Allegheny County Health Department
Air Quality Program
301 39th Street, Building 7
Pittsburgh, PA 15201

Air Monitoring Network Plan for 2017

July 1, 2016

Note:
Section 9.5 (see page 72) was added to this document on 07/13/2016 in response to comments received from GASP after the advertised due date. GASP's comment document was also added to Appendix A.

KAREN HACKER, M.D., M.P.H., DIRECTOR
ALLEGHENY COUNTY HEALTH DEPARTMENT
542 FOURTH AVENUE. • PITTSBURGH, PA 15219 PHONE (412) 687-ACHD (2243)
• FAX (412) 578-8325 • WWW.ACHD.NET

Contents

(1) EPA REQUIREMENTS FOR AIR MONITORING NETWORK DESCRIPTIONS

In October 2006, the U.S. EPA issued final regulations concerning state and local agency ambient air monitoring networks. In addition, EPA Region III requested that network descriptions contain information described in 40 CFR Part 58 §58.10.

§58.10 (a) requires for each existing and proposed monitoring site:

1. A statement of purpose for each monitor.
2. Evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of 40 CFR Part 58, where applicable.
3. Proposals for any State and Local Air Monitoring station (SLAMS) network modifications.
4. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA (submission deadline is July 1, 2016).

§58.10 (b) requires:

1. The Air Quality System (AQS) site identification number.
2. The location, including street address and geographical coordinates.
3. The sampling and analysis method(s) for each measured parameter.
4. The operating schedules for each monitor.
5. Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.
6. The monitoring objective and spatial scale of representativeness for each monitor.
7. The identification of any sites that are suitable and sites that are not suitable for comparison against the annual $PM_{2.5}$ NAAQS as described in §58.30.
8. The Metropolitan Statistical Area (MSA), Core Based Statistical Area (CBSA), Combined Statistical Area (CSA) or other area represented by the monitor.

(1.1) Data Certification

Regarding all data generated by the criteria pollutant monitors described in this network review, no later than May 1, 2016, the ACHD will submit a letter certifying accuracy and reliability of CY 2015 criteria air pollutant monitoring data reported to AQS to the Mid Atlantic Regional Administrator in hard copy. An electronic copy of this information will also be sent to the Mid-Atlantic Region Associate Director, Office of Air Monitoring and Planning by May 1, 2016.

ACHD's data certification will contain all required reports and will be accompanied with a statement from a responsible local official who certifies that;

- The ambient concentration data and the quality assurance data have been completely reported to the AQS database.
- The ambient data are accurate to the best of his or her knowledge taking into consideration the quality assurance findings according to 40 CFR Section 58.15(a).

(2) CHANGES SINCE THE LAST AIR MONITORING NETWORK PLAN

(2.1) Monitor Reductions

(2.1.1) Monroeville PM_{10} Monitor

ACHD discontinued the Monroeville air monitoring site, including the continuous PM_{10} monitor at the end of 2015. This monitor was originally activated to assess mobile particulate emissions. The newer Parkway East near road monitoring site is much better suited to this task due to conformance to siting criteria outlined in the NO_2 Near Road Monitoring Technical Assistance Document.

(2.1.2) North Braddock Filter Based PM_{10}

ACHD discontinued filter based PM_{10} sampling at the North Braddock monitoring site at the end of 2015. This includes a primary, every six-day high volume PM_{10} sampler and a secondary quality assurance high volume PM_{10} sampler. ACHD will continue to operate the continuous PM_{10} FEM monitor at this site, which has proven to correlate well with the filter based samplers.

(2.1.3) Lawrenceville $PM_{2.5}$ TEOM (non-FEM)

ACHD discontinued the $PM_{2.5}$ TEOM monitor at Lawrenceville. This was a non-reference monitor used only for daily air quality index (AQI) reporting (see section 2.2.2).

(2.2) Monitor Additions

(2.2.1) Parkway East Near Road $PM_{2.5}$

ACHD installed a continuous $PM_{2.5}$ FEM continuous monitor at the Parkway East near road monitoring site for the start of 2016. Monitoring of $PM_{2.5}$ at near road sites is required by the current $PM_{2.5}$ NAAQS by January 1, 2017.

(2.2.2) Lawrenceville $PM_{2.5}$ Met One BAM (FEM)

This is a preexisting monitor at the Lawrenceville site that is operated in tandem with a PM_{10} Met One BAM to produce PM_{coarse} data. Starting 04/01/16, the $PM_{2.5}$ Met One BAM will be considered a SLAMS monitor. Data produced by this monitor will also be used for daily air quality index (AQI) reporting.

(2.3) Method Changes

(2.3.1) $PM_{2.5}$ FRM Monitors

$PM_{2.5}$ FRM filter based monitors received final particle sizing device upgrades during the week of 03/28/2016. The samplers were previously using WINS impactors (method code 118) and are now using very sharp cut cyclones (VSCC, method code 145). This change was recommended by EPA Region III.

(2.3.2) Lead Monitoring

The lead monitoring filter analytical method was changed from Flame Atomic Absorbance Spectrometry (Flame AA, method code 803) to Inductively Coupled Plasma Mass Spectrometry (ICP-MS, method code 191), effective date 02/03/2016. Field sampling activities and filter media type remain unchanged from previous years.

(3) PROPOSED CHANGES TO THE AIR MONITORING NETWORK

(3.1) Monitor Reductions

(3.1.1) Avalon PM_{10} Sampler

ACHD proposes to discontinue the Avalon PM_{10} high volume sampler at the end of January, 2017. Shenango Coke Works, the major source of PM_{10} particles near the monitoring site permanently shut down during mid-January 2016. ACHD proposes to discontinue this monitor after collecting one year of post-shutdown data, suspecting that the data will reveal daily and annual average concentrations similar to non-source oriented PM_{10} monitors in Allegheny County.

(3.2) Monitor Additions

(3.2.1) Avalon $PM_{2.5}$ FEM Continuous Monitor

ACHD plans to add a $PM_{2.5}$ FEM continuous monitor to the Avalon site, to be operational by January 1, 2017. This monitor will be assigned primary monitor status at the Avalon site. After successful activation of the $PM_{2.5}$ FEM, the $PM_{2.5}$ FRM sampler currently operated at this site will serve as a collocated monitor and sample frequency will be reduced from one in three days to one in six days.

(4) AIR MONITORING NETWORK SUMMARY

Table 4 and Figure 4 are provided as overviews of the air monitoring network, and are presented here to show at a glance the numbers and general types of air monitors currently maintained by the Air Quality Program as well as the general location of each fixed monitoring site in respect to stationary air pollution sources. To view live and recent data for all continuous monitors listed in the table, see the Air Quality Program website;

http://www.achd.net/air/air.html

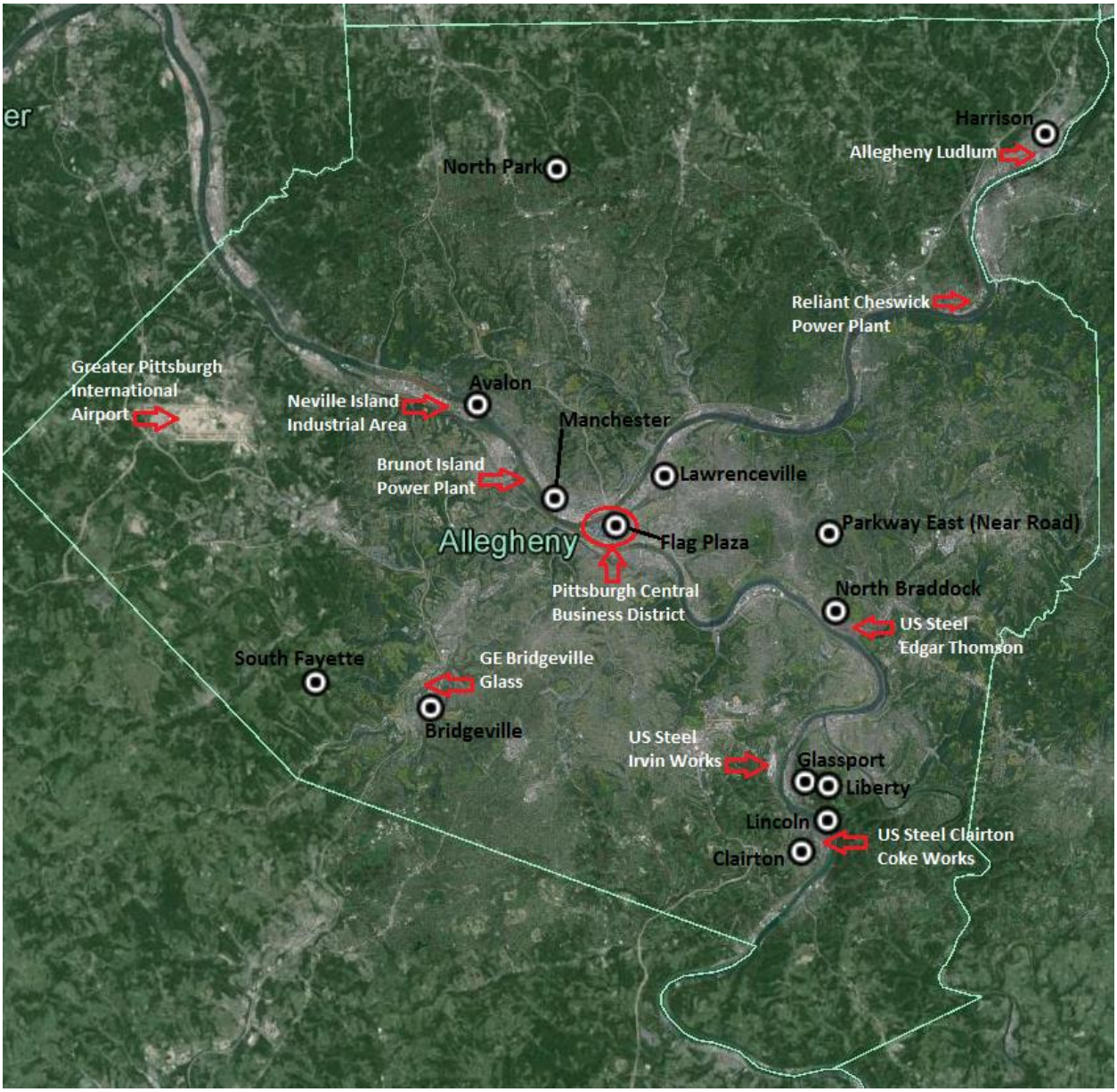
(Table 4) AIR MONITORING NETWORK SUMMARY

	SO_2	CO	NO_2	NO_y	O_3	PM_{10}	$PM_{2.5}$	PM coarse	Pb	Air Toxics
Lawrenceville	CT	CT		CT	C		C I(1), IQA(6) SPC(3)	C	I(6), IQA(6)	
Liberty	C					C I(3), IQA(6)	C I(1), IQA(6) SPC(6)			
North Braddock	C					C	I(3)			
South Fayette	C				CS	I(6)	I(3)			
Clairton						I(6)	I(6)			
Avalon	C					I(6)	I(3)			
Flag Plaza		C				C				T15(6) T11(6)
Glassport						C				
Lincoln						C				
Pittsburgh 8						I(6)				
Harrison			C		C		I(3)			
North Park							I(6)			
Bridgeville									I(3)	
Parkway East Near Road		CT	CT				C			BC(C)
	SO_2	CO	NO_2	NOy	O_3	PM_{10}	$PM_{2.5}$	PM coarse	Pb	Air Toxic
Total	C = 4 CT = 1	C = 1 CT = 2	C = 1 CT=1	CT = 1	C = 2 CS = 1	C = 5 I = 5 IQA=1	C = 3 I = 8 IQA = 2 SPC=2	C = 1	I = 2 IQA= 1	I = 2

CHART KEY

C = Continuous **I** = Intermittent or Filter-Based **SPC** = PM2.5 Speciation **S** = Seasonal Monitor
T = Trace Level Monitor **(1), (3), or (6)** = Sampling Frequency [for example, (**3**) means every third day]
T15 = SUMMA TO15 **T11** = Carbonyl TO11 **BC** = Black Carbon (Aethalometer, continuous data)
IQA = Intermittent Collocated QA monitor, **Red Shading =** Candidate for Discontinuation

(Figure 4) Air Monitoring Sites and Stationary Air Pollution Sources



Stationary Air Pollution Sources - ⇨

Air Monitoring Sites - ◉

(5) Monitoring Network Requirements

Requirements for the number and types of monitoring sites and the configuration of each monitoring site in respect to SLAMS monitoring is determined by the USEPA. Monitoring network requirements are located in 40CFR58 Appendix D. EPA updates this document routinely in response to NAAQS revisions and also in response to evolving air monitoring network objectives. The following sections provide the current requirements for each criteria pollutant as applied to the Allegheny County air monitoring network.

Many of the following monitoring requirements are based on population density of the monitoring area. For Allegheny County, the Pittsburgh MSA (metropolitan statistical area) is referenced. The latest census (2010) determined the population of the Pittsburgh MSA to be 2,356,285 people. Some monitoring requirements are also based on individual pollutant design values, which are concentrations derived from past data generated by SLAMS monitors in Allegheny County. Design values referenced in this section are based on tables available at:

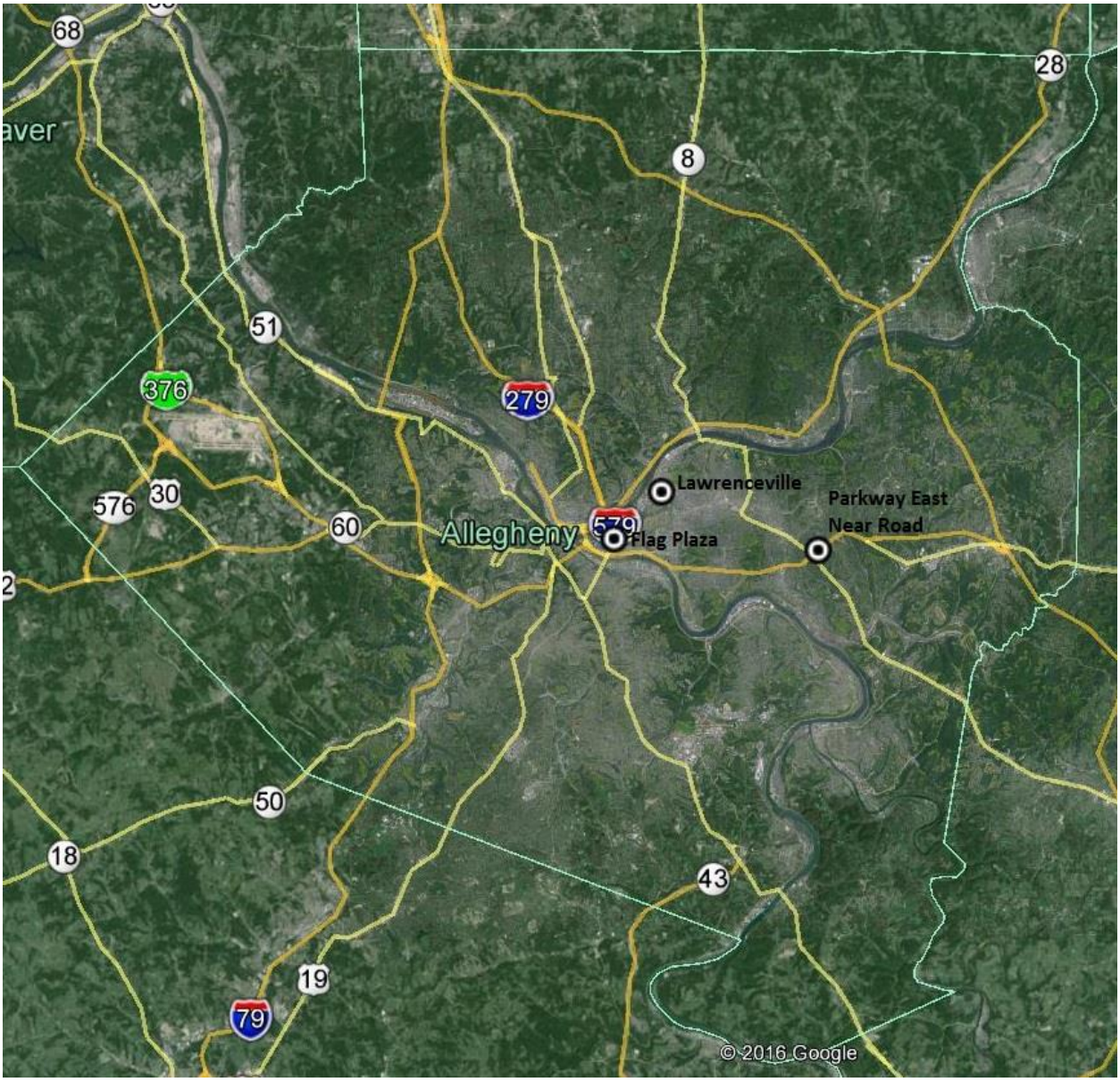
http://www.epa.gov/airtrends/values.html

(5.1) Carbon Monoxide Monitoring Requirements

EPA revised the minimum monitoring requirements for CO on August 12, 2011 (40 CFR 58 Appendix D). Applicable requirements are;

- One CO monitor is required to be collocated with a near road NO_2 in urban areas having a population of 1 million or more. ACHD included a CO monitor in the initial configuration of the Parkway East Near Road monitoring site, which was operational on 09/01/2014.
- One CO monitor is required at each NCORE site. ACHD has operated a CO monitor at the NCORE site in Lawrenceville since 4/1/2010.
- ACHD operates an additional, non-required CO monitor at Flag Plaza. This site is located in the Pittsburgh central business district and the CO monitor is operated to access impact from mobile emissions in this congested area.

(Figure 5.1) 2016 Carbon Monoxide Monitors and Major Roadways

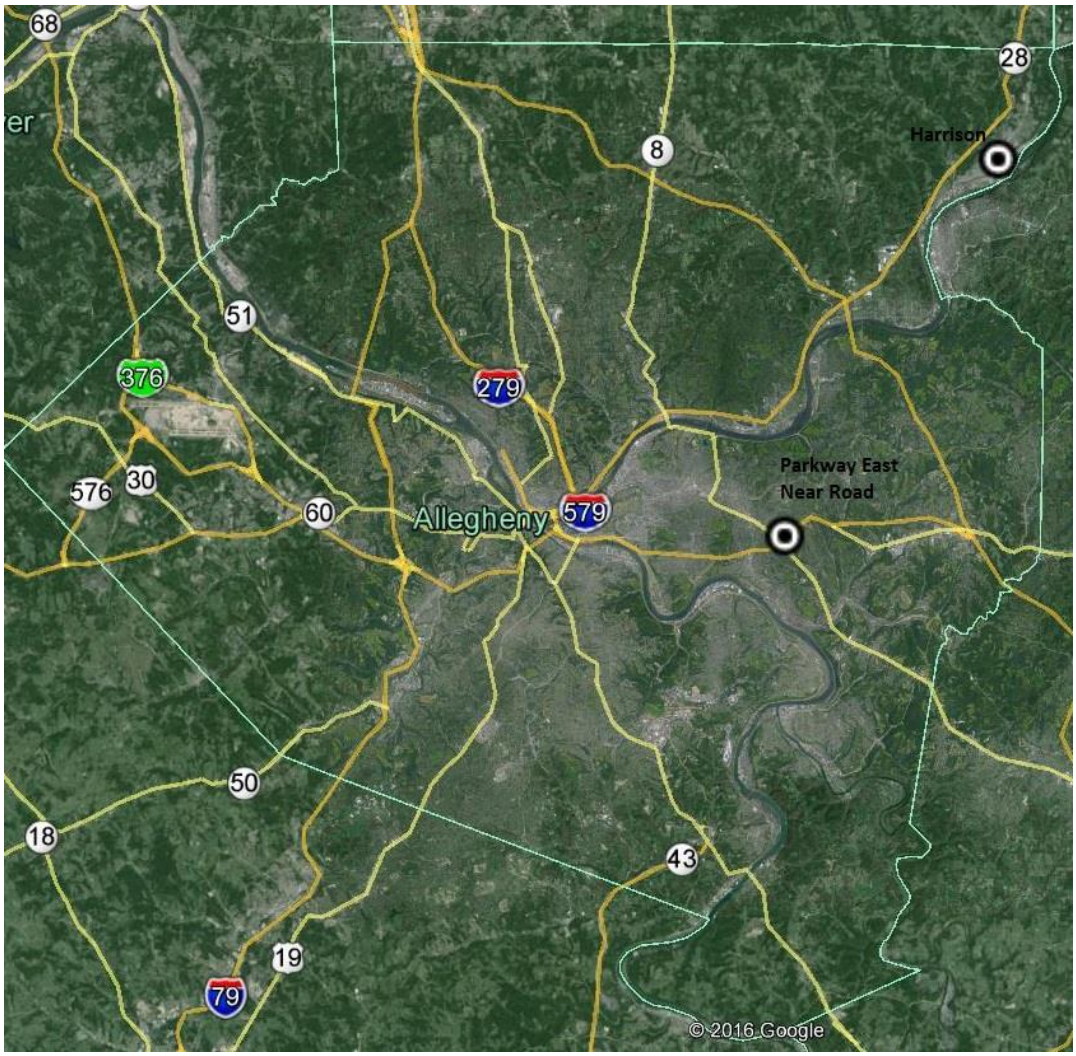


(5.2) Nitrogen Dioxide Monitoring Requirements

On January 22, 2010, EPA strengthened the health-based National Ambient Air Quality Standard (NAAQS) for nitrogen dioxide (NO_2) by setting a new 1-hour NAAQS at 100 ppb. The existing annual average NAAQS of 53 ppb has been retained as well. In addition to establishing a new 1-hour NO_2 NAAQS, EPA revised the NO_2 monitoring requirements in urban areas. Applicable requirements are as follows;

- One near road NO_2 monitoring site is required in MSA's with a population > = 500,000 and < 2,500,000 people. ACHD activated the Parkway East NO_2 near road monitoring site on 09/01/2014.
- One area wide NO_2 monitor in MSA's with a population > 1 million. The Harrison NO_2 monitor has been in operation at the current location since 02/12/2014.

(Figure 5.2) 2016 Nitrogen Dioxide Monitors and Major Roadways

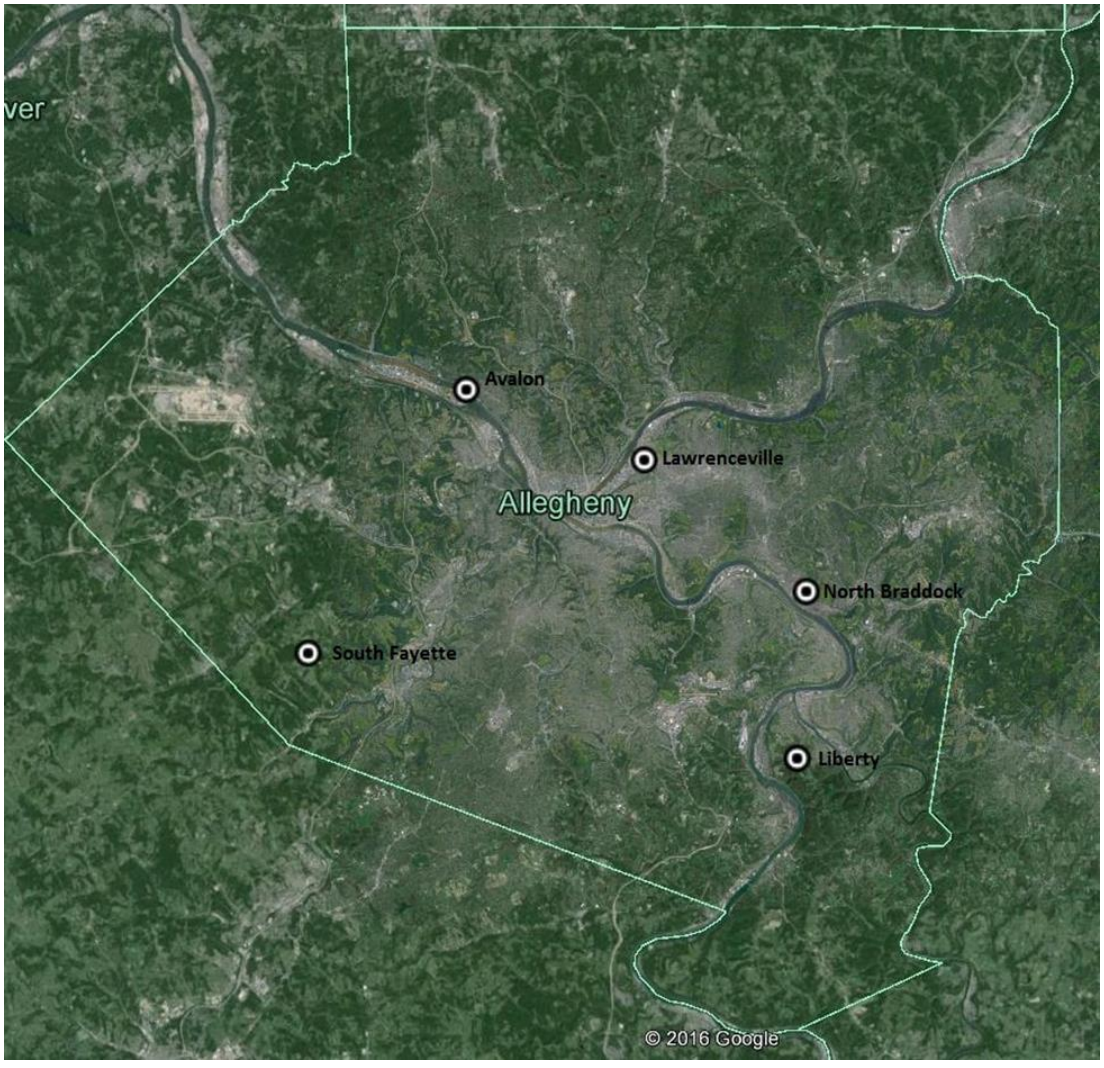


(5.3) Sulfur Dioxide Monitoring Requirements

The minimum number of required SO_2 monitors in each MSA is proportional to the product of the total amount of SO_2 emissions in the MSA and its population as specified in 40 CFR Part 58, Appendix D, Section 4.4. The resulting value is defined as the Population Weighted Emissions Index (PWEI). Using the ACHD 2014 emission inventory aggregate SO_2 emissions and 2010 census data for the Pittsburgh MSA, the PWEI is calculated at 20,096. SO_2 requirements are as follows;

- For any MSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO_2 monitor is required within that CBSA. ACHD exceeds this minimum requirement with a total of five SO_2 monitors.
- Each NCORE station must operate an SO_2 monitor. ACHD included an SO_2 monitor as part of the initial configuration of the Lawrenceville NCORE site and the monitor has been operational since 4/1/2010.

(Figure 5.3) 2016 Sulfur Dioxide Monitors

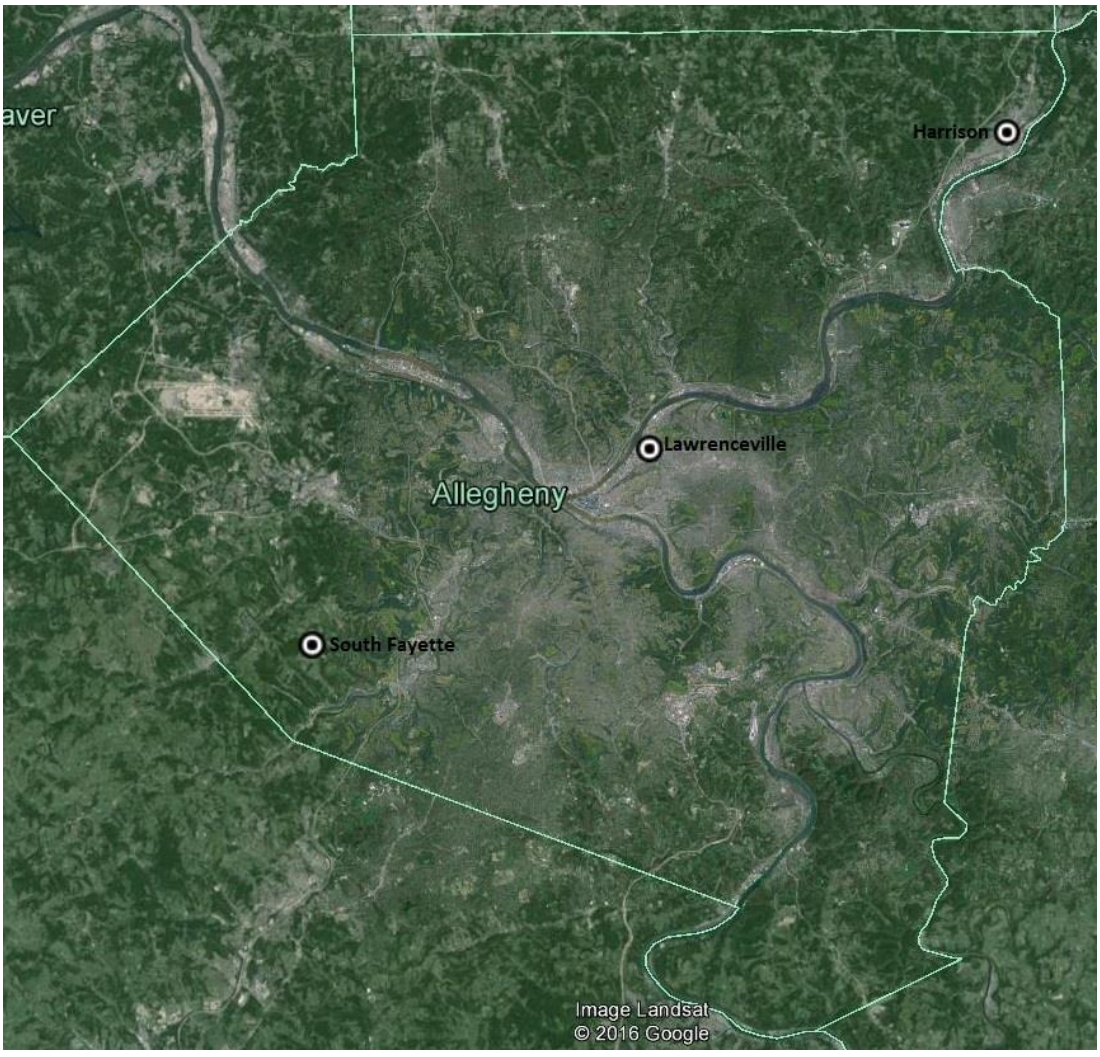


(5.4) Ozone Monitoring Requirements

Ozone monitoring requirements are determined by the MSA population and ozone design value, as specified in Table D-2 of 40 CFR Part 58 Appendix D.

- Based on the population of the Pittsburgh MSA and the fact that the latest ozone design value is greater than 85% of the ozone NAAQS, ACHD is required to operate two ozone monitors. ACHD satisfies this requirement by operating three ozone monitors.
- Each NCORE site must operate an ozone monitor. ACHD satisfies this requirement by operating an ozone monitor at the Lawrenceville NCORE site.
- Within an O_3 network, at least one O_3 site for each MSA must be designed to record the maximum concentration for that particular metropolitan area. The maximum concentration monitor site should be selected in a direction from the city that is most likely to observe the highest O_3 concentrations, more specifically, downwind during periods of photochemical activity. The Harrison monitor is assigned this designation.

(Figure 5.4) 2016 Ozone Monitors

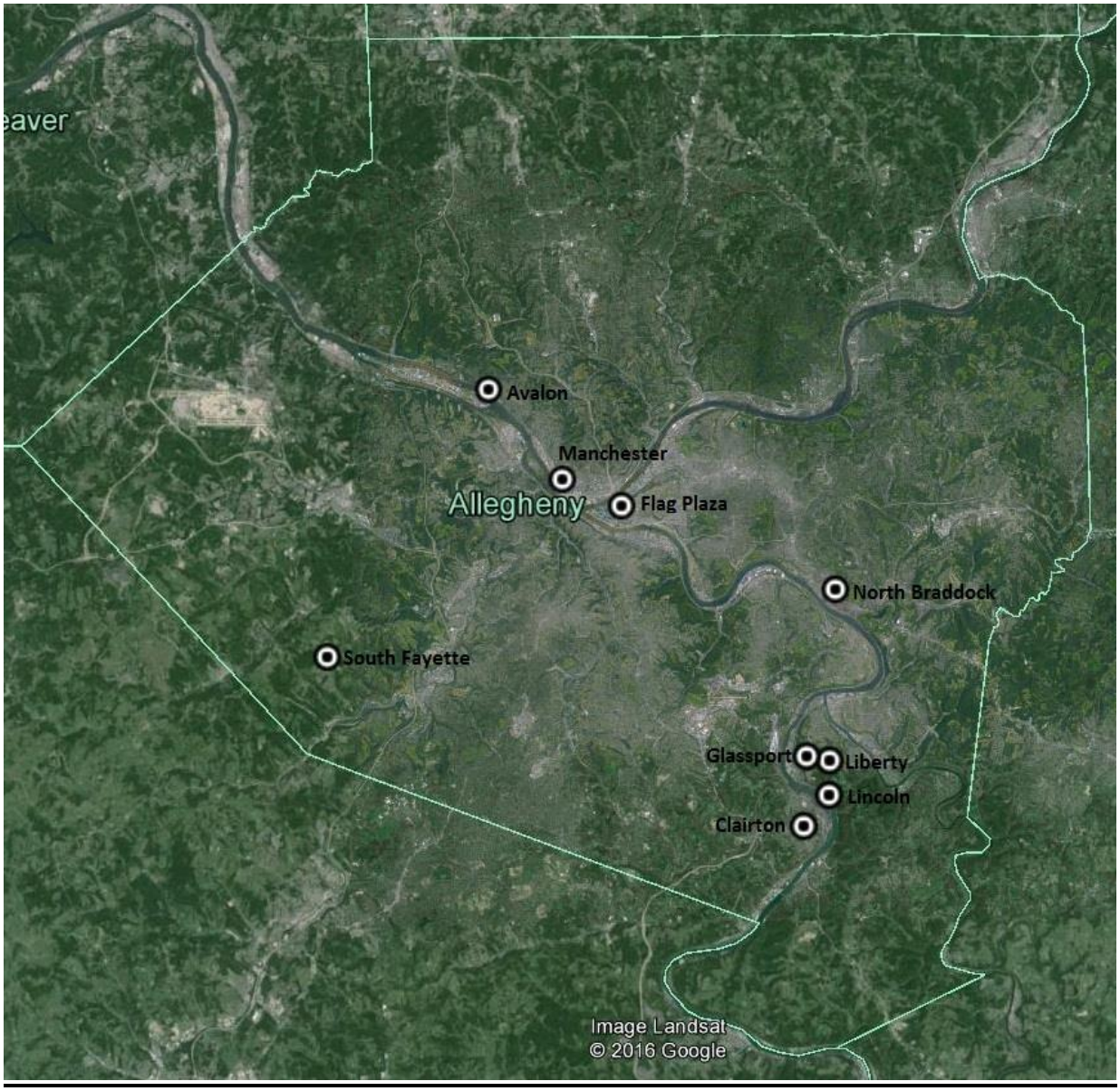


(5.5) PM_{10} Monitoring Requirements

The number of required PM_{10} monitors in each MSA is determined by the MSA population and design value, as specified in Table D-4 of Appendix D to 40 CFR Part 58.

- The Pittsburgh MSA has ambient PM_{10} concentrations well below 80% of the PM_{10} NAAQS. Table D-4 indicates that 2 to 4 sites must monitor for PM_{10}. ACHD exceeds this requirement with 9 sites that monitor PM_{10}.
- A minimum of 15%, or at least one of the PM_{10} monitors must be collocated as specified in 40 CFR Part 58 Appendix A 3.3.1. The Liberty site meets this requirement.

(Figure 5.5) 2016 PM_{10} Monitors



(5.6) $PM_{2.5}$ Monitoring Requirements

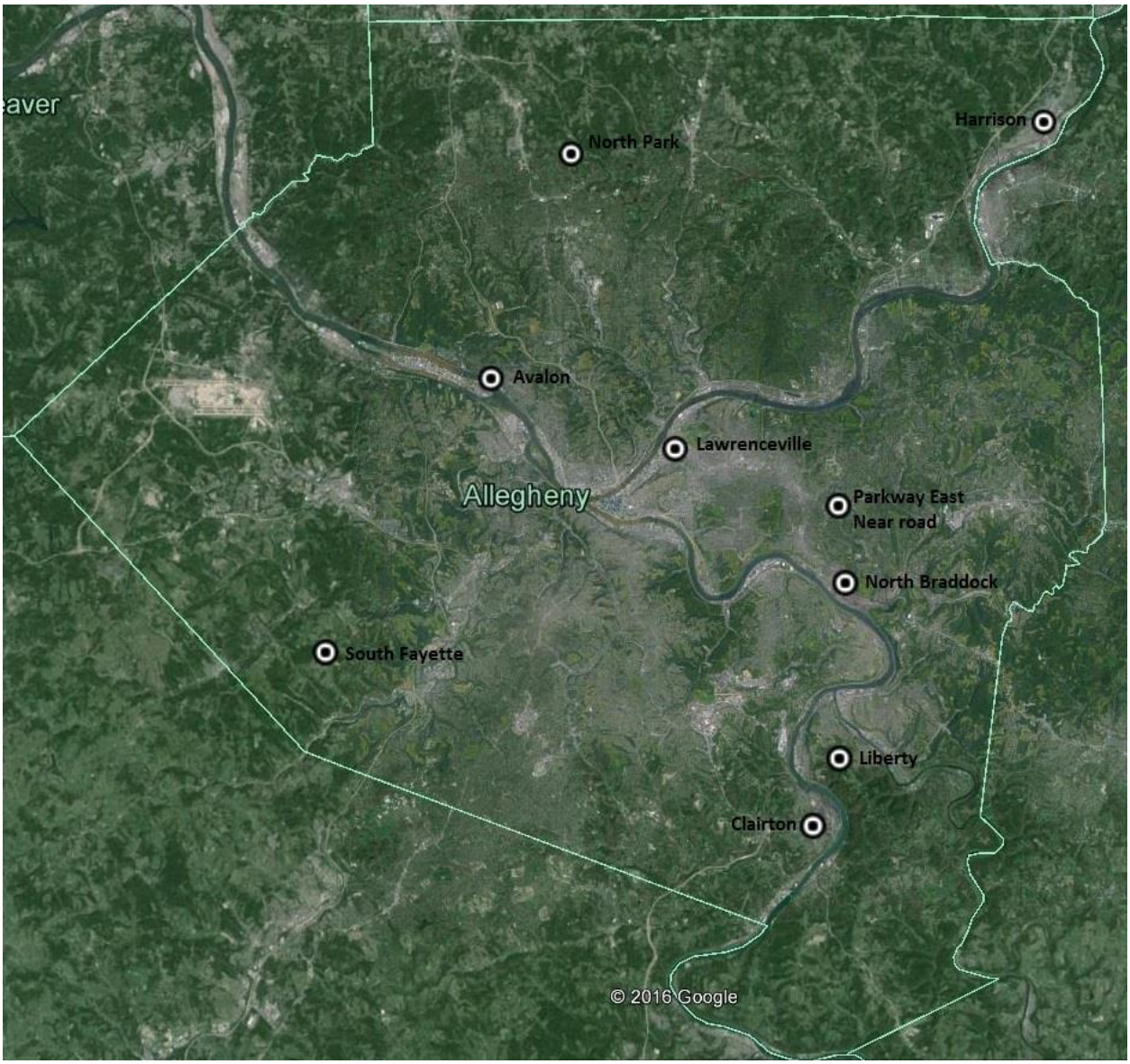
The number of required $PM_{2.5}$ monitors in each MSA is determined by the MSA population and design value, as specified in Table D-5 of Appendix D to 40 CFR Part 58.

- Pittsburgh MSA $PM_{2.5}$ 24 hour and annual design values are > 85% of the NAAQS, requiring a minimum of 3 $PM_{2.5}$ monitor sites. ACHD exceeds this requirement with 9 sites monitoring $PM_{2.5}$.
- A minimum of 15%, or at least one, of the $PM_{2.5}$ monitors must be collocated as specified in 40 CFR Part 58 Appendix A 3.3.1. ACHD exceeds this requirement by having collocated monitors at Liberty and Lawrenceville sites.
- At least one site that features a $PM_{2.5}$ FEM monitor as a primary monitor must also operate a collocated $PM_{2.5}$ FRM sampler (40 CFR Part 58 Appendix A). ACHD does not currently meet this requirement. This requirement will be met during 2017 with the addition of the $PM_{2.5}$ FEM to the Avalon site (see section 3.2.1).
- At least one half of the minimum number of sites per MSA must operate continuous $PM_{2.5}$ monitors, requiring ACHD to operate 2 continuous $PM_{2.5}$ monitors. ACHD operates continuous $PM_{2.5}$ monitors at Liberty, Lawrenceville and Parkway East Near Road sites.
- For MSA's above 1,000,000 people, at least one $PM_{2.5}$ monitor is to be collocated at a near road site. ACHD satisfies this requirement at the Parkway East Near Road site.
- Each monitoring agency shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the $PM_{2.5}$ Speciation Trends Network (STN). ACHD continues to conduct $PM_{2.5}$ speciation at Liberty and Lawrenceville sites.
- Each NCORE site must monitor $PM_{2.5}$. ACHD satisfies this requirement at the Lawrenceville NCORE site.
- The required monitoring sites must be located to represent area-wide air quality. These will typically be either neighborhood or urban scale, although micro or middle scale may be appropriate in some urban areas. At least one monitoring site must be neighborhood scale or greater in an area expected maximum concentration and one site must be sited in an area of poor air quality. Each State shall have at least one $PM_{2.5}$ site to monitor for regional background and at least one $PM_{2.5}$ site to monitor for regional transport. Table 5 shows that ACHD satisfies these requirements.

