



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECRETARY

October 28, 2014

Mr. Shawn M. Garvin
Regional Administrator
U.S. Environmental Protection Agency, Region III
1650 Arch Street (Mail Code: 3RA00)
Philadelphia, PA 19103-2029

RE: EPA's 120-day Letter Concerning Proposed Designations for the 2012 Fine Particulate Matter National Ambient Air Quality Standard

Dear Mr. Garvin:

This letter is in response to your August 19, 2014, letter to Governor Tom Corbett, providing the U.S. Environmental Protection Agency's (EPA) proposed modifications to Pennsylvania's designation recommendations for the 2012 annual fine particulate matter (PM_{2.5}) National Ambient Air Quality Standard (NAAQS). As stated in your August 19 letter, EPA intends to modify Pennsylvania's recommended boundaries for the Cambria County (Johnstown), Liberty-Clairton (Allegheny County), and Northampton County (Allentown) areas.

The Pennsylvania Department of Environmental Protection (DEP) appreciates EPA's concurrence with the majority of its designation recommendations dated December 10, 2013, and July 30, 2014. However, we urge EPA to reconsider its proposed PM_{2.5} nonattainment boundaries for Allegheny and Northampton Counties. To this end, DEP has completed additional analyses and requests the following changes to EPA's proposed designations for Pennsylvania:

- Establish partial county designations for Allegheny County consistent with the nonattainment boundaries for the 1997 and 2006 PM_{2.5} NAAQS. The nonattainment areas for the Liberty-Clairton area of Allegheny County should continue to be comprised of the City of Clairton and the Boroughs of Glassport, Liberty, Lincoln, and Port Vue. The remainder of Allegheny County, which is monitoring attainment of the 1997, 2006 and 2012 PM_{2.5} NAAQS, based on 2011-2013 design values, should be designated as an "unclassifiable/attainment" area. Historically, EPA has agreed that "a separate, distinctively local-source impacted, nonattainment area" is appropriate for the Liberty-Clairton area. Supporting documentation developed in consultation with the Allegheny County Health Department is outlined in Enclosure 1.

Additionally, I have enclosed a recent letter (dated October 15, 2014) from Ken Zapinski, the Senior Vice President of Energy and Infrastructure for the Allegheny Conference on Community Development (ACCD), in support of DEP's request for a partial county

Rachel Carson State Office Building | P.O. Box 2063 | Harrisburg, PA 17105-2063

Liberty-Clairton nonattainment area for the 2012 annual PM_{2.5} NAAQS (see Enclosure 2). ACCD expresses its concern that EPA has reversed its position that previously recognized the unique meteorology, topography and localized emissions in the Liberty monitoring area without reasonable justification.

- Change the boundaries for the Allentown nonattainment area to include only Northampton County (see Enclosure 3).
- Northampton County is expected to attain the PM_{2.5} standard, based on 2014 design values, prior to the effective date of EPA's final designations (see Enclosure 4).

The DEP respectfully requests that EPA modify its intended designations for the Allentown and Allegheny County areas, taking into consideration the significant air quality improvements and the additional documentation enclosed for your consideration. If any additional areas in Pennsylvania attain the PM_{2.5} NAAQS prior to the effective date of EPA's designations for the 2012 PM_{2.5} NAAQS, DEP will request withdrawal of the nonattainment designation for the area.

Should you have questions or need additional information during the development of the final PM_{2.5} NAAQS designations for Pennsylvania, please contact Joyce E. Epps, Director, Bureau of Air Quality, by e-mail at jeepps@pa.gov or by telephone at 717.787.9702.

Sincerely,



Dana K. Aunkst
Acting Secretary

Enclosures



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

Enclosure 1

The Commonwealth of Pennsylvania's Response to the U.S. Environmental Protection Agency's Proposed Designation of an Allegheny County Nonattainment Area for the 2012 Annual PM_{2.5} National Ambient Air Quality Standard

**Bureau of Air Quality
Department of Environmental Protection**

[This page intentionally left blank.]

The U.S. Environmental Protection Agency (EPA) promulgated the annual fine particulate matter (PM_{2.5}) National Ambient Air Quality Standard (NAAQS) on December 14, 2012; the standard was lowered to 12.0 micrograms per cubic meter (78 FR 3086; January 15, 2013). The Commonwealth of Pennsylvania submitted its recommendations to EPA, in accordance with Section 107 of the Clean Air Act, 42 U.S.C.A. § 7407, on December 10, 2013, and updated the recommendation on July 30, 2014, based on 2011-2013 ambient air monitoring data.

In its August 19, 2014, letter to Governor Corbett, EPA noted that its intended designations concur with the DEP's recommendations for Delaware and Lebanon County nonattainment areas. According to the August 19th letter, EPA intends to modify Pennsylvania's recommended boundaries for the Cambria County (Johnstown), Liberty-Clairton (Allegheny County), and Northampton County (Allentown) areas. Specifically, EPA intends to modify Pennsylvania's designation recommendations by adding a portion of Indiana County to the Cambria County Area (referred to by EPA as the Johnstown Area), adding Lehigh County to the Northampton County Area (referred to by EPA as the Allentown Area), and expanding the Liberty-Clairton Area to include all, not just part, of Allegheny County. EPA also proposed to designate all other areas of the Commonwealth as unclassifiable/attainment areas.

In December 2013, Pennsylvania recommended a partial county Liberty-Clairton nonattainment area for the 2012 PM_{2.5} NAAQS consistent with the existing boundaries promulgated by EPA for the 1997 and 2006 PM_{2.5} NAAQS. The existing nonattainment boundaries for the Liberty-Clairton Area consist of the following municipalities in southeastern Allegheny County: the City of Clairton, Borough of Glassport, Liberty Borough, Borough of Lincoln and Port Vue Borough. EPA concluded that the Commonwealth's documentation support "a separate, distinctively local-source impacted, nonattainment area, within the Pittsburgh nonattainment area."¹

In its August 19, 2014, letter to Governor Corbett, EPA proposed to expand the existing Liberty-Clairton nonattainment area to include all of Allegheny County for the 2012 annual PM_{2.5} National Ambient Air Quality Standard (NAAQS). However, an expansion of the boundaries of the existing Liberty-Clairton nonattainment areas for the 1997 and 2006 PM_{2.5} NAAQS is unwarranted.

The Pennsylvania Department of Environmental Protection (DEP) has conducted a comprehensive evaluation of EPA's proposed designations for the 2012 annual PM_{2.5} NAAQS. Based on a further review and analysis of available data by DEP and the Allegheny County Health Department (ACHD), Pennsylvania disagrees with EPA's enlargement of the proposed nonattainment area. The existing 1997 and 2006 PM_{2.5} NAAQS nonattainment boundaries for the Liberty-Clairton area should be retained for the 2012 annual PM_{2.5} standard.

The DEP worked in coordination with the ACHD to develop the supporting analysis in that justifies the partial county PM_{2.5} nonattainment area for the Liberty-Clairton Area. DEP recommends that EPA designate five municipalities in southeastern Allegheny County, the City of Clairton, the City of McKeesport and the Boroughs of Glassport, Liberty, Lincoln and Port

¹ 2006 24-Hour PM_{2.5} Standards – EPA response to Pennsylvania's recommendations. Addendum 2 - "EPA Technical Analysis for Liberty-Clairton Area".
http://www.epa.gov/airquality/particlepollution/designations/2006standards/rec/letters/03_PA_EPAMOD3.pdf

Vue as a partial county nonattainment area. The remainder of Allegheny County should be designated as an unclassifiable/attainment area. The information contained in this enclosure supplements the information DEP submitted to EPA on December 10, 2013, and July 30, 2014.

BACKGROUND AND OVERVIEW

On July 1, 1987, EPA revised the NAAQS for particulate matter, replacing total suspended particulates as the indicator for particulate matter with a new indicator called PM₁₀, or particles having a diameter less than or equal to 10 micrometers ($\mu\text{g}/\text{m}^3$).² The EPA divided the country into three categories, Groups I, II and III, based on their probability of violating the new NAAQS. On August 7, 1987, EPA classified Allegheny County as a Group II area.³ Later, the ACHD recommended a smaller Group II area consisting of the City of Clairton, the City of McKeesport and the Boroughs of Glassport, Liberty, Lincoln and Port Vue. EPA clarified the area as the City of Clairton and Boroughs of Glassport, Liberty, Lincoln and Port Vue.⁴ EPA later referred to the same area as the “Clairton & 4 Boroughs area” or the “Liberty-Clairton area.” The City of McKeesport was not included in the Group II area for the 1987 PM₁₀ NAAQS. Pursuant to Section 107(d)(4)(B) and 188(a) of the Clean Air Act, areas which had monitored violations of the PM₁₀ NAAQS prior to January 1, 1989, were, by operation of law, upon enactment of the 1990 CAA amendments on November 15, 1990, designated nonattainment and classified as moderate for PM₁₀.

On July 18, 1997, EPA published annual and 24-hour primary and secondary standards for fine particulate matter (PM_{2.5}). In February 2004, DEP submitted a letter to EPA with area recommendations for the 1997 annual PM_{2.5} NAAQS, which included the recommendation that all of Allegheny County be included as part of the Pittsburgh-Beaver Valley nonattainment area. In August 2004, after further analysis and the issuance of new EPA guidance, DEP submitted a revised recommendation that EPA designate two separate partial county nonattainment areas within Allegheny County: the Liberty-Clairton Area and a separate North Braddock Area. The Liberty-Clairton Area included the City of Clairton and the Boroughs of Glassport, Liberty, Lincoln, and Port Vue. The proposed North Braddock nonattainment area included Braddock Borough and North Braddock Borough. The separate area for Liberty-Clairton was justified by DEP as being necessary because it would take Liberty-Clairton Area longer to come into compliance than the rest of Allegheny County due to the localized influences of industry emissions, meteorology, and topography.

On January 5, 2005, EPA published a final rule that included the designation of the Liberty-Clairton Area as a separate partial county nonattainment area for the 1997 standard.⁵ EPA also established a separate nonattainment area for the Pittsburgh-Beaver Valley Area including Beaver, Butler, Washington and Westmoreland Counties and portions of Armstrong, Green and Lawrence Counties. The recommended North Braddock area was also included within the larger Pittsburgh-Beaver Valley Area.

² 52 FR 24,634; July 1, 1987

³ 52 FR 29,383; August 7, 1987

⁴ 55 FR 45,799; October 31, 1990

⁵ 70 FR 944; January 5, 2005. Effective April 5, 2005.

On October 17, 2006, EPA lowered the 24-hour PM_{2.5} standard from 65 µg/m³ to 35 µg/m³. On December 28, 2007, DEP submitted designation recommendations to EPA for the 2006 24-hour PM_{2.5} NAAQS. These recommendations included a recommendation for the same partial county Liberty-Clairton nonattainment area for the 2006 PM_{2.5} NAAQS. As supporting factors for a separate Liberty-Clairton nonattainment area, DEP specifically noted in that submittal:

Annual and 24-hour PM_{2.5} design values are much higher, particularly at the Liberty monitor, than the surrounding areas. There are significant differences between the two monitors within the PM_{2.5} nonattainment area with the Liberty monitor being significantly over the annual standard and the Clairton monitor recently just meeting the annual standard... Twenty-four hour PM_{2.5} concentrations are also significantly different (~30 µg/m³). This steep gradient between these two nearby monitors suggests a local source with enhancements from local topography is contributing to the nonattainment area's relatively high 24-hour and annual PM_{2.5} design values. A smaller nonattainment area is therefore justified.

EPA's technical support document (TSD) analysis for the 2006 24-hour PM_{2.5} NAAQS for the Liberty-Clairton area notes on page 2 that,

For the designations for the 1997 PM_{2.5} NAAQS, the Commonwealth of Pennsylvania provided extensive documentation to support a recommendation that a separate, distinctively local-source impacted, nonattainment area be designated within the Pittsburgh nonattainment area. The recommended Liberty-Clairton area was specified as the five municipalities which comprise the area in the vicinity of the Clairton Coke Works which were previously designated nonattainment for PM-10 standard as the "Clairton & 4 Boroughs area."

The Clairton Coke Works is a large and complex facility that emits a combination of particulates, sulfur dioxide, ammonia, and hundreds of volatile organic chemicals. Although the coke plant has numerous existing emission controls, the combination of a large amount of low-level emissions in a narrow river valley creates a local air quality problem which is uniquely different from the remainder of the area.

On page 3 of the EPA TSD analysis, the agency stated that monitors in Allegheny County correlate well, except for the Liberty monitor. EPA indicated that concentrations of carbon at the Liberty monitor far exceed those at other monitors in the area.

On October 20, 2008, DEP submitted a response to EPA's proposed designations for the 2006 24-hour PM_{2.5} NAAQS stating in part that,

DEP has demonstrated in the past that fine particle levels at the Liberty monitor do not correlate well with the monitors in the surrounding nonattainment area [the Pittsburgh-Beaver Valley nonattainment area] due to local source influences. The Liberty-Clairton nonattainment area was created to allow DEP and the Allegheny County Health Department to address the local impacts that contribute to this area's nonattainment.

On November 13, 2009, EPA published a final rule designating the same Liberty-Clairton Area as a separate nonattainment area for the 2006 24-hour PM_{2.5} NAAQS, with the remainder of Allegheny County again being included in the Pittsburgh-Beaver Valley Area (along with the Beaver, Butler, Washington and Westmoreland Counties and portions of Armstrong, Green and Lawrence Counties).⁶

On December 13, 2012, EPA promulgated a primary annual PM_{2.5} NAAQS of 12.0 µg/m³. On December 10, 2013, DEP recommended that the Liberty-Clairton Area be designated as nonattainment for the 2012 annual PM_{2.5} NAAQS, based primarily on 2010-2012 air quality data. The DEP recommended that the remainder of Allegheny County, as well as Westmoreland County, establish boundaries for a Greater Pittsburgh nonattainment area, because this area contained three monitors that exceeded the new PM_{2.5} standard of 12.0 µg/m³. These monitors included Avalon and North Braddock in Allegheny County and Greensburg in Westmoreland County. The remainder of the former Pittsburgh-Beaver Valley Area (Beaver, Butler, Washington Counties and portions of Armstrong, Green and Lawrence Counties) was recommended as either attainment or unclassifiable/attainment areas because the monitors recorded PM_{2.5} concentrations below the standard. DEP determined that these areas were not contributing to exceedances in a nonattainment area.

On July 30, 2014, DEP provided EPA with updated area recommendations for the 2012 PM_{2.5} NAAQS following the review of 2011-2013 air quality data. The 2013 design values for monitors in Allegheny County (except for the Liberty-Clairton Area) and Westmoreland County are below 12.0 µg/m³. Therefore, DEP recommended that EPA designate these areas attainment areas.

On August 19, 2014, EPA sent Governor Corbett a 120-day letter and technical support document indicating the intent to modify Pennsylvania's recommended area boundaries for the Liberty-Clairton Area, among others. EPA noted its intention to designate all of Allegheny County as the Allegheny County nonattainment area, expanding the existing partial county Liberty-Clairton nonattainment area to include the entire county.

For the 1997 annual and 2006 24-hour standards, the Liberty-Clairton area is a separate nonattainment area from the remainder of Allegheny County. As explained above, the remainder of Allegheny County is part of a separate Pittsburgh-Beaver Valley nonattainment area. EPA agreed with the DEP recommendation for separate partial county nonattainment areas because the Liberty monitor did not correlate well with the other monitors in the area. As expected, due to localized impacts and topography, the Liberty monitor is not attaining the 2006 or 2012 PM_{2.5} standards – the other monitors in Allegheny County are attaining the 1997, 2006 and 2012 PM_{2.5} standards. With the monitors in the Pittsburgh-Beaver Valley nonattainment area attaining the standards, including seven monitors in Allegheny County (the lone exception being the Liberty monitor), now is not the time for EPA to depart from its current designations for the Liberty-Clairton Area, which are “separate and distinct from the Pittsburgh-Beaver Valley PM_{2.5} nonattainment area.”

⁶ 74 FR 58,688; November 13, 2009. Effective December 14, 2009.

1. AIR QUALITY DATA

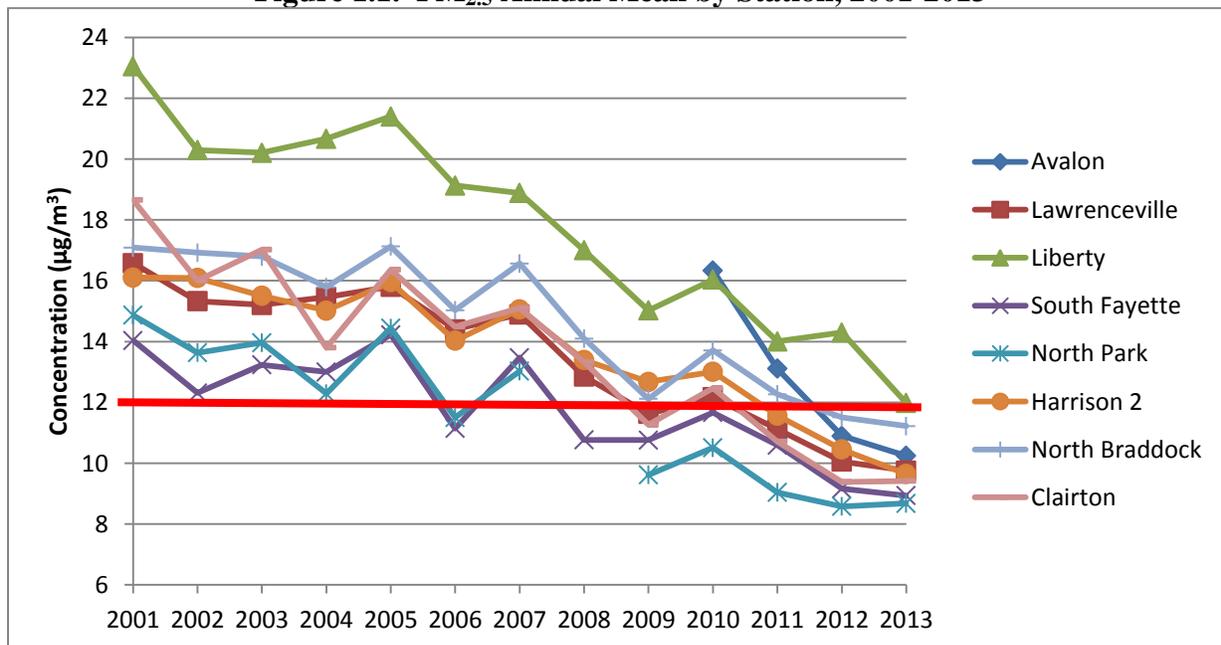
1.1. PM_{2.5} Annual Mean and Design Value Data

Table 1.1 and Figure 1.1 of this analysis show the downward trend for annual PM_{2.5} mean values monitored in Allegheny County, with the Liberty monitor constantly at a higher value than the rest of the monitors in the region. In 2012, the only monitor with an annual mean above 12.0 µg/m³ was the Liberty monitor. It should be noted that 2013 was the first year that all monitors within Allegheny County, except the Liberty monitor were below the 2012 annual PM_{2.5} NAAQS. This downward trend is expected to continue due to significant reductions in PM_{2.5} and precursor emissions including sulfur dioxide emissions. The data represents Federal Reference Method (FRM) monitored results, except for Federal Equivalent Method (FEM) monitored data at Avalon over the timeframe January 2010-May 2011.

Table 1.1. PM_{2.5} Annual Mean (in µg/m³) by Station, 2010-2013

Station	AQS Code	2010	2011	2012	2013
Avalon	42-003-0002	16.34	13.11	10.89	10.24
Lawrenceville	42-003-0008	12.16	11.11	10.05	9.76
Liberty	42-003-0064	16.04	14.00	14.29	11.98
South Fayette	42-003-0067	11.67	10.59	9.16	8.93
North Park	42-003-0093	10.51	9.04	8.58	8.68
Harrison 2	42-003-1008	13.01	11.57	10.45	9.65
North Braddock	42-003-1301	13.71	12.27	11.51	11.22
Clairton	42-003-3007	12.47	10.72	9.39	9.41

Figure 1.1. PM_{2.5} Annual Mean by Station, 2001-2013



*Please note: The Avalon monitor was deployed in 2010; North Park monitor did not run in 2008.

Table 1.2 and Figure 1.2 show the downward trend for annual PM_{2.5} design values monitored in Allegheny County, with the Liberty monitor consistently at a higher value than the rest of the monitors in the area. Only two monitoring sites, in addition to Liberty, were above 12.0 µg/m³ based on 2010-2012 data. In 2013, the only monitor with an annual PM_{2.5} design value (DV) above 12.0 µg/m³ was the Liberty monitor. Several sites have shown consecutive years of attainment of the 2012 annual PM_{2.5} NAAQS (discussed further in Section 1.2).

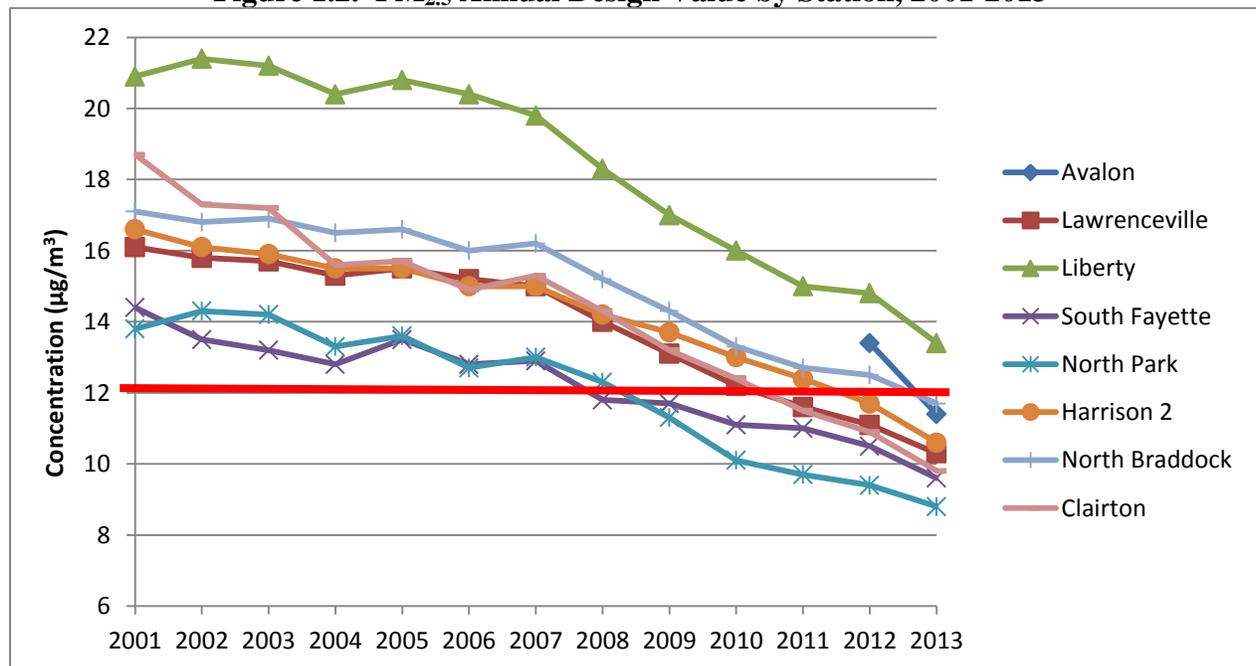
As the EPA TSD analysis points out,

The PM_{2.5} DVs at seven of the eight monitors correlate well. However, the PM_{2.5} DV at the Liberty monitor is considerably higher. The large local sources plus the unique topographical features in this location result in substantially higher PM_{2.5} monitored values at the Liberty monitor than the other monitors in Allegheny County.

Table 1.2. PM_{2.5} Annual Design Value (in µg/m³) by Station, 2010-2013

Station	AQS Code	2010	2011	2012	2013
Avalon	42-003-0002	N/A	N/A	13.4	11.4
Lawrenceville	42-003-0008	12.2	11.6	11.1	10.3
Liberty	42-003-0064	16.0	15.0	14.8	13.4
South Fayette	42-003-0067	11.1	11.0	10.5	9.6
North Park	42-003-0093	10.1	9.7	9.4	8.8
Harrison 2	42-003-1008	13.0	12.4	11.7	10.6
North Braddock	42-003-1301	13.3	12.7	12.5	11.7
Clairton	42-003-3007	12.4	11.5	10.9	9.8

Figure 1.2. PM_{2.5} Annual Design Value by Station, 2001-2013



*Please note: The Avalon monitor was deployed in 2010; North Park monitor did not run in 2008.

It is likely that the Liberty-Clairton Area could come into attainment in the near future, particularly since the higher annual PM_{2.5} mean values of 14.00 µg/m³ in 2011 and 14.29 µg/m³ in 2012 will drop off of the 2015 design value calculation (the 2015 DV will be the 3- year average of the 2013, 2014 and 2015 annual mean). For the first time, in 2013, the Liberty-Clairton annual mean value was below the 2012 standard of 12.0 µg/m³, with a value of 11.98 µg/m³.

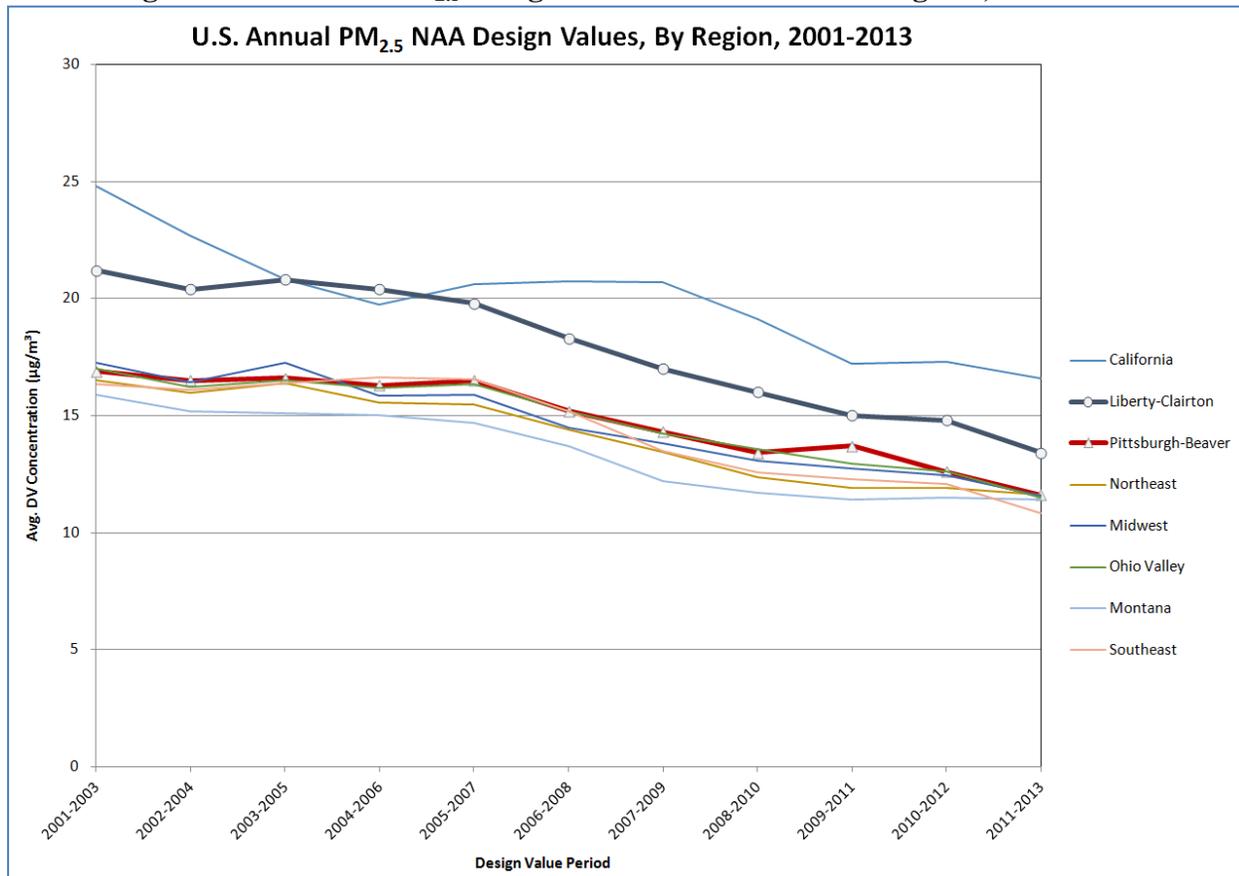
Table 1.3 provides quarterly PM_{2.5} emissions for Allegheny County in 2014 through the second quarter. Again, the data shows that the Liberty monitor is consistently higher than the rest of the monitors in Allegheny County. This data should be viewed with caution, as one or two quarterly averages above 12.0 µg/m³ does not equate to a violation of the standard. This information is only being provided to show the most recent monitoring data trends and to point out that the Liberty monitor is consistently monitoring PM_{2.5} concentrations above all other monitors in Allegheny County.

**Table 1.3. Allegheny County PM_{2.5} Monitoring Station Data
2014 Quarterly Averages to Date**

Station	AQS Code	1 st Quarter Average (µg/m ³)	2 nd Quarter Average (µg/m ³)
Avalon	42-003-0002	11.97	10.17
Lawrenceville	42-003-0008	11.03	9.93
Liberty	42-003-0064	14.73	12.50
South Fayette	42-003-0067	8.91	8.71
North Park	42-003-0093	8.91	8.75
Harrison 2	42-003-1008	10.17	10.25
North Braddock	42-003-1301	12.46	11.88
Clairton	42-003-3007	12.29	9.51

The Liberty monitor, in fact, shows noticeably higher PM_{2.5} concentrations than most of the design value monitors throughout the U.S. Figure 1.3 is a chart of annual PM_{2.5} design values for 2001-2013, averaged by region, comparing PM_{2.5} design values for Liberty-Clairton to other previously designated nonattainment areas.

Figure 1.3. Annual PM_{2.5} Design Value Trends for U.S. Regions, 2001-2013



Data taken from http://www.epa.gov/airtrends/pdfs/PM25_DesignValues_20112013_FINAL_08_28_14.xlsx

<u>Region</u>	<u>States Included in Areas</u>	<u>Region</u>	<u>States Included in Areas</u>
<i>California</i>	CA	<i>Midwest</i>	OH,IL,IN,MI
<i>Liberty-Clairton</i>	PA	<i>Ohio Valley</i>	IN,KY,MO,OH,WV
<i>Pittsburgh-Beaver</i>	PA	<i>Montana</i>	MT
<i>Northeast</i>	CT,DE,MD,NY,NJ,PA	<i>Southeast</i>	AL,GA,NC

The Liberty-Clairton Area (driven by data from the Liberty monitor) shows historical and current PM_{2.5} design values that are above the rest of the country, with the exception of California; all other areas show similar design values, including the Pittsburgh-Beaver Valley area.

1.2. PM_{2.5} Monitor Network by Site

While PM_{2.5} concentrations at each site are used for comparison to the 2012 PM_{2.5} NAAQS, the individual site details should also be considered in making area designations. Details include factors such as monitor type, measurement scale, and dominant source(s) for each monitor. All

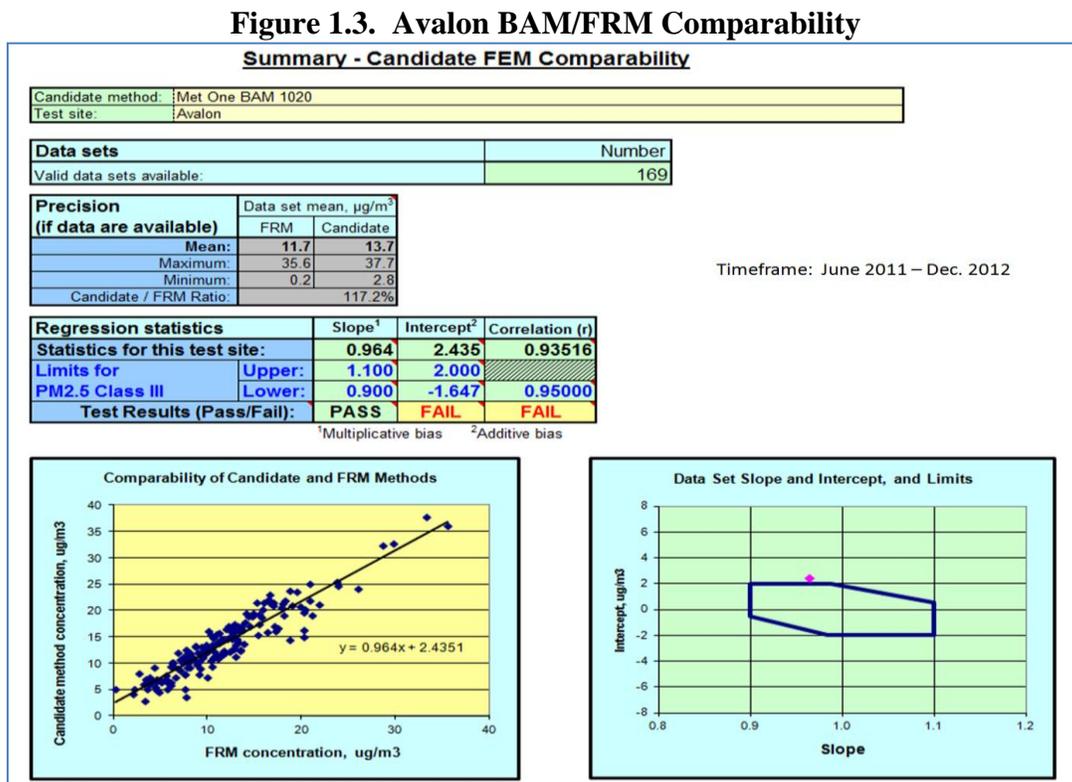
monitors are sited according to EPA criteria and located in residential communities for the objective of population exposure.

