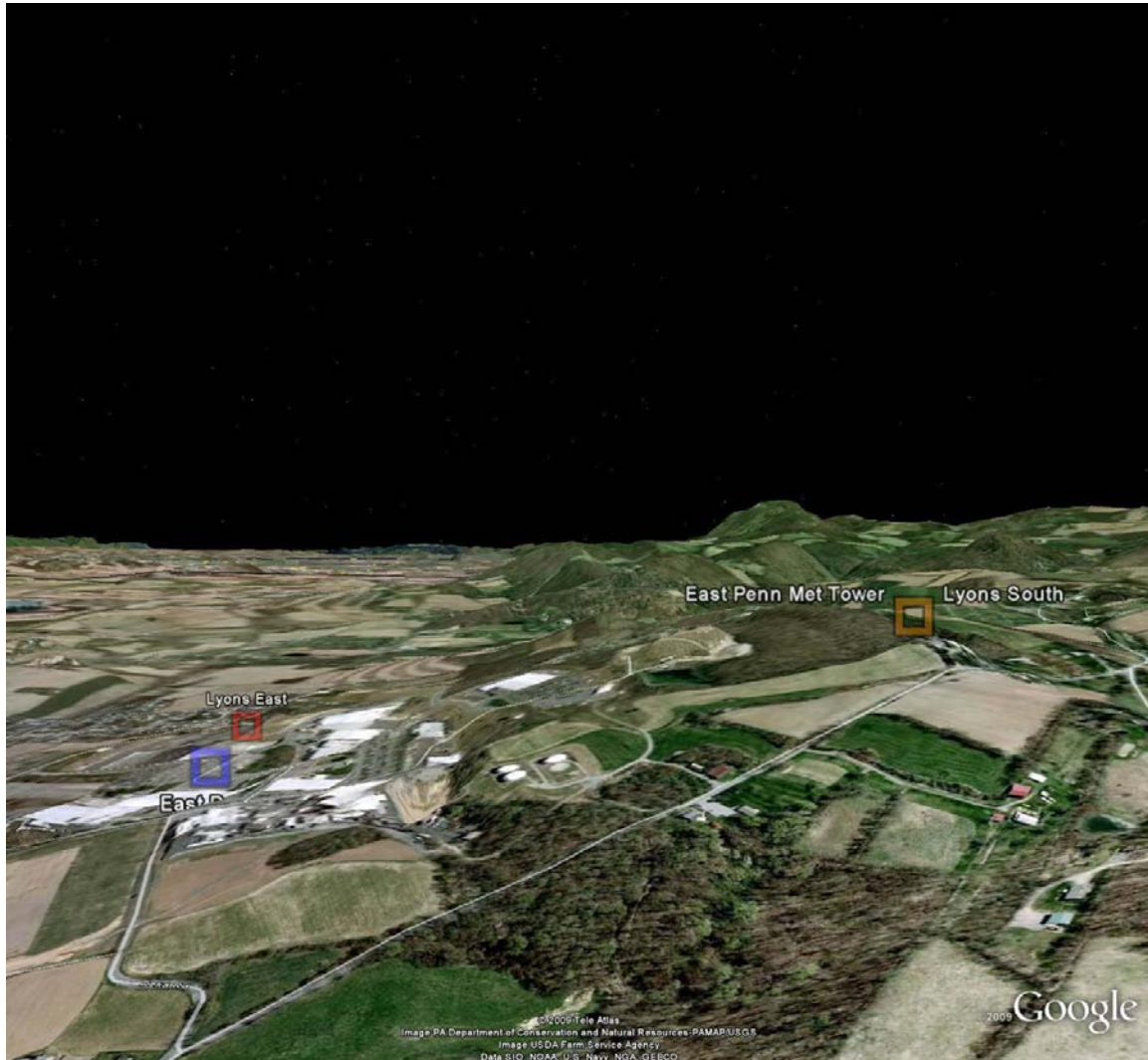


The wind is primarily out of the southwest and northeast, which basically represents the way the terrain is oriented in this area. The higher terrain to the southeast of the East Penn meteorological tower is forcing the wind in the proximity of the tower to come from the southwest.



Taking a cross section look (in three dimensions within Google Earth) at the local area in Figure 10 below, one can see the relationship of the local terrain with respect to the East Penn facility, its meteorological tower and the Lyons monitors. Figure 10 looks southwest to northeast.

