COUNTY OF ALLEGHENY

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Allegheny County Health Department
Air Quality Program
Monitoring Section
Pittsburgh, Pennsylvania

Air Monitoring Network Plan for Calendar Year 2025

July 1, 2024

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Contents

CERTIFICATION

To the best of my knowledge, this plan has been checked for completeness and the details presented herein are accurate, error-free, legible, and representative of the methods employed by the Allegheny County Health Department Air Quality Program Monitoring Section to measure air quality.

David D. Good
Program Manager, Air Monitoring & Source Testing

EXECUTIVE SUMMARY

Allegheny County Health Department's Air Quality Program: Monitoring (ACHD) operates an air monitoring network. Federal Regulations (40CFR58.10) require ACHD to prepare an annual monitoring network plan. ACHD must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan. Public comments received on the air monitoring plan must be included in the version submitted to the United States Environmental Protection Agency (EPA). All proposed additions, modifications, and discontinuations of State or Local Air Monitoring Station (SLAMS) monitors in ACHD's air monitoring network plan are subject to EPA approval.

The summary of air monitoring network changes since the previous approval includes:

- Postponement of Lawrenceville Monitoring station site move due to unforeseen new construction and commercial operations in Chateau
- Updated method code changes to Teledyne continuous $PM_{2.5}$ monitor data collected before network data alignment

The summary of *proposed* air monitoring network changes includes:

- Addition of continuous $PM_{2.5}$ monitoring at South Fayette and Harrison sites
- Addition of meteorology (wind speed & direction) sensors at Avalon and Clairton sites
- Addition of hydrogen sulfide monitoring at Clairton site
- Addition of sulfur dioxide monitoring at Clairton site
- Relocation of Lawrenceville monitoring station (NCore, PAMS, NATTS, IMPROVE, ASCENT, and CSN) after a new permanent site is located

PLAN APPROVAL

The air monitoring network plan for calendar year 2025 is hereby recommended for approval and commits the Allegheny County Health Department, Air Quality Program to present the plan to the EPA for approval.

Allegheny County Health Department, Air Quality Program

Signature:
David D. Good
Program Manager – Air Monitoring and Source Testing

1.0 Annual Air Monitoring Network Plan Requirements

The Allegheny County Health Department's Air Quality Program: Monitoring has prepared the public comment version of the 2025 air monitoring network plan. In addition to the federal requirements, effort has been made to document all air monitoring performed in Allegheny County. The body of the plan focuses on the regulatory requirements for our SLAMS (state or local air monitoring stations network) sites, whereas Appendix A presents information regarding monitoring activities not required by the plan. Appendix A is included in response to public comments received regarding previous network plans and provides details about the non-SLAMS special study monitoring performed in Allegheny County. All monitoring data generated by ACHD is available through a right to know request (Open Records page).

40 CFR Part 58, §58.10 contains the air monitoring network plan requirements. Each year on July 1, the plan is to be submitted to the USEPA Regional (Region III) Administrator. A summary of the applicable requirements that parallels and condenses the regulatory text follows.

§58.10 (a) requires each agency to prepare an annual plan for an air quality surveillance system that consists of a network of SLAMS monitoring stations that can include Federal Reference Method (FRM), Federal Equivalent Method (FEM), and Approved Regional Method (ARM) monitors that are part of SLAMS, National Core Monitoring Network (NCORE), Chemical Speciation Network (CSN), Photochemical Assessment Monitoring Stations (PAMS), and Special Purpose Monitoring (SPM) stations. Prior to submittal, the plan must be made available for public inspection and comment for at least 30 days. In addition, the plan shall include:

1. A statement of whether the operation of each monitor meets the requirements of Appendices A, B, C, D, and E of 40CFR58, where applicable.
2. Any proposed SLAMS network modifications, including new or discontinued monitoring sites, new determinations that data are not of sufficient quality to be compared to the NAAQS, and changes in identification of monitors as suitable or not suitable for comparison against the annual $PM_{2.5}$ NAAQS. The EPA Regional Administrator has 120 days to approve or disapprove the plan.
3. A plan for making PAMS measurements as required in 40CFR58, Appendix D, Paragraph 5(a). The PAMS Network Description of Appendix D may be used to meet this requirement. The plan shall provide for the required PAMS measurements to begin by June 1, 2021 (promulgated delay of 2 years from original target date of 2019).
4. An Enhanced Monitoring Plan (EMP) for ozone (O_3) in accordance with the requirements of 40CFR58, Appendix D, Paragraph 5(h). The EMP shall be submitted to the EPA Regional Administrator no later than October 1, 2019. This condition was satisfied in the 2020 plan (EPA letter dated October 28, 2019).

§58.10 (b) requires that the plan must contain the following information for each existing and proposed site:

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.
9. The designation of any lead (Pb) monitors as either source-oriented or non-source-oriented (no longer applicable in Allegheny County).
10. The identification of required NO_2 monitors as near-road, area-wide, or vulnerable and susceptible population monitors.
11. The identification of any $PM_{2.5}$ FEMs and/or ARMs used in the monitoring agency's network where the data are not of sufficient quality to be compared to the NAAQS.

§58.10 (c) requires that the plan must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.

§58.10 (d) The local agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in Appendix D, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby states and tribes or health effects studies. The agency must submit a copy of this 5-year assessment along with a revised annual network plan. The next assessment is due to be submitted to the EPA on July 1, 2025 (concurrent with the Annual Network Plan).

§58.10 (e) All proposed additions and discontinuations of SLAMS monitors in annual monitoring network plans and periodic network assessments are subject to approval according to §58.14.

2.0 Changes Since the Last Air Monitoring Network Plan

2.1 Monitoring Additions

None.

2.2 Monitoring Reductions

None.

2.3 Monitoring Relocations/Modifications

2.3.1 Postponement of Site Move of Lawrenceville Monitoring Station to Chateau

The planned move of the Lawrenceville site that houses the NCore, PAMS, NATTS, IMPROVE, ASCENT, and CSN monitoring programs has been postponed due to a new probable construction project across from the proposed site in Chateau. In late 2023 it was announced that a gas fueling station was zoned to be constructed at 1315 Western Avenue, Pittsburgh, PA 15233 - directly across the street from the proposed new monitoring site: https://apps.pittsburghpa.gov/redtail/images/23525_ZBA_079_of_2023_DCP-ZDR-2022-14292_1315_WESTERN_AVE_(1).pdf.

Due to the sensitivity of the air quality instruments the expected air emissions from the gas fueling station, while small in quantity, could disproportionally affect the measurement of trace quantities of pollutants those instruments were designed to detect. In other words, the proximity of the gas station to the instruments could show readings that are not representative of area-wide pollutant concentrations – particularly for volatile organic compounds and ozone precursors. The Department is actively assessing other properties that could house the current Lawrenceville monitoring station while meeting federal siting criteria for NCore sites.

2.3.2 $PM_{2.5}$, PM_{10} and PM_{COARSE} Monitoring Method Changes

All continuous $PM_{2.5}$ monitors in the ACHD monitoring network now use either the Teledyne T640 ($PM_{2.5}$) or T640X ($PM_{2.5}$, PM_{10}, and PM_{COARSE}) instrument. ACHD elected to change to the new data alignment algorithm provided and recommended by the manufacturer on all the T640 and T640X instruments in use in the air monitoring network. The EPA has since allowed for the data alignment algorithm to be used (under another new method code) retroactively for PM2.5 data submitted to AQS before the approved release of the algorithm in the summer of 2023. This change has lessened some of the bias that was seen in historical Teledyne $PM_{2.5}$ FEM data compared to the $PM_{2.5}$ FRM data.

3.0 Proposed Changes to the Air Monitoring Network

The following are the proposed changes to the air monitoring network beginning at the time of this plan's approval through calendar year 2025.

3.1 Proposed Monitoring Additions

3.1.1 Continuous $PM_{2.5}$ Monitors at South Fayette and Harrison

ACHD plans to proceed with the installation of continuous $PM_{2.5}$ FEM monitors at all remaining $PM_{2.5}$ SLAMS sites that do not currently have continuous $PM_{2.5}$ coverage. The Department is awaiting the arrival of new environmental shelters to house the units. The $PM_{2.5}$ FEM monitors will be candidates for designation as either a primary or collocated SLAMS $PM_{2.5}$ monitor in the network.

3.1.2 Hydrogen Sulfide Monitoring at Clairton Site

ACHD will expand continuous hydrogen sulfide (H_2S) surveillance by adding an H_2S analyzer at the Clairton monitoring site after necessary upgrades and repairs are made to the station – including a new environmental shelter.

3.1.3 Addition of Meteorology (wind speed & direction) Sensors at Avalon and Clairton site

ACHD will install a meteorology tower at the new Avalon site to provide wind speed and wind direction data for the area. A similar meteorology installation will occur at the Clairton site.

3.2 Proposed Monitoring Reductions

None.

3.3 Proposed Monitoring Relocations/Modifications

3.3.1 Sulfur Dioxide Monitoring from South Fayette to Clairton Site

ACHD proposes to relocate SO_2 monitoring that was discontinued at the South Fayette site to the Clairton site after necessary upgrades and repairs are made to the station. The originally proposed design would not meet EPA siting criteria and a special enclosure must be modified and craned up to the roof of the site.

3.4 Proposed Air Monitoring Site Relocations

3.4.1 Lawrenceville Monitoring Station (NCore)

The ACHD Air Quality program has relocated from the Clack Health Center Complex to the Chateau neighborhood as of November 2023. The Lawrenceville monitoring station that includes the NCore, PAMS, NATTS, IMPROVE, and CSN monitoring will need to be relocated. In the 2023 Annual Monitoring Network Plan, ACHD proposed to move all the current monitoring operations at the Lawrenceville site to 836 Fulton Street in the Chateau neighborhood bordering Manchester, which received EPA Region 3 approval. Because of potential interferences that could occur with the construction and operation of a new gas fueling station (see Section 2.3.1 above) the Department is actively looking for alternative sites that could meet federal siting criteria to house the air monitoring operations currently at Lawrenceville.

4.0 Air Monitoring Network Summary

Figure 4 and Table 4 are provided as overviews of the air monitoring network and 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. To view live and recent data for all continuous monitors listed in the table, see the Air Quality Program website;

https://www.alleghenycounty.us/Services/Health-Department/Air-Quality

Figure 4 Air Monitoring Network Map

Table 4 Air Monitoring Network Summary

	SO_2	CO	NO_2	NO_y	O_3	PM_{10}	$PM_{2.5}$	PM coarse	Meteorology	Air Toxics
Lawrenceville NCORE	CT	CT	C	CT	C	C	C I(3), SPC(3)	C	MET	TO15(6) TO11(6) PAH M ASCENT
Liberty	CT		C			C	C I(1), IQA(12) SPC(6)	C	MET	BTEX H2S
North Braddock	C	CT				C	C I(3)	C	MET	H2S
South Fayette					C		C I(3)			
Clairton	C						C		MET	H2S
Avalon							C		MET	
Glassport						C				
Harrison			C		C		C I(3)			
Parkway East (Near Road)		CT	C				C IQA(12)		MET	Aeth(C)
Total (Current Network)	C = 2 CT = 2	CT = 3	C = 3	CT = 1	C = 3	C = 4	C = 6 I = 6 IQA = 2 SPC=2	C = 3	MET = 4	H2S = 2 Aeth(C) = 2

Tabular Summary Key

I = Intermittent or Filter-Based; **C** = Continuous; **SPC** = PM2.5 Speciation; **T** = Trace Level Monitor
(1), (3), (6), (12) = Sampling Frequency: **(1)** = daily, **(3)** = every 3rd day, **(6)** = every 6th day, **(12)** = every 12th day
TO15 = SUMMA VOC; **TO11** = Carbonyl VOC; **Aeth** = Aethalometer: Black Carbon, Ultraviolet PM
QA = Collocated QA monitor; **N =** Non-FEM monitor (Special Study, non-regulatory use); **H2S** = Hydrogen Sulfide
PAH = Polycyclic Aromatic Hydrocarbons; **M** = PM10 Metals; **BTEX** = Charcoal Tube; **MET** = wind speed/direction
ASCENT = Aerosol Chemical Speciation Monitor, Continuous PM10 metals, Scanning Mobility Particle Sizer
Yellow Shading = Planned Monitors, Not Yet Operational; **Red Shading** = Candidate for Discontinuation/Relocation

5.0 Appendix A Requirements

40CFR58, Appendix A specifies the minimum quality system requirements applicable to SLAMS and other monitor types whose data are intended to be used to determine compliance with the NAAQS. ACHD is the Primary Quality Assurance Organization (PQAO) for this data set. A PQAO is also responsible for demonstrating data quality. ACHD has developed a quality system that is described and approved in quality management plans (QMP) and quality assurance project plans (QAPP). The purpose of these documents is to ensure that the monitoring results provide data of adequate quality for the intended monitoring objectives.

ACHD performs the requisite measurement quality checks that are used to assess data quality. ACHD also performs an internal second level audit as an added measure of the data quality. Data from these checks is submitted to the AQS within the same time frame as routinely-collected ambient concentration data. In addition to performing QA and QC checks, ACHD participates in external performance evaluation programs (which are independent assessments) and technical systems audit conducted by the EPA.

Regarding all data generated by the criteria pollutant monitors described in this network review, no later than May 1 of each year, ACHD submits a letter certifying accuracy and reliability of each previous calendar year's 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.

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

- All ambient concentration data and quality assurance data have been reported to the AQS database.
- The ambient data are accurate to the best of his or her knowledge taking into consideration all applicable quality assurance findings.

6.0 Appendix B Requirements

40CFR58, Appendix B specifies the minimum quality assurance requirements for the control and assessment of the quality of the ambient air monitoring data submitted to a Prevention of Significant Deterioration (PSD) reviewing authority or the EPA by an organization operating an air monitoring station, or network of stations, operated to comply with Part 51 New Source Review (NSR) - PSD.

At present, Appendix B requirements are not applicable since there is no PSD monitoring performed by ACHD nor performed by an external PSD PQAO within the county.

7.0 Appendix C Requirements

40CFR58, Appendix C specifies the criteria pollutant monitoring methods (manual methods or automated analyzers) which must be used in SLAMS, NCORE stations (a subset of SLAMS) and PAMS (to be located at the NCORE site and considered to be another subset of SLAMS).

All criteria pollutant monitoring methods in the air monitoring network used for making NAAQS decisions at a SLAMS site are reference (FRM) or equivalent (FEM) methods. The FRM or FEM designation acceptance tests are performed by the manufacturer in accordance with the requirements of 40CFR50 and 40CFR53.

Methods employed at the Lawrenceville NCORE multipollutant site are either reference or equivalent methods. NCORE multipollutant parameters include SO_2, CO, NO_y, NO_2, O_3, $PM_{2.5}$, and $PM_{10-2.5}$ (aka PM_{coarse}, Coarse PM, or PM_c). NO_y and PM_c do not have an associated NAAQS.

Methods to be employed at the Lawrenceville PAMS site are either reference or equivalent methods (where applicable). PAMS FEM monitoring parameters include O_3 and true NO_2. PAMS monitoring which do not have FEM nor FRM designation include methods for meteorological measurements and speciated VOC monitoring methodologies, which are specified in PAMS guidance documents.

- Meteorological monitoring guidance is provided in QA Handbook, Volume IV - Meteorological Measurements found at https://www3.epa.gov/ttn/amtic/qalist.html.

- The Compendium of Methods for the Determination of Toxic Organic (https://www3.epa.gov/ttn/amtic/airtox.html#compendium) can be found on EPA's website. Carbonyl sampling and analysis is based upon TO-11A and the automated gas chromatography method is based upon TO-15.

8.0 Appendix D Requirements

40CFR58, Appendix D describes monitoring objectives and general criteria to be applied in establishing the required SLAMS ambient air quality monitoring stations and for choosing general locations for additional monitoring sites. Appendix D also describes specific requirements for the number and location of FRM, FEM, and ARM sites for specific pollutants, NCORE multipollutant sites, PM_{10} mass sites, $PM_{2.5}$ mass sites, chemically-speciated $PM_{2.5}$ sites, and O_3 precursor measurement sites (PAMS). These criteria are used by EPA to evaluate the adequacy of the ACHD monitoring network.

The ACHD monitoring network provides air pollution data to the public in a timely manner, supports compliance with ambient air quality standards and emissions strategy development, and supports air pollution research studies. The location of the monitors in the network were chosen to correctly match the spatial scale represented by the sample of monitored air with the spatial scale most appropriate for the monitoring site type, air pollutant to be measured, and the monitoring objective.

General 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 (2020) determined the population of the Pittsburgh MSA to be 2,370,930 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. Air Quality Design Values (DV) referenced in this section are based on tables available at:

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

Each state is required to operate at least one NCORE site. States may delegate this requirement to a local agency. The NCORE location is leveraged with other multipollutant air monitoring sites including the proposed PAMS site, CSN monitoring, and monitoring performed by academia. Site leveraging includes using the same monitoring platform and equipment to meet the objectives of the variety of programs where possible and advantageous.

Pollutant specific design criteria for SLAMS sites are codified in 40CFR58, Appendix D, Section 4. EPA updates this document routinely in response to NAAQS revisions and in response to evolving air monitoring network objectives. SLAMS sites are intended to address specific air quality management interests, and as such, are frequently single-pollutant measurement sites. The following sections parallel the CFR citations and provide the current, applicable requirements for each criteria pollutant.

8.1 Ozone Design Criteria

Ozone (O_3) monitoring requirements are determined by the MSA population and ozone design value, as specified in Table D-2 of 40CFR58, Appendix D.

- Based on the population of the Pittsburgh MSA and the latest ozone design value, which 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 ozone network, at least one ozone site for each MSA must be designed to record the maximum concentration for that metropolitan area. The maximum concentration monitor site should be selected in a direction from the city that is most likely to observe the highest ozone concentrations, more specifically, downwind during periods of photochemical activity. The Harrison monitor is assigned this designation.

Figure 8.1 Ozone Monitoring Map

8.2 Carbon Monoxide Design Criteria

EPA revised the minimum monitoring requirements for carbon monoxide (CO) on August 12, 2011 (40CFR58, Appendix D). Applicable requirements are;

- One CO monitor is required to be collocated with a near road NO_2 monitor 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 trace level CO monitor at the Lawrenceville NCORE site since 4/1/2010.
- ACHD operates an additional CO monitor at the North Braddock site.

Figure 8.2 CO Monitoring Map

8.3 Nitrogen Dioxide Design Criteria

On January 22, 2010, EPA strengthened the health-based NAAQS for NO_2 by setting a new 1-hour NAAQS at 100 ppb. The existing annual average NAAQS of 53 ppb was retained. In addition, 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 an MSA with a population $\geq$ 500,000 and < 2,500,000 people. Near-road NO_2 monitoring characterizes the maximum expected hourly NO_2 concentration due to mobile source emissions on major roadways.
- 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.
- One true NO_2 monitor is required at a PAMS site. The Lawrenceville NCORE site performs measurements of true NO_2 and NOy to fulfill PAMS and NCORE requirements, respectively.

Figure 8.3 Nitrogen Dioxide Monitoring Map

8.4 Sulfur Dioxide Design Criteria

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 CBSA and its population as specified in 40CFR58, Appendix D, Section 4.4. The resulting value is defined as the Population Weighted Emissions Index (PWEI). Using the ACHD 2017 emission inventory aggregate SO_2 emissions and 2019 census estimate for the CBSA, the PWEI is calculated at 94,101. 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 three SO_2 monitors and an upcoming fourth monitor to be installed at the Clairton site.
- 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.

Figure 8.4 Sulfur Dioxide Monitoring Map

* Clairton SO_2 monitor to be installed in 2024-2025

8.5 Lead (Pb) Design Criteria

40CFR58, Appendix D, Paragraph 4.5 states that local agencies are required to conduct ambient air Pb monitoring near Pb sources which are expected to or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS, considering the logistics and potential for population exposure. At a minimum, there must be one source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year based on either the most recent National Emission Inventory (http://www.epa.gov/ttn/chief/eiinformation.html) or other scientifically justifiable methods and data (such as improved emissions factors or site-specific data) taking into account logistics and the potential for population exposure.

No lead monitoring is performed in Allegheny County. Bridgeville and Lawrenceville sites were discontinued as there are no point sources which emit greater than 0.5 tons per year. EPA approval of the 2018 Annual Network Plan allowed the sampling to end after 2017.

8.6 PM_{10} Design Criteria

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 40CFR58.

- 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 meets this requirement with 4 sites that monitor PM_{10}.