(Table 5) $PM_{2.5}$ Monitor Scales and Objectives

Site Name	Measurement Scale	Monitor Objective
Lawrenceville	Urban	Population Exposure
Liberty	Neighborhood	Population Exposure, Highest Concentration
North Braddock	Neighborhood	Population Exposure
Harrison Township	Neighborhood	Population Exposure
South Fayette	Neighborhood	Population Exposure, Region Transport, Upwind Background
Clairton	Neighborhood	Population Exposure, Welfare concerns
Avalon	Neighborhood	Population Exposure
North park	Neighborhood	Population Exposure, General Background
Parkway East Near Road	Microscale	Population Exposure, Source Oriented

(Figure 5.6) 2016 $PM_{2.5}$ Monitors

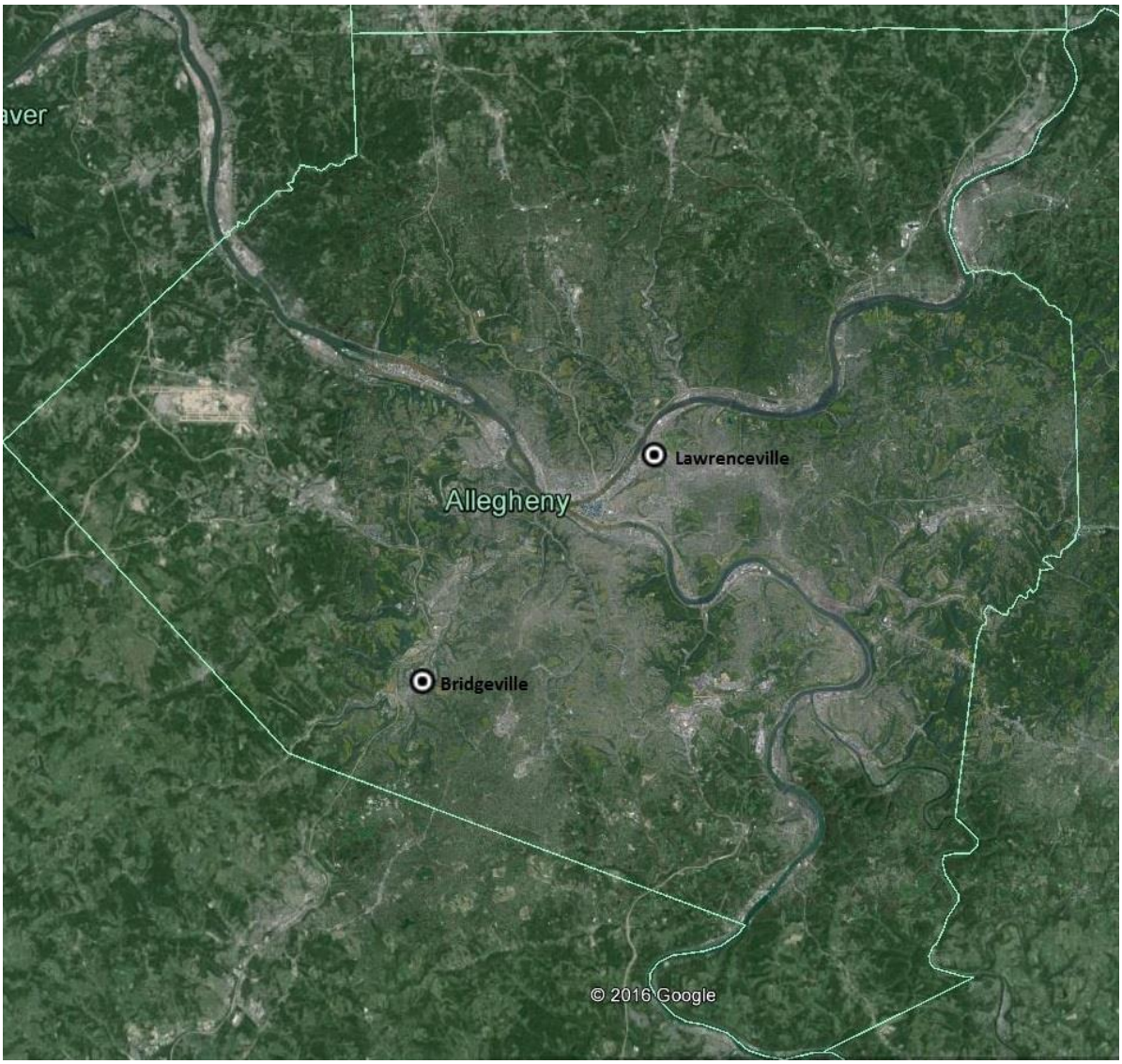


(5.7) Lead Monitoring Requirements

The latest revision to the lead (Pb) NAAQS was finalized on October 15, 2008, lowering the primary and secondary standards from 1.5 µg/m3 to 0.15 µg/m3. Revisions to the lead monitoring regulations were finalized on December 27, 2010. Current applicable network requirements are as follows:

- One source-oriented SLAMS site located to measure the maximum Pb concentration resulting from each non-airport Pb source which emits 0.50 or more tons per year. ACHD satisfies this requirement at the Bridgeville monitoring site.
- A minimum of 15%, or at least one Pb monitor must be collocated as specified in 40 CFR Part 58 Appendix A 3.3.1. The Lawrenceville site meets this requirement.

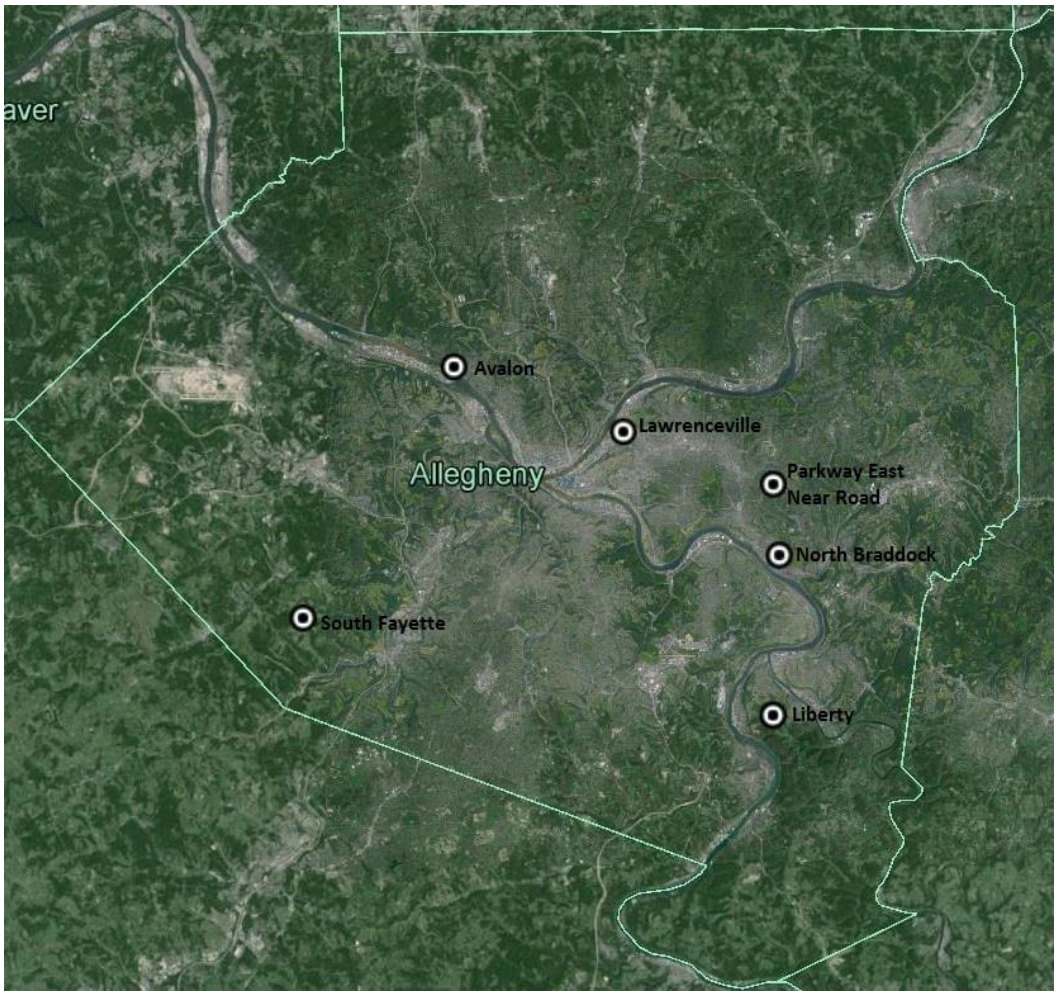
(Figure 5.7) 2016 Lead Monitors



(5.8) Meteorological Parameter Monitoring Requirements

Wind speed, wind direction, barometric pressure and ambient temperature are measure at Parkway East Near Road and Lawrenceville NCORE as required parameters of those sites. Meteorological parameters are also measured at 4 additional sites in the monitoring network.

(Figure 5.8) 2016 Meteorological Sensors



Site Name	AQS #	Wind Speed / Direction 61101	Ambient Temperature 62101	Relative Humidity 62201
Lawrenceville	42-003-0008	X	X	X
Liberty	42-003-0064	X	X	
South Fayette	42-003-0067	X	X	
Avalon	42-003-0002	X	X	
North Braddock	42-003-1301	X	X	
Parkway East	42-003-1376	X	X	X

(6) GLOSSARY OF TERMS AND ABBREVIATIONS

NAAQS	National Ambient Air Quality Standards. These standards apply only to the six criteria pollutants
Criteria Pollutants	Air pollutants considered harmful to public health and the environment (carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, lead, particulate matter PM_{10}, $PM_{2.5}$)
FRM	Federal Reference Method. Primary measurement methods designated by the USEPA for measurement of criteria pollutants and determination of compliance with NAAQS.
FEM	Federal Equivalent Method. Secondary methods approved by the USEPA for measurement of criteria pollutants and determination of compliance with NAAQS.
Hourly	Refers to continuous operating monitors which produce hourly averaged telemetered data.
TSP	Total Suspended Particles. TSP samplers are filter based, operate at a high flow rate and have no particle sizing device. Used as part of the FRM lead monitoring method.
PM_{10}	All suspended particles equal to or smaller than 10 microns.
$PM_{2.5}$	All suspended particles equal to or smaller than 2.5 microns. Also frequently referred to as fine particulates.
PM (coarse)	All suspended particulates smaller than10 microns but larger than 2.5 microns, also often referred to as $PM_{10-2.5}$. EPA has not assigned a NAAQS to this parameter as of the date of this document.
Lead (Pb)	Lead Monitor. Data is obtained by County laboratory analysis of TSP filters. This analysis measures lead that is trapped in suspended particles and is performed according to the federal reference method for lead monitoring.
Speciation	$PM_{2.5}$ speciation monitor. Multiple filter based samples which yield a breakdown of $PM_{2.5}$ composition. Analytes include heavy metals, sulfates, nitrates and various species of carbon. Analysis is conducted by the US EPA national contract lab.
Aethalometer	A continuous monitor designed to measure diesel mobile emissions by quantifying black carbon particles. This is a research instrument and does not determine compliance with NAAQS.
Benzene	C_6H_6. A six carbon aromatic ring known to be a carcinogen. Emitted by mobile and industrial sources in Allegheny County.
SUMMA	Samples collected for 24 hours every six days using an evacuated and purified stainless steel canister. Analysis by EPA method TO-15 for multiple volatile organic compounds is performed by Maryland Department of Environmental Protection.
Carbonyl	Samples collected for 24 hours every six days. Sample media is a DNPH cartridge. Analysis by EPA method TO-11a is performed by the Philadelphia Health Department for formaldehyde and other related carbonyl compounds.
PAMS	Photochemical Assessment Monitoring Stations

GLOSSARY OF TERMS AND ABBREVIATIONS (continued)

WINS	WINS Impactor. Used by the $PM_{2.5}$ reference method sampler to accomplish the final size cut to $PM_{2.5}$ and below. This device is placed in the sample stream and requires the use of a specially designated, low volatility, silicon based oil in the impactor well.
VSCC	Very Sharp Cut Cyclone. An alternate particulate sizing device approved by the EPA for use with $PM_{2.5}$ FRM and FEM monitors. The VSCC is commonly used to accomplish the final $PM_{2.5}$ size cut in continuous particulate monitors. The VSCC features longer service intervals and does not require the use of oil.
CO	Carbon Monoxide. Measured using a continuous automated analyzer.
SO_2	Sulfur Dioxide. Measured using a continuous automated analyzer.
NO_x	Oxides of nitrogen, including nitric oxide and nitrogen dioxide. Measured using a continuous automated analyzer.
NO_y	Total reactive nitrogen. A collective name for oxidized forms of nitrogen in the atmosphere such as nitric oxide (NO), nitrogen dioxide (NO_2), nitric acid (HNO_3), and numerous short lived and reactive organic nitrates, but **not** NH_3. These compounds play important roles in atmospheric ozone and ultra-fine particle formation.
O_3	Ozone. Measured using a continuous automated analyzer.
NCORE	National Core Monitoring Network, consisting of multi-pollutant ambient air monitoring sites, and specializing in $PM_{2.5}$ and associated precursor gases. These sites will be known as "CORE" sites starting 2019.
SPM	Special Purpose Monitor. Monitor not used for comparison against NAAQS. SPM's may be employed for short term studies. Monitors not approved as EPA reference or equivalent methods must be operated as SPM monitors.
TEOM	(Tapered Element Oscillating Microbalance) this technology is used by the Thermo Scientific model 1400ab continuous particulate monitor, which has FEM designation for PM_{10} measurement. This monitor is also used as a $PM_{2.5}$ SPM by adding a VSCC.
BAM	(Beta Attenuation Monitor) this technology is used by the Met One BAM1020 and the Thermo Scientific 5014i continuous particulate monitors, both which have FEM designation for PM_{10} measurement, and for $PM_{2.5}$ measurement with the addition of a VSCC particle sizing device.
Sonic Anemometer	A method to measure wind speed and wind direction that uses ultrasonic sound waves to precisely measure wind speed and wind direction. This method features much better accuracy, sensitivity and longevity as compared to the traditional "cup and vane" wind sensing method. The sonic anemometers utilized by the department are heated to avoid ice accumulation on the sensors.
AADT	Annual Average Daily Traffic count. This is the unit of measure used in this report to indicate vehicular traffic density as received from Penn Dot (Pennsylvania Department of Transportation), and represents the daily two-way traffic count averaged over a calendar year for the indicated roadway segment. The year that the data was collected is included for each count.

(7) AIR MONITORING NETWORK DESCRIPTION INTRODUCTION

The following air monitoring network description discusses each monitoring site in detail. The first information block is labeled with the site name. Inside of the block is listed site specific information as follows:

- **Street Address**
- **AQS #** - unique 9-digit number used to identify the site in the national data base.
- **Municipality** where site is located.
- **MSA**- Metropolitan Statistical Area.
- **Latitude (N), Longitude (W)** – Site coordinates, given in WGS84 datum coordinates.
- **Comments**- Specific site information of importance.

The next blocks are designed to list details of each monitor at the site. Each monitor present at the time of the review is assigned its own block. The following information is listed:

Sensor Type – The name of the pollutant measured by the sampler.

Sensor Network Designation – The name of the designated network:

- SLAMS - State or Local Ambient Air Monitor that has EPA reference or equivalent method designation
- OTHER – Monitor that does not have EPA designated reference or equivalent status

Sensor Purpose Description– The purpose of the sensor:

- Population Exposure, such as the Air Quality Index
- Regulatory Compliance with Federal or State regulation
- Research/Scientific Monitoring
- Specific Location Characterization
- Quality Assurance (Collocated)

Sample Frequency – Specifies how often a sample is taken.

- Continuous (also referred to as "Hourly") - operates 24/7; applies predominately to gaseous analyzers, although some particulate samplers (TEOM, BAM, Aethalometer) operate continuously.
- Daily – a discrete sample is taken every day; applies to manual method particulate samplers.
- Every Third Day - Manual method particulate samplers that run every third day.
- Every Sixth Day – Manual method particulate or toxics samplers that run every sixth day.

Appendix A QA Assessment – A "**YES**" indicates the sensor is maintained in accordance with the Quality Assurance (QA) requirements specified in 40 CFR Part 58, Appendix A.

Monitor Start Date – Specifies the start date of monitoring classified by the current AQS parameter code. Note that AQS method codes may change after this date, usually due to a change of manufacturer or monitor model that share AQS parameter codes.

Appendix C Monitoring Classification – Each ambient air monitor is classified using the EPA "List of Designated Reference and Equivalent Methods"

- Reference Method – a method of sampling that is specified in 40CFR53.
- Equivalent Method – a method that is designated as equivalent to the reference method, in accordance with 40CFR53.
- Automated – after sampling, the analysis results are available immediately.
- Manual - after sampling, a separate analysis at a laboratory is necessary.
- N/A – appears where there is no reference or equivalent method.

Appendix C Monitoring Method – Each ambient air monitor is classified by a specific method number. For detailed descriptions of each method number listed in this review, please follow the link below to access the EPA's Technology Transfer Network (file size 492 kb).

http://www.epa.gov/ttn/amtic/files/ambient/criteria/reference-equivalent-methods-list.pdf

Monitoring Method Description – Table 7 provides details about each type of sampler and analyzer utilized in the air monitoring network

(Table 7) Monitoring Methods

Parameter	Mfg	Model #	Parameter Code	Method Code	Description
$PM_{2.5}$ FRM	R&P	2025	88101	145	Low Volume Sampler (filter)
$PM_{2.5}$ FEM	Thermo	5014i	88101	183	Beta Attenuation Instrumental
	Met One	1020	88101	170	Beta Attenuation Instrumental
$PM_{2.5}$ (AQI)	R&P	1400	88501/88502	716/717	Gravimetric Instrumental (TEOM)
PM_{10} FRM	Tisch	TE-6070	81102	141	High Volume Sampler (filter)
	GMW	1200	81102	63	High Volume Sampler (filter)
PM_{10} FEM	R&P	1400	81102	79	Gravimetric Instrumental (TEOM)
	Met One	1020	81102	122	Beta Attenuation Instrumental
$PM_{2.5}$ Speciation	Met One SASS	SASS	multiple	812	Trace metals, Sulfate, Nitrate
	URG	3000N	multiple	812	Organic/Inorganic Carbon
PM coarse	Met One	1020 (pair)	86101	185	Beta Attenuation Instrumental

(Table 7) Air Monitoring Methods, continued

Parameter	Mfg	Model #	Parameter Code	Method Code	Description
Lead	Tisch	TE-5170 TSP	14129	803	Atomic Absorption / Flame AA
	Tisch	TE-5170 TSP	14129	191	Inductively Coupled Plasma Mass Spectrometry
Carbon Monoxide	TAPI	300A/E	42101	93	Gas Filter Correlation
Carbon Monoxide (trace)	TAPI	300 EU	42101	593	Gas Filter Correlation
Nitrogen Oxide	TAPI	200A/E	42601	99	Chemiluminescence
Nitrogen Dioxide	TAPI	200A/E	42602	99	Chemiluminescence
Oxides of Nitrogen	TAPI	200A/E	42603	99	Chemiluminescence
Nitrogen Oxide (trace)	TAPI	200EU	42601	599	Chemiluminescence
Nitrogen Dioxide (trace)	TAPI	200EU	42602	599	Chemiluminescence
Oxides of Nitrogen (trace)	TAPI	200EU	42603	599	Chemiluminescence
Reactive Oxides of Nitrogen (NOy)	TAPI	200EU/501	42600	699	Chemiluminescence
NOy - NO	TAPI	200EU/501	42612	699	Chemiluminescence
Sulfur Dioxide	Ecotech	9850	42401	92	Ultra Violet Fluorescent
	Thermo	43i	42401	60	Ultra Violet Fluorescent
Sulfur Dioxide (trace)	TAPI	100EU	42401	600	Pulsed Fluorescent
Ozone	Ecotech	10	44201	187	Ultra Violet Absorption
	Thermo	49	44201	47	Ultra Violet Absorption
Black Carbon	TAPI	633	84313	894	Aethalometer Instrumental
Air Toxics (VOC)	na	na	multiple	150	6 liter SS canister / TO-15 lab analysis
AIR Toxics (Carbonyl)	na	na	multiple	102	DNPH cartridge / TO-11 lab analysis
Wind Speed	Met One	50.5	61101	61	Sonic Anemometer
Wind Direction	Met One	50.5	61102	61	Sonic Anemometer
Temperature	Met One	083D	62101	61	Temp/RH Probe
	Climatronics	100093	62101	40	Temperature Probe
Relative Humidity	Met One	083D	62201	61	Temp/RH Probe

Appendix D Design Criteria – Appendix D requires a certain number of samplers per geographic area. A "**YES**" indicates that the number of monitors in that particular area meets or exceeds the requirement of 40 CFR Part 58 Appendix D.

Appendix D Scale – The specific "spatial scales of representation" describes the physical dimensions of the air parcel around the monitoring station throughout which actual pollutant concentrations are reasonably similar.

- Microscale - Areas with dimensions up to about 100 meters
- Middle scale - Areas with dimensions from 100 meters to 0.5 kilometers
- Neighborhood - Areas with dimensions from 0.5 to 4.0 kilometers, and uniform land use
- Urban scale - Areas with dimensions from 4 to 50 kilometers
- Regional - Areas with dimensions ranging from tens to hundreds of kilometers and usually a rural area of reasonably homogeneous geography without large sources
- National and Global Scales - Measurement scales that represent concentrations characterizing the nation and the globe as a whole.

Appendix D Objective – Describes the purpose/objective for monitoring at a site.

- Extreme Downwind
- General/Background Concentration
- Highest Concentration
- Maximum Ozone Concentration
- Maximum Precursor Emissions
- Population Exposure
- Regional Transport
- Source Oriented
- Quality Assurance
- Welfare Related

Appendix E Siting Criteria – Describes certain criteria applicable to ambient air quality sampling probes and monitoring paths, such as distances from trees, obstructions, traffic lanes, etc. A "**YES**" indicates that the sensor at the given site meets or exceeds the requirements of 40 CFR Part 58 Appendix E.

(8) Detailed Air Monitoring Site Descriptions

(8.1) Lawrenceville

Address	Allegheny County Health Department 301 39th Street Pittsburgh, PA 15201		
AQS#	42-003-0008	MSA	Pittsburgh
Latitude (N)	40.465420	Longitude (W)	-79.960757
Comments	This is a population-based, community oriented monitoring site that is located in a suburban area downwind of Central Business District. The Lawrenceville monitoring site was selected as a $PM_{2.5}$ National Trends Site, later as an NCORE site and as the candidate for expansion to a PAMS site in 2019. The most significant local pollution is generated from mobile sources, but light industry scattered throughout the area is also a contributing factor. Lawrenceville is a core $PM_{2.5}$ site that is used to determine compliance with national standards.		

Sensor Type	**Ozone**	Appendix C Method Code	187
Network Designation	SLAMS	Probe Height (m)	12
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Urban
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/1/1978	Appendix E Siting Criteria	Yes

Sensor Type	**$PM_{10-2.5}$ (coarse)**	Appendix C Method Code	185
Network Designation	Other / (NCORE)	Probe Height (m)	12
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Urban
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	4/1/2011	Appendix E Siting Criteria	Yes

Lawrenceville, continued

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	170
Network Designation	SLAMS	Probe Height (m)	12
Purpose	Regulatory Compliance / AQI Reporting	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Urban
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	08/07/2015	Appendix E Siting Criteria	Yes

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height (m)	12
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Daily	Appendix D Scale	Urban
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	02/23/1999	Appendix E Siting Criteria	Yes

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height (m)	12
Purpose	QA/Co-located Monitor	Appendix D Design Criteria	Yes
Sample Frequency	Every six days	Appendix D Scale	Urban
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure / Quality Assurance
Monitor Start Date	1/1/2005	Appendix E Siting Criteria	Yes

Sensor Type	**$PM_{2.5}$ Speciation**	Appendix C Method Code	multiple
Network Designation	Other (CSN)	Probe Height (m)	12
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	Yes
Sample Frequency	Every Three Days	Appendix D Scale	Not Assigned
Appendix A QA Assessment	Yes	Appendix D Objectives	Unknown
Monitor Start Date	6/30/2001	Appendix E Siting Criteria	Yes

Lawrenceville, continued

Sensor Type	**Carbon Monoxide**	Appendix C Method Code	593
Network Designation	SLAMS	Probe Height (m)	12
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	4/1/2010	Appendix E Siting Criteria	Yes

Sensor Type	**Sulfur Dioxide**	Appendix C Method Code	600
Network Designation	SLAMS	Probe Height (m)	12
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	4/1/2010	Appendix E Siting Criteria	Yes

Sensor Type	**Total Oxides of Nitrogen (NO_y)**	Appendix C Method Code	699
Network Designation	Other (NCORE)	Probe Height (m)	12
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	4/2/2010	Appendix E Siting Criteria	Yes

Sensor Type	**Lead (Pb)**	Appendix C Method Code	191
Network Designation	SLAMS	Probe Height (m)	12
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Urban
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	4/21/2011	Appendix E Siting Criteria	Yes

Lawrenceville, continued

Sensor Type	**Lead (Pb)**	Appendix C Method Code	191
Network Designation	SLAMS	Probe Height (m)	12
Purpose	QA/Co-located Monitor	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Urban
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure / Quality Assurance
Monitor Start Date	4/21/2011	Appendix E Siting Criteria	Yes

(8.1.1) Lawrenceville Area Information

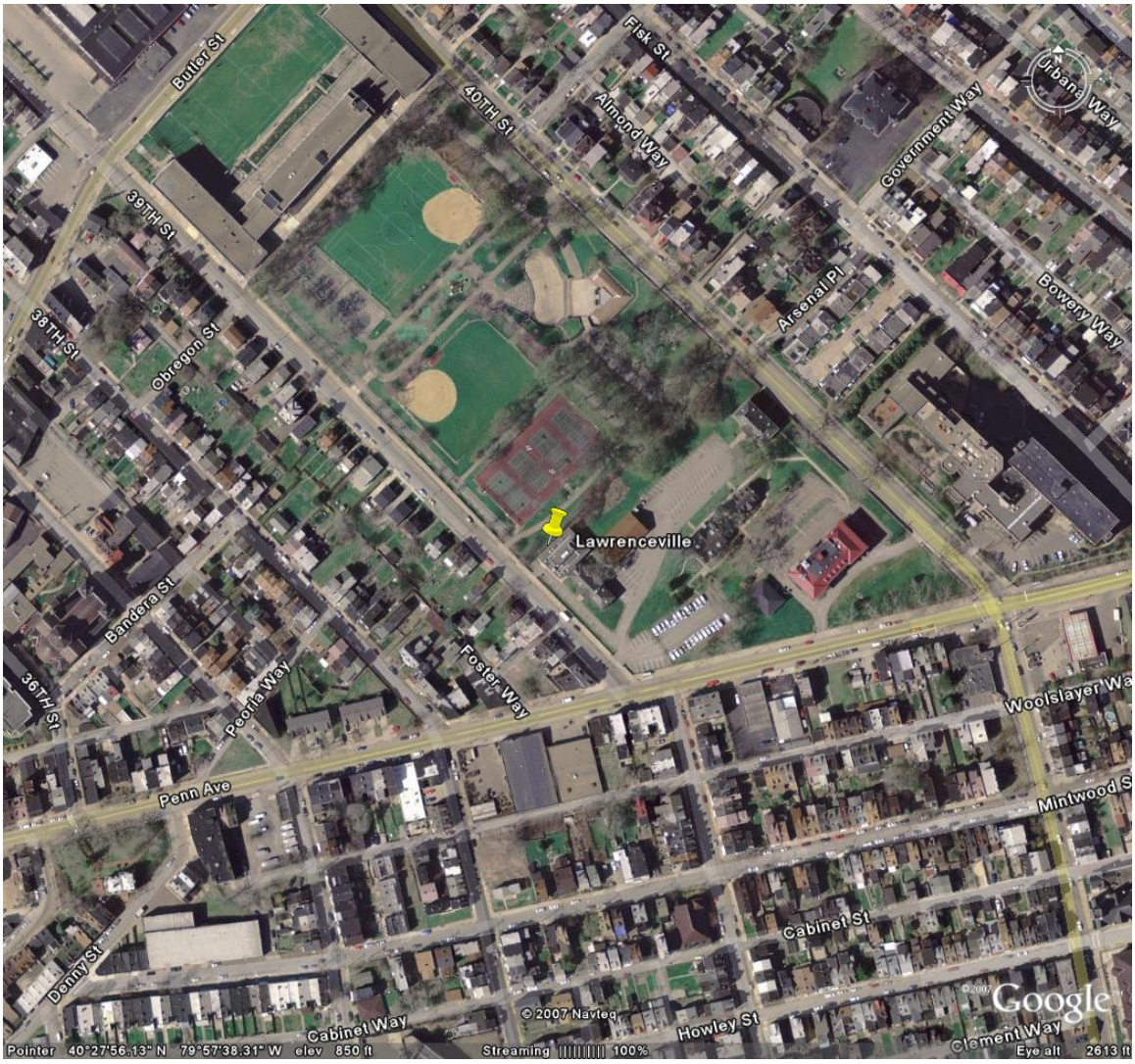
Street Name	Traffic Count (AADT)
39th Street (20 m)	Unavailable
Penn Avenue (86 m)	7,785 (PennDot 2015)
Butler Street (343 m)	7371 (PennDot 2014)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Residential
West	Residential

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South	Wall	1	2 to 3 m
West			

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North		Flat
East		Flat
South		Flat
West		Flat

(Figure 8.1) Lawrenceville Location Map



(8.2) Liberty

Address	South Allegheny High School 2743 Washington Blvd McKeesport, PA 15133		
AQS#	42-003-0064	MSA	Pittsburgh
Latitude (N)	40.323768	Longitude (W)	-79.868062
Comments	This site is in a suburban area about 3 km downwind of the US Steel Clairton Coke Works, which is a major source of particulate matter, precursor gases, sulfur dioxide and air toxics. The area around this monitoring site has a long history of higher than average levels of $PM_{2.5}$, PM_{10} and sulfur dioxide. Significant ambient levels of benzene have also been measured and documented at this site. Liberty is a core $PM_{2.5}$ site that is used to determine compliance with national standards. At the request of US Steel, telemetry devices have been installed on the PM_{10}, $PM_{2.5}$, and SO_2 monitors that transmit continuous readings via radio signals to a location within the US Steel facility. Other transmitters are also in use at the Lincoln PM_{10} monitor (site # 7.3), Glassport PM_{10} monitor (site # 7.4) and North Braddock SO_2 monitor and sonic anemometer (site # 7.5). This real-time data allows US Steel to minimize fugitive emissions and to adjust production levels to keep particulate levels and gaseous emissions within allowable ambient levels in downwind communities.		

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	716 / 717
Network Designation	Other (AQI)	Probe Height (m)	8
Purpose	Population Exposure	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	11/19/1999	Appendix E Siting Criteria	Yes

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Daily	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure, Highest Concentration
Monitor Start Date	1/23/1999	Appendix E Siting Criteria	Yes

Liberty, continued

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height (m)	8
Purpose	QA/Co-located Monitor	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Quality Assurance
Monitor Start Date	1/1/2005	Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10}**	Appendix C Method Code	79
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/1/1992	Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10}**	Appendix C Method Code	141
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Three Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/1/2005	Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10}**	Appendix C Method Code	63
Network Designation	SLAMS	Probe Height (m)	8
Purpose	QA/Co-located Monitor	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure / Quality Assurance
Monitor Start Date	4/21/1987	Appendix E Siting Criteria	Yes

Liberty, Continued

Sensor Type	**Sulfur Dioxide**	Appendix C Method Code	600
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/1/1969	Appendix E Siting Criteria	Yes

Sensor Type	**$PM_{2.5}$ Speciation**	Appendix C Method Code	Multiple
Network Designation	Other (CSN)	Probe Height (m)	8
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Unassigned
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure, Source Oriented
Monitor Start Date	10/6/2003	Appendix E Siting Criteria	Yes

(8.2.1) Liberty Area Information

Street Name	Traffic Count (AADT)
Washington Blvd. (283 m)	2080 (PennDot 2013)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Residential
West	Residential

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South			
West			

Liberty Area Information, continued

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North	Valley	Rough
East		Rolling
South	Valley	Rolling
West		Rolling

(Figure 8.2) Liberty Location Map

(8.3) Lincoln

Address	Bellbridge Road Elizabeth, PA 15037		
AQS#	42-003-7004	MSA	Pittsburgh
Latitude (N)	40.308219	Longitude (W)	- 79.869134
Comments	Located at an elevated location, directly across the Monongahela River and downwind from the US Steel Clairton Coke Works. Although this area is not populated, it is upwind of populated areas and it is modeled to be the maximum impact area of air emissions from the plant.		

Sensor Type	**PM_{10}**	Appendix C Method Code	79
Network Designation	SLAMS	Probe Height (m)	5
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Middle
Appendix A QA Assessment	Yes	Appendix D Objectives	Highest Concentration
Monitor Start Date	1/15/1993	Appendix E Siting Criteria	Yes

(8.3.1) Lincoln Area Information

Street Name	Traffic Count (AADT)
Lincoln Blvd. (238 m)	6931 (PennDot 2014)
Bellbridge Rd. (428 m)	2203 (PennDot 2014)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Industrial
West	Industrial

Lincoln Area Information, continued

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South			
West			

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North	Valley	Rolling
East	Valley	Rolling
South	Hills	Rough
West	River	Rough

(Figure 8.3) Lincoln Location Map

(8.4) Glassport

Address	Water Tower on High Street Glassport, PA 15045		
AQS#	42-003-3006	MSA	Pittsburgh
Latitude (N)	40.32600	Longitude (W)	-79.881703
Comments	Located in a residential area, this site is population oriented, and is impacted by the US Steel Clairton Coke Works, the Irvin Works and other sources in the Monongahela river valley. Glassport High Street is the site of the County's last documented exceedance of the federal 24-hour PM_{10} standard of 150 ug/m^3 (October of 1997).		

Sensor Type	**PM_{10}**	Appendix C Method Code	79
Network Designation	SLAMS	Probe Height (m)	2
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/6/1995	Appendix E Siting Criteria	Yes

(8.4.1) Glassport Area Information

Street Name	Traffic Count (AADT)
High Street (8m)	Unavailable
Scenic Street (53m)	Unavailable
Washington Blvd (140m)	2080 (PennDot 2013)
Pacific Ave. (202m)	4450 (PennDot 2012)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Residential
West	Residential

Glassport Area Information, continued

Direction	Obstructions	Height (m)	Distance (m)
North	Water Tower	25	9
East			
South			
West			

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North		Flat
East		Flat
South		Flat
West		Flat

(Figure 8.4) Glassport Location Map

(Figure 7.4.1) Liberty, Lincoln and Glassport Location Map

(7.5) North Braddock

Address	North Braddock Borough Building 600 Anderson Street Braddock, Pa 15104		
AQS#	42-003-1301	MSA	Pittsburgh
Latitude (N)	40.402328	Longitude (W)	-79.860973
Comments	This suburban site is population oriented. The area around this site is impacted by the US Steel Edgar Thomson Works, which is a large steel production facility, and is located about 1.5 km away from the monitoring site. North Braddock is a core $PM_{2.5}$ site that is used to determine compliance with national standards.		

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height (m)	7
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Three Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/30/1999	Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10}**	Appendix C Method Code	122
Network Designation	SLAMS	Probe Height (m)	7
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/1/2011	Appendix E Siting Criteria	Yes

Sensor Type	**Sulfur Dioxide**	Appendix C Method Code	92
Network Designation	SLAMS	Probe Height (m)	7
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/1/2014	Appendix E Siting Criteria	Yes

(7.5.1) North Braddock Area Information

Street Name	Traffic Count (AADT)
Bell Avenue (13 m)	2882 (PennDot 2012)
Anderson St. (40 m)	Unavailable
Braddock Ave. (370 m)	6349 (PennDot 2015)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Residential, Industry
West	Residential

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South			
West			

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North	Hills	Rolling
East	Hills	Rolling
South	River	Rolling
West		Rolling

(Figure 7.5) North Braddock Location Map

(7.6) Harrison

Address	Highlands Senior High School 1500 Pacific Avenue Natrona Heights, PA 15065		
AQS#	42-003-1008	MSA	Pittsburgh
Latitude (N)	40.617488	Longitude (W)	-79.727664
Comments	This suburban site is population-based and community oriented. Harrison is a core $PM_{2.5}$ site that is used to determine compliance with national standards. Harrison is also an important ozone monitoring site that is positioned downwind of the Pittsburgh Central Business District.		

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Three Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	2/13/1999	Appendix E Siting Criteria	Yes

Sensor Type	**Ozone**	Appendix C Method Code	47
Network Designation	SLAMS	Probe Height (m)	10
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Urban
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	2/12/2014	Appendix E Siting Criteria	No

Sensor Type	**Oxides of Nitrogen**	Appendix C Method Code	99
Network Designation	SLAMS	Probe Height (m)	10
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	2/12/2014	Appendix E Siting Criteria	No

(7.6.1) Harrison Area Information

Street Name / Distance	Traffic Count (AADT)
Idaho Ave (31m)	Unavailable
Pacific Ave (103m)	Unavailable
Freeport Road (326 m)	8018 (PennDot 2008)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Residential
West	Industrial

Direction	Obstructions	Height (m)	Distance (m)
North	Wall	3	20
East			
South			
West			

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North		Flat
East		Rough
South	Valley	Rough
West	Valley	Rolling

(Figure 7.6) Harrison Location Map

(7.7) South Fayette

Address	South Fayette Elementary School 3640 Old Oakdale Road McDonald, PA 15057		
AQS#	42-003-0067	MSA	Pittsburgh
Latitude (N)	40.375644	Longitude (W)	-80.169943
Comments	This suburban site is population-based and is the regional transport site for ozone and $PM_{2.5}$. Location in the western portion of the county makes this an excellent site to access pollution levels entering the County on prevailing winds. South Fayette is a core $PM_{2.5}$ site that is used to determine compliance with national standards.		

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Three Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure, Regional Transport, Upwind Background
Monitor Start Date	1/1/1995	Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10}**	Appendix C Method Code	63
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	General/Background
Monitor Start Date	3/27/1987	Appendix E Siting Criteria	Yes

Sensor Type	**Sulfur Dioxide**	Appendix C Method Code	92
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Regional
Appendix A QA Assessment	Yes	Appendix D Objectives	General/Background
Monitor Start Date	7/1/1980	Appendix E Siting Criteria	Yes

South Fayette, continued

Sensor Type	**Ozone**	Appendix C Method Code	187
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Regional
Appendix A QA Assessment	Yes	Appendix D Objectives	General/Background, Regional Transport
Monitor Start Date	1/1/1980	Appendix E Siting Criteria	Yes

(7.7.1) South Fayette Area Information

Street Name / Distance	Traffic Count (AADT)
Old Oakdale Rd. (142m)	Unavailable
Cannongate Dr. (377m)	Unavailable
Battle Ridge Rd. (554m)	5194 (PennDot 2014)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Agriculture
West	Agriculture

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South			
West			

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North		Rolling
East		Rolling
South		Rolling
West		Rolling

(Figure 7.7) South Fayette Location Map

(7.8) Clairton

Address	Clairton Education Center 501 Waddel St, Clairton, PA 15025		
AQS#	42-003-3007	MSA	Pittsburgh
Latitude (N)	40.294341	Longitude (W)	-79.885331
Comments	This is a population-oriented, suburban site that is located within an environmental justice area. Site selection was based on this location being on the edge of the Monongahela Valley, generally upwind of the Clairton Coke Works. During times of temperature inversions and atypical wind direction, the Coke Works and other sources in the Monongahela River valley impact this site.		

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Population Exposure	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure, Welfare Concerns
Monitor Start Date	1/1/2001	Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10}**	Appendix C Method Code	141
Network Designation	SLAMS	Probe Height (m)	8
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure, Welfare Concerns
Monitor Start Date	4/8/1992	Appendix E Siting Criteria	Yes

(7.8.1) Clairton Area Information

Street Name / Distance	Traffic Count (AADT)
Large Ave (29m)	Unavailable
Waddell Ave. (64m)	Unavailable
6th St. (144m)	Unavailable
Saint Clair Ave. (158m)	1763 (PennDot 2012)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Commercial
West	Residential

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South			
West			

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North	valley	rolling
East	valley	rolling
South		flat
West	valley	rolling

(Figure 7.8) Clairton Location Map

(7.9) Avalon

Address	520 Orchard Ave. Avalon, PA 15202		
AQS#	42-003-0002	MSA	Pittsburgh
Latitude (N)	40.499767	Longitude (W)	-80.071337
Comments	This is a population-oriented, suburban site that was previously impacted by the upwind PM and SO_2 source known as Shenango Coke Works. Historically, a large number of odor and air pollution complaints were received by the Department from communities near this monitoring site. However, Shenango Coke Works permanently ceased operations during January 2016. Avalon is a core $PM_{2.5}$ site that is used to determine compliance with national standards.		

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height (m)	5
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Three Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	6/8/2011	Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10}**	Appendix C Method Code	141
Network Designation	SLAMS	Probe Height (m)	5
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	6/6/1985	Appendix E Siting Criteria	Yes

Sensor Type	**Sulfur Dioxide**	Appendix C Method Code	60
Network Designation	SLAMS	Probe Height (m)	5
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/1/2006	Appendix E Siting Criteria	Yes

(7.9.1) Avalon Area Information

Street Name / Distance	Traffic Count (AADT)
Spruce St. (7m)	Unavailable
Orchard Ave. (33m)	Unavailable
South Birmingham Ave. (50m)	Unavailable
Ohio River Blvd. (59m)	14,140 (PennDot 2012)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Commercial
West	Residential

Direction	Obstructions	Height (m)	Distance (m)
North	Building	2	30
East	Building	4	20
South	Building	3	43
West	Building	4	15

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North	Hill	Rolling
East		Flat
South	River	Flat
West		Flat

(Figure 7.9) Avalon Location Map

(7.10) Flag Plaza

Address	Boy Scouts of America Building 1275 Bedford Avenue Pittsburgh, PA 15219		
AQS#	42-003-0031	MSA	Pittsburgh
Latitude (N)	40.443367	Longitude (W)	-79.990293
Comments	This is an urban-based monitoring site that is located on the edge of Central Business District. In respect to prevailing winds, it is positioned downwind of Central Business District and upwind of a densely populated environmental justice area.		

Sensor Type	**PM_{10}**	Appendix C Method Code	70
Network Designation	SLAMS	Probe Height (m)	10
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	4/26/1992	Appendix E Siting Criteria	Yes

Sensor Type	**Carbon Monoxide**	Appendix C Method Code	93
Network Designation	SLAMS	Probe Height (m)	10
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	5/5/2003	Appendix E Siting Criteria	Yes

Sensor Type	**Air Toxics**	Appendix C Method Code	150
Network Designation	Other	Probe Height (m)	10
Purpose	Population Exposure	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/1/1995	Appendix E Siting Criteria	Yes

Flag Plaza, Continued

Sensor Type	**Air Toxics**	Appendix C Method Code	102
Network Designation	Other	Probe Height (m)	10
Purpose	Population Exposure	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/1/1995	Appendix E Siting Criteria	Yes

(7.10.1) Flag Plaza Area Information

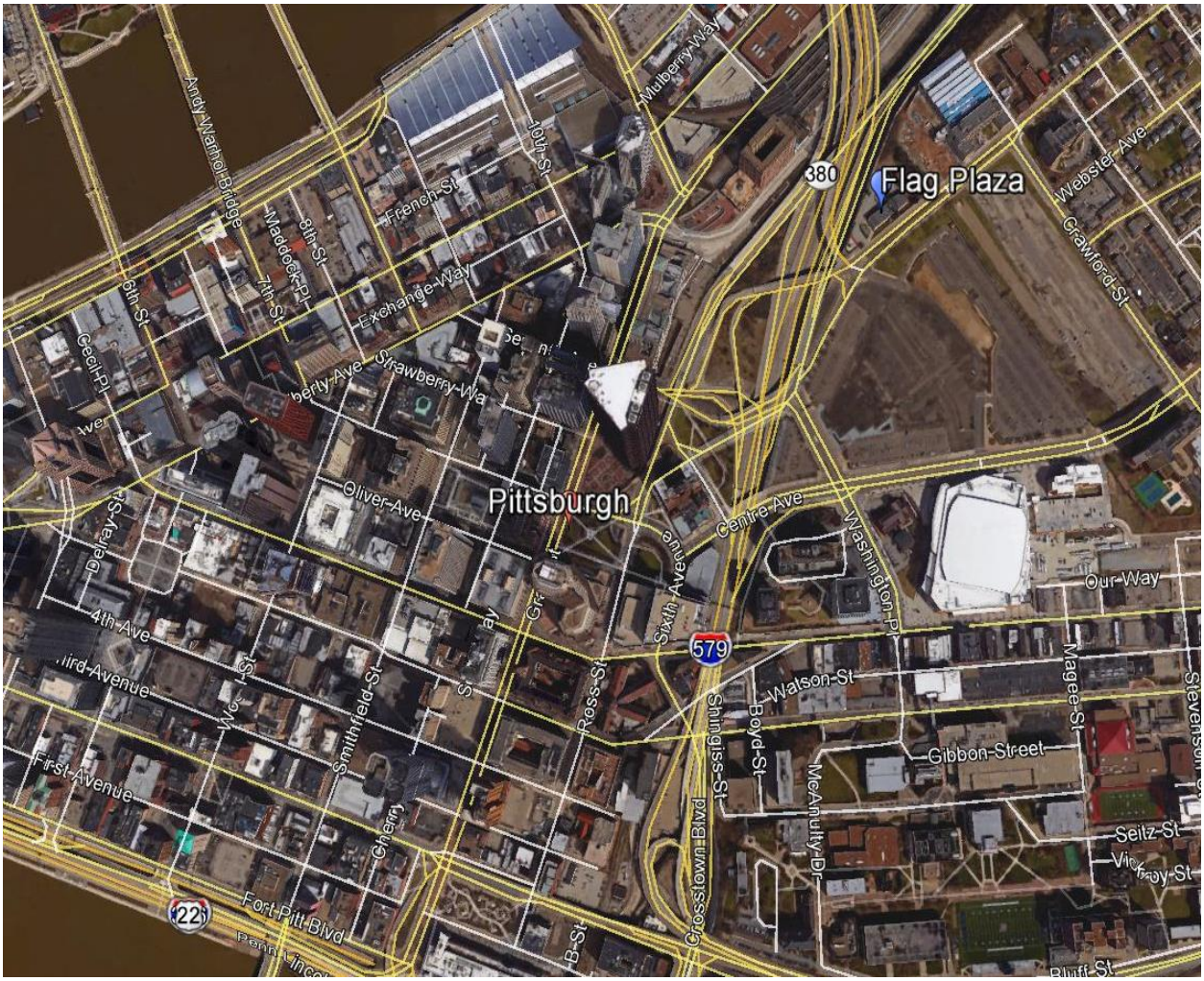
Street Name / Distance	Traffic Count (AADT)
Bedford Ave (17m)	5220 (Penndot 2015)
Rt. 579 (65m)	46,422 (PennDot 2012)
Bigelow Blvd. (105m)	20,221 (PennDot 2015)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Commercial
East	Residential
South	Commercial
West	Commercial

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South			
West	Building	5	130

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North	River	Flat
East	City	Flat
South	City	Rough
West	City	Rough

(Figure 7.10) Flag Plaza Location Map



(7.11) Manchester

Address	Manchester Elementary School 1612 Manhattan Street Pittsburgh, PA 15233		
AQS#	42-003-0092	MSA	Pittsburgh
Latitude (N)	40.456427	Longitude (W)	-80.026740
Comments	Located to the northwest of downtown Pittsburgh, this population oriented suburban site is also an environmental justice area. Sources of influences are numerous, as this community is located near various warehouse/light-industrial facilities along Ohio River valley. There is also a significant contribution by mobile sources.		