**Figure 10**

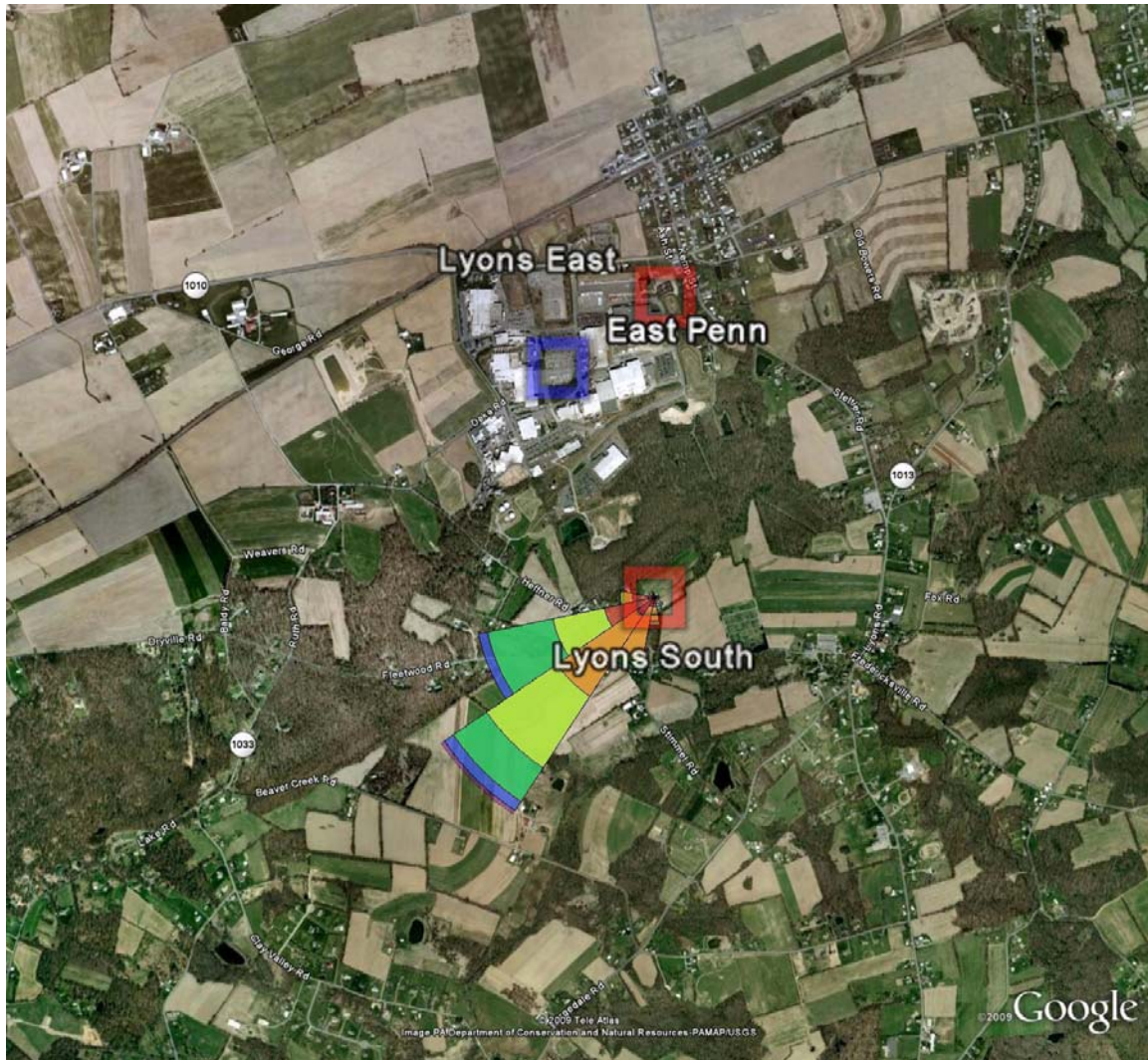


The East Penn meteorological tower, which is collocated with the Lyons South monitor, sits on top of a local hill, with much of the East Penn facility and the Lyons East monitor sitting in a valley between that local hill and the higher terrain to the north.

Also from Figure 10 above, one can see that the Lyons East monitor lies to the east and the Lyons South monitor lies to the south of the East Penn facility. Both of the Lyons monitors acquire lead samples from the air on every sixth day, which results in the monitors capturing approximately 60 samples per year. The design value for 2008 (which is based on data from 2006 to 2008) for the Lyons East monitor exceeds the 2008 lead standard with a concentration of  $0.22 \mu\text{g}/\text{m}^3$  and the Lyons South monitor attaining

the 2008 lead standard with a concentrations of  $0.11 \mu\text{g}/\text{m}^3$ . Since higher daily concentrations are driving the high 3-month averages, the Department analyzed the data on the days in which the lead concentrations were at least one standard deviation higher than the 2008 lead standard at the exceeding monitor, Lyons East. Readings on seventeen days were found to exceed this threshold. Then, the Department analyzed the wind data and created a wind rose to coincide with the meteorological data collected on those seventeen days. Figure 11 shows the results.

**Figure 11**



Note the following things about this wind rose. First, when comparing this figure with Figure 9 above, one will notice that the primary wind direction has changed. There is a very prominent southwesterly flow, with no real flow from any other direction. Overall, the prominent southwesterly winds are indicating that the driving source of the higher

lead concentrations measured at the Lyons East monitor are coming from the area in and around the East Penn facility.

Due to the nature of the high lead concentrations around the Lyons East monitor (southwesterly wind flow driving concentrations up from the local facility) and the existence of a monitor with low lead concentrations in Kutztown, the Department is recommending a nonattainment area less than the county.

### **Emission sources and controls in Berks County**

**Exide** operates a secondary lead smelter at its facility in the Borough of Laureldale/Muhlenberg Township. The facility processes used lead/acid automotive and truck batteries and other lead bearing scrap into metallic lead in one of the two smelting systems. Each system has an identical series of control devices. The area that reports the highest lead emissions is the raw material storage building, which is exhausted to fabric collectors to control particulate and lead.