Figure 8.6 PM_{10} Monitoring Map

8.7 Fine Particulate Matter ($PM_{2.5}$) Design Criteria

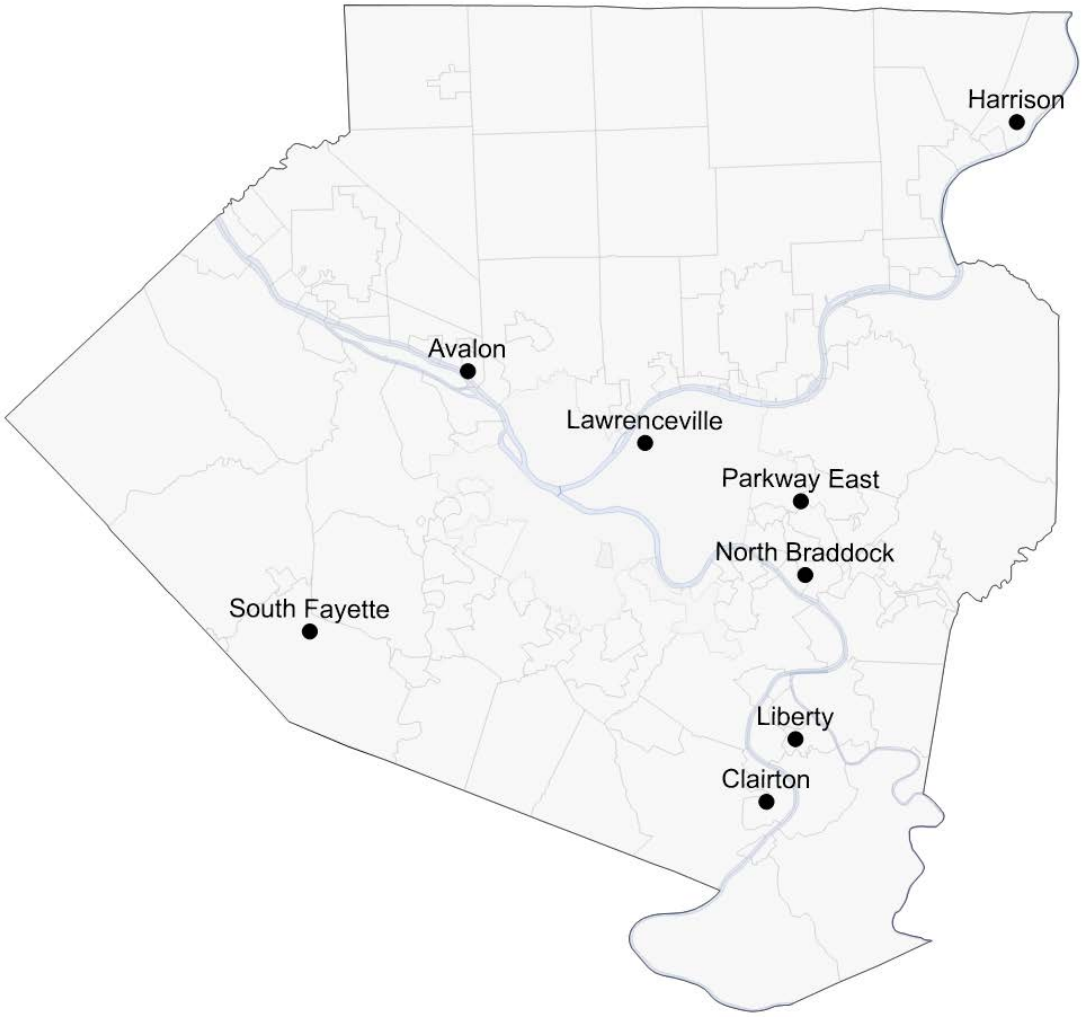
The number of required $PM_{2.5}$ monitors in each MSA is determined by the MSA population and design value, as specified in Table D-5 of 40CFR58, Appendix D.

- Pittsburgh MSA $PM_{2.5}$ 24 hour and annual design values are > 85% of the NAAQS, requiring a minimum of 3 $PM_{2.5}$ sites. ACHD exceeds this requirement with 8 sites that monitor $PM_{2.5}$.
- Regarding FRM $PM_{2.5}$ samplers (seven sites), a minimum of 15%, or at least one, of the $PM_{2.5}$ monitoring sites must be collocated (rounded to one). ACHD meets this requirement by having collocated monitors at the Liberty site.
- At least one site (15% is required) that features a primary $PM_{2.5}$ FEM monitor must also operate a collocated $PM_{2.5}$ FRM sampler (40CFR58, Appendix A). This requirement is met at the Parkway East site. Parkway East, Clairton, and Avalon have the same $PM_{2.5}$ FEM model.
- 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 6 continuous $PM_{2.5}$ monitors (Liberty, Lawrenceville, Avalon, Parkway East, Clairton, and North Braddock). See Section 10 for each site's detailed information.
- For MSA's above 1,000,000 people, at least one $PM_{2.5}$ monitor must be at a near road site. ACHD conducts continuous $PM_{2.5}$ monitoring 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 the Liberty and Lawrenceville sites.
- Each NCORE site must monitor $PM_{2.5}$. ACHD satisfies this requirement at the Lawrenceville NCORE site using filter-based monitoring as well as continuous $PM_{2.5}$ FEM monitoring.
- 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 of expected maximum concentration and one site must be sited in an area of poor air quality. At least one $PM_{2.5}$ site must monitor for regional background and at least one $PM_{2.5}$ site must monitor for regional transport. Table 8 shows the $PM_{2.5}$ network site scales and objectives.

Table 8 $PM_{2.5}$ 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, Regional Transport, Regional Background
Clairton	Neighborhood	Population Exposure, Welfare concerns
Avalon	Neighborhood	Population Exposure
Parkway East Near Road	Microscale	Population Exposure, Source Oriented

Figure 8.7 $PM_{2.5}$ Monitoring Map



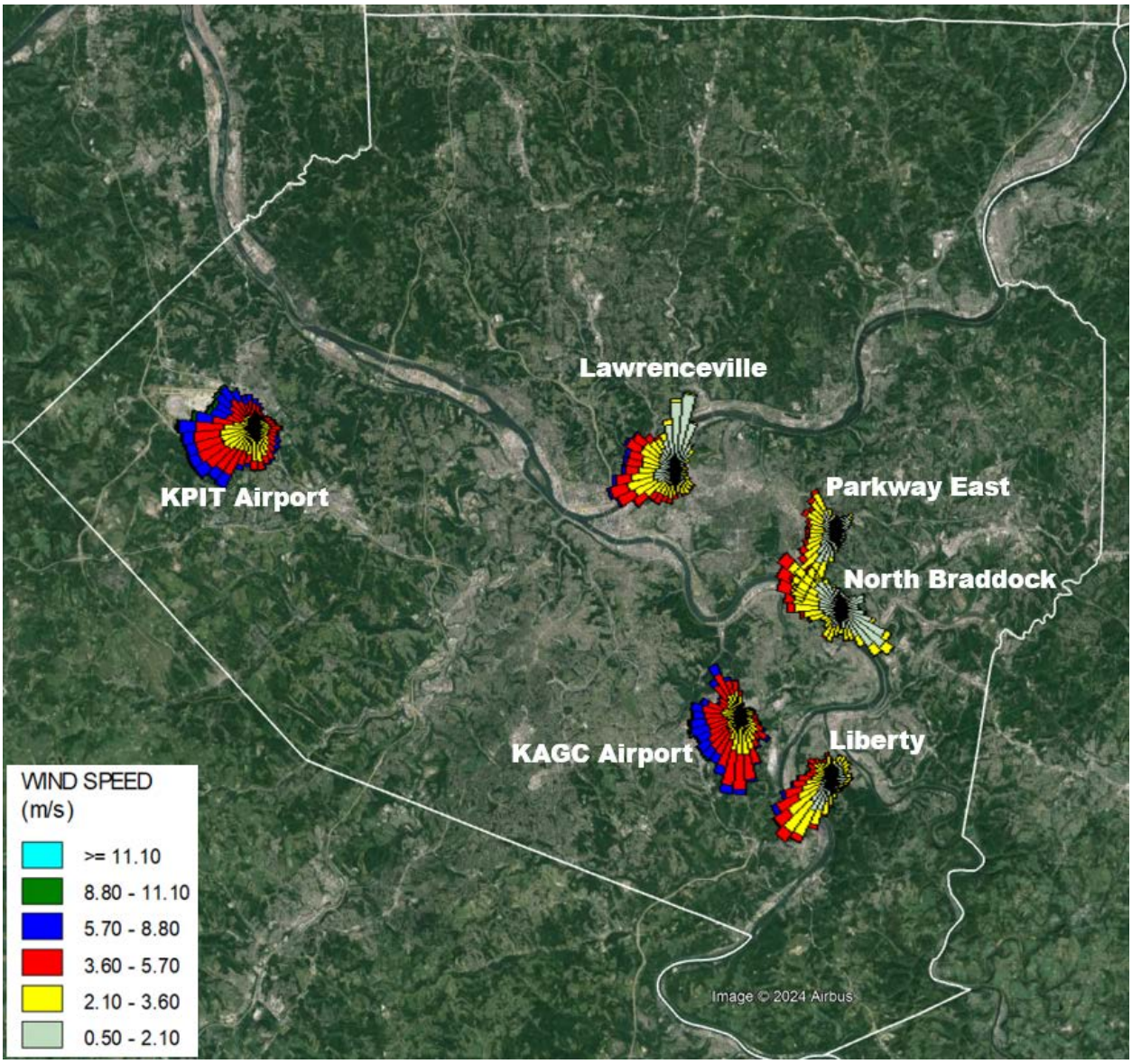
8.8 Coarse Particulate Matter Design Criteria

The only required monitors for $PM_{10-2.5}$ are those required at NCORE Stations. Note that no NAAQS exists for coarse particulate matter. Coarse PM monitoring at the Lawrenceville NCORE site employs a Teledyne T640X mass monitor that uses scattered light spectrometry. The unit has designation as an approved FEM for PM_c. Coarse PM monitoring also occurs at the North Braddock and Liberty sites. ACHD only reports the $PM_{2.5}$ and PM_{10} concentrations at those additional sites.

8.9 Meteorological Monitoring

The meteorological stations can show unique wind patterns at the different local sites and can be useful for modeling, source culpability, and other studies. Only two of the local sites, Lawrenceville and Parkway East, are required to have meteorological measurements as part of national networks. ACHD maintains additional meteorological measurements at the Liberty and North Braddock sites.

Figure 8.9 Allegheny County Meteorological Map (Surface Wind Roses 2019-2023)



9.0 Appendix E Requirements

40CFR58, Appendix E contains specific location criteria applicable to SLAMS, NCORE, and PAMS ambient air quality monitoring probes, inlets, and optical paths after the general location has been selected, based on the monitoring objectives and spatial scale of representation discussed in Appendix D. Adherence to these siting criteria is necessary to ensure the uniform collection of compatible and comparable air quality data.

Appendix E specifies probe and monitoring path siting criteria for ambient air quality monitoring. The key components of Appendix E include the following:

- Horizontal and Vertical Placement
- Spacing from Minor Sources
- Spacing from Obstructions
- Spacing from Trees
- Spacing from Roadways
- Cumulative Interferences on a Monitoring Path
- Maximum Monitoring Path Length
- Probe Material and Pollutant Sample Residence Time
- Waiver Provisions.

Discussion of Appendix E requirements will be contained in the next section.

10.0 Detailed Air Monitoring Site Descriptions

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 state, county and site in the AQS 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 and to provide further detail, FEM or FRM designation.

Sensor Network Designation – The name of the designated network:

- SLAMS – State or Local Ambient Air Monitoring Station that has EPA reference or equivalent method designation, including Primary, Secondary or Tertiary level of importance, where more than one sensor type is at the site. Waiver provisions.
- 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, T640, T640X) operate continuously.
- Daily – a discrete sample is taken every day; applies to manual method particulate or toxics samplers.
    - Every Third Day – Manual method samplers that run every third day.
    - Every Sixth Day – Manual method or toxics samplers that run every sixth day.
    - Every Twelfth Day – Manual method QA samplers that run every twelfth day.

Appendix A QA Assessment – A "**YES**" indicates the sensor is maintained in accordance with the Quality Assurance (QA) requirements specified in 40CFR58, Appendix A.

Monitor Start Date – Specifies the start date for the current AQS pollutant parameter code. Note that AQS method codes may change, usually due to a change of manufacturer or monitor model employed at the site.

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 and 40CFR50.
- 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.

Monitoring Method Description – Table 10 provides details about each type of sampler and analyzer utilized in the air monitoring network.

Probe Height – Distance from ground level that ambient air is sampled. 40CFR58, Appendix E lists acceptable probe heights for individual measurement parameters and spatial scales.

Residence Time – The amount of time that ambient air remains in contact with a probe line or manifold, considering total manifold and probe line inner volume and monitor flow rate. Residence time is applicable to reactive gas monitors that use probe lines or manifolds to deliver ambient air to the monitor. Section 7.2.1 of the QA Handbook Volume II recommends a probe residence time of ten seconds or less as optimal and over 20 seconds as unacceptable due to sample concentration loss at higher residence times.

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 area meets or exceeds the requirement of 40CFR58, 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.

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 40CFR58, Appendix E.

Table 10 Monitoring Parameters and Methods

Parameter	Mfg	Model #	Parameter Code	Method Code	Description
$PM_{2.5}$ FRM	R&P	2025	88101	145	Low Volume Sampler (filter) VSCC, very sharp cut cyclone
$PM_{2.5}$ FEM					
	Teledyne API	T640	88101	636	Broadband Spectroscopy
	Teledyne API	T640X	88101	638	Broadband Spectroscopy
PM_{10} FRM	Tisch	TE-6070	81102	141	High Volume Sampler (filter)
PM_{10} FEM	R&P	1400	81102	79	Gravimetric Instrumental (TEOM)
	Teledyne API	T640X	81102	639	Broadband Spectroscopy
$PM_{2.5}$ Speciation	Met One SASS	SASS	multiple	812	Trace metals, Sulfate, Nitrate
	URG	3000N	multiple	812	Organic/Inorganic Carbon
PM coarse	Teledyne API	T640X	86101	640	Broadband Spectroscopy
Carbon Monoxide	TAPI	300A/E	42101	93	Gas Filter Correlation
Carbon Monoxide (trace)	TAPI	300 EU	42101	593	Gas Filter Correlation
Nitrogen Dioxide (true)	Teledyne API	N500	42602	256	Cavity-Attenuated Phase-Shift (CAPs) spectroscopy
Reactive Oxides of Nitrogen (Noy)	TAPI	200EU/501	42600	699	Chemiluminescence
Sulfur Dioxide					
	TAPI	100E	42401	77	Ultra Violet Fluorescence
Sulfur Dioxide (trace)	Teledyne API	100EU / 100U	42401	600	Pulsed Fluorescence
Ozone	Thermo	49	44201	47	Ultraviolet Absorption
Black Carbon	TAPI	633	84313	894	Aethalometer Instrumental
Air Toxics (VOC)	ATEC	2200	multiple	150	6-liter SS canister / TO-15 lab analysis
AIR Toxics (Carbonyl)	ATEC	2200/8000	multiple	102	DNPH cartridge / TO-11 lab analysis
Air Toxics (PM10 Metals)	Tisch	TE-6070	Multiple		High Volume Sampler (filter)
Air Toxics (PAHs)	Tisch	TE-1000	Multiple		High Volume Sampler (PUF)
Air Toxics (hourly VOC)	CAS	Chromatotec AirmOzone	Multiple		Auto-Gas Chromatograph w/ Flame Ionization Detection
Mixing Height	Vaisala	CL-51	Multiple		High Range Ceilometer
Wind Speed/Direction	Met One	50.5	61101/61102	068	Sonic Anemometer
Wind Speed/Direction	Vaisala	WXT – 536	61101/61102	060	Sonic Anemometer
Rainfall	Met One	375	65102	013	Tipping bucket
Relative Humidity	Met One	083E	62201	061	Electronic RH Sensor
Solar / UV Radiation	Met One	094-1/6676	63301/63302	011	Electronic Sensors
Ambient Temperature	Met One	083E	62101	061	Electronic Temperature Sensor

10.1 Lawrenceville

Address	Allegheny County Health Department 301 39th Street, Building 7 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 an urban 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 proposed 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	47
Network Designation	SLAMS	Probe Height Residence Time	12 Meters 4.9 Seconds
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	640
Network Designation	Other / (NCORE)	Probe Height	12 Meters
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

Sensor Type	**$PM_{2.5}$** FRM	Appendix C Method Code	145
Network Designation	SLAMS Primary	Probe Height	12 Meters
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Every 3 Days	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	**$PM_{2.5}$** FEM	Appendix C Method Code	638
Network Designation	SLAMS Secondary	Probe Height	12 Meters
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	08/07/2015	Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10}** FEM	Appendix C Method Code	639
Network Designation	SLAMS Primary	Probe Height	12 Meters
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	01/01/2022	Appendix E Siting Criteria	Yes

Sensor Type	**$PM_{2.5}$ Speciation**	Appendix C Method Code	812
Network Designation	Other (CSN)	Probe Height (m)	12 Meters
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

Sensor Type	**Carbon Monoxide**	Appendix C Method Code	593
Network Designation	SLAMS	Probe Height Residence Time	12 Meters 8.9 Seconds
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 Residence Time	12 Meters 13.5 Seconds
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 Reactive Oxides of Nitrogen (NO_y)**	Appendix C Method Code	699
Network Designation	Other (NCORE)	Probe Height Residence Time	12 Meters 13.1 Seconds
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	**Nitrogen Dioxide (True NO_2)**	Appendix C Method Code	256
Network Designation	Other (Photochemical Assessment Monitoring Station)	Probe Height Residence Time	12 Meters 13.1 Seconds
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		Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10} Metals (See Section A2.1)**	Appendix C Method Code	N/A
Network Designation	Other (National Air Toxics Trends Station)	Probe Height Residence Time	12 Meters
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Every Six days	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	8/19/2020	Appendix E Siting Criteria	Yes

Sensor Type	**Volatile Organic Compounds (See Section A2.1)**	Appendix C Method Code	N/A
Network Designation	Other (National Air Toxics Trends Station)	Probe Height Residence Time	12 Meters
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Every Six days	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	8/19/2020	Appendix E Siting Criteria	Yes

Sensor Type	**Carbonyls**	Appendix C Method Code	N/A
Network Designation	Other (NATTS: year-round) Other (PAMS 6/1 – 8/31)	Probe Height Residence Time	12 Meters
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Every Six days (NATTS) Every Three days (PAMS)	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	8/19/2020	Appendix E Siting Criteria	Yes

Sensor Type	**Polycyclic Aromatic Hydrocarbons**	Appendix C Method Code	N/A
Network Designation	Other (National Air Toxics Trends Station)	Probe Height Residence Time	12 Meters
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Every Six days	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	8/19/2020	Appendix E Siting Criteria	Yes

Sensor Type	**Volatile Organic Compounds**	Appendix C Method Code	N/A
Network Designation	Other (Photochemical Assessment Monitoring Station)	Probe Height Residence Time	12 Meters
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Hourly during PAMS season (June 1 – August 31)	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	6/1/2021	Appendix E Siting Criteria	Yes

Sensor Type	**Aerosol Chemical Speciation Monitor (ACSM)**	Appendix C Method Code	N/A
Network Designation	ASCENT	Probe Height Residence Time	12 Meters
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Hourly	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	7/1/2023	Appendix E Siting Criteria	Yes

Sensor Type	**Xact $PM_{2.5}$ Metals**	Appendix C Method Code	N/A
Network Designation	ASCENT	Probe Height Residence Time	12 Meters
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Hourly	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	7/1/2023	Appendix E Siting Criteria	Yes

Sensor Type	**Scanning Mobility Particle Sizer (SMPS)**	Appendix C Method Code	N/A
Network Designation	ASCENT	Probe Height Residence Time	12 Meters
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Hourly	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	7/1/2023	Appendix E Siting Criteria	Yes

Sensor Type	**Aethalometer**	Appendix C Method Code	N/A
Network Designation	ASCENT	Probe Height Residence Time	12 Meters
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Hourly	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	7/1/2023	Appendix E Siting Criteria	Yes

Lawrenceville Meteorological Sensors

- Wind Speed / Wind Direction (scalar & resultant)
- Solar Radiation
- Total UV Radiation
- Relative humidity
- Barometric Pressure
- Rain/Snow amounts
- Ambient Temperature
- Mixing Height (ceilometer)

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)	7,371 (PennDot 2014)