Avalon PM_{2.5} Monitor (42-003-0002):

The Avalon PM_{2.5} monitor is located in a developed medium-intensity (by National Land Cover Database (NLCD) 2006 classification) suburb, downwind of the Neville Island industrial area, 8.7 kilometers (km) to the northwest of downtown Pittsburgh. This monitor can be affected on a neighborhood scale (0.5-4.0 km) by industrial emissions from the DTE Energy Shenango plant, which is currently under a consent agreement with ACHD for emissions violations.

The Avalon PM_{2.5} monitor was one of two monitors other than Liberty that exceeded the 2012 annual PM_{2.5} NAAQS based on 2010-2012 data. However, data for 2010 through May 2011 are biased by beta-attenuation monitor (BAM) data that was submitted prior to installation of the FRM monitor in June 2011. Although the BAM monitor is an equivalent method, concurrent BAM and FRM comparisons after June 2011 were found to be non-equivalent.

The FEM comparability results for the Avalon BAM, matched to FRM data from June 2011-December 2012, are shown in Figure 1.3.



As a result, only the FRM data has been submitted since June 2011. While the BAM data is official data for January 2010-May 2011 with no collocated FRM for comparison, the Avalon BAM likely represents non-equivalent data to the FRM. DEP contends that the 2011-2013

design value is the most appropriate design value for comparison to the 2012 annual PM_{2.5} NAAQS compared to previous 3-year periods.

North Braddock PM_{2.5} Monitor (42-003-1301):

The North Braddock PM_{2.5} Monitor is located in a developed medium-intensity suburb, 12.5 km to the east-southeast of downtown Pittsburgh, near the U.S. Steel Edgar Thomson Plant. This monitor can be affected on a neighborhood scale by industrial emissions from Edgar Thomson, and North Braddock was one of the two monitors aside from Liberty that exceeded the 2012 annual PM_{2.5} NAAQS based on 2010-2012 data. U.S. Steel is currently under a Consent Order and Agreement with ACHD for emissions violations, which has contributed to a lower 2012 PM_{2.5} design value at North Braddock below 12.0 µg/m³, based on 2011-2013 data.

Harrison PM_{2.5} Monitor (42-003-1008):

The Harrison PM_{2.5} Monitor is located in a developed medium-intensity suburb, 30.1 km to the northeast of downtown Pittsburgh, and may have been affected previously by the nearby Allegheny Ludlum facility on a neighborhood scale. Allegheny Ludlum performed major modifications to reduce emissions from the facility. Based on 2013 design values, the Harrison monitor shows attainment of PM_{2.5} NAAQS including the 2012 PM_{2.5} annual standard.

Clairton PM_{2.5} Monitor (42-003-3007):

The Clairton PM_{2.5} Monitor is located in a developed medium-intensity suburb, 18.8 km to the south-southeast of downtown Pittsburgh. This monitor is located within the Liberty-Clairton area, adjacent to the U. S. Steel Clairton Plant on a neighborhood scale. This site lies upwind of the Clairton Plant, however, and is not affected by nearby emissions in the same manner as Liberty. Based on 2011-2013 data, the current design value for the Clairton monitor is 9.8 µg/m³ – substantially lower than the 2012 PM_{2.5} NAAQS. Large differences between Clairton and Liberty (only 3.5 km away) on concurrent sample days indicate the extremely localized nature of PM_{2.5} at the Liberty monitor.

South Fayette PM_{2.5} Monitor (42-003-0067):

The South Fayette PM_{2.5} monitor is located in a developed low-intensity suburb, 16.1 km to the southwest of downtown Pittsburgh. South Fayette is a high-elevation site, considered to be representative of regional-scale background concentrations. This monitor has attained the 2012 annual PM_{2.5} NAAQS. The monitor also meets the 1997 and 2006 standards.

North Park PM_{2.5} Monitor (42-003-0093):

The North Park PM_{2.5} monitor is located in a developed low-intensity suburb, 18.5 km to the north of downtown Pittsburgh. The PM_{2.5} concentrations for North Park are representative of northern suburb concentrations on a neighborhood scale, mostly from area and mobile source emissions. Based on a 2011-2013 design value of 8.8 µg/m³, this monitor has attained the 2012 annual PM_{2.5} NAAQS.

Lawrenceville PM_{2.5} Monitor (42-003-0008):

The Lawrenceville PM_{2.5} monitor is located in a developed high-intensity district of the City of Pittsburgh, the only PM_{2.5} site within the city limits, 4.2 km from downtown Pittsburgh. It has been classified by EPA as an urban National Core (NCore) Monitoring site, with multiple pollutant monitors. It is the best representative monitor of urbanized emissions in Pittsburgh from mobile, area, and light industrial sources on an urban scale (4-50 km). Based on 2011-2013 data, Lawrenceville is monitoring attainment (of 10.3 µg/m) of the 2012 annual PM_{2.5} NAAQS.

Liberty PM_{2.5} Monitor (42-003-0064):

The Liberty PM_{2.5} monitor is located in a developed low-intensity suburb, 17.1 km to the south-southeast of downtown Pittsburgh. It is the driving design monitor within the Liberty-Clairton area, immediately downwind of the Clairton Coke Works Plant.

Concentrations are strongly affected by temperature inversions and complex river valley terrain, and PM_{2.5} concentrations for the Liberty can differ greatly from any other monitor in the county on concurrent sample dates. As seen in Table 1.4, the Liberty monitor shows the highest standard deviation in concentrations of the monitor network due to these higher values.

Table 1.4. PM_{2.5} Concentration Averages and Standard Deviations

Site	Average Concentration 2011-2013	Standard Deviation 2011-2013
Liberty	13.4	8.6
North Braddock	11.6	6.5
Avalon	11.1	5.7
Harrison	10.5	5.4
Lawrenceville	10.3	5.1
South Fayette	9.6	5.1
Clairton	9.8	4.7
North Park	8.8	4.6

The Liberty monitor is essentially a statistical outlier for PM_{2.5} compared to the rest of the monitoring network.

1.3. PM_{2.5} Monitor Network Assessment

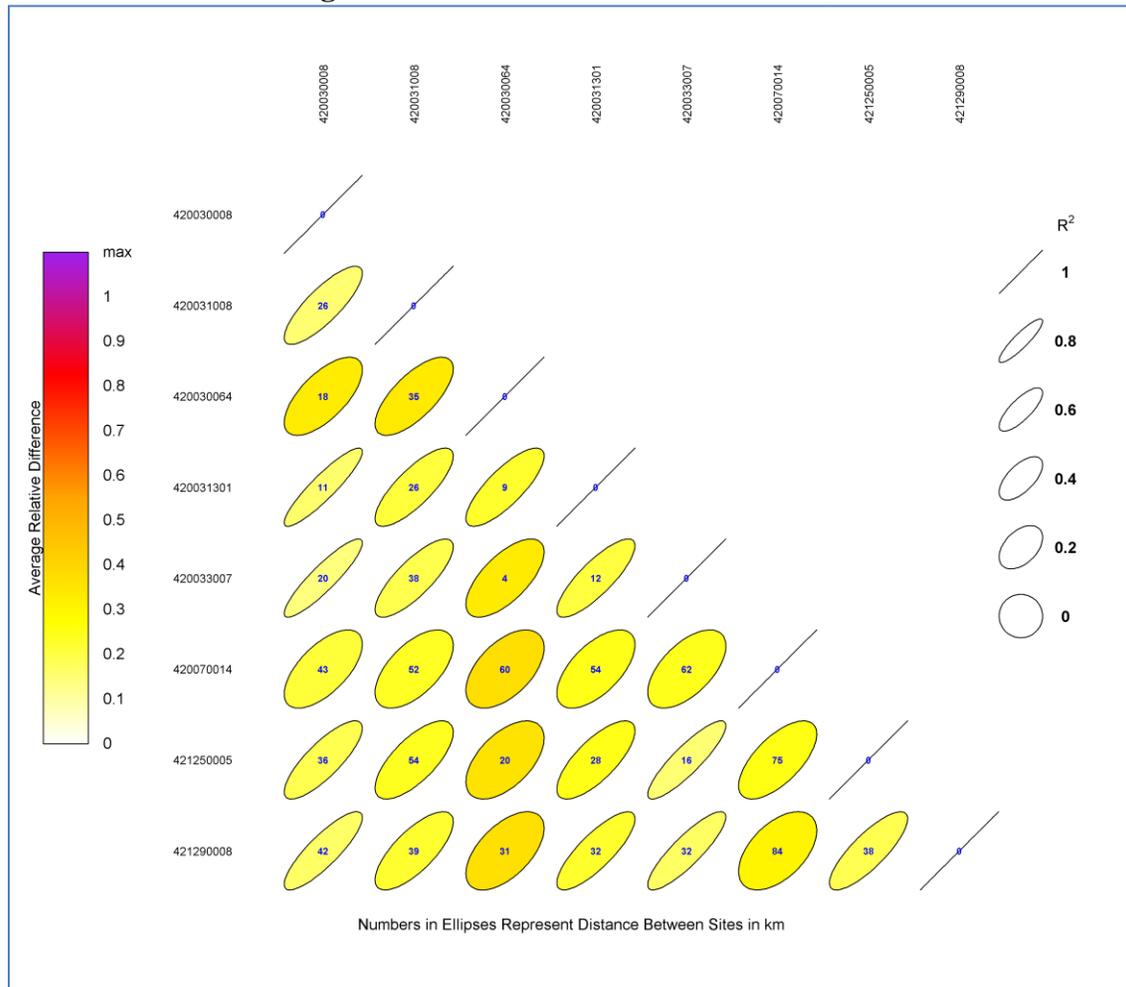
As required by amended 40 CFR Part 58, a Monitor Network Assessment was completed for the Allegheny County PM_{2.5} network in July 2010. Although this assessment is now somewhat outdated, with the next assessment due July 2015, analyses provided in the assessment may still be relevant for the network. (Note that, at this time, the PC-based EPA network assessment tools cannot be updated by the user with more recent data.)

Correlation Matrix:

Correlation matrices were utilized in the network assessment to examine consistency and correlation of monitors with the network. Figure 1.5 shows the correlation matrix for PM_{2.5} FRM monitors based on 2006-2008 averages.

PM_{2.5} monitors from Beaver, Washington, and Westmoreland Counties (420070014, 421250005, 421290008) were included to examine consistency throughout the Pittsburgh MSA. (Note: North Park and South Fayette were excluded from the EPA correlation matrix tool due to low data recovery in one or more calendar quarters.)

Figure 1.5. Correlation Matrix for PM_{2.5}



The 2006-2008 matrices showed that the Lawrenceville PM_{2.5} monitor had the best overall correlation and lowest relative difference compared to other southwestern Pennsylvania (SWPA) monitors, indicating consistency and representativeness within the network. The Liberty monitor shows the lowest correlation and highest relative difference to the rest of the network, indicating

inconsistency with the network and supporting the appropriateness of a separate Liberty-Clairton nonattainment area.

Network Rankings:

Rankings values were compiled for the network assessment based on design values, site objectives, population densities, and other factors.

Rankings from the 2010 Network Assessment are shown in Table 1.5.

Table 1.5. PM_{2.5} FRM Rankings

PM2.5 (FRM) Ranking Values by Criteria							
Site	Number of Other Pollutants at Site	Number of Years in Operation	2006-2008 Design Value 24-Hour Average (µg/m ³)	2006-2008 Design Value Annual Average (µg/m ³)	Site Objective	Population (people/mi ²)	Closest Site (km)
Liberty	2	11	54	18.3	Population Exposure	1857	4
Lawrenceville	4	10	35	15.0	Population Exposure	4117	11
South Fayette	3	11	32	12.9	Population Exposure	1179	12
Harrison	2	11	37	15.0	Population Exposure	724	25
North Braddock	1	11	39	15.2	Population Exposure	2622	9
Clairton	1	9	35	15.3	Population Exposure	1424	4
North Park	0	10	35	12.3	Population Exposure	929	17

PM2.5 (FRM) Score and Rank									
Site	Number of Other Pollutants at Site	Number of Years in Operation	2006-2008 Design Value 24-Hour Average	2006-2008 Design Value Annual Average	Site Objective	Population	Closest Site	Score	Rank
Liberty	2	0.50	5.4	4.58	1	0.25	0.00	13.7	1
Lawrenceville	3	0.25	3.5	3.75	1	1.00	0.50	13.0	2
South Fayette	3	0.50	3.2	3.23	1	0.25	0.50	11.7	3
Harrison	2	0.50	3.7	3.75	1	0.00	1.00	11.0	4
North Braddock	1	0.50	3.9	3.80	1	0.50	0.25	11.0	4
Clairton	1	0.25	3.5	3.83	1	0.25	0.00	9.8	6
North Park	0	0.25	3.5	3.08	1	0.00	0.75	7.6	7

Based on 2006-2008 factors, many of which are the same for 2011-2013 data, the Liberty PM_{2.5} monitor showed the highest rank for Allegheny County, mostly due to the highest design value. The Lawrenceville monitor was second in rank based on its importance to the network, including representativeness of the urban Pittsburgh area based on population density.

1.4. Multi-Pollutant Comparisons

PM_{2.5} shows a source-based relationship to SO₂ at the Liberty monitor which is not seen at the Lawrenceville monitor. Elevated levels of PM_{2.5} often accompany SO₂ exceedances at Liberty during poor dispersion conditions. Additionally, PM_{2.5} and SO₂ exhibit different hourly behavior at Liberty compared to other sites.

Figures 1.6 and 1.7 are scatter plots for the Liberty and Lawrenceville monitors, SO₂ vs. PM_{2.5}, daily maximum 1-hour values, for 2011-2013. Hourly data for PM_{2.5} is measured by tapered element oscillating microbalance (TEOM) PM_{2.5} monitors at both Liberty and Lawrenceville.

Figure 1.6. SO₂ vs. PM_{2.5} TEOM Daily Maximums, Liberty, 2011-2013

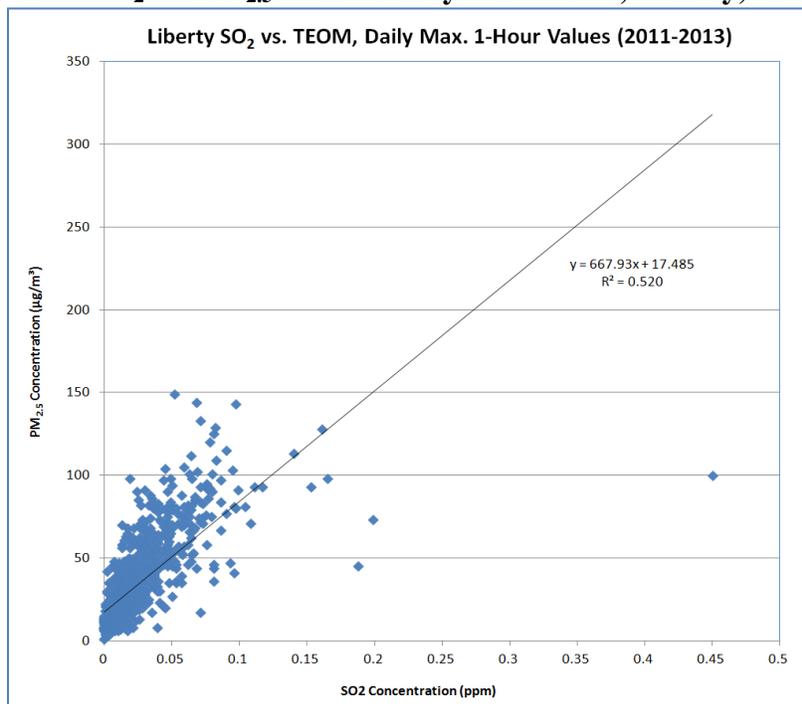
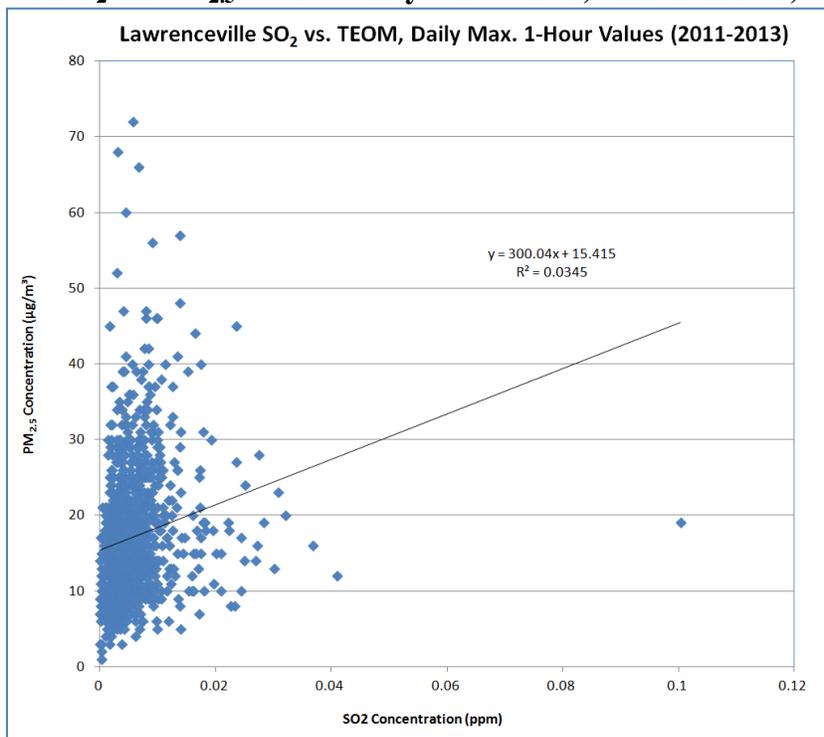


Figure 1.7. SO₂ vs. PM_{2.5} TEOM Daily Maximums, Lawrenceville, 2011-2013



It should be noted that ‘ r ’ is the correlation coefficient, and ‘ r^2 ’ is the coefficient of determination. The correlation coefficient between two variables is measured by the strength and direction of a linear relationship. The coefficient of determination is indicative of how well the regression line represents the data. If the regression line would pass through each data point on a scatter plot, then this would explain all of the variation. The further away the line is from each of the points, the less that it is able to be explained.⁷

The Liberty monitoring site shows a “high positive correlation,” where $r=0.72$ ($r^2=0.52$ in Figure 1.6) for SO₂ and PM_{2.5}, while samplers at the Lawrenceville monitoring site show a “negligible correlation” of $r=0.19$ ($r^2=0.0345$ in Figure 1.7) between the two pollutants. At the Liberty monitoring site, for every increase in SO₂ concentration, there is an increase in PM_{2.5} by 667.93 times the value of SO₂ plus 17.485 µg/m³.⁸

Of the 37 exceedances of the SO₂ daily maximum 2010 1-hour NAAQS at Liberty during 2011-2013, over 80% occurred when the FRM 24-hour value was above 20 µg/m³, as shown below in Table 1-6.

⁷ <http://mathbits.com/MathBits/TISection/Statistics2/correlation.htm>

⁸ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3576830/table/T1/>

Table 1.6. FRM Ranges and SO₂ Exceedances

FRM Range	Number of SO₂ Exceedance Days
> 40 µg/m ³	9
30-40 µg/m ³	13
20-30 µg/m ³	8
10-20 µg/m ³	7

Figures 1.8 and 1.9 are hourly average charts for SO₂ sites and continuous PM_{2.5} sites in Allegheny County.

Figure 1.8. Hourly Average SO₂, Allegheny County Sites, 2011-2013

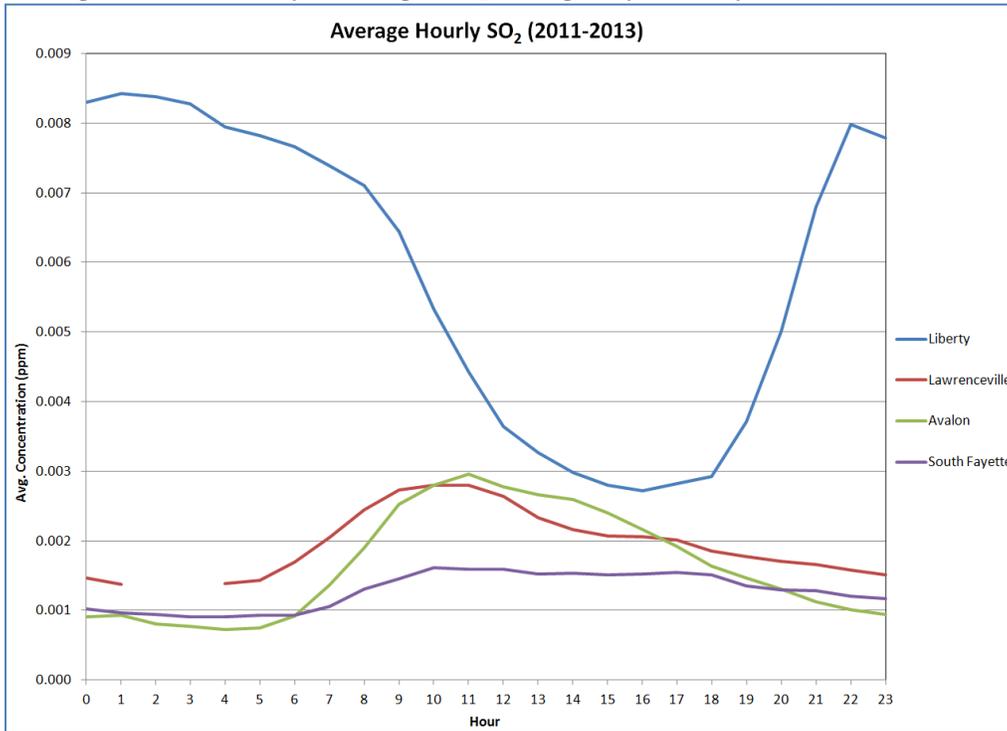
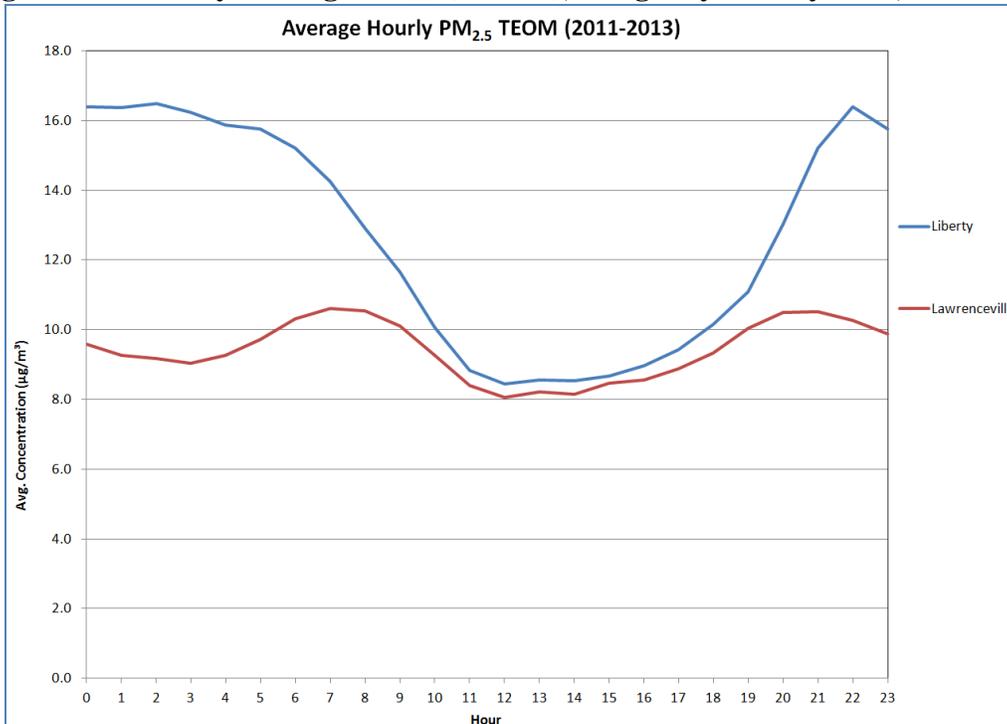


Figure 1.9. Hourly Average PM_{2.5} (TEOM), Allegheny County Sites, 2011-2013



The Liberty monitoring site shows nearly identical diurnal behavior on an hourly basis, with elevated levels occurring at night for both SO₂ and PM_{2.5}. This diurnal trend is unique to Liberty, as the other sites show peaks only during rush hour or daytime conditions.

1.5. Speciation Data

Raw speciation data was examined for tri-state monitoring sites for the period 2011-2013. These sites include Lawrenceville and Liberty in Allegheny County, Florence and Greensburg within the surrounding Pittsburgh MSA in PA, and rural federal sites at Quaker City, OH and Dolly Sods, WV.

The Florence (Washington Co.) and Greensburg (Westmoreland Co.) monitoring sites reside upwind and downwind of Allegheny County, respectively. These sites are 1-in-6 sites, operated by DEP.

The Quaker City monitoring site is a 1-in-3 CASTNET site operated by EPA, and Dolly Sods is a 1-in-3 IMPROVE site operated by the U.S. Forest Service. The Quaker City and Dolly Sods sites have been used by EPA as background speciation sites for the Pittsburgh area.

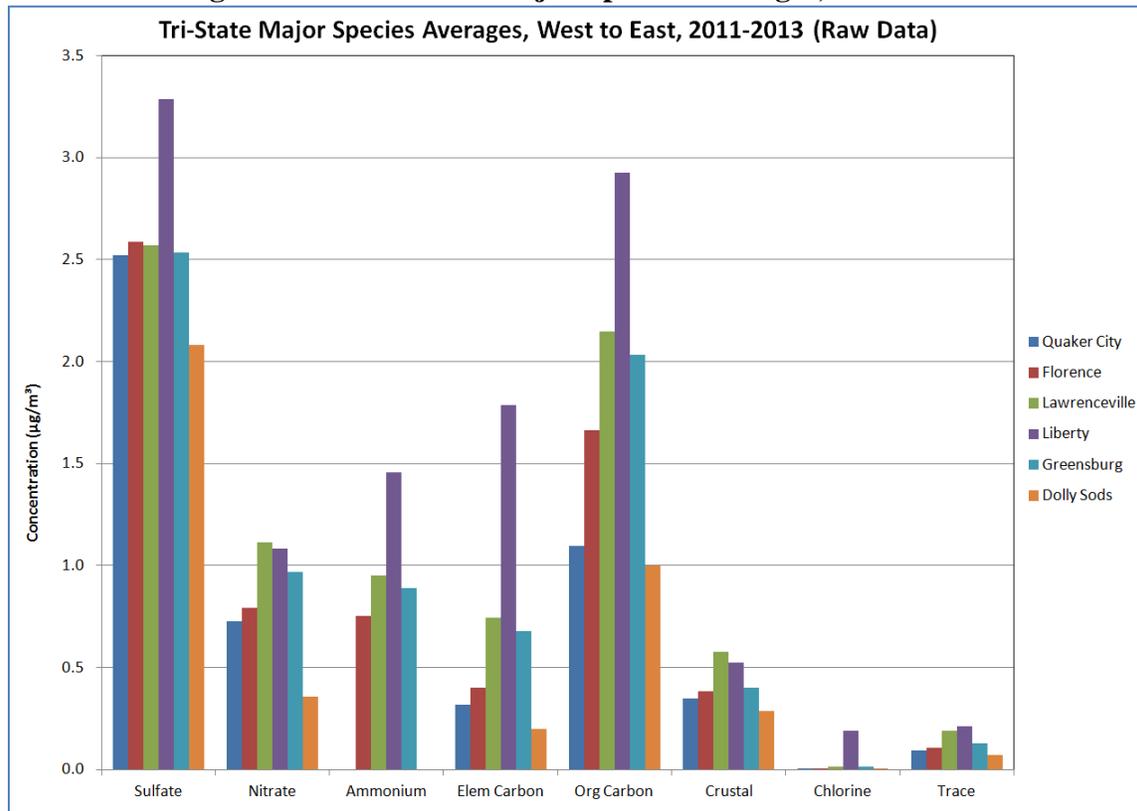
The Lawrenceville monitoring site is a 1-in-3 site, while Liberty is a 1-in-6 site. For sites with higher sampling frequencies (1-in-3), long-term averages represent a larger array of values. Figure 1.10 shows a map of these sites in Ohio, Pennsylvania and West Virginia.

Figure 1.10. Tri-State Speciation Sites



Long-term averages of the raw major species data for the tri-state sites are shown in cluster columns in Figure 1.11.

Figure 1.11. Tri-State Major Species Averages, 2011-2013



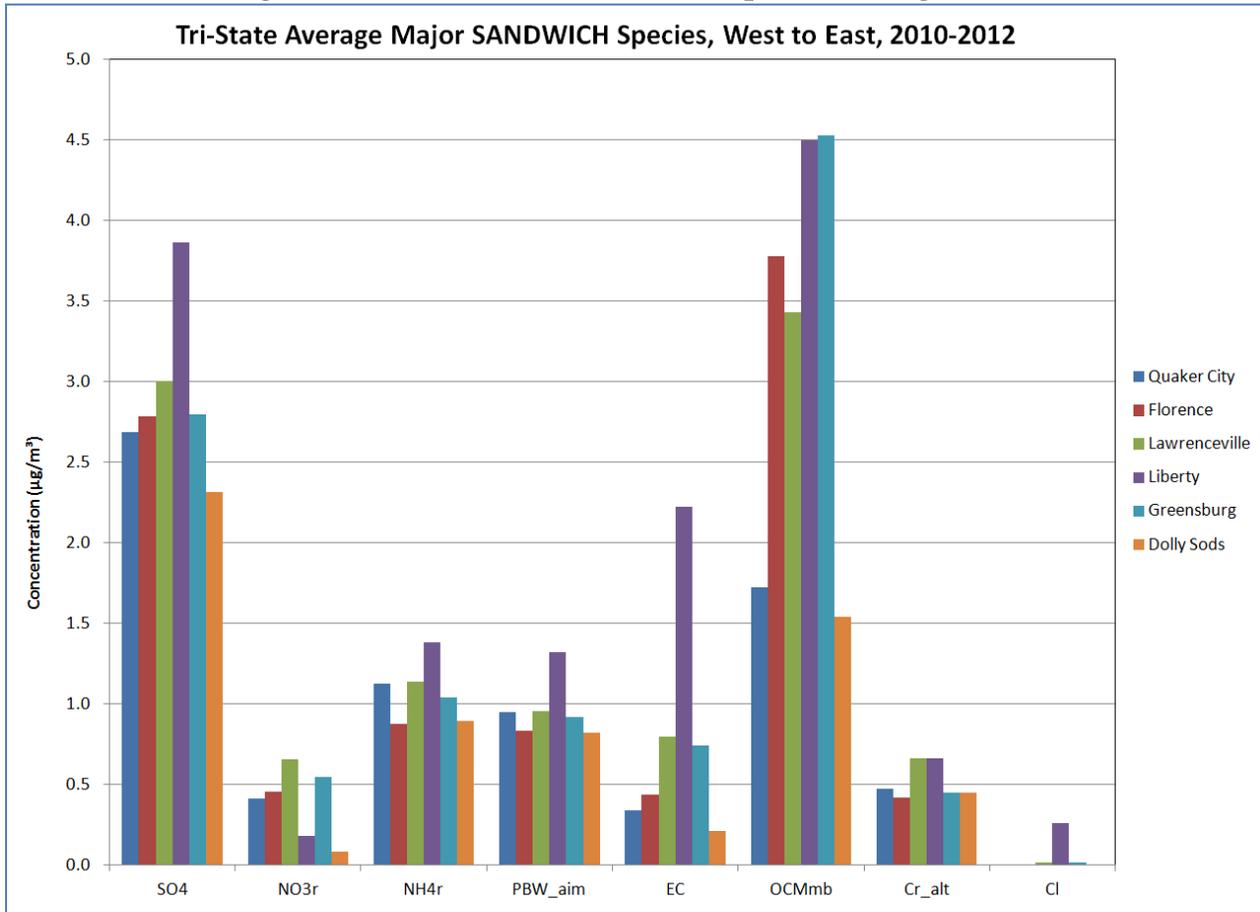
PM_{2.5} speciation data shows specific composition at the Liberty monitoring station that is not consistent with other SWPA (or tri-state) speciation monitors. Specific species such as sulfate show homogeneity throughout the MSA.