Sensor Type	**PM_{10}**	Appendix C Method Code	63
Network Designation	SLAMS	Probe Height (m)	7
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	10/24/1989	Appendix E Siting Criteria	Yes

(7.11.1) Manchester Area Information

Street Name / Distance	Traffic Count (AADT)
Manhattan St (50m)	Unavailable
Chateau St (220m)	8565 (PennDot 2011)
Ohio River Blvd. (253)	29,100 (PennDot 2010)

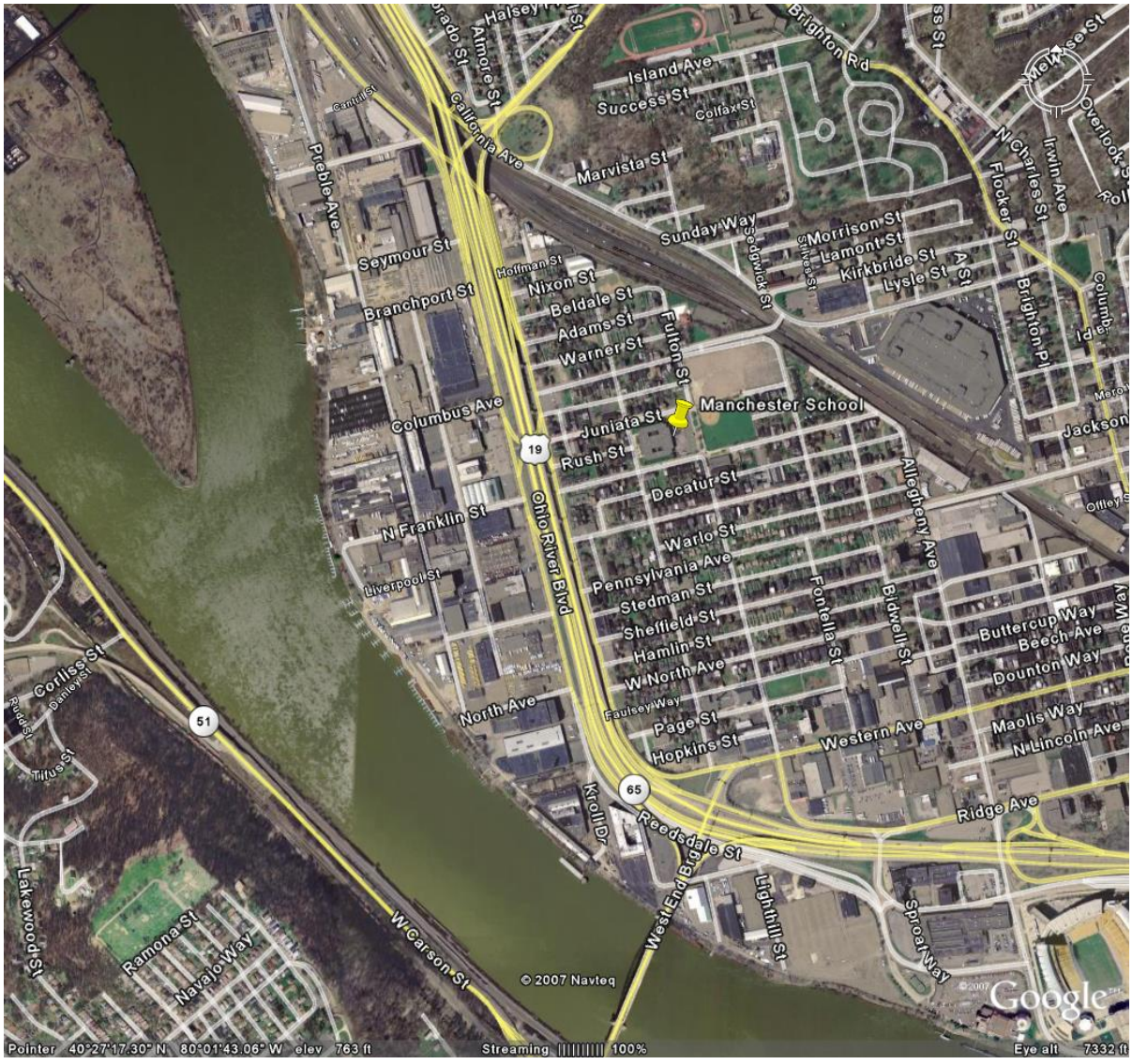
Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Residential
West	Residential

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South			
West			

Manchester Area Information, continued

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North		Flat
East	Hills	Flat
South		Flat
West	River	Flat

(Figure 7.11) Manchester Location Map



(7.12) North Park

Address	North Park Golf Course Kummer Road North Park, PA		
AQS#	42-003-0093	MSA	Pittsburgh
Latitude (N)	40.606624	Longitude (W)	-80.021669
Comments	Located in the less populated northern portion of the County, this suburban site was created as a $PM_{2.5}$ background site and also to provide for even geographical distribution of the $PM_{2.5}$ monitoring network. The sampler is located on the flat roof of the club house.		

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height (m)	5
Purpose	Population Exposure	Appendix D Design Criteria	Yes
Sample Frequency	Every Six Days	Appendix D Scale	Neighborhood
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure, General Background
Monitor Start Date	3/25/1999	Appendix E Siting Criteria	Yes

(7.12.1) North Park Area Information

Street Name / Distance	Traffic Count (AADT)
Kummer Rd. (229m)	3583 (PennDot 2014)
Pierce Mill Rd. (580m)	2397 (PennDot 2011)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Agriculture
East	Agriculture
South	Residential
West	Residential

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South			
West			

North Park Area Information, continued

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North		Rolling
East		Rolling
South		Rolling
West		Rolling

(Figure 7.12) North Park Location Map

(7.13) Bridgeville

Address	1311 Union Street Bridgeville PA 15017		
AQS#	42 003 0070	MSA	Pittsburgh
Latitude (N)	40.363016	Longitude (W)	- 80.102156
Comments	Established as a requirement of updated lead NAAQS. Air Quality Program modeling showed this location to be close to the modeled lead hot spot due to impact by G.E. Bridgeville Glass Corp. Exceedance of the lead NAAQS was documented at this site during the spring of 2014.		

Sensor Type	**Lead (Pb)**	Appendix C Method Code	191
Network Designation	SLAMS	Probe Height (m)	2
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every Three Days	Appendix D Scale	Microscale
Appendix A QA Assessment	Yes	Appendix D Objectives	Highest Concentration
Monitor Start Date	1/1/2010	Appendix E Siting Criteria	Yes

(7.13.1) Bridgeville Area Information

Street Name / Distance	Traffic Count (AADT)
Union St. (15m)	Unavailable
Terrace St. (100m)	Unavailable
Bower Hill Road (260m)	9,311 (PennDot 2011)
Washington Pike (520m)	20,870 (PennDot 2015)

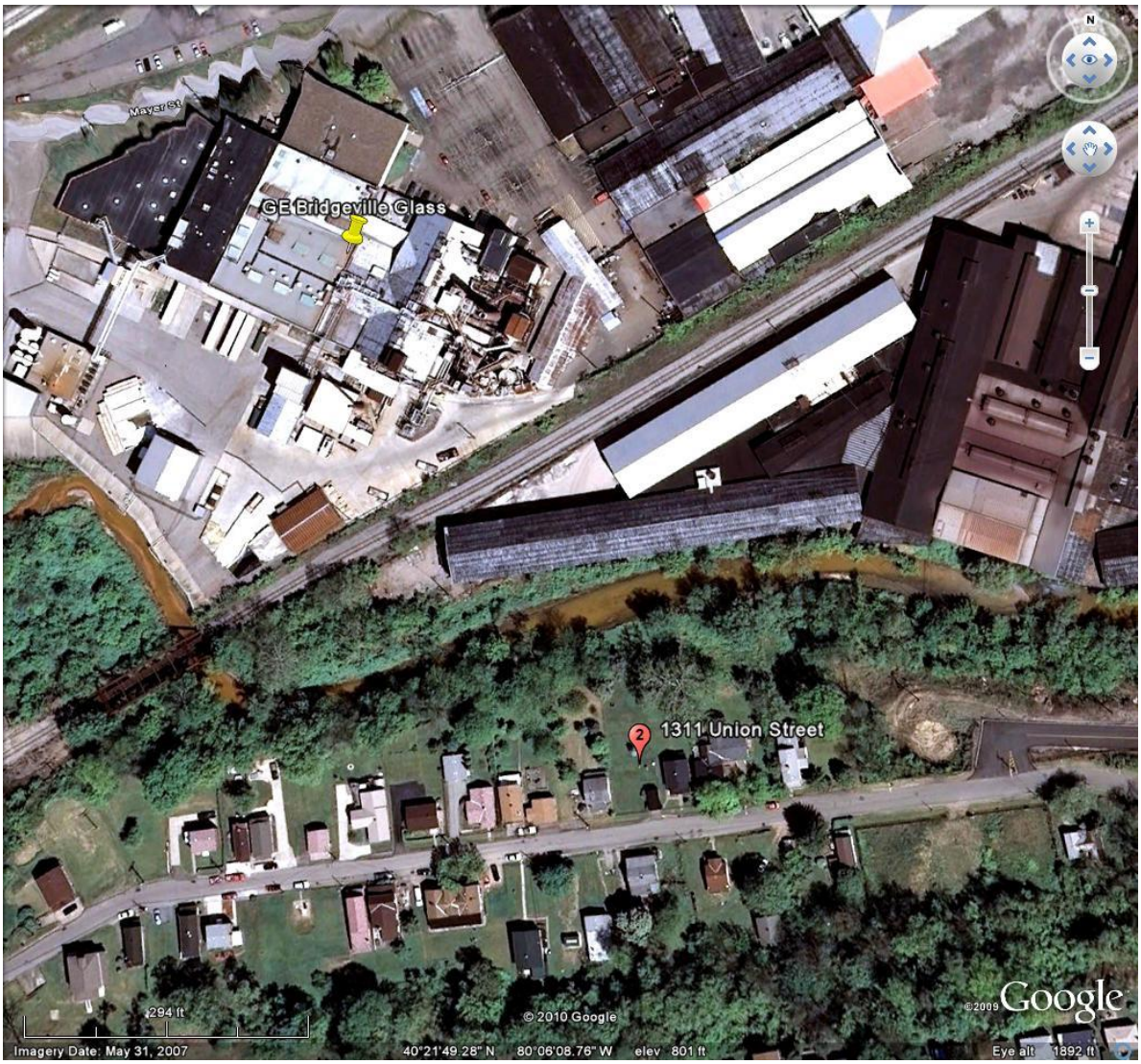
Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Industry
East	Residential
South	Residential
West	Residential

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South	Garage	2	5
West	House	4	10

Bridgeville Area Information, continued

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North	Valley	Rolling
East		Flat
South	Hill	Rolling
West		Flat

(Figure 7.13) Bridgeville Location Map



(7.14) Parkway East

Address	400 Sherwood Road Pittsburgh, PA 15221		
AQS#	42 003 1376	MSA	Pittsburgh
Latitude (N)	40.437430	Longitude (W)	-79.863572
Comments	This was installed to comply with updated NO_2 NAAQS. Monitor inlets sample air at 18 meters from the nearest traffic lane of Route 376 (Parkway East). This location was approved by EPA Region III to qualify as a near road monitoring site and measures population exposure to roadway emissions.		

Sensor Type	**Oxides of Nitrogen (NO_2) Trace Level**	Appendix C Method Code	599
Network Designation	SLAMS	Probe Height (m)	3
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Microscale
Appendix A QA Assessment	Yes	Appendix D Objectives	Highest Concentration
Monitor Start Date	9/1/2014	Appendix E Siting Criteria	Yes

Sensor Type	**Carbon Monoxide (CO) Trace Level**	Appendix C Method Code	593
Network Designation	SLAMS	Probe Height (m)	3
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Microscale
Appendix A QA Assessment	Yes	Appendix D Objectives	Highest Concentration
Monitor Start Date	9/1/2014	Appendix E Siting Criteria	Yes

Sensor Type	**Black Carbon Monitor**	Appendix C Method Code	894
Network Designation	Other	Probe Height (m)	4
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Microscale
Appendix A QA Assessment	Yes	Appendix D Objectives	Highest Concentration
Monitor Start Date	9/1/2014	Appendix E Siting Criteria	Yes

Parkway East, continued

Sensor Type	**$PM_{2.5}$**	Appendix C Method Code	183
Network Designation	SLAMS	Probe Height (m)	4
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Microscale
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure, Source Oriented
Monitor Start Date	1/1/2016	Appendix E Siting Criteria	Yes

(7.14.1) Parkway East Area Information

Street Name / Distance	Traffic Count (AADT)
Penn Lincoln Parkway Rt. 376 (18 m)	75,971 (PennDot 2014)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Residential
West	Residential

Direction	Obstructions	Height (m)	Distance (m)
North			
East	Trees	15	33
South			
West			

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North		Rolling
East	Hill	Rough
South		Rolling
West		Rolling

(Figure 7.14) Parkway East Location Map

(8) Public Comments Period

This network review was made available for public comment as required by 40 CFR Part 58 §58.10. Comments were accepted by e-mail and US mail from May 23,2016 until the close of business on June 23, 2016.

(8.1) Website Posting

During the public comment period, the final draft of the Annual Network Plan for 2017 was posted prominently on the Air Quality Program website along with instructions regarding how to submit comments.

http://www.achd.net/air/index.php

Additionally, the Pennsylvania Department of Environmental Protection (PaDEP) was notified of the posting at the beginning of the comment period.

(8.2) Allegheny County Press Release

The Allegheny County Health Department's Public Information Office issued a press release to notify the public of the opportunity to review and comment on the Annual Network Plan for 2017.

COUNTY OF ALLEGHENY

RICH FITZGERALD
COUNTY EXECUTIVE

FOR IMMEDIATE RELEASE
May 25, 2016

CONTACT: Melissa Wade
Public Health Information Officer
412-578-8312 office
412-339-7995 cell
Melissa.Wade@alleghenycounty.us

Health Department Seeks Comment on Annual Air Monitoring Network Plan

PITTSBURGH – The Allegheny County Health Department is requesting public comment on its Air Monitoring Network Plan for 2017, an annual report which provides a detailed description of how and where air pollution is monitored in Allegheny County.

The Report, a 63-page document required by the U.S. Environmental Protection Agency, provides the specific location of each monitoring station, siting criteria, monitoring methods and objectives, frequency of sampling, pollutants measured at each station and aerial photographs showing their proximity to air pollution sources.

The network includes the following 14 locations: Avalon, Bridgeville, Clairton, Glassport, Harrison, Liberty, Lincoln, North Braddock, South Fayette; three locations within the City of Pittsburgh (Flag Plaza, downtown Pittsburgh; Lawrenceville; and Manchester) and sites in North Park and near the Parkway East (I-376) in Wilkinsburg.

One or more of the following pollutants is measured at each site; sulfur dioxide, carbon monoxide, nitrogen oxides, total reactive nitrogen, ozone, PM_{10}, $PM_{2.5}$, lead and air toxics.

The complete report is posted on the Air Quality Program's section of the Health Department's web site and may be found at www.achd.net/air. Comments may be submitted via e-mail until 4:30 p.m., Thursday, June 23, to Darrell Stern, Chief of Air Monitoring, at darrell.stern@alleghenycounty.us Written comments should be received by the close by Thursday, June 23 and may be sent by U.S. Mail to Darrell Stern, Chief of Air Monitoring, 301 39th Street, Pittsburgh 15201.

###

KAREN HACKER, MD, MPH, DIRECTOR
ALLEGHENY COUNTY HEALTH DEPARTMENT – PUBLIC INFORMATION OFFICE
542 FOURTH AVENUE • PITTSBURGH, PA 15219
PHONE (412) 687-ACHD • FAX (412) 578-8325 • WWW.ACHD.NET

(9) Public Comments and Responses

Comments in this section were extracted from actual documents and messages as received by ACHD during the public comment period. Every effort will be made to summarize the major points and principles presented in the received documents. Appendix A of this plan contains copies of the actual documents and messages in unaltered form.

(9.1) Sierra Club

Comment 1: Modeling is the faster, more accurate means to characterize impacts of SO_2 emissions from large sources like the Cheswick power plant and should be the county's route to compliance with EPA's data requirements rule.

ACHD Response: ACHD is in agreement with this statement in respect to the Cheswick Power Plant. Cheswick has been identified under the Data Requirements Rule (DRR) for SO_2 characterization. PA DEP is required by July 1, 2016 to submit the method of characterization to EPA.

Comment 2: If ACHD elects to monitor the Cheswick power plant, the plan's SO_2 monitors are not located in regions that adequately characterize ambient air quality pursuant to 40 C.F.R. § 51.1203 & 40 C.F.R. Part 58, as they are all sited upwind of the facility.

ACHD Response: ACHD acknowledges that the plan does not provide expansion of the SO_2 air monitoring network for the purpose of characterizing SO_2 emissions from the Cheswick Power Plant.

Comment 3: If ACHD elects to solely monitor the Cheswick facility's emissions, proper monitor placement is likely not possible.

ACHD Response: ACHD agrees with this statement. Preliminary searches of the locations at and near the modeled hotspots for SO_2 concentrations revealed steep and undeveloped hillsides that would make monitoring site placement very difficult and costly.

(9.2) Clean Water Action

Comment 1: Allegheny County needs strong and expanded monitoring of toxic air pollutants due to continued non-attainment for three criteria pollutants: $PM_{2.5}$, ground level ozone, and sulfur dioxide.

ACHD Response: ACHD acknowledges the usefulness of air toxics monitoring. This network plan is intended primarily to address only criteria pollutant and national network monitors, all of which are submitted to the AQS database. Special study monitoring projects are not included in this plan. Special study air toxics monitoring is conducted in several locations in Allegheny County. Data from special studies is listed and discussed on the Air Quality Program website at: http://www.achd.net/air/index.php

Comment 2: Cheswick is one of the worst polluters in the county and it emits levels of sulfur dioxide that impact the region's air quality. However, at the moment sulfur dioxide is not monitored downwind of the plant. ACHD should put an SO_2 monitor at the Harrison site to collect data from Cheswick.

ACHD Response: Cheswick has been identified under the Data Requirements Rule (DRR) for SO_2 characterization. PA DEP is required by July 1, 2016 to submit the method of characterization to EPA. The 2010 SO_2 NAAQS includes guidance for SO_2 monitor siting in a modeled "hotspot" for the purpose of demonstrating attainment of the NAAQS near sources identified under the DRR. The Harrison site is not near the modeled hotspot and an SO_2 monitor at this location would not be suitable to demonstrate attainment.

Comment 3: The SO_2 monitor in Glassport should be reinstalled. Previous monitoring there showed levels of SO_2 higher than those measured at the nearby Liberty monitor. The Mon Valley region is out of attainment for the 1-hour standard of sulfur dioxide and to get the best information on emissions, the monitoring for this type of pollutant should happen at the places of maximum concentrations as the regulation states.

ACHD Response: The 2010 SO_2 NAAQS outlined procedures to demonstrate attainment of the standard in non-attainment areas through modeling and/or monitoring. For the currently designated Allegheny, PA nonattainment area, modeling is under development. If attainment can be demonstrated with modeling, no additional monitors will be required. Due to serious degradation and vandalism at the former Glassport monitoring site, that location is no longer suitable as a monitoring location. If the decision is made to add new monitors to that area a new site will be installed at the location of maximum modeled SO_2 peak concentrations. Currently, among existing monitoring sites, the Lincoln monitoring site may an appropriate location for additional SO_2 monitoring.

Comment 4: Health Department should further monitor volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) in Lawrenceville around the McConway and Torley steel foundry. The foundry located in the densely populated neighborhood in the city of Pittsburgh is the third largest source of benzene and manganese in the county. While there is fence line monitoring occurring at the facility and a monitor in Lawrenceville, both are upwind of the facility. A monitor should be placed downwind of the plant to better calculate the VOCs, HAPs, and criteria pollutants being emitted from the facility.

ACHD Response: ACHD conducts manganese monitoring on McConway & Torley property. In place since 2011, this monitor was placed within the modeled hotspot for particle deposition and the location is judged adequate by ACHD. An up to date report is available on the ACHD webpage: http://www.achd.net/air/pubs/pdf/031416_LawrencevilleToxicMetals.pdf. Various health based standards for ambient manganese concentrations are presented and discussed, but report states that ACHD will reference the EPA endorsed ATSDR MRL for manganese as a screening level which is appropriate for long term manganese exposure for periods over one year. Although there is no routine VOC monitoring downwind of the plant, emissions of volatile organic compounds are quantified by required stack testing at the source.

(9.3) Protect Our Parks

Comment 1: The Plan does not identify a context for the proposed monitoring network. As written, the Plan is essentially a pro forma deliverable, written to satisfy a specific requirement of EPA. Its lack of context – or of any references to related ACHD documentation – makes public understanding more difficult. The Plan addresses only the collection of air quality data, so it is impossible to know how the monitoring would drive or support enforcement actions.

ACHD Response: ACHD acknowledges that the Air Monitoring Network Plan is a federally required annual document, and as such it must conform to guidance and requirements set forth in 40 CFR Part 58 §58.10. However, in response to this comment, additional information was added to Section 5, detailing monitoring requirements for each monitoring parameter presented in this report. Hopefully this will make the report more meaningful to the public.

Comment 2: EPA should require ACHD to formalize and justify the data-sharing agreement with US Steel. Such justification must demonstrate to EPA that the arrangement is in the public interest, and will not lead to "gaming" of the enforcement process.

ACHD Response: Air quality data generated by the air monitoring network is public property and may be provided to anyone upon request. Up to date hourly data is also available on the Air Quality Program web page. While US Steel's transmitters provide them with more instantaneous, minute by minute data, the network monitoring sites are situated downwind of the plants in respect to the prevailing wind directions so that a great majority of high emission episodes are captured and quantified by the monitors.

Comment 3: ACHD should make – and EPA should encourage – additional efforts to anticipate and manage the air quality impacts of unconventional oil and gas development (UOGD). Specific efforts could include steps such as the following:

- Adding monitoring sites at appropriate distance and direction from concentrations of UOGD wells, compressor stations and related infrastructure;
- Adding chemical species such as VOCs, BTEX and others which have been implicated as pathways for adverse impacts of UOGD on human health;
- Collecting and analyzing information on health outcomes which are potentially related to UOGD, and for which no specific pathways have been identified.

ACHD Response: Monitoring near UOGD sites is beyond the required scope of this plan. However, two special monitoring studies are currently ongoing. Details on these projects as well as links to current UOGD research literature and ACHD's regulatory policy are posted and updated on the Air Quality Program webpage: http://www.achd.net/shale/index.html

Comment 4: ACHD should pursue – and EPA should encourage – further analysis and public awareness of greenhouse gas (GHG) emissions and the resulting climate impacts. Specific efforts could include steps such as the following:

- Tracking and reporting on residential and industrial consumption of fossil fuels, and the county's contribution to worldwide GHG emissions;
- Tracking and reporting local extraction of fossil fuels (no matter what their ultimate point of consumption), as an additional "contribution" to GHGs by the county;
- Including GHGs in emission inventory data for sources which report to ACHD.

ACHD Response: Greenhouse gas emissions are not classified as criteria pollutants. Monitoring, tracking and reporting these compounds is not currently required or supported by the EPA and as such the topic is beyond the scope of this plan. ACHD is prepared to comply with any federal requirements relating to GHGs in the event that they are promulgated.

Comment 5: The plan proposes to downgrade one monitor (Avalon) to take advantage of the shutdown of a major source (the Shenango coke works). But the former Shenango site will almost certainly be aggressively marketed to other operators, and ACHD will be under political pressure to expedite the requisite permits.

ACHD Response: The plan proposes to replace a manual PM_{10} sampler that operates every 6 days with a continuous, federal equivalent method $PM_{2.5}$ monitor that will produce live data. Continuous PM data is much more valuable and the move to the $PM_{2.5}$ targets a pollutant that is more relevant to the actual air quality issues in the local community. The County is currently in nonattainment of $PM_{2.5}$, while the PM_{10} NAAQS has not been exceeded since 1997 (see section 8.4, page 37). ACHD considers the suggested changes to the Avalon site to be a considerable improvement that will further protect the communities in that area.

Comment 6: Shell Chemical Appalachia has announced construction of an ethylene "cracker" plant in neighboring (upwind) Beaver County. Shell has already submitted an air quality plan to DEP, showing a significant air quality impact on Allegheny County residents. Although ACHD has no role in permitting or enforcement in Beaver County, it is reasonable to expect that downwind air monitoring would be an important facet of DEP's oversight. Yet the current Plan does not have even a placeholder for such a consideration.

ACHD Response: The ethylene "cracker" plant is now entering a construction phase of at least 18 months. Full production and the associated air emissions are outside of the timeframe of this plan. However, the current air monitoring network configuration would provide relevant air quality data to access impact on the densely populated Pittsburgh urban area and surrounding communities. ACHD will address additional required monitoring in future network plans.

(9.4) Carol Wivell, Bellevue Community Resident

Comment 1: Please place monitors in such a way that low level neighborhood wood smoke can be captured and measured in places where people call in the complaints. It should be measured as best you can where you know it's a problem, as shown by citizen complaints. Measure it at human level where we are being forced to breathe it, at street level, not on top of some building.

ACHD Response: Monitoring for wood smoke and other emissions from individual properties is beyond the required scope of this plan. However, as can be seen from the network description, the PM_{10} and $PM_{2.5}$ monitoring network in Allegheny greatly exceeds EPA requirements and also greatly exceeds PM monitor density in the surrounding counties. Each of these monitors complies with appendix E of 40CFR part 58 which states probe inlets must be between 2 and 15 meters above ground level for all O_3 and SO_2 monitors and for neighborhood or larger spatial scale Pb, PM_{10}, $PM_{10\text{-}2.5}$, $PM_{2.5}$, NO_2, and CO sites. Smaller spatial scales require probe inlets to be between 2 and 7 meters above the ground.

ACHD enforces it's open burning policy on a case by case basis and is responsive to community complaints. ACHD updated and strengthened it's open burning regulations in 2015. More information on ACHD's open burning policy and information about health risks of wood smoke and proper wood burning practices may be found on the ACHD web page: http://www.achd.net/air/burning/index.html

(9.5) GASP

Comment 1: ACHD's air monitoring network must include SO_2 monitors located downwind from the Cheswick Power Station and at ACHD's existing monitoring station in Glassport.

ACHD Response: Regarding the installation of an SO_2 monitor downwind of the Cheswick power plant, please refer to ACHD's responses to Sierra Club's comments numbers one, two and three on page number 67. Regarding the installation of an SO_2 monitor at ACHD's existing monitoring station in Glassport, please refer to ACHD's response to Clean Water Action's comment number three on page number 68.

Comment 2: ACHD should install and operate a special purpose monitor in Downtown Pittsburgh to evaluate $PM_{2.5}$ concentrations exacerbated by diesel emissions.

ACHD Response: The $PM_{2.5}$ monitoring network in Allegheny County currently exceeds minimum requirements specified in Appendix D to 40 CFR Part 58. Please refer to section 5.5 on page 15 for more details. Roadway $PM_{2.5}$ mass and $PM_{2.5}$ black carbon are continuously measured at the Parkway East near road monitoring site. The Parkway East site was installed along one of the most heavily traveled and congested roadway segments in the Pittsburgh MSA according to EPA guidance to satisfy the requirement for monitoring in an area of predicted maximum roadway emissions concentration.

The 5-Year Network Assessment conducted during 2015 recognized the significance of PM monitoring in the Central Business District. However, street-level monitoring may not meet official $PM_{2.5}$ siting requirements due to the street canyon environment in most of the Downtown area and data produced by such a special purpose monitor would not be relevant to the $PM_{2.5}$ NAAQS.

Comment 3: ACHD should install and operate a special purpose monitor for air toxics downwind of the Clairton coke works.

ACHD Response: Special study monitoring is beyond the EPA mandated scope of this plan and details relating to these activities are not included. However, routine special purpose air toxics sampling at the Liberty monitoring site will continue every three days during 2017. Charcoal based sorbent tubes are analyzed for BTEX and naphthalene. PM_{10} high volume filters are are analyzed for benzoalphapyrene. Data is available upon request. See figure 7.4.1 on page 38 which shows the location of the Liberty monitoring site in relation to the Clairton Coke Works.

Comment 4: ACHD should continue to operate the PM_{10} high volume sampler in Avalon until at least the end of January 2017.

ACHD Response: As stated in section 3.1 on page 6, ACHD plans to operate the PM_{10} sampler until the end of January 2017. Data gathered during 2016 will be evaluated before the final decision to discontinue the PM_{10} monitor is made.

Appendix A

Response Documents Received During the Public Comment Period

Section 1 – Sierra Club Comments

Section 2 – Clean Water Action Comments

Section 3 – Protect our Parks Comments

Section 4 – Carol Wivell (Bellevue Resident) Comments

Section 5 - GASP Comments

Mr. Darrell Stern
Air Quality Manager, Air Quality Program
Allegheny County Health Department
301 39th Street, Building 7
Pittsburgh, Pennsylvania 15201
darrell.stern@alleghenycounty.us

June 20, 2016

Via Electronic Mail

Re: Comments Concerning 2017 Draft Air Monitoring Network Plan

Dear Mr. Stern:

The Sierra Club submits the following comments regarding Allegheny County's 2017 Draft Air Monitoring Network Plan ("Plan"). As described in more detail below, the Sierra Club believes that the choice facing Allegheny County concerning its route to compliance with the Environmental Protection Agency's ("EPA") Data Requirements Rule[1] is a significant one. The modeling pathway presents a faster and more accurate way to characterize air quality—to the extent that the draft Plan, by not including additional sulfur dioxide ("SO_2") monitors to characterize sources in the County above the Data Requirements threshold, indicates that the County plans to use this modeling pathway, the Sierra Club strongly supports the County's decision. As discussed below, the current monitor placement is entirely inadequate to characterize air quality under the SO_2 National Ambient Air Quality Standards ("NAAQS").

Substantive Comments

1. **Modeling is the Faster, More Accurate Means to Characterize Impacts of SO_2 Emissions from Large Sources like the Cheswick Power Plant and Should Be the County's Route to Compliance with EPA's Data Requirements Rule.**

In 2015, the EPA developed the Data Requirements Rule in recognition of the insufficiency of the national SO_2 ambient monitoring network.[2] The Rule required state and local air agencies to submit a list to EPA by January 15, 2016 of SO_2 sources that have annual actual SO_2 emissions of 2,000 tons or more and SO_2 sources that they believe require further air quality characterization.[3] Under the Rule, listed sources' peak 1-hour SO_2 emissions are to be characterized either through ambient air quality monitoring

[1] 40 C.F.R. § 51.12; 80 Fed. Reg. 51,052 (Aug. 21, 2015).
[2] 80 Fed. Reg. at 51,053 ("although the current SO_2 ambient monitoring network included more than 400 monitors nationwide, the scope of the network had certain limitations, and approximately two-thirds of the monitors are not located to characterize maximum 1-hour SO_2 concentration impacts from emissions sources").
[3] 40 C.F.R. § 51.1203(a).

or air quality modeling techniques.[4] Air agencies are free to choose either of these characterization methodologies to be in compliance with the Rule, though they must inform EPA of an intention to monitor by July 1, 2016.[5]

To promote compliance with the Data Requirements Rule, the Pennsylvania Department of Environmental Protection ("DEP") developed a comprehensive list of SO_2 sources above the 2,000 tons per year emission threshold. DEP listed the Cheswick Power Plant, which is located in Northeastern Allegheny County, as one such source subject to requirements for SO_2 characterization,[6] recognizing that the plant emitted almost 4,500 tons of SO_2 in 2014 alone.[7]

For the reasons discussed below, the Allegheny County Health Department ("ACHD") should elect to use air dispersion modeling, rather than monitoring, to characterize peak 1-hour emissions from the Cheswick Power Plant.

As outlined by EPA in the Final SO_2 NAAQS Rule,[8] air dispersion modeling is the best method for evaluating the short-term impacts of large SO_2 sources. This is consistent with ACHD's own practices: Sierra Club is aware that ACHD has conducted SO_2 dispersion modeling in the past. In response to Sierra Club's comments on ACHD's 2015 Air Monitoring Network Plan,[9] the Department stated that "for the currently designated Allegheny, PA nonattainment area, modeling is under development."[10] Sierra Club supports all modeling efforts made to accurately characterize compliance with the NAAQS and would like to contribute and engage in the process where possible to ensure development of a robust monitoring network, informed and supplemented by air quality modeling, to confirm that the County is able to identify, address, and prevent NAAQS exceedances.

EPA has historically used modeling to determine attainment for the SO_2 standard.[11] In fact, in EPA's 1994 SO_2 Guideline Document, EPA noted that "for SO_2 attainment demonstrations, monitoring data alone will generally not be adequate"[12] and that "[a]ttainment determinations for SO_2 will generally not rely on ambient monitoring data alone but instead will be supported by an acceptable modeling analysis which quantifies that the SIP strategy is sound and that enforceable emission limits are responsible for attainment."[13] The 1994 SO_2 Guideline Document goes on to note that monitoring alone is likely to be inadequate: "[f]or SO_2, dispersion modeling will generally be necessary to evaluate comprehensively a

[4] 40 C.F.R. § 51.1203(b).
[5] *Id*.
[6] Letter from Joyce E. Epps, Director, Penn. Dep't of Envtl. Protection, to Nikos Singelis, Acting Director, Air Protection Division, U.S. E.P.A., Region III (Mar. 9, 2016) (on file with the U.S. E.P.A.), *available at*: https://www3.epa.gov/airquality/sulfurdioxide/drr/pa-revised.pdf; Letter from John H. Quigley, Secretary, Penn. Dep't of Envtl. Protection, to Shawn Garvin, Regional Administrator, U.S. E.P.A., Region III (Jan. 15. 2016) (on file with U.S. E.P.A.), *available at*: https://www3.epa.gov/airquality/sulfurdioxide/drr/pa.pdf.
[7] *See* U.S. E.P.A. Air Markets Program Database, *available at*: https://ampd.epa.gov/ampd/.
[8] 75 Fed. Reg. 35,551.
[9] Allegheny County Health Dep't, 2015 Air Monitoring Network Review, at 81 (Jul. 1, 2015), *available at*: https://www3.epa.gov/ttn/amtic/files/networkplans/PghPlan2015.pdf.
[10] *Id*., at 80.
[11] *See, e.g.*, U.S. E.P.A., *Implementation of the 1-Hour SO_2 NAAQS Draft White Paper for Discussion* at 3, fn.1, *available at*: http://www.epa.gov/airquality/sulfurdioxide/pdfs/20120522whitepaper.pdf; *see also* Respondent's Opposition to Motion of the State of North Dakota for a Stay of EPA's 1-Hour Sulfur Dioxide Ambient Standard Rule at 3, *National Environmental Development Association's Clean Air Project v. EPA* (D.C. Cir. 2010) (No. 10-1252), attached hereto as Ex. 1 ("the Agency has historically relied on modeling to make designations for sulfur dioxide").
[12] U.S. E.P.A., 1994 SO_2 Guideline Document at 2-5, *available at*: http://www.epa.gov/ttn/oarpg/t1/memoranda/so2_guide_092109.pdf.
[13] *Id*., at 2-1.

source's impacts and to determine the areas of expected high concentrations based upon current conditions."[14]

Moreover, EPA's approval and acceptance of modeling for making attainment designations stretches back decades. In 1983, the Office of Air Quality Planning and Standards issued a Clean Air Act ("CAA") Section 107 Designation Policy Summary, which explained that "air quality modeling emissions data, etc., should be used to determine if the monitoring data accurately characterize the worst case air quality in the area."[15] Without modeling data, the worst-case air quality may not be accurately characterized. In certain instances, EPA has relied solely on modeling data to determine nonattainment designations, thereby demonstrating that modeling is accepted and trustworthy.[16] In fact, reliance on modeling for ascertaining impacts from SO_2 on air quality stretches back to the Carter Administration. In 1978, EPA designated Laurel, Montana as a nonattainment area "due to measured and modeled violations of the primary SO_2 standard."[17]

EPA's Final 2010 SO_2 NAAQS rule simply built upon EPA's historical practice of using modeling to determine attainment and nonattainment status for SO_2 NAAQS. In doing so, EPA properly recognized the "strong source-oriented nature of SO_2 ambient impacts[18] and concluded that the appropriate methodology for the purposes of determining compliance, attainment, and nonattainment with the new NAAQS is modeling.[19] Accordingly, in promulgating the Final 2010 SO_2 NAAQS, EPA explained that, for the one-hour standard, "it is more appropriate and efficient to principally use modeling to assess compliance for medium to larger sources . . . ."[20] Similarly, EPA then explained that using modeling to determine attainment for the SO_2 standard "could better address several potentially problematic issues than would the narrower monitoring-focused approach discussed in the proposal for the SO_2 NAAQS, including the unique source-specific impacts of SO_2 emissions and the special challenges SO_2 emissions have historically presented in terms of monitoring short-term SO_2 levels for comparison with the NAAQS in many situations (75 FR 35550)."[21]

EPA's use of modeling in NAAQS implementation both in general and for attainment designations is, additionally, court-validated. For example, in *Montana Sulphur*, the eponymous company challenged a SIP call, a SIP disapproval, and a Federal Implementation Plan promulgation because they were premised on a modeling analysis that showed the Billings/Laurel, Montana area was in nonattainment for SO_2.[22] The court rejected Montana Sulphur's argument that EPA's reliance on modeling data was arbitrary and capricious or otherwise unlawful.[23] Further demonstrating the superiority of modeling, the D.C. Circuit

[14] *Id.*, at 2-3.
[15] Sheldon Meyers Memorandum, RE Section 107 Designation Policy Summary at 1 (April 21,. 1983), attached hereto as Ex. 2.
[16] *Id.*, at 2.
[17] *Mont. Sulphur & Chem. Co.*, 666 F.3d at 1181 (9th Cir. 2012) (citing 43 Fed. Reg. 8,962 (Mar.3, 1978)).
[18] Final SO_2 NAAQS Rule at 35,370.
[19] *See Id.*, at 35,551. (describing dispersion modeling as "the most technically appropriate, efficient, and readily available method for assessing short-term ambient SO_2 concentrations in areas with large point sources.").
[20] *Id.*, at 35,570.
[21] EPA White Paper, *supra* at 3-4.
[22] 666 F.3d at 1184.
[23] *Id.*, at 1185; *see also Sierra Club v. Costle*, 657 F.2d 298, 332 (D.C. Cir. 1981) ("Realistically, computer modeling is a useful and often essential tool for performing the Herculean labors Congress imposed on EPA in the Clean Air Act"); *Republic Steel Corp. v. Costle*, 621 F.2d 797, 805 (6th Cir. 1980) (approving use of modeling to preduict future violations and incorporating "worse-case" assumptions regarding weather and full-capacity operations of pollutant sources).

has acknowledged the inherent problem of using monitored data for criteria pollutants, namely that "a monitor only measures air quality in its immediate vicinity."[24]

Indeed, EPA employs and relies on modeling to inform its designations because the agency is well aware that modeling produces reliable results. For example, as John C. Vimont, EPA Region 9's Regional Meteorologist has stated under oath:

> EPA does recognize the usefulness of ambient measurements for information on background concentrations, provided reliable monitoring techniques are available. *EPA does not recommend, however, that ambient measurements be used as the sole basis of setting emission limitations or determining the ambient concentrations resulting from emissions from an industrial source. These should be based on an appropriate modeling analysis*.[25]

Testimony as to the accuracy and appropriateness of modeling has also been presented by Roger Brode, a physical scientist in EPA's Air Quality Modeling Group who co-chairs the AMS/EPA Regulatory Model Improvement Committee and the AERMOD Implementation Workgroup.[26] Mr. Brode has explained:

> As part of the basis for EPA adopting the AERMOD model as the preferred model for nearfield applications in the *Guideline on Air Quality Models*, Appendix W to 40 CFR Part 51, *the performance of the AERMOD model was extensively evaluated based on a total of 17 field study data bases* (AERMOD: Latest Features and Evaluation Results. EPA-454/R-03-003. U.S. Environmental Protection Agency, Research Triangle Park (2003), portions of which are attached to this affidavit) ("EPA 2003"). *The scope of the model evaluations conducted for AERMOD far exceeds the scope of evaluations conducted on any other model that has been adopted in Appendix W to Part 51. These evaluations demonstrate the overall good performance of the AERMOD model* based on technically sound model evaluation procedures, and also illustrate the significant advancement in the science of dispersion modeling represented by the AERMOD model as compared to other models that have been used in the past. *In particular, adoption of the AERMOD model has significantly reduced the potential for overestimation of ambient impacts from elevated sources in complex terrain compared to other-models.*[27]

EPA's practice in a number of other contexts also demonstrates that modeling is a technically superior approach for ascertaining impacts on the SO_2 NAAQS, as well as the extensive history of EPA's preference for modeling over monitoring to evaluate compliance. For example, all nitrogen dioxide, fine particulate matter ("PM2.5"), and SO_2 Prevention of Significant Deterioration ("PSD") increment compliance verification analyses are performed with air dispersion modeling, such as running AERMOD in a manner consistent with the Guideline on Air Quality Models.[28] Indeed, in order to ensure consistency in how air impacts are determined, both existing sources and newly permitted sources should be assessed using the same methods. AERMOD modeling performs particularly well in evaluating emission sources with one or a handful of large emission points. The stacks are well characterized in terms of location, dimensions, and exhaust parameters, and have high release heights. AERMOD accurately models medium-to-large SO_2 sources—even with conditions of low wind speed, the use of off-site meteorological data, and variable weather conditions. Indeed, AERMOD has been tested and performs very well during conditions of low wind speeds:

---

[24] *Catawha County v. EPA*, 571 F.3d 20, 30 (D.C. Cir. 2009).
[25] Declaration of John C. Vimont at 1, 11, attached hereto as Ex. 3 (emphasis added).
[26] *See* Declaration of Roger W. Brode at 1, 2, attached hereto as Ex. 4.
[27] *Id*., at 3-4
[28] 40 C.F.R. § 52.21(1)(l).