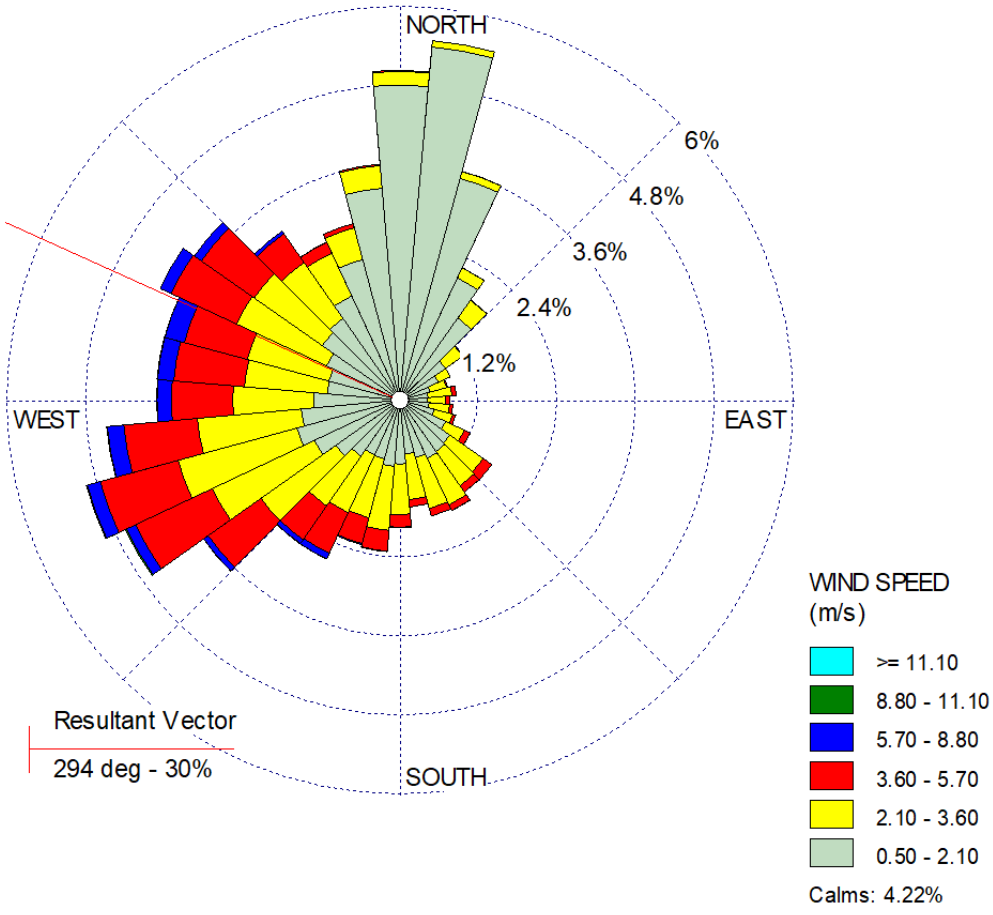
Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Residential
West	Residential

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 10.1.1 Lawrenceville Location Map

Figure 10.1.2 Lawrenceville Wind Rose (2019-2023)



10.2 Liberty

Address	South Allegheny High School 2743 Washington Blvd McKeesport, PA 15133		
AQS#	42-003-0064	MSA	Pittsburgh
Latitude (N) Particulate and BTEX	**40.323761**	**Longitude (W)** Particulate and BTEX	**-79.868151**
Latitude (N) SO2, H2S	**40.324759**	**Longitude (W)** SO2, H2S	**-79.867030**
Comments	This site is in a suburban area about 3 km north-northeast (and primarily downwind) of the US Steel Clairton Coke Works. 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: Glassport PM_{10} monitor and North Braddock SO_2 monitor and sonic anemometer. This real-time data allows the opportunity for 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	**$PM_{2.5}$** FRM	Appendix C Method Code	145
Network Designation	SLAMS Primary	Probe Height	8 Meters
Purpose	Regulatory Compliance	Appendix D Design Criteria	Yes
Sample Frequency	Daily	Appendix D Scale	Neighborhood, Highest Concentration
Appendix A QA Assessment	Yes	Appendix D Objectives	Population Exposure
Monitor Start Date	1/23/1999	Appendix E Siting Criteria	Yes

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

Sensor Type	**$PM_{2.5}$** FEM	Appendix C Method Code	238
Network Designation	SLAMS Tertiary	Probe Height	8 meters
Purpose	QA/Co-located Monitor AQI Reporting	Appendix D Design Criteria	Yes
Sample Frequency	Hourly	Appendix D Scale	Neighborhood, Highest Concentration
Appendix A QA Assessment	Yes	Appendix D Objectives	Neighborhood, Highest Concentration
Monitor Start Date	11/01/2017	Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10}** FEM	Appendix C Method Code	239
Network Designation	SLAMS Primary	Probe Height	8 Meters
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	**$PM_{2.5}$ Speciation**	Appendix C Method Code	Multiple
Network Designation	Other (CSN)	Probe Height	8 Meters
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
Monitor Start Date	10/6/2003	Appendix E Siting Criteria	Yes

Sensor Type	**Sulfur Dioxide**	Appendix C Method Code	600
Network Designation	SLAMS	Probe Height Residence Time	8 Meters 11.5 Seconds
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	**Hydrogen Sulfide**	Appendix C Method Code	N/A
Network Designation	Special Purpose monitor	Probe Height Residence Time	8 Meters 11.5 Seconds
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Hourly	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	1/1/1981	Appendix E Siting Criteria	Yes

Sensor Type	**BTEX / Sorbent Tube** See Section A3.1	Appendix C Method Code	N/A
Network Designation	Special Purpose Monitor	Probe Height Residence Time	8 Meters 3.1 Seconds
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Every Three Days	Appendix D Scale	Undetermined
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	2/1/2014	Appendix E Siting Criteria	Yes

Liberty Meteorological Sensors

- Wind Speed / Wind Direction
- Ambient Temperature
- Barometric Pressure

Liberty Area Information

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

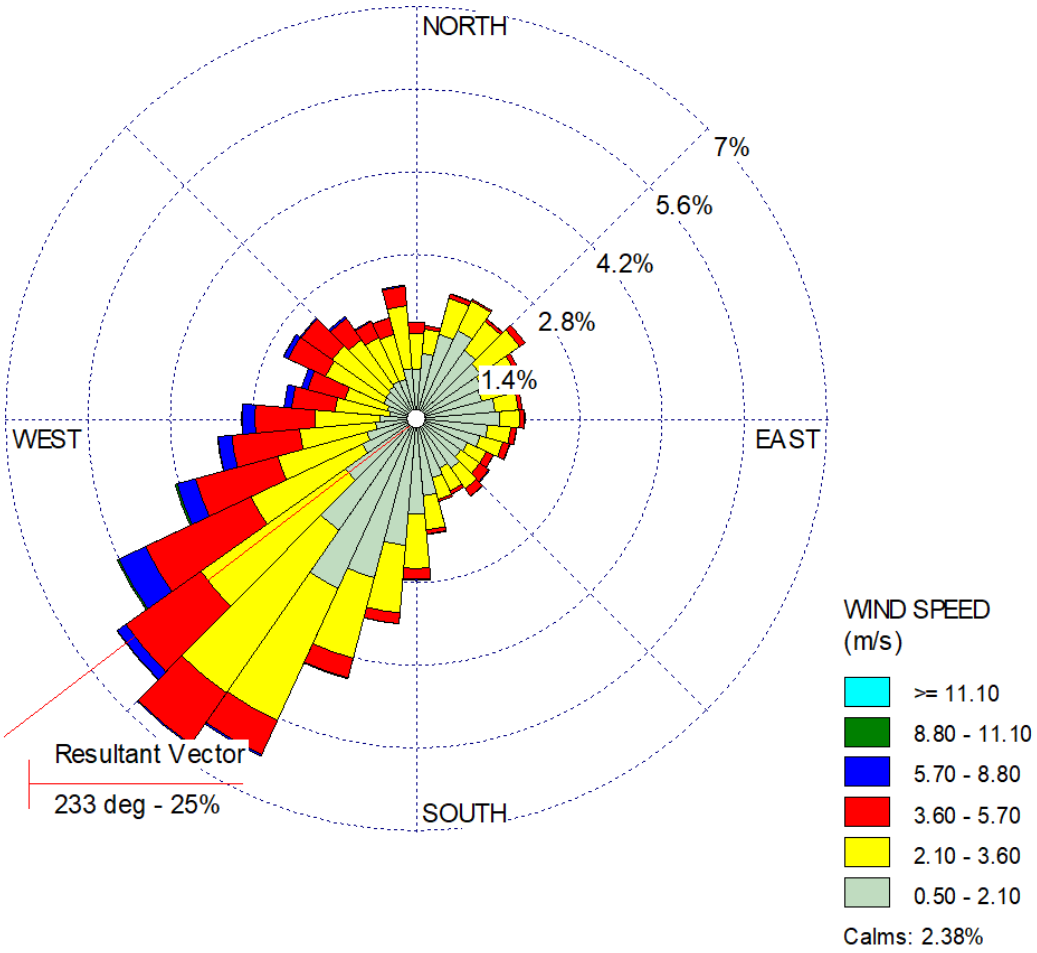
Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Residential
West	Residential

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

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

Figure 10.2.1 Liberty Location Map

Figure 10.2.2 Liberty Wind Rose (2019-2023)



10.3 Glassport

Address	Water Tower on High Street Glassport, PA 15045		
AQS#	42-003-3006	MSA	Pittsburgh
Latitude (N)	40.326008	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 µg/m^3 (October 1997).		

Sensor Type	**PM_{10}** FEM	Appendix C Method Code	79
Network Designation	SLAMS	Probe Height	2 Meters
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

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

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	Valley	Flat

Figure 10.3.1 Glassport Location Map

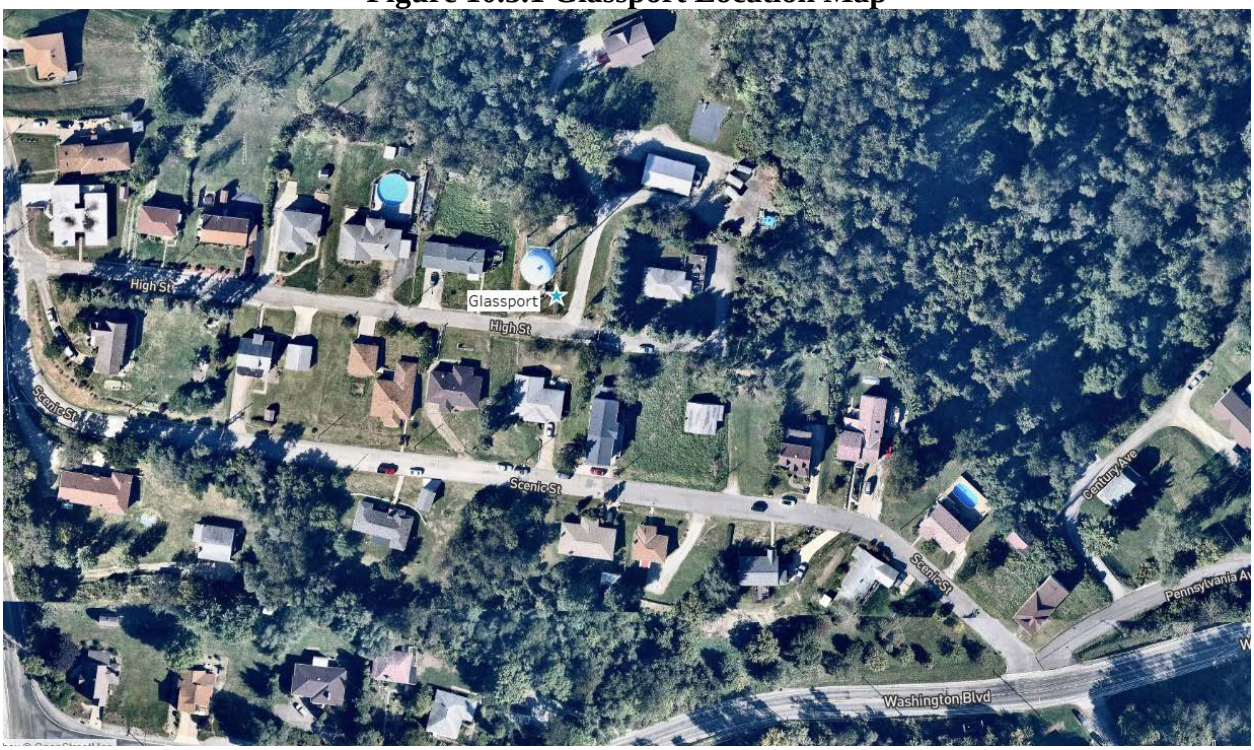
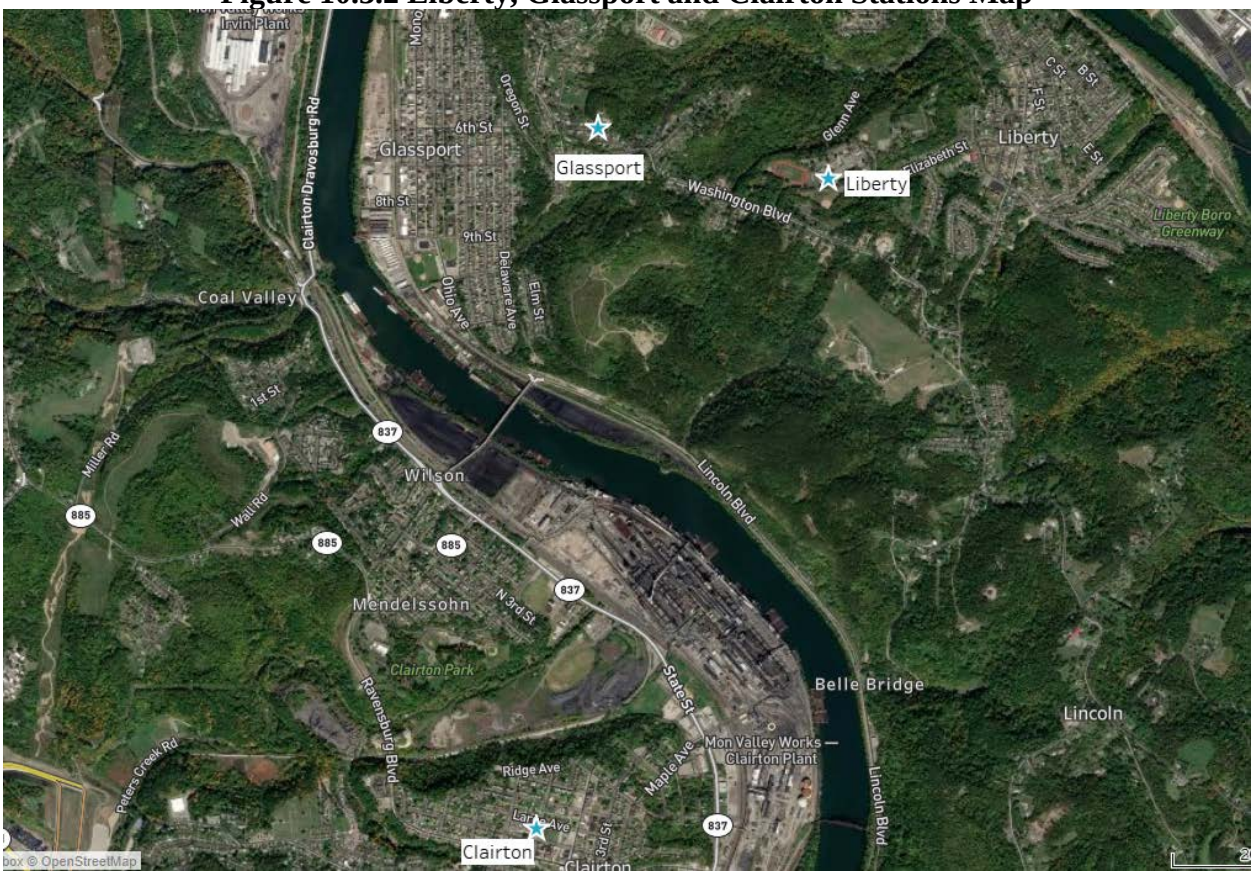


Figure 10.3.2 Liberty, Glassport and Clairton Stations Map



10.4 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 basic steel production facility located about 1.5 km south-southwest from the monitoring site. North Braddock is a core $PM_{2.5}$ site that is used to determine compliance with national standards.		

Sensor Type	**$PM_{2.5}$** FRM	Appendix C Method Code	145
Network Designation	SLAMS Primary	Probe Height	7 Meters
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	**$PM_{2.5}$** FEM	Appendix C Method Code	638
Network Designation	SLAMS Secondary	Probe Height	7 Meters
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	1/1/2022	Appendix E Siting Criteria	Yes

Sensor Type	**PM_{10}** FEM	Appendix C Method Code	639
Network Designation	SLAMS	Probe Height	7 Meters
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	600
Network Designation	SLAMS	Probe Height Residence Time	7 Meters 14.4 Seconds
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, Highest Concentration
Monitor Start Date	1/1/2014	Appendix E Siting Criteria	Yes

Sensor Type	**Carbon Monoxide**	Appendix C Method Code	93
Network Designation	SLAMS	Probe Height Residence Time	7 Meters 14.4 Seconds
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		Appendix E Siting Criteria	Yes

Sensor Type	**Hydrogen Sulfide**	Appendix C Method Code	N/A
Network Designation	Special Purpose monitor	Probe Height Residence Time	7 Meters 11.5 Seconds
Purpose	Research/Scientific Monitoring	Appendix D Design Criteria	N/A
Sample Frequency	Hourly	Appendix D Scale	N/A
Appendix A QA Assessment	N/A	Appendix D Objectives	N/A
Monitor Start Date	12/9/2020	Appendix E Siting Criteria	Yes

North Braddock Meteorological Sensors

- Wind Speed / Wind Direction
- Ambient Temperature
- Barometric Pressure

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 10.4.1 North Braddock Location Map

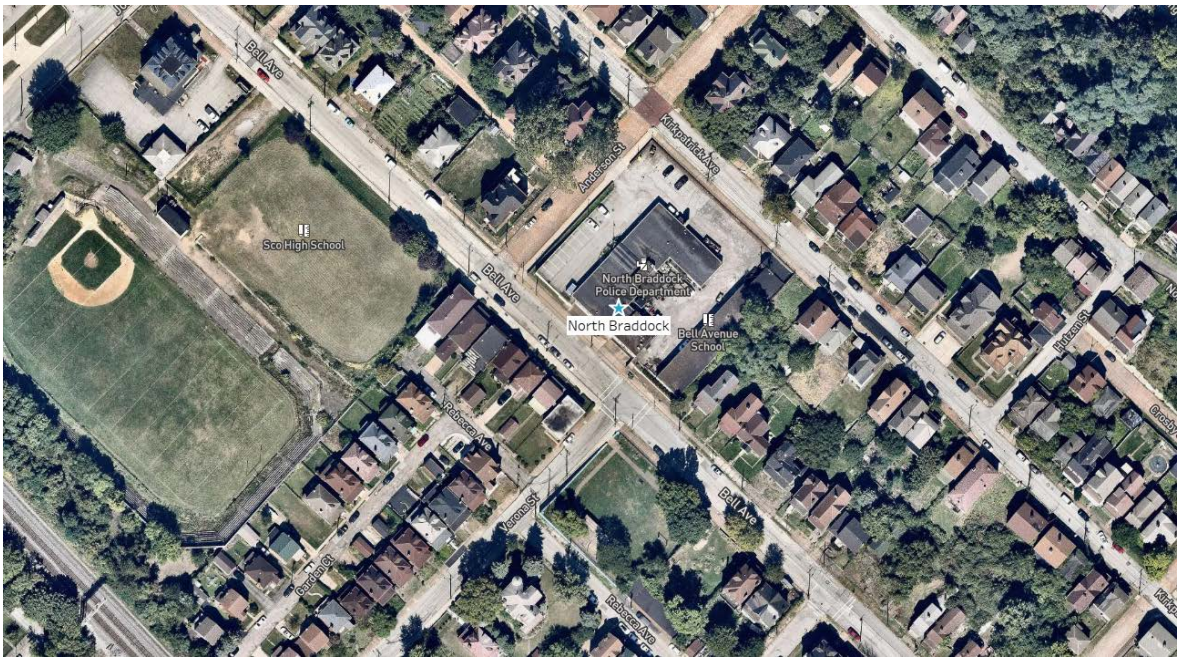
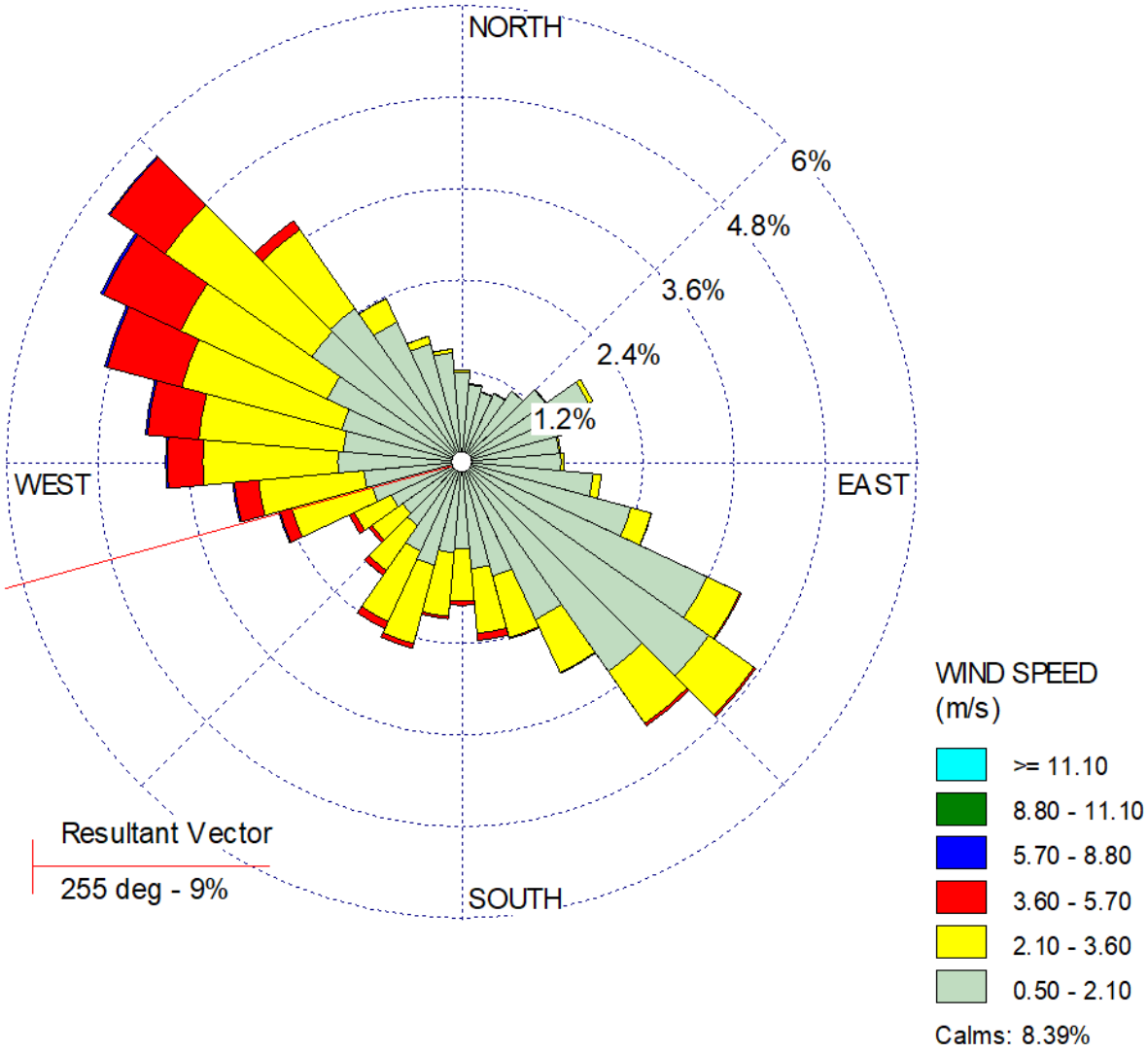


Figure 10.4.2 North Braddock Wind Rose (2019-2023)



10.5 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. This is a core $PM_{2.5}$ site used to determine compliance with national standards. This ozone monitoring site is positioned downwind of the Pittsburgh Central Business District and is expected to demonstrate maximum ozone concentrations. The nitrogen oxides monitor adds significant value to the ozone data and was upgraded to read True NO_2 concentrations in 2022.		