The raw data for speciation monitors are based on different analytical methods and can include some amount of error between the measurements. To relate the speciation monitor data to FRM data, EPA’s SANDWICH (Sulfate, Adjusted Nitrate, Derived Water, Inferred Carbon Hybrid) method was used to adjust the major species. The 2010-2012 timeframe was used for the SANDWICH data, since it was the most recent 3-year period available from EPA. (See EPA PM_{2.5} SANDWICH data at <http://epa.gov/ttn/analysis/sandwich.htm>)

Figure 1.12 shows the average tri-state species for 2010-2012 by SANDWICH method. Note that several assumptions are built into the SANDWICH technique:

- Retained nitrate (NO_{3r}) is calculated by EPA from temperature, relative humidity, and dissociation constants;
- OCMmb is organic carbonaceous material by mass balance (total minus other species);
- Ammonium is calculated indirectly from sulfate and nitrate and degree of neutralization;
- Without measured ammonium at federal sites, ammonium is derived as fully neutralized sulfate;
- For cases where no FRM value is present, STN mass is used.

Figure 1.12. Tri-State SANDWICH Species Averages, 2010-2012



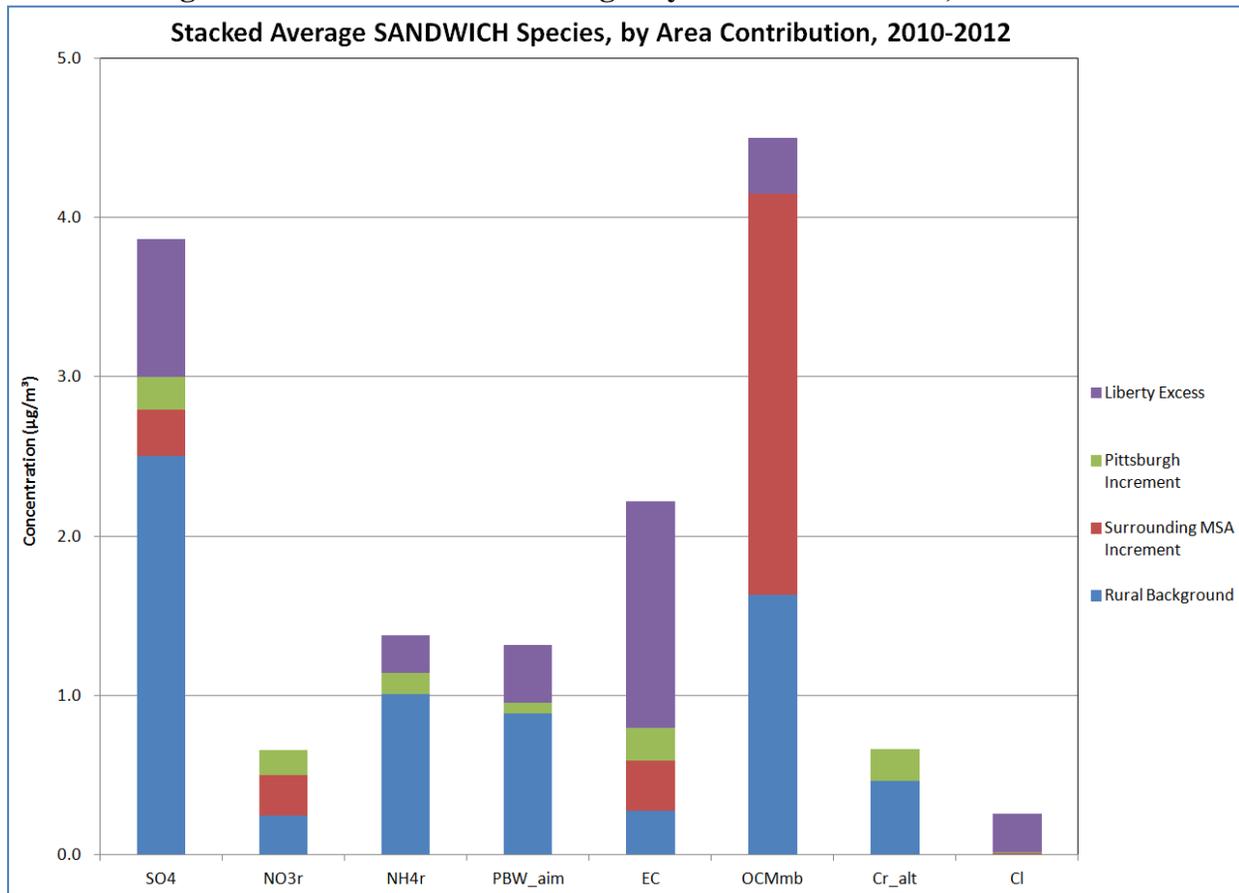
Legend: *SO₄* = sulfate ion; *NO_{3r}* = retained nitrate ion; *NH_{4r}* = retained ammonium ion (associated with sulfate and nitrate); *PBW_aim* = particle-bound water (associated with sulfate and nitrate), calculated from the AIM model; *EC* = elemental carbon; *OCMmb* = organic carbonaceous material by mass balance (FRM mass minus all other species); *Cr_alt* = crustal material calculated from Ca, Fe, Si, Ti; *Cl* = elemental chlorine

The SANDWICH method transforms the species compositions into more probable components based on the FRM data. The Liberty monitor shows higher data than other sites for sulfate and elemental carbon, while other species such as organic carbonaceous material by mass balance are normalized throughout the Pittsburgh MSA by the SANDWICH calculations.

Assuming spatial homogeneity throughout the tri-state region, the SANDWICH data can also be lumped into average area contributions for each species. For this analysis, rural transported background is considered to be the average of the rural federal sites (Quaker City, OH and Dolly Sods, WV), surrounding MSA increment is the average of surrounding Pittsburgh MSA sites (Florence and Greensburg), Lawrenceville is the urban increment monitor for Allegheny County, and Liberty is a localized industrial excess monitor.

SANDWICH concentrations by area contribution/excess are shown in the stacked column chart in Figure 1.13.

Figure 1.13. SANDWICH Averages by Area Contribution, 2010-2012



Example calculation: Liberty Excess SO_4 = Liberty SO_4 – Lawrenceville SO_4 – Avg(Florence SO_4 + Greensburg SO_4) – Avg (Quaker City SO_4 + Dolly Sods SO_4)

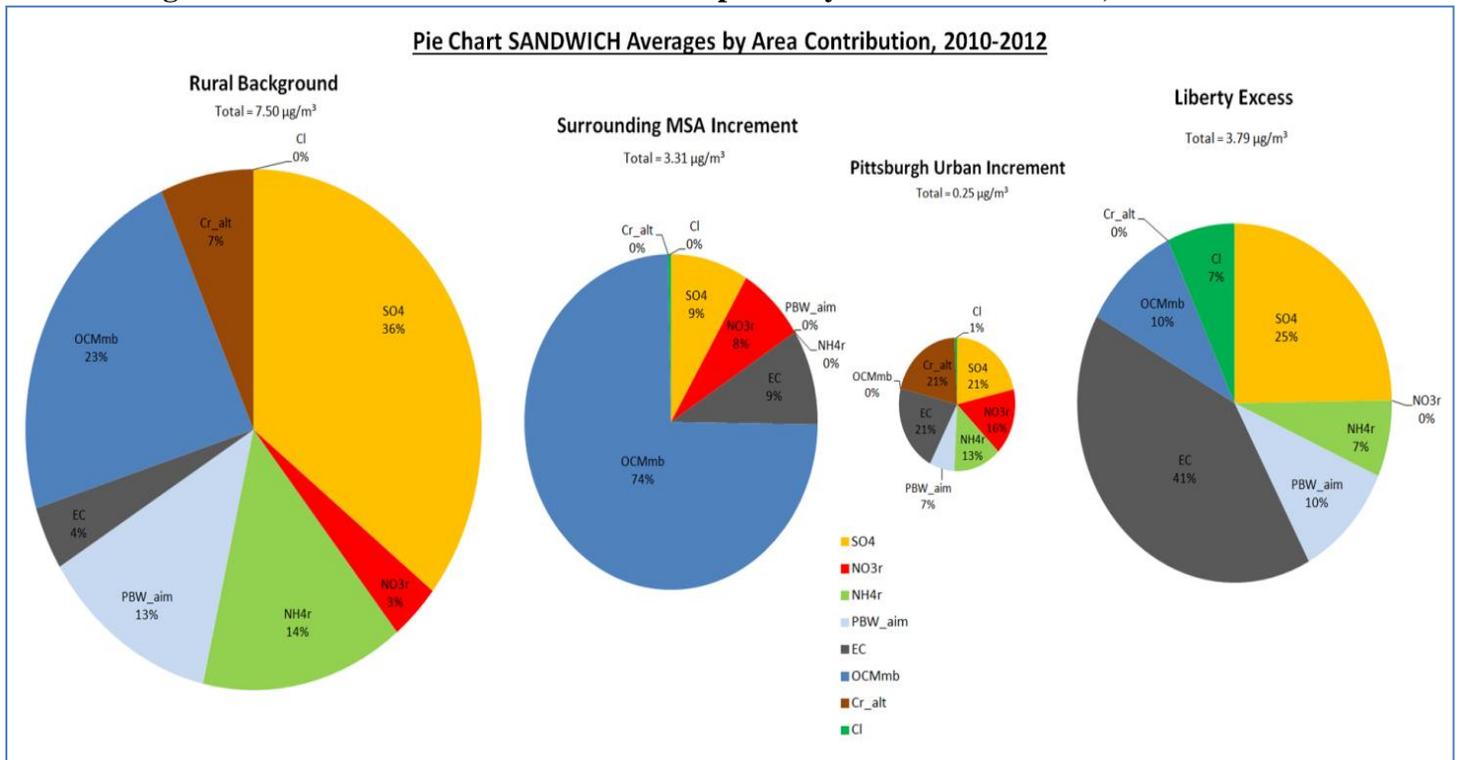
Figure 1.13 indicates that Liberty monitoring site shows excess contributions of carbons and sulfate for the tri-state area, as well as the only source of excess elemental chlorine. These compounds are very specific to local source contributions.

The surrounding MSA shows a large increment of organic carbonaceous material, indicating that the larger metropolitan area contributes significant wide-spread area, mobile, and point source emissions. The rural background sites show large contributions for sulfate, nitrates, as well as a portion of the organic carbonaceous material, indicating a regionally transported nature for these species.

The City of Pittsburgh contributes only small amounts of urban increment for species, showing that Allegheny County is contributing minimal urban influence for $PM_{2.5}$ in comparison to the surrounding area.

This can also be demonstrated by showing the area contributions by scaled pie charts, shown in Figure 1.14.

Figure 1.14. Pie Charts for SANDWICH Species by Area Contribution, 2010-2012

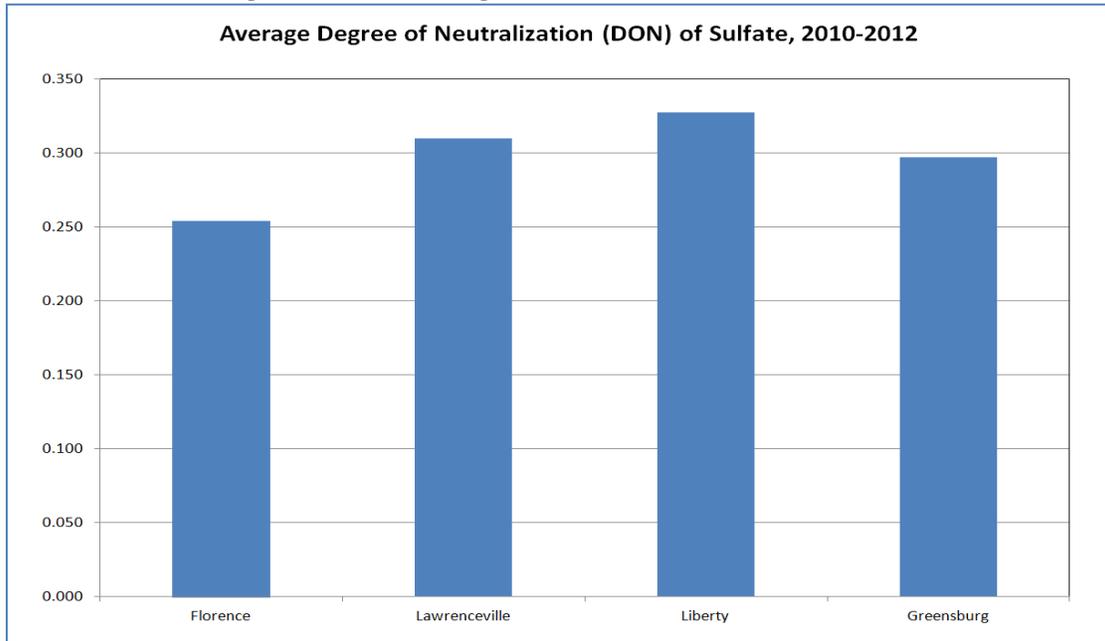


Pittsburgh urban increment is a minor component of PM_{2.5} in SWPA that is not contributing to exceedance levels of PM_{2.5}. Other area components contribute significantly larger amounts and in varying overall composition.

Additionally, the amount of excess ammonium sulfate at the Lawrenceville site may not be due to additional contributions from Allegheny County, but rather the neutralization of upwind incoming sulfuric acid into the area.

The degree of neutralization (DON) is a measure of the amount of ammonium associated with sulfate, up to 0.375 (complete neutralization to (NH₄)₂SO₄, based on molar ratios). Figure 1.15 shows the average DON for SWPA sites.

Figure 1.15. Average DON Values for SWPA Sites



The increasing DON ratios from west to east indicate that more acidic conditions are present with incoming air in the Pittsburgh region. Transported sulfuric acid (H_2SO_4) may be fresher or limited by NH_3 and partially neutralizing to ammonium bisulfate (NH_4HSO_4). Sulfate may be higher at Lawrenceville due to the time and distance required to neutralize sulfur compounds from outside of the county.

2. EMISSIONS AND EMISSIONS-RELATED DATA

2.1. Allegheny County Emissions Inventory

The EPA TSD analysis on emissions data was based on the 2011 National Emissions Inventory (NEI). Table 2h on page 92 of EPA's TSD analysis indicated major point source emissions from version 1 of the 2011 NEI, in tons per year. Table 2h listed facilities and facility-level emissions in the area of analysis for the Allegheny County area. In this table, EPA documented nine major facilities in Allegheny County (in addition to facilities outside of the county) with emissions of direct PM_{2.5}, components of direct PM_{2.5} and precursor pollutants. Table 2.1 shows the 2011 NEI data for the nine Allegheny County facilities.

Table 2.1. Allegheny County Facilities Over 500 Tons of Emissions in 2011 NEI

<u>Facility Name (Facility ID)</u>	<u>Distance from violating monitor (miles)</u>	<u>NH₃</u>	<u>NO_x</u>	<u>PM_{2.5}</u>	<u>SO₂</u>	<u>VOC</u>	<u>Total</u>
USS/Clairton Coke Works (4200300032)	1	123	3,075	500	1,468	336	5,502
Us Steel Corp/Irvin Plant (4200300203)	2	4	762	72	419	61	1,318
USS Corp/Edgar Thomson Works (4200300202)	5	22	275	633	1,279	41	2,250
Guardian Ind Corp /Jefferson Hills (4200300342)	5	0	978	22	73	19	1,092
Bay Valley Foods LLC /Pgh (4200300024)	11	0	212	20	313	1	546
Genon Energy Inc /Cheswick Sta (4200300157)	15	3	3,294	498	9,290	10	13,095
Shenango Inc /Shenango Coke Plant (4200300022)	16	3	427	97	372	100	999
Allegheny Ludlum LLC /Brackenridge (4200300093)	21	4	255	223	33	62	577
<i>Pittsburgh International*</i>	23	0	13	3	0	28	44
	<u>TOTAL</u>	159	9,291	2,068	13,247	658	<u>25,423</u>

**Pittsburgh International was altered in the 2011 NEI from what PA submitted, which was 44 total tons for 2011. EPA's TSD, Table 2h, listed Pittsburgh International as emitting 729 total tons per year.*

The DEP reviewed these same nine facilities in its Air Information Management System (AIMS) database for the 2013 calendar year. The 2013 emissions for each of the nine Allegheny County facilities are provided below in Table 2.2.

**Table 2.2. Facilities in Allegheny County with Emissions in Tons in 2013
Identified in PA DEP's AIMS Database**

<u>Facility Name</u> <u>(Facility ID)</u>	<u>Distance</u> <u>from</u> <u>violating</u> <u>monitor</u> <u>(miles)</u>	<u>NH₃</u>	<u>NO_x</u>	<u>PM_{2.5}</u>	<u>SO₂</u>	<u>VOC</u>	<u>Total</u>
USS/Clairton Coke Works (4200300032)	1	145	3,761	327	1,637	307	6,177
Us Steel Corp/Irvin Plant (4200300203)	2	3	754	43	507	70	1,377
USS Corp/Edgar Thomson Works (4200300202)	5	22	320	43	1,454	40	1,879
Guardian Ind Corp /Jefferson Hills (4200300342)	5	0	470	21	70	12	573
Bay Valley Foods LLC /Pgh (4200300024)	11	1	145	2	209	2	359
Genon Energy Inc /Cheswick Sta (4200300157)	15	1	5,333	88	1,686	11	7,119
Shenango Inc /Shenango Coke Plant (4200300022)	16	3	392	35	285	93	808
Allegheny Ludlum LLC /Brackenridge (4200300093)	21	4	222	93	31	57	407
Pittsburgh International	23	0	10	3	0	21	34
	TOTAL	179	11,407	655	5,879	613	18,733

Emission totals for the nine facilities in Allegheny County are compared between 2011 and 2013 in Table 2.3.

Table 2.3. Emission Differences Between 2011 and 2013 for Facilities in Allegheny County

<u>Facility Name (Facility ID)</u>	<u>2011 Totals</u>	<u>2013 Totals</u>	<u>Difference</u>	<u>Percent Change</u>
USS/Clairton Coke Works (4200300032)	5,502	6,177	675	12.3%
Us Steel Corp/Irvin Plant (4200300203)	1,318	1,377	59	4.5%
USS Corp/Edgar Thomson Works (4200300202)	2,250	1,879	-371	-16.5%
Guardian Ind Corp/Jefferson Hills (4200300342)	1,092	573	-519	-47.5%
Bay Valley Foods LLC/Pgh (4200300024)	546	359	-187	-34.2%
Genon Energy Inc/Cheswick Sta (4200300157)	13,095	7,119	-5,976	-45.6%
Shenango Inc/Shenango Coke Plant (4200300022)	999	808	-191	-19.1%
Allegheny Ludlum LLC/Brackenridge (4200300093)	577	407	-170	-29.5%
Pittsburgh International*	44*	34*	-10*	-22.7%
GRAND TOTAL	25,423	18,733	-6,690	-26.3%

**Based on DEP databases. EPA adjusted the emission numbers submitted by PA for the 2011 NEI for Pittsburgh International. EPA's calculation for 2013 would show a downward trend in emissions at the Pittsburgh International Airport.*

As shown in Table 2.3, seven of the nine sources have decreased emissions 16.5% to 47.5% between 2011 and 2013, while the whole county had reduced emissions by more than 26% during the same time. Only two facilities increased emissions during the same period of time – U.S. Steel Clairton Coke Works and U.S. Steel Irvin Plant. The Clairton Coke Works facility, the country's largest coking operation, increased emissions by 675 tons, an increase of 12.3%.

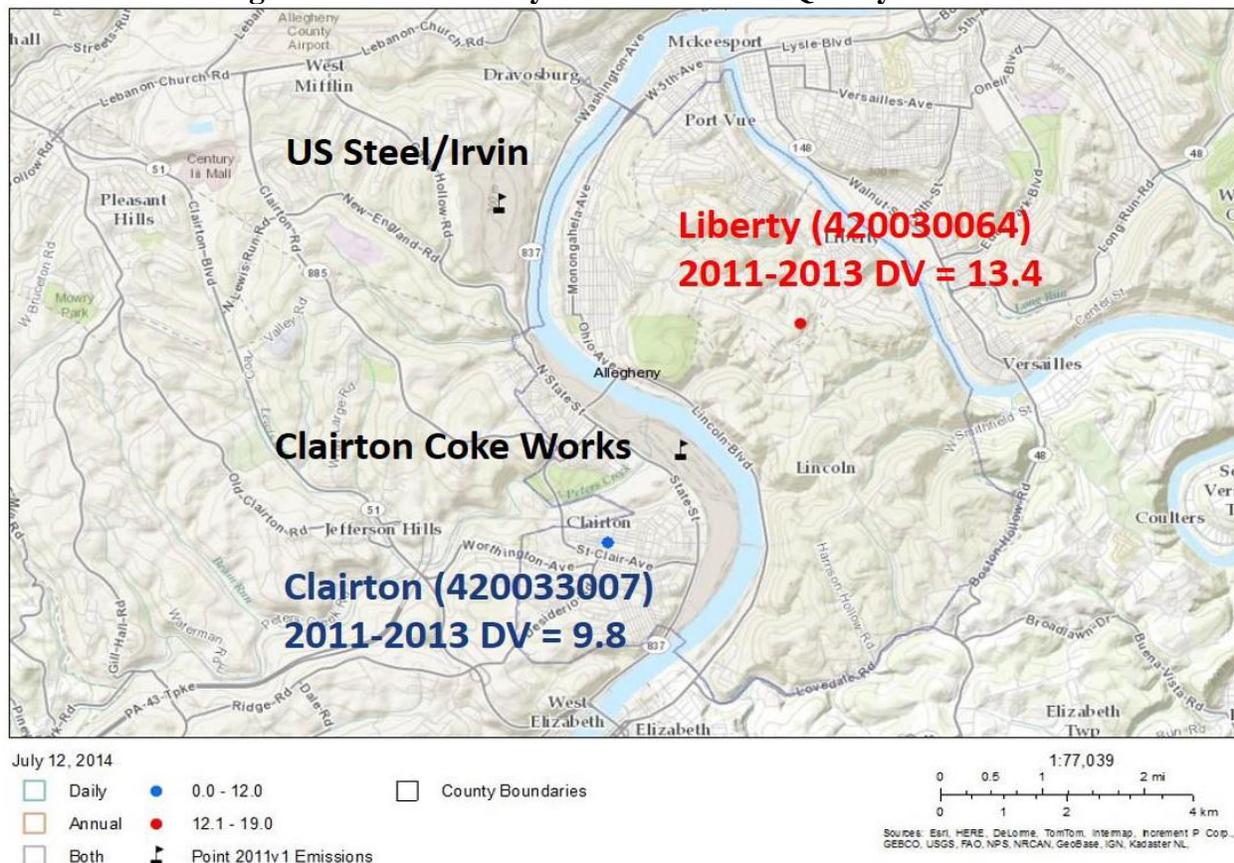
The Cheswick Power Plant, the largest emissions source in Allegheny County (several kilometers away from either the City of Pittsburgh or Liberty-Clairton and downwind relative to prevailing wind directions) has decreased sulfur dioxide emissions significantly since 2009, due to the installation of a flue gas desulfurization (FGD) system. Sources outside of the Liberty-Clairton area, including the Cheswick plant and others, will be subject to controls required to meet the 2010 1-hour SO₂ NAAQS.

It should be pointed out that the emission numbers Pennsylvania submitted for the 2011 NEI for Pittsburgh International Airport was later changed by EPA. Tables 2.1-2.3 include Pittsburgh International data as submitted by Pennsylvania for the 2011 NEI and in DEP's AIMS database for 2013. Regardless of whether EPA's adjusted numbers or Pennsylvania's database numbers are used, both would show a downward trend between 2011 and 2013 at the Pittsburgh International Airport.

As noted in Figure C on page 78 of EPA's TSD, the Clairton Coke Works facility is in the Monongahela Valley, in the area of Liberty-Clairton. This source is also the closest of the nine sources to the Liberty monitor, at a distance of one mile. Clairton Coke Works is located to the southwest of the Liberty monitor, where the emissions are frequently coming from. The US

Steel Irvin Plant is the second closest of the nine sources, located two miles to the west/northwest of the Liberty monitor. The location of these sources in relation to the monitors in the Monongahela Valley can be seen in Figure 2.1.

Figure 2.1. The Liberty and Clairton Air Quality Monitors



Source: EPA's August 19, 2014 intended designations letter, TSD Section 3.3, Allegheny County.

Additionally, several power plants outside of Allegheny County, which were included in the EPA TSD analysis, have deactivated since 2011:

- Washington County, PA – NRG Elrama (October 2012);
- Washington County, PA – Allegheny Energy Mitchell (October 2013);
- Greene County, PA – Allegheny Energy Hatfield's Ferry (October 2013);
- Armstrong, PA – Allegheny Energy Armstrong (September 2012);
- Preston County, WV – Monongahela Power Albright (September 2012).

Additionally, the owner of the Homer City power plant in Indiana County is in the process of installing a desulfurization system, which is expected to come online in 2016; this system will significantly decrease sulfur dioxide emissions. The Homer City plant is located within the partial Indiana County area that is included in EPA's intended Johnstown nonattainment area, which also includes all of Cambria County.

The urbanized area of Allegheny County (which is primarily the City of Pittsburgh) does not affect Liberty-Clairton, and vice-versa. Liberty shows extremely localized behavior and composition for PM_{2.5}. This is also evident with the Clairton monitor, only a few kilometers away from Liberty, which can show much lower concentrations than Liberty as well as Lawrenceville. The urbanized area of Pittsburgh is well-characterized by population, modeling demonstrations, and other factors. It is best defined as the City of Pittsburgh extending into a few immediately adjacent municipalities and portions of the interstate parkway corridors. The Lawrenceville monitor is the best monitor to represent urbanized Pittsburgh. The Lawrenceville monitor is influenced by urban emissions, but shows attainment of the 2012 annual PM_{2.5} NAAQS. The Liberty monitor is influenced by extreme localized industrial emissions, causing nonattainment. The remaining Allegheny County sites, while showing uniqueness on a neighborhood scale, are similar to other sites within the larger Pittsburgh MSA and are showing attainment.

The EPA TSD analysis attempted to relate emissions from Pittsburgh as an urban increment that can influence the violating monitor. EPA cited Pittsburgh International Airport as well as a few stationary sources as additional sources that could influence the Liberty monitor, despite the prevailing winds coming from the southwest. If EPA designates all of Allegheny County as a nonattainment area, as opposed to the Liberty-Clairton Area, this would result in making all of the sources subject to Reasonable Further Progress (RFP). The baseline for the RFP would be increased if this happened, resulting in a greater emission reduction required to meet the RFP. Since the ACHD does not have authority to control emissions from airports, there are no remaining CAA measures to implement for transportation emissions. In addition, most of the stationary sources are well controlled, resulting in few attainable RFP goals. Designating all of Allegheny County as a single nonattainment area could cause the area to fail to meet RFP. When finalizing a nonattainment designation, the potential for control is an important consideration that must be applied to sources of emissions.

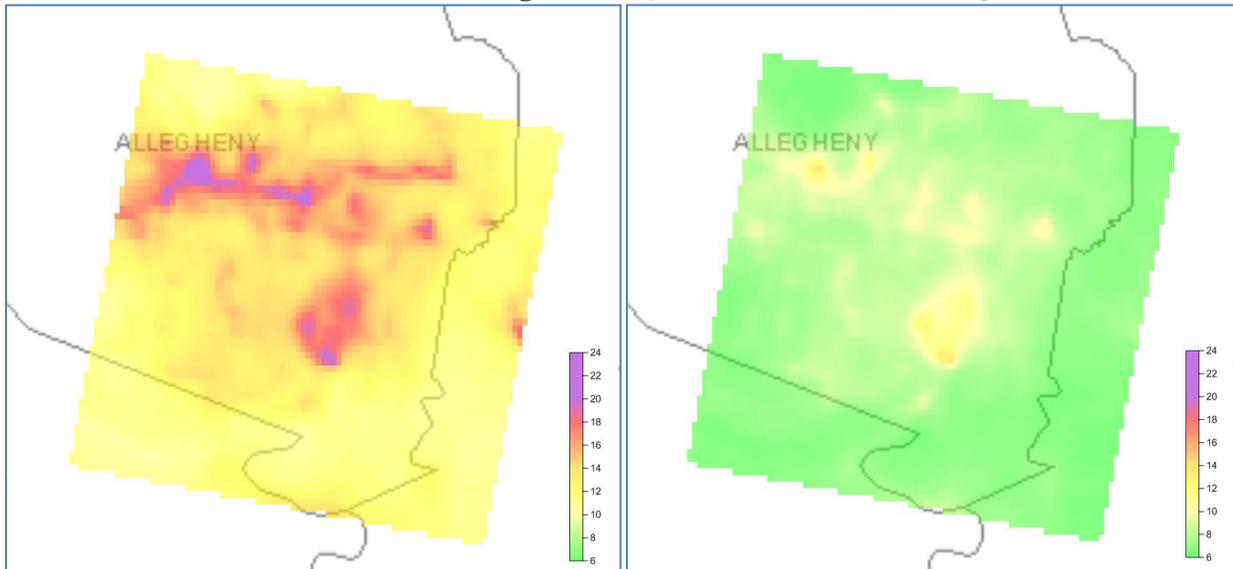
In the past, EPA and DEP both agreed that this is a local problem, specific to the Monongahela Valley. All counties and municipalities surrounding the Liberty-Clairton area have attained the PM_{2.5} standards, and Liberty-Clairton lags behind, as was expected when EPA designated the 1997 and 2006 PM_{2.5} nonattainment areas.

2.2. PM_{2.5} SIP Modeling

CAMx modeling and Modeled Attainment Test Software (MATS) unmonitored area tests performed for the 2006 24-hour PM_{2.5} NAAQS SIP shows much more refined gridded modeling results than shown in the EPA TSD analysis for the 2012 annual PM_{2.5} NAAQS.

Unmonitored area PM_{2.5} impacts are shown in Figure 2.2 for baseline year 2007 to future projected 2014 (see DEP's June 21, 2013 State Implementation Plan (SIP) revision submittal pertaining to the attainment demonstration of the 2006 PM_{2.5} NAAQS for the Liberty-Clairton nonattainment area; herein referred to as the June 2013 SIP) at 0.8 km and 4 km resolution.

Figure 2.2. MATS Spatial PM_{2.5} Analysis, Baseline 2007 (left) and Projected 2014 (right), 0.8 km Gridded Modeling Domain, from 2006 PM_{2.5} NAAQS SIP



These results show distinct borders for the extent of urban impacts compared to Liberty-Clairton area impacts. Furthermore, areas influenced by urban emissions are not showing county-wide modeled impacts. Urbanized PM_{2.5} emissions are highest at the urban core, extending into the parkway corridors of Interstates 279 and 376 (Note that near-road PM_{2.5} monitored results are not part of the current 2012 annual PM_{2.5} NAAQS designations.).

CAMx modeling performed for the June 2013 SIP revision also showed impacts by both local and regional contribution. The CAMx Particulate Matter Source Apportioning Technology (PSAT) tracked local source emissions in the model separately from regional impacts. The largest sources (>50 tons summed emissions) tracked locally are shown in Table 2.4.