> AERMOD's evaluation analyses included a number of site-specific meteorological data sets that incorporate low wind speed conditions. For example, the Tracy evaluation included meteorological data with wind speeds as low as 0.39 meter/second (m/s); the Westvaco evaluation included wind speeds as low as 0.31 m/s; the Kincaid SO_2 evaluation included wind speeds as low as 0.37 m/s; and the Lovett evaluation included wind speeds as low as 0.30 m/s. Concerns . . . regarding AERMOD's ability to model low wind speed conditions seem to neglect the data used in actual AERMOD evaluations.[29]

Finally, EPA's use of air dispersion modeling, and AERMOD in particular, was upheld in the context of a CAA section 126 petition for resolution of cross-state impacts.[30] In this case, EPA granted the New Jersey Department of Environmental Protection's 126 petition, finding that trans-boundary SO_2 emissions from the Portland coal-fired power plant in Pennsylvania were significantly contributing to nonattainment and interference with the maintenance of the one-hour SO_2 NAAQS in New Jersey.[31] EPA based its finding on a review of the AERMOD dispersion modeling submitted by New Jersey, its independent assessment of AERMOD, and other highly technical analyses.[32] The court upheld EPA's decision after examining the record, which demonstrated that EPA had thoroughly examined the relevant scientific data and clearly articulated a satisfactory explanation of the action that established a rational connection between the facts found and the choice made.[33]

Dispersion modeling, then, is a rigorously verified method for evaluating impacts on the SO_2 NAAQS, and has a lengthy and court-validated history as an appropriate tool for us ascertaining air quality.

All of this bears heavily on the decision of whether to comply with the Data Requirements Rule by modeling, or by monitoring: modeling is clearly faster, more thorough, and more accurate. Further, using dispersion modeling (as opposed to purchasing and installing expensive new monitors) would result in earlier area designations: under the Data Requirements Rule, while area designations for areas characterized by modeling would occur in 2017, area designations for areas with new monitors would happen in 2020.[34] Thus, not only would modeling be more accurate, but also it would deliver air quality information to the public and to regulators fully three years sooner.

2. If ACHD Elects to Monitor the Cheswick Power Plant, The Plan's SO_2 Monitors Are Not Located in Regions that Adequately Characterize Ambient Air Quality Pursuant to 40 C.F.R. § 51.1203 & 40 C.F.R. Part 58, as they are All Sited Upwind of the Facility.

Notwithstanding the above, if Allegheny were to select the monitoring pathway under the Data Requirements Rule, the SO_2 monitoring network proposed by the Plan inadequately characterizes air quality and SO_2 emissions in the region.

As discussed above, air agencies' experience with SO_2 and the historical record indicate that modeling, and not monitoring, is the appropriate method for ascertaining source-derived impacts on attainment of the NAAQS. Because a single monitor cannot suffice to characterize the SO_2 air quality in the area surrounding a large stationary source, agencies must continue to use air dispersion modeling to evaluate

[29] Comments of Camille Sears, at 10, *available at*: http://www.epa.gov/ttn/scram/dispersion_prefrec.htm, attached hereto as Ex. 5 (citing AERMOD evaluations and modeled meteorological data).
[30] *See Genon Rema, LLC v. U.S. EPA*, 722 F.3d 513, 526 (3rd Cir. 2013).
[31] *Id*., at 518.
[32] *Id*.
[33] *Id*., at 525-28.
[34] 80 Fed. Reg. at 51,064 tbl.1 (Aug. 21, 2015).

and demonstrate compliance with the one-hour SO_2 NAAQs. Modeling can capture ambient concentrations across vast areas, and is sensitive to minute changes in meteorology that monitors are unable to capture.

If, however, monitors are to be used to determine areas of nonattainment, they should be sited based on modeling performed to evaluate impacts on the SO_2 NAAQS: specifically, modeling conducted to determine where the multiple peak concentrations of SO_2 occur due to emissions from a source. Attempting to place monitors based on prior monitor location (or even the time-consuming process of "exploratory monitoring") is overwhelmingly unlikely to result in a monitor network that will capture peak concentrations; such a network is effectively useless for evaluating short-term NAAQS. Nonetheless, if ACHD elects to monitor rather than model emissions from the city, monitoring should be in accordance with the requirements of Appendix D to 40 C.F.R. Part 58 as well as the Data Requirements Rule.

The Clean Air Act expressly enumerates that state implementation plans must "provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to . . . monitor, compile, and analyze data on ambient air quality."[35] Air quality agencies' emissions monitoring is subject to "[m]inimum ambient air quality monitoring network requirements,"[36] which must satisfy the criteria provided by Appendix D to Part 58.[37] The principal purpose of developing an air quality monitoring network is to promote compliance with the relevant NAAQS.

Appendix D to Part 58 ("Appendix D") requires that ambient air monitoring network plans achieve three objectives: (1) to provide the public with air pollution data,[38] (2) to support compliance with ambient air quality standards and emissions strategy development,[39] and (3) to provide supporting data for air pollution research.[40] Ultimately, "[m]onitoring sites must be capable of informing [air quality] managers about many things including *the peak air pollution levels*, typical levels in populated areas, air pollution transported into and outside of a city or region, and *air pollution levels near specific sources*."[41] Beyond the requirements of Appendix D, monitoring must now also be consistent with the Data Requirements Rule. This rule requires air agencies to submit a list of SO_2 sources that are subject to requirements for characterization of *maximum* one-hour SO_2 concentrations via ambient air quality monitoring or air quality modeling techniques.[42]

As drafted, ACHD's Plan proposes to maintain its five current SO_2 monitors located in Liberty, South Fayette, Avalon, Lawrenceville, and North Braddock. This network is insufficient to accomplish the monitoring objectives enumerated by Appendix D, principally because none of these monitors are adequately placed to capture SO_2 emissions data from the Cheswick Power Plant let alone peak or maximum one-hour concentrations. Because atmospheric SO_2 predominantly emanates from a handful of large stationary sources, a network that neglects to include modeling-located monitors placed at areas of predicted maximum concentrations near the largest sources of SO_2, cannot accurately and adequately provide the public with reliable information about air quality in the region it covers, nor can it ensure compliance with the NAAQS.

---

[35] 42 U.S.C. § 7410(a)(2)(B).
[36] 40 C.F.R. § 58.2(a)(5).
[37] 40 C.F.R. § 58.11(c).
[38] 40 C.F.R. § 58, App. D, § 1.1(a).
[39] 40 C.F.R. § 58, App. D, § 1.1(b).
[40] 40 C.F.R. § 58, App. D, § 1.1(c).
[41] 40 C.F.R. § 58.11, App. D § 1.1.1 (emphasis added).
[42] 40 C.F.R. § 51.1203(a); 40 C.F.R. § 51.1203(b). The regulations also permit air agencies to provide federally enforceable emission limitations that limit emissions of applicable sources to less than 2,000 tons per year. 40 C.F.R. § 51.1203(e).

In the absence of dispersion modeling analyses, the Plan inadequately addresses the requirements of both Appendix D and the Data Requirements Rule with respect to SO_2 emissions from the Cheswick plant. As discussed above, the Pennsylvania Department of Environmental Protection developed a list of SO_2 sources that will be subject to monitoring requirements pursuant to the Rule and listed the Cheswick Power Plant as one such source subject to requirements for SO_2 characterization.[43] The Cheswick Power Plant's SO_2 emissions are substantial; the facility emits more SO_2 into the atmosphere than any other source in the county.[44] In 2010, the plant emitted over 11,806.3 tons of SO_2. Although emissions in recent years have decreased due to the operation of scrubbers at the facility, Cheswick is still the greatest SO_2 emitter in the region. Despite the danger that the facility poses to the region, none of Allegheny County's SO_2 monitors are located so as to capture peak impacts from this large source.

Table 1: Annual SO_2 Emissions from Cheswick Power Plant[45]

Year	SO_2 Emissions (tons)
2010	11,806.3
2011	9,290.2
2012	1,910.8
2013	1,686.3
2014	4,445.3
2015	1,690

If the monitoring pathway to Data Requirements Rule compliance is chosen (and Sierra Club urges that it not be), ACHD must include SO_2 monitors in areas of predicted peak emissions concentrations for the Cheswick Power Plant as part of its Plan for 2017. The highest concentrations of SO_2 are found near large stationary sources, as acknowledged by EPA when adopting the 2010 one-hour SO_2 NAAQS.[46] Data gathered in response to the Data Requirements Rule must accordingly reflect targeted, source-oriented monitoring intended to identify peak SO_2 concentrations in the ambient air attributable to an identified emissions source.[47] All existing, new, or relocated ambient monitors intended to meet regulatory requirements must be installed and operational by January 1, 2017.[48]

ACHD has not included SO_2 monitors with the intention of capturing peak emissions from the Cheswick facility as part of its 2017 Plan. The SO_2 monitors in closest proximity to the Cheswick site are located in Lawrenceville, Avalon, and North Braddock. None of these sites appear to be particularly close to the facility; nor, more importantly, are they at all able to capture peak ambient concentration impacts from the

[43] Letter from Joyce E. Epps, Director, Penn. Dep't of Envtl. Protection, to Nikos Singelis, Acting Director, Air Protection Division, U.S. E.P.A., Region III (Mar. 9, 2016) (on file with the U.S. E.P.A.), *available at*: https://www3.epa.gov/airquality/sulfurdioxide/drr/pa-revised.pdf; Letter from John H. Quigley, Secretary, Penn. Dep't of Envtl. Protection, to Shawn Garvin, Regional Administrator, U.S. E.P.A., Region III (Jan. 15. 2016) (on file with U.S. E.P.A.), *available at*: https://www3.epa.gov/airquality/sulfurdioxide/drr/pa.pdf.
[44] *See* Facility Emissions Report, Pennsylvania Dep't of Envt'l Protection, *available at*: http://www.ahs.dep.pa.gov/eFACTSWeb/criteria_facilityemissions.aspx (last visited June 7, 2016).
[45] Data taken from U.S. E.P.A. Air Markets Program Database, *available at*: https://ampd.epa.gov/ampd/.
[46] Primary National Ambient Air Quality Standard for Sulfur Dioxide, 75 Fed. Reg. 35,557 ("A significant fact for ambient SO_2 concentrations is that stationary sources are the predominant emission sources of SO_2 and the peak, maximum SO_2 concentrations that may occur are most likely to occur nearer the parent stationary source").
[47] SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, at 2, U.S. E.P.A., Off. Of Air and Radiation, Off. Or Air Quality Planning and Standards, Air Quality Assessment Div. (Feb. 2016), *available at*: https://www3.epa.gov/airquality/sulfurdioxide/pdfs/SO2MonitoringTAD.pdf.
[48] 40 C.F.R. § 51.1203(c)(2).

facility. An expert modeling analysis Sierra Club undertook in 2014[49] indicated that there had been NAAQS exceedances up to 18 kilometers from the Cheswick plant. The three existing monitors are over 20 kilometers from the plant and thereby likely beyond the area heavily impacted by Cheswick. Beyond their poor proximity to the Cheswick Plant, these sites are not appropriately located to capture peak emissions from the facility because they are all located upwind, to the south and southwest, of it. Prevailing winds in the region generally come from the west and southwest.[50] More importantly, the modeling analysis Sierra Club performed indicates that peak impacts from Cheswick are likely to occur much closer: near River Road on Coxcomb hill directly across the Allegheny River from the plant, as well as in the neighborhoods surrounding Cheswick in Springdale itself.[51] For a network of monitors to be properly placed for Data Requirements Rule purposes, they should instead be placed based in sites corresponding to loci of predicted peak concentration identified through aerial dispersion modeling such as that of the Sierra Club.

Likewise, if Cheswick's emissions were to be monitored rather than modeled, the Plan must include monitors adequate to accurately characterize impacts from the plant pursuant to Appendix D. Appendix D states that "ambient air monitoring networks must be designed to . . . [s]upport compliance with ambient air quality standards."[52] Allegheny County is already substantially in nonattainment for SO_2.[53] The fact that SO_2 monitors have not been placed in the most appropriate regions indicates that the County may be more in nonattainment than had been previously contemplated,[54] especially in light of our 2014 modeling analysis, which demonstrates that there are likely to be further exceedances in close proximity to the Cheswick facility.

Notably, the EPA has instructed state and local air agencies to take existing modeling results into account when determining where to site monitors that will characterize ambient peak SO_2 concentrations.[55] Sierra Club has provided ACHD with modeling results demonstrating nonattainment in the region surrounding the Cheswick facility and indicating where peak impacts are expected to occur. If it will be monitoring SO_2 levels from Cheswick, ACHD should revise the Plan to reflect the results of this study.

Ultimately, ACHD must include monitors within range of the Cheswick Power Plant as part of its 2017 Air Monitoring Network Plan. Because the Plan fails to include a monitor that will measure peak SO_2 concentrations in the region, stemming from the region's greatest SO_2-emitting facility, the SO_2

[49] Attached hereto as Ex. 6.
[50] Pittsburgh Intl. Airport Wind Weather & Statistics, Wind Finder, *available at*: https://www.windfinder.com/windstatistics/pittsburgh_intl_airport (last visited Jun. 15, 2016); *see also* EPA Technical Support Document: Pennsylvania Area Designations for the 2010 SO_2 Primary National Ambient Air Quality Standard at 11, *available at* http://www.epa.gov/so2designations/tsd/03_PA_tsd.pdf ("The prevailing wind directions at the Allegheny County Airport are predominantly out of the south and west. At the Pittsburgh International Airport, the prevailing winds are predominantly out of the west/southwest.").
[51] *See* Ex. 6 at 6 (Figure 2).
[52] 40 C.F.R. § 58, App. D, § 1.1(b).
[53] Sulfur Dioxide (2010) Nonattainment Area/State/County Report, U.S. E.P.A. (last modified Apr. 22, 2016), *available at*: https://www3.epa.gov/airquality/greenbook/tnca.html#SO2.2010.Liberty-Clairton. Specifically in non-attainment is the area consisting of the boroughs of Braddock, Dravosburg, East McKeesport, East Pittsburgh, Elizabeth, Glassport, Jefferson Hills, Liberty, Lincoln, North Braddock, Pleasant Hills, Port Vue, Versailles, Wall, West Elizabeth, West Mifflin City, Clairton City, Duquesne City, McKeesport, Elizabeth Township, Forward Township, and North Versailles Township.
[54] EPA has admitted that at least two-thirds of monitors in the nation are not located in areas that appropriately characterize maximum SO_2 impacts and, as a result, some areas without monitoring likely have concentrations that are violating NAAQs. SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, *supra*, at 1.
[55] *See* SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, *infra*, at 2.

monitoring Network cannot accomplish the Appendix D objectives, nor can it ensure compliance with the Data Requirements Rule.

3. If ACHD Elects to Solely Monitor the Cheswick Facility's Emissions, Proper Monitor Placement Is Likely Not Possible.

Even if modeling is used to carefully determine the locations in which monitors might be expected to measure indicative levels of ambient concentration there is no guarantee—or even likelihood—that monitors could actually be placed at those locations. Siting a monitor is often logistically difficult. It first requires that the regulatory authority have access to the monitoring site. The agency thus needs not only the right to place an object at the location (i.e. by right of land ownership, easement, eminent domain, etc.), but also must have the ability to utilize a road leading up to the location so that the monitor can be installed, inspected, and maintained regularly. Second, the proper support infrastructure must be in place; monitors require power hookups that may not be available in ideal locations. Third, the location would have to be one in which hyper-local pollutant effects would not distort the data recorded by the monitor. Placing an SO_2 monitor by a road, for example, could result in aberrant measurements during periods of high vehicular traffic, or could suffer from winds and heat-island effects generated by vehicles. Similar problems may arise from changing land use near the monitor. Construction of new buildings, for example, can change the local wind profile in ways that render the monitor unlikely to measure characteristic air pollution concentrations. Lastly, monitors must be placed at locations that are inaccessible to vandals. It is exceedingly unlikely that the specific locations at which modeling predicts peak impacts would *also* satisfy all of these concerns. It is far more likely that these physical siting issues will be dispositive.

As EPA and numerous stakeholders have recognized, installing and operating air monitors can be a costly affair; by comparison, modeling is rapid and relatively cheap. Indeed, for sources that have already been modeled once, periodic remodeling will generally be quite straightforward, requiring little in the way of resources or personnel time. Further, state air agencies are empowered under the Clean Air Act to collect permitting fees sufficient to cover the costs of their programs, so ultimately it should be emitting sources themselves, not the taxpayer, who are covering the cost of assessing the impact on air quality from sources emitting SO_2. Accordingly, ACHD should elect to take the modeling route with respect to characterizing peak SO_2 emissions from the Cheswick Power Plant.

For the foregoing reasons, Sierra Club urges ACHD to model emissions from the Cheswick Power Plant. If air dispersion modeling will not continue, or will not be used for compliance with the Data Requirements Rule, the Plan must be revised to ensure that adequate and appropriate levels of monitoring—with a robust monitor network sited through careful modeling analyses—are performed to accurately evaluate air quality and NAAQS compliance within Allegheny County.

Respectfully submitted,

_____/s/_____

Michael Lanci
Legal Intern
Zachary M. Fabish
Staff Attorney
The Sierra Club
50 F. St. NW, 8th Floor
Washington, D.C. 20001
(202) 675-7917
(202) 547-6009 (fax)

EXHIBIT 1

ORAL ARGUMENT NOT YET SCHEDULED

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

NATIONAL ENVIRONMENTAL DEVELOPMENT ASSOCIATION'S CLEAN AIR PROJECT, Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, Respondent.	)	Docket No. 10-1252 (and consolidated cases)

RESPONDENT'S OPPOSITION TO MOTION OF THE STATE OF NORTH DAKOTA FOR A STAY OF EPA'S 1-HOUR SULFUR DIOXIDE AMBIENT STANDARD RULE

Respondent United States Environmental Protection Agency ("EPA") submits this Opposition to the Motion of the State of North Dakota for a Stay of EPA's 1-Hour Sulfur Dioxide Ambient Standard Rule ("Stay Motion"). In its Stay Motion, North Dakota seeks a stay of the rule in its entirety or, in the alternative, a stay of the statutory directive that States submit any recommendations for attainment/nonattainment designations no later than June 3, 2011. The motion should be denied because North Dakota has not satisfied the stringent requirements

for obtaining a stay of agency action. The motion fails to address any of the elements for obtaining a stay with regard to any of the promulgated elements of the rule, i.e., the revised sulfur dioxide ("SO_2") standard itself and the promulgated revisions to the SO_2 monitoring network. Rather, the motion is addressed solely to an advisory discussion in the final rule preamble regarding EPA's anticipated approach to implementing the revised NAAQS. Thus, the motion provides no basis to stay the rule as a whole.

The motion must also be denied with regard to the alternative relief requested. First, North Dakota has not demonstrated a substantial likelihood of success on the merits. It challenges only advisory statements in the final rule preamble concerning EPA's contemplated approach for making initial attainment designations by the June 2012 statutory deadline, an approach the Agency will be addressing in future actions. As the preamble makes clear, EPA has taken no final action nor promulgated any regulatory requirements regarding designations, and, in particular, has taken no final action on its approach to making attainment determinations. To the contrary, the preamble specifically preserves EPA's ability to make those decisions solely on the basis of monitoring data. 75 Fed. Reg. 35,520, 35,552 n.22 (June 22, 2010). Because these preamble statements are not final agency action, the Court lacks jurisdiction to review them, and North Dakota has no substantial likelihood of prevailing on the merits.

Moreover, even if the challenged preamble statements could be read as final agency action, the Agency has historically relied on modeling to make designations for sulfur dioxide. To the extent the proposal preamble reflected a possible change to that practice, it clearly left open the possibility that the Agency would choose not to adopt the proposed change. Interested parties should have known that EPA might retain its past practice, and had ample opportunity to comment on that possibility. Thus, North Dakota cannot demonstrate a likelihood of success on its claim that it lacked an opportunity to comment on the approach to initial designations discussed in the preamble.

Second, North Dakota cannot demonstrate that it will suffer irreparable harm from the statutory directive that it submit designation recommendations to EPA by June 2011. North Dakota claims harm from an alleged bar to the use of monitoring data as the sole basis for its designation recommendations. But, nothing in the SO_2 Rule prevents North Dakota from basing its recommendations solely on monitoring data, and thus the Rule does not cause the harm North Dakota claims. Id. Furthermore, designation recommendations have no independent legal effect. An area is not designated until EPA promulgates the designation, which EPA is required to do by June 2012[1/] (a requirement that would not be affected by a stay of

[1/] The date can be extended to June 2013 if EPA lacks sufficient information to act in 2012. 42 U.S.C. § 7407(d)(1)(B)(i).

the 2011 recommendation submission date). Moreover, EPA is not bound by the State's recommendations and must promulgate a designation for an area even if the State submits no recommendation at all.

Finally, a stay of the SO_2 Rule will cause harm to other parties and is contrary to the public interest. The rule under review revises the primary ambient air quality standard for sulfur dioxide based on findings by EPA that the prior standards were not requisite to protect human health with an adequate margin of safety. A stay of the rule's regulatory provisions promulgating the new standard would delay implementation of the measures needed to achieve attainment with the new standard, including requirements associated with the permitting of new and modified major stationary sources which became effective on the effective date of the standard. A stay of the Rule would thus prolong the time during which existing air quality causes adverse impacts to public health. A stay of the 2011 deadline for States to submit recommendations to EPA would not alter EPA's obligation to promulgate designations by 2012, but would increase the burden on EPA to develop the designations.

BACKGROUND

The consolidated petitions in this case seek review of an EPA regulation revising the primary National Ambient Air Quality Standards ("NAAQS") and associated regulatory requirements for oxides of sulfur as measured by SO_2

pursuant to section 109 of the Clean Air Act, 42 U.S.C. § 7409. 75 Fed. Reg. 35,520 (June 22, 2010) ("SO_2 Rule"). Those regulatory requirements took effect on August 23, 2010, and are currently being implemented. The NAAQS provisions of the Clean Air Act establish a comprehensive scheme to protect public health and welfare from ubiquitous air pollutants. 42 U.S.C. § 7409. Primary standards must be set at levels that, in the judgment of the Administrator, are requisite to protect public health with an adequate margin of safety. Id. § 7409(b)(1). The Act requires periodic review of the NAAQS. Id. § 7409(d). See generally American Lung Ass'n v. EPA, 134 F.3d 388, 388-89 (D.C. Cir. 1998).

EPA first promulgated a primary NAAQS for sulfur dioxide in 1971. 36 Fed. Reg. 8187 (April 30, 1971). In May 1996, after a lengthy review, EPA announced a final decision not to revise the NAAQS. 61 Fed. Reg. 25,566 (May 22, 1996). Petitions for review of that decision were filed in this Court, and the Court held that EPA had failed to adequately explain the basis for its conclusion that short-term SO_2 exposures to asthmatics do not constitute a public health problem. American Lung Ass'n v. EPA, 134 F.3d 388. In the rule under review here EPA has addressed that issue by replacing the prior 24-hour and annual primary standards with a new 1-hour primary standard. The new standard is now in effect, and is being implemented in EPA's prevention of significant deterioration

permitting program for new and modified major stationary sources. See 57 Fed. Reg. at 35,580/1.

Within one year after promulgation of a new or revised NAAQS (or sooner if required by EPA) States are directed to submit to EPA a list of all areas that the State recommends be designated by EPA as attainment, nonattainment, or unclassifiable for the new or revised NAAQS. 42 U.S.C. § 7407(d)(1)(A). In the case of the revised SO_2 standards, such designations are due by June 3, 2011, one year after EPA promulgated the revised NAAQS by signing and publicly disseminating the notice of final rulemaking. Within two years of promulgation (or three years if EPA lacks sufficient information), the Act requires EPA to promulgate designations. Id. § 7407(d)(1)(B)(i). EPA may modify any submitted list of designations provided by a State if it gives the State 120 days notice, and must promulgate designations as EPA deems appropriate for any area for which no designation recommendation is provided by a State. Id. § 7407(d)(1)(B)(ii). Thus, EPA's statutory obligation to promulgate designations is independent of whether a State submits recommendations.

The SO_2 Rule, like its predecessors, includes regulatory provisions that establish the NAAQS itself, as well as regulations governing the installation and use of monitors utilized to measure ambient concentrations of SO_2. See, e.g., 40 C.F.R. §§ 50.4(e); 50.14(c)(2)(vi); 50.17; part 50 Appendices A-1 and T; part 53,

and part 58. Historically, to determine if an area is in attainment with the SO_2 NAAQS, EPA has used a combination of results from regulation-required monitors and air quality modeling, even though in the NAAQS regulations themselves EPA has not promulgated requirements that States or sources conduct modeling. Instead, at 40 C.F.R. part 51, Appendix W, EPA has promulgated guidelines on air quality models, to be used for regulatory purposes such as State Implementation Plan ("SIP") development and new source review and prevention-of-significant-deterioration permitting actions. See, e.g., 40 C.F.R. part 51, Appendix W, § 1.0. In the current rule EPA has revised the regulatory requirements for the minimum number and placement of monitors and adopted a new reference method for detecting ambient SO_2, but did not promulgate or revise any requirements regarding modeling.

In the preamble to the proposed SO_2 Rule, EPA discussed the revisions to the monitoring network proposed to account for the revision of the standard, i.e., the change from the 24-hour and annual standards to a single one-hour standard. 74 Fed. Reg. 64,810, 64,846-55 (Dec. 8, 2009). In the proposal EPA did not discuss its historic and current uses of modeling in implementing the then-effective annual and 24-hour SO_2 standards. In public comments on the proposal, numerous parties suggested that the proposed monitoring network was both inadequate in scope and overly burdensome to administer, and some commenters suggested that

modeling should be used to relieve the administrative burden that a more extensive monitoring regime would otherwise impose. 75 Fed. Reg. at 35,551/1.

In the preamble to the final rule, EPA explained in response to comments that the Agency anticipated in subsequent actions to continue its historic practice of relying on both modeling and monitoring for determining whether an area is in attainment with the SO_2 NAAQS and adopted rules for a smaller monitoring network than initially proposed. 75 Fed. Reg. at 35,550-51. However, the preamble makes clear that, except for the promulgated requirements relating to the scope of the monitoring network and detection method, the Agency is still developing its policy for such future actions as designations and SIP approvals/disapprovals and intends to issue further guidance in the future through a notice-and-comment process. Id. The preamble also states EPA's expectation that any decisions about whether to base an attainment designation or determination on monitoring alone, without reliance on modeling, would be made on a case-by-case basis. Id. at 35,552 n.22.

Following promulgation of the rule, numerous parties filed petitions for review with this Court, and each of those parties also submitted to EPA administrative petitions for reconsideration of the rule under section 307(d)(7)(B) of the Act, 42 U.S.C. § 7607(d)(7)(B). The petitions for reconsideration objected to EPA's final rulemaking preamble discussion explaining EPA's anticipated

approaches in future designations and SIP actions. In addition, each requested that EPA administratively stay the final rule pending such reconsideration. EPA is currently evaluating the petitions for reconsideration and has not yet formally responded to them, but, as the Agency stated in its pending motion filed with the Court seeking a short-term abeyance of the instant litigation, EPA intends to provide initial responses to the petitions for reconsideration, including the requests for a stay of the rule, by January 8, 2011.

STANDARD OF REVIEW

A stay is a disfavored remedy. "On a motion for stay, it is the movant's obligation to justify the court's exercise of such an extraordinary remedy." Cuomo v. United States Nuclear Regulatory Comm'n, 772 F.2d 972, 978 (D.C. Cir. 1985). The factors for determining whether a stay is warranted are: (1) whether the movant has demonstrated a substantial likelihood that it will prevail on the merits; (2) the prospect of irreparable injury to the moving party if relief is withheld; (3) the possibility of harm to other parties if relief is granted; and (4) the public interest. Nken v. Holder, 129 S. Ct. 1749, 1761 (2009). These four prongs of the stay standard are to be applied stringently. Aberdeen & Rockfish R.R. Co. v. Students Challenging Regulatory Agency Procedures, 409 U.S. 1207, 1218 (1972). "A stay is not a matter of right, even if irreparable injury might otherwise result." Nken, 129 S. Ct. at 1760 (citation omitted).

To demonstrate a substantial likelihood of success on the merits, a petitioner must show that it is likely to persuade this Court that EPA's action is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 42 U.S.C. § 7607(d)(9)(A). This narrow, deferential standard prohibits a court from substituting its judgment for that of the agency and presumes the validity of agency actions. Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43-44 (1983). Judicial deference also typically extends to an agency's interpretation of a statute it administers, United States v. Mead Corp., 533 U.S. 218, 227-31 (2001); Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc., 467 U.S. 837, 842-45 (1984), and of its own regulations. Auer v. Robbins, 519 U.S. 452, 457 (1997).

To establish irreparable harm, a petitioner must demonstrate an injury that is "both certain and great; it must be actual and not theoretical." Wisconsin Gas Co. v. FERC, 758 F.2d 669, 674 (D.C. Cir. 1985). A movant for injunctive relief must show that "[t]he injury complained of [is] of such imminence that there is a clear and present need for equitable relief to prevent irreparable harm." Id. (citation omitted). The movant must "substantiate the claim that irreparable injury is 'likely' to occur," and "show that the alleged harm will directly result from the action which the movant seeks to enjoin." Id; see also Nken, 129 S. Ct. at 1761 (more than a "mere possibility" of success on the merits is required, and the standard for

irreparable harm is more than showing the "possibility" of harm); Winter v. NRDC, 129 S. Ct. 365, 375-76 (2008) (holding that in a preliminary injunction case, plaintiffs must demonstrate that irreparable injury is "likely," not just "possible").

ARGUMENT

I. THE MOTION IS PREMATURE

Fed. R. App. Proc. 18(a) requires that a petitioner must ordinarily move first before the agency for a stay of its order before seeking a stay in the Court of Appeals, or else show that moving before the agency would be impracticable. In this case, although North Dakota (and other Petitioners) have sought a stay of the SO_2 Rule from EPA, EPA has not yet acted on that request, and North Dakota has not demonstrated that it is impracticable to wait for EPA to act on those requests before seeking a stay from this Court. As described in EPA's Motion to Hold Case in Abeyance, EPA intends to act on the pending administrative petitions for reconsideration by January 8, 2011. At that time EPA will also act on the included requests for a stay, as the Agency previously informed Petitioners. Implicit in Rule 18's requirements is that a petitioner must receive a response to its request for a stay from the agency before seeking a judicial stay. North Dakota has neither waited for that response, nor demonstrated why doing so would be impracticable for submitting a recommendation that is not due until June 2011. Because North

Dakota's request for a stay is still pending before the Agency and the Agency has committed to responding in a timely fashion, North Dakota's motion for stay in this Court is premature and should be denied.

II. NORTH DAKOTA HAS PRESENTED NO BASIS FOR STAYING THE ENTIRE SO_2 RULE

In its motion, North Dakota asks the Court to stay the SO_2 Rule in its entirety (including the standard itself and the associated monitoring provisions) or, in the alternative, to stay the June 3, 2011 statutory deadline by which States may submit recommended designations to EPA. North Dakota, however, identifies no grounds for staying the entire rule. With regard to the merits, North Dakota advances no objection to the promulgated standard or the promulgated requirements related to monitoring. Nor does it present any claim that it will suffer irreparable harm from either the revised standard or the revised requirements related to monitoring. In fact, North Dakota does not address any aspect of the Rule except the non-binding preamble discussion concerning how EPA expects to use modeling in future area designations and SIP actions. Thus, North Dakota has not met the stringent standard for obtaining a stay of the Rule as a whole, and that request must be denied.

III. NORTH DAKOTA CANNOT DEMONSTRATE A SUBSTANTIAL LIKELIHOOD OF SUCCESS ON THE MERITS

The sole claim on the merits presented in the Stay Motion is that the preamble of the final rule allegedly requires the use of air quality modeling for determining whether an area is in attainment with the revised SO_2 NAAQS, that this approach differs from the approach discussed in the preamble to the proposal, and that the public did not have an opportunity to comment on the approach discussed in the final rule. This claim lacks merit for two reasons.

First, North Dakota is not challenging any provision of the promulgated regulations, but rather a discussion in the preamble, i.e., 75 Fed. Reg. at 35,550-54. Although some preamble discussions may constitute final agency action, it is clear that this particular discussion does not. Rather, the challenged discussion regarding the potential use of modeling is, at most, non-binding guidance that the Court lacks jurisdiction to review. The preamble specifically states:

> In many respects, both the overview discussion below and the subsequent more detailed discussions explain our **expected and intended future action** in implementing the 1-hour NAAQS – in other words, they constitute guidance, rather than final agency action – and it is possible that our approaches may continue to evolve as we, States, and other stakeholders proceed with actual implementation. In other respects, such as in the final regulatory provisions regarding the promulgated monitoring network, we are explaining EPA's final conclusions regarding what is required by this rule. We expect to issue further guidance regarding implementation . . . . EPA intends to solicit public comment prior to finalizing this guidance.

Id. at 35,550/3 (emphasis added).

Moreover, nowhere in the preamble (much less in any promulgated regulation) does EPA state that modeling must be used for designating areas as attainment, nonattainment or unclassifiable. Thus, the alleged requirement North Dakota seeks to challenge does not exist. Rather, the preamble states: "We expect that EPA's final area designation decisions in 2012 would be based principally on data reported from SO_2 monitors currently in place today, and any refined modeling the State chooses to conduct specifically for initial designations." Id. at 35,552/1 (emphasis added). The preamble then goes on to say "EPA anticipates making the determination of when monitoring alone is 'appropriate' for a specific area on a case-by-case basis, informed by the area's factual record, as part of the designation process." Id. at 35,552 n.22.

In short, EPA has simply not taken the final agency action alleged by North Dakota and there is no such action for the Court to review or to stay. To the contrary, the preamble states that EPA believes that its historic approach to SO_2 designations continues to appear to be appropriate, while at the same time giving States the flexibility to recommend the appropriate mix of data to rely on, including the possibility of relying entirely on monitoring if supportable.

Second, even if the preamble could be construed as final agency action, North Dakota's claim that the public lacked notice of the possibility that EPA might continue to use modeling when making designations is without merit. As

EPA has frequently explained, because of the nature of SO_2 pollution, EPA has historically relied on air quality modeling (in addition to any required monitoring) to determine whether an area is violating the SO_2 NAAQS. 75 Fed. Reg. at 35,551/2-3, 35,559/2-3; see SO_2 Guideline Document (available at www.epa.gov/ttn/oarpg/t1/memoranda/so2_guide_092109.pdf) at 2-5 ("For SO_2 attainment demonstrations, monitoring data alone will generally not be adequate.") and at 2-1 ("Attainment determinations for SO_2 will generally not rely on ambient monitoring data alone, but instead will be supported by an acceptable modeling analysis which quantifies that the SIP strategy is sound and that enforceable emission limits are responsible for attainment.") As a State responsible for recommending whether an area should be designated attainment or nonattainment, North Dakota certainly should have been aware of the Agency's historical approach.

Thus, to the extent the approach to designations described in the proposal preamble was limited to monitoring, in de-emphasizing the role modeling has long played in SO_2 implementation it represented a departure from the Agency's prior practice. In such circumstances, affected parties are surely aware that not adopting the proposed change is a possibility. American Iron & Steel Inst. v. EPA, 886 F.2d 390, 400 (D.C. Cir. 1989) ("One logical outgrowth of a proposal is surely, as EPA says, to refrain from taking the proposed step.") In fact, the Agency did receive

comments urging the Agency to retain its historic approach. 75 Fed. Reg. at 35,551/1. Accordingly, there is no basis for North Dakota's claim that it lacked notice that the Agency might choose not to adopt a more monitoring-focused approach as discussed in the proposal preamble, but instead to expect to retain its historic approach in which modeling is generally, though not always, utilized.

IV. NORTH DAKOTA CANNOT DEMONSTRATE AN IMMINENT THREAT OF IRREPARABLE HARM

There is no merit to North Dakota's claim that it will suffer irreparable harm if the SO_2 Rule or the statutory deadline to submit designation recommendations is not stayed. North Dakota first claims that it will be harmed because the SO_2 Rule "casts a cloud" over its ability to use its monitoring data and "deprive[s] the state of its right to manage its air resources." Stay Motion at 17. As demonstrated above, there is no factual basis for this claim because neither the SO_2 Rule itself nor the preamble discussion prohibits North Dakota from basing its recommended designations on its monitoring data alone. 75 Fed. Reg. at 35,552 n.22. Nor does anything in the Rule or preamble prohibit EPA from basing its designations for North Dakota on monitoring data alone if EPA determines that the monitoring data is sufficient to determine North Dakota's attainment status.[2/]

[2/] If EPA were to determine that the monitoring data was not sufficient to determine an area's attainment status, and thus that the area would have to be categorized as unclassifiable until sufficient monitoring data or modeling results were available,

(continued...)

Moreover, the State's recommended designations, which are due June 3, 2011, have no legal effect on sources. Not until EPA promulgates the actual designations, which the statute requires it do by June 3, 2012 (or 2013 if extended), will there be a designation in place that has legal effect. Thus, North Dakota can suffer no actual harm from submitting its recommended designations.

North Dakota's second claim of harm, that the use of modeling will result in more areas being designated as nonattainment because modeling is more "conservative," Stay Motion at 17-18, is purely speculative. North Dakota presents no evidence at all to support its assertion that modeling will necessarily result in areas of the State being designated as nonattainment inappropriately, and thus there is no basis on which the Court could find that North Dakota could suffer injury.[3/] Furthermore, as the preamble states, the modeling guidance that EPA intends to

---

[2/](...continued)
that designation would be result of the insufficiencies in the data, not of anything that EPA has done in the Rule.

[3/] While it might seem at first blush as if actual monitoring should be inherently more accurate than modeling, this is not necessarily the case. In fact, "[i]n the past, EPA used a combination of modeling and monitoring for SO_2 during permitting, designations and re-designations in recognition of the fact that a single monitoring site is generally not adequate to fully characterize ambient concentrations, including the maximum ground level concentrations, which exist around stationary SO_2 sources." 75 Fed. Reg. at 35,559. This is especially important because "[t]he 1-hour NAAQS is intended to provide protection against short-term (5 minute to 24 hour) peak exposures". Id. See American Lung Ass'n v. EPA, 134 F. 3d at 392-93 (remanding EPA's determination that such exposures do not constitute a threat to public health) and 75 Fed. Reg. at 35,536 (5-10 minute SO_2 exposures can result in adverse health effects to asthmatics).

provide States for use in determining attainment of the revised SO_2 standard is still under development. 75 Fed. Reg. at 35,552-54. Thus, any statements about how the use of modeling affects the designation process for the revised SO_2 standard are necessarily speculative.

Finally, the actual designations will be made by EPA, an action that EPA expects to take by June 3, 2012. States have an opportunity under the Act to provide input on the designations before they are made, and EPA's designations are subject to judicial review. Any claim that modeling is inappropriately used by EPA for a particular designation can and should be raised in that process.

V. A STAY WOULD HARM THIRD PARTIES AND IS CONTRARY TO THE PUBLIC INTEREST

A stay of the SO_2 Rule, whether in whole or in part, would cause harm to third parties and is contrary to the public interest because it would delay achievement of the public health benefits of the revised standard, which is now in effect and being used for the Act's New Source Review and Prevention of Significant Deterioration permitting programs. After an exhaustive review of the existing data, EPA determined that the prior SO_2 standard was not adequately protective of human health and required revision, a conclusion amply supported by the record. EPA's statutorily mandated science review committee, the Clean Air Scientific Advisory Committee, recommended unanimously that the current standard be revised because the current standards are not adequate to protect the

public health, and that EPA should adopt a one-hour standard in their place. 75 Fed. Reg. at 35,530, 35,538. Short-term exposure to SO_2 results in adverse respiratory effects such as bronchoconstriction (narrowing of the airways) and increased asthma symptoms. Id. at 35,525-26. Studies also show an association between short-term SO_2 exposure and increased emergency department visits and hospital admissions for respiratory illness, particularly among children, the elderly, and asthmatics. Id. at 35,547.

Importantly, the data demonstrate that these adverse health effects can occur at concentration levels that are allowed by the prior SO_2 NAAQS. Id. at 35,535-36. Thus, implementation of the revised standard is necessary to reduce the adverse health effects associated with these exposures. North Dakota's motion does not address this issue at all, and thus fails to address two of the elements needed for a stay of agency action.

A stay of the SO_2 Rule, either in whole or in part, is likely to delay attainment of the revised standard. A delay of the SO_2 Rule as a whole will delay States' implementation of the control measures needed to achieve compliance with the revised standard and the requirement for new or modified major stationary sources to implement necessary controls pursuant to the Clean Air Act's New Source Review and Prevention of Significant Deterioration permit requirements.

A stay of the date for States to recommend designations for areas as attainment, nonattainment, or unclassifiable will not delay EPA's independent obligation to promulgate designations. However, it could complicate the process of establishing area designations and impose additional burdens on EPA if States do not submit designation recommendations because EPA would not have the States' recommended designations as a starting point. Thus, a stay of the SO_2 Rule will harm third parties and be adverse to the public interest by delaying the public health benefits of the revised standard.

CONCLUSION

For the reasons stated above, North Dakota's motion for a stay of the SO_2 Rule should be denied.

Respectfully submitted,

IGNACIA S. MORENO
Assistant Attorney General

/S/ Norman L. Rave, Jr.
NORMAN L. RAVE, JR.
Environmental Defense Section
Environment & Natural Resources Division
United States Department of Justice
P.O. Box 23986
Washington, D.C. 20026-3986
(202) 616-7568
Counsel for Respondent

Of Counsel:

STEVEN SILVERMAN
MICHAEL THRIFT
Office of General Counsel
U. S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460

November 8, 2010

CERTIFICATE OF SERVICE

I hereby certify that on this 8th day of November, 2010, I caused a copy of the foregoing document to be served by the Court's CM/ECF system on:

Andrea Bear Field
Lucinda Minton Langworthy
Hunton & Williams LLP
1900 K Street, N.W.
Washington, DC 20006

Leslie Sue Ritts
Ritts Law Group, PLLC
620 Fort Williams Parkway
Carriage House
Alexandria, Virginia 22304

Donald Trahan
State of Louisiana Dept. of Environmental Quality
P.O. Box 82282
Legal Affairs Division
Baton Rouge, Louisiana 70884-2282

David S. Baron
Seth Lee Johnson
Earthjustice Legal Defense Fund
1625 Massachusetts Ave., NW
Suite 702
Washington, DC 20036-2212

Roxanne Giedd
Office of the Attorney General,
State of South Dakota
1302 East Highway 14
Suite 1
Pierre, South Dakota 57501-8501

Nhu Q. Nguyen
Office of the Attorney General,
State of Nevada
100 North Carson Street
Carson, Nevada 89701-4717

Sandra Patricia Franco
Robert N. Steinwurtzel
Bingham McCutchen LLP
2020 K Street, NW
Washington, DC 20006-1806

Margaret I. Olson
Assistant Attorney General
Office of the Attorney General
State of North Dakota
Solicitor General
500 North 9th Street
Bismark, North Dakota 58501-4509

Paul M. Seby
Marian C. Larsen
Moye White, LLP
1400 16th Street
6th Floor
Denver, Colorado 80202-1486

Nancy Elizabeth Olinger
Assistant Attorney General
Environmental Protection and
Administrative Law Division
P.O. Box 12548 (MC-018)
Austin, Texas 78711-2548

Benjamin Joseph Alke
Goetz, Gallik & Baldwin, PC
35 North Grand
P.O. Box 6580
Bozeman, Montana 59771-6580

/S/ Norman L. Rave, Jr.
Norman L. Rave, Jr.