Sensor Type	**$PM_{2.5}$** FRM	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height	8 Meters
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 Residence Time	10 Meters 4.9 Seconds
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, Highest Concentration
Monitor Start Date	2/12/2014	Appendix E Siting Criteria	yes

Sensor Type	**Oxides of Nitrogen + True NO_2**	Appendix C Method Code	256
Network Designation	SLAMS	Probe Height Residence Time	10 Meters 14.7 Seconds
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	Yes

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 10.5 Harrison Location Map

10.6 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 O_3 and $PM_{2.5}$. Located in the western portion of the county, this site monitors 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	**$PM_{2.5}$** FRM	Appendix C Method Code	145
Network Designation	SLAMS	Probe Height	8 Meters
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	**Ozone**	Appendix C Method Code	47
Network Designation	SLAMS	Probe Height Residence Time	8 Meters 5.3 Seconds
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

South Fayette Area Information

Street Name / Distance	Traffic Count (AADT)
Old Oakdale Rd. (142m)	Unavailable
Cannon Gate 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 10.6 South Fayette Location Map

10.7 Clairton

Address	Clairton Education Center 501 Waddell Avenue 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 within the Monongahela Valley and generally upwind of the USS 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	**$PM_{2.5}$** FEM	Appendix C Method Code	636
Network Designation	SLAMS Secondary	Probe Height	8 Meters
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, Welfare Concerns
Monitor Start Date	4/2/2022 (replaced PM2.5 FRM sampler that started 1/1/2001)	Appendix E Siting Criteria	Yes

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 10.7 Clairton Location Map

10.8 Avalon

Address	721 California Avenue Avalon, PA 15202		
AQS#	42-003-0002	MSA	Pittsburgh
Latitude (N)	40.500840	Longitude (W)	-80.066488
Comments	This is a population-oriented, suburban site previously impacted by the PM and SO_2 coke battery emissions. Many odor and air pollution complaints were from communities near this monitoring site. However, the coke work battery permanently ceased operations in 2016. As a result, the 2016 1-hour SO_2 DV is half the 2010 DV and SO_2 monitoring was removed. Avalon is a core $PM_{2.5}$ site that is used to determine compliance with national standards.		

Sensor Type	**$PM_{2.5}$** FEM	Appendix C Method Code	636
Network Designation	SLAMS (Primary)	Probe Height	10 Meters
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	7/12/2023 (replaced a site with an FEM that began 1/1/2017)	Appendix E Siting Criteria	Yes

Avalon Area Information

Street Name / Distance	Traffic Count (AADT)
California Ave (25m)	Unavailable
N School St (56m)	Unavailable
Center Ave (157m)	Unavailable
N Chestnut St (107m)	Unavailable

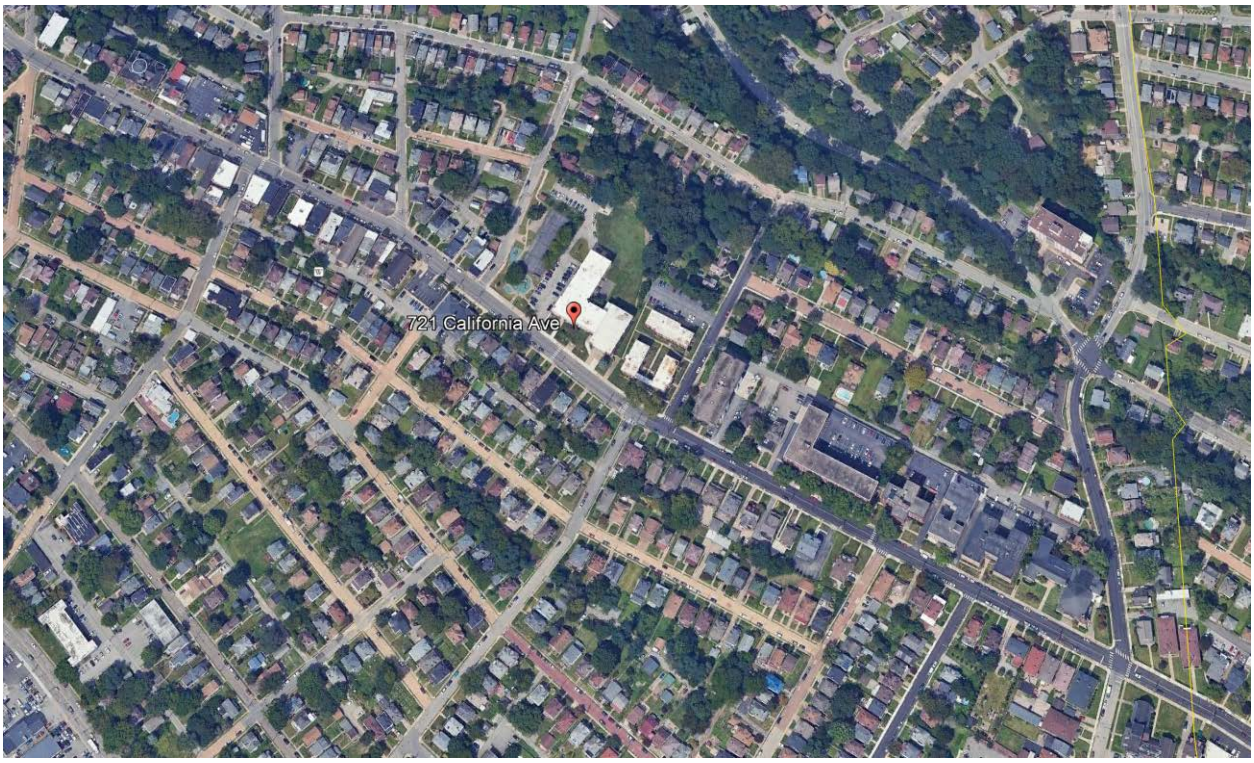
Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	Residential
East	Residential
South	Residential
West	Residential

Direction	Obstructions	Height (m)	Distance (m)
North	Trees	15	75
East	Building	15	64
South			

West			

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

Figure 10.8 Avalon Location Map



10.9 Parkway East

Address	Hosanna House Event Center 400 Sherwood Road Pittsburgh, PA 15221		
AQS#	42-003-1376	MSA	Pittsburgh
Latitude (N)	40.437430	Longitude (W)	-79.863572
Comments	This site was installed to comply with NO_2 design criteria. Monitor inlets sample air at 18 meters from the nearest traffic lane of Route 376 (Parkway East). This location was approved by EPA as a near road monitoring site that measures population exposure to roadway emissions. Concentration data for CO and NO_2 are near network maximums.		

Sensor Type	**$PM_{2.5}$** FEM	Appendix C Method Code	636
Network Designation	SLAMS	Probe Height	4 meters
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

Sensor Type	**$PM_{2.5}$** FRM	Appendix C Method Code	145
Network Designation	SLAMS Secondary	Probe Height	4 Meters
Purpose	QA/Co-located Monitor	Appendix D Design Criteria	Yes
Sample Frequency	Every Twelve Days	Appendix D Scale	Neighborhood, Highest Concentration
Appendix A QA Assessment	Yes	Appendix D Objectives	Quality Assurance
Monitor Start Date	1/10/2021	Appendix E Siting Criteria	Yes

Sensor Type	**Oxides of Nitrogen + True NO_2**	Appendix C Method Code	256
Network Designation	SLAMS	Probe Height Residence Time	3 Meters 5.3 Seconds
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	12/9/2022 (replaces NO_X monitor that began 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 Residence Time	3 Meters 3.4 Seconds
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** 7-channel Aethalometer	Appendix C Method Code	894
Network Designation	Other	Probe Height (m)	4 Meters
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 Meteorological Sensors

- Wind Speed / Wind Direction
- Relative Humidity
- Ambient Temperature

Parkway East Area Information

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

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

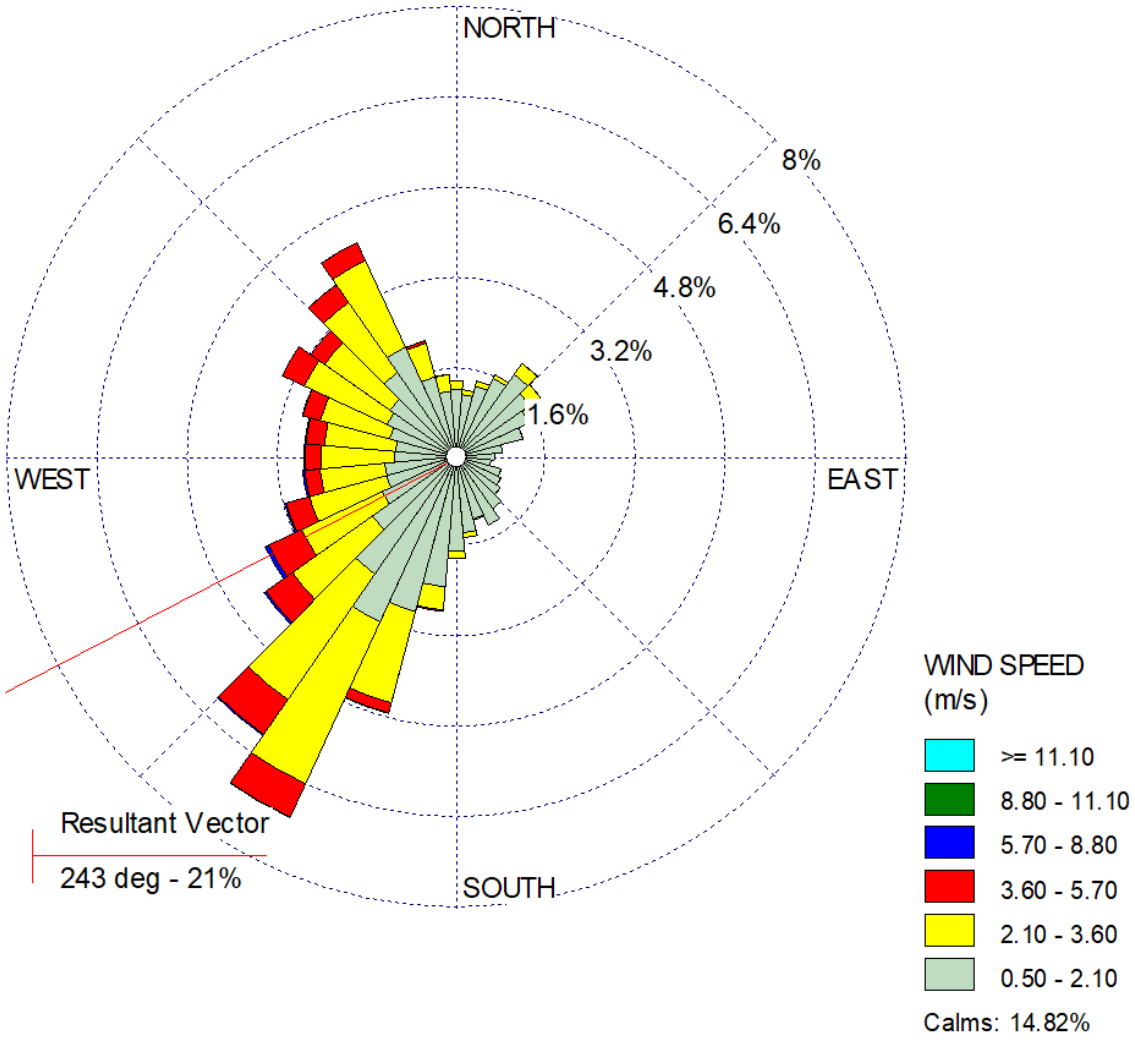
Direction	Obstructions	Height (m)	Distance (m)
North			

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 10.9.1 Parkway East Location Map

Figure 10.9.2 Parkway East Wind Rose (2019-2023)



11.0 GLOSSARY OF TERMS AND ABBREVIATIONS

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.
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.
CO	Carbon Monoxide. Measured using a continuous automated analyzer.
Criteria Pollutants	Air pollutants considered harmful to public health and the environment (carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, lead, particulate matter: PM_{10}, $PM_{2.5}$)
FEM	Federal Equivalent Method. Secondary methods approved by the USEPA for measurement of criteria pollutants and determination of compliance with NAAQS.
FRM	Federal Reference Method. Primary measurement methods designated by the USEPA for measurement of criteria pollutants and determination of compliance with NAAQS.
Lead (Pb)	Lead Monitoring. Laboratory analysis of Total Suspended Particle filters. This analysis is performed according to the federal reference method for lead monitoring.
NAAQS	National Ambient Air Quality Standards. These standards apply only to the six criteria pollutants
NATTS	National Air Toxics Trends Station. Air monitoring program to assess nationwide air toxics trends. The ACHD Lawrenceville station became a NATTS site in 2020.
NCore	National Core Monitoring Network, consisting of multi-pollutant ambient air monitoring sites, and specializing in $PM_{2.5}$ and associated precursor gases.
Near Road	Monitoring site designed to measure peak exposure to roadway emissions. Required monitoring parameters are NO_2, CO, and $PM_{2.5}$. Installation of near road monitoring sites were required by revisions to the NO_2 NAAQS during 2010.
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.
PAMS	Photochemical Assessment Monitoring Stations
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. 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.
SLAMS	State or Local Air Monitoring Stations Network. The SLAMS make up the ambient air quality monitoring sites that are operated by State or local agencies for the primary purpose of comparison to the National Ambient Air Quality Standards (NAAQS), but may serve other purposes. The SLAMS network includes stations classified as NCore, PAMS, and Speciation, and formerly categorized as NAMS, and does not include Special Purpose Monitors (SPM) and other monitors used for non-regulatory or industrial monitoring purposes.
SO_2	Sulfur Dioxide. Measured using a continuous automated analyzer.
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.
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.
SPM	Special Purpose Monitor. An SPM is defined as any network monitor that the agency has designated as a special purpose monitor in its annual monitoring network plan and in AQS. SPMs do not count when showing compliance with the minimum requirements for the number and siting of monitors of various types.
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.
TO11	An EPA compendium method for air toxics sampling. Operated every 6 days for 24 hours, the sample is collected into a 2,4-DNPH (dinitrophenylhydrazine) cartridge and is analyzed by Eastern Research Group Laboratory. This procedure has been written specifically for the sampling and analysis of formaldehyde, the most important carbonyl that participates in ozone formation. However, the analysis also yields acetone, propionaldehyde acetaldehyde, benzaldehyde, methyl ethyl ketone and methyl isobutyl ketone results
TO15	An EPA compendium method for air toxics sampling. Operated every 6 days for 24 hours, the sample is collected into a special prepared stainless-steel canister and is then sent to the laboratory for analysis. The analysis tests for 62 volatile organic compounds.
VSCC	Very Sharp Cut Cyclone. A particulate sizing device 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 low flow (16.7 lpm), continuous particulate monitors.

12.0 Public Comment Period

This network review is available for public comment beginning on May 16, 2024. Comments can be made by e-mail and conventional mail until the close of business on June 14, 2024. All comments received as well as ACHD responses were included in the final version submitted to EPA Region III.

Submit comments by e-mail → **David.Good@AlleghenyCounty.US**

Submit comments by conventional mail → **David D. Good**
836 Fulton Street
Pittsburgh, PA 15233

12.1 Allegheny County Health Department Notification

The Allegheny County Health Department notified the public on May 16, 2024, to inform the public of the annual network plan comment period. The notice provides a web link to the draft annual network plan and explains how to submit written comments during the comment period.

13.0 Public Comment and Response

13.1 Clean Air Council, CREATE Lab, Allegheny County Clean Air Now (ACCAN), Breathe Project, and Citizens for Pennsylvania's Future (PennFuture) joint comments

1. **The Department must provide an opportunity for public comment on the new location it chooses for the Lawrenceville monitor.**

   Response: When a new location to move the Lawrenceville monitoring station is determined the Department will follow the normal protocol of public involvement in this activity. 40 CFR Part 58 Appendix E establishes siting requirements and there are unique infrastructure needs to consider (roof space, electrical draw, indoor space, etc.).

2. **The new location for the Lawrenceville monitor should still collect data on emissions of upwind, dense city-center traffic, or else there will be a void in the Network's data that is not filled by monitoring only highway emissions. According to the 2024 AMNP, the Lawrenceville monitor is in "an urban area downwind of [the] Central Business District," with the primary emissions it captures being from mobile sources. The wind rose for the Lawrenceville monitor below shows that the location, which is northeast of downtown Pittsburgh, is well suited for collecting data on cumulative downtown traffic emissions. With the Lawrenceville monitor being relocated, it will leave the area directly downwind of downtown Pittsburgh, completely unmonitored.**

   Response: The comment confuses the purpose and siting of the Lawrenceville NCore monitoring station, as the site description notes local mobile sources as the most significant source of pollution affecting the area – which is typical of an urban center. The NCore site is not a source-oriented monitoring station meant to specifically measure and characterize traffic pollution, as it is located 4km from downtown Pittsburgh and would not meet siting requirements as a near-road monitoring station. As stated in last year's report, the Department may add a new urban monitoring site that will capture downtown Pittsburgh air quality if the current Lawrenceville monitoring station is moved to a significantly different location (distance, orientation, etc.).

3. **The Department should undertake an air toxics study in the Neville Island region to address persistent citizen odor and health complaints and to better inform the possible placement of long-term VOC monitors in the airshed.**

   Response: The nature of this comment (a special study air toxics campaign) is beyond the scope of this document. As previously stated, the Department is willing to evaluate and assess long-term ambient air quality data (along with the methodology used to obtain those data) to determine if additional air surveillance is warranted. Note that data collected downwind of Neville Island after the closure of the Shenango Coke Works did not demonstrate elevated levels of BTEX VOCs.

4. **ACHD should consider installing additional PM2.5 monitoring to develop a more comprehensive picture of ambient PM2.5 levels throughout Allegheny County in response to the lowering of the annual PM2.5 National Ambient Air Quality Standard ("NAAQS") from 12 µg/m³ to 9 µg/m³.**

   Response: As part of the 5-year Monitoring Network Assessment, the Department will utilize the tools provided by the EPA to determine if changes to the PM2.5 network are warranted in the 2025 Monitoring Network Assessment report. Use of the tools provided by the EPA allows for monitoring parity with other air quality regulatory jurisdictions.

5. **The Department should install an airborne metals monitor, predominantly for lead, in the Braddock area.**

   Response: Please refer to the lead surveillance that has already been performed in both Braddock and Swissvale within the past 4 years.