The Exide smelter is subject to several special permitting requirements in the Code of Federal Regulations (CFR). The entire facility is also subject to the lead Reasonably Available Control Technology SIP. Included in the permit are the following requirements: annual or semi-annual testing for lead, routine monitoring of all control devices at the facility, recordkeeping and reporting. These requirements have been made part of the Commonwealth's SIP, per 40 CFR 52.2063(c)(62) and are codified at 40 CFR 52.2020(e)(1). The Exide Smelter sources are regulated according to the current federal and state standards.

**East Penn** operates a lead/acid storage battery assembly facility and a secondary lead smelter in Richmond Township. The six battery assembly plants and lead oxide plant account for most of the lead emissions reported by the facility. Each assembly plant consists of four main operations that result in particulate and lead emissions controlled by fabric collectors. Most fabric collectors are followed by a HEPA filter to further reduce the emissions. The East Penn smelter recycles used lead/acid batteries into elemental lead. (This smelter is smaller than the Exide smelter. Although the process and controls are similar, the emissions are lower due to the size of facility.)

All of the East Penn sources of lead emissions are subject to several special permitting requirements in the CFR. The entire facility is also subject to the lead Reasonably Available Control Technology SIP. Included in the permit are the following requirements: operation of an ambient air monitoring network for lead, operation of control devices and specific work practices for the control of fugitive emissions at the smelter. These requirements have been made part of the Commonwealth's SIP, per 40 CFR 52.2063(c)(62) and are codified at 40 CFR 52.2020(e)(1). The East Penn battery assembly and smelter sources are regulated according to the current federal and state standards.

## **Other factors**

Berks County has historically been the location of many battery-related industries that did not follow today's waste management practices. There have been several completed site remediation projects in the county and at least one ongoing remediation, at Bernhart Park in north Reading. Soil samples in the vicinity of these cleanups indicate that soil contamination did not extend more than about ½ mile from the waste disposal. In addition, battery casing dumps are common in the county, associated with defunct lead recycling operations. However, the waste is typically buried at these sites and does not actively contribute lead to the ambient air.

Berks County has a relatively high population density with a positive growth trend based on population growth from 2000 to 2007. The Commonwealth has considered the population data. Based on the fact that emissions of lead are primarily from large stationary facilities and not from source types that are influenced by population density or growth trends, the Commonwealth concludes that population density and growth trends do not bear on the recommendation to designate partial county nonattainment areas in Berks County. The City of Reading is the most densely populated area in the county. The Department considered including the city in the nonattainment area in order to protect sensitive populations; however, meteorology, topography and preliminary modeling indicates that lead emissions from the contributing source are not likely to violate the standard in the city, even with a considerable margin of safety.

Traditionally, Berks County has had its own planning functions. The Reading Metropolitan Planning Organization provides transportation planning services for Berks County. Berks County was designated as a single county nonattainment area for the 1997 PM<sub>2.5</sub> standard and for the 8-hour ozone standard. However, these boundaries were not used in the 2008 lead nonattainment recommendation since evidence supports a designation of less than a county and transportation is no longer a source of lead emissions.

## **Conclusion**

Considering information obtained from preliminary modeling results and based on the above analyses of the eight factors provided by EPA to define better nonattainment area boundaries when a state recommends boundaries smaller than county boundaries, the Commonwealth recommends that the EPA designate North Reading and Lyons as lead nonattainment areas, rather than the entire County of Berks.



## **2. Lower Beaver Valley Nonattainment Area**

The Commonwealth recommends the following municipalities in Beaver County be designated as the Lower Beaver Valley nonattainment area for the 2008 lead NAAQS: Potter Township and Vanport Township. The recommended partial county nonattainment boundary includes the largest lead source in the county that emits more than one ton of lead per year and one ambient lead monitor in Vanport Township which exceeds the 2008 lead NAAQS.

The Commonwealth recommends the remainder of Beaver County be designated unclassifiable. Figure A-3 in Appendix A is a map that visually demonstrates the municipalities included in the proposed nonattainment area.

EPA has indicated that facilities that emit greater than one tpy could potentially cause lead NAAQS violations. There are two facilities that are significant sources of lead in Beaver County, according to the Department's 2007 inventory: Horsehead Corporation's Monaca Smelter in Potter Township (Horsehead) (5.64 tpy) and FirstEnergy Generation Corporation's Bruce Mansfield Plant (Bruce Mansfield) (1.2 tpy).

There is currently an ambient lead monitor located in Vanport which is approximately 1.2 miles northeast of Horsehead. It has a design value of  $0.21 \mu\text{g}/\text{m}^3$ , exceeding the 2008 lead NAAQS. The Department is required to continue monitoring the air at the current location for one year in conjunction with monitoring at the sites designated by modeling Horsehead's and Bruce Mansfield's emissions as the high concentration location.

A lead source is also located in Allegheny County, near the border of Beaver County, that emits greater than a half a ton of lead. The Allegheny County facility is approximately 10-15 miles from the sources in Beaver County. Based on modeling performed to assess monitor siting, the Department does not believe the Allegheny County source should be considered to influence lead emissions in conjunction with the Beaver County sources.

Beaver County has a relatively high population density with a declining trend based on population data from 2000 to 2007. The Commonwealth has considered the population data. Based on the fact that emissions of lead are primarily from large stationary facilities and not from source types that are influenced by population density or growth trends, the Commonwealth concludes that population density and growth trends do not bear on the recommendation to designate a partial county nonattainment area for Beaver County.