EXHIBIT 2

PN 107-83-04-21-C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C 20460

APR 21 1983

OFFICE OF
AIR, NOISE, AND RADIATION

MEMORANDUM

SUBJECT: Section 107 Designation Policy Summary

FROM: Sheldon Meyers
Sheldon Meyers, Director
Office of Air Quality Planning and Standards (ANR-443)

TO: Director, Air and Waste Management Division
Regions II-IV, VI-VIII, X

Director, Air Management Division
Regions I, V, IX

On February 3, 1983, the Agency published a Federal Register notice regarding the status of all areas designated nonattainment under Part D of the Clean Air Act. This notice indicated that for a significant number of nonattainment areas States are anticipated to be able to demonstrate attainment of the primary national ambient air quality standards. Accordingly, for those areas, States have been encouraged to update their Section 107 designations. In addition, a number of nonattainment areas were identified in the February 3, 1983, notice as "unlikely to attain standards." The Federal Register also stated that the basic existing policy will generally be continued for redesignation. This memorandum summarizes and clarifies existing policy for reviewing designations and provides new guidance on processing these actions.

Policy For Reviewing 107 Designations

1. Data: In general, all available information relative to the attainment status of the area should be reviewed. These data should include the most recent eight (8) consecutive quarters of quality assured, representative ambient air quality data plus evidence of an implemented control strategy that EPA had fully approved. Supplemental information, including air quality modeling emissions data, etc., should be used to determine if the monitoring data accurately characterize the worst case air quality in the area. Also, the following items can be considered in special situations.

An attainment designation can be made using only the most recent four (4) quarters of ambient data if an acceptable state of the art modeling analysis (such as city-specific EKMA for ozone) is provided showing that the basic SIP strategy is sound and that actual, enforceable emission reductions are responsible for the recent air quality improvement.

For nonattainment designations which were originally based solely on modeling, redesignation to attainment is possible even if less than four (4) quarters of ambient data are available provided that a reference modeling analysis considering the sources' legal emission limits shows attainment of the standards. Information must also be presented showing that the sources causing the problem are in compliance with the enforceable SIP measures.

Although the current ozone standard implies the need for three years of data for attainment designations, two years of data with no exceedances is an acceptable surrogate. As discussed previously, this should be accompanied by evidence of an implemented control strategy that EPA had fully approved.

2. Projected Future Violations: Projections of future violations can provide the basis for continuing nonattainment designations. This concept is particularly important because of the current economic downturn. Information submitted to support attainment redesignations must adequately and accurately reflect anticipated operating rates. Areas should remain nonattainment where such projections reveal air quality violations.

3. Modeling: In most SO_2 cases, monitoring data alone will not be sufficient for areas dominated by point sources. A small number of ambient monitors usually is not representative of the air quality for the entire area. Dispersion modeling employing the legally enforceable SO_2 SIP limits will generally be necessary to evaluate comprehensively the sources' impacts as well as to identify the areas of highest concentrations. If either the modeling or monitoring indicates that SO_2 air quality standards are being violated, the area should remain nonattainment.

4. Boundaries: Current policies on appropriate boundaries for designation of nonattainment areas by EPA remain in effect, i.e., generally political boundaries such as city or county for TSP and SO_2, county as a minimum for rural ozone, entire urbanized area and fringe areas of development for urban ozone, and urban core area for CO. When States redesignate, EPA will continue to accept reasonable boundaries which are supported by appropriate data, such as specific new monitoring and/or modeling data or evidence of improvement due to control strategy implementation. Nonattainment areas for ozone should include the significant VOC sources.

5. Dispersion Techniques: Areas which are projected to attain the TSP or SO_2 standards because of the use of unauthorized dispersion techniques should continue to be designated as nonattainment.

Policy for Processing 107 Redesignations

1. SIP Review Actions: Section 107 designations have generally been classified as minor actions, with only a few of the more significant ones being processed as moderate. In the future, redesignations of Tier II nonattainment areas should be classified as major actions so that they can receive a comprehensive review to help ensure regional consistency. Redesignation of Tier I nonattainment areas should continue to be handled as minor or moderate actions, as appropriate.

2. "Unclassifiable" Areas: Since EPA and the States have had nearly five years to resolve discrepancies for nonattainment designations, it is now inappropriate to redesignate any area from nonattainment to unclassifiable. There has been ample time since the first designations were made in 1978 to thoroughly study each nonattainment area. Sufficient data should now exist to either make a redesignation to attainment or to keep the nonattainment designation.

If you have any questions, please contact Tom Helms at (FTS) 629-5525.

cc: Regional Administrator, Regions I-X
Chief, Air Programs Branch, Regions I-X

EXHIBIT 3

COPY

FILED
SUPERIOR COURT
SANTA BARBARA
DEC 03 1990
KENNETH A. PETTIT, County Clerk-Recorder
By: L. Katherine Rogers
L. KATHERINE ROGERS, Deputy Clerk-Recorder

JOHN K. VAN DE KAMP, Attorney General
of the State of California
ANDREA SHERIDAN ORDIN
Chief Assistant Attorney General
THEODORA BERGER
Assistant Attorney General
CRAIG C. THOMPSON
EDWARD G. WEIL
CLIFFORD RECHTSCHAFFEN
Deputy Attorneys General
2101 Webster Street
Oakland, CA 94612
Telephone: (415) 464-0572

Attorneys for the People of the State of California

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF SANTA BARBARA

PEOPLE OF THE STATE OF CALIFORNIA ex. rel. JOHN K. VAN DE KAMP, Attorney General of the State of California, Plaintiffs, v. SANTA MARIA CHILI, INC. Defendant.	No. SM 64010 (Case transferred to South County, 2/26/90) **DECLARATION OF JOHN C. VIMONT** DATE: Dec. 14, 1990 TIME: 9:00 a.m. Dept: To Be Assigned

I, John C. Vimont, declare:

1. I am currently employed by the United States Environmental Protection Agency (hereafter "EPA"), Region IX (hereafter the "Region" or "Regional Office") as the Regional Meteorologist. I have been employed in this position since June 1987.

a. As the Regional Meteorologist I serve as the Region's expert on air quality modeling, meteorological information and ambient air impact analyses. My position is

within the Air and Toxics Division of the Regional Office. I provide support to that division; to the other divisions within the Region, such as the Hazardous Waste Division; and to state and local agencies within Region IX. One of the primary duties of my position is to ensure that appropriate air quality modeling techniques are used by this and other agencies when conducting ambient air quality impact analyses.

b. There are a variety of "air quality models." These include conceptual models, qualitative descriptions of the behavior of pollutants in the atmosphere; physical models, scaled models of pollution sources and their surroundings studied in a controlled environment, such as a wind tunnel; statistical models, which encompass statistically based descriptions of source-receptor relationships; and mathematical models, which are mathematical representations of the physical processes which lead to transport and dispersion of pollutants in the atmosphere. The focus of the remaining discussion is on mathematical models; hereafter any reference to an air quality model is implicitly meant to refer to a mathematical air quality model.

c. I perform, review and oversee air quality modeling for a variety of different sources and source types. These include stationary sources with emissions emanating from a stack, including stack sources with aerodynamic downwash induced by nearby buildings; stationary sources with emissions emanating from a broad area, commonly called area sources; mobile sources, emissions from automobiles, trucks, busses, aircraft, etc.; and urban and regional scale modeling, which encompasses modeling all

of the above processes together on the scale of an entire urban area or over a number of urban areas together.

d. The pollutants modeled include both inert pollutants, those which remain chemically stable for long periods of time in the atmosphere, and chemically reactive pollutants, those which undergo relatively rapid chemical transformation and those which are not directly emitted, but rather form through a series of chemical reactions within the atmosphere.

2. Previous to my employment at EPA, I worked from March 1982 to June 1987 as an Environmental Engineering Specialist in the Air Quality Bureau of the State of New Mexico. My primary responsibilities there were very similar to my current position at EPA. I performed ambient impact analyses of various air pollution sources and conducted engineering analyses of the sources to determine emission characteristics. The primary focus of the analyses was on inert pollutants from stationary sources.

a. From August 1978 to March 1982 I worked for the Atmospheric Science Department at Colorado State University (CSU) as a Research Assistant. I worked on a variety of basic scientific research projects dealing with cloud physics. My primary area of research dealt with the uptake of acidic pollutants in snow.

b. From November 1977 to August 1978 I worked as a Physical Science Aide for the Pacific Marine Environmental Laboratory of the National Oceanographic and Atmospheric Administration. My duties there involved writing a

climatological summary of Puget Sound and analyzing the affects of winds on oil spill transport in Puget Sound.

3. I received a Bachelor of Science Degree in Atmospheric Sciences from the University of Washington in 1978 and a Master of Science Degree in Atmospheric Science from Colorado State University.

4. As the Regional Meteorologist, I routinely evaluate the adequacy of air quality modeling on a technical basis and with respect to its acceptability in the regulatory framework. Acceptable air quality modeling and analysis procedures are outlined in The Guideline on Air Quality Models (Revised) (EPA 450/2-78-027R, July 1986, Supplement A, July 1987) (hereafter the "Guideline"). The Guideline was first published in April 1978 to satisfy the requirements of §320 of the 1977 amendments to the Clean Air Act. The Guideline specifies appropriate models to use and provides guidance on their appropriate application. The Guideline provides a common basis for estimating the air quality concentrations used in assessing control strategies and developing emission limits. The modeling techniques embodied in the Guideline are subjected to public, scientific review in accordance with §320 of the CAA.

a. EPA has four primary, on-going activities to provide direct input for consistency in implementation and for revisions to the Guideline. The first is a series of annual EPA workshops conducted for the purpose of ensuring consistency and providing clarification in the application of models. The second activity, directed toward the improvement of modeling procedures,

is the cooperative agreement that EPA has with the scientific community represented by the American Meteorological Society. This agreement provides scientific assessment of procedures and proposed techniques and sponsors workshops on key technical issues. The third activity is the solicitation and review of new models from the technical and user community. In the March 27, 1980 Federal Register, a procedure was outlined for the submittal to EPA of privately developed models. After extensive evaluation and scientific review, these models, as well as those made available by EPA, are considered for recognition in the Guideline. The fourth activity is the extensive, on-going research efforts by EPA and others in air quality and meteorological modeling.

b. From the aforementioned process a number of models were selected as being refined models, suitable for regulatory application. Each refined model underwent intensive evaluation. The evaluation exercises include statistical measures of model performance in comparison with measured air quality data and, where possible, peer scientific reviews.

c. After a model has been selected as a refined model for a particular type of application, EPA considers the model appropriate for general use for that type of application without undergoing case-by-case evaluation, provided that the application follows the EPA recommendations specified in the Guideline.

5. The Industrial Source Complex models (hereafter ISC), have been deemed refined models by EPA for application to industrial complexes. The ISC models consist of a short term

model (ISCST) and a long term model (ISCLT). Long term models, such as ISCLT, are only appropriate for calculating ambient concentrations for averaging periods of months to a year. Short term models, such as ISCST, can be used for averaging times from one hour up to a year. (Hereafter my comments referring to ISC apply to both ISCST and ISCLT, unless otherwise specified.) The ISC model is appropriate for simulating the emissions of a variety of industrial air emissions. These would include emissions from free standing stacks and vents; stacks and vents which are influenced by the aerodynamic effects of nearby structures; emissions from area sources, such as storage piles or evaporative emissions from open tanks; line sources, such as roadways; and volume sources, such as large openings in buildings from which emissions emanate. The model is appropriate for simulating the ambient impacts of relatively inert pollutants, such as ethylene oxide, which do not undergo rapid chemical transformation in the atmosphere. The model will calculate the ambient concentrations at a number of user-specified "receptor" locations.

a. For simulating a stack-type source, ISC requires the input of the location, emission rate, physical stack height, stack gas exit velocity, stack inside diameter, and stack gas temperature. If the source is affected by the aerodynamic effects of buildings then inputs would also include information about the building dimensions.

b. The ISC model also requires meteorological data as input. These data include the wind speed, wind direction,

temperature, stability class and mixing height. The meteorological data must be representative of the geographic area being modeled to be accepted for a refined regulatory application.

c. The ISC model has gone through a number of performance evaluation studies, as outlined above. The following are several references of evaluation studies involving ISC:

(1) Bowers, J. F., and A. J. Anderson, 1981. An Evaluation Study for the Industrial Source Complex (ISC) Dispersion Model, EPA Publication No. EPA-450/4-81-002. U. S. Environmental Protection Agency, Research Triangle Park, NC.

(2) Bowers, J. F., A. J. Anderson, and W. R. Hargraves, 1982. Tests of the Industrial Source Complex (ISC) Dispersion Model at the Armco Middle-town, Ohio Steel Mill, EPA Publication No. EPA-450/4-82-006. U. S. Environmental Protection Agency, Research Triangle Park, NC.

(3) Scire, J. S., and L. L. Schulman, 1981. Evaluation of the BLP and ISC Models with SF_6 Tracer Data and SO_2 Measurements at Aluminum Reduction Plants. Air Pollution Control Association Specialty Conference on Dispersion Modeling for Complex Sources, St. Louis, MO.

(4) Schulman, L. L. and S. R. Hanna, 1986. Evaluation of Downwash Modifications to the Industrial Source Complex Model. Journal of the Air Pollution Control Association, 36:258-264.

d. In my experience of conducting and reviewing air quality modeling analyses, I have found that of the EPA approved

models, the ISC model is the most widely used model for determining the ambient concentrations of emissions from industrial sources. This is primarily due to its ability to simulate almost any type of industrial configuration and its status as a refined model under EPA guidelines. EPA considers it appropriate for use without undergoing case by case performance evaluation.

6. When EPA has a refined model appropriate for a specific type of application, such as the ISC model, the modeling results, based on the appropriate input data, are generally preferred by EPA over ambient monitoring data for determining emission limitations for both new and existing sources. Normally, EPA does not accept monitoring data as the sole basis for determining an emission limitation. When a refined model is available, EPA generally considers the model results alone (including background concentrations) sufficient for determining ambient concentrations of emissions from industrial sources and setting appropriate emission limitations.

a. Monitoring data suffers from a number of limitations. One of the primary limitations is that any given monitor can only measure what is happening at the location where the monitor is physically located and at the time it is operating. In order to adequately detect the maximum impact of any particular source, many monitors would have to be run over a number of years. A monitoring program designed to adequately detect a maximum concentration and to adequately characterize the concentration field would be very expensive. A number of years

of data would be necessary to collect enough samples to cover all possible meteorological situations in combination with the different operating conditions of the facility. A monitoring program with only one or two monitors or of a very short duration would be inadequate to ensure that maximum ambient impacts would be detected.

b. The usual intent of conducting an ambient impact analysis of an air pollution source is to determine if the emissions are likely to affect human health or affect the environment. The ambient concentrations are compared against health or environmental affects data. Rather than helping to resolve a problem, a prolonged ambient monitoring study allows continued air quality degradation, which in turn affects the health or environmental quality which was to be protected. For a new source being proposed, it is impossible to measure its impacts, since it is not yet built.

c. The method of analysis preferred by EPA for determining the ambient concentrations resulting from emissions into the atmosphere of industrial sources, including toxic air emissions, is modeling. As discussed above, before EPA determines a model, such as ISC, to be a refined model, appropriate for general use, the model undergoes rigorous evaluation and is determined to yield accurate estimates of the ambient air concentrations resulting from emission sources under a variety of conditions. With a model, the source can be simulated under the full range of its potential operating and emission conditions, rather than being limited to the specific

operating conditions occurring during the period of a limited monitoring study. The model can also yield ambient concentration data at any number of receptor locations, rather than only at the limited number of locations where a monitor is physically located. Also, an air quality model provides the only practical method of estimating the ambient impacts of a new source. A model provides flexibility in an analysis and can be run relatively quickly, at relatively little expense.

d. Modeling also allows source contributions to a particular ambient concentration to be ascertained. If two sources each emit the same pollutant, it is impossible to tell from an ambient measurement of the specific pollutant, the relative contributions to the measured ambient concentration, unless there is some unique surrogate being emitted from one of the facilities. Also, there is the uncertainty of whether a heretofore unknown source of the pollutant of concern has contributed to the measurement. Modeling, allows the impact of each source to be calculated separately and in combination.

e. The use of monitoring data also pre-supposes that there are acceptable and reliable monitoring techniques available for the pollutant of interest. In the past, this has generally been the case. EPA has established acceptable and reliable methods of measuring a number of pollutants which were regulated under the Clean Air Act. Recently, however, the issue of toxic air contaminants has arisen. Ambient measurement techniques, which can adequately and accurately detect a specific toxic air contaminant, are not necessarily available. The transport and

dispersion of buoyant or neutral plumes of gaseous pollutants, which are relatively inert in the atmosphere, is the same, regardless of the specific chemical constituents of the gas. Therefore, modeling provides a useful technique for detecting levels of pollutants in the air if reliable ambient measurement techniques are not available.

f. EPA does recognize the usefulness of ambient measurements for information on background concentrations, provided reliable monitoring techniques are available. EPA does not recommend, however, that ambient measurements be used as the sole basis of setting emission limitations or determining the ambient concentrations resulting from emissions from an industrial source. These should be based on an appropriate modeling analysis.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: November 30, 1990

JOHN C. VIMONT

EXHIBIT 4

ORAL ARGUMENT NOT YET SCHEDULED

UNITED STATES COURT OF APPEALS

FOR THE DISTRICT OF COLUMBIA CIRCUIT

NATIONAL ENVIRONMENTAL DEVELOPMENT ASSOCIATION'S CLEAN AIR PROJECT,	)	
Petitioner,	)	
v.	)	Docket No. 10-1252
	)	(and consolidated cases)
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,	)	
Respondent.	)	

DECLARATION OF ROGER W. BRODE

1. My name is Roger W. Brode. I hold B.S. and M.S. degrees in Atmospheric Sciences and I am currently assigned as a physical scientist in the Air Quality Modeling Group within the Air Quality Assessment Division of the Office of Air and Radiation's Office of Air Quality Planning and Standards at the U.S. Environmental Protection Agency ("EPA"), where my

responsibilities include the development, evaluation and application of air quality dispersion models and the development of guidance associated with application of such models in support of EPA regulations governing the Prevention of Significant Deterioration ("PSD")_permitting program. I have been involved in the development, evaluation, testing, and documentation of the American Meteorological Society EPA Regulatory Model ("AERMOD") throughout its history. I currently serve as co-chair of the AMS/EPA Regulatory Model Improvement Committee (AERMIC) consisting of atmospheric scientists and dispersion model experts overseeing the further technical development of the model, and as co-chair of the AERMOD Implementation Workgroup consisting of EPA Regional Office and State dispersion modelers whose charge has been to indentify and assess potential issues with implementation of the AERMOD model as EPA's preferred model under Appendix W of Part 51 of the Code of Federal Regulations.

2. The revised primary national ambient air quality standard for oxides of sulfur ("SO2 NAAQS") requires that the three year average of the annual 99th percentile of the daily maximum 1-hour average concentrations of SO2 be less than or equal to 75 parts per billion. In addition, owners and operators of a new major stationary source or a major source undergoing a major modification located in areas not designated "nonattainment" for the SO2 NAAQS must obtain a PSD permit, and to do so must demonstrate (among other things) that the emissions increases from the new or modified source will not cause or contribute to a violation of the revised SO2 NAAQS. Existing air quality models, including AERMOD, are readily capable of accurately predicting whether the revised primary SO2 NAAQS is attained and whether individual sources cause or contribute to a violation of the SO2 NAAQS. Specifically, dispersion models that are used to demonstrate compliance with the SO2 (and

other) NAAQS, including under PSD permitting programs, use sequential hourly meteorological data as the basis for estimating ambient concentration levels. These data are combined with other inputs (chiefly source emission information, background emissions, and receptor information) to predict transport and dispersion of emitted pollutant plumes. Since the key varying inputs to these models are input on an hourly basis, all applications of these models under the guidance in Appendix W (40 CFR Part 51) are predicated upon the models' ability to predict hourly ambient concentrations. These models thus generate one-hour air quality distributions from which the three year average of the annual 99th percentile of daily maximum 1-hour average concentration of SO2 can be readily calculated or otherwise reasonably approximated.

3. As part of the basis for EPA adopting the AERMOD model as the preferred model for near-field applications in the *Guideline on Air Quality Models*, Appendix W to 40 CFR Part 51, the performance of the AERMOD model was extensively evaluated based on a total of 17 field study data bases (AERMOD: Latest Features and Evaluation Results. EPA-454/R-03-003. U.S. Environmental Protection Agency, Research Triangle Park (2003), portions of which are attached to this affidavit) ("EPA 2003"). The scope of the model evaluations conducted for AERMOD far exceeds the scope of evaluations conducted on any other model that has been adopted in Appendix W to Part 51. These evaluations demonstrate the overall good performance of the AERMOD model based on technically sound model evaluation procedures, and also illustrate the significant advancement in the science of dispersion modeling represented by the AERMOD model as compared to other models that have been used in the past. In particular, adoption of the AERMOD model has significantly reduced the

potential for overestimation of ambient impacts from elevated sources in complex terrain compared to other models.

4. Some of the field studies used to evaluate AERMOD model performance involved ambient sampling of SO2 for a period of one year or more at several (typically about 10) monitors sited around operating power plants. Other field studies involved sampling of controlled releases of non-reactive tracers, typically SF6, generally over a shorter duration than the operational studies, but with more robust sampling to facilitate more detailed diagnosis of model performance. Although the long-term field studies associated with operating power plants included assessments of 3-hour, 24-hour and even annual average impacts from the model, evaluation results for 1-hour averages were routinely included for all of the field studies. As shown in Tables 2 and 3 of EPA 2003, modeling and monitored results for 1-hour averages are in excellent correlation in these studies, with the ratio of predicted to observed performance approaching 1:1 in most instances. Thus, in my opinion, the performance of the AERMOD model for estimating 1-hour ambient concentrations is well-documented and the form of the new 1-hour SO2 standard raises no questions or concerns regarding the appropriateness of AERMOD.
5. The SO2 NAAQS Coalition states that the revised SO2 NAAQS is a "probabilistic" standard and asserts that this makes modeling more problematic, especially as compared to the previous "deterministic" standard. (Coalition p. 5.) The terms "probabilistic" and "deterministic" do not have an ordinarily understood meaning in this context, but it appears that the assertion is that predictive models like AERMOD are not suitable for a standard which includes a percentile-based form (where the relevant comparison is to a percentile of air quality from an air quality distribution), as opposed to an expected exceedance form

(whereby a standard may exceeded on a given number of days and compliance is assessed based on air quality on the designated day once the allowed exceedance days are removed from the distribution). I know of no reason that AERMOD and other similar types of models is suitable for one type of form and not the other. As just stated in paragraph 2, the models readily generate air quality distributions from which either percentiles (for the revised SO2 NAAQS, the 99th percentile) or exceeding days can be determined. In fact, the percentile form of the 1-hour SO2 NAAQS is a more "stable" metric than a standard based on the 1st-highest or 2nd-highest concentrations, since the potential impact of "outliers" in the distribution is mitigated, especially when the multi-year average aspect of the SO2 NAAQS is accounted for.

6. Both the SO2 NAAQS Coalition and their affiant Mr. Paine raise a number of points regarding the issue of whether allowable or actual source emissions should be modeled, stating that use of allowable emissions overstates sources' impacts. See, e.g. Paine Decl. at ¶ ¶ 11-14. This issue is independent of the predictive accuracy of AERMOD or other models.
7. EPA's rules and guidance provide significant flexibility in the choice of which models to use in determining if sources cause of contribute to NAAQS violations for purposes of PSD permitting. EPA's rules specify that "where an air quality model specified in Appendix W of this part ... is inappropriate, the model may be modified or another model substituted" with written approval from EPA. 40 C.F.R. §51. 166 (l)(2). The rules therefore allow flexibility, subject to appropriate requirements, for alternative modeling techniques to be applied on a case-by-case basis subject to approval by appropriate reviewing authority.
8. The declaration of Michael E. Long voices concerns regarding the use of the AERMOD dispersion model to support implementation of the 1-hour SO2 standard, and asserts that

"AERMOD significantly over predicts the actual one-hour ambient concentrations in our area when the available information is used in the model as directed by EPA." Long Decl. at ¶ 8. This assertion is based on a comparison of model-predicted ambient concentrations to ambient SO2 concentrations reported for 2008 at local EPA monitoring stations in the vicinity of the ArcelorMittal facilities being modeled. Mr. Long reports that the "AERMOD model predicted one-hour concentrations that were higher than the monitored values 90% of the time and the predicted values were as much as 373,131 times higher than the actual monitored values." Id. Lacking any additional details regarding the model-to-monitor comparisons cited by Mr. Long, the response here is necessarily limited to a general discussion of issues involved in such comparisons. A number of factors can affect the comparison of a modeled concentration with a monitored concentration, including the accuracy of the emission rate and other source characteristics input to the model, the representativeness of the meteorological data input to the model, and the influence of local geographical features and land use characteristics on the transport and dispersion of the plume. Another key factor that affects comparisons of modeled vs. monitored concentrations, paired in time and space, is the potential error or uncertainty in the wind direction input to the model for that hour since the wind direction will determine the transport direction of the plume. Slight errors in the transport wind direction may account for significant differences in modeled vs. monitored concentrations for a specific hour, especially for elevated plumes under stable atmospheric conditions where the lateral spread of the plume can be very limited for relatively long transport distances, and errors of a few degrees in wind direction can be the difference in the plume directly impacting the monitor for a particular hour or the plume missing the monitor completely. In such cases, a factor of

373,131 difference between modeled and monitored concentrations could easily be attributable to error or uncertainty in the wind direction. Note that wind directions reported from routine meteorological monitoring stations located at airports, the most common source of meteorological data used in air quality modeling applications, are reported to the nearest 10 degrees. In addition, the comparison may reflect issues related to use of allowable versus actual emissions, which is irrelevant for purposes of determining whether the AERMOD model itself is biased.

9. The declaration of Robert J. Paine addresses practical issues in applying the AERMOD model that allegedly arise due to the form of the 1-hour SO2 standard, as well as concerns regarding the conservatism of the assumptions on source emissions based on Appendix W guidance in relation to the 1-hour SO2 standard. Responses to these issues are summarized below, numbered according to Mr. Paine's declaration, with some responses applying to multiple comments:

    (a)

Paine Decl. ¶ 9. : The AERMOD model "does not yet provide results that allow permit applicants to follow EPA's guidance for determining whether they comply with the 1-hour SO2 NAAQS because of the unique statistical form of that NAAQS."

Paine Decl. ¶ 10. : "The form of the 1-hour SO2 NAAQS requires the applicable guideline dispersion model to compute the highest 1-hour concentration for each day at each modeled receptor point, and to keep track of this daily 1-hour maximum concentration statistic for each of the 365 days for each year modeled independently at each location modeled.

Paine Decl. ¶ 11. : "In the case for which a cumulative modeling analysis is required, this same procedure must be applied to the combined contributions of the individual source being permitted, nearby sources and regional background."

Response: As stated in paragraph 2 above, all of these metrics are readily obtainable from model outputs. Although the existing version of AERMOD does not contain an algorithm from which these metrics emerge automatically as model outputs, this does not change the result that all of these metrics are obtainable. In fact, we are aware that Mr. Paine, along with other private sector parties, developed post-processing tools to compute the 1-hour SO2 design value based on the form of the revised SO2 NAAQS utilizing model output options available at the time.

(b)

Paine Decl. ¶ 11. : "Furthermore, EPA in most cases requires a conservatively high regional background concentration to be added for all hours modeled, rather than the actual values measured during each hour of the modeling simulation."

Response: EPA issued guidance on a range of issues related to the new 1-hour SO2 standard on August 23, 2010, including a recommendation that the overall highest 1-hour monitored SO2 concentration from a representative monitor could be used to account for the monitored background component in a cumulative impact assessment "without further justification." We recognize that use of the overall highest 1-hour monitored value may entail a degree of conservatism that could prevent a source from demonstrating compliance with NAAQS; however, that conservatism forms the basis for allowing the approach to be used without further justification. The August 23 memorandum further stated that "Additional refinements to this 'first tier' approach based on some level of temporal pairing of modeled and monitored values

may be considered on a case-by-case basis, subject to approval by the reviewing authority, with adequate justification and documentation." However, we also note that Appendix W explicitly makes "no attempt" to "comprehensively define" the criteria involved in determining which nearby sources to include in an analysis "owing to both the uniqueness of each modeling situation and the large number of variables involved in identifying nearby sources." See Appendix W section 8.2.3.b.

(c)

Paine Decl. ¶ 12. : "Following EPA's regulatory requirements for PSD modeling, the modeled predictions of hourly concentrations of a probabilistic standard such as the 99th percentile daily maximum hourly SO2 concentrations produced by a single source for which a permit is sought can be much higher than concentrations that actually occur in the ambient air."

Response: As noted in paragraph 6 above, the issue of allowable versus actual emissions is independent to the question of the accuracy of AERMOD or other models. Also, as stated in paragraph 5 above, there is no reason that AERMOD (or other similar models) is not equally accurate in predicting percentile air quality distributions or expected exceedances on a given day. The underlying data which are input to the model generate air quality distributions which are equally suitable for either type of form.

(d)

Paine Decl. ¶ 12. : "Modeling of peak SO2 emissions as if they occur continuously is a distortion of reality and will overestimate the ambient air concentrations. This is especially true for 1-hour averages, since the variation of emissions for such a short averaging period is

potentially much higher than that for the other SO2 NAAQS averaging periods. This makes the assumption of constant peak emissions a critical issue for this new standard."

Response: The purpose of dispersion modeling in the context of the PSD permitting program is to demonstrate that the proposed new or modified emissions will not cause or contribute to violations of the standard if the permit is granted. This is inherently a predictive exercise since it entails an assessment of proposed future emissions. EPA's guidance for conducting such analyses is dictated by and consistent with that purpose. Mr. Paine's statement that 1-hour averages are more variable than longer averaging periods again does not relate to potential model bias and in any case makes a sweeping generalization for situations that differ case-by-case. The statement that peak SO2 emissions should not be modeled is a restatement of the dispute as to use of allowable or actual emissions, and does not relate to the issue of model bias.

(e)

Paine Decl. ¶ 13. : "The model overprediction tendency is even more likely to be a problem in a cumulative impact analysis because numerous sources (i.e., the source being permitted and potentially thousands of other nearby sources) are all modeled at peak emissions at all times and added to a regional background level of SO2. . . leading to unrealistic predictions that the 1-hour SO2 NAAQS will be exceeded."

Response: As noted, the issue of allowable versus actual emissions is independent of the issue of models' predictive accuracy. However, EPA's August 23, 2010 clarification memo regarding the applicability of Appendix W guidance for the 1-hour SO2 NAAQS cautioned "against the literal and uncritical application of very prescriptive procedures for identifying which background sources should be included in the modeled emission inventory for NAAQS

compliance demonstrations, including those described in Chapter C, Section IV.C.1 of the draft New Source Review Workshop Manual (EPA, 1990), noting [again] that Appendix W emphasizes the importance of professional judgment in this process." One motivation for that caution was a concern that application of such procedures could lead to an overly conservative result by including too many background sources in the cumulative impact assessment. As noted elsewhere, Section 8.2.3.b of Appendix W suggests that "the number of such sources is expected to be small except in unusual situations."

(f)

Paine Decl. ¶ 13. : "Moreover, since the nearby sources will be modeled individually (but their emissions are already accounted for in the regional monitoring), there will inevitably be double-counting of the background impacts between the components of the "nearby sources" and the "regional background", especially for the common situation of the state requiring a single peak regional background value to be used for all modeled hours."

Response: As noted in several responses above, there are many application-specific factors that need to be considered in determining how to conduct an adequate assessment of cumulative impacts, accounting for contributions from nearby background sources explicitly in the model as well as a monitored contribution, while avoiding or minimizing the potential for double-counting of modeled and monitored impacts.

(g)

Paine Decl. ¶ 14. : "The distribution of total peak daily emissions over the three-year period of 2000-2002 [from major SO2 sources in central North Dakota] was found to overpredict the second-highest monitored 24-hour concentrations by roughly a factor of 2 because the emissions

on average are lower than peak values assumed in the modeling. For the probabilistic 1-hour standard . . . and for closer receptors, the overprediction ratio would likely be even higher than for a 24-hour average, causing extensive areas of fictitious modeled NAAQS violations."

Response: The first statement in this comment merely confirms what was indicated in an earlier response, namely that modeled impacts based on maximum allowable emissions should not be expected to accurately predict ambient monitored concentrations in most cases, since monitored concentrations can only reflect impacts from actual emissions. Overprediction by a factor of 2 does not suggest a significant degree of conservatism given that modeled emissions reflected peak emissions. No rationale is offered to support the assertion that the overprediction ratio would likely be even higher for the 1-hour standard, and we see no reason to expect that necessarily to be the case.

(h)

Paine Decl. ¶ 14. : "Based on my experience with modeling the 1-hour NAAQS for nitrogen dioxide – a NAAQS that is similar in form to the 1-hour SO2 NAAQS – this overprediction ratio could approach a factor of 10 in areas with numerous sources modeled together."

Response: Although the form of the 1-hour NO2 standard is very similar to the form of the 1-hour SO2 standard, the role of NOx chemistry in modeling ambient NO2 impacts associated with NOx emissions makes it difficult to draw comparisons between the two standards in terms of the potential for the model to overestimate ambient impacts as compared to monitored concentrations. The comment does not indicate what assumptions were made in the NO2 modeling analyses regarding the conversion of NO emissions to ambient NO2. An overly conservative assumption in relation to that conversion could introduce a significant bias in the

modeled concentrations relative to monitored concentrations of NO2 that would have no relevance to modeling 1-hour SO2 impacts.

(i)

Paine Decl. ¶ 15. : "If a cumulative modeling assessment shows violations of the NAAQS, then the PSD permit applicant can still obtain a permit for its source by showing that the proposed source does not contribute significantly to the modeled violation. EPA, however, has not yet defined a procedure for determining whether a proposed source that conducts a cumulative modeling analysis and finds modeled violations due to other sources is by itself causing or contributing to these predicted (and possibly false) 1-hour SO2 NAAQS violations. This "safety valve" thus does not yet exist for applicants trying to demonstrate that their proposed SO2-emitting sources will not cause or contribute to any modeled violations of the 1-hour SO2 NAAQS."

Response: Recognizing the importance of the significant contribution test within the PSD permitting program, EPA recommended an interim Significant Impact Level (SIL) in its August 23 guidance memorandum regarding the 1-hour SO2 NAAQS. This interim SIL provides the "safety valve" that may allow a permit applicant to obtain a permit in cases where the cumulative impact assessment shows modeled violations of the 1-hour SO2 NAAQS, if it can be demonstrated that the proposed emission increases do not contribute significantly to those modeled violations, paired in time and space. Although the form of the 1-hour SO2 standard may complicate the "bookkeeping" needed to make such a demonstration, the principle of the significant contribution test based on the SIL has not changed under the 1-hour SO2 NAAQS.

Pursuant to 28 U.S.C. § 1746, and under penalty of perjury, I declare the foregoing is true and correct to the best of my knowledge.

01/18/2011

Date

Roger W. Brode

EXHIBIT 5

Camille Sears 502 W. Lomita Ave., Ojai, CA 93023
Tel: (805) 646-2588 e-mail: camille.marie@sbcglobal.net

June 28, 2012

EPA Docket Center
1301 Constitution Ave., NW., Room 3334
Washington DC 20004

Re: Docket#: EPA-HQ-OAR-2010-1059
Comments on USEPA's Guidance for One-Hour SO_2 NAAQS SIP Submissions

Thank you for the opportunity to comment on USEPA's guidance for one-hour SO_2 NAAQS SIP submissions. In the 9/22/2011 public draft of their guidance, USEPA summarizes their planned program elements as follows:

> In addition to this guidance document, EPA is also planning a rulemaking to address some of the 1-hour SO_2 NAAQS implementation program elements. These elements include: (1) establishing that compliance with the 1-hour SO_2 NAAQS is appropriately based on the results of both air quality modeling and monitoring; (2) establishing the modeling requirements necessary to determine compliance with the 1-hour SO_2 NAAQS; (3) establishing the minimum scope of analysis required to demonstrate attainment and maintenance of the 1-hour SO_2 NAAQS to comply with the SIP requirements in CAA section 110(a)(1); (4) establishing a reasonable time period for sources to comply with any new emissions limitations states need to establish in the 110(a)(1) SIPs to demonstrate attainment and maintenance of the 1-hour SO_2 NAAQS; (5) to set an attainment date for areas designated as unclassifiable; and (6) establishing the criteria for redesignating areas from "unclassifiable" to "attainment."[1]

This document goes on to say:

> EPA will also propose a rulemaking that would codify the hybrid modeling and monitoring implementation approach in order to ensure compliance with the 1-hour SO_2 NAAQS in a timely manner.[2]

In summary, I believe that air dispersion modeling should be the preferred method for determining one-hour SO_2 impacts from existing sources. Monitoring should be used only in specific cases to supplement modeled impacts, and the monitored data, which cannot cover all ambient air locations, should not be given more weight than the modeled concentrations. In

[1] USEPA, Guidance for One-Hour SO_2 NAAQS SIP Submissions, Public Review Draft, September 22, 2011, pp. iii-iv. (http://www.epa.gov/airquality/sulfurdioxide/pdfs/DraftSO2Guidance_9-22-11.pdf)
[2] Id., p. iv.

essence, USEPA's proposed hybrid modeling and monitoring implementation approach should be heavily weighted towards modeling.

Air dispersion modeling has been used for decades to assess ambient air impacts from proposed and existing sources, and for SO_2 NAAQS SIP purposes, monitoring alone (or a program based predominantly on monitoring) is not a viable alternative. I recently submitted a subset of these comments to USEPA's 10th Conference on Air Quality Modeling docket.

I specialize in atmospheric dispersion modeling, which uses regulatory-approved computer programs to estimate chemical concentrations in the air and deposition fluxes to the ground. In the past 30 years I have prepared over 1,000 air dispersion modeling analyses. I hold B.S. (1978) and M.S. (1980) degrees in Atmospheric Science from the University of California at Davis. A copy of my curriculum vitae is attached.

My comments on this docket concentrate on the issue of modeling vs. monitoring for verifying compliance with the one-hour SO_2 NAAQS (attainment determinations). My comments are in response to USEPA's "key questions" presented in their *Implementation of the 2010 Primary 1-Hour SO_2 NAAQS: Draft White Paper for Discussion*. I address key questions a. and b. on monitoring and key questions a., b., c., and d. on modeling.

Monitoring key questions:

a. Are the conceptual monitoring networks described above sufficient to determine whether ambient SO_2 levels meet the NAAQS and are protective of public health without the need for additional modeling? If not, then what enhancements should be made to them? In what situations should meteorological data collection also be required?

b. What is an appropriate number of monitors to site around a source to assess air quality?

I am providing a combined response to the above questions.

I do not believe that it is feasible for monitoring alone to verify compliance with the one-hour SO_2 NAAQS. A suitable monitoring program would require many monitors and data would need to be collected for at least several years. The number of required monitors would be prohibitively expensive and the duration of the monitoring program, while compounding the expense, also delays the implementation needed to protect public health from any unhealthy SO_2 exposures.

The question of modeling or monitoring was discussed in a California Proposition 65 enforcement declaration by John Vimont, when he was USEPA's Region IX Regional Meteorologist:

> Monitoring data suffers from a number of limitations. One of the primary limitations is that any given monitor can only measure what is happening at the location where the monitor is physically located and at the time it is operating. In order to adequately detect the maximum impact of any particular source, many monitors would have to be run over a number of years. A monitoring program designed to adequately detect a maximum concentration and to adequately characterize the concentration field would be very expensive. A number of years of data would be necessary to collect enough samples to cover all possible meteorological situations in combination with the different operating conditions of the facility. A monitoring program with only one or two monitors or of a very short duration would be inadequate to ensure that maximum ambient impacts would be detected.[3]

Mr. Vimont also declared:

> EPA does recognize the usefulness of ambient measurements for information on background concentrations, provided reliable monitoring techniques are available. EPA does not recommend, however, that ambient measurements be used as the sole basis of setting emission limitations or determining the ambient concentrations resulting from emissions from an industrial source. These should be based on an appropriate modeling analysis.[4]

I agree with Mr. Vimont on the disadvantages of relying on air monitoring to verify compliance with ambient air quality standards. This sentiment is also expressed by the State of California, in their Air Toxics Hot Spots Health Risk Assessment (HRA) guidelines:

> Pollutant concentrations are required in HRA calculations to estimate the potential cancer risk or hazard indices associated with the emissions of any given facility. Although monitoring of a pollutant provides excellent characterization of its concentrations, it is time consuming, costly, and typically limited to a few receptor locations and snapshots in time. Air dispersion modeling has the advantage of being relatively inexpensive and is less time consuming, provided that all the model inputs are available. In addition, air dispersion modeling provides greater flexibility for placement of receptors, assessment of individual

[3] Vimont, John, People of the State of California v. Santa Maria Chili, Declaration, November 30, 1990. (see attached file: Vimont-John-Declaration.pdf)
[4] Id.

> and cumulative source contributions, and characterization of concentration over greater spatial extents.[5]

In addition, it is not always possible to place monitors where maximum project or cumulative impacts may be occurring. I have first-hand experience with the problem of siting monitors to ensure that maximum project impacts are being measured. While I was an employee with the Santa Barbara County Air Pollution Control District, I sited over 30 pre- and post-construction air quality PSD monitoring systems. These monitors were required by permit conditions for various oil and gas processing facilities, and several monitors were to be sited for each project. Using air dispersion modeling, we determined where the peak project impacts were likely to occur and then attempted to place the air quality monitoring systems at those locations. In virtually every case, it was not possible to place the air quality monitor in the desired location. Impediments to siting the monitors where we wanted to place them included: power or communication constraints, lack of security, denial of landowner permission, lack of access, and terrain and vegetation restrictions. In other words, it's one thing to have an adequate number of monitors; it's quite another thing to place them where they are needed.

Part of the problem is that there are relatively few existing monitors that can be used for SO_2 NAAQS attainment determinations. There are not nearly enough SO_2 monitors in place to determine attainment status of the existing major SO_2 emission sources. Moreover, very few, if any, of these monitors are "well-placed" for measuring the maximum ambient air impacts from these existing SO_2 sources. This situation dictates that in virtually every instance, a monitoring program needs to be started from scratch, or air dispersion modeling must be used as the method for determining SO_2 ambient air concentrations and resulting attainment status.

The lack of existing major source-specific SO_2 monitoring is partly due to a failure of State air agencies requiring pre-and post-construction air quality monitoring. In the past few years I have reviewed and commented on major SO_2 emission source PSD permit applications in Texas, Louisiana, Oklahoma, Nevada, Kentucky, North Carolina, South Carolina, Missouri, Kansas, South Dakota, Illinois, and Arkansas. With the exception of Nevada, the State air agencies have not required pre- or post-construction air quality monitoring, even though the PSD significant monitoring concentrations were exceeded. This is the norm for these major sources, and it is one of the key reasons that there is a paucity of ambient air quality monitoring data that could be used to help determine attainment status surrounding these facilities. It is self-serving if a facility that could (should) have been collecting ambient air quality data now argues that SO_2 NAAQS attainment determinations must be based on monitoring, not modeling.