6. **As a necessary step in protecting public health from dangerous carcinogens, the Department should improve benzene monitoring and add monitoring for benzene soluble organics and polycyclic aromatic hydrocarbons around the U.S. Steel Clairton and Irvin facilities. Recent benzene monitoring data and air dispersion modeling indicates that benzene levels around Clairton Coke Works pose a significant public health risk and that the facility's benzene emissions are the source of the elevated ambient benzene concentrations. The 2024 AMNP should include BSO monitoring and increased benzene monitoring which would make it possible to (1) better protect the public from significant health harms and to (2) make possible necessary public health studies to determine the actual health burden these emissions inflict on local communities.**

   Response: The Department has conducted numerous benzene (and other VOCs) studies measuring such. The Department continues long-term VOC sampling at the Liberty monitoring site, which was found to be at the highest concentration levels of any other monitoring site measured in Allegheny County. Additionally, the pre-publication copy (expected to be finalized soon) of the National Emission Standards for Hazardous Air Pollutants for Coke Ovens: Pushing, Quenching, and Battery Stacks, and Coke Oven Batteries; Residual Risk and Technology Review, and Periodic Technology Review is expected to require fenceline monitoring for benzene, as a surrogate for coke oven emissions, along with a corrective action plan for rolling 12-month average concentrations exceeding the action level of 7 $\mu g/m^3$.

13.2 Citizen Comments (Jonathan Nadle – Beechview)

1. **I just read about and am supportive of ACHD's monitoring plan. In particular, adding meteorology installations at the Avalon and Clairton stations, and moving SO2 monitoring from South Fayette to Clairton, nearer to USS, the main source of SO2 problems in our region.**

   Response: The Department appreciates the supportive comment.

Appendix A: Special Study Projects

A1: Introduction

ACHD frequently conducts investigations and studies using techniques that produce quantifiable results by methods that may not be classified by the USEPA as approved reference or equivalent methods. Often these investigations originate as responses to citizen concerns or complaints. This section briefly describes special studies that are currently ongoing or have been discontinued within the past year. Data from these studies is not submitted to the AQS database, however much of it is available for review on the ACHD webpage or through a right to know request (Open Records page).

A2: Air Toxics Sampling

A2.1 Lawrenceville National Air Toxics Trends Station (NATTS)

The National Air Toxics Trends Station (NATTS) program was developed by the EPA to fulfill the need for long-term hazardous air pollutants (HAP) monitoring data of consistent quality. The Lawrenceville NCORE site was selected by the EPA for inclusion into the NATTS program and began operations in August of 2020. The NATTS monitoring is year-round on a 1 in 6-day sampling frequency. NATTS sampling includes:

- **Volatile Organic Compounds** using SUMMA canister sampling via EPA Compendium Method TO-15.
- **Carbonyls** using DNPH cartridge sampling via EPA Compendium Method TO-11A.
- **Polycyclic Aromatic Hydrocarbons** using glass cartridge PUF sampling via EPA Compendium Method TO-13A.
- **PM_{10} Metals** using a HI-VOL PM_{10} sampler and quartz fiber filters via EPA Compendium Method IO-3.5.

A2.2 Charcoal Tube Sampling

Charcoal tube sampling is used by ACHD to measure ambient concentrations of targeted VOCs. 24-hour average samples are collected at Liberty every three days. Sampling is performed using sampling pumps calibrated to 1 liter per minute. Each tube is exposed for 24 hours, from midnight to midnight. The exposed sorbent tubes are sent to the Allegheny County Medical Examiner's Laboratory for analysis by a GC/FID method for benzene, ethyl benzene, toluene, and xylenes (BTEX). Data is available upon request.

A2.3 Hydrogen Sulfide

Hydrogen Sulfide is an odorous compound that has a very low odor threshold concentration. Expectedly, numerous ongoing community odor complaints are common near industries that release hydrogen sulfide. Traditionally, ACHD has measured H_2S at monitoring sites impacted by the metallurgical coking industry. Hydrogen sulfide is routinely and continuously measured at the Liberty and North Braddock air monitoring sites. Recent hourly hydrogen sulfide data is available on the Air Quality Program's portion of the ACHD website and historic data is available to the public upon request. The Department references ambient H_2S standards as listed in the Pennsylvania Code, Title 25, Chapter 131.3 (24-hour average not to exceed 0.005 ppm, 1-hour average not to exceed 0.1 ppm). Additional hydrogen sulfide surveillance is performed using portable hydrogen sulfide analyzers in and around the Mon Valley.

A3: Settled Particulate

Total settled particulate, also commonly referred to as dust fall, is collected and quantified in various locations in Allegheny County using ASTM method D 1793, which yields monthly average concentrations. This simple method is employed in response to complaints of heavy dust deposits in communities. Currently two collectors are maintained at Braddock and Lawrenceville. The Department references settled particulate standards as listed in the Pennsylvania Code, Title 25, Chapter 131.3 (12-month average not to exceed 0.8 mg/cm^2/month, 30-day average not to exceed 1.5 mg/cm^2/month). Data is available upon request.

Appendix B: Full Citizen Comments

June 14, 2024

VIA ELECTRONIC MAIL:
david.good@alleghenycounty.us

Allegheny County Health Department
Air Program
836 Fulton Street
Pittsburgh, PA 15233-2124

Re: Comments on Draft Air Monitoring Network Plan for Year 2025

To Whom it May Concern:

Clean Air Council ("the Council"), the Community Robotics, Education and Technology Empowerment Lab at Carnegie Mellon University ("CREATE Lab"), Allegheny County Clean Air Now ("ACCAN"), the Breathe Project, and Citizens for Pennsylvania's Future ("PennFuture") (collectively "Commenters") submit these comments regarding the Allegheny County Health Department's ("ACHD") proposed Air Monitoring Network Plan for Calendar Year 2025, dated May 16, 2024 ("Draft AMNP" or "2025 AMNP").[1]

In these comments, Commenters present several ways to strengthen the 2024 AMNP to improve the accuracy of ambient air pollution data, which would lead to better protecting public health. Issues raised include the: (1) public must have the opportunity to comment on the new site for the Lawrenceville monitor relocation once it is selected by ACHD; (2) new site for the Lawrenceville monitor should provide an adequate measurement of downtown Pittsburgh traffic impacts, which is needed in addition to existing monitoring for highway traffic emissions; (3) Neville Island and surrounding communities need an air toxics study to facilitate more effective VOC monitoring; (4) AMNP should include additional monitoring for fine particulates; (5) need

[1] Sara Innamorato, *Air Monitor Network Plan for Calendar Year 2025,* Allegheny County Health Department, May 2024, https://www.alleghenycounty.us/files/assets/county/v/1/government/health/documents/air-quality/reports/2025-anp-draft.pdf [hereinafter "Draft AMNP" or "2025 AMNP"].

for lead monitoring around USS Edgar Thomson; and (6) necessity for monitoring for benzene and benzene soluble organics around U.S. Steel Mon Valley facilities.

ABOUT THE COMMENTERS

Clean Air Council is a nonprofit environmental health organization with offices in Philadelphia and Pittsburgh, Pennsylvania. The Council has been working to protect everyone's right to a clean and healthy environment for over 50 years. The Council has members throughout Pennsylvania and the Mid-Atlantic region who support its mission, including many in Allegheny County.

The Community Robotics, Education and Technology Empowerment Lab (CREATE Lab) at Carnegie Mellon University explores socially meaningful innovation and deployment of robotic technologies. The CREATE Lab aims to empower the public and scientists with affordable environmental sensing and documentation instruments, building on the combined power of crowd-sourced reporting, continuous sensor measurements, time-lapse imagery, and visualizations to promote evidence-based decision making, public discourse, and action.

Allegheny County Clean Air Now, ACCAN, was originally formed to try to get better regulation of the Shenango Coke Works on Neville Island. After the coke works closed in 2016, ACCAN continues to give a voice to those living downwind from industries in the Neville Island area.

The Breathe Project is a coalition of citizens, environmental advocates, public health professionals and academics working to improve air quality, eliminate climate pollution and make Southwestern Pennsylvania a healthy and prosperous place to live through science-based work and a community outreach platform.

PennFuture is a Pennsylvania-statewide environmental organization dedicated to leading the transition to a clean energy economy in Pennsylvania and beyond. PennFuture strives to protect our air, water, and land, and to empower citizens to build sustainable communities for future generations. A main focus of PennFuture's work is to improve and protect air quality across Pennsylvania through public outreach and education, advocacy, and litigation.

COMMENTS

1. **The Department must provide an opportunity for public comment on the new location it chooses for the Lawrenceville monitor.**

The Draft AMNP includes a proposal to relocate the Lawrenceville monitor. Relocating this monitor has been a component of the previous two network plans, but ACHD has not yet moved it. Commenters understand that ACHD invested a good deal of effort into selecting an alternate site for the monitor, only to then discover that a gas station would be built too close to the site. Commenters are also aware that ACHD is required to submit the 2025 AMNP to EPA for approval by July 1, 2024.[2] However, ACHD cannot solve the problem by skipping providing the public with the required opportunity to comment on the new location.

Yet, this year's proposal does not include a new location for the monitoring site now that the formerly proposed Chateau site is no longer viable. The community needs to know where the Department plans to move this monitor to be able to provide critique and insight on that specific location. The only way that Commenters can envision ACHD both meeting the statutory deadline and providing an opportunity for public input on the new location is for ACHD to build a mechanism for timely meaningful engagement of the impacted period when ACHD selects a proposed site.

ACHD may accomplish this by, as part of the plan submitted to EPA, committing to (1) selecting a new site for the monitor within a reasonable and fair amount of time, (2) issuing an additional public comment period narrowly focused on the chosen site for the monitor. In the AMNP, ACHD must commit to a date certain by which it will propose the new site. Doing so should also allow EPA to approve the 2025 AMNP, which might otherwise be impossible without the ability to evaluate the new monitoring site and while knowing that the 2025 AMNP was submitted without the mandatory opportunity for meaningful public engagement.

2. **The new location for the Lawrenceville monitor should still collect data on emissions of upwind, dense city-center traffic, or else there will be a void in the Network's data that is not filled by monitoring only highway emissions.**

Commenters appreciate the Department, in response to our comment on the proposed 2024 AMNP asking that the Lawrenceville monitor be relocated to a site that continues to capture emissions from downtown Pittsburgh.[3] The Department indicated that it considers the

[2] *See* 40 CFR § 58.10.

[3] Sara Innamorato, *Air Monitoring Network Plan for Calendar Year 2024,* Allegheny County Health Department, January 2024, at 76,

vehicular air emissions data from the Parkway East monitor to be sufficient to cover traffic-related emissions.[4] However, the Parkway East monitor's data is not representative of the overall mobile emissions from downtown Pittsburgh which is congested urban traffic, as opposed to highway traffic. The Parkway East monitor also monitors fewer parameters than does the Lawrenceville monitor.

Numerous studies from China and the United States demonstrate a strong correlation between vehicular traffic congestion and $PM_{2.5}$,ozone, and NOx emissions. The elevated congestion-related emissions are associated with numerous public health impacts. For example, a Massachusetts study performed in 2012 found that roughly 80% of the state's vehicular emissions came from just 10% of the roadways.[5] Significantly, the study found that "[t]raffic congestion enhances vehicle air pollutant emissions by up to 75% at roadway scales."[6] A study by Wang et al. performed in China found that excess $PM_{2.5}$ and ozone emissions attributable to traffic congestion lead to an estimated combined 25,000 premature deaths in China.[7] "In major cities, the increased rate of premature mortality caused by traffic congestion may reach 17.5 %."[8] Another study performed using population-based birth data in Texas found that traffic congestion-related emissions correlate with reduced birth weight in infants.[9] Additionally, a 2010 study by Jonathan Levy et al. linked traffic volume and speed with $PM_{2.5}$ and partile precursor emissions specifically attributable to traffic congestion in 83 major cities, and estimated that the monetized impact of $PM_{2.5}$ related mortality in the United States specifically from traffic congestion could rise as high as 100 billion USD by the year 2030.[10]

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https://www.alleghenycounty.us/files/content/county/v/8/services/health-department/air-quality/air-quality-reports-and-studies/2024-anp.pdf [hereinafter "2024 AMNP"].

[4] *Id.*

[5] Conor Gately et al., *Urban Emissions Hotspots: Quantifying Vehicle Congestion and Air Pollution Using Mobile Phone GPS Data*, 229 Env't Pollution 496, (2017), *available at:* https://pubmed.ncbi.nlm.nih.gov/28628865/.

[6] *Id.*

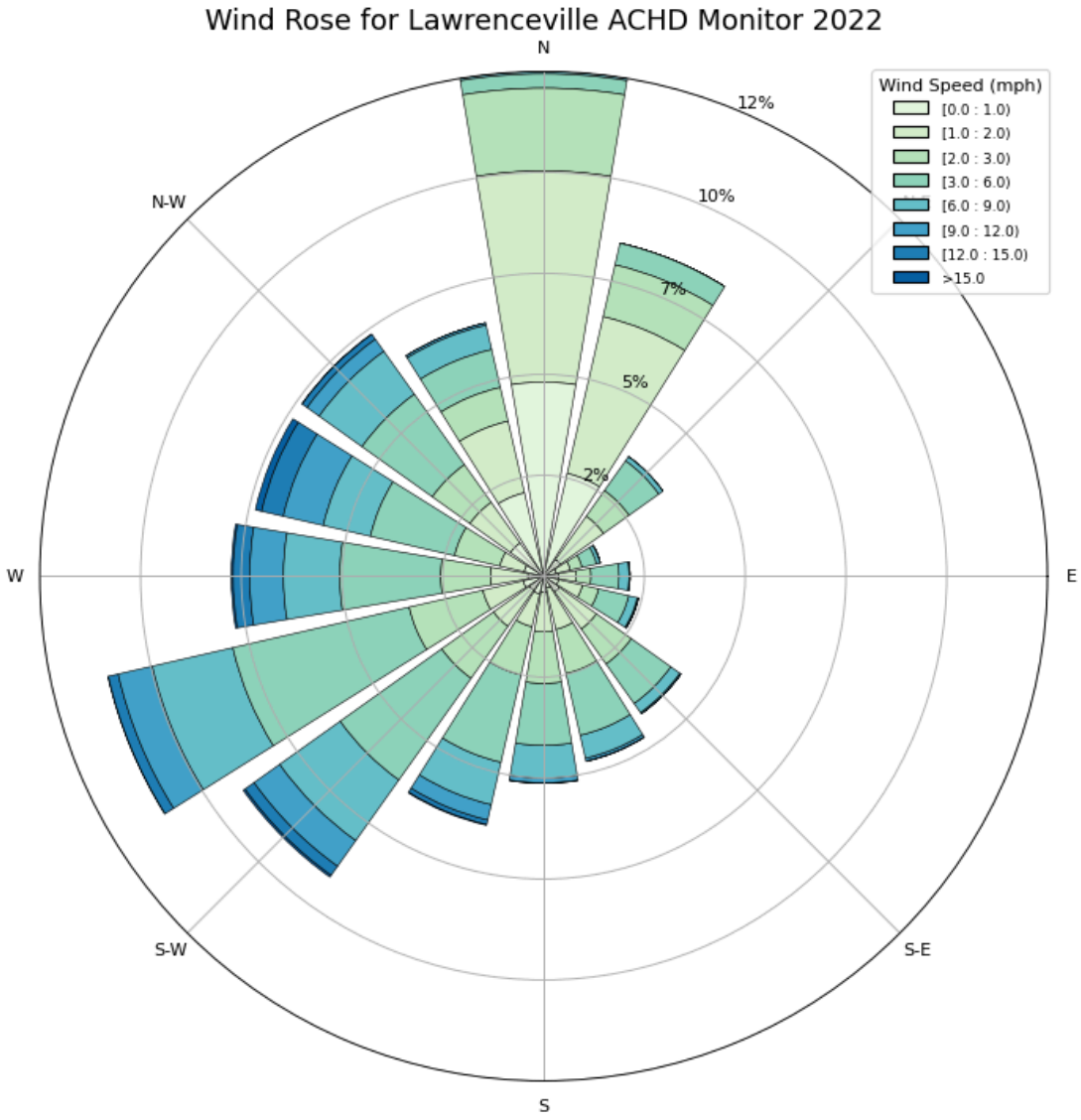
[7] Peter Wang et al., *Aggravated Air Pollution and Health Burden Due to Traffic Congestion in Urban China*, 23 Atmospheric Chem. and Physics 2983, (2023), *available at:* https://acp.copernicus.org/articles/23/2983/2023/.

[8] *Id.*

[9] Mary Willis et al., *A Population-Based Cohort Study of Traffic Congestion and Infant Growth Using Connected Vehicle Data*, 8 Sci. Advances 8281, (2022), *available at:* https://pubmed.ncbi.nlm.nih.gov/36306359/.

[10] Jonathan Levy et al., *Evaluation of the Public Health Impacts of Traffic Congestion: A Health Risk Assessment*, 9 Env't Health 65, (2010), *available at:* https://ehjournal.biomedcentral.com/articles/10.1186/1476-069X-9-65.

According to the 2024 AMNP, the Lawrencville monitor is in "an urban area downwind of [the] Central Business District," with the primary emissions it captures being from mobile sources.[11] The wind rose for the Lawrencville monitor below shows that the location, which is northeast of downtown Pittsburgh, is well suited for collecting data on cumulative downtown traffic emissions.[12]



[11] 2024 AMNP at 39.

[12] Lawrenceville Monitoring Station MET Data, Retrieved from Environmental Sensor Data repository at https://environmentaldata.org/#channels=26.SONICWD_DEG,26.SONICWS_MPH.

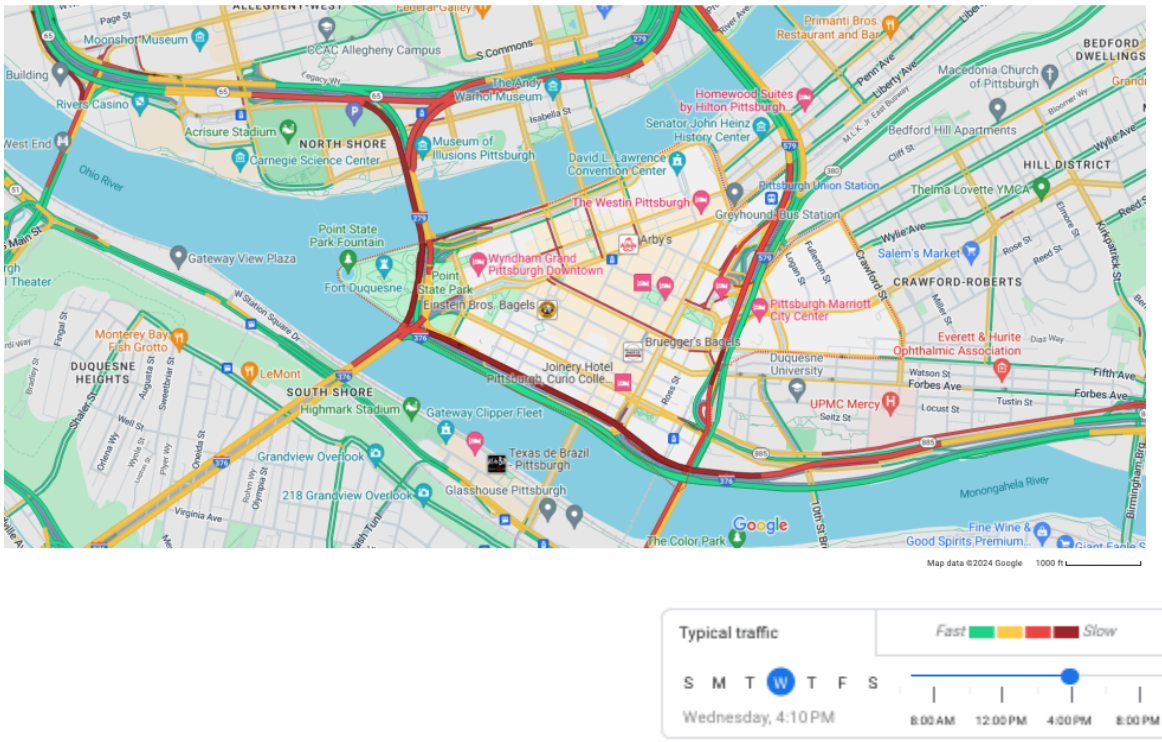
With the Lawrenceville monitor being relocated, it will leave the area directly downwind of downtown Pittsburgh, completely unmonitored. This is of concern due to the heavy traffic congestion that is present in city centers. The Parkway East monitor, by contrast, as "a near road monitoring site that measures population exposure to roadway emissions," captures vehicle traffic along Route 376, which represents a different type of traffic than that present in the downtown area.[13] Even though traffic from arterial roadways such as Route 376 feed directly into downtown traffic, the downtown traffic tends to be more densely packed, as well as being stop-and-go in nature. Stop-and-go traffic is less efficient from a combustion viewpoint, leading to more exhaust emissions, and causes more wear and tear on tires and brakes, a contributor to $PM_{2.5}$ emissions. Densely populated urban areas and the regions immediately downwind of them often have the highest burden of $PM_{2.5}$ pollution, with the most polluted census tract of Pennsylvania being downtown Philadelphia and downtown Pittsburgh.[14]

To illustrate the difference in traffic congestion between downtown Pittsburgh and Route 376, Commenters generated the traffic maps below by using the "Traffic" layer on Google maps to show the typical traffic patterns in a section of downtown Pittsburgh and the Parkway East highway by the so-named monitor. For each, typical traffic congestion is shown for Wednesdays at 4:00 p.m., representing the time approaching the evening rush hour, and Thursdays at 1:05 p.m., representing midday traffic not associated with any rush hour. For both time periods, both the sections of highways passing through downtown and, perhaps more significantly, numerous smaller downtown roads, experience significant congestion, as indicated by the yellow and red coloration. The elevated emissions from that traffic can be captured by a downwind monitor. By contrast, the section of Route 376 near the Parkway East monitor is green during both time periods, indicating freely flowing traffic, which allows the vehicles to operate more efficiently and produce lower emissions.