The Southwestern Pennsylvania Commission provides transportation planning services for Beaver County. Beaver County is part of the Pittsburgh-Beaver Valley  $\text{PM}_{2.5}$  and 8-hour ozone nonattainment areas. However, these boundaries were not used in the 2008 lead nonattainment recommendation since evidence supports a designation of less than a county and transportation is no longer a source of lead emissions.

## Meteorology and geography/topography.

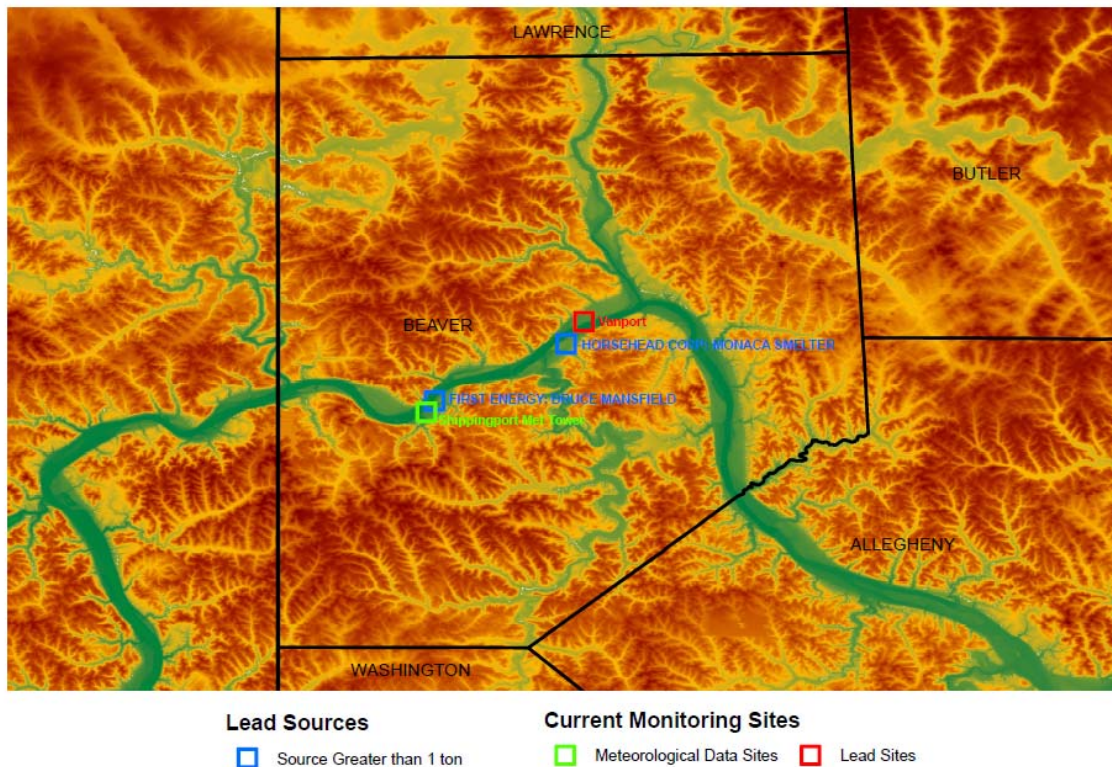
Beaver County is situated to the northwest of the Pittsburgh metropolitan area and to the west of the Appalachian Mountains. Figure 12 below displays a topographical overview of all of Beaver County. There are several topographical features within Beaver County. The entire county ranges in elevation from 660 feet to 1380 feet. The two main features that separate the county into three distinct areas of higher elevation are:

- 1.) the Ohio River (which runs from the Ohio / Pennsylvania border eastward and then southward toward Pittsburgh) and
- 2.) the Beaver River (which runs from the Lawrence County / Beaver County border southward into the Ohio River).

These types of steep gradients, especially when combined with the rivers that run through the county, drive the meteorological conditions witnessed within the county.