Table 2.4. Local Sources Tracked by PSAT in CAMx, with Emissions (tons/year)

2007 Baseline						
Facility	SO ₂	NO _x	CO	VOC	NH ₃	PM _{2.5}
EASTMAN CHEMICAL RESINS, INC.	4.4	73.2	29.8	177.7	0.1	17.6
GUARDIAN INDUSTRIES CORP. FLOREFFE	82.4	686.6	10.3	13.9	0.0	20.0
US STEEL CORP - EDGAR THOMSON PLANT	1868.6	318.1	1300.9	68.6	0.5	803.3
US STEEL CORP - IRVIN PLANT	456.0	694.5	194.0	71.8	0.7	51.1
US STEEL CORP - CLAIRTON PLANT	1739.9	4807.4	3559.3	570.6	18.4	929.2
ALLEGHENYENERGYSUPPLYCO/MITCHELL	637.9	1495.6	31.4	11.7	0.0	79.9
ORIONPOWERMIDWEST/ELRAMA	4267.4	6027.5	230.9	22.4	6.9	512.8
2014 Projected						
Facility	SO ₂	NO _x	CO	VOC	NH ₃	PM _{2.5}
EASTMAN CHEMICAL RESINS, INC.	4.4	73.2	29.8	177.7	0.1	17.6
GUARDIAN INDUSTRIES CORP. FLOREFFE	82.4	686.6	10.3	13.9	0.0	20.0
US STEEL CORP - EDGAR THOMSON PLANT	1868.6	318.1	1300.9	68.6	0.5	803.3
US STEEL CORP - IRVIN PLANT	456.0	694.5	194.0	71.8	0.7	51.1
US STEEL CORP - CLAIRTON PLANT	1717.6	4312.8	4197.7	443.5	17.6	645.1
ALLEGHENYENERGYSUPPLYCO/MITCHELL	948.1	1335.0	44.1	17.3	0.0	102.1
ORIONPOWERMIDWEST/ELRAMA	1846.0	1943.0	99.7	9.7	3.0	221.5

Modeled impacts at Liberty from the June 2013 SIP are shown in Table 2.5, split into local and regional contributions. Local sources were those within a 20 km domain surrounding the Liberty monitor.

Table 2.5. Modeled CAMx Impacts, Local and Regional, Baseline 2007 and Projected 2014

Local CAMx Impacts at Liberty								
	SO ₄	NO ₃	NH ₄	POA	SOA	EC	OTHER	TOTAL
2007	0.442	0.010	0.137	0.219	0.000	0.282	2.274	3.363
2014	0.361	0.014	0.109	0.204	0.000	0.269	1.789	2.746
Regional CAMx Impacts at Liberty								
	SO ₄	NO ₃	NH ₄	POA	SOA	EC	OTHER	TOTAL
2007	4.517	1.031	1.346	2.287	0.036	1.192	3.189	13.597
2014	2.256	0.876	0.984	1.777	0.030	0.499	2.755	9.175

Legend: SO₄ = sulfate ion; NO₃ = nitrate ion; NH₄ = ammonium ion; POA = primary organic aerosol; SOA = secondary organic aerosol; EC = elemental carbon; OTHER = unspiciated PM_{2.5}.

CAMx modeling from the June 2013 SIP showed little transformation locally at Liberty, indicating that secondary compounds are not readily formed from precursor emissions from

immediately upwind sources such as Eastman, Guardian, Elrama, or Mitchell. Most of the local impacts were from direct PM emissions (OTHER, POA, EC), while secondary components (SOA, NO₃) contributed minimally to impacts at Liberty. It should be noted that Elrama and Mitchell were modeled at Cross-State Air Pollution Rule (CSAPR) emission levels for future case 2014. Both of these power plants are currently deactivated.

Local sulfate can be apportioned to either primary or secondary PM_{2.5}, depending on the Standard Classification Code (SCC) code of the modeled source. Stack tests have shown significant amounts of primary sulfate for local sources near Liberty (Note: ammonium is mostly associated with sulfate in the model.).

It should also be noted that modeled impacts for the PM_{2.5} SIP were used in a relative sense for future design value calculations (See PM_{2.5} modeling guidance, April 2007.). When applied to monitored data, the modeling projected future case annual values for 2014 (5-year weighted basis) below 12.0 µg/m³ for Liberty.

2.3. PMF Source Apportionment

Positive Matrix Factorization (PMF) source apportionment receptor modeling referenced in the EPA TSD (based on 2005-2010 speciation data) represented a “best-guess” scenario of probable source factors. For many source factors, there is a mix of components that cannot be resolved by the model, and there is considerable uncertainty associated with the results. The PMF results should be considered “ballpark” estimates, with the importance lying in the factor types and the associated wind directions for each factor at Lawrenceville and Liberty. Subsequent modeling, control strategies, and past/current monitored data have shown that Clairton Coke Works is the main source contributing to exceedances at Liberty.

Updated PMF modeling (using PMF v5.0) was performed using more recent speciation data for 2011-2013, including modeling for the additional tri-state sites (see Air Quality Data section). For this analysis, samples with missing species or exceptional outliers are removed from the model to provide a better fit.

Modeled source factor profiles from PMF are shown in Figures 2.3 and 2.4 for Lawrenceville and Liberty, respectively.

Figure 2.3. Lawrenceville Source Factor Profiles

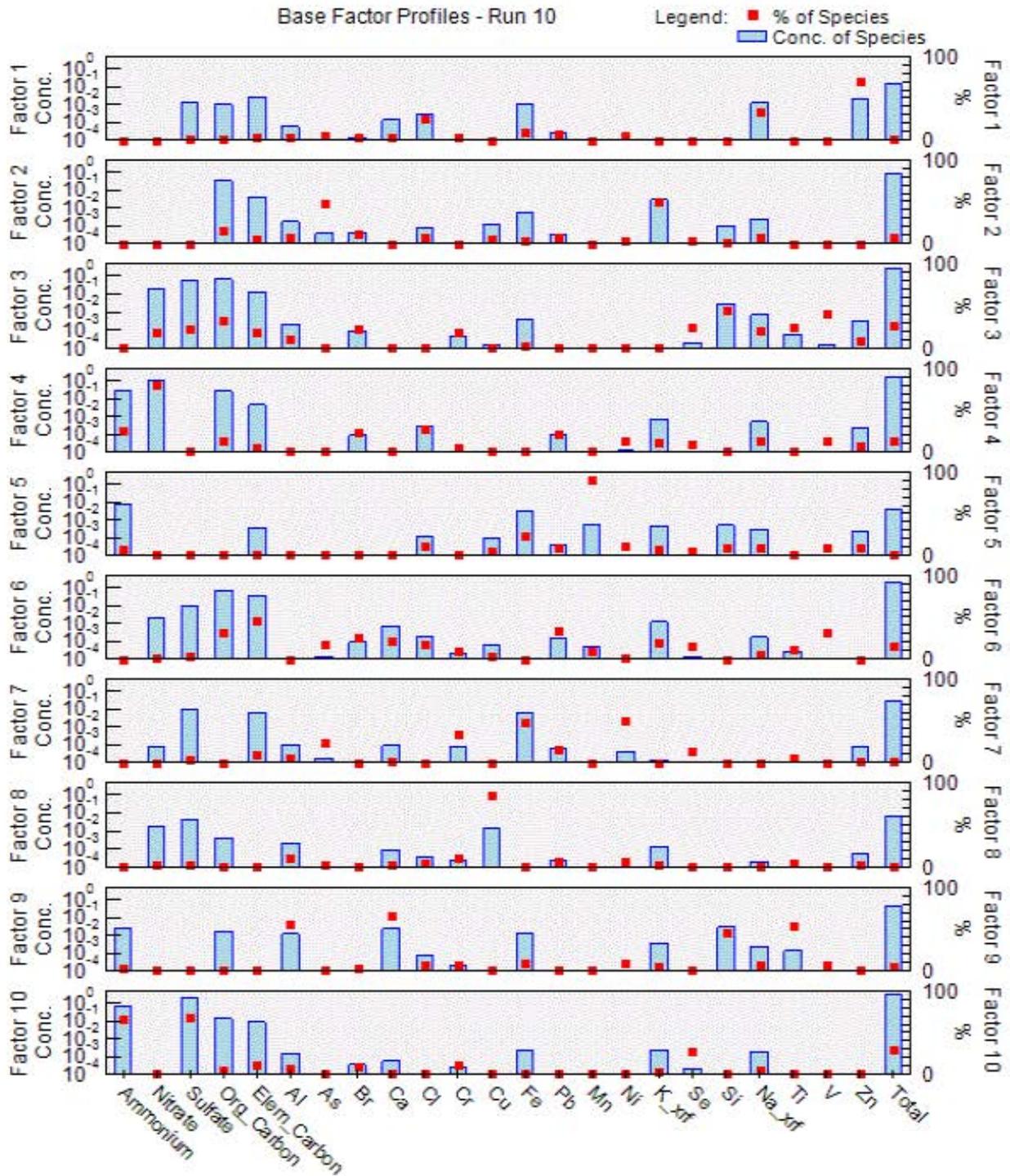
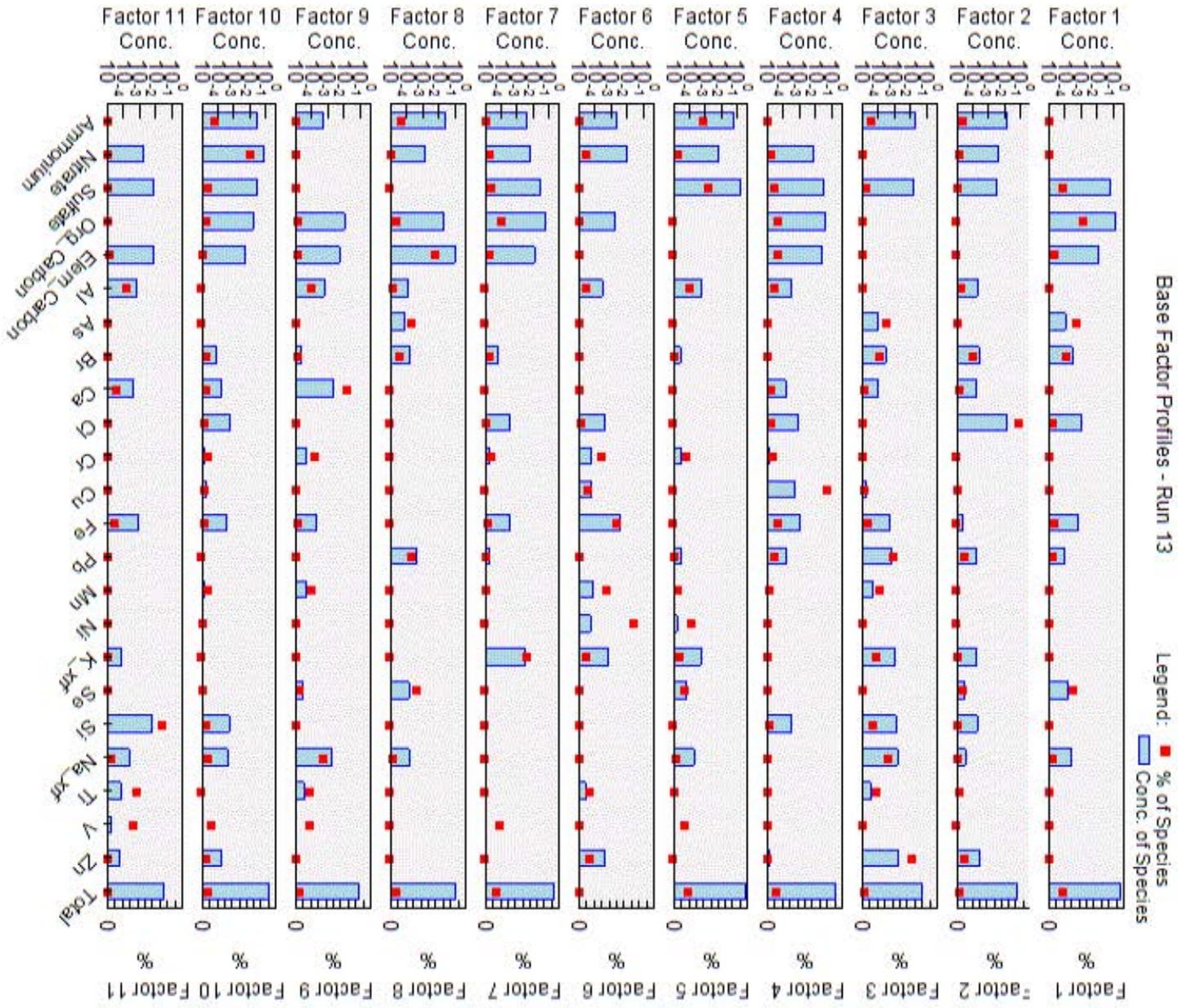


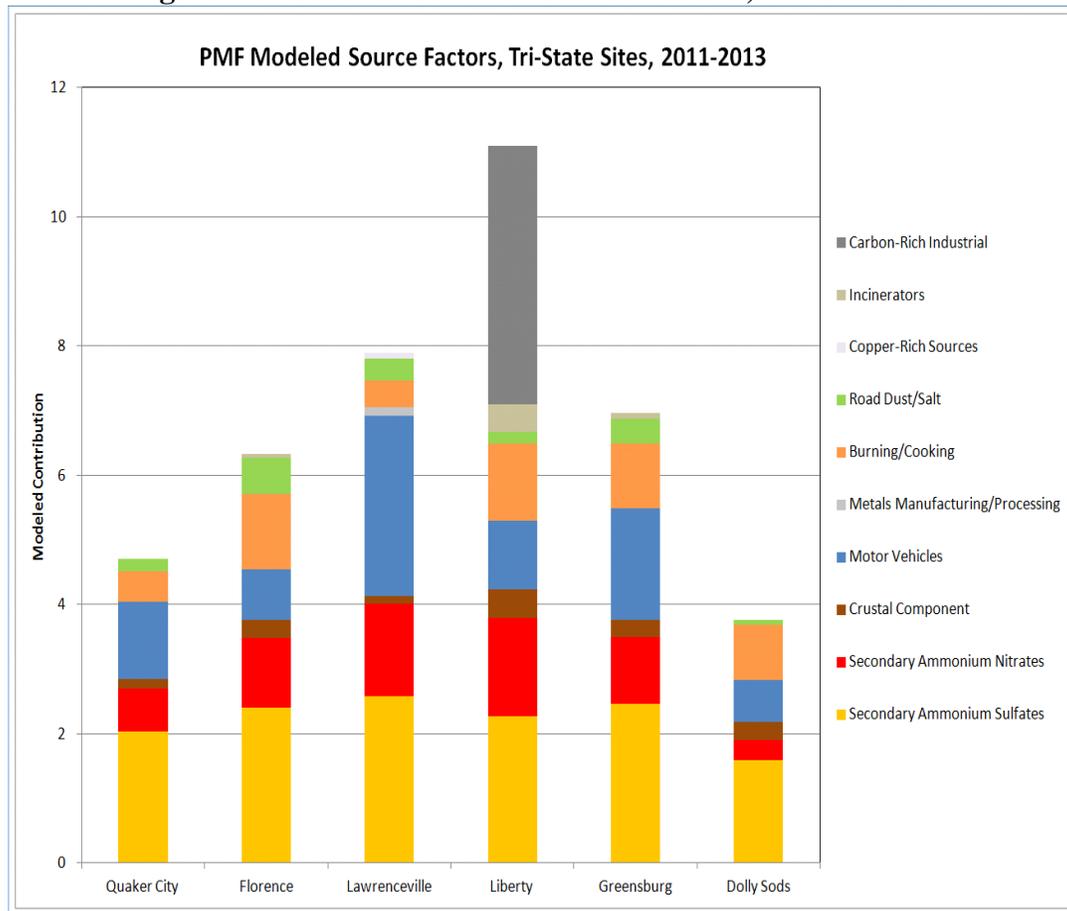
Figure 2.4. Liberty Source Factor Profiles



Figures 2.3 and 2.4 show some common factors between Lawrenceville and Liberty, with some distinct larger industrial source factors only evident at Liberty.

A comparison of source factors between the tri-state sites are given in Figure 2.6. Some of these factors are combinations of one or more profiles originating from similar sources for better comparison between sites (Note: source factors are assigned according to most prevalent indicator species for each source factor, but factors can contain amounts of other species.).

Figure 2.5. Stacked Common Source Factors, Tri-State Sites



The modeled source factors show consistency with the speciation analysis (see Air Quality Data section). Contributions from regional components such as ammonium sulfate and crustal component are fairly consistent through the tri-state area. Motor vehicles show higher contributions at more population sites such as Lawrenceville and Greensburg. Liberty shows a large contribution from carbon-rich industrial sources – not present at the other sites – that contribute carbons, primary sulfate, chlorine, and several trace elements.

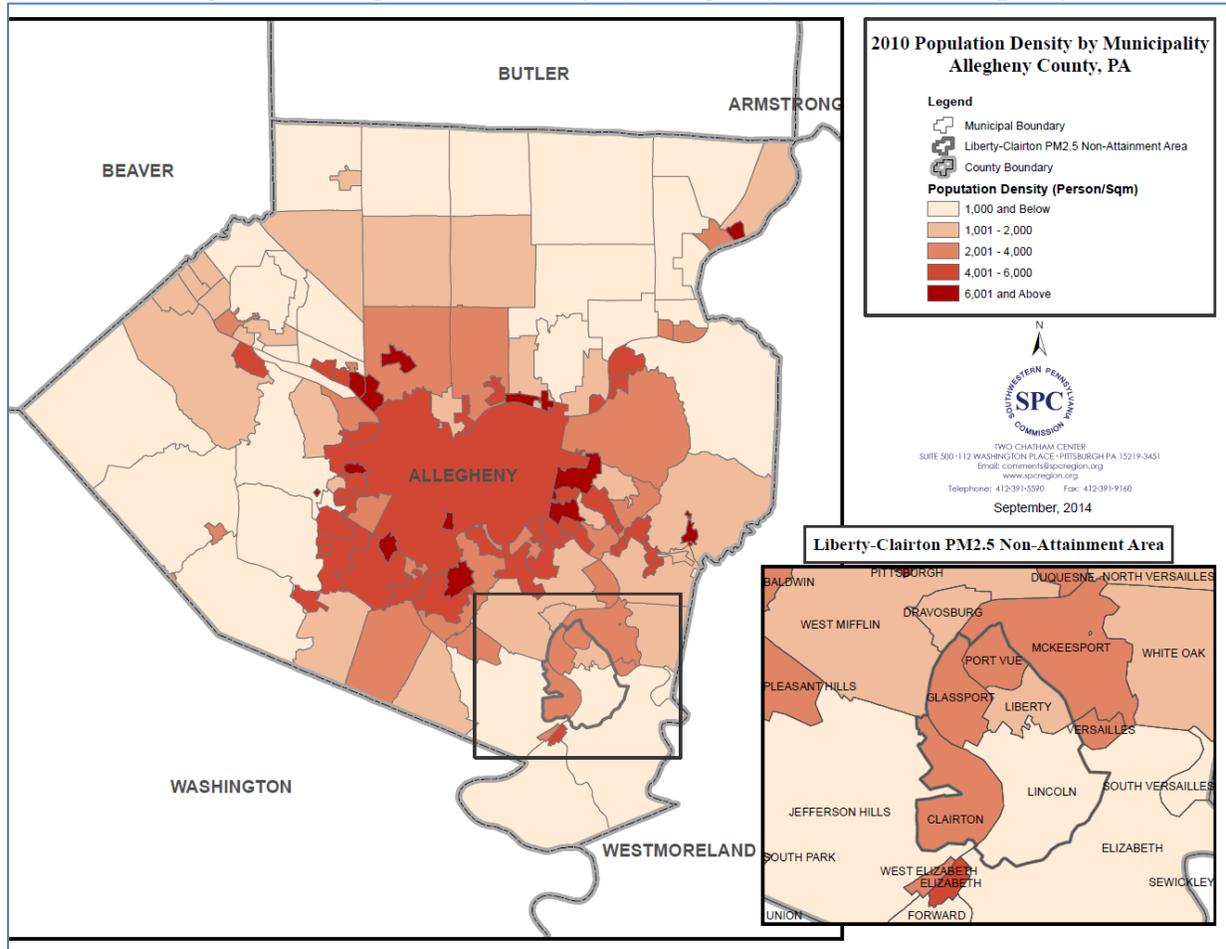
Modeling and source apportionment analysis indicate that sources immediately upwind of the Liberty-Clairton area are showing minimal impacts on the area. Additionally, the two largest upwind sources within 15 km of Liberty (Elrama and Mitchell plants) have deactivated in 2012-2013 (in addition to other nearby sources), while Liberty continues to exceed the annual NAAQS.

Additional ACHD speciation and PMF analysis can be found at www.achd.net/air/reports.html.

2.4. Allegheny County Population Data

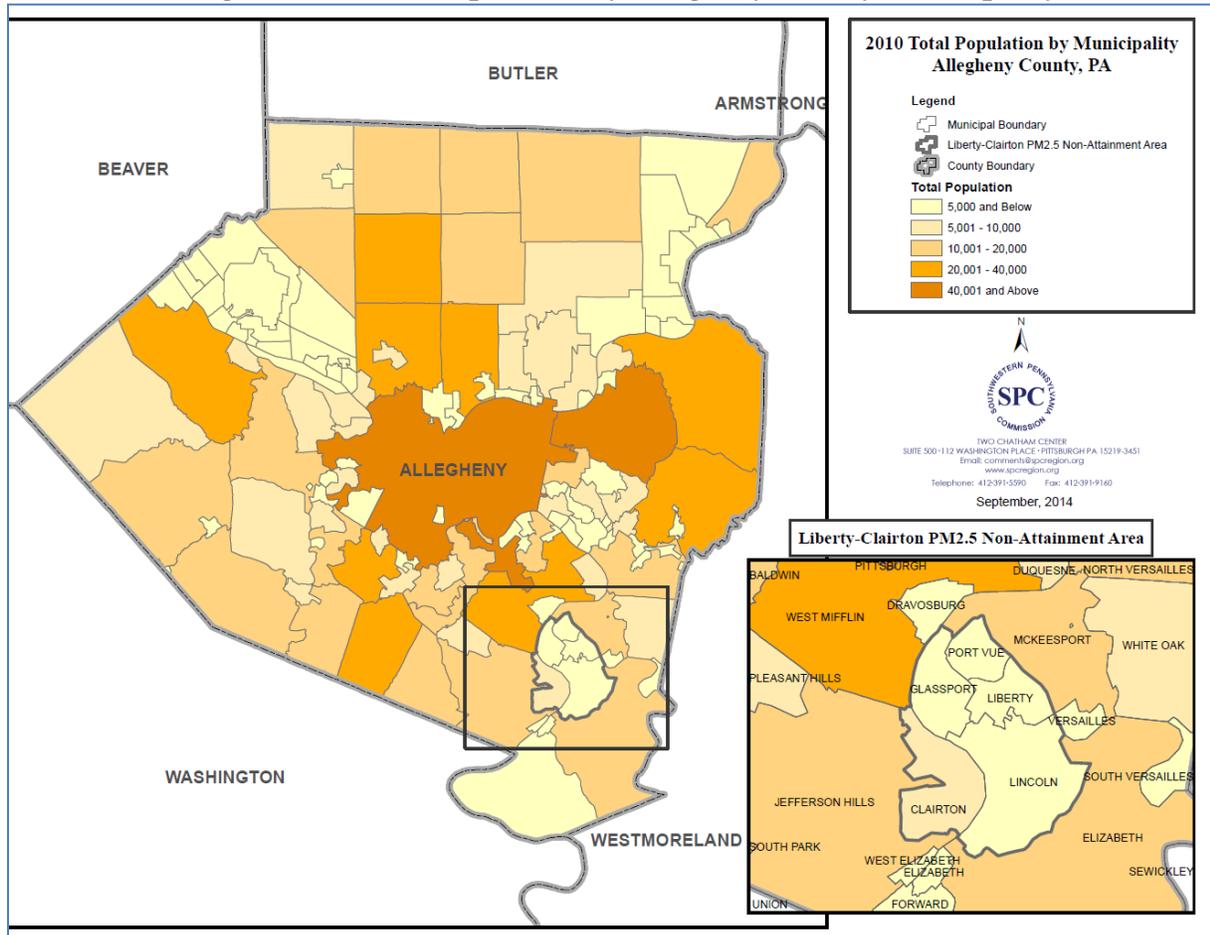
Allegheny County population data, based on 2010 census data was examined for the extent of the urban Pittsburgh area. Figures 2.6 and 2.7 show population density and total population, respectively, by municipality. The City of Pittsburgh (in the middle of the maps) is the largest municipality by area.

Figure 2.6. Population Density by Allegheny County Municipality



Population density shows that the Pittsburgh urban core is best defined as the City of Pittsburgh along with a few immediately adjacent municipalities. The Greater Pittsburgh area is best defined as the Pittsburgh MSA.

Figure 2.7. Total Population by Allegheny County Municipality



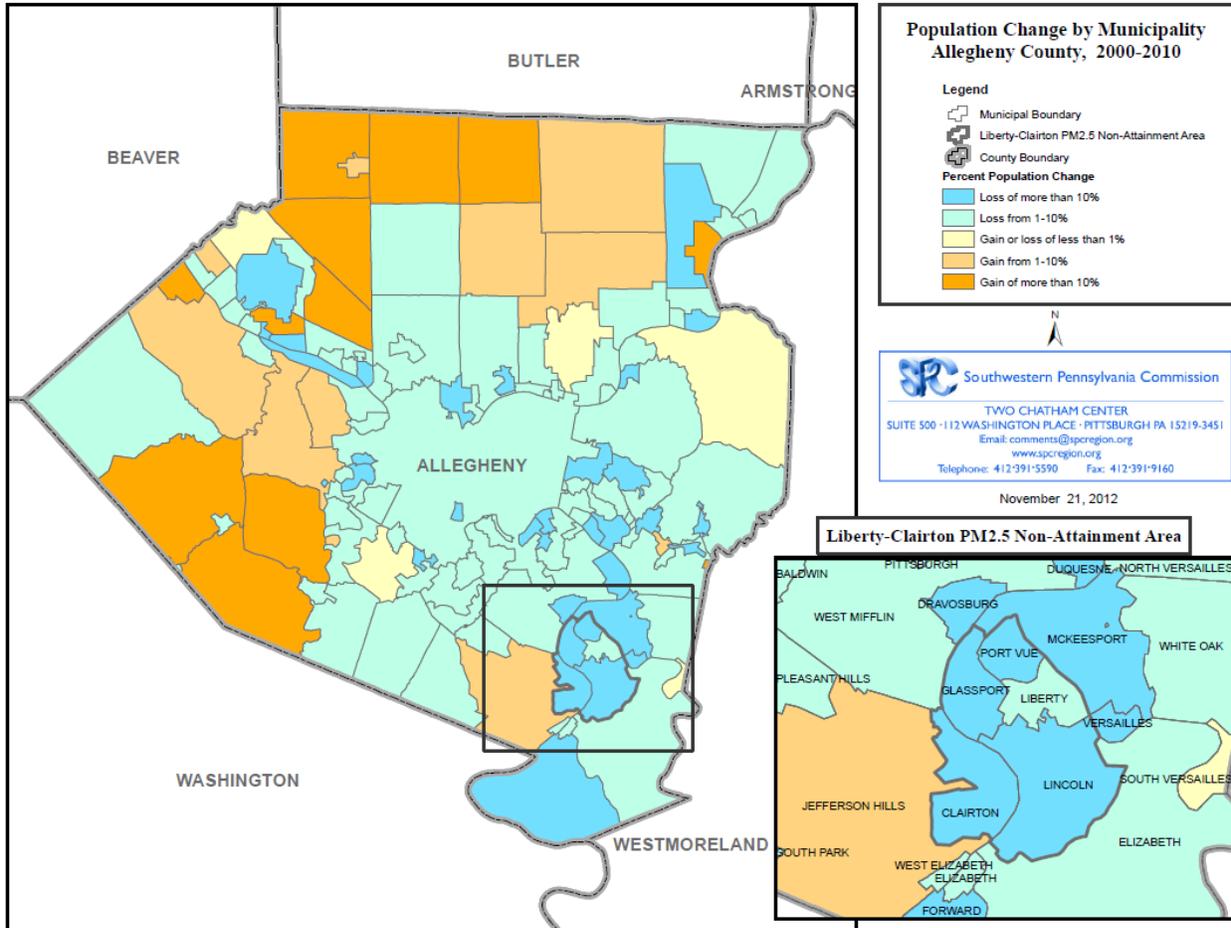
Total population shows similar results to population density, indicating the city of Pittsburgh as the most urbanized area.

The EPA TSD analysis showed population growth and population density in terms of a full-county, Allegheny County, area. While the information was accurate, this data was not broken down any further than the county level, and a trend in the Liberty-Clairton area was not discussed.

On July 25, 2014, DEP submitted a revision to the June 21, 2013, SIP submittal, which was a supplement to the attainment demonstration for the Liberty-Clairton PM_{2.5} Nonattainment Area 2006 Standards. In Section 2.7 of the revision, it was pointed out that according to the U.S. Census Bureau, the five municipalities of the Liberty-Clairton area have decreased in population. From 2000 to 2010, the City of Clairton had a decrease in population of about 20%, the largest population decrease in the Liberty-Clairton nonattainment area. The other municipalities saw population decreases as follows: Borough of Glassport -10.2%; Liberty Borough -4.5%; Borough of Lincoln -12.0%, and Port Vue Borough -10.2%. In total, the nonattainment area had a decrease in population of 2,900 people, or a decrease of 13.4% from 2000 to 2010. Due to a reduction of population, it would signal a reduction of the use of cars,

school buses and other diesel-engine vehicles. Figure 2.8 shows the Allegheny County population trend from the July 25, 2014, submittal.

Figure 2.8. Population Trends - Liberty-Clairton Area and Allegheny County, 2000-2010



Source: Allegheny County Health Department's proposed SIP revision to the June 21, 2013 SIP, as submitted by DEP on July 25, 2014.

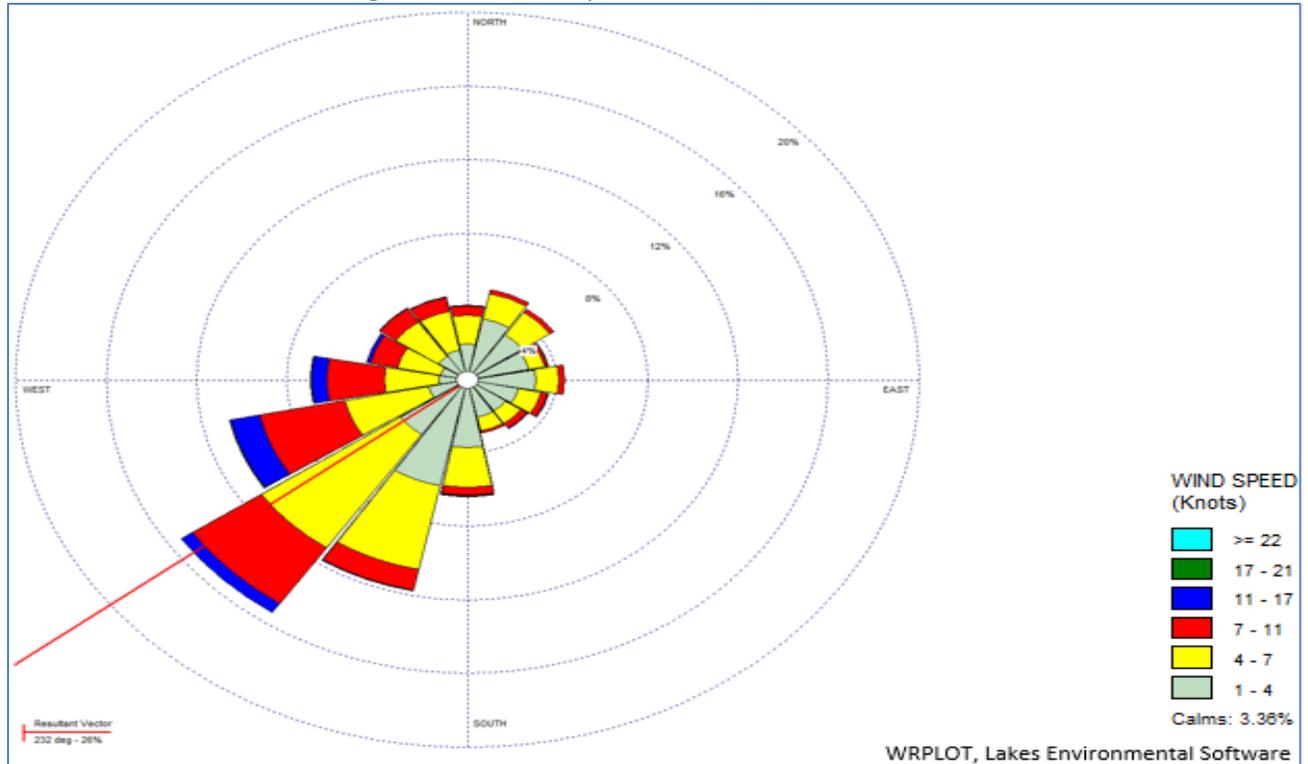
While EPA's TSD analysis for the 2006 24-hour and 2012 PM_{2.5} annual standards both evaluated the Allegheny County population as a full-county, the analysis for the 2006 standard indicated that "because of the unique nature of the Liberty-Clairton area, with its local source and topography issues, this factor does not weigh heavily in this technical analysis." The EPA TSD analysis for the 2012 PM_{2.5} annual standard did not include a similar statement, even though the factor of population was comparable and the local source and topography issues remained the same.