---

[5] California Office of Environmental Health Hazard Assessment, Air Toxics Hot Spots Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003, p. 4-1. (http://www.oehha.org/air/hot_spots/pdf/HRAguidefinal.pdf)

This same issue applies to pre-construction monitoring for meteorological data. On many occasions I have commented that States should require major source facilities, as part of their PSD permit analysis, to collect site-specific meteorological data rather than rely on National Weather Service (NWS) airport data. On every occasion, my comments were disregarded, even though the PSD significant monitoring concentrations were exceeded for the proposed project. The State's response and comment denial followed a common theme, summarized as follows: site-specific meteorological data monitoring is unnecessary for modeling purposes and that NWS airport data are appropriate for permit application analyses. Although it's water under the bridge, site-specific data could have been collected during these application processes without causing time delays to permit issuance.

USEPA asked the question "*In what situations should meteorological data collection also be required?"* I believe the time has passed when these data could or should have been collected. Of course it would be ideal to have additional site-specific meteorological data for modeling major SO_2 emissions sources. But such a monitoring system will take at least two years to implement, and then the modeling will still have to be performed. The data collection itself will take a minimum of one year. It will take at least another year for developing the data collection protocol, review and approval of the protocol, siting of the system, installation, and afterwards post-processing of the data for modeling. Starting a site-specific meteorological data collection effort from scratch contributes to an unreasonable delay of the measures that may be needed to protect ambient air from any excessive SO_2 exposures.

While I feel that site-specific meteorological data are preferable to NWS airport data, USEPA's AERMINUTE program allows significant improvements to the NWS data in that calms and variable wind hours that were previously unusable by AERMOD can now be recaptured. In lieu of requiring new site-specific data collection efforts, modeling of SO_2 emissions for NAAQS SIP submissions should be performed using NWS data prepared with AERMET, in conjunction with AERMINUTE. The use of one-minute ASOS data should be a requirement, not a recommendation. If available high-quality site-specific meteorological data already exist, then I believe they should be used in preference to NWS airport data.

Based on my experience, site-specific meteorological data tends to result in higher modeled impacts than NWS airport data, even when the NWS data is processed with AERMINUTE and one-minute ASOS data. For example, I modeled the Homer City, PA power station with three different meteorological data sets: One year of site-specific data from the Manor monitoring station; 2006 through 2010 NWS data from Johnstown PA, including one-minute ASOS data processed with AERMINUTE (KJST); and 2006 through 2010 NWS data from Pittsburgh PA, including one-minute ASOS data processed with AERMINUTE (KAGC). All three data sets

used Pittsburgh upper air soundings. The peak receptor grid ambient air impacts from AERMOD modeling using Manor site-specific data were about twice as high as the KJST or KAGC results. And even at specific receptor locations, such as Homer City High School, the Manor site-specific data resulted in significantly higher impacts than the NWS/AERMINUTE data sets.

In other words, using available NWS airport data, processed with AERMINUTE, will not likely over-predict modeled impacts, as suggested by some stakeholders. Moreover, these data have the advantage of being readily available on NCDC data DVDs for years 2007 through 2011, thus meeting The Guideline on Air Quality Modeling requirements of at least five years of consecutive data from the most recent, readily available five-year period. [6]

Modeling key questions:

a. Should some criteria (e.g., the PWEI concept) be used to identify priority sources to be modeled in an area where there is no nearby monitor?

I do not believe that a population weighted emissions index (PWEI) should be used to identify priority sources. The NAAQS, by definition, apply to ambient air, or "… that portion of the atmosphere, external to buildings, to which the general public has access."[7] Ambient air is the defining criteria, and it is not based on the number of people who are exposed, but whether anyone could have access to given locations. This includes waterways and unpopulated areas of all sorts, so long as someone in the public has access.

b. How should the modeling be performed – i.e., what changes to the March 24, 2011 guidance should be made, such as the use of size cut-offs and use of actual emissions?

Some stakeholders have suggested that one-hour SO_2 modeling analyses used for nonattainment SIP modeling should use actual emissions, and not the potential to emit. I understand that using allowable emissions may result in higher impacts than the facility's actual emissions. I have modeled many coal-fired EGUs where I analyzed both allowable and actual emissions obtained from USEPA's Clean Air Markets Database (CAMD). The facility permitted emissions are often, though not always, greater than the reported actual emissions. This is because the permitted allowable emissions are often based on 30-day averaging periods and peak hourly emission limits were not set by the State agency in question. Also, startup, shutdown, and upset conditions are included in the CAMD that may represent quite high actual emission rates.

[6] USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, November 9, 2005. (http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf)

[7] 40 CFR Part 50.1 (e) (http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&rgn=div5&view=text&node=40:2.0.1.1.1&idno=40#40:2.0.1.1.1.0.1.1)

If actual emissions are used for nonattainment SIP modeling, a condition must be added to the facility's permit requiring that emissions must not be greater than the level used in the modeling analysis. In other words, a facility that wants to use actual emissions in their modeling analysis must agree to an enforceable permit condition limiting their emissions, by unit, to that quantity modeled. Also, actual emissions cannot be modeled using full load stack parameters. Stack gas exit velocity and temperature will be reduced under less than full load conditions, affecting plume rise and resulting modeled impacts. Any AERMOD modeling using actual emission levels must use corresponding actual stack gas exit velocity and temperature. I suggest that USEPA should develop a method for calculating stack gas exit velocity and temperature as a function of load, for use in cases where these data are not directly measured and reported.

I believe that any emission limits based on actual operating conditions must be rather straight-forward and enforceable. For example, the actual emission rates could be based on the maximum hourly emissions, by stack, for the latest calendar year (or perhaps the maximum for the past three years). Maximum actual emissions could also be for shorter time periods (by season, for example), but emission limits by portion of the year may be more difficult to enforce, or the facility may not wish to be restricted by this condition. And while it is possible to model hour-by-hour actual emissions (using HOUREMIS in AERMOD) coupled with contemporaneous meteorological data, this analysis does not ensure that the one-hour SO_2 NAAQS will be protected in the future. This is because combinations of meteorology and facility emissions that result in peak impacts are virtually unenforceable.

I believe that USEPA should be very careful in considering emission rate cut-off levels. Without modeling, it is very difficult to determine the combined effects that emission rate, stack height, source-to-receptor distance and elevation differences, building downwash, background air quality, and plume rise will have on ambient air concentrations and NAAQS compliance. Obviously not every source will require modeling, but any cut-off criteria should consider all parameters that affect air concentration, not simply emission rate.

c. Are there situations where modeling is preferable to monitoring? If so, then what are these situations? Should EPA require modeling in certain situations, or is monitoring alone always a sufficient option for areas of concern?

As discussed above, modeling is preferable to monitoring for determining ambient air concentrations and for verifying compliance with the one-hour SO_2 NAAQS. I cannot envision a feasible air monitoring network that would verify compliance for a major SO_2 emission source – too many monitors would be needed and the delay in attainment demonstration and resulting controls would be unacceptably long.

I think it is beneficial to consider how California's Air Toxics Hot Spots program, also known as AB 2588, determined ambient air concentrations of air toxics. This program required thousands of facilities in California to quantify emissions of scores of hazardous air pollutants, when virtually no inventory of these pollutants previously existed. AB 2588 also required at least 1,000 facilities state-wide to prepare health risk assessments, which are based on ambient air concentrations of the air toxics in question. In all instances, these facilities used air modeling as the basis for determining ambient air concentrations. This is based not only on State of California guidance (see the Air Toxics Hot Spots program citation in the air monitoring comments above), but on the practicality of actually quantifying air concentrations in a reasonable fashion.

I believe that the AB 2588 program required as much or more modeling work than will be needed for the one-hour SO_2 NAAQS SIP determinations. For example, in Santa Barbara County, where I was the Air Toxics Program Coordinator, we prepared air dispersion modeling analyses for up to 50 facilities per year. Many of these facilities were very complicated and involved numerous toxic air pollutants. Plus, we calculated excess cancer risk and non-carcinogenic health effects from inhalation and all other pathways of exposure. In other words, I think State air agencies should be able to handle the effort required in modeling the major SO_2 emission sources within their jurisdiction.

Some stakeholders have expressed concern that AERMOD will over-predict air impacts, compared to monitoring results. While this may be true in some circumstances, e.g., at one location at a given time, the true value in modeling is the ability to calculate air concentrations at many more places and under many physical conditions that cannot be handled by air monitoring. On the other hand, there are likely many situations where AERMOD underpredicts air concentrations compared to monitoring data.

USEPA should rely on the detailed AERMOD evaluations that were performed during the model development phase. I agree with Roger Brode's 10th Modeling Conference presentation, where he concluded: "AERMOD model performance has been extensively evaluated and shown to provide generally unbiased estimates of 1-hr SO_2 concentrations across a wide range of scenarios."[8]

[8] Roger Brode, USEPA/OAQPS, AERMOD Evaluations Under the 1-hour NO_2 and SO_2 NAAQS, 10th Conference on Air Quality Modeling. (http://www.epa.gov/ttn/scram/10thmodconf/presentations/2-8-Brode_10thMC_AERMOD_Evals_1hr-NO2-SO2_NAAQS_Final_3-25.pdf)

I believe that the concerns about AERMOD over-predicting air concentrations are, on the whole, without merit. At the 2012 RSL Modelers' Workshop, George Bridgers and Roger Brode presented a summary of AERMOD's performance evaluation results. They document that AERMOD provided better model predictions than ISCST3, ISC-Prime, and CTDMPLUS. In addition, they point out that the average ratio of predicted to observed one-hour and three-hour robust highest concentration values across all field studies for AERMOD was 0.995.[9] This is clearly an unbiased estimate of AERMOD's predictive performance.

It is also evident that most of the large SO_2 emission sources have tall stacks, which were rigorously evaluated during AERMOD's development process. From USEPA's Compendium of Reports from the Peer review Process for AERMOD:

> Concerning the model evaluation, we reiterate that AERMOD has been evaluated against 10 substantial data bases, including: 1) four data sets for tall stack buoyant plumes in flat terrain (Kincaid SO2, Kincaid SF6, Baldwin, and Clifty Creek), 2) four data sets for tall stacks in complex terrain or near elevated terrain (Lovett, Martins Creek, Tracy, and Westvaco), 3) a buoyant elevated release in an urban environment (Indianapolis), and 4) a nonbuoyant surface release (Prairie Grass). We agree that more evaluation would be desirable (as always) especially for downwash conditions, urban sources, and surface releases. However, there is a key question to the AERMOD development process: Has there been enough evaluation already to justify replacing ISC3 by AERMOD? AERMIC believes that there has been.[10]

Thus, any argument that AERMOD is not applicable to tall stack emission sources should be dismissed based on the studies used for developing AERMOD. In particular, AERMOD has been extensively evaluated for power plant emissions:

> It is worth noting in this regard that all of the AERMOD evaluation data bases (except for Prairie Grass) involved tall, non-downwashed, highly buoyant power plant stacks (the shortest stack in the group was 84 meters in Indianapolis).[11]

AERMOD's evaluation process ultimately comprised 17 separate data sets. I believe that any concerns from stakeholders that AERMOD over-predicts power plant impacts, or over-predicts impacts from other source types represented in the evaluation databases, should be dismissed.

---

[9] George Bridgers and Roger Brode, USEPA/OAQPS, Challenges in Modeling Compliance for New NAAQS: 1-hour NO_2 & SO_2 and $PM_{2.5}$, 2012 RSL Modelers' Workshop. (http://www.cleanairinfo.com/regionalstatelocalmodelingworkshop/archive/2012/presentations/Tues/3-1_2012RSL_ModelingChallenges_Bridges.pdf)

[10] USEPA OAQPS, Compendium of Reports from the Peer review Process for AERMOD, February 2002, pdf page 38/69. (http://www.epa.gov/scram001/7thconf/aermod/dockrpt.pdf)

[11] Id., pdf page 49/69.

I would also add that AERMOD's evaluation analyses included a number of site-specific meteorological data sets that incorporate low wind speed conditions. For example, the Tracy evaluation included meteorological data with wind speeds as low as 0.39 meter/second (m/s); the Westvaco evaluation included wind speeds as low as 0.31 m/s; the Kincaid SO_2 evaluation included wind speeds as low as 0.37 m/s; and the Lovett evaluation included wind speeds as low as 0.30 m/s.[12] Concerns raised by stakeholders regarding AERMOD's ability to model low wind speed conditions seem to neglect the data used in actual AERMOD evaluations.

Some stakeholders are concerned that AERMOD is inaccurate in areas with extreme topography, such as complex river valleys and steep hillsides. This concern has already been addressed by USEPA in their response to the New Jersey Department of Environmental Protection (NJDEP) section 126 petition for SO_2 emissions from the Portland Generating Station. In their review of NJDEP's petition, USEPA found that AERMOD is the most appropriate model for determining air impacts in the complex terrain and complex wind fields surrounding the Portland facility.[13] USEPA also recognizes that "the performance of the AERMOD model for estimating impacts associated with tall stacks in complex terrain settings has been extensively evaluated and documented in peer-review journals… and has consistently been shown to perform better than competing models."[14]

Air monitoring of SO_2 is not a feasible alternative to modeling for steep hillsides and other complex terrain conditions. Proper air quality monitor siting is extremely difficult in these settings, and any siting would depend on prior air dispersion modeling in the first place.

While I have used CALPUFF to model emissions in complex river valleys, I was able to do so only because there were multiple site-specific meteorological monitors to provide the needed data to develop the CALMET wind fields. For facilities where adequate meteorological data exist to run CALPUFF, I believe this is a possible alternative to running AERMOD. Otherwise, AERMOD should be used due to the problems associated with siting and operating an adequate monitoring network in these complex terrain environments.

---

[12] The AERMOD evaluations and modeled meteorological data are at: http://www.epa.gov/ttn/scram/dispersion_prefrec.htm

[13] USEPA, Air Quality Modeling Technical Support Document: NJ 126 Petition of September 17, 2010, April 2011, p. 12 of 63. (http://www.epa.gov/ttn/scram/reports/EPA-HQ-OAR-2011-0081-0026.pdf)

[14] Id., p.11 of 63.

d. Are there situations where monitoring is preferable to modeling? If so, then what are these situations? Should EPA require monitoring in certain situations, or is modeling alone always a sufficient option for areas of concern?

As discussed above, I believe that modeling alone is sufficient for verifying compliance with the one-hour SO_2 NAAQS. If monitoring is used, as in USEPA's proposed hybrid modeling and monitoring approach, it should be only as a supplement to modeling and the modeling and monitoring results should be given equal weight.

I think it is important to remember that all NO_2, $PM_{2.5}$, and SO_2 NAAQS and PSD increment permit application analyses are performed with air dispersion modeling, such as running AERMOD in a manner consistent with the Guideline on Air Quality Models. In order to ensure consistency in how air impacts are determined, both existing sources and newly permitted sources should be assessed using the same methods. From the Guideline on Air Quality Models:

> The *Guideline* is used by EPA, States, and industry to prepare and review new source permits and State Implementation Plan revisions. The *Guideline* is intended to ensure consistent air quality analyses for activities regulated at 40 CFR 51.112, 51.117, 51.150, 51.160, 51.166, and 52.21.[15]

Allowing existing sources to use monitoring (assuming adequate monitoring even exists or could exist), results in a lower standard of compliance verification than that being used for new permit applicants.

Concluding Remarks

Using AERMOD for one-hour SO_2 NAAQS SIP submissions is reasonable and reliable. AERMOD has undergone rigorous model evaluations, was subjected to numerous peer-reviewed studies, and has already been used in hundreds, if not thousands, of air quality impact analyses of major emission sources. USEPA must not exchange their existing guideline model for an ambient air monitoring program which will never be able to verify compliance with the one-hour SO_2 NAAQS.

Based on my experience with both modeling and monitoring, I believe that air modeling, using AERMOD, is the best available method for verifying compliance with the one-hour SO_2 NAAQS. I suggest that USEPA's proposed hybrid modeling and monitoring implementation

[15] USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, November 9, 2005, Section II. (http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf)

approach for one-hour SO_2 NAAQS SIP submissions should be heavily weighted towards modeling.

Thank you for the opportunity to submit these comments on USEPA's guidance for one-hour SO_2 NAAQS SIP submissions.

Sincerely,

Camille Sears

Camille Sears

Camille Marie Sears 502 W. Lomita Ave., Ojai, CA 93023

Tel: (805) 646-2588 e-mail: camille.marie@sbcglobal.net

Summary

I have over 30 years of regulatory and private-sector experience in air quality impact analyses, health risk assessments, meteorological monitoring, and geographic information systems. I specialize in litigation support; I have successfully provided testimony in numerous cases, both as an individual consultant and as part of a team of experts.

Education

- M.S., Atmospheric Science, University of California, Davis, 1980.
- B.S., Atmospheric Science, University of California, Davis, 1978.

Air Dispersion Modeling

- I am experienced in applying many different air dispersion models, including programs still in the development phase. I have prepared well over 1,000 air dispersion modeling analyses requiring the use of on-site or site-specific meteorological data. These runs were made with the USEPA ISC, OCD, MESOPUFF, INPUFF, CALPUFF, ISC-PRIME, AERMOD, COMPLEX-I, MPTER, and other air dispersion models.
- I prepared and submitted technical comments to the USEPA on beta-testing versions of AERMOD; these comments are being addressed and will be incorporated into the model and instructions when it is ready for regulatory application.
- I am experienced in performing air dispersion modeling for virtually every emission source type imaginable. I have modeled:
  Refineries and associated activities;
  Mobile sources, including cars, trains, airplanes, trucks, and ships;
  Power plants, including natural gas and coal-fired;
  Smelting operations;
  Area sources, such as housing tracts, biocides from agricultural operations, landfills, highways, fugitive dust sources, airports, oil and gas seeps, and ponds;
  Volume sources, including fugitive emissions from buildings and diesel construction combustion emissions;
  Small sources, including dry cleaners, gas stations, surface coating operations, plating facilities, medical device manufacturers, coffee roasters, ethylene oxide sterilizers, degreasing operations, foundries, and printing companies;
  Cooling towers and gas compressors;
  Diatomaceous earth, rock and gravel plants, and other mining operations;
  Offshore oil platforms, drilling rigs, and processing activities;
  Onshore oil and gas exploration, storage, processing, and transport facilities;
  Fugitive dust emissions from roads, wind erosion, and farming activities;
  Radionuclide emissions from actual and potential releases.
- I have extensive experience in modeling plume depletion and deposition from air releases of particulate emissions.
- As a senior scientist, I developed the Santa Barbara County Air Pollution Control District (SBAPCD) protocol on air quality modeling. I developed extensive modeling capabilities for the SBAPCD on VAX 8600 and Intel I-860 computer systems; I acted as systems analyst for the SBAPCD air quality modeling system; I served as director of air quality analyses for numerous major energy projects; I performed air quality impact analyses using inert and photochemical models, including EPA, ARB and private-sector models; I performed technical review and evaluating air quality and wind field models; I developed software to prepare model inputs consistent with the SBAPCD protocol on air quality modeling for OCD, OCDCPM, MPTER, COMPLEX-I/II and ISC.
- I provided detailed review and comments on the development of the Minerals Management Service OCD model. I developed the technical requirements for and

supervised the development of the OCDCPM model, a hybrid of the OCD, COMPLEX-I and MPTER models.

- I prepared the "Modeling Exposures of Hazardous Materials Released During Transportation Incidents" report for the California Office of Environmental Health Hazard Assessment (OEHHA). This report examines and rates the ADAM, ALOHA, ARCHIE, CASRAM, DEGADIS, HGSYSTEM, SLAB, and TSCREEN models for transportation accident consequence analyses of a priority list of 50 chemicals chosen by OEHHA. The report includes a model selection guide for adequacy of assessing priority chemicals, averaging time capabilities, isopleth generating capabilities, model limitations and concerns, and model advantages.
- I am experienced in assessing uncertainty in emission rate calculations, source release, and dispersion modeling. I have developed numerous probability distributions for input to Monte Carlo simulations, and I was a member of the External Advisory Group for the California EPA *Air Toxics Hot Spots Program Risk Assessment Guidelines, Part IV, Technical Support Document for Exposure Assessment and Stochastic Analysis*.

Health Risk Assessment

- I have prepared more than 300 health risk assessments of major air toxics sources. These assessments were prepared for AB 2588 (the Air Toxics "Hot Spots" Information and Assessment Act of 1987), Proposition 65, and other exposure analysis activities. More than 120 of these exposure assessments were prepared for Proposition 65 compliance verification in a litigation support setting.
- I reviewed approximately 300 other health risk assessments of toxic air pollution sources in California. The regulatory programs in this review include AB 2588, Proposition 65, the California Environmental Quality Act, and other exposure analysis activities. My clients include the California Attorney General's Office, the Los Angeles County District Attorney's Office, the SBAPCD, the South Coast Air Quality Management District, numerous environmental and community groups, and several plaintiff law firms.
- I am experienced in assessing public health risk from continuous, intermittent, and accidental releases of toxic emissions. I am experienced in generating graphical presentations of risk results, and characterizing risks from carcinogenic and acute and chronic noncarcinogenic pollutants.
- I am experienced in communicating adverse health risks discovered through the Proposition 65 and AB 2588 processes. I have presented risk assessment results in many public settings -- to industry, media, and the affected public.
- For four years, I was the Air Toxics Program Coordinator for the SBAPCD. My duties included: developing and managing the District air toxics program; supervising District staff assigned to the air toxics program; developing District air toxics rules, regulations, policies and procedures; management of all District air toxics efforts, including AB 2588, Proposition 65, and federal activities; developing and tracking the SBAPCD air toxics budget.
- I have prepared numerous calculations of exposures from indoor air pollutants. A few examples include: diesel PM_{10} inside school buses, formaldehyde inside temporary school buildings, lead from disturbed paint, phenyl mercuric acetate from water-based paints and drywall mud, and tetrachloroethene from recently dry-cleaned clothes.

Litigation Support

- I have prepared numerous analyses in support of litigation, both in Federal and State Courts. I am experienced in preparing F.R.C.P. Rule 26(a)(2) expert reports and providing deposition and trial testimony (I have prepared eight Rule 26 reports). Much of my work is focused on human dose and risk reconstruction resulting from multiple air emission sources (lifetime and specific events).

- I am experienced in preparing declarations (many dozens) and providing expert testimony in depositions and trials (see my testimony history).
- I am experienced in providing support for legal staff. I have assisted in preparing numerous interrogatories, questions for depositions, deposition reviews, various briefs and motions, and general consulting.
- Recent examples of my work include:
  DTSC v. Interstate Non-Ferrous; United States District Court, Eastern District of California (2002).
  In this case I performed air dispersion modeling, downwind soil deposition calculations, and resultant soil concentrations of dioxins (TCDD TEQ) from historical fires at a smelting facility. I prepared several Rule 26 Reports in my role of assisting the California Attorney General's Office in trying this matter.
  Akee v. Dow et al.; United States District Court, District of Hawaii (2003-2004).
  In this case I performed air dispersion modeling used to quantify air concentrations and reconstruct intake, dose, excess cancer risk, and noncancer chronic hazard indices resulting from soil fumigation activities on the island of Oahu, Hawaii. I modeled 319 separate AREAPOLY pineapple fields for the following chemicals: DBCP, EDB, 1,3-trichloropropene, 1,2-dichloropropane, and epichlorohydrin. I calculated chemical flux rates and modeled the emissions from these fumigants for years 1946 through 2001 (56 years) for 34 test plaintiffs and 97 distinct home, school, and work addresses. I prepared a Rule 26 Expert Report, successfully defended against Daubert challenges, and testified in trial.
  Lawrence O'Connor v. Boeing North America, Inc., United States District Court, Central District of California, Western Division (2004-2005).
  In this case I performed air dispersion modeling, quantified air concentrations, and reconstructed individual intake, dose, and excess cancer risks resulting from approximately 150 air toxics sources in Los Angeles and Ventura Counties, California. I prepared these analyses for years 1950 through 2000 (51 years) for 173 plaintiffs and 741 distinct home, school, and work addresses. I prepared several Rule 26 Reports, and the case settled on the eve of trial in September, 2005. Defendants did not attempt a Daubert challenge of my work.
- I have prepared hundreds of individual and region-wide health risk assessments in support of litigation. These analyses include specific sub-tasks, including: calculating emission rates, choosing proper meteorological data inputs, performing air dispersion modeling, and quantifying intake, dose, excess cancer risk, and acute/chronic noncancer health effects.
- I have prepared over 120 exposure assessments for Proposition 65 litigation support. In these analyses, my tasks include: reviewing AB 2588 risk assessments and other documents to assist in verifying compliance with Proposition 65; preparing exposure assessments consistent with Proposition 65 Regulations for carcinogens and reproductive toxicants; using a geographic information system (Atlas GIS) to prepare exposure maps that display areas of required warnings; calculating the number of residents and workers exposed to levels of risk requiring warnings (using the GIS); preparing declarations, providing staff support, and other expert services as required. I have also reviewed scores of other assessments for verifying compliance with Proposition 65. My proposition 65 litigation clients include the California Attorney General's Office, the Los Angeles County District Attorney's Office, As You Sow, California Community Health Advocates, Center for Environmental Health, California Earth Corps, Communities for a Better Environment, Environmental Defense Fund, Environmental Law Foundation, and People United for a Better Oakland.

Geographic Information Systems

- ArcGIS: I am experienced in preparing presentation and testimony maps using ArcView versions 3 through 9.3. I developed methods to convert AutoCAD DXF files to ArcView polygon theme shape files for use in map overlays.

- I have created many presentation maps with ArcView using MrSID DOQQ and other aerial photos as a base and then overlaying exposure regions. This provides a detailed view (down to the house level) of where air concentrations and health risks are projected to occur.
- Using ArcView, I have created numerous presentations using USGS Topographic maps (as TIFF files) as the base on to which exposure regions are overlaid.
- MapInfo for Windows: I prepared numerous presentation maps including exposure isopleths, streets and highways, and sensitive receptors, labels. I developed procedures for importing Surfer isopleths in AutoCAD DXF format as a layer into MapInfo.
- Atlas GIS: I am experienced in preparing presentation maps with both the Windows and DOS versions of Atlas GIS. In addition to preparing maps, I use Atlas GIS to aggregate census data (at the block group level) within exposure isopleths to determine the number of individuals living and working within exposure zones. I am also experienced in geocoding large numbers of addresses and performing statistical analyses of exposed populations.
- I am experienced in preparing large-scale graphical displays, both in hard-copy and for PowerPoint presentations. These displays are used in trial testimony, public meetings, and other litigation support.
- I developed a Fortran program to modify AutoCAD DXF files, including batch-mode coordinate shifting for aligning overlays to different base maps.

Ozone and Long-Range Transport

- I developed emission reduction strategies and identified appropriate offset sources to mitigate project emissions liability. For VOC offsets, I developed and implemented procedures to account for reactivity of organic compound species for ozone impact mitigation. I wrote Fortran programs and developed a chemical database to calculate ozone formation potential using hydroxyl radical rate constants and an alkane/non-alkane reactive organic compound method.
- I provided technical support to the Joint Interagency Modeling Study and South Central Coast Cooperative Aerometric Monitoring Program. With the SBAPCD, I provided technical comments on analyses performed with the EKMA, AIRSHED, and PARIS models. I was responsible for developing emissions inventory for input into regional air quality planning models.
- I was the project manager for the Santa Barbara County Air Quality Attainment Plan Environmental Impact Report (EIR). My duties included: preparing initial study; preparation and release of the EIR Notice of Preparation; conducting public scoping hearings to obtain comments on the initial study; managing contractor efforts to prepare the draft EIR.
- I modified, tested, and compiled the Fortran code to the MESOPUFF model (the precursor to CALPUFF) to incorporate critical dividing streamline height algorithms. The model was then applied as part of a PSD analysis for a large copper-smelting facility.
- I am experienced in developing and analyzing wind fields for use in long-range transport and dispersion modeling.
- I have run CALPUFF numerous times. I use CALPUFF to assess visibility effects and both near-field and mesoscale air concentrations from various emission sources, including power plants.

Emission Rate Calculations

- I developed methods to estimate and verify source emission rates using air pollution measurements collected downwind of the emitting facility, local meteorological data, and dispersion models. This technique is useful in determining whether reported source emission rates are reasonable, and based on monitored and modeled air concentrations, revised emission rates can be created.

- I am experienced in developing emission inventories of hundreds of criteria and toxic air pollutant sources. I developed procedures and programs for quantifying emissions from many air emission sources, including: landfills, diesel exhaust sources, natural gas combustion activities, fugitive hydrocarbons from oil and gas facilities, dry cleaners, auto body shops, and ethylene oxide sterilizers.
- I have calculated flux rates (and modeled air concentrations) from hundreds of biocide applications to agricultural fields. Emission sources include aerial spraying, boom applications, and soil injection of fumigants.
- I am experienced in calculating emission rates using emission factors, source-test results, mass-balance equations, and other emission estimating techniques.

Software Development

- I am skilled in computer operation and programming, with an emphasis on Fortran 95.
- I am experienced with numerous USEPA dispersion models, modifying them for system-specific input and output, and compiling the code for personal use and distribution. I own and am experienced in using the following Fortran compilers: Lahey Fortran 95, Lahey Fortran 90 DOS-Extended; Lahey F77L-EM32 DOS-Extended; Microsoft PowerStation 32-bit DOS-Extended; and Microsoft 16-bit.
- I configured and operated an Intel I-860 based workstation for the SBAPCD toxics program. I created control files and recoded programs to run dispersion models and risk assessments in the 64-bit I-860 environment (using Portland Group Fortran).
- Using Microsoft Fortran PowerStation, I wrote programs to extract terrain elevations from both 10-meter and 30-meter USGS DEM files. Using a file of discrete x,y coordinates, these programs extract elevations within a user-chosen distance for each x,y pair. The code I wrote can be run in steps or batch mode, allowing numerous DEM files to be processed at once.
- I have written many hundreds of utilities to facilitate data processing, entry, and quality assurance. These utility programs are a “tool chest” from which I can draw upon to expedite my work.
- While at the SBAPCD, I designed the ACE2588 model - the first public domain multi-source, multi-pathway, multi-pollutant risk assessment model. I co-developed the structure of the ACE2588 input and output files, supervised the coding of the model, tested the model for quality assurance, and for over 10 years I provided technical support to about 200 users of the model. I was responsible for updating the model each year and ensuring that it is consistent with California Air Pollution Control Officer’s Association (CAPCOA) Risk Assessment Guidelines.
- I developed and coded the ISC2ACE and ACE2 programs for distribution by CAPCOA. These programs were widely used in California for preparing AB 2588 and other program health risk assessments. ISC2ACE and ACE2 contain "compression" algorithms to reduce the hard drive and RAM requirements compared to ISCST2/ACE2588. I also developed ISC3ACE/ACE3 to incorporate the revised ISCST3 dispersion model requirements.
- I developed and coded the "HotSpot" system - a series of Fortran programs to expedite the review of air toxics emissions data, to prepare air quality modeling and risk assessment inputs, and to prepare graphical risk presentations.
- I customized ACE2588 and developed a mapping system for the SBAPCD. I modified the ACE2588 Fortran code to run on an Intel I-860 RISC workstation; I updated programs that allow SBAPCD staff to continue to use the "HotSpot" system – a series of programs that streamline preparing AB 2588 risk assessments; I developed a risk assessment mapping system based on MapInfo for Windows which linked the MapInfo mapping package to the "HotSpot" system.
- I developed software for electronic submittal of all AB 2588 reporting requirements for the SBAPCD. As an update to the "HotSpot" system software, I created software that allows facilities to submit all AB 2588 reporting data, including that needed for risk prioritization, exposure assessment, and presentation mapping. The data submitted

by the facility is then reformatted to both ATDIF and ATEDS formats for transmittal to the California Air Resources Board.
- I developed and coded Fortran programs for AB 2588 risk prioritization; both batch and interactive versions of the program were created. These programs were used by several air pollution control districts in California.

Air Quality and Meteorological Monitoring
- I was responsible for the design, review, and evaluation of an offshore source tracer gas study. This project used both inert tracer gas and a visible release to track the onshore trajectory and terrain impaction of offshore-released buoyant plumes.
- I developed the technical requirements for the Santa Barbara County Air Quality/Meteorological Monitoring Protocol. I developed and implemented the protocol for siting pre- and post-construction air quality and meteorological PSD monitoring systems. I determined the instrumentation requirements, and designed and sited over 30 such PSD monitoring systems. Meteorological parameters measured included ambient temperature, wind speed, wind direction, sigma-theta (standard deviation of horizontal wind direction fluctuations), sigma-phi (standard deviation of vertical wind direction fluctuations), sigma-v (standard deviation of horizontal wind speed fluctuations), and sigma-w (standard deviation of vertical wind speed fluctuations). Air pollutants measured included PM_{10}, SO_2, NO, NO_x, NO_2, CO, O_3, and H_2S.
- I was responsible for data acquisition and quality assurance for an offshore meteorological monitoring station. Parameters measured included ambient temperature (and delta-T), wind speed, wind direction, and sigma-theta.
- In coordination with consultants performing air monitoring for verifying compliance with Proposition 65 and other regulatory programs, I wrote software to convert raw meteorological data to hourly-averaged values formatted for dispersion modeling input.
- Assisting the Ventura Unified School District, I collected air, soil, and surface samples and had them analyzed for chlorpyrifos contamination (caused by spray drift from a nearby citrus orchard). I also coordinated the analysis of the samples, and presented the results in a public meeting.
- Using summa canisters, I collected numerous VOC samples to characterize background and initial conditions for use in Santa Barbara County ozone attainment modeling. I also collected samples of air toxics (such as xylenes downwind of a medical device manufacturer) to assist in enforcement actions.
- For the California Attorney General's Office, I purchased, calibrated, and operated a carbon monoxide monitoring system. I measured and reported CO air concentrations resulting from numerous types of candles, gas appliances, and charcoal briquettes.

Support, Training, and Instruction
- For 10 years, I provided ACE2588 risk assessment model support for CAPCOA. My tasks included: updating the ACE2588 risk assessment model Fortran code to increase user efficiency and to maintain consistency with the CAPCOA Risk Assessment Guidelines; modifying the Fortran code to the EPA ISC model to interface with ACE2588; writing utility programs to assist ACE2588 users; updating toxicity data files to maintain consistency with the CAPCOA Risk Assessment Guidelines; developing the distribution and installation package for ACE2588 and associated programs; providing technical support for all users of ACE2588.
- I instructed approximately 20 University Professors through the National Science Foundation Faculty Enhancement Program. Instruction topics included: dispersion modeling, meteorological data, environmental fate analysis, toxicology of air pollutants, and air toxics risk assessment; professors were also trained on the use of the ISC2ACE dispersion model and the ACE2 exposure assessment model.
- I was the instructor of the Air Pollution and Toxic Chemicals course for the University of California, Santa Barbara, Extension certificate program in Hazardous Materials Management. Topics covered in this course include: detailed review of criteria and

noncriteria air pollutants; air toxics legislation and regulations; quantifying toxic air contaminant emissions; criteria and noncriteria pollutant monitoring; air quality modeling; health risk assessment procedures; health risk management; control/mitigating air pollutants; characteristics and modeling of spills and other short-term releases of air pollutants; acid deposition, precipitation and fog; indoor/occupational air pollution; the effect of chlorofluorocarbons on the stratospheric ozone layer. I taught this course for five years.

- I have trained numerous regulatory staff on the mechanics of dispersion modeling, health risk assessments, emission rate calculations, and presentation mapping. I provided detailed training to SBAPCD staff in using the HARP program, and in comparing and contrasting ACE2588 analyses to HARP.
- Through UCSB Extension, I taught a three-day course on dispersion modeling, preparing health risk assessments, and presentation mapping with Atlas GIS and MapInfo.
- I hold a lifetime California Community College Instructor Credential (Certificate No. 14571); Subject Matter Area: Physics.
- I have presented numerous guest lectures – at universities, public libraries, farm groups, and business organizations.

Indoor Air Quality

- I prepared mercury exposure assessments caused by applying indoor latex paints containing phenylmercuric acetate as a biocide.
- Using a carbon monoxide monitor, I examined CO concentrations inside rooms of varying sizes and with a range of ventilation rates. Indoor sources of CO emissions included gas appliances and candles. I also examined CO concentrations within parking garages.
- I calculated air concentrations of tetrachloroethene inside homes and cars from offgassing dry-cleaned clothes.
- I examined air concentrations of formaldehyde inside manufactured homes and school buildings. I also calculated formaldehyde exposures from carpet emissions within homes.
- I assessed lead air exposures and surface deposition from deteriorating lead-based paint applications within apartments. I also calculated lead air concentrations and associated exposures resulting from milling of brass pipes and fittings.
- While employed by the SBAPCD, I assisted with exposure assessment and awareness activities for Santa Barbara County high-exposure radon areas.
- I calculated BTEX air concentrations and health risks inside homes from leaking underground fuel tanks and resultant contaminated soil plumes. I also assessed indoor VOC exposures and remediation options with the AERIS model.
- I have assessed indoor air concentrations from numerous volatile organic compound sources, including printing operations, microprocessor manufacturing, and solvent degreasing activities.
- I calculated indoor emission flux rates and air concentrations of elemental mercury for plaintiff litigation support purposes. This analysis included an exposure reconstruction (home, school, workplace, outside, and other locations) for 16 plaintiffs who had collected spilled mercury in their village. The study required room volume calculations, air exchange rates, exposure history reconstruction, mercury quantity and droplet size estimation, elemental mercury flux rate calculations (including decay with time), and resultant air concentration calculations. I calculated both peak acute (two-hour) and 24-hour average concentrations.
- I calculated emission rates of lead from disturbed paint surfaces. I then calculated indoor air concentrations of lead for plaintiff litigation support purposes.

Publications

- To establish a legal record and to assist in environmental review, I prepared and submitted dozens of detailed comment letters to regulatory and decision-making bodies.
- I have contributed to over 100 Environmental Impact Statements/Reports and other technical documents required for regulatory decision-making.
- I prepared two software review columns for the *Journal of the Air and Waste Management Association*.
- Correlations of total, diffuse, and direct solar radiation with the percentage of possible sunshine for Davis, California. Solar Energy, 27(4):357-360 (1981).

Employment History

• Self-Employed Air Quality Consultant	1992 to 2012
• Santa Barbara County APCD, Senior Scientist	1988 to 1992
• URS Consultants, Senior Scientist	1987 to 1988
• Santa Barbara County APCD, Air Quality Engineer	1983 to 1987
• Dames and Moore, Meteorologist	1982 to 1983
• UC Davis, Research Associate	1980 to 1981

Testimony History

- People of the State of California v. McGhan Medical, Inc.
  Deposition: Two dates: June - July 1990
- People of the State of California v. Santa Maria Chili
  Deposition: Two dates: August 1990
- California Earth Corps v. Johnson Controls, Inc.
  Deposition: October 26, 1995
- Larry Dale Anderson v. Pacific Gas & Electric
  Deposition: January 4, 1996
  Arbitration: January 17, 1996
- Adams v. Shell Oil Company
  Deposition: July 3, 1996
  Trial: August 21, 1996
  Trial: August 22, 1996
- California Earth Corps v. Teledyne Battery Products
  Deposition: January 17, 1997
- Marlene Hook v. Lockheed Martin Corporation
  Deposition: December 15, 1997
- Lawrence O'Connor v. Boeing North America, Inc.
  Deposition: May 8, 1998
- Bristow v. Tri Cal
  Deposition: June 15, 1998
- Abeyta v. Pacific Refining Co.
  Deposition: January 16, 1999
  Arbitration: January 25, 1999
- Danny Aguayo v. Betz Laboratories, Inc.
  Deposition: July 10, 2000
  Deposition: July 11, 2000
- Marlene Hook v. Lockheed Martin Corporation
  Deposition: September 18, 2000
  Deposition: September 19, 2000
- Tressa Haddad v. Texaco
  Deposition: March 9, 2001

- California DTSC v. Interstate Non-Ferrous
  United States District Court, Eastern District of California,
  Case No. CV-F-97 50160 OWW LJO
  Deposition: April 18, 2002
- Akee v. Dow et al.
  United States District Court, District of Hawaii,
  Case No. CV 00 00382 BMK
  Deposition: April 16, 2003
  Deposition: April 17, 2003
  Deposition: January 7, 2004
  Trial: January 17, 2004
  Trial: January 20, 2004
- Center for Environmental Health v. Virginia Cleaners
  Superior Court of the State of California
  County of Alameda, Case No. 2002 07 6091
  Deposition: March 4, 2004
- Application for Certification for Small Power Plant Exemption – Riverside Energy Resource Center. Docket No. 04-SPPE-01.
  Evidentiary Hearing Testimony before the California Energy Resource Conservation And Development Commission: August 31, 2004
- Lawrence O'Connor v. Boeing North America, Inc.
  United States District Court, Central District of California,
  Western Division. Case No. CV 97-1554 DT (RCx)
  Deposition: March 1, 2005
  Deposition: March 2, 2005
  Deposition: March 3, 2005
  Deposition: March 15, 2005
  Deposition: April 25, 2005
- Clemente Alvarez, et al, v. Western Farm Service, Inc.
  Superior Court of the State of California
  County of Kern, Metropolitan Division. Case No. 250 621 AEW
  Deposition: April 11, 2005
- Gary June et al. v. Union Carbide Corporation & UMETCO Minerals Corporation
  United States District Court, District of Colorado,
  Case No. 04-CV-00123 MSK-MJW
  Deposition: January 9, 2007
- Alberto Achas Castillo, et al. v. Newmont Mining Corporation, et al.
  District Court, Denver County, Colorado,
  Case No. 01-CV-4453
  Deposition: February 19, 2007
  Deposition: February 20, 2007
  Arbitration: March 6, 2007
  Arbitration: March 7, 2007
- Jacobs Farm/Del Cabo Inc. v. Western Farm Service, Inc.
  Superior Court of the State of California
  County of Santa Cruz, Case No. CV 157041
  Deposition: May 8, 2008
  Deposition: August 26, 2008
  Trial: September 18, 2008
  Trial: September 24, 2008

- Environmental Law Foundation et al. v. Laidlaw Transit Inc. et al.
  Superior Court of the State of California
  County of San Francisco, Case No. CGC-06-451832
  Deposition: July 8, 2008
- Application of NRG Texas Power, LLC for State Air Quality Permit No. 79188 and Prevention of Significant Deterioration Air Quality Permit PSD-TX-1072.
  State Office of Administrative Hearings Docket No. 582-08-0861;
  TCEQ Docket No. 2007-1820-AIR.
  Deposition: February 12, 2009
  Hearing: February 24, 2009
- Application of IPA Coleto Creek, LLC for State Air Quality Permit No. 83778 and Prevention of Significant Deterioration Air Quality Permit PSD-TX-1118 and for Hazardous Air Pollutant Major Source [FCAA § 112(G)] Permit HAP-14.
  State Office of Administrative Hearings Docket No. 582-09-2045;
  TCEQ Docket No. 2009-0032-AIR.
  Deposition: September 21, 2009
  Hearing: October 16, 2009
- Application of Las Brisas Energy Center, LLC for State Air Quality Permit No. 85013 and Prevention of Significant Deterioration Air Quality Permit PSD-TX-1138 and for Hazardous Air Pollutant Major Source [FCAA § 112(G)] Permit HAP-48 and Plantwide Applicability Permit PAL41.
  State Office of Administrative Hearings Docket No. 582-09-2005;
  TCEQ Docket No. 2009-0033-AIR.
  Deposition: October 9, 2009
  Hearing: November 5, 2009
  Hearing: November 6, 2009
- Abarca, Raul Valencia, et al. v. Merck & Co., Inc., et al.
  United States District Court, Eastern District of California,
  Case No. 1:07-CV-00388-OWW-DLB
  Deposition: April 13, 2010
  Daubert Hearing: October 7, 2010
  Daubert Hearing: October 13, 2010
  Daubert Hearing: October 14, 2010
  Rule 706 Expert Hearing: December 2, 2010
  Trial: February 10, 2011
- Commonwealth of Kentucky, Energy and Environment Cabinet, File No. DAQ-41109-048. Sierra Club, Kentucky Environmental Foundation, and Kentuckians for the Commonwealth v. Energy and Environment Cabinet, Division for Air Quality, and East Kentucky Power Cooperative, Inc.
  Deposition: August 31, 2010

COPY

FILED
SUPERIOR COURT
SANTA BARBARA
DEC 03 1990
KENNETH A. PETTIT, County Clerk-Recorder
By: L. Katherine Rogers
L. KATHERINE ROGERS, Deputy Clerk-Recorder

JOHN K. VAN DE KAMP, Attorney General
of the State of California
ANDREA SHERIDAN ORDIN
Chief Assistant Attorney General
THEODORA BERGER
Assistant Attorney General
CRAIG C. THOMPSON
EDWARD G. WEIL
CLIFFORD RECHTSCHAFFEN
Deputy Attorneys General
2101 Webster Street
Oakland, CA 94612
Telephone: (415) 464-0572

Attorneys for the People of the State of California

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF SANTA BARBARA

PEOPLE OF THE STATE OF CALIFORNIA ex. rel. JOHN K. VAN DE KAMP, Attorney General of the State of California, Plaintiffs, v. SANTA MARIA CHILI, INC. Defendant.	No. SM 64010 (Case transferred to South County, 2/26/90) **DECLARATION OF JOHN C. VIMONT** DATE: Dec. 14, 1990 TIME: 9:00 a.m. Dept: To Be Assigned

I, John C. Vimont, declare:

1. I am currently employed by the United States Environmental Protection Agency (hereafter "EPA"), Region IX (hereafter the "Region" or "Regional Office") as the Regional Meteorologist. I have been employed in this position since June 1987.

a. As the Regional Meteorologist I serve as the Region's expert on air quality modeling, meteorological information and ambient air impact analyses. My position is

within the Air and Toxics Division of the Regional Office. I provide support to that division; to the other divisions within the Region, such as the Hazardous Waste Division; and to state and local agencies within Region IX. One of the primary duties of my position is to ensure that appropriate air quality modeling techniques are used by this and other agencies when conducting ambient air quality impact analyses.

b. There are a variety of "air quality models." These include conceptual models, qualitative descriptions of the behavior of pollutants in the atmosphere; physical models, scaled models of pollution sources and their surroundings studied in a controlled environment, such as a wind tunnel; statistical models, which encompass statistically based descriptions of source-receptor relationships; and mathematical models, which are mathematical representations of the physical processes which lead to transport and dispersion of pollutants in the atmosphere. The focus of the remaining discussion is on mathematical models; hereafter any reference to an air quality model is implicitly meant to refer to a mathematical air quality model.

c. I perform, review and oversee air quality modeling for a variety of different sources and source types. These include stationary sources with emissions emanating from a stack, including stack sources with aerodynamic downwash induced by nearby buildings; stationary sources with emissions emanating from a broad area, commonly called area sources; mobile sources, emissions from automobiles, trucks, busses, aircraft, etc.; and urban and regional scale modeling, which encompasses modeling all

of the above processes together on the scale of an entire urban area or over a number of urban areas together.

d. The pollutants modeled include both inert pollutants, those which remain chemically stable for long periods of time in the atmosphere, and chemically reactive pollutants, those which undergo relatively rapid chemical transformation and those which are not directly emitted, but rather form through a series of chemical reactions within the atmosphere.