**Figure 12**

### Beaver County Topographical Map



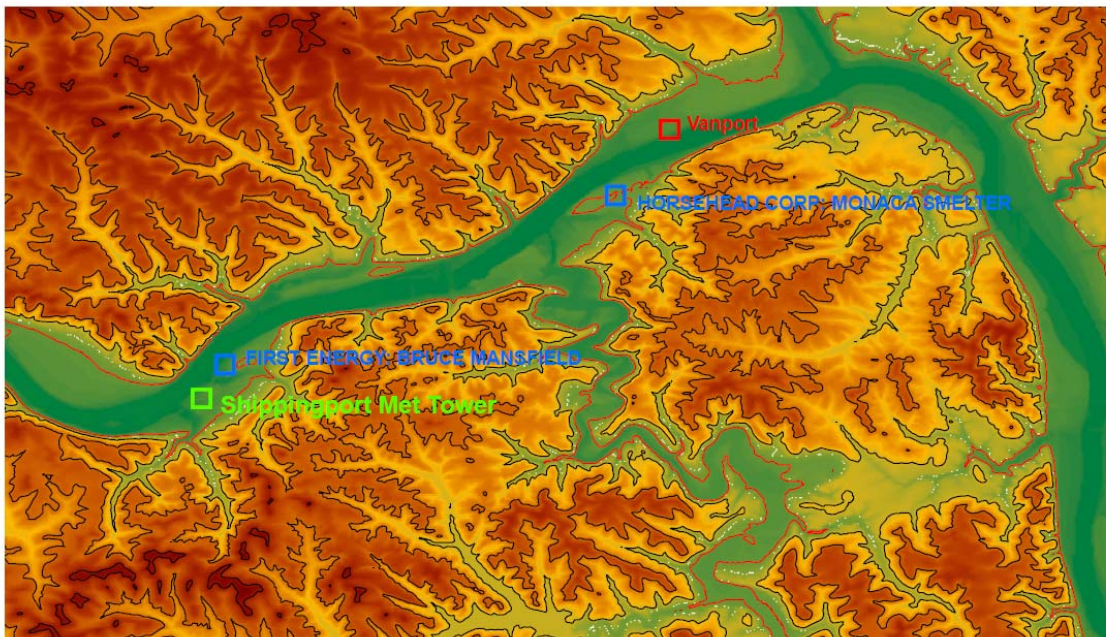


### Vanport Lead Monitoring Location

Locally, the topography in and around the Vanport monitor is driven by the fact that the Vanport monitor sits within the Ohio River valley. Figure 13 displays the location of the Vanport monitor in relation to the Bruce Mansfield and Horsehead facilities and the FirstEnergy Beaver Valley nuclear facility's (Shippingport) meteorological tower. In addition, Figure 13 highlights the terrain above the anemometer of height on the Shippingport meteorological tower (anemometer is at 35 feet plus base elevation of tower at 750 feet). Therefore, the measurements being taken by the Shippingport meteorological tower are significantly influenced by the terrain to its north and south, since the tower sits within the same river valley as the Vanport monitor.

**Figure 13**

### Vanport (Beaver County) Topographic Map



#### Lead Sources

□ Source Greater than 1 ton

#### Current Monitoring Sites

□ Meteorological Data Sites

□ Lead Sites

#### Topographical Contours

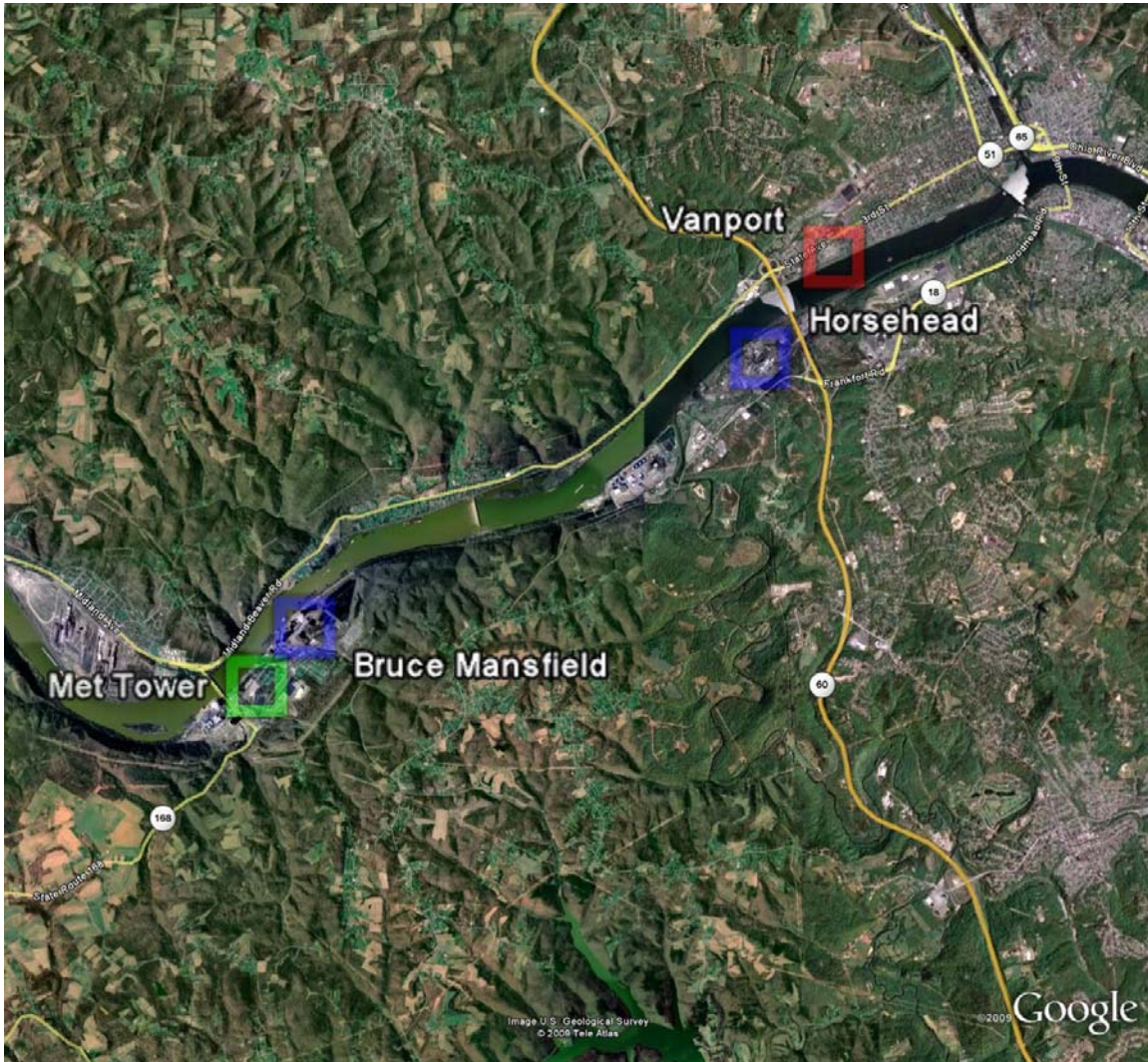
— Below Anemometer Height

— At Anemometer Height (240 m)