3. METEOROLOGY

3.1. Wind Rose Analysis

The EPA TSD analysis excluded local meteorological sites from the analysis, only looking at airport data. Figure 3.1 shows the Liberty wind rose for 2009-2013 which clearly demonstrates the preponderance of winds from the south through west, especially southwest, at the Liberty Borough site.

Figure 3.1. Liberty Wind Rose, 2009-2013



3.2. Temperature Inversions

The EPA TSD states on page 109 that for Allegheny County,

EPA evaluated available meteorological data to determine how meteorological conditions, including but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of directly emitted particulate matter and precursor emissions from sources in the area of analysis.

However, there is no evidence in EPA's assessment that stagnation conditions were directly evaluated. Inversion statistics for 2009-2013 are shown in Table 3.1.

Table 3.1. Total Days of Inversions: 2009-2013, Derived from PIT NWS Soundings*

Month	2009	2010	2011	2012	2013	2009-2013
JAN	7 (23)	5 (16)	5 (16)	9 (29)	8 (26)	34 (22)
FEB	8 (30)	8 (30)	10 (36)	10 (36)	6 (21)	42 (30)
MAR	12 (43)	17 (55)	7 (23)	11 (35)	6 (19)	53 (35)
APR	11 (37)	20 (67)	6 (20)	12 (40)	10 (33)	59 (39)
MAY	18 (64)	16 (52)	13 (43)	14 (45)	9 (29)	70 (46)
JUN	14 (61)	14 (47)	8 (28)	13 (43)	13 (43)	62 (44)
JUL	16 (52)	17 (55)	18 (60)	15 (48)	9 (29)	75 (49)
AUG	16 (52)	15 (48)	21 (68)	19 (61)	16 (53)	87 (56)
SEP	15 (50)	20 (67)	12 (40)	14 (47)	14 (47)	75 (50)
OCT	15 (48)	16 (52)	11 (35)	15 (48)	18 (60)	75 (49)
NOV	14 (47)	17 (57)	12 (40)	17 (57)	10 (33)	70 (47)
DEC	8 (26)	6 (19)	11 (35)	9 (29)	8 (27)	42 (27)
Annual	154 (44)	171 (47)	134 (37)	158 (43)	127 (35)	744 (41)

* For morning (12Z) surface inversions of at least 1.0 °C in strength (shallow isothermal and/or unstable conditions may also be present below or within ground inversion). Percent based on available days of data is given in parenthesis.

As indicated by this Pittsburgh National Weather Service (PIT NWS) data obtained from sounding balloons released at more than 1170 feet mean sea level (MSL), Allegheny County experiences frequent surface temperature inversions. Yet, in the numerous low-lying river valleys within the county, inversion frequency is likely greater than that observed at PIT NWS. So, couple the high frequency of surface inversions with light winds typical of overnight conditions, and atmospheric mixing is expected to be quite limited on about half or more of the mornings in the county. Additionally, since much of the county's large PM_{2.5} emitters are located in valleys, high concentrations are expected from local sources during times with substantial temperature inversions and light winds.

3.3. Back Trajectories

As stated on page 5 of the EPA TSD analysis,

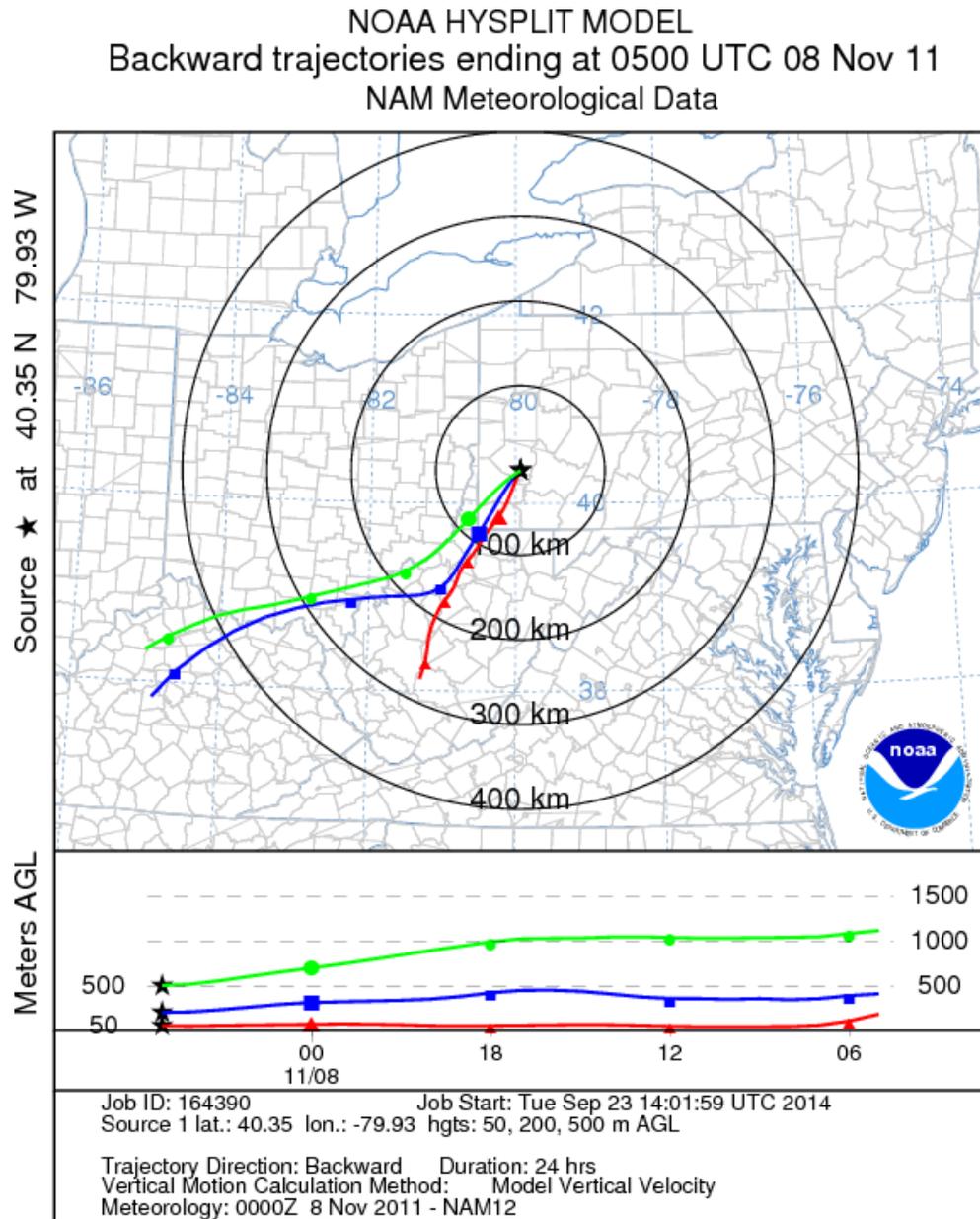
Evaluating meteorological data helps to determine the effect on the fate and transport of emissions contributing to PM_{2.5} concentrations and to identify areas potentially contributing to the violations at monitoring sites. The factor 3 analysis includes assessing potential source-receptor relationships in the area identified for evaluation using summaries of air trajectories, wind speed, wind direction and other meteorological data as available.

In addition, a description of factor 3 on EPA's website regarding "Area Designations for the 2012 Annual Fine Particle (PM_{2.5}) Standard -- Designations Guidance and Data," states: "A more sophisticated assessment involves modeling air parcel trajectories."⁹

⁹ <http://www.epa.gov/pmdesignations/2012standards/techinfo.htm#F3>

Figures 3.2a – 3.2j provide a HYSPLIT model back-trajectory analysis with the top ten $PM_{2.5}$ concentration days for 2011-2013 at Liberty Borough. The trajectory end point is at Allegheny County Airport. Surface temperature inversion conditions as observed by the 12Z and 00Z Pittsburgh National Weather Service soundings for the max days are included. During each of the days, substantial inversions existed (indicative of poor dispersion conditions) in the morning (12Z) while most of the ten days also recorded small evening (00Z) inversions. Note that the ending time, 0500 UTC, is midnight for the indicated day.

**Figure 3.2a. 24-hr $PM_{2.5} = 59.0 \mu\text{g}/\text{m}^3$
(11/07/11 12Z Sfc. Inv. = 8.2°C , 251 m; 11/08/11 00Z Sfc. Inv. = 0.8°C , 77 m)**



**Figure 3.2b. 24-hr $PM_{2.5} = 57.0 \mu\text{g}/\text{m}^3$
 (12/13/11 12Z Sfc. Inv. = 5.9°C , 162 m; 12/14/11 00Z Sfc. Inv. = None)**

NOAA HYSPLIT MODEL
 Backward trajectories ending at 0500 UTC 14 Dec 11
 NAM Meteorological Data

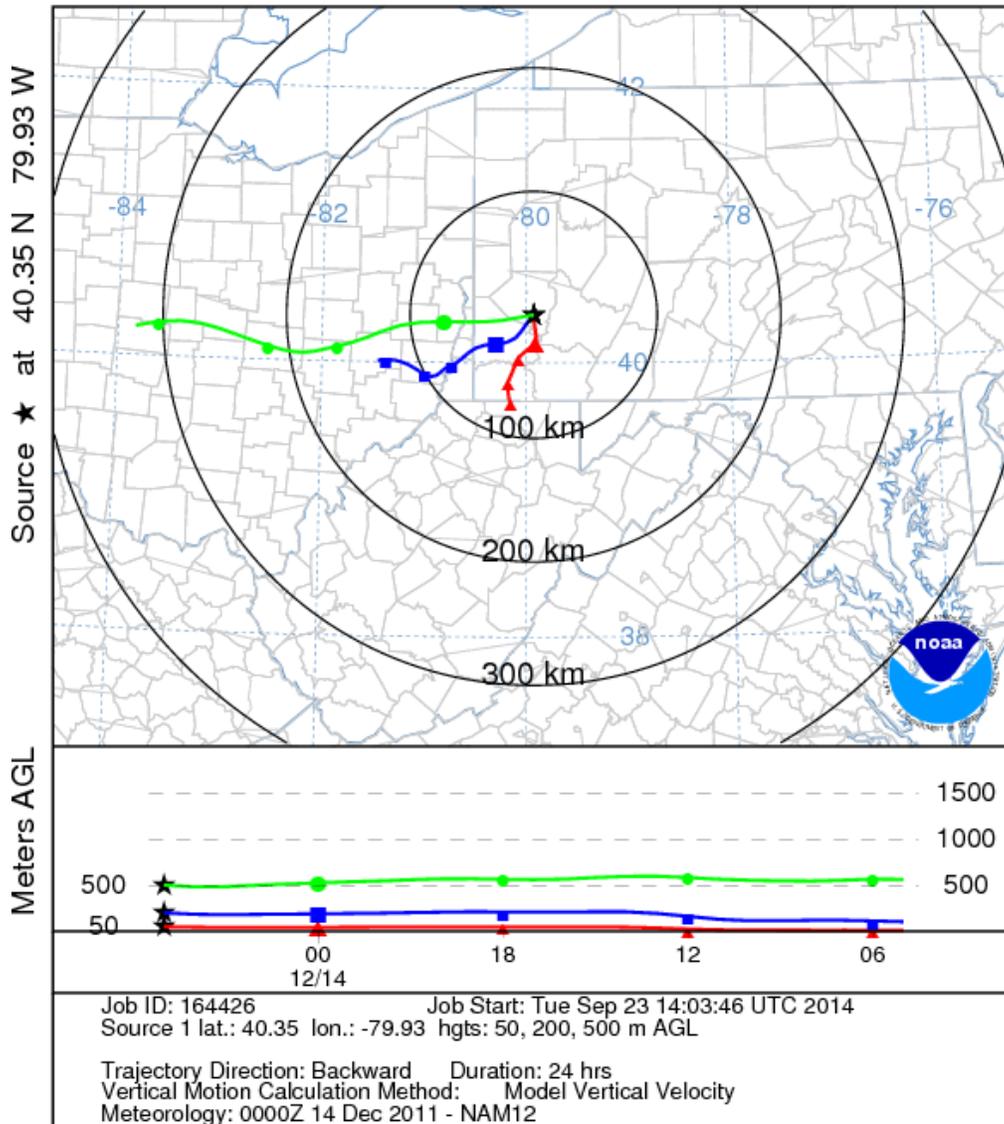


Figure 3.2c. 24-hr $PM_{2.5} = 54.7 \mu\text{g}/\text{m}^3$
 (11/22/12 12Z Sfc. Inv. = 10.9°C , 194 m; 11/23/12 00Z Sfc. Inv. = 1.0°C , 68 m)

NOAA HYSPLIT MODEL
 Backward trajectories ending at 0500 UTC 23 Nov 12
 NAM Meteorological Data

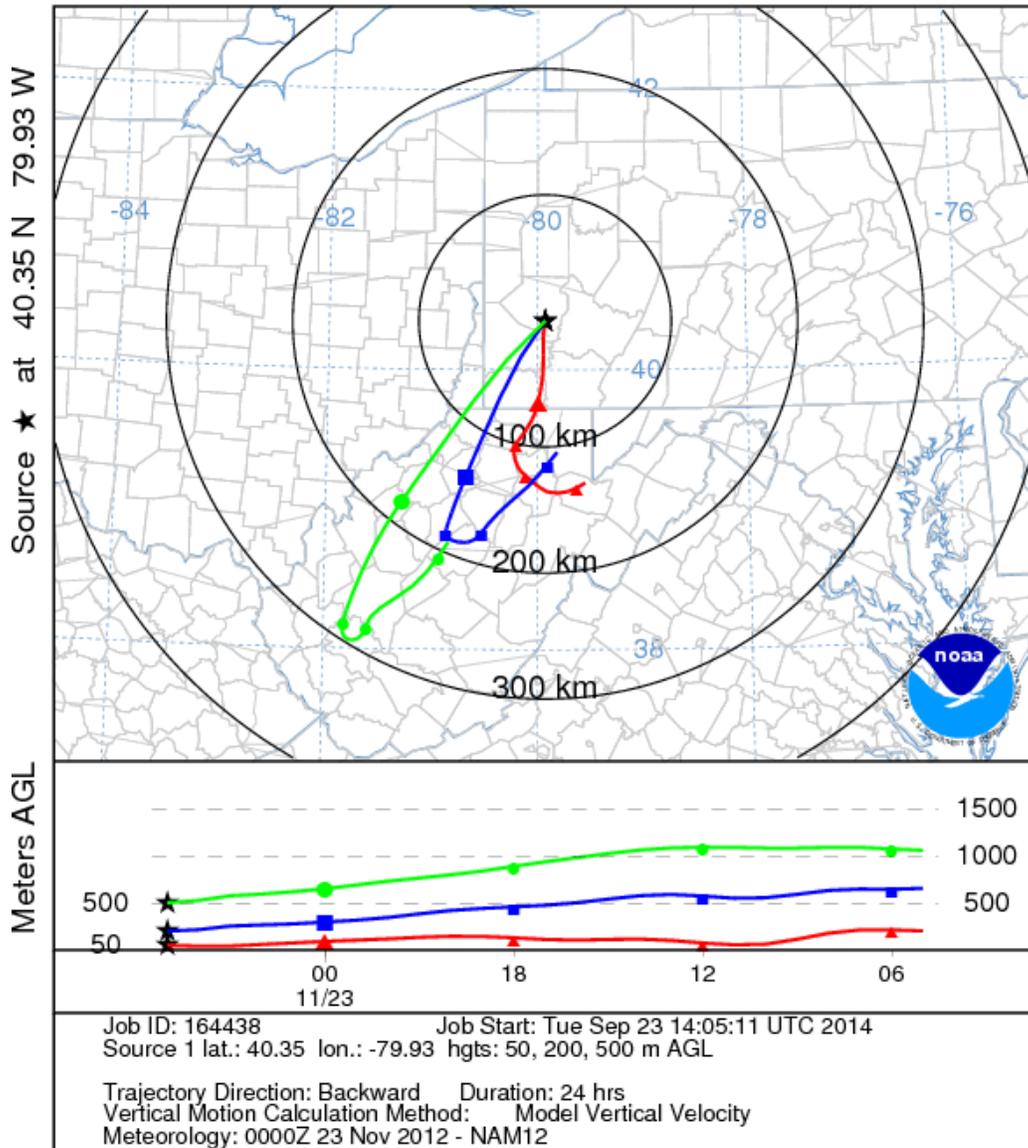


Figure 3.2d. 24-hr PM_{2.5} = 54.3 µg/m³
(03/11/12 12Z Sfc. Inv. = 7.6°C, 530 m; 03/12/12 00Z Sfc. Inv. = None)

NOAA HYSPLIT MODEL
 Backward trajectories ending at 0500 UTC 12 Mar 12
 NAM Meteorological Data

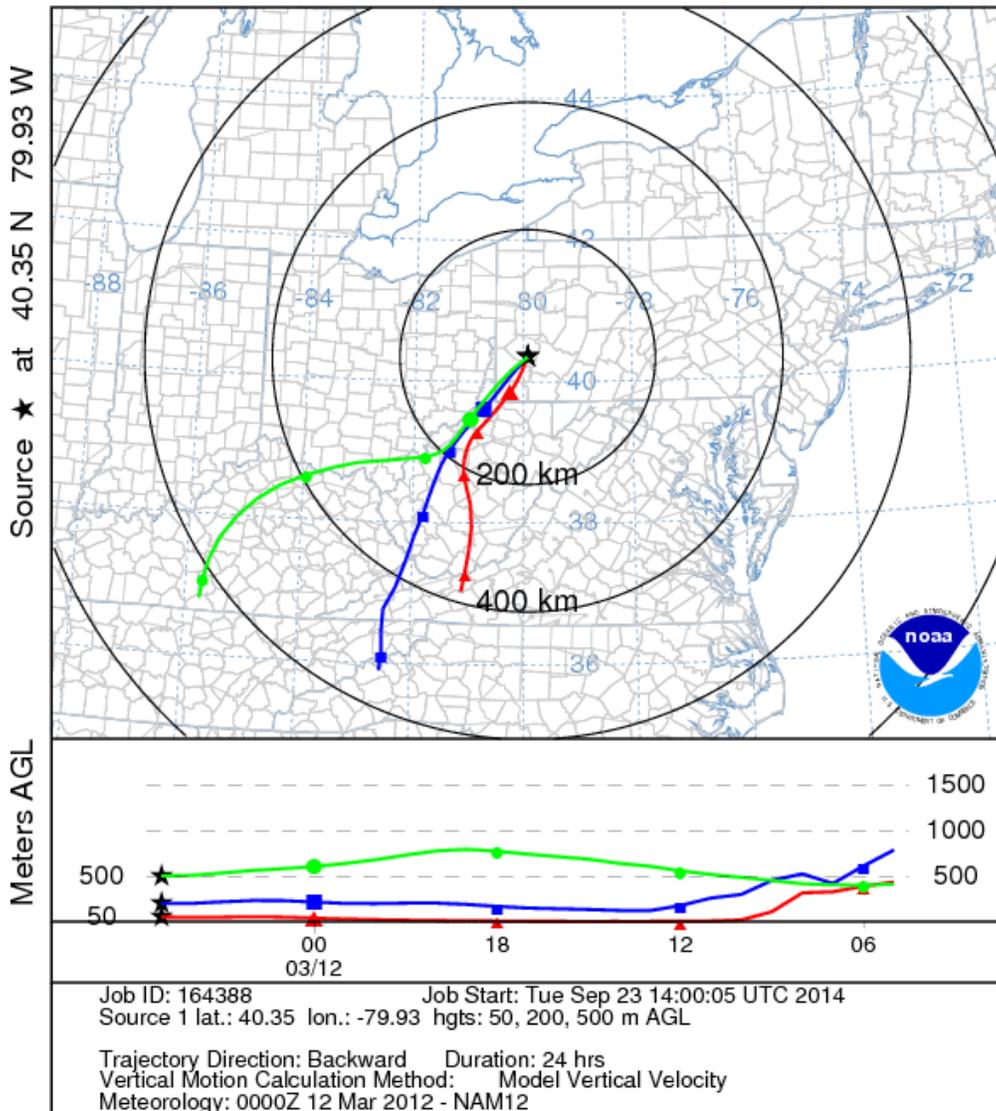


Figure 3.2e. 24-hr $PM_{2.5} = 48.9 \mu\text{g}/\text{m}^3$
 (12/14/12 12Z Sfc. Inv. = 6.1°C , 388 m; 12/15/12 00Z Sfc. Inv. = 1.8°C , 82 m)

NOAA HYSPLIT MODEL
 Backward trajectories ending at 0500 UTC 15 Dec 12
 NAM Meteorological Data

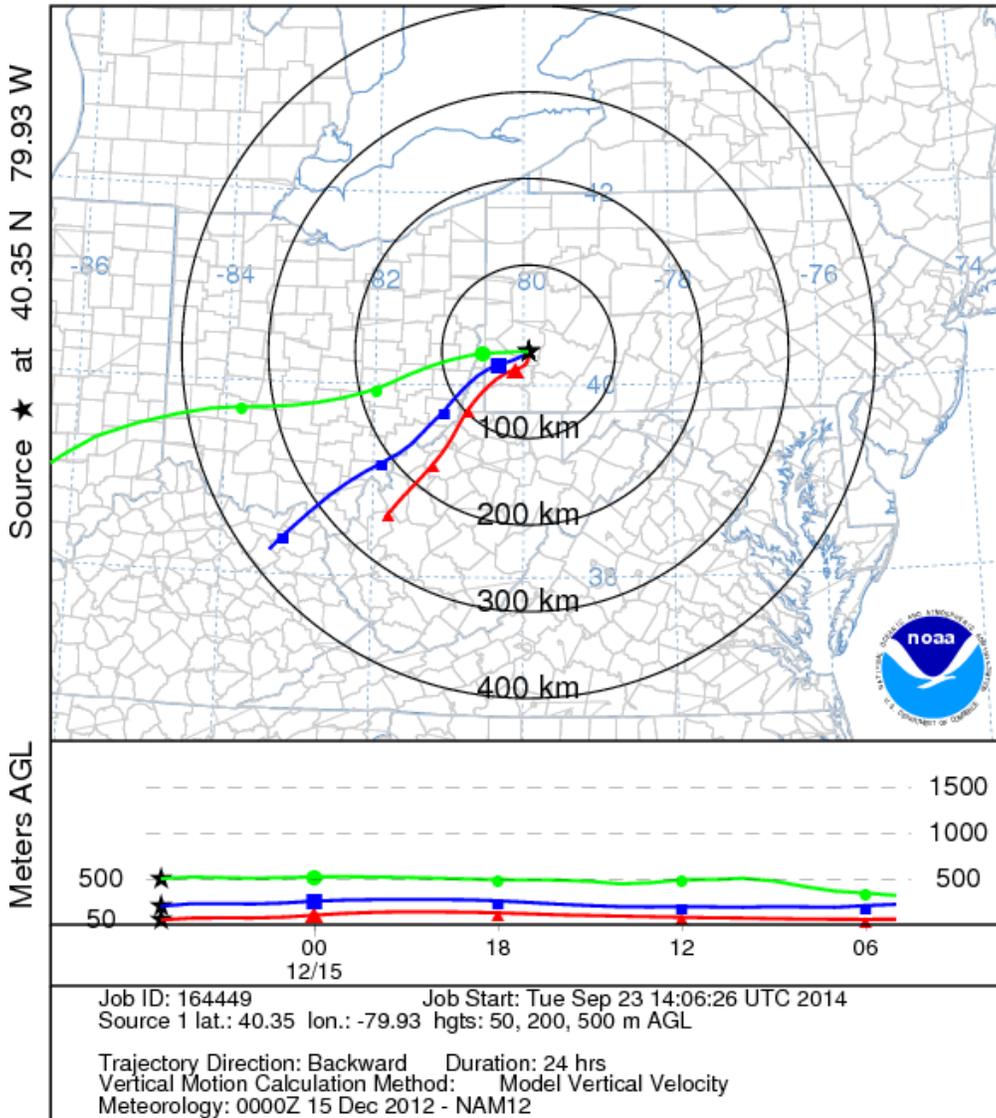


Figure 3.2f. 24-hr PM_{2.5} = 48.6 µg/m³
(03/15/12 12Z Sfc. Inv. = 5.4°C, 222 m; 03/16/12 00Z Sfc. Inv. = None)

NOAA HYSPLIT MODEL
 Backward trajectories ending at 0500 UTC 16 Mar 12
 NAM Meteorological Data

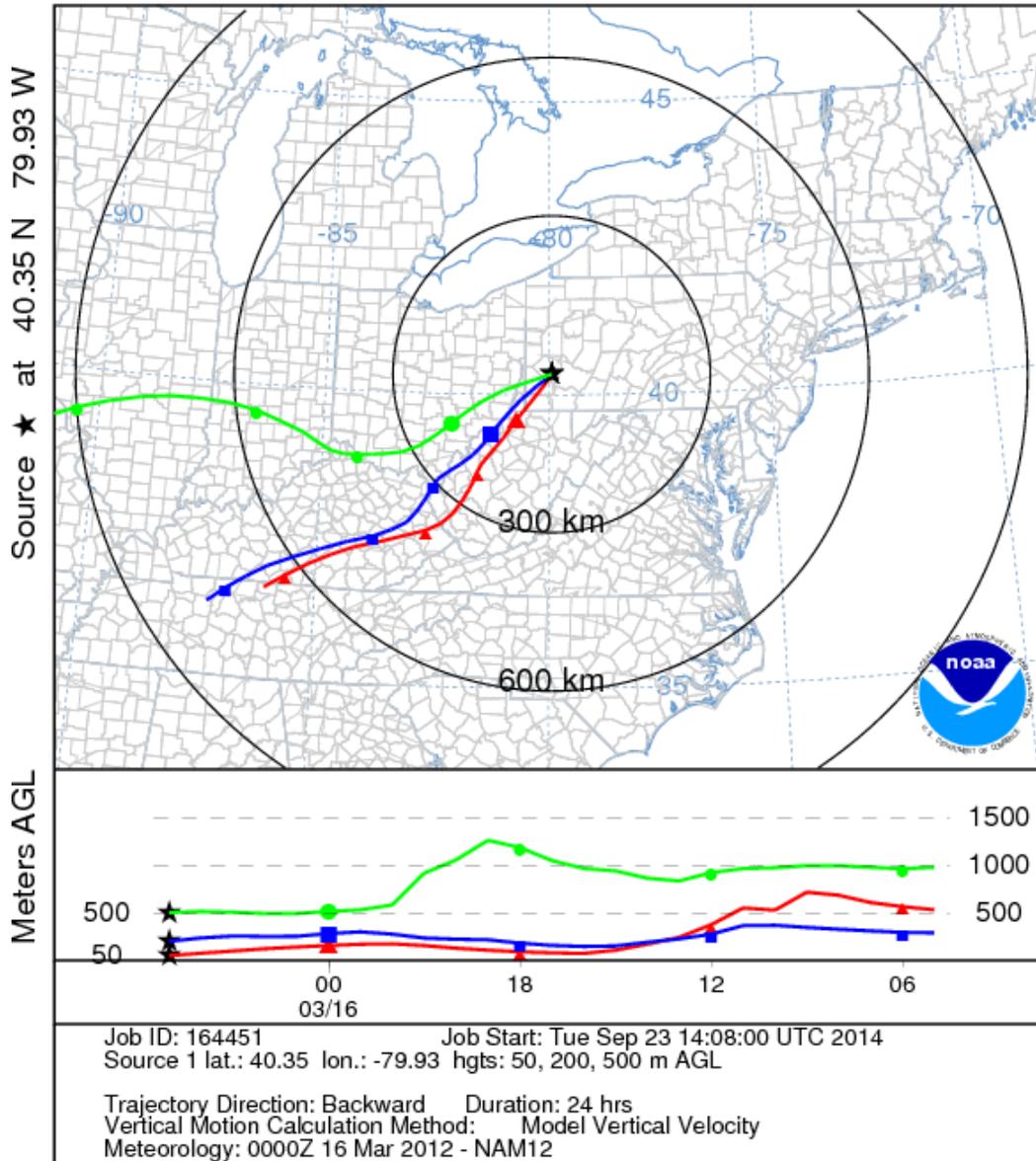


Figure 3.2g. 24-hr $PM_{2.5} = 48.1 \mu\text{g}/\text{m}^3$
 (11/26/11 12Z Sfc. Inv. = 1.4°C , 195 m; 11/27/11 00Z Sfc. Inv. = 0.4°C , 189 m)

NOAA HYSPLIT MODEL
 Backward trajectories ending at 0500 UTC 27 Nov 11
 NAM Meteorological Data