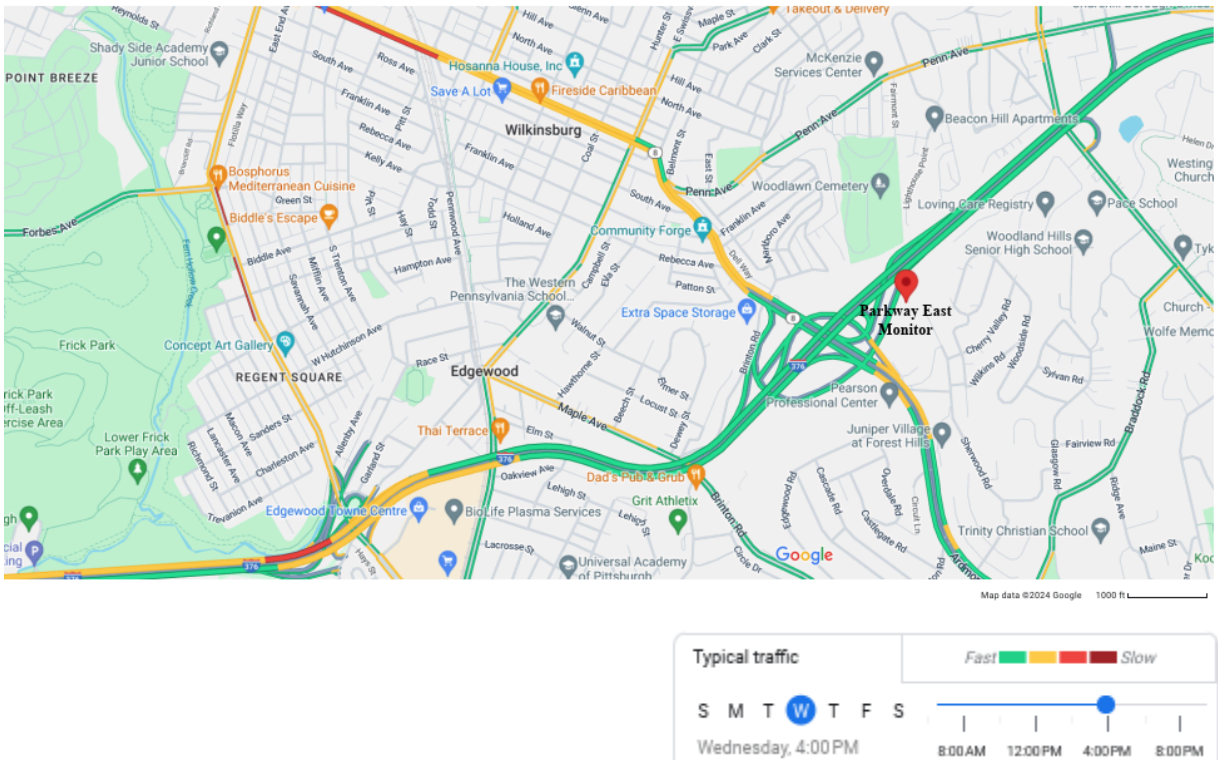
[13] 2025 AMNP at 63.

[14] https://www.ucsusa.org/sites/default/files/attach/2019/06/Inequitable-Exposure-to-Vehicle-Pollution-Northeast-Mid-Atlantic-Region.pdf, pg 5.

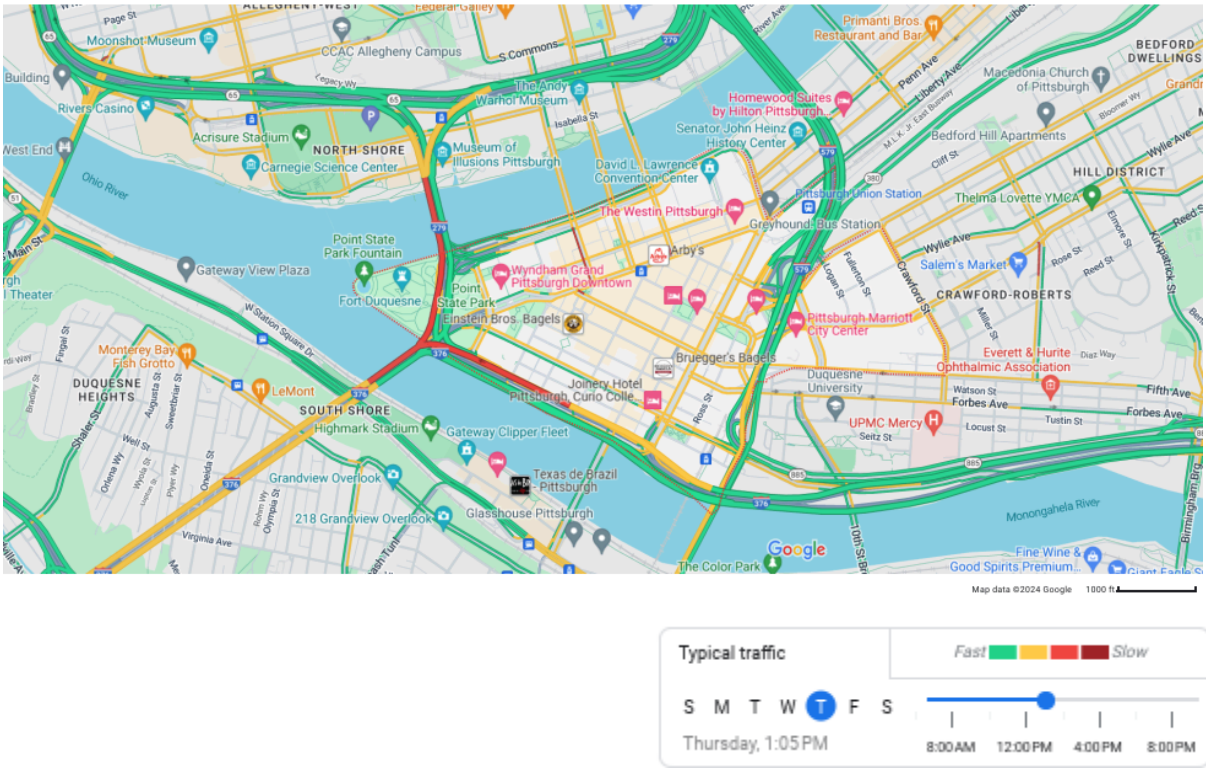
Typical Downtown Pittsburgh Traffic on Wednesdays at 4:00 p.m.



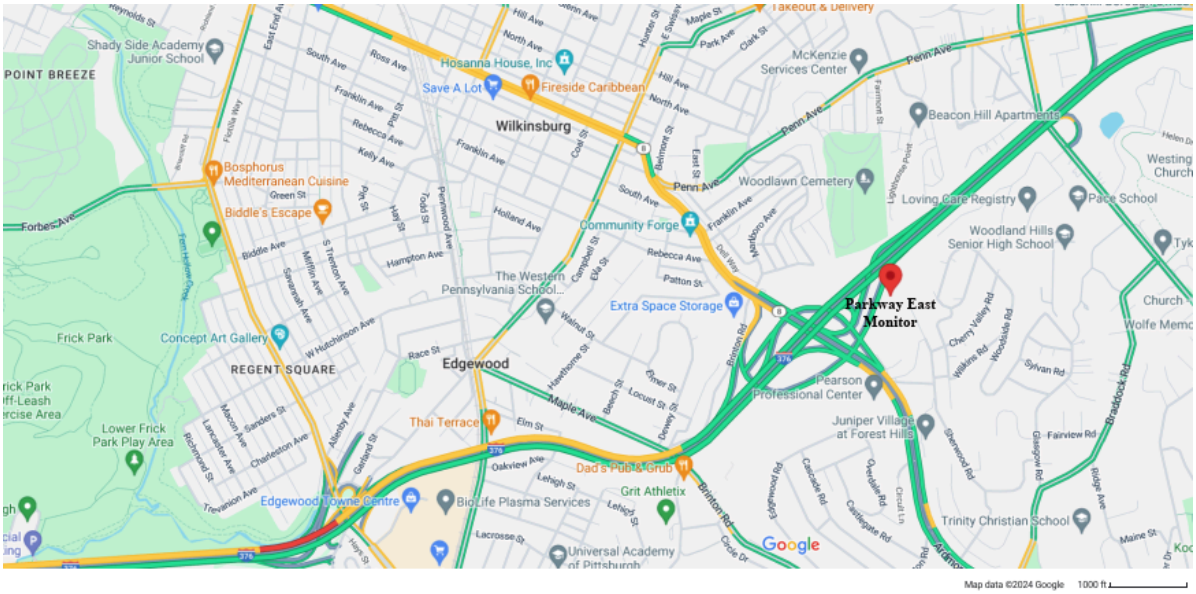
Typical Parkway East Traffic on Wednesdays at 4:00 p.m.



Typical Downtown Pittsburgh Traffic on Thursdays at 1:05 p.m.



Typical Parkway East Traffic on Thursdays at 1:05 p.m.



Moreover, the Lawrenceville monitor covers several more air quality parameters than does the Parkway East monitor. Specifically, the Lawrenceville site has monitored for ozone, $PM_{2.5}$ (FRM), $PM_{2.5}$ (FEM), PM_{10}, PM10-2.5, $PM_{2.5}$ Speciation, CO, SO2, NOy (total reactive oxides of nitrogen), NO2, PM_{10} Metals, VOC, Carbonyls, PAHs, and Aerosol Chemical Speciation Monitor, among other pollutants.[15] Parkway East monitors only $PM_{2.5}$ (FEM), $PM_{2.5}$ (FRM), NOy, NO2, CO, and black carbon.[16] It does not even monitor for ozone, considerable quantities of which may be emitted from vehicle tailpipes.

Commenters recognize that the Lawrenceville station must be relocated ACHD's headquarters will no longer be located there. However, it is unreasonable for ACHD to allow this relocation to create such a significant gap in the network. The Parkway East monitor cannot be considered a substitute for the Lawrenceville monitor because it does not capture the elevated traffic emissions caused by typical downtown traffic congestion in Pittsburgh. As such Commenters strongly recommend that ACHD place a supplementary monitoring station near the current Lawrenceville location with monitors for, at minimum, $PM_{2.5}$, ozone, and NOx.

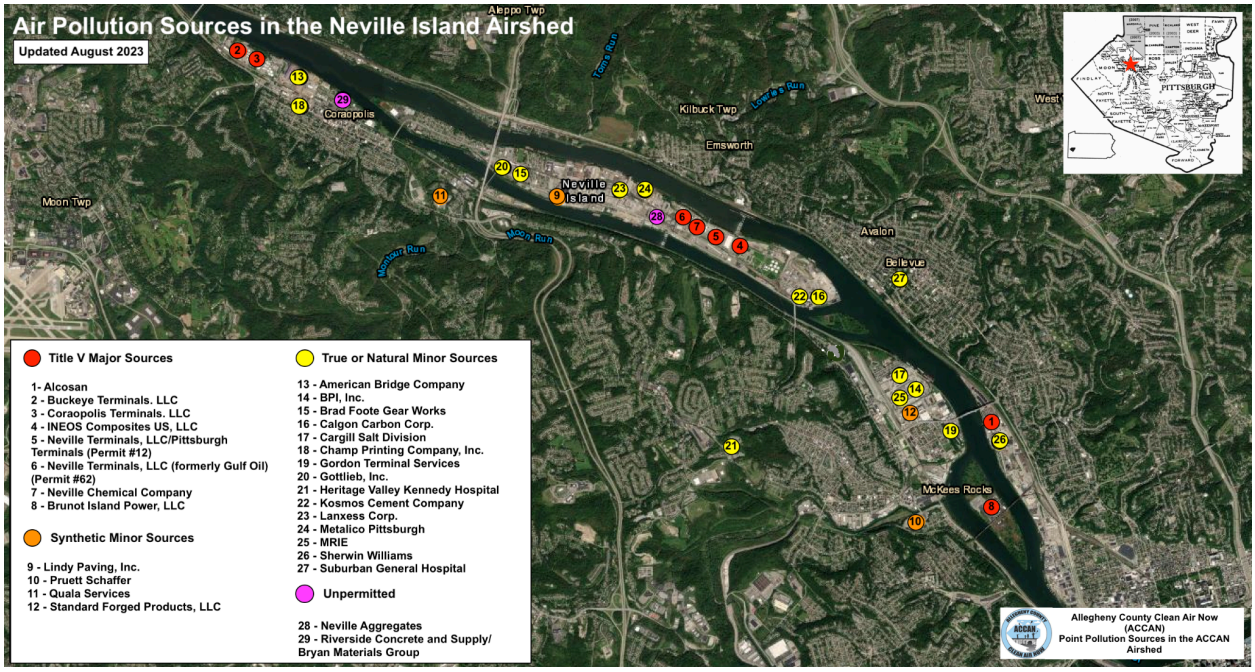
3. The Department should undertake an air toxics study in the Neville Island region to address persistent citizen odor and health complaints and to better inform the possible placement of long-term VOC monitors in the airshed.

Despite low VOC readings at the Avalon monitoring station that lead ACHD to discontinue the VOC monitor at the site, residents of Neville Island are suffering from foul odors that are often accompanied by physical symptoms such as burning eyes and headaches.[17] Between October 1st 2016 and June 13th 2024, there have been 1,903 reports submitted to the Smell PGH app from the zip codes 15225, 15202, 15108, 15136, 15204, and 15233.[18] These were reports rated with a smell severity of 2 or higher, on a scale from 1-5. Smell PGH, developed by the CREATE Lab at Carnegie Mellon University, is an open source, crowd sourcing app that allows residents to report odors in realtime to help better track how odors from pollutants travel through the air across the Pittsburgh region.[19] Due to this large number of smell complaints, and the large number of sources in the area, Commenters recommend that ACHD undertake an air toxics study in the Neville Island area to better understand the nature of VOC emissions, especially BTEX (benzene, toluene, ethylbenzene, and xylene), which have significant health impacts, on and around Neville Island.[20] Many residents who have for years

[15] 2024 AMNP at 39–43.
[16] *Id.* at 68–69.
[17] Attachment 01, Spreadsheet of Resident Odor Complaints Submitted through the SmellPGH App.
[18] *Id.*
[19] https://smellpgh.org/.
[20] https://www.health.pa.gov/topics/Documents/Environmental%20Health/BTEX.pdf.

endured foul odors often associated with physical ailments are hoping for such a study to enable them to protect themselves and ACHD to address the sources or their suffering.

As shown in the map below, the Neville Island area has numerous large sources of VOC and HAP emissions that are of concern to the community.



Based on the nature of the nearby emissions sources and the experiences of frontline community members, Commenters recommend that ACHD locate VOC monitors for the air toxics study at or near the following facilities:

1. Neville Chemical Facility Fenceline

One of the primary facilities of concern is Neville Chemical, a Title V facility permitted to emit up to 181.8 tpy of VOCs and 16.40 tpy HAPs.[21] These emissions include the carcinogenic and toxic chemicals benzene, ethylbenzene, and xylene.[22] A study conducted by ACCAN in 2022 utilizing Summa Canister sampling detected twenty one different VOCs at the facility's fenceline.[23] This facility is also the source of numerous anecdotal reports of industrial odors that community members who pass the facility have reported to Commenters. Therefore, Commenters suggest using a site near this facility as one of the locations for the air toxics study.

[21] Draft Neville Chemical TVOP (0060-OP24), proposed 1 February 2024, pg 95.
[22] *Id.*
[23] Attachment 02, Neville Chemical Summa Canister Report.

2. and 3. Buckeye and Coraopolis Bulk Petroleum Product Terminals

Another two facilities of concern are the Buckeye and Coraopolis bulk petroleum product terminals. These facilities are located down river a short distance from Neville Island in Coraopolis. Both of these terminals are Title V permitted facilities, with Buckeye having an allowable annual emissions rate of 142 tpy VOCs and 9.66 tpy HAPs, and Coraopolis being permitted for 107.64 tpy VOCs and 7.53 tpy HAPs.[24]

4. Metalico Facility Fenceline

Metalico Pittsburgh, Inc., located at 3100 Grand Avenue, is a synthetic minor permitted facility with a maximum allowable annual emission rate of 46.94 tpy VOC and 1.33 tpy HAPs.[25] A 2022 summa canister study performed by ACCAN at the facility's fence line showed the presence of all BTEX chemicals.[26] Metalico is also of concern to the community after a spate of fires in recent years.

5. Lindy Paving Asphalt Facility

Lindy Paving, located at 4200 Neville Road, is another synthetic minor facility in the area, currently permitted to emit up to 12 tpy VOC. However, a recent installation permit application proposes to triple that allowable limit to 36 tpy.[27] ACCAN's 2022 summa canister study detected the presence of 12 VOCs, including two members of the BTEX family.[28] The facility is also a frequent source of odor complaints made by Neville Island residents.[29]

6. Pruett Schaffer Chemical Company

Pruett Schaffer Chemical Company, located in the Espen neighborhood, is permitted to emit up to 11 tpy of VOCs and 9 tpy of HAPs.[30] 12 different VOCs, including all BTEX chemicals were found at the facility by ACCAN's 2022 summa canister study.[31] This facility in particular is located adjacent to a low income neighborhood.

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[24] Buckeye Coraopolis TVOP, issued May 1, 2019, pg 65; Coraopolis Terminal TVOP, issued June 22, 2018, pg 56.
[25] Metalico SYNOP (0692-OP23), issued 18 April 2024, pg 35.
[26] Attachment 03, Metalico Facility Fenceline Summa Canister Report.
[27] Lindy Paving Neville Island (OP-0311), page 39.
[28] Attachment 04, Lindy Paving Neville Island Summa Canister Report.
[29] Attachment 01.
[30] PRUETT-SCHAFFER MSOP (0003-OP23)
[31] Attachment 05, Pruett Schaffer Summa Canister Report.

7. McKees Rocks

McKees Rocks, located at Wayne and Russel Avenues is yet another facility of concern for the community. Results from the 2022 Summa canister study performed by ACCAN showed the presence of 12 different VOCs, including three out of four BTEX compounds, at the facility's fenceline.[32] ACCAN has placed a Sensit SPOD monitor—a type of VOC monitor being developed by EPA researcher[33]—at this site, and Commenters request that ACHD co-locates a BTEX monitor.

In addition, there are several surrounding residential neighborhoods, many of which are home to vulnerable populations, where ACHD should install monitors for the air toxics study. These include:

1. The residential area of Neville Island itself. This community is in the immediate vicinity of 4 TVOP sources, 2 SYNOP sources, and 5 MSOP sources—a significant burden for a small community.

2. The Island Heights neighborhood, across the backchannel from Neville Island. This community is home to an elementary school and a middle school. Residents also report a high incidence of cancers in their community.

3. Emsworth and Ben Avon are located downwind of Neville Island, and residents complain regularly about the foul odors. Residents of Emsworth, downwind of Metalico, frequently report smoke and odors from the facility.

4. The neighborhood around Riverside Concrete & Supply in Coraopolis, where residents report experiencing significant odors from diesel exhaust emitted by trucks associated with Riverside Concrete as well as other facilities in Coraopolis. Diesel emissions are known to contain benzene, and as such is of great concern to residents.[34] Residents also report experiencing odors coming from the concrete plant that they attribute to additives used in the process of making concrete.

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[32] Attachment 06, McKees Rocks Summa Canister Report.

[33] https://www.epa.gov/sciencematters/epa-researchers-develop-new-air-monitoring-technology-understand-leaks-and-irregular

[34] https://pubmed.ncbi.nlm.nih.gov/9988090/#:~:text=Conclusions%3A%20The%20particulate%20matter%20of,the%20usually%20found%20nitro%2DPAH .

5. Commenters would also request that an additional location for study be at 825 Orchard Avenue, Avalon, PA 15202. This location is of note because it was one of the locations that was part of the retrospective Radiello study that ACHD performed in 2015-2016 as the Shenango Coke Works were shutting down.[35] This location is of particular note as it showed the largest drop in benzene levels following the closure of the Shenango coke works.