— Above Anemometer Height

Figure 14 (courtesy of Google Earth) shows the Vanport monitoring location with respect to the Bruce Mansfield and Horsehead facilities and the Shippingport meteorological tower.

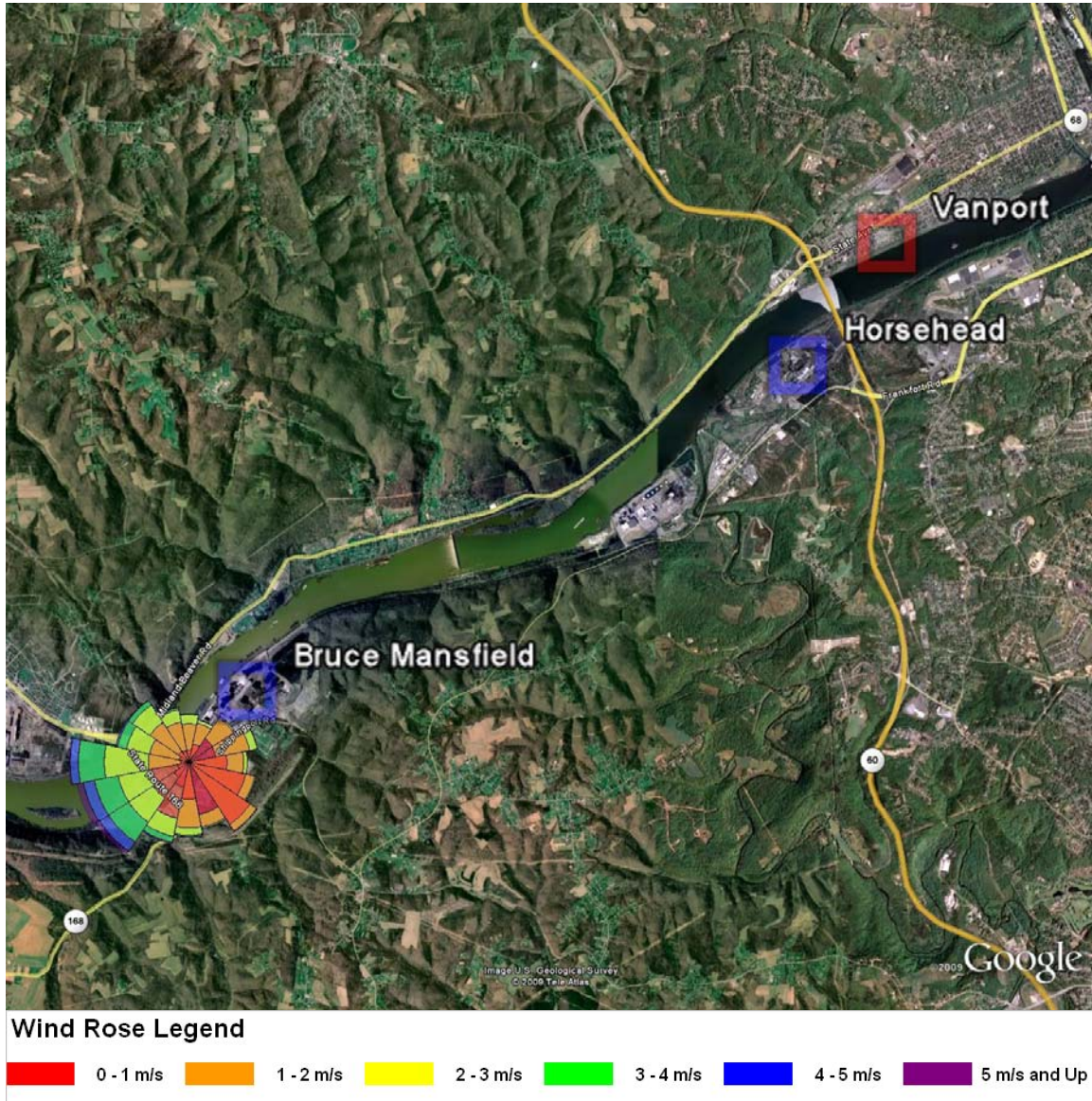
**Figure 14**





The impact of the river valley that Vanport sits within can also be seen by looking at the wind measurements that were collected at the Shippingport meteorological tower. Figure 15 (courtesy of Google Earth) displays the wind data measured at Shippingport's meteorological tower from January 2004 to December 2008 (a five-year dataset).