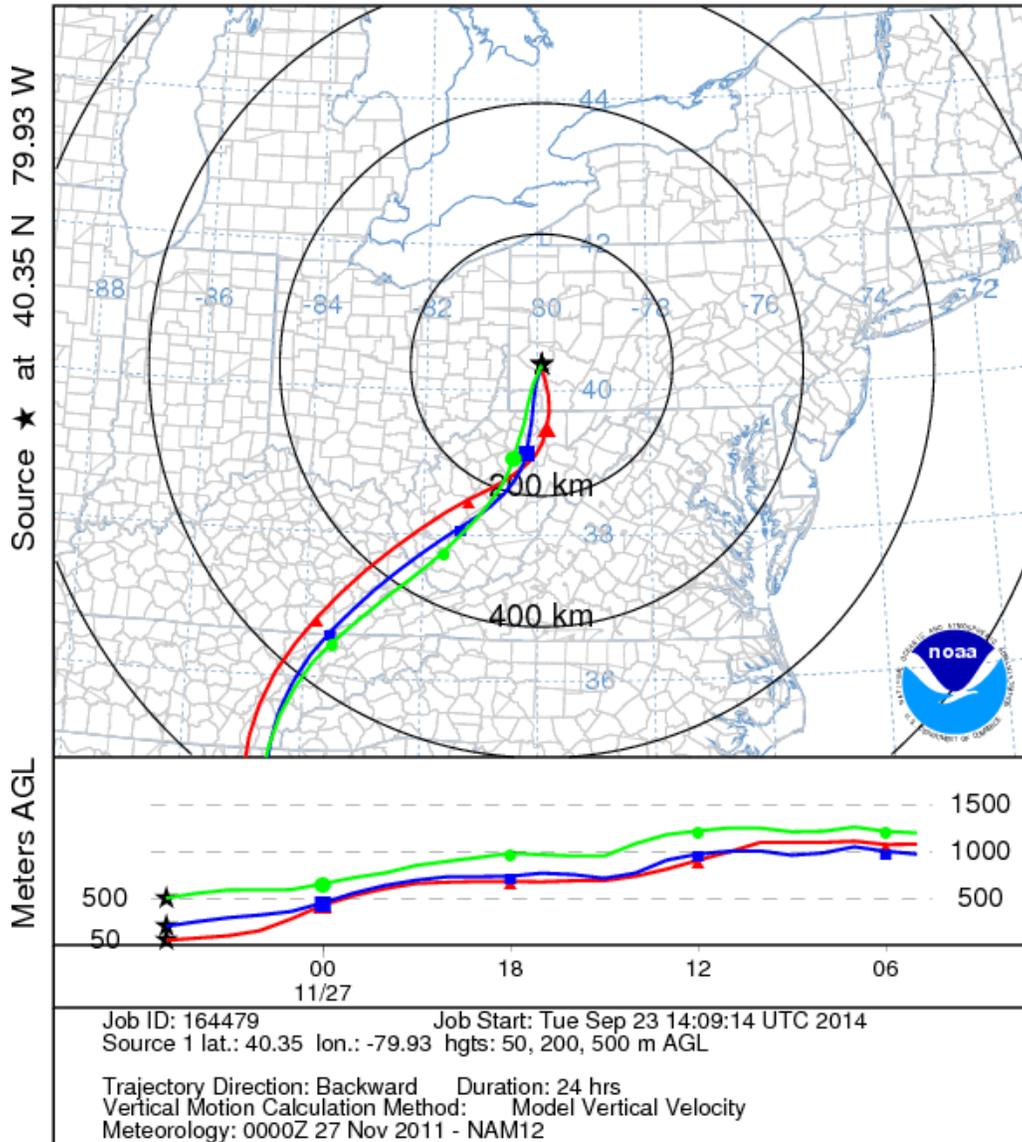
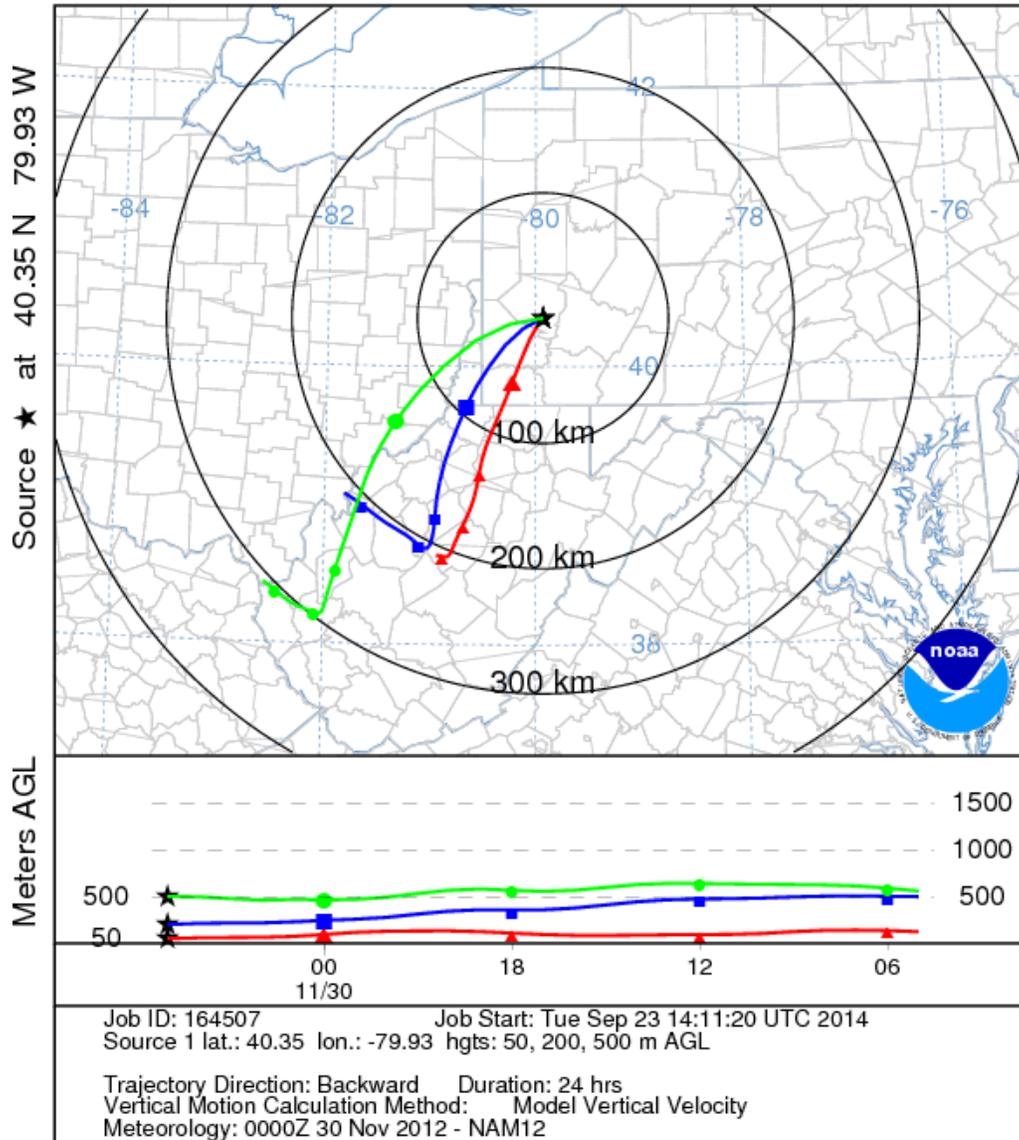


Figure 3.2h. 24-hr $PM_{2.5} = 47.1 \mu\text{g}/\text{m}^3$
 (11/29/12 12Z Sfc. Inv. = 2.3°C , 121 m; 11/30/12 00Z Sfc. Inv. = 0.2°C , 116 m)

NOAA HYSPLIT MODEL
 Backward trajectories ending at 0500 UTC 30 Nov 12
 NAM Meteorological Data



**Figure 3.2i. 24-hr $PM_{2.5} = 46.7 \mu\text{g}/\text{m}^3$
 (12/12/11 12Z Sfc. Inv. = 8.5°C , 195 m; 12/13/11 00Z Sfc. Inv. = 0.6°C , 64 m)**

NOAA HYSPLIT MODEL
 Backward trajectories ending at 0500 UTC 13 Dec 11
 NAM Meteorological Data

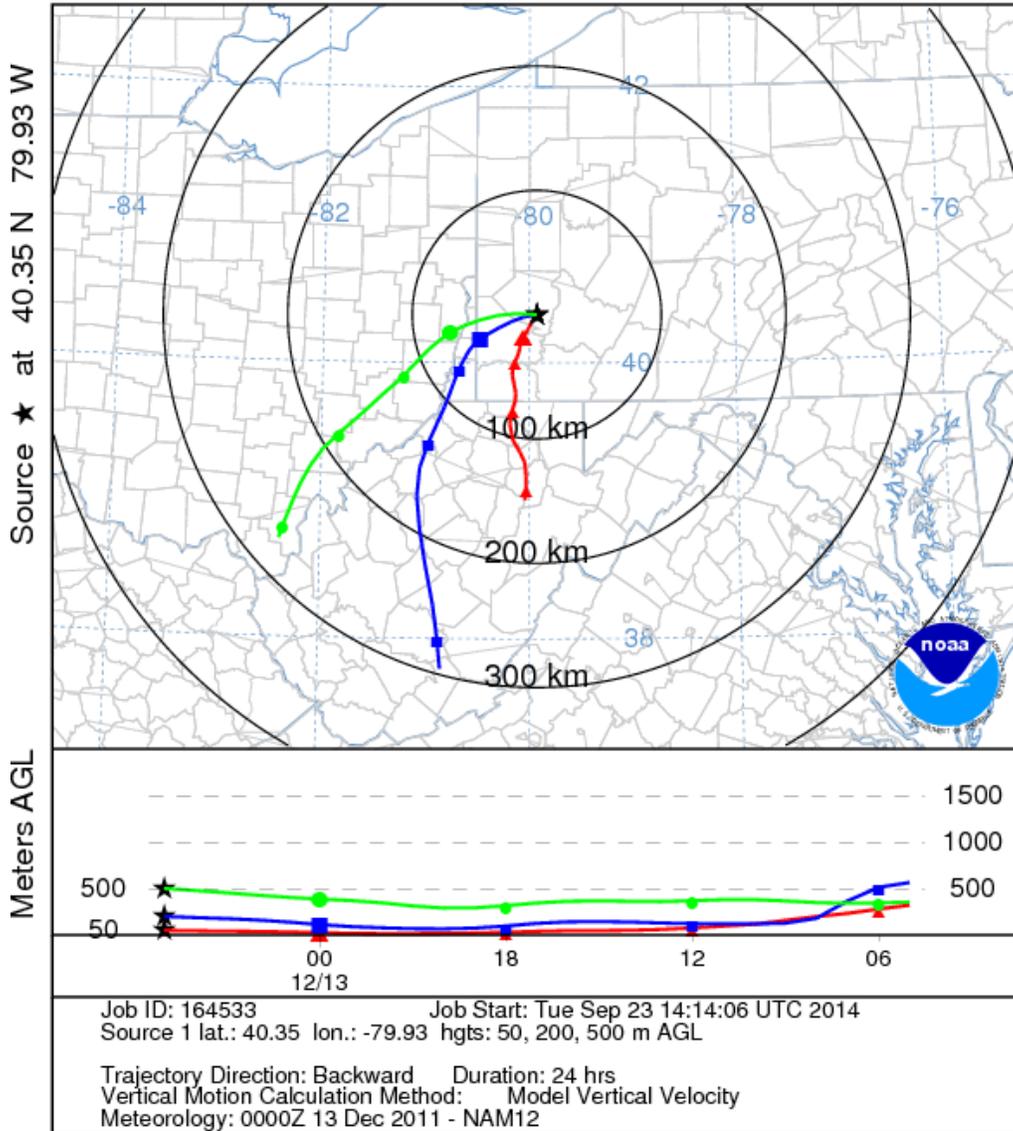
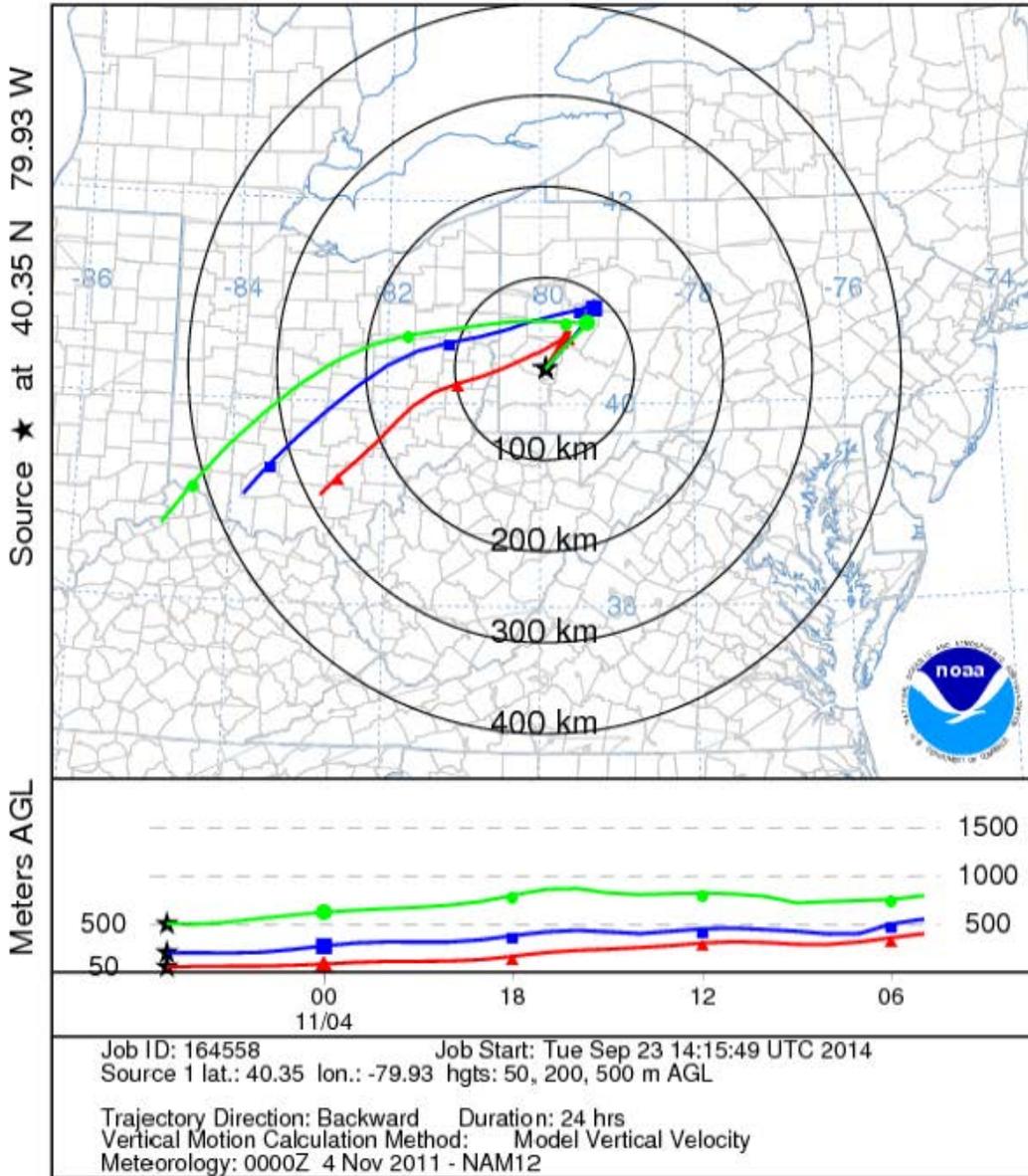


Figure 3.2j. 24-hr $PM_{2.5} = 44.8 \mu\text{g}/\text{m}^3$
 (11/03/11 12Z Sfc. Inv. = 3.8°C , 411 m; 11/04/11 00Z Sfc. Inv. = 0.4°C , 157 m)

NOAA HYSPLIT MODEL
 Backward trajectories ending at 0500 UTC 04 Nov 11
 NAM Meteorological Data



Furthermore, ENVIRON International, the PM_{2.5} modeling contractor for ACHD, performed extensive sophisticated air modeling for the June 2013 SIP revision that supports the claim that only locales in and around the Liberty Borough monitoring site should be included in the nonattainment area (see modeling analysis provided with June 2013 SIP).

3.4. Additional Information on Meteorology in Allegheny County

Meteorology is complex throughout all of Allegheny County. Wind roses can show very different results at sites only a few kilometers from one another and temperature inversions play a key role to elevated PM_{2.5} levels at Liberty. The strongest wind rose signals measured near the Liberty monitor indicate that the winds are primarily from the southwest. DEP's analysis included in the designation recommendations showed that on the high days of PM_{2.5}, that the wind signal comes from the southwest, with a lack of northwesterly winds from the city of Pittsburgh. The EPA TSD analysis included HYSPLIT data that is also weighted heavily in the southwesterly direction.

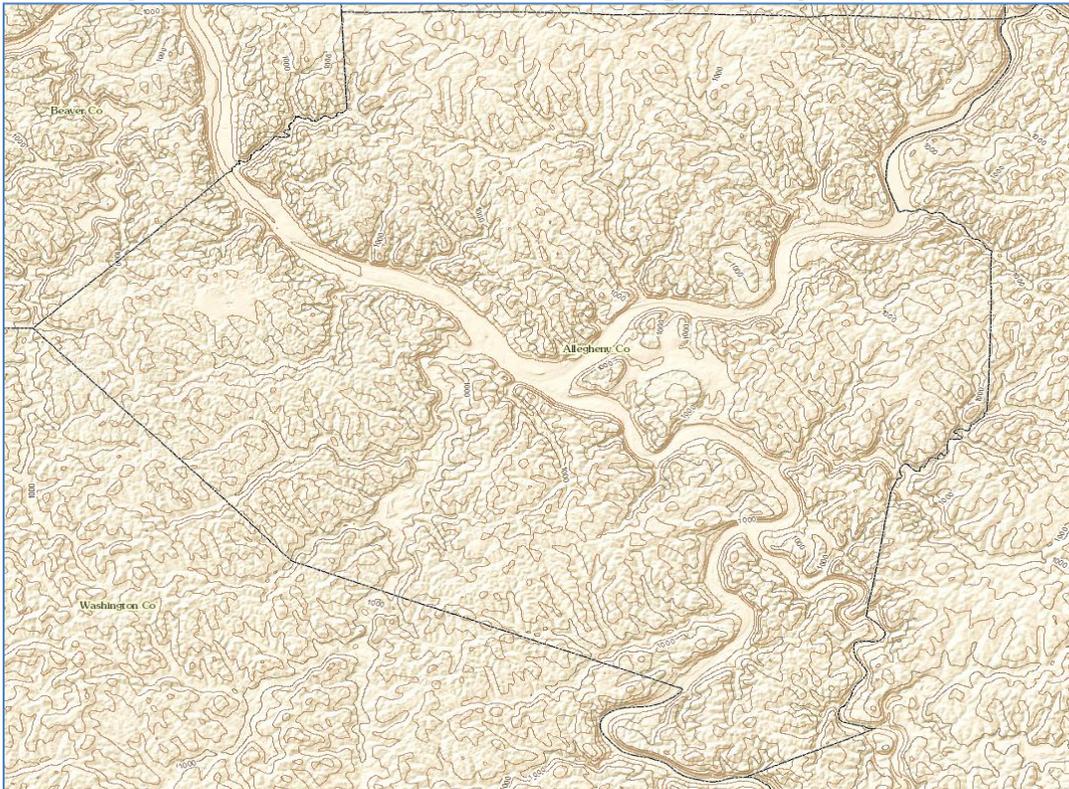
The EPA TSD analysis for Allegheny County appears to give contradictory information relating to emissions transport and meteorology. On the bottom of page 110, EPA talks about how terrain limits the transport of emissions, while earlier on the same page EPA claims that "northwesterly component [of the wind as indicated by the AGC sensor] indicates that the highly urbanized Pittsburgh area" contributes to PM_{2.5} concentrations at the Liberty monitor. The EPA TSD analysis used complex terrain to exclude sources with stack emissions in Washington County, yet did not use complex terrain to exclude ground-level emissions from Pittsburgh (which is further away from the Liberty monitor) in an attempt to link urban emissions to the Liberty monitor. In addition, figures 2d through 2g, 3c and 3d argue against large contributions from the direction of Pittsburgh. On page 112, EPA observes that "wind direction on the high PM_{2.5} days at the Liberty monitor is almost completely from the southwest."

4. GEOGRAPHY/TOPOGRAPHY

4.1. Topography

Figure 4.1 shows a shaded relief map from the U.S. Geological Survey (USGS) with elevation contours for Allegheny County.

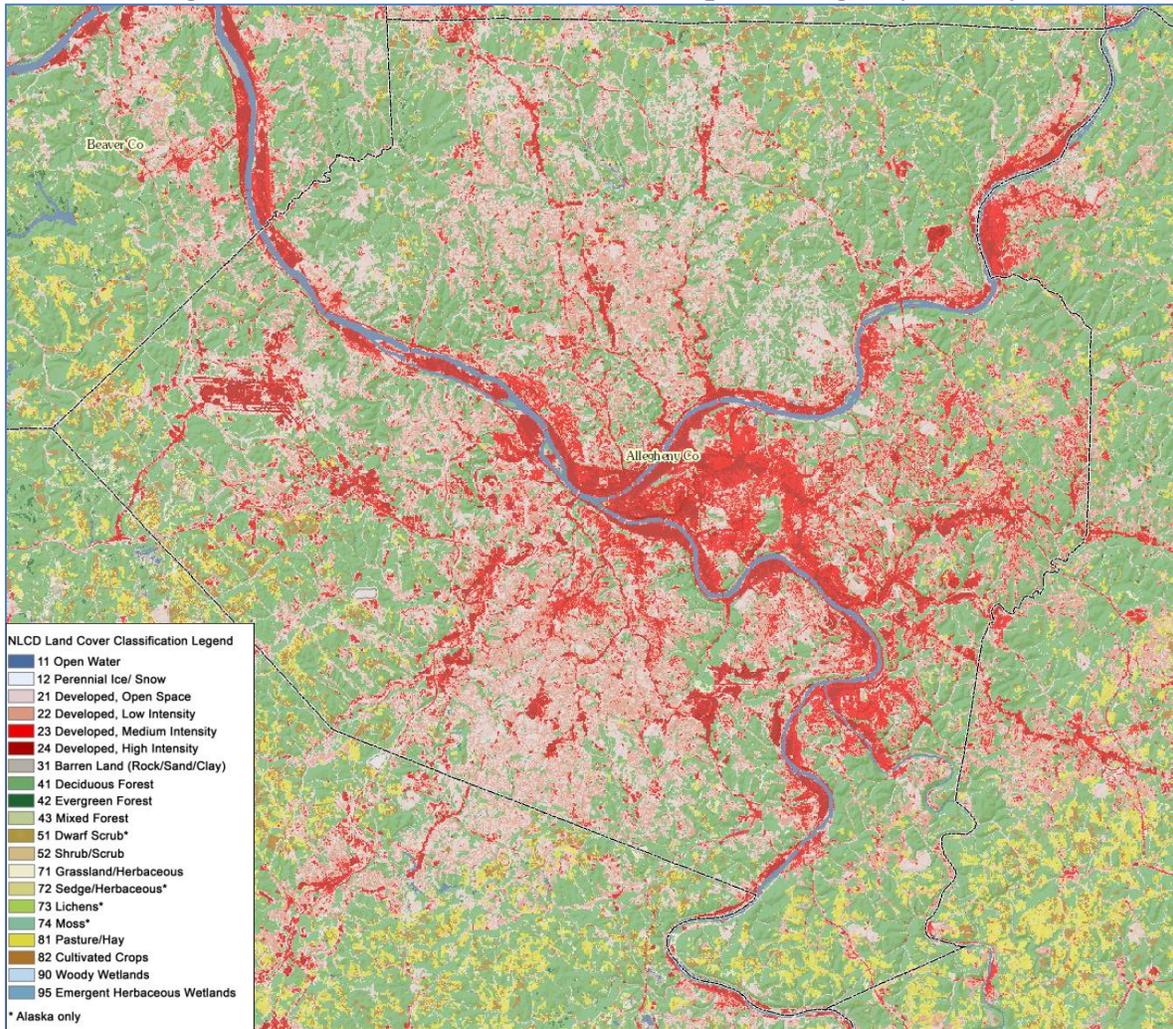
Figure 4.1. USGS Relief and Contour Map for Allegheny County



Topographical analysis reveals complex terrain throughout Allegheny County, which can act as natural barriers for low-level $PM_{2.5}$ emissions. Direct $PM_{2.5}$ from low level sources in river valleys have been the cause of localized exceedances at the Liberty monitor, as the terrain forms a “bowl” that traps pollutants during poor dispersion conditions. Taller stacks from sources, such as power plants, contribute to Allegheny County on a regional scale for secondary $PM_{2.5}$. Emissions from area sources and mobile source emissions affect the county only in large volumes (i.e., closest to the City of Pittsburgh).

Figure 4.2 shows the National Land Cover Database’s (NLCD) land cover classifications map for Allegheny County in 2011.

Figure 4.2. NLCD 2011 Land Cover Map for Allegheny County



Land use analysis shows that the most concentrated areas of developed high-intensity classification are nearest the City of Pittsburgh. Classifications of medium to high intensity in river valleys are mostly representative of industrial areas.

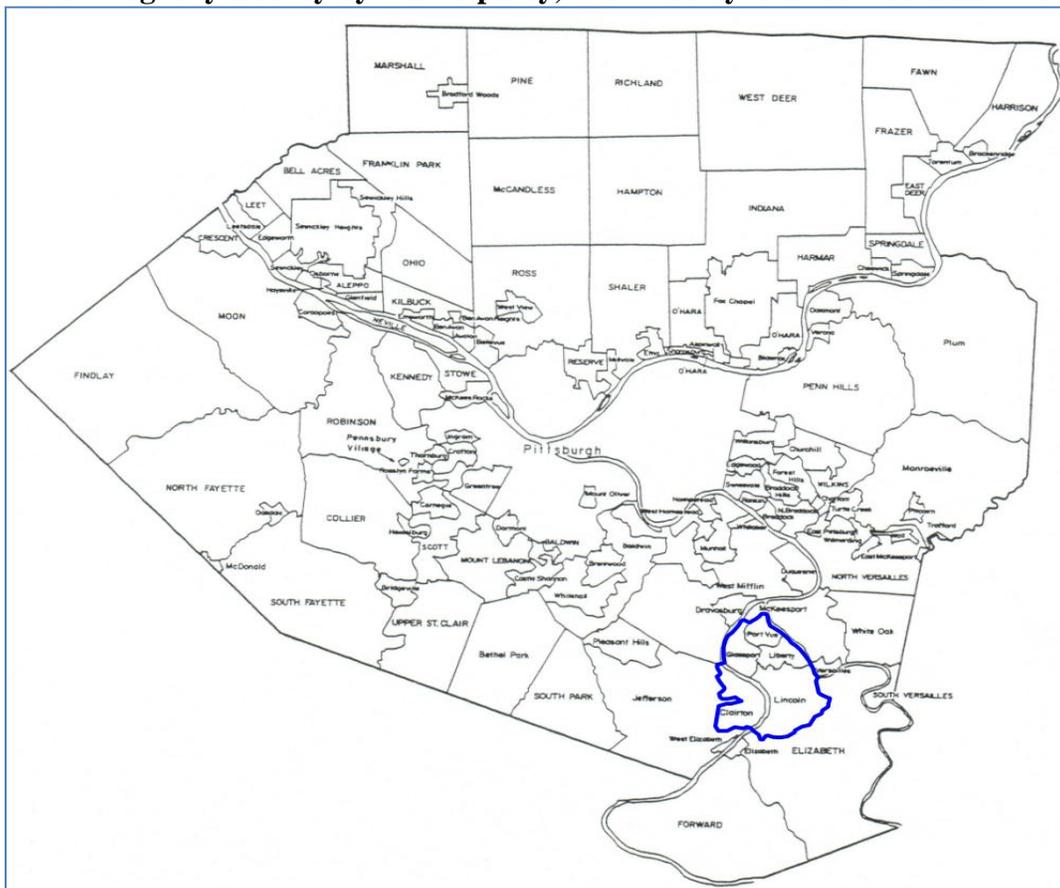
5. JURISDICTIONAL BOUNDARIES

While DEP is responsible for overseeing air quality throughout the Commonwealth, ACHD is authorized by DEP to administer and enforce the local air quality management program in Allegheny County.

In EPA's TSD analysis on page 118, it was indicated that based on a review of jurisdictional boundaries, "the same locally focused planning will bring the area into attainment for the 2012 annual PM_{2.5} NAAQS." DEP agrees. Maintaining the 1997 annual and 2006 24-hour PM_{2.5} NAAQS boundaries will allow for the continuity of planning. This preservation of the continuity of planning allows for DEP and ACHD to continue their strong working relationship in the partial county, Liberty-Clairton area to achieve and maintain the 1997, 2006 and 2012 PM_{2.5} NAAQS. A partial county designation for the Liberty-Clairton should be applicable and appropriate for the consistent implementation of the standards.

The DEP proposes the same partial county designation within Allegheny County, the Liberty-Clairton nonattainment area, as seen in Figure 5.1. This five-municipal area was previously designated as nonattainment for PM₁₀ and PM_{2.5}, as explained in the background section.

Figure 5-1. Allegheny County by Municipality, with Liberty-Clairton Nonattainment Area



CONCLUSION

After considering the facts as described above, DEP, in coordination with ACHD, is recommending the reduction of EPA's proposed Allegheny County nonattainment area to a partial county Liberty-Clairton Area, consisting of the City of Clairton, Borough of Glassport, Liberty Borough, Borough of Lincoln and Port Vue Borough. This approach is consistent with existing nonattainment boundaries for the 1997 and 2006 PM_{2.5} NAAQS. The analysis supports the conclusion that the size of the 2012 annual PM_{2.5} nonattainment area should be reduced from EPA's proposed designation of Allegheny County, to a partial county designation for the Liberty-Clairton Area. The remainder of Allegheny County should be designated as attainment for the 2012 PM_{2.5} NAAQS.



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

Enclosure 2

The Commonwealth of Pennsylvania's Response to the U.S. Environmental Protection Agency's Proposed Designations for the 2012 Annual PM_{2.5} National Ambient Air Quality Standard

Letter of Support for Partial County Liberty-Clairton PM_{2.5} Nonattainment Area from the Allegheny Conference on Community Development

**Bureau of Air Quality
Department of Environmental Protection**

[This page intentionally left blank.]



Greater Pittsburgh Chamber of Commerce | Pennsylvania Economy League of Greater Pittsburgh | Pittsburgh Regional Alliance

11 Stanwix Street, 17th Floor
PITTSBURGH, PA 15222-1312

T: 412.281.4783

F: 412.281.1896

AlleghenyConference.org

October 15, 2014

Acting Secretary Dana Aunkst
Rachel Carson State Office Building
400 Market St.
Harrisburg, PA 17101

Dear Acting Secretary Aunkst:

The Allegheny Conference on Community Development has a history of supporting the strong enforcement of environmental regulations. The Conference was founded 70 years ago to improve environmental conditions impacting the quality of life of our region's citizens. We continue striving to be a leader in environmental stewardship by monitoring and engaging on a variety of environmental conditions in the region, including air quality.

We are concerned with EPA's preliminary response to Pennsylvania's recommendation for area designations for the 2012 primary National Ambient Air Quality Standard for annual PM_{2.5}. EPA has inexplicably reversed its position recognizing the unique meteorology, topography and localized emissions in the Liberty monitoring area without reasonable justification. Simply put, EPA's proposal to designate all of Allegheny County as a non-attainment area is not supported by the evidence.

We continue to be encouraged by the historical downward trend of *all* monitors in the region and the progress this region has made to meet air quality standards.

Air quality attainment designations are an important factor when companies consider expanding or relocating to this region. While it is critical we continue to improve the air quality in areas not meeting the standards, it is just as important we do not place unwarranted requirements on areas that do meet them.

On behalf of the Allegheny Conference, I strongly urge the non-attainment area be kept at its current size and not unnecessarily expanded.

Sincerely,

A handwritten signature in black ink, appearing to read "Ken Zapinski", is written over a horizontal line.

Ken Zapinski
Senior Vice President, Energy and Infrastructure

cc: Joyce E. Epps, Director, Bureau of Air Quality

pittsburgh
imagine what you can do here®



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

Enclosure 3

The Commonwealth of Pennsylvania's Response to the U.S. Environmental Protection Agency's Proposed Designation of an Allentown Nonattainment Area for the 2012 Annual PM_{2.5} National Ambient Air Quality Standard

**Bureau of Air Quality
Department of Environmental Protection**

[This page intentionally left blank.]

The U.S. Environmental Protection Agency (EPA) promulgated the annual fine particulate matter (PM_{2.5}) National Ambient Air Quality Standard (NAAQS) on December 14, 2012; the standard was lowered to 12.0 micrograms per cubic meter (78 FR 3086; January 15, 2013). The Commonwealth of Pennsylvania submitted its recommendations to EPA, in accordance with Section 107 of the Clean Air Act, 42 U.S.C.A. § 7407, on December 10, 2013, and updated the recommendation on July 30, 2014, based on 2011-2013 ambient air monitoring data.

In its August 19, 2014, letter to Governor Corbett, EPA proposed to expand the PA Department of Environmental Protection's (DEP) recommended Northampton County nonattainment area to include Lehigh County and Northampton County in an Allentown nonattainment area for the 2012 annual PM_{2.5} National Ambient Air Quality Standard (NAAQS). Pennsylvania had recommended to EPA a smaller nonattainment area limited solely to Northampton County.

DEP has conducted a comprehensive evaluation of EPA's proposed modifications to Pennsylvania's designation recommendations. Based on a further review and analysis of available data, Pennsylvania disagrees with EPA's enlargement of the recommended nonattainment area for Northampton County. The final nonattainment area for the 2012 annual PM_{2.5} NAAQS should not include Lehigh County in its nonattainment area, but rather should remain the one-county area, of Northampton County that DEP initially recommended. The information contained in this enclosure supplements the information DEP submitted to EPA on December 10, 2013, and July 30, 2014.

DEP has developed the following information to support the extreme local nature of this fine particulate problem in a limited nonattainment area of Northampton County, as initially recommended. DEP recommends that EPA designate the Northampton County area as a separate nonattainment area, and designate Lehigh County as an unclassifiable/attainment area.

BACKGROUND AND OVERVIEW

On July 18, 1997, EPA published annual and 24-hour primary and secondary standards for fine particulate matter (PM_{2.5}). In February 2004, DEP submitted a letter to EPA with area recommendations for the 1997 annual PM_{2.5} NAAQS, which included the recommendation that the Allentown-Bethlehem-Easton area (Northampton and Lehigh Counties) be designated as attainment, as both counties were monitoring attainment of the standard. On January 5, 2005, EPA published a final rule that included the designation of Lehigh and Northampton Counties as "unclassifiable/attainment" for the 1997 standard.¹

On October 17, 2006, EPA lowered the 24-hour PM_{2.5} standard from 65 µg/m³ to 35 µg/m³. On December 28, 2007, DEP submitted designation recommendations to EPA for the 2006 24-hour PM_{2.5} NAAQS. These recommendations included an Allentown-Bethlehem-Easton nonattainment area, which comprised of Lehigh and Northampton Counties. As DEP's designation recommendations pointed out in the submittal on pages 11-12:

¹ 70 FR 944; January 5, 2005. Effective April 5, 2005.

No area in this metropolitan area violates the 2012 annual PM_{2.5} standard. However, for the 24-hour standard, the Freemansburg monitor in Northampton County is violating the standard. The Allentown monitor in Lehigh County was discontinued at the end of 2005. Twenty-four hour PM_{2.5} design values in 2005, the last year both monitors were operating, for Allentown and Freemansburg were 36.4 µg/m³ and 36.1 µg/m³ respectively.