In sum, to address the foul odors and health injuries consistently reported for years by residents of Neville Island and downwind communities, Commenters hereby request that ACHD undertake an air toxics study monitors placed around the above-mentioned stationary sources and communities, in addition to other sites as needed for a comprehensive study. Focusing on characterizing the emissions from the major sources in the Neville Island area will allow the Department to better address the injuries to the health and quality of life of the citizens the Department is charged with protecting. Only through such a study can ACHD determine where to best place ambient air quality monitors as part of the next Air Monitoring Network plan to effectively capture the air toxin in this area.

4. **ACHD should consider installing additional $PM_{2.5}$ monitoring to develop a more comprehensive picture of ambient $PM_{2.5}$ levels throughout Allegheny County in response to the lowering of the annual $PM_{2.5}$ National Ambient Air Quality Standard ("NAAQS") from 12 µg/m³ to 9 µg/m³.**

As the department is aware, EPA has lowered the annual $PM_{2.5}$ NAAQS from 12 µg/m³ to 9 µg/m³.[36] This means that Allegheny County continues to be in nonattainment, after only recently attaining the former 12 µg/m³ standard. This more stringent standard means that a robust network of $PM_{2.5}$ monitors is advisable. Installing more $PM_{2.5}$ monitors would provide the Department with a more comprehensive picture of $PM_{2.5}$ pollution in the County, allowing it to better address problematic sources and more swiftly bring Allegheny County into attainment with the new standard.

5. **The Department should install an airborne metals monitor, predominantly for lead, in the Braddock area.**

Commenters are pleased to learn that ACHD has performed PM_{10} metals surveillance in North Braddock and installed a new aethalometer there. We recognize that the average lead concentration at the monitoring station was 15.4ng/m³, and thus well below the 150 ug/m^3 (3-month average) limit set in the NAAQS. However, the Centers for Disease Control and

[35] ACHD Health Hazard Investigation of North Boroughs, Board of Health, March 7, 2018.
[36] EPA, *Reconsideration of the National Ambient Air Quality Standards for Particulate Matter*, 89 Fed. Reg. 16,202 (March 6, 2024), *available at:* https://www.govinfo.gov/content/pkg/FR-2024-03-06/pdf/2024-02637.pdf.

Prevention ("CDC") determined that there are *no* safe levels of lead, especially for children.[37] This conclusion is supported by numerous studies.[38] Moreover, lead exposure through different routes is cumulative. Pennsylvania has a high rate of lead exposure from non-air sources,[39] as does the Pittsburgh region.[40] Inhalation of high lead levels, even if they are below the NAAQS value, contribute to its accumulation in children and the resulting adverse health effects that can persist throughout their lifetime.

North Braddock is an Environmental Justice ("EJ") area—46% of North Braddock residents are Black and 24.5% are below the poverty line, which makes its population more vulnerable to the lead pollution emitted by iron and steel manufacturing facilities.[41] In comparison the Commonwealth of Pennsylvania has 12.2% Black residents, and 11.8% population in poverty.[42] EPA acknowledges that the disproportionate impact of Iron and Steel manufacturing on EJ communities must be addressed.[43]

In light of this, Commenters renew their call for ACHD to monitor specifically for lead in the Braddock area.

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[37] CDC, *Lead Exposure Symptoms and Complications*, (April 10, 2024), https://www.cdc.gov/nceh/lead/prevention/health-effects.htm.

[38] *See, e.g.*, Wani AL, Ara A, Usmani JA, *Lead Toxicity: A Review*, Interdiscip Toxicol. 55–64 (June 2015), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4961898/; Evens, A., Hryhorczuk, et al., *The impact of low-level lead toxicity on school performance among children in the Chicago Public Schools: a population-based retrospective cohort study*, Environ Health 14, 21 (2015), https://doi.org/10.1186/s12940-015-0008-9.

[39] David C. Wheeler, Joseph Boyle, Shyam Raman, & Erik J. Nelson, *Modeling Elevated Blood Lead Level Risk Across the United States*, Sci. Total Enviro. (May 15, 2021), *available at:* https://pubmed.ncbi.nlm.nih.gov/33493912/; CDC, *Childhood Blood Lead Surveillance: National Data* (June 13, 2024), https://www.cdc.gov/lead-prevention/php/data/national-surveillance-data.html.

[40] ACHD, *2022 Lead Report* (Dec. 2023), *available at:* https://www.alleghenycounty.us/files/assets/county/v/1/government/health/documents/housing-and-community/lead/lead-task-force-report-2022.pdf.

[41] Census Reporter, *North Braddock, PA*, https://censusreporter.org/profiles/16000US4254816-north-braddock-pa/ (last visited June 14, 2024).

[42] https://www.census.gov/quickfacts/fact/table/PA/PST045222 (last visited June 14, 2024).

[43] 88 Fed. Reg. 49423.

6. As a necessary step in protecting public health from dangerous carcinogens, the Department should improve benzene monitoring and add monitoring for benzene soluble organics and polycyclic aromatic hydrocarbons around the U.S. Steel Clairton and Irvin facilities.

Commenters appreciate the Department's response to their previous year's comment. We are glad to read of the Department's support for EPA's potential requirement of fenceline monitoring for cokeworks, and recognize that the AMNP is not the proper venue to call for fenceline monitoring. However, ACHD never addressed Commerters' previous related comments. Commenter's previous comments to the 2024 AMNP never requested fenceline monitoring as a part of the AMNP. Instead, Commenters asked for more robust monitoring, especially for Benzene Soluble Organics, in the communities surrounding Clairton and Irvin facilities. Additionally, the Liberty monitoring station does not monitor for BSOs nor does it provide a full picture of air emissions in the Mon Valley as a whole. As explained, BSOs may present a significant health threat to these communities, and ACHD needs to thoroughly consider and respond to the following information and requests, largely resubmitted from last year..

Recent monitoring by the Environmental Integrity Project (EIP), CREATE Lab, and the Department has shown a significantly higher benzene exposure near USS Clairton and Irvin than would be anticipated from the USS-reported benzene emissions.[44] The Department is aware that the USS Mon Valley Works, particularly USS Clairton, is the largest benzene emitter in the county. As the Department knows, benzene is a known human carcinogen and benzene can cause blood disorders and damage reproductive systems.[45] There are also potentially dangerous levels of unmonitored benzene soluble particle emissions, which are far more carcinogenic than benzene. By requiring fenceline monitoring of benzene concentrations around USS Clairton and all other coke oven batteries, EPA highlighted the need for additional benzene data in Mon Valley and demonstrated that risks to the community are likely being underestimated.[46]

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[44] BTEX sampling results from ACHD received in response to a Pennsylvania Right-to-Know Law request submitted in June by Group Against Smog & Pollution; Data from an 18-month community benzene monitoring project in Mon Valley, PA through a collaboration between The Environmental Integrity Project (EIP), the Breathe Project and Carnegie Mellon University (CMU) CREATE Lab, Funded by EIP Center for Applied Environmental Sciences, available at: https://www.documentcloud.org/documents/23562239-2022_12_14_final_letter-to-epa-re-mon-valley-benzene-emissions_release, pages 5–10.

[45] EPA, *Benzene* (last updated April 2012), *available at* https://www.epa.gov/sites/default/files/2016-09/documents/benzene.pdf.

[46] EPA, *National Emission Standards for Hazardous Air Pollutants for Coke Ovens: Pushing, Quenching, and Battery Stacks, and Coke Oven Batteries; Residual Risk and Technology Review, and Periodic Technology Review*, Proposed Rule, 88 Fed. Reg. 55858, (Aug. 16, 2023), *available at* https://www.govinfo.gov/content/pkg/FR-2023-08-16/pdf/2023-16620.pdf [hereinafter

Commenter will first demonstrate that the elevated benzene concentrations around Clairton are caused by the Clairton facility and pose a threat to public health, then discuss the health injuries correlated with exposure to benzene and benzene soluble organics generated by coke works, and lastly explain the need for additional monitoring of these chemicals to be added to the AMNP.

a. Recent benzene monitoring data and air dispersion modeling indicates that benzene levels around Clairton Coke Works pose a significant public health risk and that the facility's benzene emissions are the source of the elevated ambient benzene concentrations.

EPA defines chronic Reference Concentration (RfC) as the concentration that a person may continuously inhale that is "likely to be without an appreciable risk of deleterious effects during a lifetime." EPA sets the RfC for benzene at 3 µg/m³,[47] and the California chronic inhalation Reference Exposure Level for benzene (REL) is also 3 µg/m³. [48] Calculated averages for a 16–18 month period have shown exceedances of the RfC at multiple locations along the Clairton fenceline, as shown in the table below. In fact, one monitoring site showed an average concentration over that period of 4.8 µg/m³, which is 160% of the RfC, and thus potentially exposing people to significant risk.

Proposed Coke Oven NESHAPs]at 55885 "Fenceline Monitoring" ("The requirements and decisions that we are proposing in this action are informed by the fenceline monitoring results reported by facilities in response to the 2022 Coke Ovens CAA section 114 request, consideration of dispersion modeling results, and consideration of the uncertainty with estimating emissions from fugitive emission sources. Based on the monitoring results and the other considerations, we determined that it is appropriate under CAA section 112(d)(6) to require coke oven facilities to monitor, and if necessary, take corrective action to minimize fugitive emissions, to ensure that facilities appropriately limit emissions of HAP from fugitive sources.").

[47] EPA, *Chemical-Specific Reference Values for Benzene (CASRN 71-43-2)* at 6 (Aug. 2012), *available at* https://nepis.epa.gov/Exe/ZyNET.exe/P100KJIX.txt?ZyActionD=ZyDocument&Client=EPA&Index=2011%20Thru%202015&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&UseQField=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5CZYFILES%5CINDEX%20DATA%5C11THRU15%5CTXT%5C00000012%5CP100KJIX.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1 [hereinafter EPA Benzene Reference Values].

[48] OEHHA, *Benzene*, https://oehha.ca.gov/air/chemicals/benzene (last visited Dec. 1, 2023).

Monitor Name (approx. distance from USS Clairton, miles)	Lat	Long	Period average ± s.d, in µg/m^3
#01A EIP * (1.5)	40.32457	-79.8809	4.2±3.1
#2 EIP * (2.5)	40.3335	-79.8886	3.2±2.6
#9 ACHD/EPA ** (2)	40.32601	-79.88172	1.6±1.1
#11 ACHD/EPA ** (2)	40.32779	-79.89301	4.1±1.9
#14 ACHD/EPA ** (1)	40.3106	-79.89889	4.8±2.9

* average for the period of 1/3/2022-5/9/2023

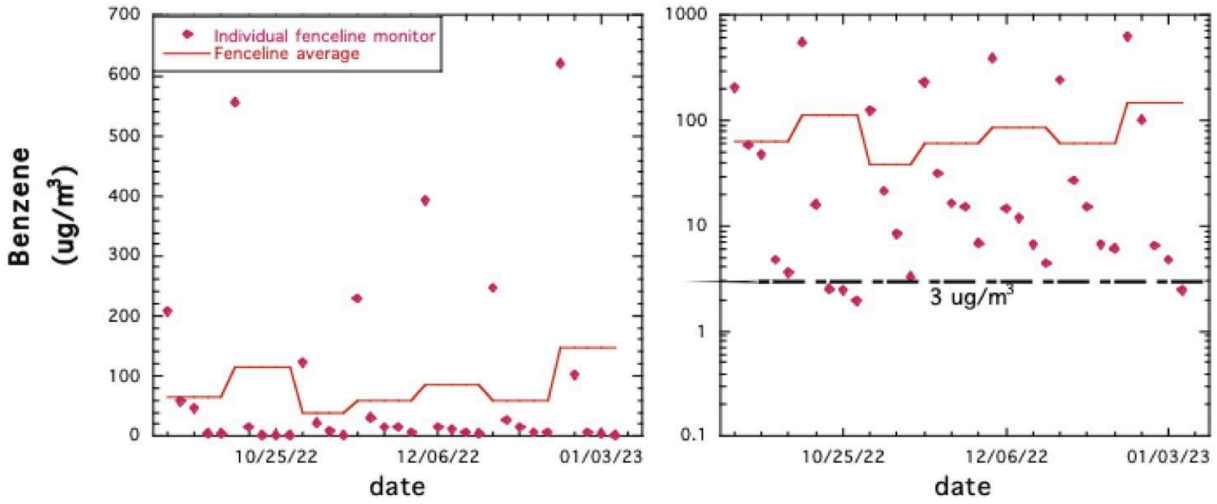
** average for the period of 7/7/21-1/5/23

Notably, EPA collected fenceline benzene data from several coke oven facilities as part of the coke oven NESHAPs review.[49] Samples from USS Clairton show benzene levels well above the proposed 3µg/m^3 limit for practically all fenceline monitors from different locations around the facility.[50] The average concentration was also well above the proposed value.[51] In the charts below, the diamonds represent the benzene concentrations measured in the individual fenceline monitors on the given date. The red lines represent the average of all fenceline monitors on each date.

[49] Proposed Coke Oven NESHAPs at 55865.

[50] *See* Proposed Coke Oven NESHAPs at 55887.

[51] Fenceline TO15 monitor data for benzene from supplemental materials to Docket #: EPA-HQ-OAR-2003-0051-0668: *Residual Risk Assessment for the Coke Ovens: Pushing, Quenching, and Battery Stacks Source Category in Support of the 2023 Risk and Technology Review,* Proposed Rule (May 2023), https://www.regulations.gov/document/EPA-HQ-OAR-2003-0051-0668.



Only 4 of over 30 samples are below the 3µg/m^3 RfC, and all fenceline averages are well above it. The average benzene concentration for the period of 10/11/22 to 1/3/23 is 83 µg/m^3. The average values apply to approximately four months, not the rolling annual period proposed by EPA; however, even if the average benzene concentration for the other eight months is zero, the rolling annual average would be 28 µg/m^3, nearly ten times the proposed action level.

More significantly, many measurements found extremely high concentrations for acute exposure. The Center for Disease Control's ("CDC") Agency for Toxic Substances and Disease Registry ("ATSDR") establishes Minimum Risk Levels ("MRLs") for toxins, including benzene. ATSDR explains that an MRL "is an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health," and that "MRLs can be made for 3 different time periods [the length of time people are exposed to the chemical: acute (about 1 to 14 days), intermediate (from 15-364 days), and chronic (exposure for more than 364 days)]."[52] ATSDR set the acute MRL for benzene as 29 µg/m^3.[53] Many fenceline measurements around the Clairton facility are at least three times the MRL, and some are ten times the MRL. Such values

[52] ATSDR, *Minimal Risk Levels – General Public*, https://www.atsdr.cdc.gov/minimalrisklevels/index.html (June 4, 2018).

[53] EPA, *Chemical-Specific Reference Values for Benzene (CASRN 71-43-2)* at 6 (Aug. 2012), *available at* https://nepis.epa.gov/Exe/ZyNET.exe/P100KJIX.txt?ZyActionD=ZyDocument&Client=EPA&Index=2011%20Thru%202015&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&UseQField=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5CZYFILES%5CINDEX%20DATA%5C11THRU15%5CTXT%5C00000012%5CP100KJIX.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1

pose a substantial acute inhalation hazard to both workers inside the fenceline and to those living along it, risks that are particularly great for members of vulnerable populations and those with underlying health conditions.

The high USS Clairton Coke Works fenceline benzene concentrations strongly indicate that the facility is responsible for benzene pollution in the region near the facility. This conclusion is supported by emissions reports from the Pennsylvania Department of Environmental Protection that show annual benzene emissions from USS Clairton consist of 50% to 80% of the total benzene emissions in Allegheny County:

	2015 *			2020 *#			2023**
	USS Clairton (tons)	County total (tons)	Clairton % of county	USS Clairton (tons)	County total (tons)	Clairton % of county	USS Clairton (tons)
Benzene	16.6	32.55	51%	11.6	14.7	79%	15.21

* http://cedatareporting.pa.gov/reports/

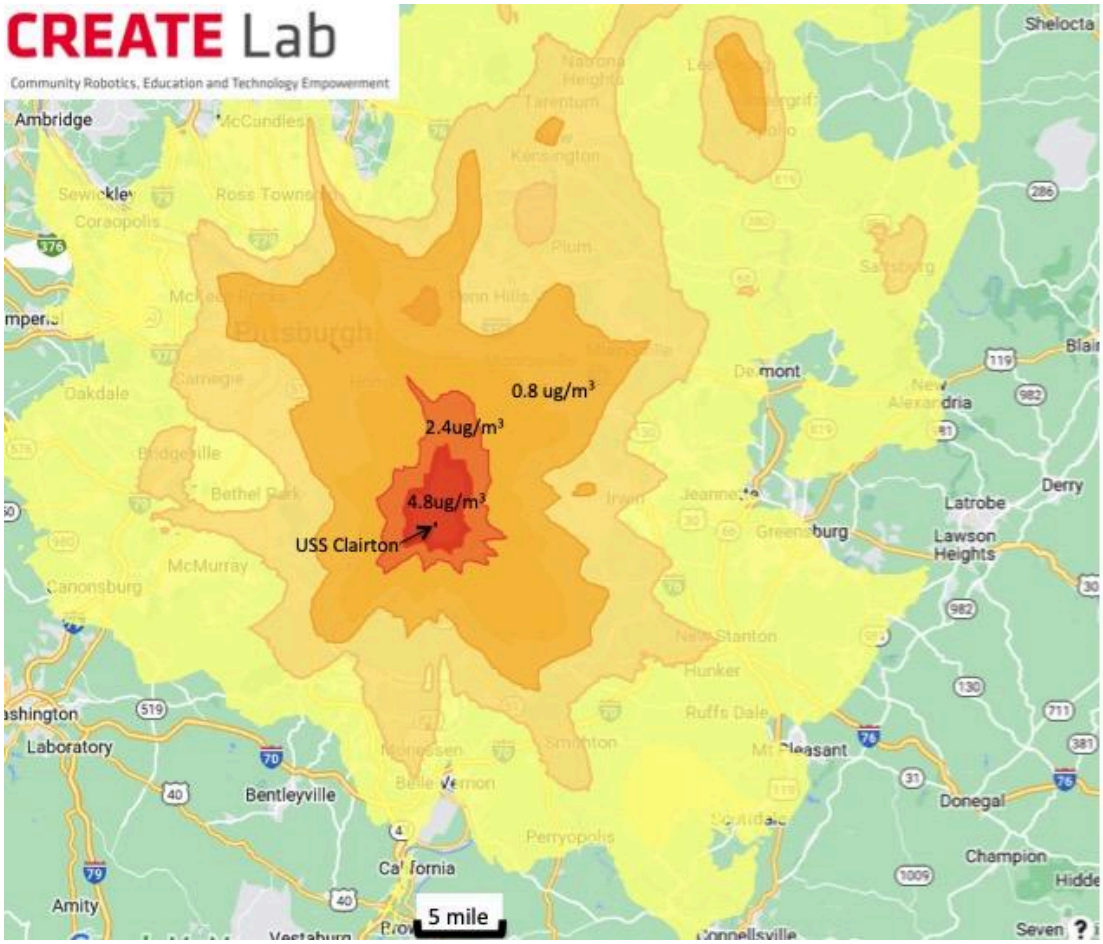
Note that 2020 coke production was lower than in typical years due to COVID19; see for example and 2023 emissions numbers.[54]

**https://achd-public.govonlinesaas.com/pub/pub-rcd/submittals/review/7/2840;tab=sub

These benzene emissions and associated hazardous air pollutants ("HAPs") disperse throughout the county. To examine the link between USS Clairton and the benzene air pollution in the region, Commenters ran the NOAA HYSPLIT dispersion model.[55] HYSPLIT is a broadly utilized tool to assess air pollution dispersion over space and time. The HYSPLIT map presented below shows the simulation-modeled average concentration of benzene from USS Clairton for the period of 2/1/2020–1/31/2021. The model assumes a constant emission rate, and is scaled to match the annual average value recorded at ACHD/EPA monitor #14 sampling results from ACHD's Mon Valley Air Toxics and Odors Study (which is within the core, red level concentration at 40.3106 , -79.89889) to assign values to the different regions.

[54] Carissa L. Lange, et al., *Pittsburgh Air Pollution Changes During the COVID-19 Lockdown*, ENVIRON. ADV. (Apr. 7 2022), *available at:* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8638247/; U.S. Steel, *2022 Annual Report*, page 113, *available at:* https://www.annualreports.com/HostedData/AnnualReports/PDF/NYSE_X_2022.pdf.

[55] NOAA, *HYSPLiT Air Resources Lab*, https://www.ready.noaa.gov/HYSPLIT.php (last visited Dec. 1, 2023).



The high ambient levels of benzene in areas near USS Clairton shown in the HYSPLIT model can be linked directly to benzene emissions from the facility.

EPA proposes that benzene be used as a surrogate for the levels of other HAPs.[56] Commenters' analysis supports the linear correlation between benzene and other HAPs, including, for example, polycyclic aromatic hydrocarbons (PAHs). Therefore, these extremely high levels of benzene recorded at the USS Clairton fenceline likely indicate high levels of other toxic air pollutants that also disperse throughout Allegheny County.