**Figure 15**



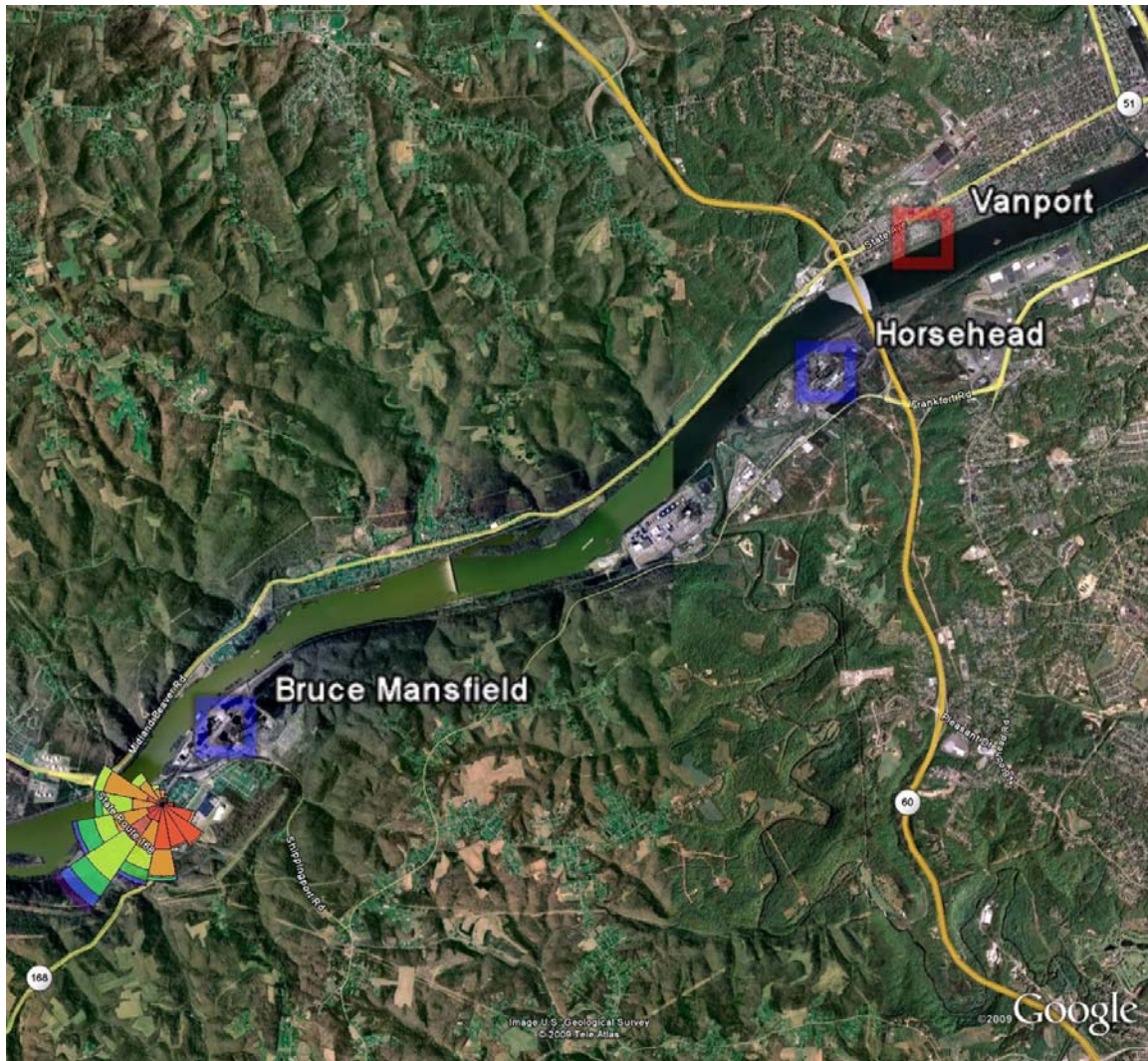
The wind is primarily out of the west-southwest. There is also a strong influence from the east-southeast. In addition, the strongest winds are coming from the west-southwest, primarily because the wind is traveling unimpeded through the river valley to the Shippingport meteorological tower. The lightest winds are being seen from the southeast, primarily due to the terrain (see Figure 13) the wind is traveling over. By traveling from the southeast, the wind is undergoing more friction (from its impact with the terrain), which is resulting in the slower wind speeds.





Then, the Department analyzed the wind data and created a wind rose to coincide with the meteorological data collected on those twenty days. Figure 17 shows the results.

**Figure 17**



**Wind Rose Legend**

0 - 1 m/s    1 - 2 m/s    2 - 3 m/s    3 - 4 m/s    4 - 5 m/s    5 m/s and Up

When comparing this figure with Figure 15 above, one will notice that the primary wind direction has changed. There is a very prominent southwesterly flow. Wind speeds are generally slower, indicating that a much more stable air mass is in place over the region when we are seeing the concentrations rise. A stable boundary layer would limit vertical mixing, thus allowing concentrations to build near the surface. This effect would only be strengthened within a river valley, where the pollutants are not able to rise above the terrain and remain concentrated near the surface. Overall, the prominent southwesterly winds along with the lighter wind speeds are indicating that the driving source of the

higher lead concentrations is coming from the area in and around the Bruce Mansfield and Horsehead facilities and their orientation within the river valley. In fact, as is apparent with Figure 17, the very high concentrations being monitored at Vanport are driven in from the southwest because of the orientation of the Ohio River in this part of Beaver County. Due to the monitor located within the river valley, it is unlikely that there are any other sources farther to east along the Ohio River (for example, in Allegheny County) that would be contributing to the higher readings being measured at Vanport. Therefore, due to the location of the Bruce Mansfield and Horsehead sources with respect to the Vanport monitor, the modeling to support monitoring activities within this area included only these two sources. These sources should not be considered a cluster with any source in Allegheny County.