On November 13, 2009, EPA published a final rule designating the Allentown Area, made up of Lehigh and Northampton Counties, as a nonattainment area for the 2006 24-hour PM_{2.5} NAAQS.²

On December 13, 2012, EPA strengthened the primary annual PM_{2.5} NAAQS to 12.0 µg/m³. On December 10, 2013, DEP recommended that the Northampton County area be designated as nonattainment for the 2012 annual PM_{2.5} NAAQS, based primarily on 2010-2012 air quality data. The Freemansburg monitor exceeded the standard at 13.2 µg/m³, while the other monitor in the county, the Lehigh Valley monitor, attained the standard with a design value of 10.6 µg/m³. The DEP recommended that Lehigh County be considered unclassifiable/attainment since the county does not have any monitors and was not determined to be contributing to the localized problem seen at the Freemansburg monitor in Northampton County.

On July 30, 2014, DEP provided EPA with updated area recommendations for the 2012 PM_{2.5} NAAQS following the review of 2011-2013 air quality data. These updated recommendations did not change the recommended Northampton County nonattainment area. The 2013 design values for monitors in Northampton County were 12.2 µg/m³ at the Freemansburg monitor and 10.6 µg/m³ at the Lehigh Valley monitor.

On August 19, 2014, EPA sent Governor Corbett a 120-day letter and technical support document indicating the intent to modify Pennsylvania's recommended area boundaries for the Northampton County area. EPA noted its intention to designate Northampton County, as well as Lehigh County, as an Allentown nonattainment area for the 2012 annual PM_{2.5} NAAQS, expanding DEP's recommended smaller Northampton County nonattainment area.

² 74 FR 58,688; November 13, 2009. Effective December 14, 2009.

1. AIR QUALITY DATA

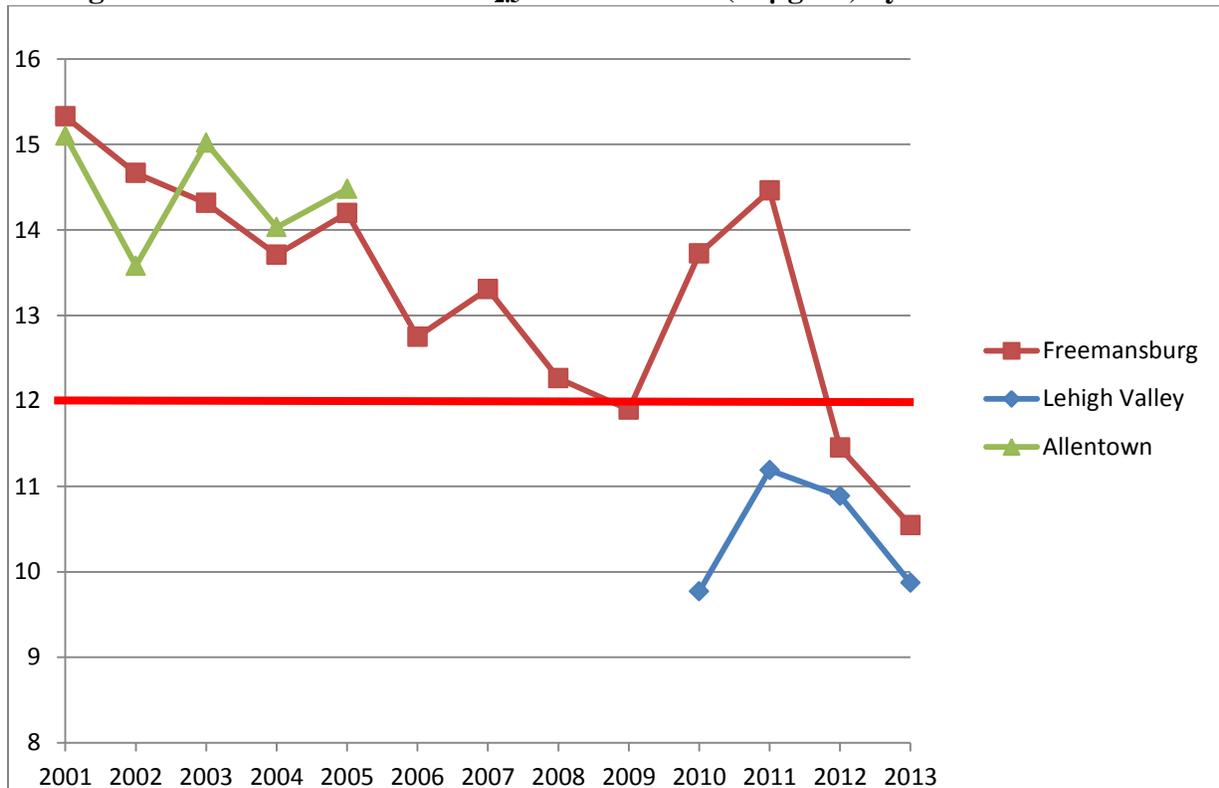
EPA's technical support document (TSD) analysis for the 2012 annual PM_{2.5} NAAQS noted that while Lehigh County does not have a monitor, the county contributes to the nearby violation at the Freemansburg monitor. While Lehigh County does not currently have a monitoring station, a monitor used to be located in Allentown until it ceased operation on December 31, 2005. The Allentown monitor was removed, because at the time it was considered to be a duplicative sampler. In 2010, the Lehigh Valley monitor was added to the Allentown-Bethlehem-Easton Metropolitan Statistical Area (MSA), in Northampton County, due to the requirement in 40 CFR Part 58, Appendix, Table D-5, requiring that this area have two PM_{2.5} monitors.

Table 1.1 and Figure 1.1 show the trend for the annual mean values monitored in the Allentown area.

Table 1.1. Allentown Area PM_{2.5} Annual Mean (in µg/m³) by Station – 2010-2013

<u>Station</u>	<u>AQS Code</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
Freemansburg	42-095-0025	13.73	14.46	11.45	10.55
Lehigh Valley	42-095-0027	9.77	11.19	10.89	9.87
	<i>Difference</i>	<i>3.96</i>	<i>3.27</i>	<i>0.56</i>	<i>0.68</i>

Figure 1.1. Allentown Area PM_{2.5} Annual Mean (in µg/m³) by Station - Since 2001



*The Allentown monitor ceased operation on 12/31/2005.

**The Lehigh Valley monitor commenced operation in 2010.

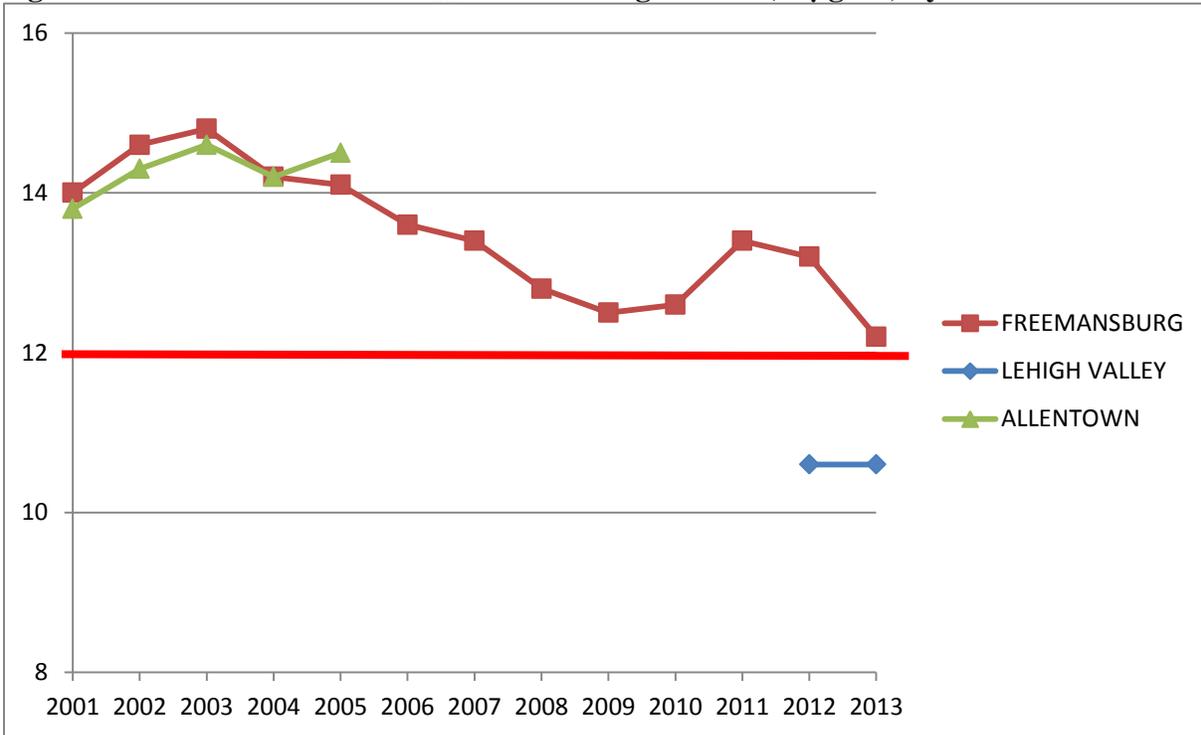
Figure 1.1 clearly illustrates a localized problem being observed at the Freemansburg monitor in 2010 and 2011, with the values seen at the Freemansburg monitor at least 3 $\mu\text{g}/\text{m}^3$ higher than the Lehigh Valley monitor. Information on the Allentown monitor was included in Figure 1.1 to illustrate how these monitors typically correlate well with one another. Other than 2010 and 2011, the Allentown monitor (in 2001-2005) and the Lehigh Valley monitor (in 2012 and 2013), compared to the Freemansburg monitor, never had a difference of more than 1.08 $\mu\text{g}/\text{m}^3$. The increase in the annual mean at the Freemansburg monitor in 2010 and 2011 is an anomaly specific to Freemansburg. If emissions from Lehigh County were causing this increase, the Lehigh Valley monitor also would have gone up significantly, which did not occur. This local issue is tied to construction activity on the land of the former Bethlehem Steel Corporation plant, just south of the Freemansburg monitor, as described in more detail in Section 4.

Table 1.2 and Figure 1.2 show that the trend for annual design values monitored in the Allentown area is downward, with the exception of an upward tick in Freemansburg for the 2011-2013 time period. The Allentown monitor is included in Figure 1.2 to show the strong correlation in monitors in the Allentown area of Lehigh and Northampton Counties. This correlation is not evident in the 2010-2013 time frame, which is due to local construction activities in the vicinity of the Freemansburg monitor. Again, it should be noted that the Allentown monitor ceased operation on December 31, 2005, and the Lehigh Valley monitor began operation in 2010. Since the design value is the average of 3 years of data, Lehigh Valley's design value was not calculated until 2012. Both 2012 and 2013 design values at the Lehigh Valley monitor were steady at 10.6 $\mu\text{g}/\text{m}^3$, while the Freemansburg monitor design values were 13.2 $\mu\text{g}/\text{m}^3$ and 12.2 $\mu\text{g}/\text{m}^3$ respectively.

Table 1.2. Allentown Area PM_{2.5} Annual Design Value (in $\mu\text{g}/\text{m}^3$) by Station – 2010-2013

Station	AQS Code	2010	2011	2012	2013
Freemansburg	42-095-0025	12.6	13.4	13.2	12.2
Lehigh Valley	42-095-0027	N/A	N/A	10.6	10.6

Figure 1.2. Allentown Area PM_{2.5} Annual Design Value (in µg/m³) by Station - Since 2001



*The Allentown monitor ceased operation on 12/31/2005.

**The Lehigh Valley monitor began operation in 2010, so the first design value was valid in 2012.

The downward trend since 2011, shown in the tables and figures above, is expected to continue, with the Freemansburg monitor likely attaining the 2012 annual PM_{2.5} NAAQS based on the 2014 design value.

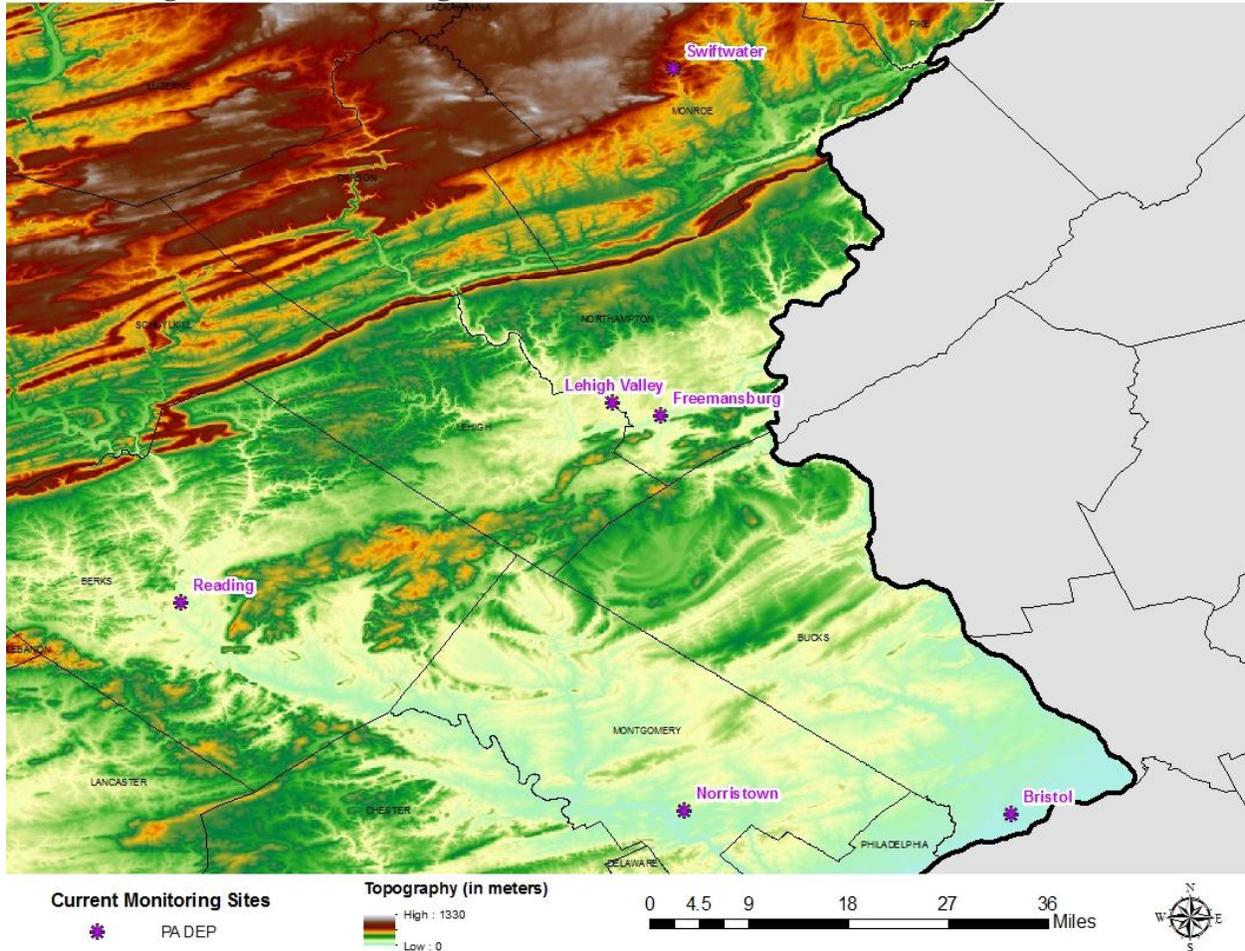
Table 1.3 shows the quarterly average for the Freemansburg and Lehigh Valley monitors for the first and second quarters of 2014. It should be noted that no single quarterly average above 12.0 µg/m³ is a violation of the standard. The annual mean is the average of the four quarterly averages, which is then averaged with the annual mean from each of the two previous years to obtain the current design value. In order to meet the 2012 annual PM_{2.5} NAAQS, the Freemansburg monitor would need a 2014 annual mean of 14.15 µg/m³. Currently, the average of the quarterly averages at both Lehigh Valley and Freemansburg monitors show a value of less than 11 µg/m³.

Table 1.3. Allentown Area Monitoring Station Data – 2014 Quarterly Averages to Date

Station	AQS Code	1 st Quarter Average (µg/m ³)	2 nd Quarter Average (µg/m ³)	Average of 1 st & 2 nd Quarters
Freemansburg	42-003-0002	13.76	7.98	10.87
Lehigh Valley	42-003-0008	13.67	7.72	10.70

A correlation analysis of the 2013 design value PM_{2.5} data was completed using a 24-hour daily average PM_{2.5} comparison of the values measured at Freemansburg compared to those at Lehigh Valley, Reading, Swiftwater, Bristol and Norristown. Figure 1.3 shows the location of these monitors in relation to the Freemansburg monitoring location. The associated chart provides the distance and direction from the Freemansburg monitoring location.

Figure 1.3. Monitoring Locations Related to the Freemansburg Monitor



Monitor	DISTANCE (MILES)	Degrees	Direction	Monitor	DISTANCE (MILES)	Degrees	Direction
LEHIGH VALLEY	3.5	290.1	WNW	BRISTOL	43.4	146.1	SE
SWIFTWATER	31.4	1.7	N	NORRISTOWN	35.6	177.2	S
READING	37.0	242.8	WSW				

Tables 1.4 and 1.5 provide the calculation of the correlation coefficient, ‘r’, and the coefficient of determination ‘r²,’ respectively, for the five monitoring locations compared to the Freemansburg monitor (based on the 2013 design value, for calendar years 2011, 2012 and 2013). The correlation coefficient between two variables is measured by the strength and direction of a linear relationship. The coefficient of determination is indicative of how well the regression line represents the data. If the regression line would pass through each data point on a scatter plot,

then this would explain all of the variation. The further away the line is from each of the points, the less that it is able to be explained.³

Table 1.4. Calculation of r (Correlation Coefficient)

	Lehigh Valley	Reading	Swiftwater	Bristol	Norristown
2011-13	0.828930077	0.787194606	0.613021262	0.735520741	0.742178037
2011	0.767578003	0.764991712	0.755702134	0.667923623	0.721879358
2012	0.827356044	0.747365310	0.617786461	0.727071440	0.704021058
2013	0.953881874	0.909063001	0.689684057	0.857663778	0.828215254

Table 1.5. Calculation of r² (Coefficient of Determination)

	Lehigh Valley	Reading	Swiftwater	Bristol	Norristown
2011-13	0.687125073	0.619675348	0.375795068	0.540990760	0.550828239
2011	0.589175990	0.585212320	0.571085715	0.446121966	0.521109808
2012	0.684518024	0.558554907	0.381660112	0.528632878	0.495645650
2013	0.909890630	0.826395540	0.475664099	0.735587156	0.685940507

In analyzing Tables 1.4 and 1.5, Freemansburg correlates the best with Lehigh Valley (which is expected due the proximity of the sites to one another). Notice the “very high positive correlation” in 2013 as opposed to 2011, which indicates the issue of local emissions near the Freemansburg monitor as opposed to Lehigh Valley.⁴

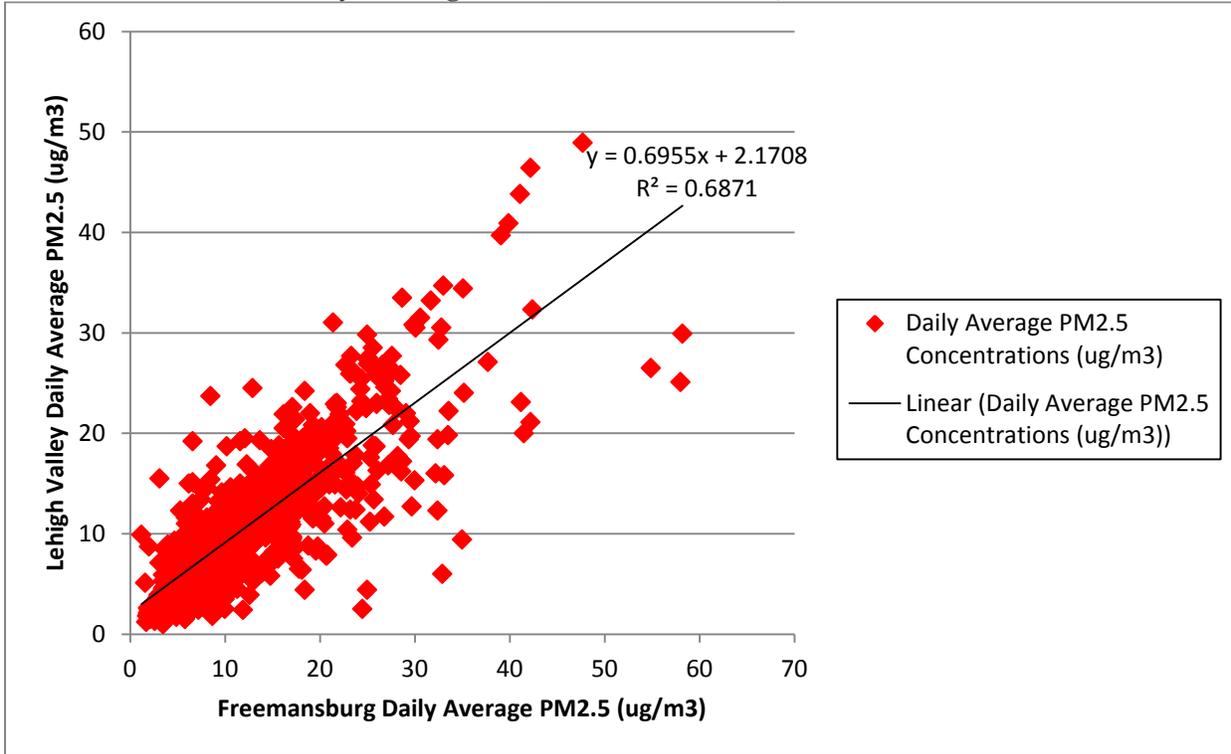
Freemansburg correlates second best with Reading (due to the orientation of the valley from Reading and into the Allentown/Freemansburg area as seen in Figure 1.3). For instance, prevailing westerly flow would ensure that the air mass remains regionalized in nature (blowing from Reading toward Allentown). As was the case with Lehigh Valley, Reading correlates better with Freemansburg in 2013 than 2011.

Figures 1.4 through 1.8 present an illustration of the coefficient of determination, or r² values, as described above and seen in Table 1.5.

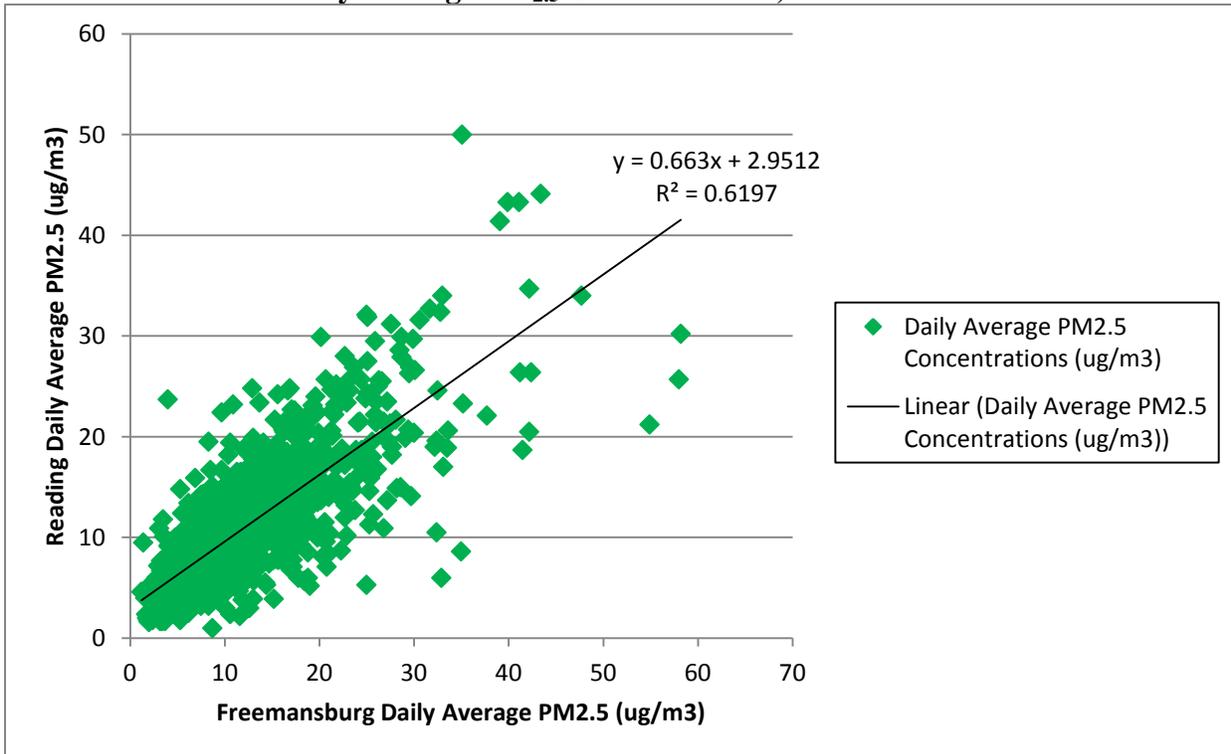
³ <http://mathbits.com/MathBits/TISection/Statistics2/correlation.htm>

⁴ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3576830/table/T1/>

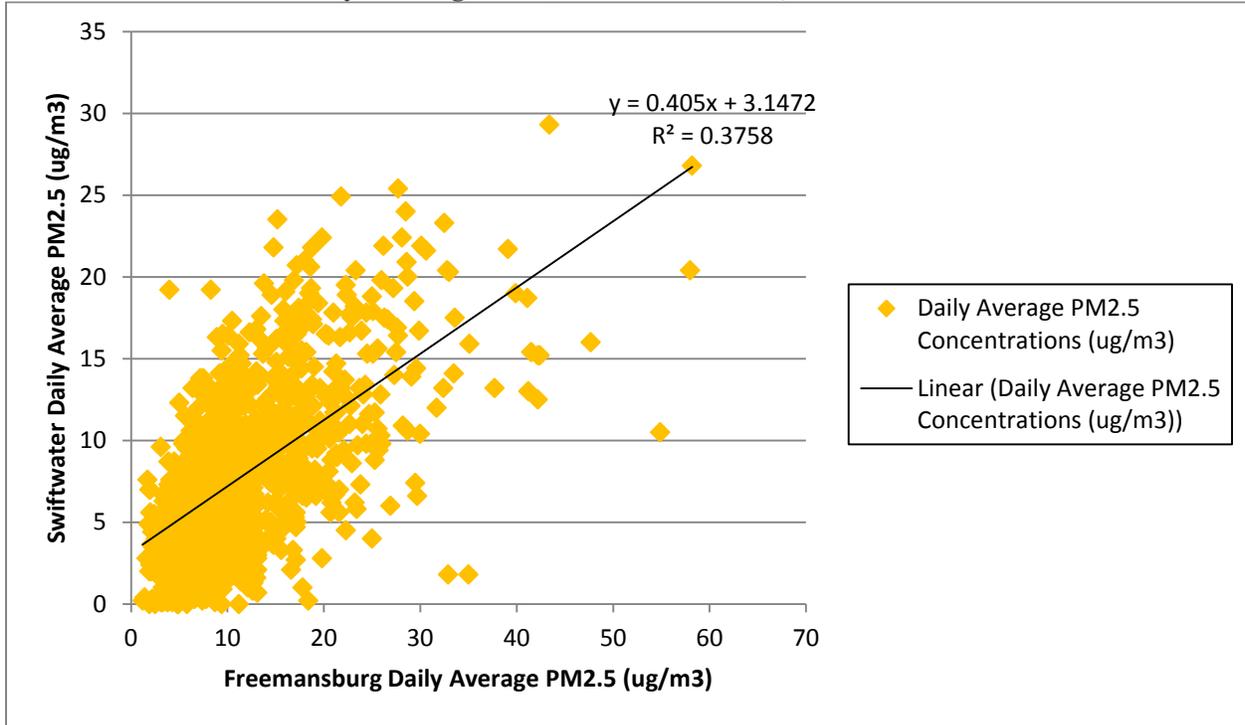
**Figure 1.4. Freemansburg vs. Lehigh Valley
Daily Average PM_{2.5} Concentrations, 2011 to 2013**



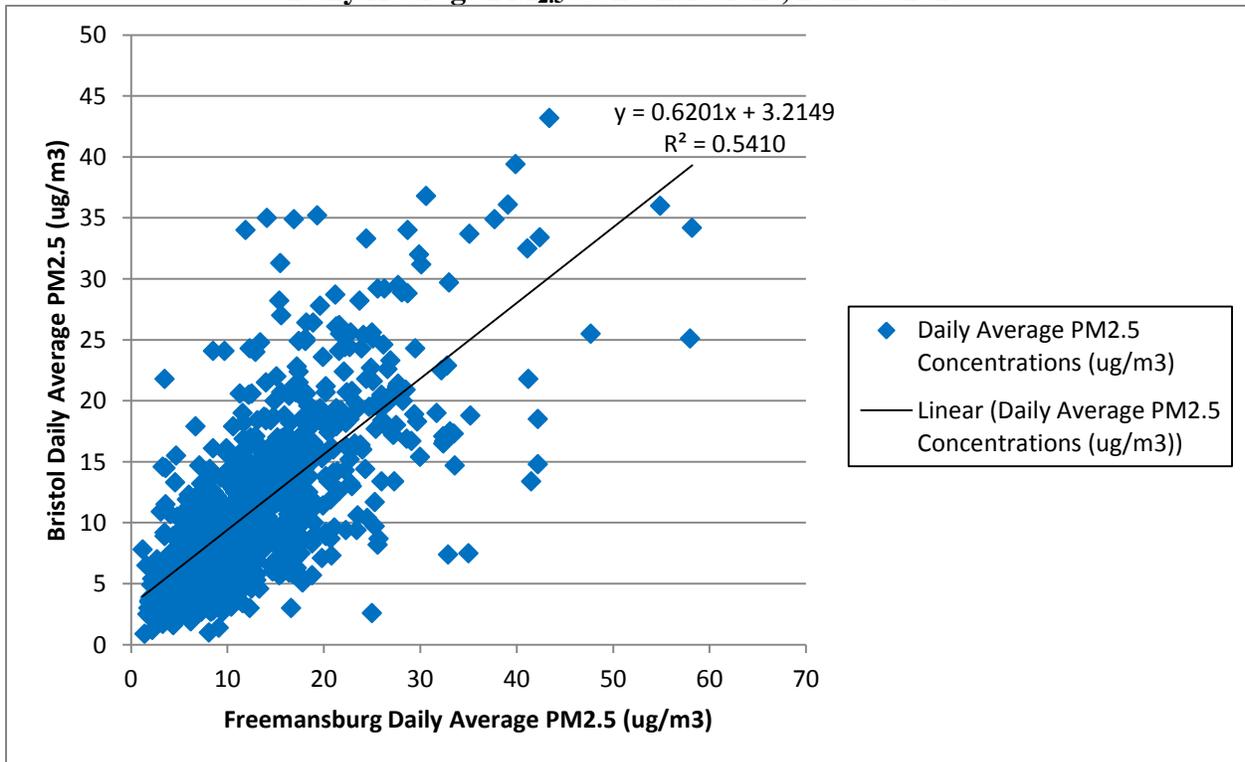
**Figure 1.5. Freemansburg vs. Reading
Daily Average PM_{2.5} Concentrations, 2011 to 2013**



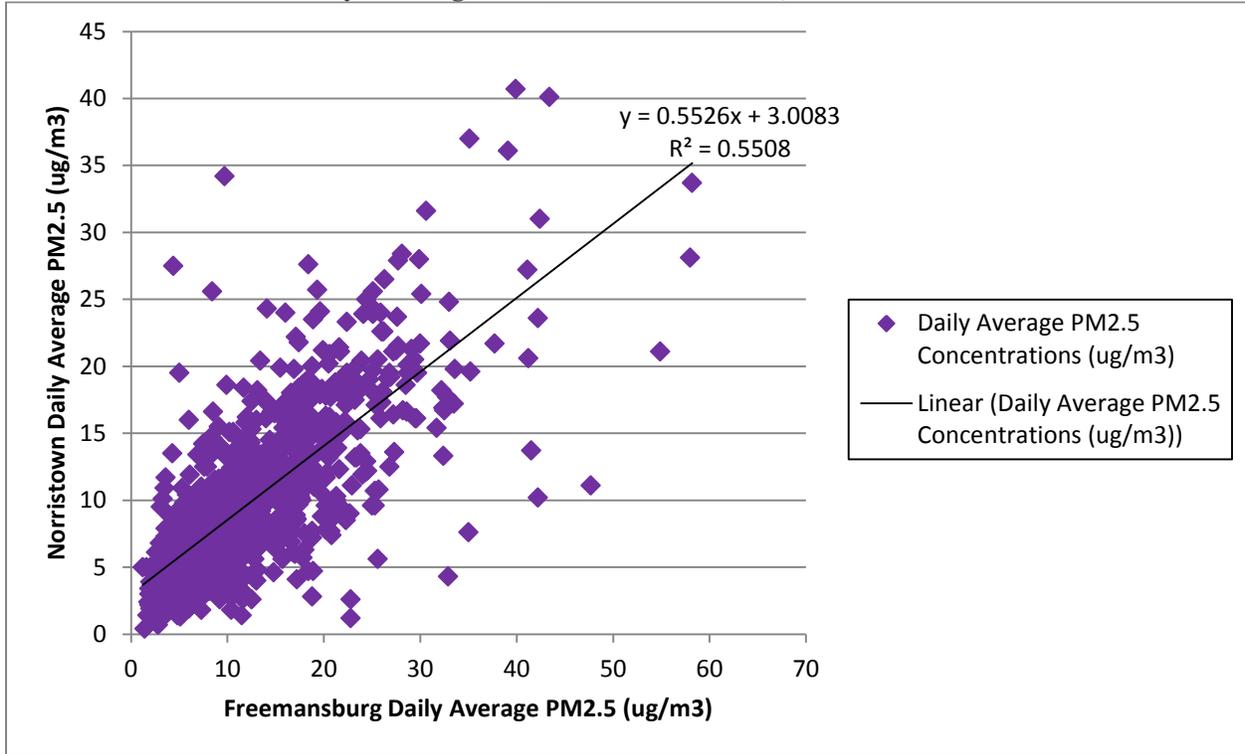
**Figure 1.6. Freemansburg vs. Swiftwater
Daily Average PM_{2.5} Concentrations, 2011 to 2013**



**Figure 1.7. Freemansburg vs. Bristol
Daily Average PM_{2.5} Concentrations, 2011 to 2013**



**Figure 1.8. Freemansburg vs. Norristown
Daily Average PM_{2.5} Concentrations, 2011 to 2013**



2. EMISSIONS AND MONITORING DATA

The EPA TSD analysis on emissions data was based on the 2011 National Emissions Inventory (NEI). Table 5 on page 138 of EPA's TSD analysis indicated major point source emissions from version 1 of the 2011 NEI, in tons per year. Table 5 listed facilities and facility-level emissions in the area of analysis for the Allentown area. In this table, EPA documented six major facilities in Northampton County and one in Lehigh County (in addition to facilities outside of these counties) with emissions of direct PM_{2.5}, components of direct PM_{2.5} and precursor pollutants. Table 2.1 shows the 2011 NEI data for the seven facilities.