The PADEP annual reports show that USS Clairton is also the largest contributor of other hazardous air pollutants in Allegheny County, as seen in the table below:

[56] Jasno M. DeWees, *Refinery Fenceline Monitoring & Method 325A/B*, EPA (Oct. 28, 2015), https://www3.epa.gov/ttn/amtic/files/ambient/airtox/2015workshop/Petroleum%20Refinery.pdf.

Compound	2015 *			2020 *#			2023**
	USS Clairton (tons)	County total (tons)	Clairton % of county	USS Clairton (tons)	County total (tons)	Clairton % of county	USS Clairton (tons)
Cyanide compounds	17.1	19.65	87%	15.9	15.9	100%	16.14
Coke oven emissions	87	97.6	89%	39.1	39.1	100%	57.11
HCl and HF	101.2	141.7	71%	71	110.2	64%	101.0
Naphthalene	4.5	11.1	40%	3.1	4.3	72%	3.851
PAH	0.68	0.68	100%	0.5	0.5	100%	0.5410
PM2.5	343	846	40.5%	286	577.5	50%	451.4

* CE Data Reporting, http://cedatareporting.pa.gov/reports/ (search by pollutant and facility inside the Air Quality Permit Report)
# Note that 2020 production was lower than typical years due to COVID19.[57]
** https://achd-public.govonlinesaas.com/pub/pub-rcd/submittals/review/7/2840;tab=sub

The data presented here demonstrates that USS Clairton Coke Works is responsible for high levels of air pollution in Allegheny County, especially in the vicinity of the facility. As discussed below, these pollutants are directly correlated with elevated disease rates.

b. Benzene and benzene soluble organics exposure around coke facilities is linked to significant health injuries, including increased levels of cancer, and may exacerbate the cardiac and respiratory harms caused by other air pollutants emitted by such facilities.

The benzene and benzene-soluble organics ("BSOs") emitted from Clairton pose significant health risks, and yet the AMNP does not include BSO monitoring. The closure of the Shenango Coke Works in Allegheny County, PA at Neville Island in January 2016[58] provided a natural experiment and opportunity to observe changes in pollution metrics as well as public

[57] *See, e.g.*, Carissa L. Lange, et al., *Pittsburgh Air Pollution Changes During the COVID-19 Lockdown*, ENVIRON. ADV. (Apr. 7 2022), *available at:* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8638247/; U.S. Steel, *2022 Annual Report*, page 113, *available at:* https://www.annualreports.com/HostedData/AnnualReports/PDF/NYSE_X_2022.pdf.

[58] Aaron Aupperlee, *Shenango Inc. Begins Shutdown of Neville Island Coke Plant* (Jan. 6, 2016), https://archive.triblive.com/local/pittsburgh-allegheny/shenango-inc-begins-shutdown-of-neville-island-coke-plant/ (link leads to a website landing page, and the article can be accessed by clicking to enter the site and then searching for "Shutdown of Neville Island Coke Plant").

health before and after the shutdown, enabling a direct test of the link between public health and coke oven facility emissions. The Shenango Coke Works on Neville Island was located about 1.5 miles from the Pittsburgh city limits. Shenango produced 350,000 tons of coke annually during its operation.[59] When reviewing the data from Shenango, please keep in mind that USS Clairton Coke Works produces 4.7 million tons of coke annually, 13 times more than did Shenango.[60] Even though there are differences in the production processes, Commenters expect that the health effects from Clairton's emissions are spread over a much larger geographic area, as supported by the HYSPLIT map above. The impact for the closest residents to Clairton is likely to be correspondingly higher, as well.

Cancer

Benzene is a well-established human carcinogen, and BSOs emitted from coke ovens are approximately 280 times as carcinogenic as benzene from inhalation.[61] Residents of municipalities exposed to air pollution from the USS Clairton Coke Works and, historically, from the Shenango Coke Works, have an elevated cancer mortality rate of 34%, or 860 excess cancer deaths per 1,000,000 annually. This figure is derived from Allegheny County's study of all-cause mortality 2006–2010, corrected for age.[62] Specifically, chronic exposure to benzene is known to cause leukemia, a cancer of blood-forming organs.[63] While the existing available data is not sufficient to establish a causal link between exposures to benzene and county-level leukemia rates, these rates are still a reason for concern. Between 2011 and 2015, Allegheny County had an age-adjusted leukemia incidence rate of 15.6 out of 100,000 people—significantly higher than the Pennsylvania age-adjusted leukemia incidence rate of 14.1 out of 100,000 people.[64] Many Allegheny County residents currently express deep concern and grief around the elevated cancer levels that they observe, which they largely attribute to Clairton Coke Works.

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[59] Jeffrey Fraser, *Is Better Good Enough?*, PITTSBURGH QUARTERLY (Fall 2014), https://pittsburghquarterly.com/articles/is-better-good-enough/.

[60] EPA, *Hazardous Waste Cleanup: U.S. Steel Corporation MVW Clairton Plant in Clairton, Pennsylvania*, https://www.epa.gov/hwcorrectiveactioncleanups/hazardous-waste-cleanup-us-steel-corporation-mvw-clairton-plant-clairton (last updated May 2, 2023).

[61] Computed from unit risks described in subsequent paragraphs.

[62] ACHD, *Allegheny County Community Profiles*, https://www.alleghenycounty.us/Health-Department/Resources/Data-and-Reporting/Chronic-Disease-Epidemiology/Community-Profiles.aspx.

[63] CDC, *Facts about Benzene*, https://emergency.cdc.gov/agent/benzene/basics/facts.asp (last reviewed Apr. 4, 2018).

[64] ACHD, *Allegheny County Cancer Incidence Report 2011-2015*, https://www.alleghenycounty.us/uploadedFiles/Allegheny_Home/Health_Department/Resources/Data_and_Reporting/Chronic_Disease_Epidemiology/2011-2015-Cancer-Incidence-Report.pdf.

EPA's Carcinogen Assessment of coke oven emissions presents strong epidemiological evidence of large and statistically significant excess cancer mortality of coke oven workers. EPA has estimated that a lifetime of continuous exposure to coke oven emissions quantified by a concentration of 1 μg/m³ of the benzene-soluble organic portion of particulates from a coke oven could result in a 6.17 x 10^-4 lifetime risk of cancer *mortality* due to that exposure (95% upper-bound estimate), or 617 cancer *deaths* out of 1,000,000 people (95% upper-bound estimate).[65] That risk is significantly greater than for benzene exposure alone. For benzene, a 1 μg/m^3 lifetime exposure is estimated to cause a 2.2 x 10^-6 lifetime risk of cancer *incidence*, or 2 cancer *cases* in 1,000,000.[66]

The cancer danger of coke oven emissions, as quantified by the BSO fraction, underscores the need for systematic monitoring and control of these emissions. Much of the benzene-soluble fraction of coke oven emissions is composed of PAHs, and so Commenters estimate concentrations of the benzene-soluble fraction at USS Clairton Coke Works from the fenceline monitoring data by using the samples collected by EPA around the facility in 2022–2023 which measure PAH concentrations.[67] The estimates make two assumptions: (1) that the PAHs reaching the method TO-13A fenceline samplers came directly from fugitive or other emissions from the coke ovens (potentially overestimating coke oven emissions), and (b) that the TO-13A sampler quantified in total all the benzene-soluble organics that reached it (potentially significantly underestimating the BSO levels given the limited number of compounds detected by Method TO-13A).

The resulting estimates are deeply disturbing. Multiplying by EPA's unit risk estimate above of 6.17 x 10^{-4} per μg/m³, a lifetime exposure to the concentration in sample ID PAH04_230103_S, 10.5 μg/m³, is estimated at an alarming 56,564 cancer deaths per 1,000,000, or increasing the chance of cancer by 5.6%.

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[65] EPA IRIS, *Coke Oven Emissions IRIS Summary*, *available at:* https://iris.epa.gov/static/pdfs/0395_summary.pdf (last visited Dec. 1, 2023); J. Graham and D. Holtgrave, *Coke Oven Emissions: A Case Study of Technology-Based Regulation, RISK: Issues in Health & Safety*, (June 1990), *available at:* https://scholars.unh.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1023&context=risk; EPA, *Carcinogen Assessment of Coke Oven Emissions Final Report*, (Feb. 1984), *available at:* https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=47897.

[66] EPA, IRIS, *Benzene*, *available at:* https://cfpub.epa.gov/ncea/iris2/chemicallanding.cfm?substance_nmbr=276 (last visited Dec. 1, 2023).

[67] Fenceline data for five facilities 2022–2023, from *Coke Ovens: Pushing, Quenching, and Battery Stacks: National Emission Standards for Hazardous Air Pollutants*, *available at:* https://www.epa.gov/stationary-sources-air-pollution/coke-ovens-pushing-quenching-and-battery-stacks-national-emission, with datafile downloaded from https://www.epa.gov/system/files/other-files/2023-06/Fenceline%20data%20for%20five%20facilities%202022-2023.zip.

The table below, generated from Clairton Coke Works' fenceline data, shows PAH concentrations calculated by summing detected concentrations of all individually reported PAHs and the estimated associated cancer mortality from a lifetime of exposure to each estimated associated BSO concentrations.[68] However, because EPA's Carcinogen Assessment was conducted in 1984 and cancer treatments have since improved, the mortality data is best considered a proxy for cancer prevalence.

Clairton Coke Works Sample ID	Sample Date	PAH Concentration	Lifetime exposure estimated cancer mortality per 1,000,000 (assuming PAH concentration represents benzene-soluble fraction of oven emission)
PAH01_221011_S	2022-10-11	0.52 µg/m^3	262 deaths per 1,000,000
PAH01_221025_S	2022-10-25	0.53 µg/m^3	266 deaths per 1,000,000
PAH01_221108_S	2022-11-08	1.18 µg/m^3	588 deaths per 1,000,000
PAH01_221122_S	2022-11-22	0.38 µg/m^3	188 deaths per 1,000,000
PAH01_221206_S	2022-12-06	1.27 µg/m^3	634 deaths per 1,000,000
PAH01_221219_S	2022-12-19	0.13 µg/m^3	64 deaths per 1,000,000
PAH02_221011_S	2022-10-11	16.65 µg/m^3	8,326 deaths per 1,000,000
PAH02_221025_S	2022-10-25	2.87 µg/m^3	1,435 deaths per 1,000,000
PAH02_221108_S	2022-11-08	32.43 µg/m^3	16,213 deaths per 1,000,000
PAH02_221122_S	2022-11-22	7.21 µg/m^3	3,603 deaths per 1,000,000
PAH02_221206_S	2022-12-06	7.61 µg/m^3	3,805 deaths per 1,000,000
PAH02_221219_S	2022-12-19	1.92 µg/m^3	958 deaths per 1,000,000
PAH02_230103_S	2023-01-03	10.5 µg/m^3	5,248 deaths per 1,000,000
PAH03_221011_S	2022-10-11	11.7 µg/m^3	5,849 deaths per 1,000,000
PAH03_221025_S	2022-10-25	12.45 µg/m^3	6,224 deaths per 1,000,000

[68] The PAHs detected by the USS Clairton TO-13A samplers are: Acenaphthene, Acenaphthylene, Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene (naphthene), Phenanthrene, and Pyrene.

PAH03_221108_S	2022-11-08	3.68 µg/m^3	1,838 deaths per 1,000,000
PAH03_221122_S	2022-11-22	3.03 µg/m^3	1,517 deaths per 1,000,000
PAH03_221206_S	2022-12-06	2.55 µg/m^3	1,277 deaths per 1,000,000
PAH03_221219_S	2022-12-19	0.93 µg/m^3	467 deaths per 1,000,000
PAH03_230103_S	2023-01-03	7.09 µg/m^3	3,546 deaths per 1,000,000
PAH04_221011_S	2022-10-11	87.27 µg/m^3	43,634 deaths per 1,000,000
PAH04_221025_S	2022-10-25	99.62 µg/m^3	49,812 deaths per 1,000,000
PAH04_221108_S	2022-11-08	42.38 µg/m^3	21,191 deaths per 1,000,000
PAH04_221122_S	2022-11-22	47.78 µg/m^3	23,889 deaths per 1,000,000
PAH04_221206_S	2022-12-06	54.76 µg/m^3	27,382 deaths per 1,000,000
PAH04_221219_S	2022-12-19	66.87 µg/m^3	33,437 deaths per 1,000,000
PAH04_230103_S	2023-01-03	113.13 µg/m^3	56,564 deaths per 1,000,000

The table clearly shows a problematic increase in cancer rates associated with BSO, which underscores the importance of associated monitoring.

Cardiovascular Health

Cardiovascular injury from air pollutants such as particulate matter is well documented.[69] A recent study by Igor N. Zelenko, et al., "suggest[s] that benzene exacerbates heart failure by promoting endothelial activation and neutrophil recruitment."[70] Thus benzene is likely a contributing factor to the increased cardiovascular mortality and injury associated with living near coke works.

In a recent publication, NYU's George Thurston and Wuyue Yu compared the area near Shenango to two control groups, looking for health changes pre- to post-shutdown, and found a:

- 42% immediate drop (95% CI: 33%, 51%) in local cardiovascular emergency department ("ED") visits from the pre-closure mean;
- Long-term continual decline in the rate of overall ED visits following the shutdown, with 460 fewer ED visits each year when compared to each previous year; and

[69] EPA, *Air Pollution and Cardiovascular Disease Basics*, https://www.epa.gov/air-research/air-pollution-and-cardiovascular-disease-basics#:~:text=Fine%20particulate%20matter%20(particulate%20matter,related%20heart%20attacks%20and%20death. (last updated Nov. 2, 2023).
[70] Igor N. Zelko, et al., *Chronic Benzene Exposure Aggravates Pressure Overload-Induced Cardiac Dysfunction*, TOXICOL. SCI. (Dec. 28, 2021), *available at:* https://pubmed.ncbi.nlm.nih.gov/34718823/.

- Long-term continual decline in the rate of cardiovascular hospitalizations following the shutdown, with 28 fewer hospitalizations each year when compared to each previous year.[71]

This data further underscores the importance of accurately monitoring and controlling benzene emissions.

Asthma and other respiratory health impacts

Although not well researched, there are studies linking benzene to respiratory injury, particularly in children.[72] Thus, benzene pollution likely contributed to the respiratory injuries from coke oven emissions that were demonstrated by the drop in respiratory health conditions in local communities after Shenango closed. ACHD and Dr. Deborah Gentile have shown Shenango's shutdown to be associated with very significant reductions in respiratory disease, especially pediatric asthma, including a:

- 3.3-fold decrease in all asthma ED visits;[73]
- 5-fold decrease in pediatric asthma ED visits;[34]
- 37.9% decrease in other respiratory ED visits;[34]
- 24.5% reduction in doctor-diagnosable pediatric asthma with same ages year over year. *Many fewer children were developing asthma*;[74] and
- 41.6% reduction in children with uncontrolled asthma..[35]

[71] Wuyue Yu and George D Thurston, *An Interrupted Time Series Analysis of the Cardiovascular Health Benefits of a Coal Coking Operation Closure*, Environ. Res.: Health, Vol. 1:4 (July 31, 2023), https://iopscience.iop.org/article/10.1088/2752-5309/ace4ea#:~:text=Overall%2C%20our%20research%20provides%20compelling,health%20of%20the%20nearby%20community.

[72] *See, e.g.*, Mark A. D'Andrea & G. Kesava Reddy, *Health Risks Associated with Benzene Exposure in Children: A Systematic Review*, GLOBAL PEDIATRIC HEALTH (2018), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6100118/.

[73] LuAnn Lynn Brink, et al., *Changes In Emergency Department Visits For Respiratory And Cardiovascular Disease After Closure Of A Coking Operation Near Pittsburgh, PA*, J. AIR POLLUTION & HEALTH (Autumn 2019), https://publish.kne-publishing.com/index.php/JAPH/article/view/2195.

[74] Dr. Deborah Gentile, *Shenango Closure: A Living Laboratory*, Research Presentation (2021).

Children in the city of Clairton adjacent to the Clairton facility have much higher asthma rates than the rest of Allegheny County, or the state of Pennsylvania as a whole.[75] The impact of Clairton is likely more far-reaching and severe than the impact of the smaller Shenango facility. The probable contribution of benzene emissions to that harm is another reason for more comprehensive benzene monitoring in the 2024 AMNP.

In sum, benzene and BSOs emitted from USS facilities in Mon Valley are likely under-reported or, in the case of BSOs, entirely unmonitored. Yet these chemicals are highly carcinogenic and likely contribute to a host of other health injuries.

c. The 2024 AMNP should include BSO monitoring and increased benzene monitoring which would make it possible to (1) better protect the public from significant health harms and to (2) make possible necessary public health studies to determine the actual health burden these emissions inflict on local communities.

As described above, benzene emissions from coke ovens are likely largely underreported, and ambient levels around polluting facilities are inadequately monitored. Additionally, the uncounted benzene emissions found in the fenceline monitoring recently conducted around Clairton Coke Works likely directly correlates to levels of other fugitive coke oven emissions, including BSOs. The BSOs known to be emitted by coke ovens are a Group A known human carcinogen as categorized by EPA. In addition to being extremely carcinogenic, chronic exposure to BSOs can result in severe dermatitis and lesions of the respiratory and digestive systems.[76] Yet BSO monitoring is absent from the AMNP.

Despite being highly carcinogenic, BSO emissions are currently unmonitored. If unaccounted benzene emissions are indicative of fugitive emissions directly from coke ovens, then benzene could be only a small part of the cancer risk posed by these emissions, with most of the cancer risk coming from the benzene-soluble organic portion of PM from the coke ovens. Although BSOs emissions might vary directly with benzene emissions, the BSOs from coke ovens are so carcinogenic that they should be monitored directly to ensure accurate data regarding public exposure. BSOs were monitored during EPA fenceline measurements at Clairton and EPA Method TO13A sampling is the commonly used way of estimating BSO concentrations at coke ovens.[77]

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[75] Deborah A. Gentile, MD; Tricia Morphew, MS; Jennifer Elliott, Pharm D; Albert A. Presto, PhD; & David P. Skoner, MD, *Asthma Prevalence and Control Among Schoolchildren Residing Near Outdoor Air Pollution Sites*, J. Asthma, Volume 59:1 (2022).

[76] EPA, *Coke Oven Emissions*, https://www.epa.gov/sites/default/files/2016-09/documents/coke-oven-emissions.pdf (last visited Dec. 1, 2023).

[77] EPA, *Compendium of Methods for the Determination of Toxic Organic Compounds*

To ensure public health is protected, HAP emissions from coke oven facilities, especially USS Clairton, must be reduced. In order to be reduced, the Department must ensure that benzene and BSOs are monitored accurately and consistently within the air monitoring network. These data can then be used to conduct further cancer and public-health-focused studies. Past studies have led to institutional change at Clairton, including original research into cancer for Clairton coke workers, together with a survey of previous studies, leading to the carcinogenicity estimate for coke oven BSO, and eventually leading to workers exposed to the batteries wearing helmet respirators.[78]

There is a clear need for updated BSO and benzene monitoring in order to more accurately understand the cancer impact of the coking activities, and to determine what efforts are needed to reduce fugitive emissions of these toxins. Additionally, accurate monitoring is necessary to allow proper studies to understand the impact of these chemicals on the local communities. ACHD's Community Profiles reports from 2000–2010 show elevated cancer mortality in municipalities exposed to the Clairton and Shenango coke works, although the only age adjustment available in the report is for all-cause deaths.[79] Commenters suggest that ACHD first develop an AMNP that would support future public health research, and then undertake necessary studies.

One such study should be a cancer-focused analysis to better elucidate cancer mortality and incidence as correlated to coke oven exposure revealed by dispersion analysis. ACHD should also analyze the prevalence of different forms of cancer, including those associated with certain chemical exposures. For example, benzene exposure is associated with some forms of leukemia. However, without adequate monitoring, neither these studies nor enforcing emissions reductions necessary to protect public health are possible.

CONCLUSION

Commenters appreciate the opportunity to comment on the Allegheny County Air Monitoring Network Plan for 2025. We urge ACHD to strengthen the 2025 AMNP by incorporating the changes suggested above. Doing so would enable ACHD to collect the more complete and robust data necessary to protect the health and environment of everyone in

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in Ambient Air: Compendium Method TO-13A: Determination of Polycyclic Aromatic Hydrocarbons (PAHs) in Ambient Air Using Gas Chromatography/Mass Spectrometry, *(GC/MS)*, 2nd Ed., https://www.epa.gov/sites/default/files/2019-11/documents/to-13arr.pdf.

[78] Carcinogen Assessment of Coke Oven Emissions Final Report, February 1984, downloaded from https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=47897

[79] https://www.alleghenycounty.us/uploadedFiles/Allegheny_Home/Health_Department/Resources/Data_and_Reporting/Chronic_Disease_Epidemiology/AlleghenyCounty.pdf.

Allegheny County, and particularly the frontline residents long frustrated by the unfilled need to identify the industrial and mobile emissions that have been harming their health for years.

Sincerely,

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