Due to the nature of the high lead concentrations around the Vanport monitor (light flow along with southwesterly flow driving concentrations up from the local facilities), the Department is recommending a nonattainment area smaller than the county.

### **Emission sources and controls in Beaver County**

**Horsehead** owns and operates a zinc processing facility located in Potter Township. As part of this operation, Horsehead produces high purity zinc oxide and high grade zinc metal using a two step distillation process. This is a large complex facility, with various lines and processes. However, two sources here are responsible for the majority of lead emissions from the facility: the sintering line and the electrothermic furnace line.

Raw materials consisting of crude zinc oxide and other secondary materials are fed to a sintering machine. Under high temperatures, air is drawn through the materials, resulting in fused chunks that become feedstock for the electrothermic furnaces. Various impurities (such as lead) are volatilized during the processing. Emissions from this process are controlled by baghouses.

According to the company, 95% of the lead emissions from the furnaces are emitted through baghouses, and only 5% escapes as fugitive emissions. The Horsehead zinc processing sources are regulated according to the current standards.

**FirstEnergy (Bruce Mansfield)** operates three coal-fired boilers/turbine-generator units (designated Units 1-3) with a net power capacity of about 800, 780, and 800 nominal megawatts at its Bruce Mansfield Plant. Units 1 and 2 have identical scrubbers for particulate and sulfur dioxide (SO<sub>2</sub>) removal. Unit 3 has electrostatic precipitators for particulate control and an absorber vessel for SO<sub>2</sub> and particulate removal. Each unit's effluent is ducted to its pair of dedicated flues for venting to the atmosphere.

The Bruce Mansfield units are regulated according to the current standards.

## **Conclusion**

Considering information obtained from preliminary modeling results and based on the above analyses of the eight factors provided by EPA to define better nonattainment area boundaries when a state recommends boundaries smaller than county boundaries, the Commonwealth recommends that the EPA designate Lower Beaver Valley as a lead nonattainment area, rather than the entire County of Beaver. The preliminary modeling results showed that the Bruce Mansfield facility did not contribute to the monitored lead concentrations at the Vanport monitor. As stated in 73 FR 67032, “[f]or each monitor or group of monitors that exceed a standard, nonattainment boundaries must be set that include a sufficiently large enough area to include both the area judged to be violating the standard as well as the source areas that are determined to be contributing to these violations.” Therefore, the Commonwealth is recommending that Lower Beaver Valley nonattainment area consist of only Potter (where Horsehead is located) and Vanport (where the Vanport monitor is located) Townships.

The Department will, however, begin operating a ambient monitor associated with the Bruce Mansfield plant starting January 1, 2010.

## **Information regarding the recommended designation areas**

The two appendices contain maps and tables supporting and explaining Pennsylvania’s recommended designations for all areas of the Commonwealth. Appendix A includes a table listing all counties and their recommended designation, along with the design values of lead monitors. This appendix also includes maps of the recommended nonattainment areas.

Appendix B includes documenting data and material that address the EPA’s designation criteria pertaining to air quality, emissions and population factors, as well as a map of the OMB statistical areas in Pennsylvania. This appendix also includes maps of the modeled concentrations for the Central Berks County Nonattainment Areas.

## Acronyms and Terms

ACHD	Allegheny County Health Department
AMS	Air Management Services (Philadelphia)
CAA	Clean Air Act
CBSA	core-based statistical areas
CFR	Code of Federal Regulations
CSA	Combined Statistical Area
DEP	Department of Environmental Protection (Pennsylvania)
EPA	Environmental Protection Agency (United States)
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
OMB	Office of Management and Budget (United States)
PM	Particulate Matter
SIP	State Implementation Plan
tpy	tons per year
TRI	Toxic Release Inventory
TSP	Total Suspended Particles
USDOT	United States Department of Transportation



## References

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[http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/docs/2010\\_NetworkDescription\\_for\\_EPA.pdf](http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/docs/2010_NetworkDescription_for_EPA.pdf)

The Philadelphia Air Management Services’ (AMS) “*2009/2010 Air Monitoring Network Plan*” (July 1, 2009) [http://www.phila.gov/health/units/ams/pdf/2009-10\\_AMNP\\_-\\_7-1-09\\_-\\_Final.pdf](http://www.phila.gov/health/units/ams/pdf/2009-10_AMNP_-_7-1-09_-_Final.pdf)

The Allegheny County Health Department’s (ACHD) “*Monitoring Network Review*” (May 31, 2009)  
<http://www.achd.net/air/pubs/public%20comment/ACHD2009%20draft.pdf>

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U.S. Census Bureau, Population Division, Updated List of Statistical Areas available at: [www.census.gov/population/www/estimates/metrodef.html](http://www.census.gov/population/www/estimates/metrodef.html)