Table 2.1. Allentown Area Facilities Over 500 Tons in 2011 NEI

<u>County</u>	<u>Facility Name (Facility ID)</u>	<u>Distance from violating monitor (miles)</u>	<u>NH₃</u>	<u>NO_x</u>	<u>PM_{2.5}</u>	<u>SO₂</u>	<u>VOC</u>	<u>Total</u>
Northampton	Keystone Portland Cement /East Allen (420950012)	7	2	828	57	984	7	1,878
Northampton	Essroc/Nazareth Lower Cement Plant 1 (420950045)	7	68	1,804	522	722	62	3,177
Northampton	Northampton Gen Co /Northampton (420950536)	9	2	441	44	546	2	1,034
Northampton	Hercules Cement Co LP /Stockertown (420950006)	9	3	989	29	1,420	20	2,462
Lehigh	Lafarge Corp/Whitehall Plant (420770019)	10	14	368	36	331	7	754
Northampton	PPL Martins Creek LLC /Martins Creek (420950010)	17	13	943	37	274	30	1,297
Northampton	Genon Rema LLC /Portland Generating Station (420950011)	24	0	1,977	67	15,148	14	17,206
		<u>TOTAL</u>	102	7,350	792	19,425	142	27,808

DEP reviewed these same seven facilities in its Air Information Management System (AIMS) database for the 2013 calendar year. The 2013 emissions for each of the seven facilities within Northampton and Lehigh Counties can be seen in Table 2.2.

Table 2.2. Allentown Area Facilities Over 500 Tons in 2013 in PA's AIMS Database

<u>County</u>	<u>Facility Name (Facility ID)</u>	<u>Distance from violating monitor (miles)</u>	<u>NH₃</u>	<u>NO_x</u>	<u>PM_{2.5}</u>	<u>SO₂</u>	<u>VOC</u>	<u>Total</u>
Northampton	Keystone Portland Cement /East Allen (420950012)	7	3	734	41	743	3	1,524
Northampton	Essroc/Nazareth Lower Cement Plant 1 (420950045)	7	60	1,109	545	878	56	2,648
Northampton	Northampton Gen Co /Northampton (420950536)	9	2	366	15	455	6	844
Northampton	Hercules Cement Co LP /Stockertown (420950006)	9	4	1,405	30	1,418	26	2,883
Lehigh	Lafarge Corp/Whitehall Plant (420770019)	10	12	257	36	273	5	583
Northampton	PPL Martins Creek LLC /Martins Creek (420950010)	17	14	770	16	161	34	995
Northampton	Genon Rema LLC/Portland Generating Station (420950011)	24	0	414	12	2,103	3	2,532
		TOTAL	95	5,055	695	6,031	133	12,009

Emission totals for the seven Lehigh and Northampton County facilities are compared between 2011 and 2013 in Table 2.3.

Table 2.3. Allentown Area Facility Emissions Difference Between 2011 and 2013

<u>County</u>	<u>Facility Name (Facility ID)</u>	<u>2011 Totals</u>	<u>2013 Totals</u>	<u>Difference</u>	<u>Percent Change</u>
Northampton	Keystone Portland Cement/East Allen (420950012)	1,878	1,524	-354	-18.8%
Northampton	Essroc/Nazareth Lower Cement Plant 1 (420950045)	3,177	2,648	-529	-16.7%
Northampton	Northampton Gen Co/Northampton (420950536)	1,034	844	-190	-18.4%
Northampton	Hercules Cement Co LP/Stockertown (420950006)	2,462	2,883	421	17.1%
Lehigh	Lafarge Corp/Whitehall Plant (420770019)	754	583	-171	-22.7%
Northampton	PPL Martins Creek LLC/Martins Creek (420950010)	1,297	995	-302	-23.3%
Northampton	Genon Rema LLC/Portland Generating Sta (420950011)	17,206	2,532	-14,674	-85.3%
	GRAND TOTAL	27,808	12,009	-15,799	-56.8%

As can be seen in the charts above, significant progress has been made in the region, having reduced emissions by more than 56 percent between 2011 and 2013.

3. GEOGRAPHY/TOPOGRAPHY

The EPA TSD analysis accurately describes the geography and topography associated with Lehigh and Northampton Counties. However, the last sentence of Factor 4 in EPA's TSD analysis stated that, "EPA believes that these topographical barriers significantly affect the formation and distribution of PM_{2.5} concentrations in the area of analysis" without any further explanation. There was a large disparity of more than 3 µg/m³ between the Lehigh Valley and Freemansburg monitors. DEP believes that the PM_{2.5} concentrations in the Bethlehem/Freemansburg area were being influenced by emissions south of the Freemansburg monitor.

The history of the Bethlehem Steel property, (approximately 1.5 miles south of the Freemansburg monitor) according to EPA's Corrective Action Statement of Basis document for redevelopment at the former Bethlehem Steel property, is:

From approximately 1899 to 1995, BSC [Bethlehem Steel Corporation] and its corporate predecessors manufactured steel at the approximately 1800-acre BSC Facility. In 1995, BSC discontinued steel manufacturing operations at the BSC Facility and in 2001, filed for bankruptcy under Chapter 7 of the United States Bankruptcy Code. In May 2003, with approval of the U.S. Bankruptcy Court for the Southern District of New York, International Steel Group Acquisition, Inc. (ISG) acquired substantially all of BSC's assets. Title to the BSC Facility was taken by Tecumseh Redevelopment, LLC (Tecumseh), a subsidiary of ISG. A 125-acre westernmost tract, the BW Tract, was sold to Sands Retail, LLC. In addition, Tecumseh sold approximately 1000 acres of the BSC Facility to Lehigh Valley Industrial Park (LVIP). That 1000-acre area is part of the parcel known as Bethlehem Commerce Center. In 2005, ISG merged with Mittal Steel USA, Incorporated (Mittal). Mittal sold 441 acres to Majestic Realty Company in 2007. Tecumseh, now a subsidiary of Mittal, retains the remaining acreage of the BSC Facility.⁵

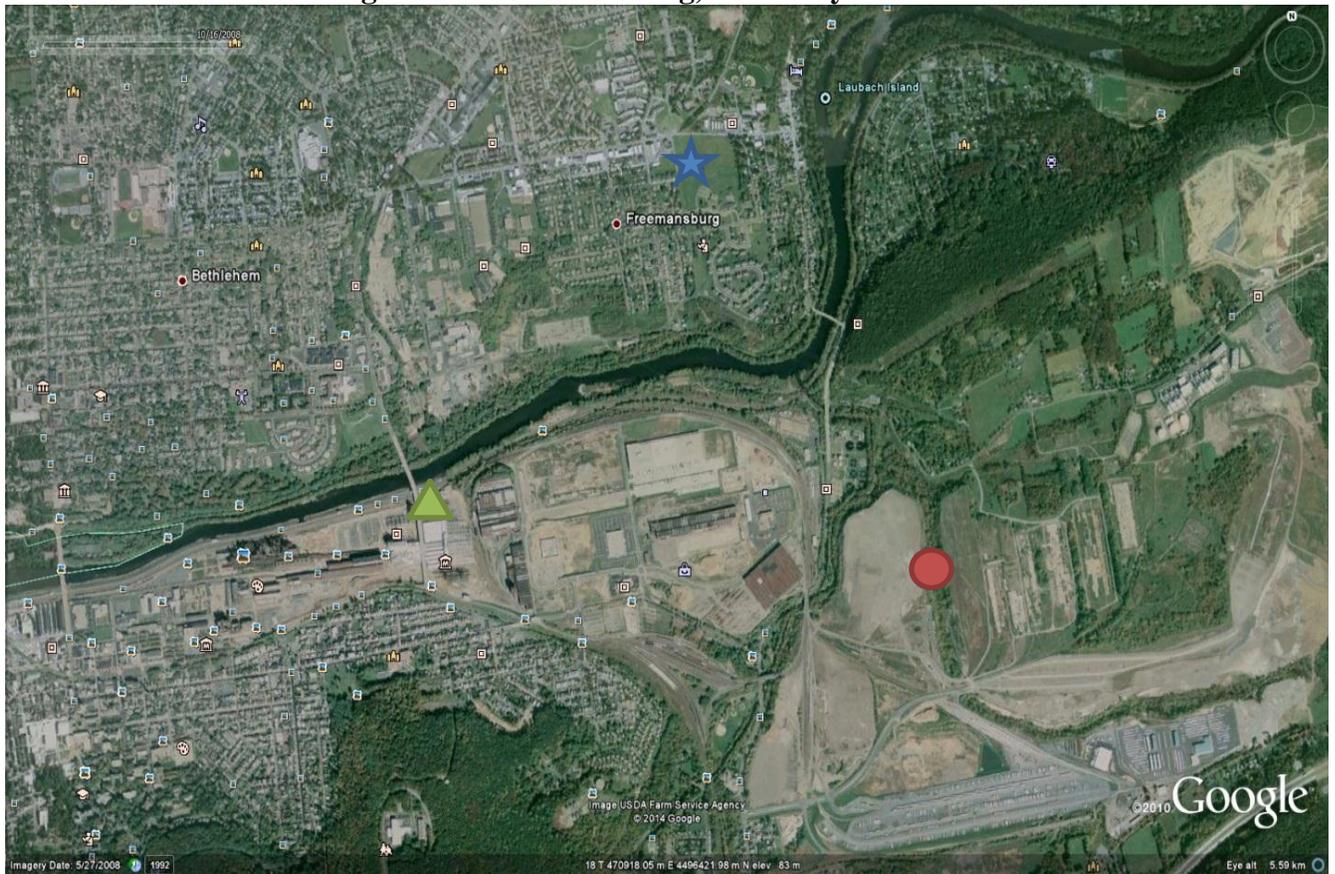
Figures 3.1-3.6 show the nearly 1,800 acres of land formerly owned by Bethlehem Steel (along the southern edge of the Lehigh River). The land, subject to Resource Conservation and Recovery Act (RCRA) Corrective Action activities and DEP's Land Recycling Program (Act 2), has been and continues to be redeveloped.⁶ These images, starting in 2008 (in Figure 3.1), show the land that was heavily developed south of the Freemansburg monitor.

In Figures 3.1, 3.5 and 3.6, the blue star (★) depicts the location of the Freemansburg monitor; the green triangle (▲) is the location of the casino, hotel and shops which were built between late 2008 and mid 2011; the red circle (●) is where warehouses and distribution centers were built between 2010 and 2013.

⁵ http://www.epa.gov/reg3wcmd/ca/pa/otherdocs/BethlehemSteelCommerceCtr_SB.pdf

⁶ http://www.epa.gov/reg3wcmd/ca/pa/reuse/lu_PAD990824161.pdf

Figure 3.1. Freemansburg, PA – May 2008



Source: Google Earth

Figure 3.2 shows the land formerly owned by Bethlehem Steel. This image, from June 2012, is taken from the northwest, looking southeast.

Figure 3.2. Former Property of Bethlehem Steel Corporation



Source: Liberty Property Trust – Lehigh Valley Industrial Park VII

<http://www.gisplanning.net/photos/pa/2785%20Commerce%20Center%20Bld%20LVIP%20VII.pdf>

Figures 3.3 and 3.4 show the redevelopment projects on the old Bethlehem Steel property. The Lehigh Valley Industrial Park VII Land Development project is highlighted in orange in Figure 3.3. Please note that phases 1-4 appear to be completed, while phases 5 and 6 are still in progress.

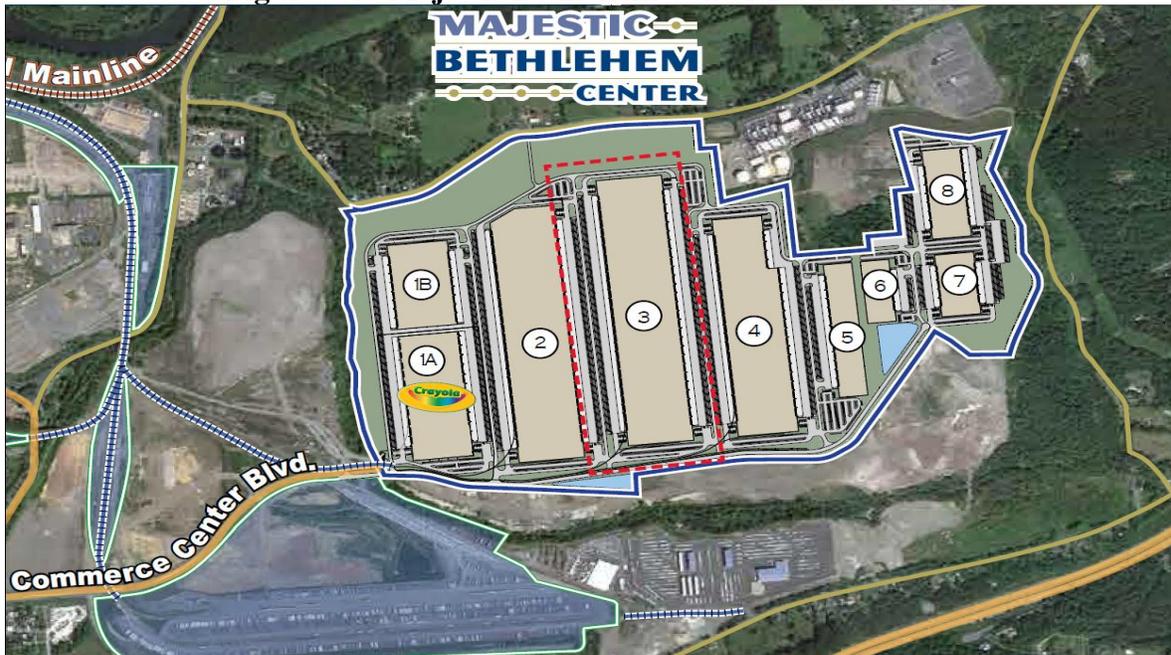
Figure 3.3. Lehigh Valley Industrial Park VII Land Development Project



Source: Lehigh Valley Industrial Park, Inc. <http://www.lvip.org/available-land>

Figure 3.4 shows the redevelopment project by Majestic Realty on the property. The buildings proposed at the Majestic business park are seen in Figure 3.4, which includes the first completed structure, a warehouse and distribution center for Crayola, LLC.

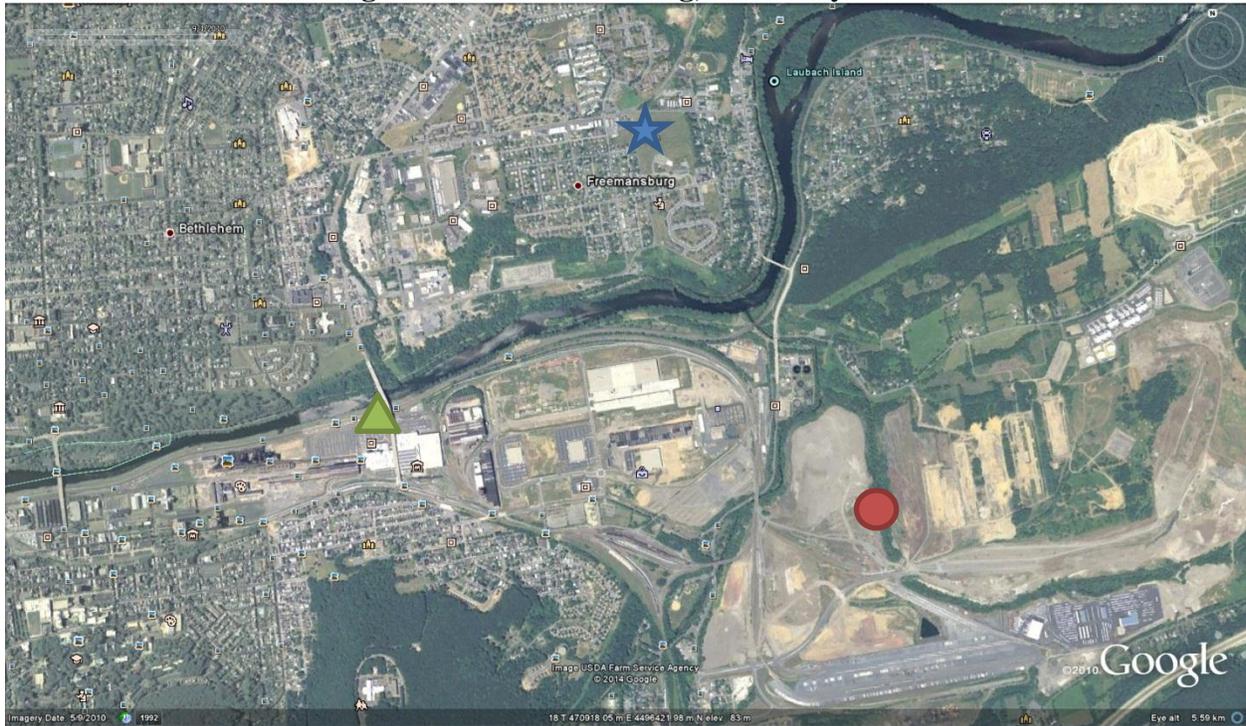
Figure 3.4. Majestic Bethlehem Center Business Park



Source: Majestic Realty. http://www.majesticrealty.com/downloads/beth/majesticbethlehem-bldg3_broch.pdf

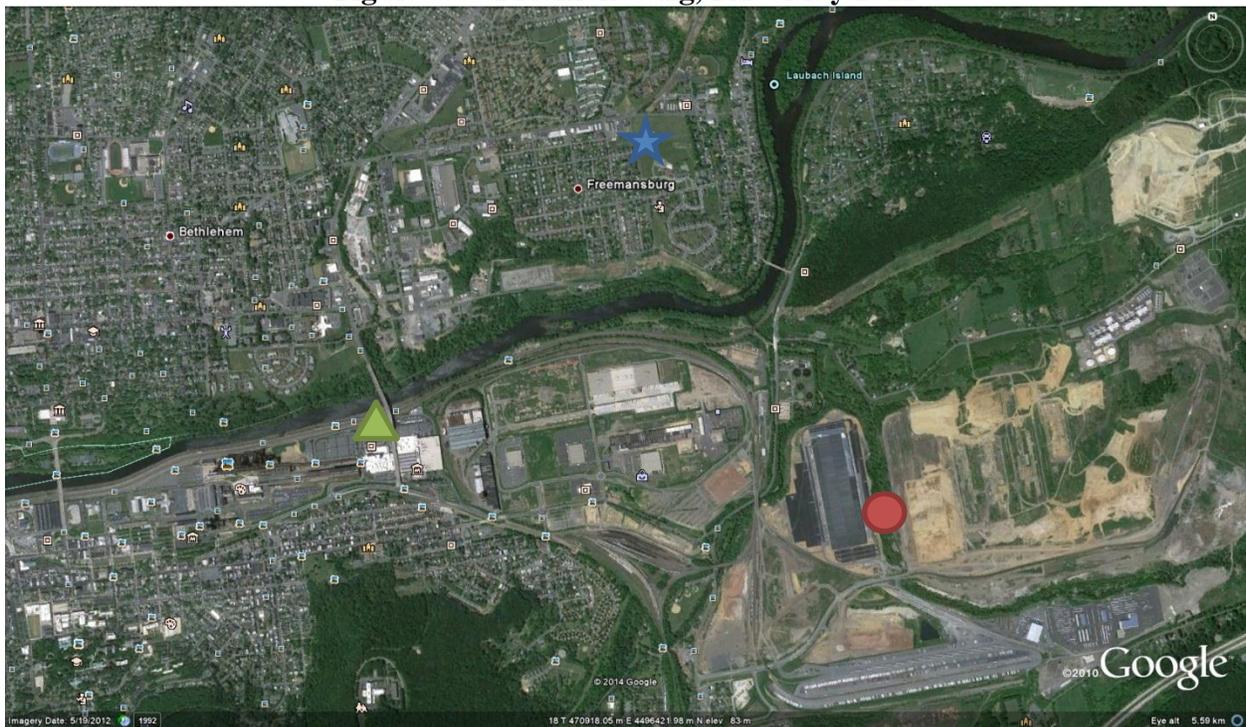
Figures 3.5 and 3.6 show the Freemansburg area in 2010 and 2012, respectively.

Figure 3.5. Freemansburg, PA – May 2010



Source: Google Earth

Figure 3.6. Freemansburg, PA – May 2012



Source: Google Earth

As you can see, when comparing Figures 3.1-3.6, over time, the landscape of the old Bethlehem Steel plant has changed. In 2008, not much work was going on at the site due to economic conditions. However, starting in late 2008 and early 2009, land development including demolition, excavation of land and old foundations, and construction began to occur on various sections of 1,800 acres of land. This work, along with vehicular traffic on unpaved roads on the former Bethlehem Steel property, would likely cause dust to leave the premises. As seen in the Google Earth images, over time, development initially occurred from the western portion of the property and has moved east. Construction on the Bethlehem Sands Casino was completed in mid-2009; the Bethlehem Sands Hotel in mid-2011; and the Outlets at Sands Bethlehem in late 2011. Also note, in Figure 3.6, the Walmart warehouse was completed by May 2012 (with the Crayola warehouse, built immediately to the east of the Walmart warehouse (as indicated in Figure 3.4), being completed since this image). While construction is still ongoing, particularly for warehouses on the eastern-most portion of the property, the preparation and earthmoving is minimal compared to the late 2008-2012 timeframe.

4. JURISDICTIONAL BOUNDARIES

In Factor 5 of EPA's TSD analysis, it is pointed out that, "examples of such jurisdictional boundaries include existing/prior nonattainment area boundaries for particulate matter, county lines, air district boundaries, township boundaries, areas covered by a metropolitan planning organization, state lines, and Reservation boundaries, if applicable."

The EPA TSD analysis described the existing jurisdictional boundaries for the Allentown-Bethlehem-Easton MSA, Lehigh Valley Planning Commission (Metropolitan Planning Organization) and the previously established nonattainment boundary for the 2006 24-hour PM_{2.5} NAAQS. As noted in Section 1, the Freemansburg and Lehigh Valley monitors have typically correlated well. DEP's analysis supports a single-county boundary finding due to a proven local issue caused between 2009 and 2011, by earth-moving activities just south of the Freemansburg monitor in Northampton County. DEP believes that in this case, a jurisdictional boundary of a single-county, Northampton County nonattainment area, is appropriate because the Freemansburg monitor is now showing a downward trend in PM_{2.5} concentrations.

CONCLUSION

After considering the facts as described above, and previously presented in the designation recommendations, DEP is recommending that EPA reduce the intended nonattainment area from the Allentown Area consisting of Lehigh and Northampton County to solely comprise of Northampton County as the nonattainment area. The Allentown-Bethlehem-Easton Area was previously designated nonattainment for the 2006 24-hour PM_{2.5} NAAQS when the monitored 24-hour values had extremely similar values, something that was not seen in 2010 and 2011 between the Freemansburg and Lehigh Valley monitors.

DEP's analysis shows that in 2010 and 2011, the Freemansburg monitor had an annual mean more than 3 µg/m³ higher than the Lehigh Valley monitor. This difference was due to local projects just south of the monitor (where winds come from on the highest PM_{2.5} days, as analyzed in DEP's designation recommendations). Due to higher annual mean values at the Freemansburg monitor in 2010 and 2011, the design values for 2010 through 2013 were also higher. Since the annual mean has dropped below the 2012 annual PM_{2.5} NAAQS, starting in 2012, the annual design value is on the decline (which correlates with much of the demolition and earth-moving of land south of the monitor being completed) and is expected to achieve attainment of the 2012 annual PM_{2.5} NAAQS based on the 2014 design value. Although the EPA TSD analysis points to area and mobile source emissions due to a connection with population and population density within the Allentown area, the Lehigh Valley monitor is more indicative of the regional emissions. In addition, the seven major facilities referenced in Lehigh and Northampton Counties have reduced direct PM_{2.5} and precursor emissions by more than 56 percent.

DEP's analysis supports the conclusion that the size of the 2012 annual PM_{2.5} nonattainment area should be reduced from EPA's proposed designation to a single-county nonattainment area. It is strongly recommended that Northampton County area be designated as a separate PM_{2.5} nonattainment area and that Lehigh County be designated as an unclassifiable/attainment area.



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

Enclosure 4

**The Commonwealth of Pennsylvania's Response to the
U.S. Environmental Protection Agency's Proposed Designations for
the 2012 Annual PM_{2.5} National Ambient Air Quality Standard**

**Request for Consideration of 2014 Design Values Prior to the
Effective Date of Final Designations**

**Bureau of Air Quality
Department of Environmental Protection**

[This page intentionally left blank.]

In its August 19, 2014, letter to Governor Corbett, EPA indicated plans to promulgate final annual PM_{2.5} designations in December 2014 for the 2012 annual PM_{2.5} NAAQS. EPA has indicated that the effective date of the final designations will likely be March 2015. Several areas in Pennsylvania that EPA proposed to designate as nonattainment areas may come into attainment of the NAAQS before March, based on the 2014 design value. Therefore, the PA Department of Environmental Protection (DEP) intends to complete early certification of the data for monitors within Pennsylvania. Once the 2014 data is received, DEP will submit a letter to EPA, prior to the effective date of the final designations, requesting withdrawal of any area showing attainment of the 2012 annual PM_{2.5} NAAQS. The DEP would also in that letter request that the designated nonattainment area(s) be reclassified as unclassifiable/attainment. Current air quality monitoring data for nonattaining monitors is provided below.

AIR QUALITY MONITORING DATA

The tables in this section include information for nonattaining monitors that are within EPA's intended nonattainment areas, including the Allegheny County Area, Johnstown area (Cambria County and partial Indiana County), Delaware County Area, Lebanon County Area and Allentown Area (Northampton and Lehigh Counties). The purposes of these tables is to show what the monitors in the nonattainment areas have been monitoring and to point out the potential for one or more of these areas to attain the 2012 annual PM_{2.5} NAAQS, based on data as early as the 2014 design value.

Table 1.1 includes annual mean data for the five monitors located in EPAs proposed nonattainment areas. In 2013, all of these monitoring locations recorded an annual mean lower than the 2012 annual PM_{2.5} NAAQS of 12.0 µg/m³.

Table 1.1. PM_{2.5} Nonattaining Monitors - Annual Mean (in µg/m³)

<u>County</u>	<u>Station</u>	<u>AQS Code</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
Allegheny	Liberty	42-003-0064	16.04	14.00	14.29	11.98
Cambria	Johnstown	42-021-0011	11.94	13.43	11.57	11.93
Delaware	Chester	42-045-0002	13.51	12.94	12.81	11.47
Lebanon	Lebanon	42-075-0100	N/A	11.43	14.25	11.22
Northampton	Freemansburg	42-095-0025	13.73	14.46	11.45	10.55

Table 1.2 includes annual design value data for the five monitors located in EPA's proposed nonattainment areas. The general trend for design values is downward across these monitors since 2010. The Chester, Freemansburg and Liberty monitors had a difference in design value from 2012 to 2013 of 0.7 µg/m³, 1.0 µg/m³ and 1.4 µg/m³, respectively.

Table 1.2. PM_{2.5} Nonattaining Monitors - Annual Design Value (in µg/m³)

<u>County</u>	<u>Station</u>	<u>AQS Code</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
Allegheny	Liberty	42-003-0064	16.0	15.0	14.8	13.4
Cambria	Johnstown	42-021-0011	12.6	12.4	12.3	12.3
Delaware	Chester	42-045-0002	13.3	12.9	13.1	12.4
Lebanon	Lebanon	42-075-0100	N/A	N/A	N/A	12.3
Northampton	Freemansburg	42-095-0025	12.6	13.4	13.2	12.2

Table 1.3 projects the annual mean necessary at the nonattaining monitors in the 2014 calendar year in order to meet or drop below the 2012 annual PM_{2.5} NAAQS of 12.0 µg/m³.

Table 1.3. PM_{2.5} Annual Mean Necessary in 2014 to Achieve Attainment (in µg/m³)

<u>County</u>	<u>Station</u>	<u>AQS Code</u>	<u>2014</u>
Allegheny	Liberty	42-003-0064	9.88
Cambria	Johnstown	42-021-0011	12.65
Delaware	Chester	42-045-0002	11.87
Lebanon	Lebanon	42-075-0100	10.68
Northampton	Freemansburg	42-095-0025	14.15

Table 1.4 provides the first and second quarter values for 2014 at each of the five nonattaining monitors that are within EPA's proposed nonattainment areas.

Table 1.4. PM_{2.5} Quarterly Values Through Second Quarter 2014 (in µg/m³)

<u>County</u>	<u>Station</u>	<u>AQS Code</u>	<u>1st Quarter Average</u>	<u>2nd Quarter Average</u>	<u>Average of 1st & 2nd Quarters</u>
Allegheny	Liberty	42-003-0064	14.73	12.50	13.61
Cambria	Johnstown	42-021-0011	16.07	10.35	13.21
Delaware	Chester	42-045-0002	15.07	10.95	13.01
Lebanon	Lebanon	42-075-0100	17.22	10.95	14.09
Northampton	Freemansburg	42-095-0025	13.76	7.98	10.87

CONCLUSION

Based on the information provided above, it appears probable that the Freemansburg monitor (for Northampton and Lehigh Counties) will be in attainment of the 2012 annual PM_{2.5} NAAQS after calculation of the 2014 design value. It is also possible that the Johnstown monitor and/or the Chester monitor (for Cambria and Indiana Counties and Delaware County, respectively) will achieve attainment of the standard, based on the 2014 design value. The Liberty and Lebanon monitors will likely take another year or two to come into attainment of the standard.

If any of these monitoring locations achieves a 2014 design value that is equal to or less than the 2012 annual PM_{2.5} NAAQS of 12.0 µg/m³, then prior to the effective date of EPA's final designations (effective date currently expected in March 2015), DEP will submit a letter to EPA requesting withdrawal of the appropriate nonattainment area and requesting that the designated nonattainment area(s) be reclassified as unclassifiable/attainment.