2. Previous to my employment at EPA, I worked from March 1982 to June 1987 as an Environmental Engineering Specialist in the Air Quality Bureau of the State of New Mexico. My primary responsibilities there were very similar to my current position at EPA. I performed ambient impact analyses of various air pollution sources and conducted engineering analyses of the sources to determine emission characteristics. The primary focus of the analyses was on inert pollutants from stationary sources.

a. From August 1978 to March 1982 I worked for the Atmospheric Science Department at Colorado State University (CSU) as a Research Assistant. I worked on a variety of basic scientific research projects dealing with cloud physics. My primary area of research dealt with the uptake of acidic pollutants in snow.

b. From November 1977 to August 1978 I worked as a Physical Science Aide for the Pacific Marine Environmental Laboratory of the National Oceanographic and Atmospheric Administration. My duties there involved writing a

climatological summary of Puget Sound and analyzing the affects of winds on oil spill transport in Puget Sound.

3. I received a Bachelor of Science Degree in Atmospheric Sciences from the University of Washington in 1978 and a Master of Science Degree in Atmospheric Science from Colorado State University.

4. As the Regional Meteorologist, I routinely evaluate the adequacy of air quality modeling on a technical basis and with respect to its acceptability in the regulatory framework. Acceptable air quality modeling and analysis procedures are outlined in The Guideline on Air Quality Models (Revised) (EPA 450/2-78-027R, July 1986, Supplement A, July 1987) (hereafter the "Guideline"). The Guideline was first published in April 1978 to satisfy the requirements of §320 of the 1977 amendments to the Clean Air Act. The Guideline specifies appropriate models to use and provides guidance on their appropriate application. The Guideline provides a common basis for estimating the air quality concentrations used in assessing control strategies and developing emission limits. The modeling techniques embodied in the Guideline are subjected to public, scientific review in accordance with §320 of the CAA.

a. EPA has four primary, on-going activities to provide direct input for consistency in implementation and for revisions to the Guideline. The first is a series of annual EPA workshops conducted for the purpose of ensuring consistency and providing clarification in the application of models. The second activity, directed toward the improvement of modeling procedures,

is the cooperative agreement that EPA has with the scientific community represented by the American Meteorological Society. This agreement provides scientific assessment of procedures and proposed techniques and sponsors workshops on key technical issues. The third activity is the solicitation and review of new models from the technical and user community. In the March 27, 1980 Federal Register, a procedure was outlined for the submittal to EPA of privately developed models. After extensive evaluation and scientific review, these models, as well as those made available by EPA, are considered for recognition in the Guideline. The fourth activity is the extensive, on-going research efforts by EPA and others in air quality and meteorological modeling.

b. From the aforementioned process a number of models were selected as being refined models, suitable for regulatory application. Each refined model underwent intensive evaluation. The evaluation exercises include statistical measures of model performance in comparison with measured air quality data and, where possible, peer scientific reviews.

c. After a model has been selected as a refined model for a particular type of application, EPA considers the model appropriate for general use for that type of application without undergoing case-by-case evaluation, provided that the application follows the EPA recommendations specified in the Guideline.

5. The Industrial Source Complex models (hereafter ISC), have been deemed refined models by EPA for application to industrial complexes. The ISC models consist of a short term

model (ISCST) and a long term model (ISCLT). Long term models, such as ISCLT, are only appropriate for calculating ambient concentrations for averaging periods of months to a year. Short term models, such as ISCST, can be used for averaging times from one hour up to a year. (Hereafter my comments referring to ISC apply to both ISCST and ISCLT, unless otherwise specified.) The ISC model is appropriate for simulating the emissions of a variety of industrial air emissions. These would include emissions from free standing stacks and vents; stacks and vents which are influenced by the aerodynamic effects of nearby structures; emissions from area sources, such as storage piles or evaporative emissions from open tanks; line sources, such as roadways; and volume sources, such as large openings in buildings from which emissions emanate. The model is appropriate for simulating the ambient impacts of relatively inert pollutants, such as ethylene oxide, which do not undergo rapid chemical transformation in the atmosphere. The model will calculate the ambient concentrations at a number of user-specified "receptor" locations.

a. For simulating a stack-type source, ISC requires the input of the location, emission rate, physical stack height, stack gas exit velocity, stack inside diameter, and stack gas temperature. If the source is affected by the aerodynamic effects of buildings then inputs would also include information about the building dimensions.

b. The ISC model also requires meteorological data as input. These data include the wind speed, wind direction,

temperature, stability class and mixing height. The meteorological data must be representative of the geographic area being modeled to be accepted for a refined regulatory application.

c. The ISC model has gone through a number of performance evaluation studies, as outlined above. The following are several references of evaluation studies involving ISC:

(1) Bowers, J. F., and A. J. Anderson, 1981. An Evaluation Study for the Industrial Source Complex (ISC) Dispersion Model, EPA Publication No. EPA-450/4-81-002. U. S. Environmental Protection Agency, Research Triangle Park, NC.

(2) Bowers, J. F., A. J. Anderson, and W. R. Hargraves, 1982. Tests of the Industrial Source Complex (ISC) Dispersion Model at the Armco Middle-town, Ohio Steel Mill, EPA Publication No. EPA-450/4-82-006. U. S. Environmental Protection Agency, Research Triangle Park, NC.

(3) Scire, J. S., and L. L. Schulman, 1981. Evaluation of the BLP and ISC Models with SF_6 Tracer Data and SO_2 Measurements at Aluminum Reduction Plants. Air Pollution Control Association Specialty Conference on Dispersion Modeling for Complex Sources, St. Louis, MO.

(4) Schulman, L. L. and S. R. Hanna, 1986. Evaluation of Downwash Modifications to the Industrial Source Complex Model. Journal of the Air Pollution Control Association, 36:258-264.

d. In my experience of conducting and reviewing air quality modeling analyses, I have found that of the EPA approved

models, the ISC model is the most widely used model for determining the ambient concentrations of emissions from industrial sources. This is primarily due to its ability to simulate almost any type of industrial configuration and its status as a refined model under EPA guidelines. EPA considers it appropriate for use without undergoing case by case performance evaluation.

6. When EPA has a refined model appropriate for a specific type of application, such as the ISC model, the modeling results, based on the appropriate input data, are generally preferred by EPA over ambient monitoring data for determining emission limitations for both new and existing sources. Normally, EPA does not accept monitoring data as the sole basis for determining an emission limitation. When a refined model is available, EPA generally considers the model results alone (including background concentrations) sufficient for determining ambient concentrations of emissions from industrial sources and setting appropriate emission limitations.

a. Monitoring data suffers from a number of limitations. One of the primary limitations is that any given monitor can only measure what is happening at the location where the monitor is physically located and at the time it is operating. In order to adequately detect the maximum impact of any particular source, many monitors would have to be run over a number of years. A monitoring program designed to adequately detect a maximum concentration and to adequately characterize the concentration field would be very expensive. A number of years

of data would be necessary to collect enough samples to cover all possible meteorological situations in combination with the different operating conditions of the facility. A monitoring program with only one or two monitors or of a very short duration would be inadequate to ensure that maximum ambient impacts would be detected.

b. The usual intent of conducting an ambient impact analysis of an air pollution source is to determine if the emissions are likely to affect human health or affect the environment. The ambient concentrations are compared against health or environmental affects data. Rather than helping to resolve a problem, a prolonged ambient monitoring study allows continued air quality degradation, which in turn affects the health or environmental quality which was to be protected. For a new source being proposed, it is impossible to measure its impacts, since it is not yet built.

c. The method of analysis preferred by EPA for determining the ambient concentrations resulting from emissions into the atmosphere of industrial sources, including toxic air emissions, is modeling. As discussed above, before EPA determines a model, such as ISC, to be a refined model, appropriate for general use, the model undergoes rigorous evaluation and is determined to yield accurate estimates of the ambient air concentrations resulting from emission sources under a variety of conditions. With a model, the source can be simulated under the full range of its potential operating and emission conditions, rather than being limited to the specific

operating conditions occurring during the period of a limited monitoring study. The model can also yield ambient concentration data at any number of receptor locations, rather than only at the limited number of locations where a monitor is physically located. Also, an air quality model provides the only practical method of estimating the ambient impacts of a new source. A model provides flexibility in an analysis and can be run relatively quickly, at relatively little expense.

d. Modeling also allows source contributions to a particular ambient concentration to be ascertained. If two sources each emit the same pollutant, it is impossible to tell from an ambient measurement of the specific pollutant, the relative contributions to the measured ambient concentration, unless there is some unique surrogate being emitted from one of the facilities. Also, there is the uncertainty of whether a heretofore unknown source of the pollutant of concern has contributed to the measurement. Modeling, allows the impact of each source to be calculated separately and in combination.

e. The use of monitoring data also pre-supposes that there are acceptable and reliable monitoring techniques available for the pollutant of interest. In the past, this has generally been the case. EPA has established acceptable and reliable methods of measuring a number of pollutants which were regulated under the Clean Air Act. Recently, however, the issue of toxic air contaminants has arisen. Ambient measurement techniques, which can adequately and accurately detect a specific toxic air contaminant, are not necessarily available. The transport and

dispersion of buoyant or neutral plumes of gaseous pollutants, which are relatively inert in the atmosphere, is the same, regardless of the specific chemical constituents of the gas. Therefore, modeling provides a useful technique for detecting levels of pollutants in the air if reliable ambient measurement techniques are not available.

f. EPA does recognize the usefulness of ambient measurements for information on background concentrations, provided reliable monitoring techniques are available. EPA does not recommend, however, that ambient measurements be used as the sole basis of setting emission limitations or determining the ambient concentrations resulting from emissions from an industrial source. These should be based on an appropriate modeling analysis.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: November 30, 1990

JOHN C. VIMONT

EXHIBIT 6

Cheswick Power Station

Springdale, Pennsylvania

Sierra Club Evaluation of Compliance with 1-hour SO_2 NAAQS

January 23, 2014

Conducted by:

Steven Klafka, P.E., BCEE

Wingra Engineering, S.C.

Madison, Wisconsin

1. Introduction

Wingra Engineering, S.C. was hired by the Sierra Club to conduct an air modeling impact analysis to help USEPA, state and local air agencies identify facilities that are likely causing violations of the 1-hour sulfur dioxide (SO_2) national ambient air quality standard (NAAQS). This document describes the results and procedures for an evaluation conducted for the Cheswick Power Station located in Springdale, Pennsylvania.

The dispersion modeling analysis predicted ambient air concentrations for comparison with the one hour SO_2 NAAQS. The modeling was performed using the most recent version of AERMOD, AERMET, and AERMINUTE, with data provided to the Sierra Club by regulatory air agencies and through other publicly-available sources as documented below. The analysis was conducted in adherence to all available USEPA guidance for evaluating source impacts on attainment of the 1-hour SO_2 NAAQS via aerial dispersion modeling, including the AERMOD Implementation Guide; USEPA's Applicability of Appendix W Modeling Guidance for the 1-hour SO_2 National Ambient Air Quality Standard, August 23, 2010; modeling guidance promulgated by USEPA in Appendix W to 40 CFR Part 51; and, USEPA's March 2011 Modeling Guidance for SO_2 NAAQS Designations.[1]

2. Compliance with the 1-hour SO_2 NAAQS

2.1 1-hour SO_2 NAAQS

The 1-hour SO_2 NAAQS takes the form of a three-year average of the 99th-percentile of the annual distribution of daily maximum 1-hour concentrations, which cannot exceed 75 ppb.[2] Compliance with this standard was verified using USEPA's AERMOD air dispersion model, which produces air concentrations in units of μg/m^3. The 1-hour SO_2 NAAQS of 75 ppb equals 196.2 μg/m^3, and this is the value used for determining whether modeled impacts exceed the NAAQS.[3] The 99th-percentile of the annual distribution of daily maximum 1-hour concentrations corresponds to the fourth-highest value at each receptor for a given year.

2.2 Modeling Results

Modeling results for Cheswick Power Station are summarized in Table 1. It was determined that based on either currently permitted emissions or measured actual emissions, the Cheswick Power Station is estimated to create downwind SO_2 concentrations which exceed the 1-hour NAAQS.

---

[1] http://www.epa.gov/scram001/so2_modeling_guidance.htm
[2] USEPA, Applicability of Appendix W Modeling Guidance for the 1-hour SO_2 National Ambient Air Quality Standard, August 23, 2010.
[3] The ppb to μg/m^3 conversion is found in the source code to AERMOD v. 12345, subroutine Modules. The conversion calculation is 75/0.3823 = 196.2 μg/m^3.

For the modeling results presented in Table 1, the evaluated emission rates include the allowable and maximum. "Allowable" is the peak emission rate from each unit as approved by the current air quality operation permit for the facility. "Maximum" is the highest combined emission rate from all units during any single hour as measured during 2012.

Air quality impacts in Pennsylvania are based on a background concentration of 20.9 µg/m^3. This is the 2009-11 design value for Philadelphia County, Pennsylvania - the lowest measured background concentration in the state. This is the most recently available design value.

Table 1 - SO_2 Modeling Results for Cheswick Power Station Modeling Analysis

Emission Rates	Location	Averaging Period	99th Percentile 1-hour Daily Maximum (µg/m^3)				Complies with NAAQS?
			Impact	Background	Total	NAAQS	
Allowable	All	1-hour	610.7	20.9	631.6	196.2	No
Maximum	All	1-hour	403.4	20.9	424.3	196.2	No

The currently permitted emissions and measured maximum emissions used for the modeling analysis are summarized in Table 2.

Table 2 - Modeled SO_2 Emissions from Cheswick Power Station [4,5]

Stack ID	Unit ID	Allowable Emissions 3-hour Average (lbs/hr)	Maximum Emissions 1-hour Average (lbs/hr)
S-001	No. 1	15,400	10,172

Based on the modeling results, emission reductions from current rates considered necessary to achieve compliance with the 1-hour NAAQS were calculated and presented in Table 3.

[4] Allowable emissions are based on a limitation of 2.8 lbs of SO_2 per million BTU heat input in Title V Operating Permit and Federally Enforceable State Operating Permit #0054, Allegheny County Health Department, Air Quality Program, December 30, 2010. The maximum heat input of Boiler No. 1 is 5,500 mmbtu per hour.
[5] Maximum emissions are measured hourly rates reported for 2012 in USEPA, Clean Air Markets - Data and Maps.

Table 3 - Required Emission Reductions for Compliance with 1-hour SO_2 NAAQS

Acceptable Impact (NAAQS - Background) 99th Percentile 1-hour Daily Max ($\mu g/m^3$)	Required Total Facility Reduction Based on Allowable Emissions (%)	Required Total Facility Emission Rate (lbs/hr)	Required Total Facility 1-hour Average Emission Rate (lbs/mmbtu)
175.3	71.3%	4,420.5	0.80

Predicted exceedences of the 1-hour NAAQS for SO_2 extend throughout the region to a maximum distance of 18 kilometers.

Figure 1 shows the extent of NAAQS violations throughout the entire 50 kilometer modeling domain.

Figure 2 provides a close-up local view of NAAQS violations.

2.3 Conservative Modeling Assumptions

A dispersion modeling analysis requires the selection of numerous parameters which affect the predicted concentrations. For the enclosed analysis, several parameters were selected which under-predict facility impacts.

Assumptions used in this modeling analysis which likely under-estimate concentrations include the following:

- Allowable emissions are based on a limitation with an averaging period which is greater than the 1-hour average used for the SO_2 air quality standard. Emissions and impacts during any 1-hour period may be higher than assumed for the modeling analysis.
- No consideration of facility operation at less than 100% load. Stack parameters such as exit flow rate and temperature are typically lower at less than full load, reducing pollutant dispersion and increasing predicted air quality impacts.
- No consideration of building or structure downwash. These downwash effects typically increase predicted concentrations near the facility.
- No evaluation has been conducted to determine if the stack height exceeds Good Engineering Practice or GEP height. If the stack height exceeds GEP, the predicted concentrations will increase.
- No consideration of off-site sources. These other sources of SO_2 will increase the predicted impacts.

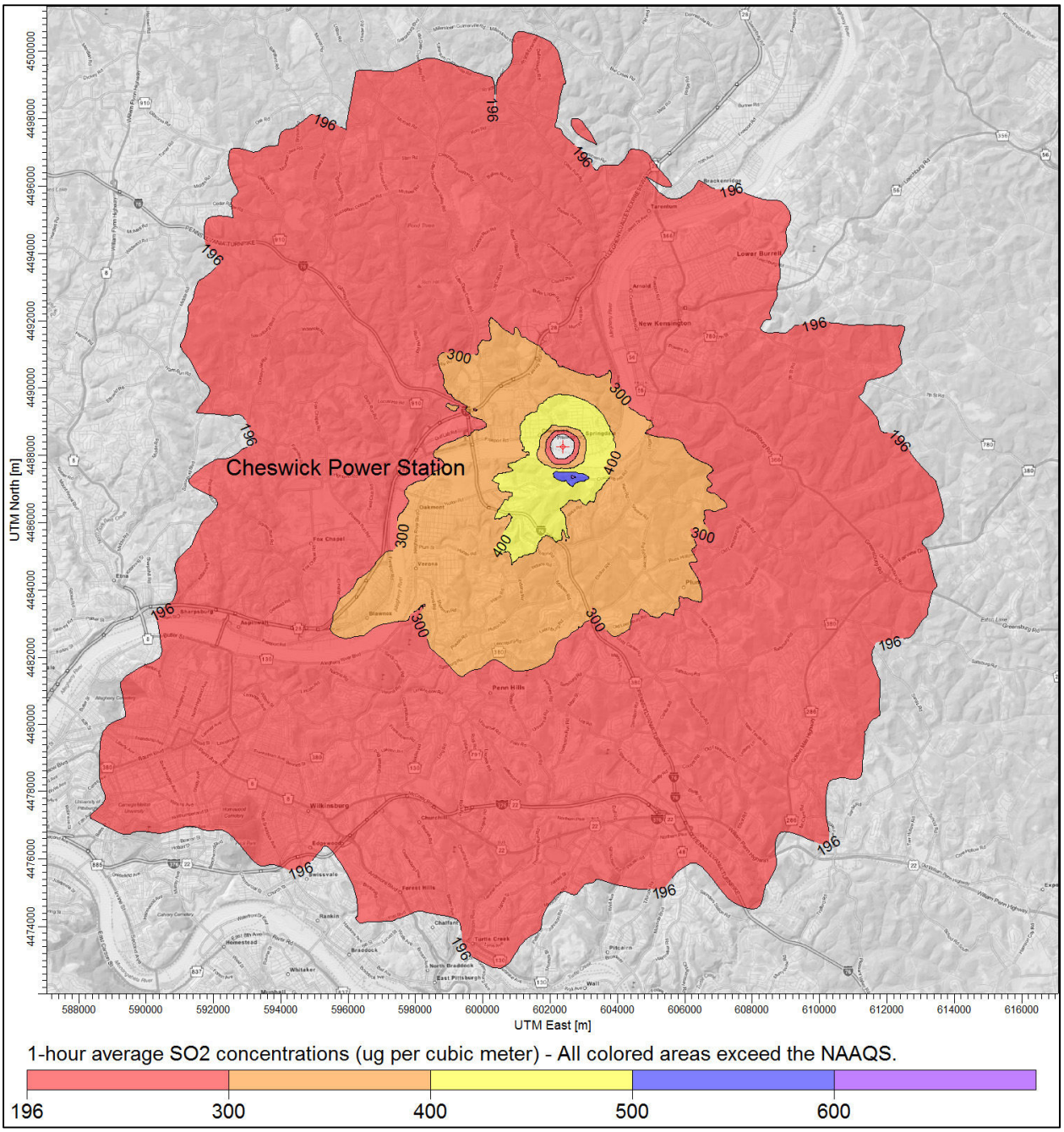


Figure 1 - Regional View - Cheswick Power Station (Allowable Emissions)

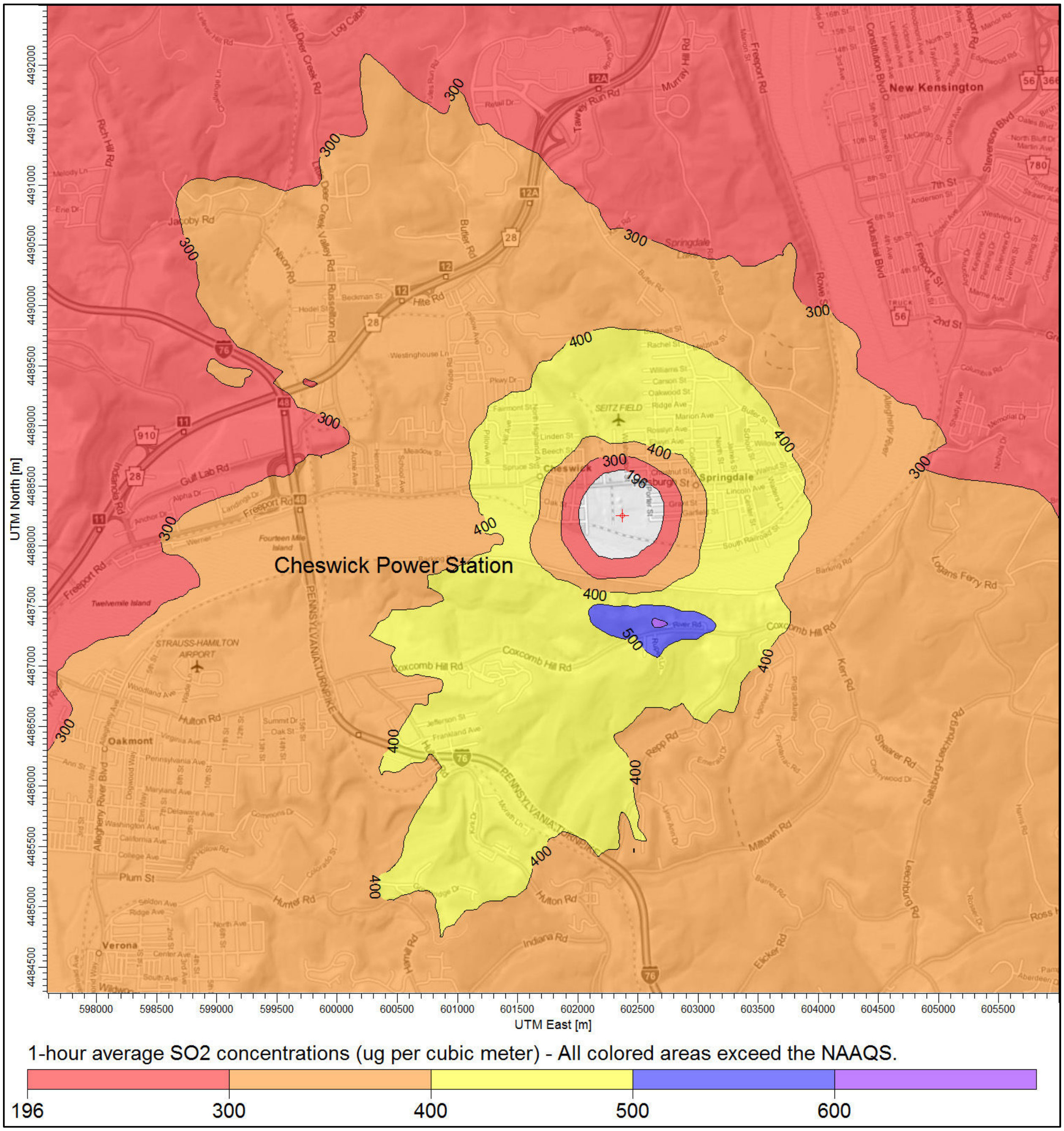


Figure 2 - Local View - Cheswick Power Station (Allowable Emissions)

3. Modeling Methodology

3.1 Air Dispersion Model

The modeling analysis used USEPA's AERMOD program, v. 12345. AERMOD, as available from the Support Center for Regulatory Atmospheric Modeling (SCRAM) website, was used in conjunction with a third-party modeling software program, *AERMOD View*, sold by Lakes Environmental Software.

3.2 Control Options

The AERMOD model was run with the following control options:

- 1-hour average air concentrations
- Regulatory defaults
- Flagpole receptors

To reflect a representative inhalation level, a flagpole height of 1.5 meters was used for all modeled receptors. This parameter was added to the receptor file when running AERMAP, as described in Section 4.4.

An evaluation was conducted to determine if the modeled facility was located in a rural or urban setting using USEPA's methodology outlined in Section 7.2.3 of the Guideline on Air Quality Models.[6] For urban sources, the URBANOPT option is used in conjunction with the urban population from an appropriate nearby city and a default surface roughness of 1.0 meter. Methods described in Section 4.1 were used to determine whether rural or urban dispersion coefficients were appropriate for the modeling analysis.

3.3 Output Options

The AERMOD analysis was based on five years of recent meteorological data. The modeling analyses used one run with five years of sequential meteorological data from 2008-2012. Consistent with USEPA's Modeling Guidance for SO_2 NAAQS Designations, AERMOD provided a table of fourth-high 1-hour SO_2 impacts concentrations consistent with the form of the 1-hour SO_2 NAAQS.[7]

Please refer to Table 1 for the modeling results.

---

[6] USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, November 9, 2005.
[7] USEPA, Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards, Attachment 3, March 24, 2011, pp. 24-26.

4. Model Inputs

4.1 Geographical Inputs

The "ground floor" of all air dispersion modeling analyses is establishing a coordinate system for identifying the geographical location of emission sources and receptors. These geographical locations are used to determine local characteristics (such as land use and elevation), and also to ascertain source to receptor distances and relationships.

The Universal Transverse Mercator (UTM) NAD83 coordinate system was used for identifying the easting (x) and northing (y) coordinates of the modeled sources and receptors. Stack locations were obtained from facility permits and prior modeling files provided by the state regulatory agency. The stack locations were then verified using aerial photographs.

The facility was evaluated to determine if it should be modeled using the rural or urban dispersion coefficient option in AERMOD. A GIS was used to determine whether rural or urban dispersion coefficients apply to a site. Land use within a three-kilometer radius circle surrounding the facility was considered. USEPA guidance states that urban dispersion coefficients are used if more than 50% of the area within 3 kilometers has urban land uses. Otherwise, rural dispersion coefficients are appropriate.[8]

USEPA's AERSURFACE model v. 13016 was used to develop the meteorological data for the modeling analysis. This model was also used to evaluate surrounding land use within 3 kilometers. Based on the output from the AERSURFACE, approximately 24.6% of surrounding land use around the modeled facility was of urban land use types including Type 21 – Low Intensity Residential, Type 22 – High Intensity Residential and Type 23 – Commercial / Industrial / Transportation.

This is less than the 50% value considered appropriate for the use of urban dispersion coefficients. Based on the AERSURFACE analysis, it was concluded that the rural option would be used for the modeling summarized in this report. Please refer to Section 4.5.3 for a discussion of the AERSURFACE analysis.

[8] USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, November 9, 2005, Section 7.2.3.

4.2 Emission Rates and Source Parameters

The modeling analyses only considered SO_2 emissions from the facility. Off-site sources were not considered. Concentrations were predicted for two scenarios shown in Table 2:

1) approved or allowable emissions based on permits issued by the regulatory agency, and

2) measured actual hourly SO_2 emissions obtained from USEPA's Clean Air Markets Database. To assure realistic emission rates were used, emissions from all units at the facility were combined and the hour with the maximum total facility emissions was used to determine the actual emissions.

Stack parameters and emissions used for the modeling analysis are summarized in Table 4.

Table 4 – Facility Stack Parameters and Emissions [9]

Stack	S-001
Description	Boiler No. 1
X Coord. [m]	602369
Y Coord. [m]	4488254
Base Elevation [m]	232.05
Release Height [m]	168.4
Gas Exit Temperature [°K]	328.706
Gas Exit Velocity [m/s]	17.012
Inside Diameter [m]	8.153
Allowable Emission Rate [g/s]	1,940
Maximum Emission Rate [g/s]	1,282

The above stack parameters and emissions were obtained from regulatory agency documents and databases identified in Section 2.3. The analysis was conducted based on 100% operating load using maximum exhaust flow rates and emission rates. Operation at less than full capacity loads was not considered. This assumption tends to under-predict impacts since stack parameters such as exit flow rate and temperature are typically lower at less than full load, reducing pollutant dispersion and increasing predicted air quality impacts. Stack location, height and diameter were verified using aerial photographs, and flue gas flow rate and temperature were verified using combustion calculations.

[9] Part VII - Stack Data, B001 - Main Boiler No. 1 with Flue Gas Desulfurization (FDG) System.

4.3 Building Dimensions and GEP

No building dimensions or prior downwash evaluations were available. Therefore this modeling analysis did not address the effects of downwash which may increase predicted concentrations.

4.4 Receptors

For Cheswick Power Station, three receptor grids were employed:

1. A 100-meter Cartesian receptor grid centered on Cheswick Power Station and extending out 5 kilometers.
2. A 500-meter Cartesian receptor grid centered on Cheswick Power Station and extending out 10 kilometers.
3. A 1,000-meter Cartesian receptor grid centered on Cheswick Power Station and extending out 50 kilometers. 50 kilometers is the maximum distance accepted by USEPA for the use of the AERMOD dispersion model.[10]

A flagpole height of 1.5 meters was used for all these receptors.

Elevations from stacks and receptors were obtained from National Elevation Dataset (NED) GeoTiff data. GeoTiff is a binary file that includes data descriptors and geo-referencing information necessary for extracting terrain elevations. These elevations were extracted from 1 arc-second (30 meter) resolution NED files. The USEPA software program AERMAP v. 11103 is used for these tasks.

4.5 Meteorological Data

To improve the accuracy of the modeling analysis, recent meteorological data for the 2008-2012 period were prepared using the USEPA's program AERMET which creates the model-ready surface and profile data files required by AERMOD. Required data inputs to AERMET included surface meteorological measurements, twice-daily soundings of upper air measurements, and the micrometeorological parameters surface roughness, albedo, and Bowen ratio. One-minute ASOS data were available so USEPA methods were used to reduce calm and missing hours.[11] The USEPA software program AERMINUTE v. 11325 is used for these tasks.

---

[10] USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, Section A.1.(1), November 9, 2005.
[11] USEPA, Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards, Attachment 3, March 24, 2011, p. 19.

This section discusses how the meteorological data was prepared for use in the 1-hour SO_2 NAAQS modeling analyses. The USEPA software program AERMET v. 12345 is used for these tasks.

4.5.1 Surface Meteorology

Surface meteorology was obtained for Allegheny County Airport located near the Cheswick Power Station. Integrated Surface Hourly (ISH) data for the 2008-2012 period were obtained from the National Climatic Data Center (NCDC). The ISH surface data was processed through AERMET Stage 1, which performs data extraction and quality control checks.

4.5.2 Upper Air Data

Upper-air data are collected by a "weather balloon" that is released twice per day at selected locations. As the balloon is released, it rises through the atmosphere, and radios the data back to the surface. The measuring and transmitting device is known as either a radiosonde, or rawindsonde. Data collected and radioed back include: air pressure, height, temperature, dew point, wind speed, and wind direction. The upper air data were processed through AERMET Stage 1, which performs data extraction and quality control checks.

For Cheswick Power Station, the concurrent 2008-2012 upper air data from twice-daily radiosonde measurements obtained at the most representative location were used. This location was the Pittsburgh, Pennsylvania measurement station. These data are in Forecast Systems Laboratory (FSL) format and were downloaded in ASCII text format from NOAA's FSL website.[12] All reporting levels were downloaded and processed with AERMET.

4.5.3 AERSURFACE

AERSURFACE is a program that extracts surface roughness, albedo, and daytime Bowen ratio for an area surrounding a given location. AERSURFACE uses land use and land cover (LULC) data in the U.S. Geological Survey's 1992 National Land Cover Dataset to extract the necessary micrometeorological data. LULC data was used for processing meteorological data sets used as input to AERMOD.

AERSURFACE v. 13016 was used to develop surface roughness, albedo, and daytime Bowen ratio values in a region surrounding the meteorological data collection site. AERSURFACE was used to develop surface roughness in a one kilometer radius surrounding the data collection site. Bowen ratio and albedo was developed for a 10 kilometer by 10 kilometer area centered on the meteorological data collection site. These micrometeorological data were processed for seasonal

[12] Available at: http://esrl.noaa.gov/raobs/

periods using 30-degree sectors. Seasonal moisture conditions were considered average with no months with continuous snow cover.

4.5.4 Data Review

Missing meteorological data were not filled as the data file met USEPA's 90% data completeness requirement.[13] The AERMOD output file shows there were 2.4% missing data.

To confirm the representativeness of the airport meteorological data, the surface characteristics of the airport data collection site and the modeled source location were compared. Since the Allegheny County Airport is located close to Cheswick Power Station, this meteorological data set was considered appropriate for this modeling analysis. [14]

5. Background SO_2 Concentrations

Background concentrations were determined consistent with USEPA's Modeling Guidance for SO_2 NAAQS Designations.[15] To preserve the form of the 1-hour SO_2 standard, based on the 99th percentile of the annual distribution of daily maximum 1-hour concentrations averaged across the number of years modeled, the background fourth-highest daily maximum 1-hour SO_2 concentration was added to the modeled fourth-highest daily maximum 1-hour SO_2 concentration.[16]

Background concentrations were based on the 2009-11 design value measured by the ambient monitors located in Pennsylvania.[17]

6. Reporting

All files from the programs used for this modeling analysis are available to regulatory agencies. These include analyses prepared with AERSURFACE, AERMET, AERMAP, and AERMOD.

---

[13] USEPA, Meteorological Monitoring Guidance for Regulatory Modeling Applications, EPA-454/R-99-05, February 2000, Section 5.3.2, pp. 5-4 to 5-5.
[14] USEPA, AERMOD Implementation Guide, March 19, 2009, pp. 3-4.
[15] USEPA, Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards, Attachment 3, March 24, 2011, pp. 20-23.
[16] USEPA, Applicability of Appendix W Modeling Guidance for the 1-hour SO_2 National Ambient Air Quality Standard, August 23, 2010, p. 3.
[17] http://www.epa.gov/airtrends/values.html

CLEAN WATER ACTION
PENNSYLVANIA

Darrell Stern
Chief of Air Monitoring
Allegheny County Health Department
3901 Penn Ave, Suite 3
Pittsburgh, PA 15201

Dear Mr. Stern,

Clean Water Action and our more than 15,000 members within Allegheny County who are concerned about the affects of poor air quality on the environment and public health throughout the county and region I offer the following comments on The Allegheny County Health Department's Annual Air Monitoring Network Plan.

Allegheny County needs strong and expanded monitoring of toxic air pollutants due to continued non-attainment for three criteria pollutants: PM 2.5, ground level ozone, and Sulfur Dioxide.

Much of the Annual Air Monitoring Network Plan does a good job of monitoring for criteria pollutants around targeted areas of industrial pollution throughout Allegheny County. However there are a few areas where we believe the plan could be strengthened and expanded.

First, thank you for continuing to operate the Avalon monitor despite the closure of the DTE Shenango Coke Works. The data that is gathered during the next year is important to assessing the impact that the plant had on the air quality in the North Boroughs and creating a picture of how this region has improved since its closure.

We're concerned by the limited monitoring of Sulfur Dioxide around major emitters, specifically the Cheswick Power Station and the Clairton Coke Works. Cheswick is one of the worst polluters in the county and it emits levels of Sulfur Dioxide that impact the region's air quality. However, at the moment Sulfur Dioxide is not monitored downwind of the plant. ACHD should put an SO2 monitor at the Harrison site to collect data from Cheswick The SO2 monitor in Glassport should be reinstalled. Previous monitoring there showed levels of SO2 higher than those measured at the nearby Liberty monitor. The Mon Valley region is out of attainment for the 1-hour standard of Sulfur Dioxide and to get the best information on emissions, the monitoring for this type of pollutant should happen at the places of maximum concentrations as the regulation states.

Finally, the Health Department should further monitor volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) in Lawrenceville around the McConway and Torley steel foundry. The foundry located in the densely populated neighborhood in the city of Pittsburgh is the third largest source of benzene and manganese in the county. While there is fenceline monitoring occurring at the facility and a monitor in Lawrenceville, both are upwind of the facility. A monitor should be placed downwind of the plant to better calculate the VOCs, HAPs, and criteria pollutants being emitted from the facility.

1010 Vermont Avenue NW, Suite 1100, Washington, DC 20005-4918
Phone 202.895.0420 | Fax 202.895.0438 | cwa@cleanwater.org
www.cleanwateraction.org

CLEAN WATER ACTION
PENNSYLVANIA

Thank you for your time and the opportunity to comment on this plan to monitor the air quality in Allegheny County.

Sincerely,

Cassi Steenblok
Program Organizer

1010 Vermont Avenue NW, Suite 1100, Washington, DC 20005-4918
Phone 202.895.0420 | **Fax** 202.895.0438 | cwa@cleanwater.org
www.cleanwateraction.org

Protect Our Parks
c/o Thomas Merton Center
5129 Penn Avenue
Pittsburgh, PA 15224
June 23, 2016

Allegheny County Health Department
542 Fourth Avenue
Pittsburgh, PA 15219
ATTN: Karen Hacker, MD, MPH, Director

REF: *Air Monitoring Network Plan for 2017* (Public Comment)

Dear Dr. Hacker:

Thank you for the opportunity to comment on ACHD's referenced submittal to the Environmental Protection Agency (**EPA**). The attached "public comment" document is offered by *Protect Our Parks* and the other grassroots groups and individuals listed below.

Local responsibility for air quality ought to be a source of pride and reassurance to Allegheny County residents. At its best, local responsibility allows for more responsive and more creative decisions, reflecting local concerns and local conditions. This delegated responsibility can also offer opportunities to go beyond the minimum requirements of national standards, so as to reflect the values and the aspirations of our community.

But local responsibility comes with a price. It calls for a proportionally greater public awareness and participation (such as this "public comment" period), from a relatively smaller constituency. Even more important, there is a greater risk of "regulatory capture" because of the smaller size and necessarily limited resources and sophistication of a local agency, compounded by the political pressures exerted by large-scale industries. Examples are easy to find in our region, where the very existence of some Mon Valley municipalities is the result of industrial self-interest. So "regulatory capture" is a central concern in our attached comments.

We recognize that the proposed monitoring plan is a largely *pro forma* deliverable, written to meet a specific requirement of DEP and EPA. But we also see the plan as an early "window" into the strategic direction of ACHD, demonstrating the impact which the *Plan for a Healthier Allegheny* (**PHA**) is – or is not – having on day-to-day activities of your Department. So we have given closer attention to this plan than such a routine work product might otherwise demand.

As such, then, our comments include recommendations for changes to the proposed plan, and for longer-term actions which are suggested by our review of the monitoring plan itself.

Thank you again for this opportunity to participate in the important responsibilities of your Department.

cc: Board of Health
EPA

Sincerely,

John S. Detwiler, PhD, P.E.
for *Protect Our Parks*

Submitted on behalf of *Protect Our Parks* and these additional grassroots groups and individuals (as described on the following page):

Aaron Booz (for *South Hills Area Against Dangerous Drilling – SHAADD*)

Peter Wray (for *350Pittsburgh*)

Terri Supowitz (for *Marcellus Protest*)

Dana Dolney (for *Friends of the Harmed*)

Thaddeus Popovich (for *Allegheny County Clean Air Now*)

Stephanie Ulmer (for *Churchill Residents Against Fracking*)

Briget Shields (for *Pennsylvanians Against Fracking*)

Gwen Chute (for *Allegheny Group of the Sierra Club*)

- *Protect Our Parks* – an association of Allegheny County residents, formed to preserve public spaces from industrialization and pollution. Among its other accomplishments, *Protect Our Parks* made the first successful petition drive to bring a citizens' agenda initiative under the provision of the county's Home Rule Charter, and presented over 7,000 signatures to the County Council as part of the debate on natural gas drilling at Deer Lakes Park.

- *South Hills Area Against Dangerous Drilling (**SHAADD**)* – a group of concerned citizens working to educate the public about the dangers of fracking and shale gas extraction and to advocate for the protection of our communities and environment.

- *350 Pittsburgh* – a grassroots organization devoted to promoting awareness of the impacts of climate change on our rural and urban communities, to ending our reliance on fossil fuels, and to achieving just investment in good jobs in a renewable energy economy.

- *Marcellus Protest* – an alliance of Western Pennsylvania groups and individuals, building a broad movement to stop the destruction of our environment and communities caused by Marcellus Shale drilling, as well as to support other directly-affected communities.

- *Friends of the Harmed* – educating the public on all aspects of development and the impacts that the oil and gas industry has had on our health, land, air and water; actively helping the people in Pennsylvania who have been negatively impacted.

- *Allegheny County Clean Air Now (**ACCAN**)* – a grassroots group working to clean up the air to improve health in Allegheny County with a focus on the DTE Shenango coke plant – a facility that spewed toxic emissions from Neville Island for years. ACCAN is committed to telling the stories of those who have been affected by those toxic emissions, and sharing them with other communities to inspire action. ACCAN is committed to documenting the health impacts of the facility, and to repurposing the site to be used as a non-polluting facility (such as a solar array).

- *Churchill Residents Against Fracking* – citizens working to raise public awareness regarding the safety and zoning of fossil fuel extraction through hydrofracturing within the Borough of Churchill and surrounding communities.

- *Pennsylvanians Against Fracking* – a statewide coalition of groups who are calling for a ban on fracking in Pennsylvania.

- *Allegheny Group of the Sierra Club* – one of the local groups which comprise the Pennsylvania Chapter of the Sierra Club. The Sierra Club represents over 2 million members and supporters, and is a leader in the effort to move away from fossil fuels which are causing climate disruption.

PUBLIC COMMENT on ACHD's

"Air Monitoring Network Plan for 2017"

from *Protect Our Parks*
on behalf of Allegheny County residents
and other grassroots groups as listed

Executive Summary

Protect Our Parks is a grassroots, unincorporated association of Allegheny County residents and non-profit organizations, working to preserve public lands from industrialization and its resultant environmental pollution. We are joined by other grassroots groups and individuals as listed in the transmittal letter. The following Comments are presented to the Allegheny County Health Department (**ACHD**) with respect to the Department's *Air Monitoring Network Plan for 2017* (the "Plan").

We are concerned by continued evidence of "regulatory capture" in the Plan. ACHD's approach to monitoring, like its use of consent agreements, demonstrates a virtual partnership with large industrial operators and an abdication of arms-length oversight and enforcement. Working in such a partnership, ACHD seeks no more than nominal "attainment" to national standards, while deflecting and delaying any cost or inconvenience to its "partner" operators.

Our review of the Plan has led us to the following recommendations:

#1. That EPA require documentation and justification of ACHD's data-sharing arrangement with US Steel (wherein ACHD provides exclusive, real-time telemetry from its monitoring locations). In the absence of compelling justification and clear protections against "gaming" of regulation, EPA should require ACHD to dismantle this data-sharing capability.

#2. That EPA and DEP assess the potential risks to Allegheny County air quality which are created by the proposed ethylene "cracker" plant in Beaver County, and that ACHD be directed to include that proposed source in the scope of its monitoring responsibilities.

#3. That EPA assist and encourage ACHD to adopt a more comprehensive approach to air monitoring and emissions-inventory, for the benefit of Allegheny County residents, which should include:

   a. Consideration of unconventional oil and gas development (**UOGD**) as a distributed major source;

   b. Inclusion of greenhouse gas (**GHG**) emissions as equally significant as "criteria" pollutants.

Introduction

Protect Our Parks is delivering these comments on behalf of Allegheny County residents and the other grassroots groups listed in our transmittal letter. We are responding to the May 25, 2016, solicitation[1] from the Allegheny County Health Department (**ACHD**) – the "Department" – concerning the proposed *Air Monitoring Network Plan for 2017*[2],– the "Plan."

Collectively, among our various organizations, *Protect Our Parks* and the other signatories represent roughly 10,000 county residents who have directly participated in our efforts to preserve and improve the county's environment. As laypeople, we claim no special expertise in the regulatory requirements to which the Plan is written. (In any case, EPA will make its own determination as to whether ACHD's submittal meets those formal criteria.) But, as individuals and as a broad-based collection of grassroots groups, we do have a breadth of credentials, experience and local knowledge which can be valuable to both ACHD and to EPA.

We appreciate this opportunity to offer public comment on the Plan. Necessarily, our comments are directed toward possible omissions, unintended consequences and missed opportunities we find in the current Plan. This does not imply any judgment on the overall technical quality of the ACHD's submittal.

Observations

#1. The Plan does not identify a context for the proposed monitoring network.

As written, the Plan is essentially a *pro forma* deliverable, written to satisfy a specific requirement of EPA. Its lack of context – or of any references to related ACHD documentation – makes public understanding more difficult. There may be other filings on record which would address our questions, but those documents are so far unknown to us.

- ACHD has stated[3] that a new "State Improvement Plan" (SIP) will be submitted in late October, 2017. In the interim, there is no clear framework to explain just what objectives the current Plan (for 2017) is intended to achieve.
- Apparently, the existing monitoring and enforcement regime has failed to achieve "attainment," so it would be reasonable to expect that a more rigorous implementation should be required going forward. Yet the proposed Plan appears to be a minimal 'refresh' of prior monitoring submittals, with no indication of higher aspirations.

[1] http://www.achd.net/pr/pubs/2016release/052516_air-monitoring-comment.html

[2] *Air Monitoring Network Plan for 2017,* Allegheny County Health Department, May 25, 2016. (Obtained from … http://www.achd.net/air/publiccomment2016/ANP2017.pdf)

[3] *Analysis of the Allegheny County Health Department's Air Quality Program,* Allegheny County Controller's Office, May 16, 2016. (Obtained from … http://alleghenycontroller.com/report.php?fn_name=document_download&file=admin/uploads/9443235AirQuality-FinalReport.pdf)

- The Plan addresses only the collection of air quality data, so it is impossible to know how the monitoring would drive or support enforcement actions.

If, as would seem to be necessary, the future SIP is more ambitious than ACHD's past efforts, the Department might be well advised to include some – at least "preliminary" – monitoring plans in this current submittal cycle, if only to minimize delay in implementing its new long-awaited SIP.

#2. The data-sharing arrangement with US Steel may undermine enforcement. It underscores fears of "regulatory capture."

The following annotation appears at multiple places in the Plan (e.g., p. 28, §7.2):

> *At the request of US Steel, telemetry devices have been installed on the … monitors that transmit continuous readings via radio signals to a location within the US Steel facility…. This real-time data allows US Steel to minimize fugitive emissions and to adjust production levels to keep particulate levels and gaseous emissions within allowable ambient limits in downwind communities.*

ACHD's willingness to cooperate in such data-sharing suggests that ACHD treats US Steel as a virtual partner in satisfying a set of "external" reporting requirements imposed by EPA, rather than as the subject of arms-length oversight for the benefit of the county population.

In particular, in the context of other intra-governmental warnings about the efficacy of consent agreements for enforcement [for example, see Ref. 3, above], this data sharing posture must raise alarms about the opening it creates for US Steel to "game" the regulatory process.

- "Spot" monitoring (as described in the Plan, consistent with accepted practices) is a necessarily imperfect surrogate for the total air pollution "load" affecting a community. Spot monitoring may be the only practical approach to estimating that pollution load. But by arranging for a major industrial source to directly manipulate the monitoring data (i.e., by "managing to the monitor"), ACHD is acting in a fashion which can only increase the real (although, in practice, unmeasurable) pollution load from US Steel's operations.

  For example, when prevailing winds are carrying emissions toward the monitor location and the monitor reading rises, the plant operator will naturally take steps to avoid "unallowable" readings. In the same way, however, when winds carry emissions away from the monitor, the operator will feel free to relax those process constraints, up to the point where the readings are once again approaching the "allowable" limit. As a result, the monitor no longer serves as a statistical indicator of total pollution; it has become a "best case" measurement, and the intended health benefit from monitoring has been compromised.

- There is no information in the Plan about additional real-time measurements within the plant(s), or at the fence-line, either on behalf of ACHD or for US Steel's process management. But a proper quality assurance protocol would require the plant operator to manage according to its own real-time data, while the oversight authority collects independent "blind" measurements

for enforcement purposes only[4]. In that way, the operator remains responsible for keeping the plant processes within acceptable control at all times, regardless of varying external conditions.

When circumstances are such that "gaming" cannot be entirely prevented, there are commonly-used statistical methods[5] to help detect it. Unfortunately, ACHD's detailed real-time data has been offered only to US Steel, and is not available to the public or to independent researchers. So we cannot say for certain whether "gaming" is happening; but the existence of this data-sharing arrangement (at US Steel's request) would strongly suggest that it could be.

#3. The Plan offers no evidence that ACHD is anticipating future challenges, even those which are already near at hand.

As already noted, the Plan does not look ahead to the SIP that the Department has committed to delivering in the 2017 timeframe. But even beyond that promised SIP – which is to address existing nonattainments of very long standing – there are challenges to air quality coming from new major sources and from entirely new forms of pollution.

- The Plan proposes to downgrade one monitor (Avalon) to take advantage of the shutdown of a major source (the Shenango coke works). But the former Shenango site will almost certainly be aggressively marketed to other operators, and ACHD will be under political pressure to expedite the requisite permits.
- Shell Chemical Appalachia has announced construction of an ethylene "cracker" plant in neighboring (upwind) Beaver County. Shell has already submitted an air quality plan to DEP, showing a significant air quality impact on Allegheny County residents. Although ACHD has no role in permitting or enforcement in Beaver County, it is reasonable to expect that downwind air monitoring would be an important facet of DEP's oversight. Yet the current Plan does not have even a placeholder for such a consideration.

  Moreover, given the enthusiasm which the incumbent Allegheny County Executive has demonstrated for the "cracker" project (and his political domination of the ACHD) we are concerned as to whether the ACHD can prepare for this challenge without rigorous leadership from EPA.

[4] As a less technical illustration, imagine that every automobile had – instead of a speedometer – a real-time dashboard display from every police radar gun along the highway. Now imagine further that this display discloses the effective speed limit (at which the police will collect fines) instead of the posted limit, as well as showing the dollar amount of the fine to be assessed at each level of violation. Such a scheme would, naturally, be welcomed by commercial haulers (and other wealthy or aggressive drivers), but could hardly be expected to ensure highway safety.

[5] Such statistical methods begin with simple analysis-of-variance, cross-correlations between monitoring and plant control data, etc. More sophisticated techniques are available, and we would suggest involving experts from (for example) Carnegie Mellon University – while emphasizing that CMU has had no role in preparing these comments.

- In its *Plan for a Healthier Allegheny*[6] ACHD makes a commitment to address "unconventional oil and gas development" (**UOGD**). However, in spite of peer-reviewed scientific literature on health impacts, and mounting anecdotal evidence from local health outcomes, the Plan reflects no influence of the Department's public commitment nor any intention to fulfill it.

  It should also be noted that ACHD has issued public statements about two air monitoring locations related to UOGD: "Imperial Pointe" and "Deer Lakes Park." Neither of those locations is included in the scope of the Plan. We would appreciate clarification as to whether these two UOGD sites have some lesser status within ACHD: *Is their data not of the same technical quality? Is their continued operation in doubt? Is ACHD less interested or committed to following up on the data from these UOGD locations? Is ACHD unwilling, for some reason, to share data from these locations with EPA?*

- Finally, county residents are increasingly aware of the implications of climate change; ACHD itself has sponsored public meetings on "anticipating" the health effects to be expected from climate disruption.

  So far, state, national and international leaders are failing to launch effective action on climate change, apparently hamstrung by the breadth of their obligation to other economic, military and societal pressures. That leaves ACHD, as a local agency with delegated authority, uniquely positioned to demonstrate practical leadership. Yet, again, the Plan is silent as to ACHD's intentions, although air quality monitoring is a valuable asset which could be deployed to respond to the unprecedented challenge of climate change.

Recommendations

#1. **EPA should require ACHD to formalize and justify the data-sharing agreement with US Steel.** Such justification must demonstrate to EPA that the arrangement is in the public interest, and will not lead to "gaming" of the enforcement process. ACHD's justification and EPA's analysis should be subject to public review and comment. Failing that, EPA should disapprove of this arrangement, and require its dismantling.

As a less desirable alternative, ACHD might be directed to deliver the same data[7] to the public as it provides to US Steel, and *vice versa*. In principle, the regulated source should not have better access to governmental monitoring data than is available to the general population.

As part of any approved data-sharing agreement, ACHD should also require US Steel to reciprocate by providing time-tagged data from any in-plant monitors relevant to air quality

[6] *Plan for a Healthier Allegheny,* Allegheny County Health Department, rev. April 15, 2016. (Obtained from … http://www.achd.net/pha/PHA_rev041516.pdf)

[7] For example, US Steel might receive monitoring data via an open "RSS" feed from ACHD, instead of by private radio telemetry. Regardless of the technology employed, ACHD should be required to suspend data transmittal to US Steel at any time that the public data feed is interrupted.

control. ACHD should be directed to provide that high-granularity data to the public for statistical cross-correlation.

#2. ACHD should make – and EPA should encourage – additional efforts to anticipate and manage the air quality impacts of unconventional oil and gas development (UOGD).

Specific efforts could include steps such as the following:

- adding monitoring sites at appropriate distance and direction from concentrations of UOGD wells, compressor stations and related infrastructure;
- adding chemical species such as VOCs, BTEX and others which have been implicated as pathways for adverse impacts of UOGD on human health;
- collecting and analyzing information on health outcomes which are potentially related to UOGD, and for which no specific pathways have been identified.

Since Western Pennsylvania is "ground zero" for Marcellus and Utica Shale development, ACHD ought to become a leader – or, at a poor minimum, a facilitator – for applied research on health impacts of shale extraction. The residents of Allegheny and surrounding counties have already become "guinea pigs" for shale gas development. The ACHD could at least try to ensure that something is learned from this unplanned, uncontrolled environmental experiment.

#3. ACHD should pursue – and EPA should encourage – further analysis and public awareness of greenhouse gas (GHG) emissions and the resulting climate impacts.

Specific efforts could include steps such as the following:

- tracking and reporting on residential and industrial consumption of fossil fuels, and the county's contribution to worldwide GHG emissions;
- tracking and reporting local extraction of fossil fuels (no matter what their ultimate point of consumption), as an additional "contribution" to GHGs by the county;
- including GHGs in emission inventory data for sources which report to ACHD.

Stern, Darrell

From: Belle Vue <bellevuebelle@yahoo.com>
Sent: Thursday, June 23, 2016 10:55 AM
To: Stern, Darrell
Subject: monitors comment

Please place monitors in such a way that low level neighborhood wood smoke can be captured and measured in places where people call in the complaints. It should be measured as best you can where you know it's a problem, as shown by citizen complaints. Measure it at human level where we are being forced to breathe it, at street level, not on top of some building.

Thank you,
Carol Wivell

GROUP AGAINST SMOG & POLLUTION
1133 South Braddock Avenue, Suite 1A
Pittsburgh, PA 15218
(412) 924-0604
http://www.gasp-pgh.org

July 6, 2016

Mr. Nikos Singelis, Acting Director
Air Protection Division
U.S. Environmental Protection Agency, Region III
1650 Arch Street (Mail Code 3AP00)
Philadelphia, PA 19103-2029

Re: Comments to 2017 Air Network Monitoring Plan for Allegheny County, Pennsylvania

Dear Mr. Singelis:

I have enclosed comments of the Group Against Smog and Pollution to the 2017 Air Network Monitoring Plan for Allegheny County, Pennsylvania (the "Plan"). GASP hopes EPA will consider them in its review of the Plan.

GASP learned that the Allegheny County Health Department ("ACHD") did not consider GASP's comments when it published its comment-response document for the Plan, and surmises that occurred because GASP submitted the documents to the incorrect email address (darrel.stern@alleghenycounty.us instead of darrell.stern@alleghenycounty.us) when they were due on June 23, 2016. Although the comments were sent to the incorrect email address, the email with the comments did not bounce back.

Thanks in advance for your attention to this.

Very truly yours,

John K. Baillie
Staff Attorney

Attachments
cc: Darrell Stern, ACHD (w/attachments)

Gmail

John Baillie <johnbaillie412@gmail.com>

GASP comments re Air Monitoring Network Plan for 2017

1 message

John Baillie <johnbaillie412@gmail.com> Thu, Jun 23, 2016 at 10:47 AM
To: "darrel.stern@alleghenycounty.us" <darrel.stern@alleghenycounty.us>
Bcc: jamin@gasp-pgh.org, rachel@gasp-pgh.org

Hi Darrel, I've attached GASP's comments regarding the Air Monitoring Network Plan for 2017. Thanks in advance for your attention to the comments, John Baillie

Virus-free. www.avast.com

160623 comments 2017 network monitoring plan.pdf
509K

GROUP AGAINST SMOG & POLLUTION
1133 South Braddock Avenue, Suite 1A
Pittsburgh, PA 15218
(412) 924-0604
http://www.gasp-pgh.org

June 23, 2016

VIA EMAIL: darrel.stern@alleghenycounty.us

Mr. Darrel Stern, Chief of Monitoring
Allegheny County Health Department
Air Quality Program
301 39th Street
Pittsburgh, PA 15201

Re: **Comments to 2017 Air Monitoring Network Plan**

Dear Mr. Stern:

Please accept the following comments of the Group Against Smog and Pollution ("GASP") regarding the ACHD's Air Network Monitoring Plan for 2017. Notice of draft Plan is posted on ACHD's website, which states that public comments will be received if submitted by before June 23, 2016.

Thanks in advance for your consideration of these comments.

Very truly yours,

/s

John K. Baillie
Staff Attorney

GROUP AGAINST SMOG & POLLUTION
1133 South Braddock Avenue, Suite 1A
Pittsburgh, PA 15218
(412) 924-0604
http://www.gasp-pgh.org

July 6, 2016

VIA EMAIL: dstern@achd.net

Mr. Darrel Stern, Chief of Monitoring
Allegheny County Health Department
Air Quality Program
301 39th Street
Pittsburgh, PA 15201

Re: **Comments to 2017 Air Monitoring Network Plan**

Dear Mr. Stern:

Please accept the following comments of the Group Against Smog and Pollution ("GASP") regarding the ACHD's Air Network Monitoring Plan for 2017. Notice of draft Plan is posted on ACHD's website, which states that public comments will be received if submitted by before June 23, 2016.

Thanks in advance for your consideration of these comments.

Very truly yours,

/s

John K. Baillie
Staff Attorney

COMMENTS OF THE GROUP AGAINST SMOG AND POLLUTION ("GASP") REGARDING THE ALLEGHENY COUTY HEALTH DEPARTMENT'S AIR MONITORING NETWORK PLAN FOR 2017

The Clean Air Act requires each state implementation plan to "provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to … monitor, compile, and analyze data on ambient air quality."[1] 40 C.F.R. Part 58 specifies state implementation plan requirements for monitoring and reporting data regarding ambient air quality, including "[m]inimum ambient air quality monitoring network requirements."[2] Ambient air quality monitoring networks operated by state or local agencies must satisfy the criteria in Appendix D to Part 58.[3]

I. ACHD'S AIR MONITORING NETWORK MUST INCLUDE SO_2 MONITORS LOCATED DOWNWIND FROM THE CHESWICK POWER STATION AND AT ACHD'S EXISTING MONITORING STATION IN GLASSPORT

Appendix D to Part 58 identifies three basic monitoring objectives: the provision of timely air pollution data to the public;[4] supporting compliance with ambient air quality standards and emissions strategy development;[5] and supporting air pollution research studies.[6] "Monitoring sites must be capable of informing managers about many things, including the **peak air pollution levels**, typical levels in populated areas, air pollution transported into and outside of a city or region, and **air pollution levels near specific sources**."[7]

Appendix D includes monitoring network requirements specific to each pollutant for which a National Ambient Air Quality Standard ("NAAQS") has been established, including

---

1 42 U.S.C. § 7410(a)(2)(B).

2 40 C.F.R. § 58.2(a)(5).

3 40 C.F.R. § 58.11(c).

4 App. D, § 1.1(a).

5 App. D, § 1.1(b).

6 App. D, § 1.1(c).

7 App. D, § 1.1.1 (emphasis added).

sulfur dioxide ("SO_2"). The requirements for SO_2 monitoring networks include (in Appendix D's Section 4.4.2) a method for determining the minimum number of monitors that must be operated in each "core based statistical area." According to that formula (and assuming that Allegheny County counts as a "core based statistical area"), ACHD is required to operate one SO_2 monitor only.[8]

However, Appendix D recognizes that "[t]he total number of [SO_2] monitoring sites that will serve the variety of data needs will be substantially higher" than the minimum requirements.[9] "SIP control strategies for SO_2 abatement are usually keyed on achieving the NAAQS at [] points of maximum concentration ... [m]onitoring sites should be located at or near these points of maximum concentration as revealed by modelling to provide a continuing assessment of the situation."[10] Thus, when there is a single source "that contributes overwhelmingly to SO_2 pollution" in an area, it is "very desirable to monitor the maximum ground-level contribution from that source since the attainment and maintenance of the NAAQS in the area would be highly dependent on the effectiveness of control measures applied to that source."[11] Thus, ACHD currently operates five SO_2 monitors, which are located in South

---

[8] The minimum number of required monitors is determined according to the "core based statistical area's" "population weighted emissions index." An area's "population weighted emissions index" is "calculated by multiplying the population of [the area], ... and the total amount of SO_2 in tons per year emitted within the ...area,... The resulting product shall be divided by one million, providing a [population weighted emissions index" value], the units of which are million persons-tons per year." App. D, § 4.4.2.

According to GASP's calculations based on data from the 2011, and most recent, National Emissions Inventory, there were 15,079.93 tons of SO_2 emitted in Allegheny County in 2011, and the most recent population estimate for the County by the Census Bureau is 1,230,459. Consequently, the County's "population weighted emissions index" is 18,555. "For any ["core based statistical area"] with a calculated ["population weighted emissions index"] value equal or greater than 5,000 but less than 100,000, a minimum of one SO_2 monitor is required within that [area]." *Id.*

[9] App. D, § 1.1.2.

[10] ROBERT J. BALL & GERALD E. ANDERSON, OPTIMUM SITE EXPOSURE CRITERIA FOR SO_2 MONITORING 9 (U.S.E.P.A. Pub. No. EPA-450/3-77-013) (1977). This is consistent with the Clean Air Act's directive that each state, and each local agency designated to implement the requirements of the Clean Air Act within a specific area of a state, must adopt an implementation plan to achieve and maintain the NAAQS "within the entire geographic area" of the state or specific area over which the local agency is responsible. *See* 42 U.S.C. § 7407(a).

[11] BALL AND ANDERSON, *supra* note 12, at 10.

Fayette Township, Avalon, Lawrenceville, North Braddock, and Liberty. Three of those five monitors are located downwind of at least one existing major source of SO_2 – ACHD's SO_2 monitor in Liberty Borough is downwind from U.S. Steel's Clairton and Irvin Works; ACHD's SO_2 monitor in North Braddock is downwind from U.S. Steel's J. Edgar Thomson Works; and ACHD's SO_2 monitor in Lawrenceville is downwind from Bay Valley Foods' facility on the North Side. One of the other two monitors, ACHD's SO_2 monitor in Avalon, is located downwind from coke ovens that were operated by Shenango, Inc., on Neville Island until January 2016;[12] the other, ACHD's SO_2 monitor in South Fayette, is located "to access pollution levels entering the County on prevailing winds."[13]

The five SO_2 monitors currently operated by ACHD and called for by the 2016 Air Monitoring Network Plan are insufficient to accomplish the monitoring objectives set forth in 40 C.F.R. Part 58 Appendix D because no monitor analyzes SO_2 concentrations in the ambient air in the areas of the County that are: 1) most affected by emissions from the Cheswick Power Station ("Cheswick"); or 2) heavily exposed to emissions from the industrial facilities in the Liberty-Clairton area and also subject to atmospheric inversions.

A. <u>An SO_2 Monitor Must Be Installed Downwind From Cheswick</u>

Even after the installation of its flue gas desulfurization system, Cheswick remains the largest source of SO_2 emissions in Allegheny County – in 2014, the most recent year for which emissions data is reported on the Pennsylvania Department of Environmental Protection's ("DEP") eFACTS website, Cheswick emitted over 4,445 tons of SO_2, up from 1,686 tons in 2013.[14] Nevertheless, there is no monitor installed and operated to ascertain concentrations of SO_2 in the immediate downwind vicinity of Cheswick. All SO_2 monitors in ACHD's network

---

12 Allegheny County Health Department, *Air Network Monitoring Plan for 2017*, at 49.

13 *Id.*, at 43.

14 *See* Exhibit A.

are located upwind of Cheswick,[15] and the nearest downwind SO_2 monitor (which is operated by DEP) is in Strongstown, Indiana County, approximately fifty miles from Cheswick.[16] Ground-level concentrations of SO_2 emitted by Cheswick are likely to be greatest to the east and northeast of Cheswick, on the hilltops across the Allegheny River in Plum Township. Indeed, "Short-Term Test Modeling" results of SO_2 concentrations in the vicinity of Cheswick that ACHD provided to GASP in response to a records request indicate that the concentration of SO_2 in the areas around Cheswick is likely to exceed the one-hour SO_2 standard of 75 ppb.[17] However, there is no monitor installed and operated to ensure that the SO_2 emitted by Cheswick does not cause ground-level concentrations of SO_2 in inhabited, immediately-downwind areas to exceed the NAAQS for SO_2.

ACHD's apparent choice to comply with the Data Requirements Rule for the 2010 Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard[18] by using air quality modeling to characterize 1-hour concentrations of SO_2 downwind of Cheswick does not excuse the need to install and operate an SO_2 monitor downwind of Cheswick. Every other major source of SO_2 in Allegheny County has an SO_2 monitor located close by and downwind – U.S. Steel's Clairton and Irvin Works are upwind of ACHD's SO_2 monitor in Liberty Borough; U.S. Steel's J. Edgar Thomson Works is upwind of ACHD's SO_2 monitor in North Braddock; and Bay Valley Foods' facility on the North Side is upwind of ACHD's SO_2 monitor in Lawrenceville. Presumably, these monitors were installed, and are operated, at least in part to ensure that the ambient air in

---

15 The prevailing wind in Allegheny County is generally from the west or southwest. *See* http://www.windfinder.com/windstatistics/pittsburgh_intl_airport.

16 *See* PENNSYLVANIA DEPT. OF ENVTL. PROT., 2015 ANNUAL AMBIENT AIR MONITORING NETWORK PLAN, at 11-12 (June 2015), *available at* http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-108070/Final%202015%20PA%20Annual%20Monitoring%20Network%20Plan.pdf.

17 *See* Exhibit B.

18 The final Data Requirements Rule was published at 80 Fed. Reg. 51052 (Aug. 21, 2015). Cheswick appears to be the only source in Allegheny County to which the Data Requirements Rule applies, because it is not located in a designated non-attainment area and had actual SO_2 emissions of more than 2,000 tons (in 2014). *See* 40 C.F.R. § 51.1200 (defining "Applicable source").

areas near those facilities actually attains the NAAQS for SO_2 despite the facilities' significant SO_2 emissions. Cheswick's SO_2 emissions must be monitored in similar fashion.

ACHD's 2017 Air Monitoring Network plan is insufficient to accomplish the objectives identified by 40 C.F.R. Part 58 Appendix D (including most particularly the provision of timely air pollution data to the public – members of the public cannot use air quality models to determine whether and when they may be exposed to unhealthy SO_2 concentrations) because the Plan does not provide for a monitor that ascertains ground-level concentrations of SO_2 in the ambient air in those areas of Allegheny County where such concentrations are likely to be the greatest, specifically, the hilltops in Plum Township that are across the Allegheny River from Cheswick.

B. An SO_2 Monitor Must Be Re-Installed at ACHD's Existing Monitoring Station in Glassport

In recent years, ACHD's SO_2 monitor in Liberty has measured SO_2 levels that violate the 1-hour NAAQS for SO_2, leading to the nonattainment area designation of a number of communities in southeastern Allegheny County.[19] SO_2 concentrations that were measured at the monitor that ACHD operated in Glassport until 2006 significantly exceeded the concentrations measured in Liberty,[20] likely as a result of local topography and the difference in elevation between the two sites:

> The base of the river valley lies at about 720 feet in elevation above mean sea level (MSL), while adjacent hilltops are over 1,100 feet MSL in elevation. Large temperature differences can be seen between hilltop and valley floor observations (*e.g.*, 2 to 7°F) during clear, low-wind, nighttime conditions. Strong nighttime

---

[19] Specifically, EPA has designated an SO_2 nonattainment area consisting of the following communities: City of Clairton, City of Duquesne, City of McKeesport, Borough of Braddock, Borough of Dravosburg, Borough of East McKeesport, Borough of East Pittsburgh, Borough of Elizabeth, Borough of Glassport, Borough of Jefferson Hills, Borough of Liberty, Borough of Lincoln, Borough of North Braddock, Borough of Pleasant Hills, Borough of Port Vue, Borough of Versailles, Borough of Wall, Borough of West Elizabeth, Borough of West Mifflin, Elizabeth Township, Forward Township, and North Versailles Township. Air Quality Designations for the 2010 Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard, 78 Fed. Reg. 47191, 47203 (Aug. 5, 2013).

[20] ACHD, SO_2 MODELLING PROTOCOL – 2010 STANDARDS, at 6 (Draft, March 2014).

> drainage flows can cause differences of up to 180° in wind direction from the prevailing wind pattern with 3-4 mph downslope flows. Also, strong nighttime inversions can lead to poor dispersion scenarios on several days of the year.[21]

The Glassport SO_2 monitor purportedly was removed because the monitoring site was deteriorating and difficult to reach. However, almost all of the industrial and transportation sources of SO_2 that contributed to high concentrations of SO_2 in the ambient air in Glassport still operate today. Accordingly, it is probable that SO_2 levels in the ambient air in Glassport continue to exceed those measured in Liberty. Because "SIP control strategies for SO_2 abatement are usually keyed on achieving the NAAQS at [] points of maximum concentration"[22] such as the one in Glassport, ACHD should re-install an SO_2 monitor at its existing Glassport monitoring station. Such a monitor would permit an informed determination of whether the ambient air in low-lying areas in the areas actually attains the NAAQS for SO_2.[23]

II. ACHD SHOULD INSTALL AND OPERATE A SPECIAL PURPOSE MONITOR IN DOWNTOWN PITTSBURGH TO EVALUATE $PM_{2.5}$ CONCENTRATIONS EXACERBATED BY DIESEL EMISSIONS

An air toxics study that was performed between 2005 and 2008 for ACHD by researchers from Carnegie Mellon University determined that a "hotspot" for diesel particulate matter in the ambient air exists in Downtown Pittsburgh; concentrations of diesel particulate matter in Downtown's ambient air may pose a statistically significant cancer risk.[24] As a follow up, ACHD has conducted a second study focused on characterizing diesel emissions in Downtown Pittsburgh. GASP understands that this study has been completed (but is not yet published) and that it shows that unhealthy levels of fine particulate matter ("$PM_{2.5}$") are present at street level Downtown, most likely as the result of heavy bus traffic. ACHD should install a special purpose

---

21 *Id.*, at 4.

22 BELL AND ANDERSON, *supra* note 12, at 9.

23 *See id.* (stating that "[m]onitoring sites should be located at or near [] points of maximum concentration as revealed by modelling to provide a continuing assessment of the situation").

24 ALLEN ROBINSON, ET AL., AIR TOXICS IN ALLEGHENY COUNTY: SOURCES, AIRBORNE CONCENTRATIONS, AND HUMAN EXPOSURE, ACHD Agreement # 36946 (March 2009), at 4.

monitor for $PM_{2.5}$ at street level Downtown, to ensure that the NAAQS for $PM_{2.5}$ are not being violated, or (if they are) to better inform ACHD's design of control measures to ensure compliance with those NAAQS. The existing monitor at Flag Plaza is not well situated to measure the localized pollution concentrations of $PM_{2.5}$ that exist Downtown but not at Flag Plaza, due to the heavy bus traffic and densely-packed tall buildings that are present Downtown but not at Flag Plaza.

III. ACHD SHOULD INSTALL AND OPERATE A SPECIAL PURPOSE MONITOR FOR AIR TOXICS DOWNWIND OF THE CLAIRTON COKE WORKS

Unless properly controlled, coke ovens can emit substantial quantities of air toxics, including benzo(a)pyrene:

> Benzo(a)pyrene plays an important role with regard to the environmental assessment of the coking process. Very often it is used as a guide substance for polycyclic aromatic hydrocarbons (PAH) which can be emitted from leaks at the coking chambers. In order to reduce these fugitive emissions, measuring methods are necessary by which the made progress can be quantified. Reliable statements on the amount of emitted [benzo(a)pyrene] are indispensable, too, for making a forecast on the [benzo(a)pyrene] burden in ambient air of the surrounding [areas].[25]

ACHD should operate a benzo(a)pyrene monitor at its monitoring station in Liberty, which is downwind from U.S. Steel's Clairton Coke Works, to ensure that the air toxics emitted by those facilities are minimized and that the air toxics load in the communities surrounding that facility is maintained at levels that do not increase health risks for the people who live, work, and visit there.

---

[25] Michael Hein and Manfred Kaiser. *Environmental Control and Emission Reduction for Coking Plants*, in AIR POLLUTION - A COMPREHENSIVE PERSPECTIVE (Dr. Budi Haryanto, ed.), at 237 (ISBN: 978-953-51-0705-7, InTech, DOI: 10.5772/48275 (2012)), *available at*: http://www.intechopen.com/books/air-pollution-a-comprehensive-perspective/environmental-control-and-emission-reduction-for-coking-plants.

IV. ACHD SHOULD CONTINUE TO OPERATE THE PM_{10} HIGH VOLUME SAMPLER IN AVALON UNTIL AT LEAST THE END OF JANUARY 2017

It is appropriate for ACHD to discontinue operation of the PM_{10} high volume sampler at Avalon in January 2017 as proposed, after the monitor collects data for one year following the shutdown of the nearby Shenango Coke Works. 2016 data from the monitor can be used to establish new background concentrations for PM_{10} in the area of the Avalon monitor. If however, PM_{10} concentrations do not decrease as expected in 2016, ACHD should continue to operate the monitor through 2017 to ensure that nearby communities are not being exposed to unhealthy levels of PM_{10}.

EXHIBIT A

eFACTS on the Web
DEP Information
About DEP
Contact Us
DEP Home
Search eFACTS
Authorization Search
Client Search
Facility Search
Inspection Search
Mammography Search
Name Search
Pollution Prevention
Sites by County/Municipality
Site Search
Reports
Emission Summary
Facility Emissions
Other Sites
eMapPA
eNotice
EPA ECHO
EPA Envirofacts
Licensing, Permits, and Certification
The PA Code

Facility Emissions Report

Year: **2014**
County: **Allegheny**
Pollutant: **Sulfur Oxides**
Top Records: **10**

Primary Facility ID	Primary Facility Name	Tons/Year
737442	NRG MIDWEST LP/CHESWICK	4445.4142
737439	USS/CLAIRTON WORKS	1511.7339
737436	USS CORP/EDGAR THOMSON WORKS	1329.0207
737318	US STEEL CORP/IRVIN PLT	715.9371
73743S	SHENANGO INC/SHENANGO COKE PLT	275.8858
737350	GUARDIAN IND CORP/JEFFERSON HILLS	108.8668
737434	ALLEGHENY LUDLUM LLC/BRACKENRIDGE	33.7
737323	REDLAND BRICK INC/HARMAR PLT	30.86
737336	ALLIED WASTE SVC OF PA/MSW LDFL	17.6921
737263	BAY VALLEY FOODS LLC/PGH	12.751

Total Emissions for Selected Records: 8481.8620
Total Emissions for Selected Area: 8528.7540

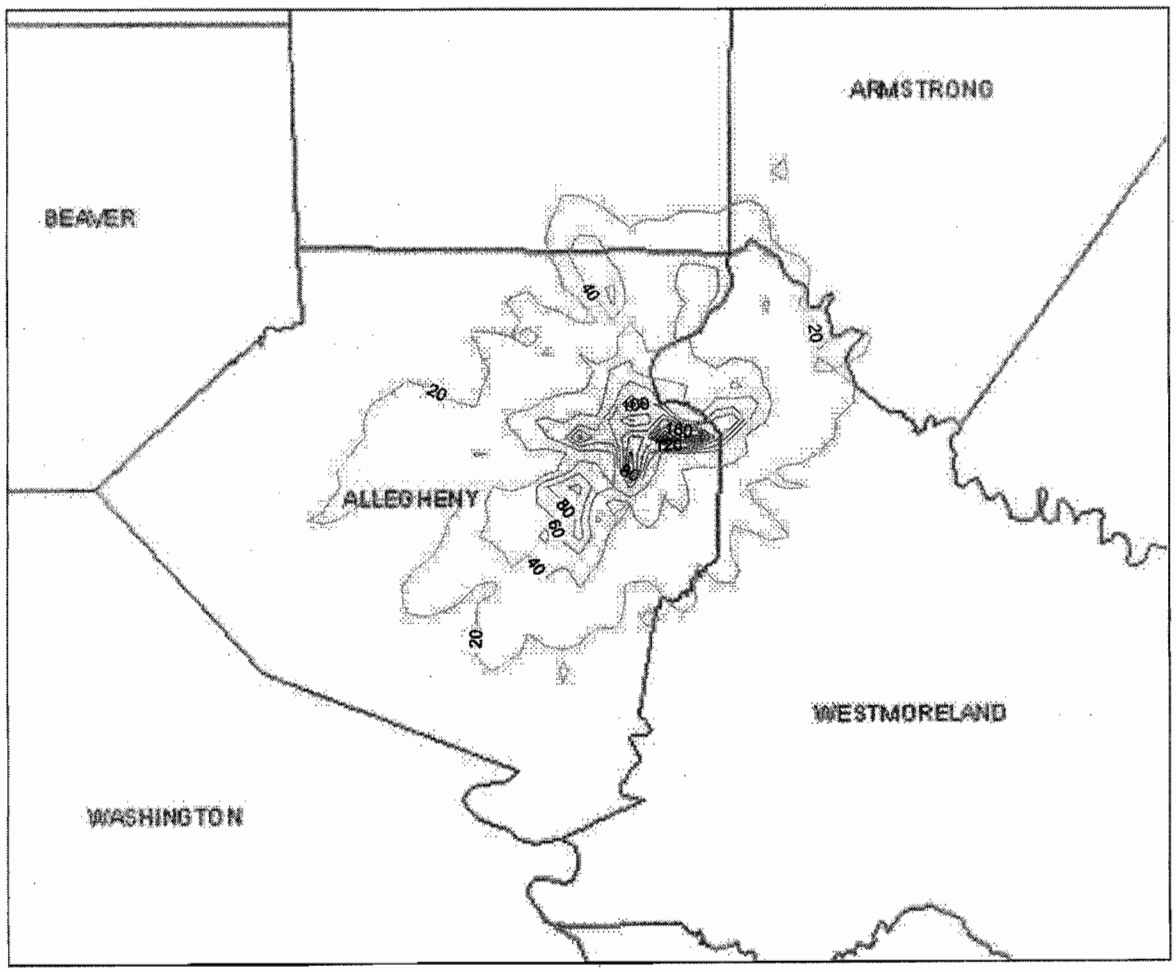
Run report again

EXHIBIT B

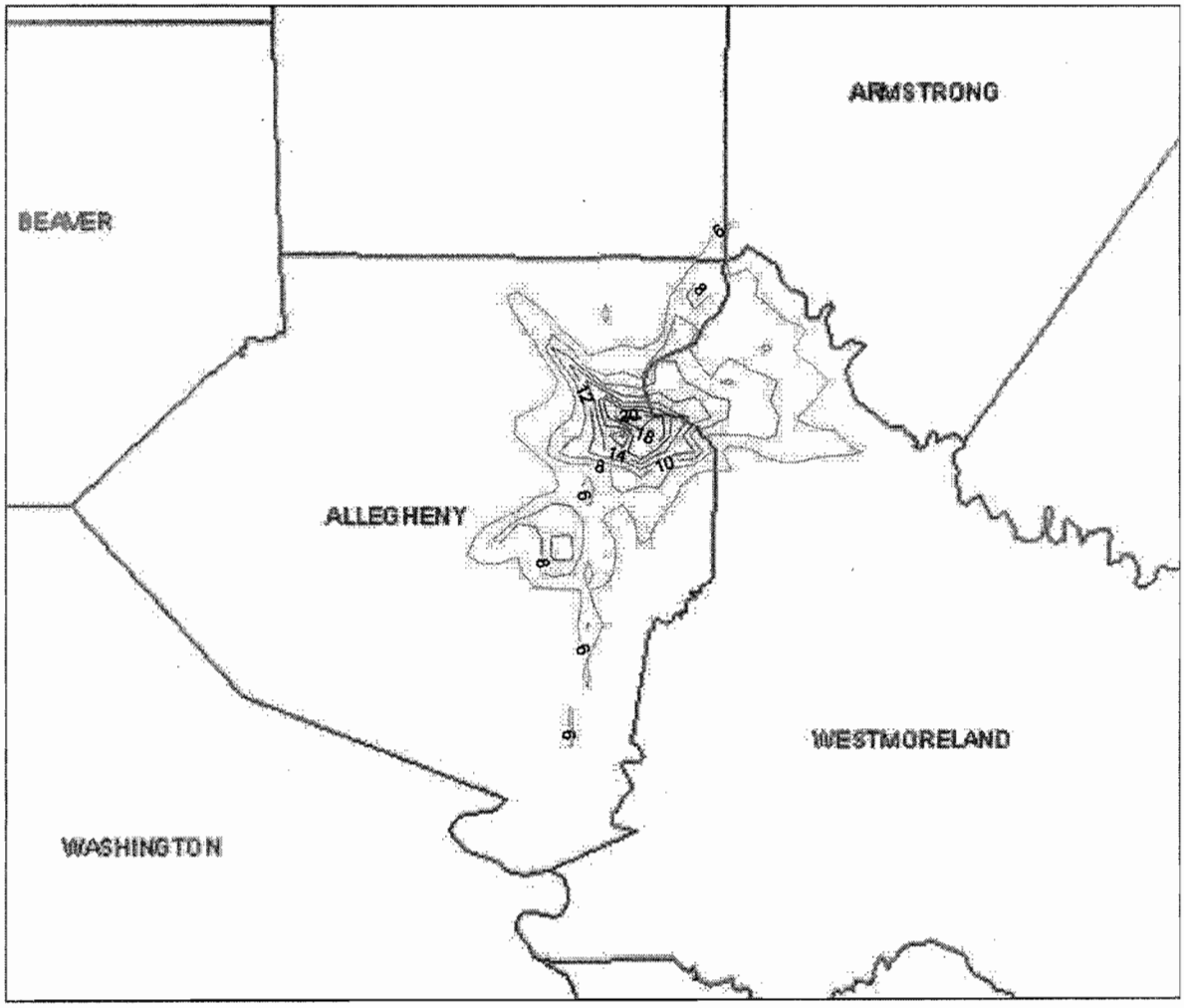
Cheswick SO2 Short-Term Test Modeling

CALPUFF model results
2002 meteorology from PIT, AGC, MM5
1 km gridded receptor spacing
FGD stack height = 552 ft
Emissions based on preliminary 2010 totals

Cheswick Maximum 1-Hr SO2 Impacts, ppb (max = 240 ppb)



Cheswick Maximum 24-Hr SO2 Impacts, ppb (max = 23 ppb)



Cheswick Maximum Annual SO2 Impacts, ppb (max = 2.5 ppb)