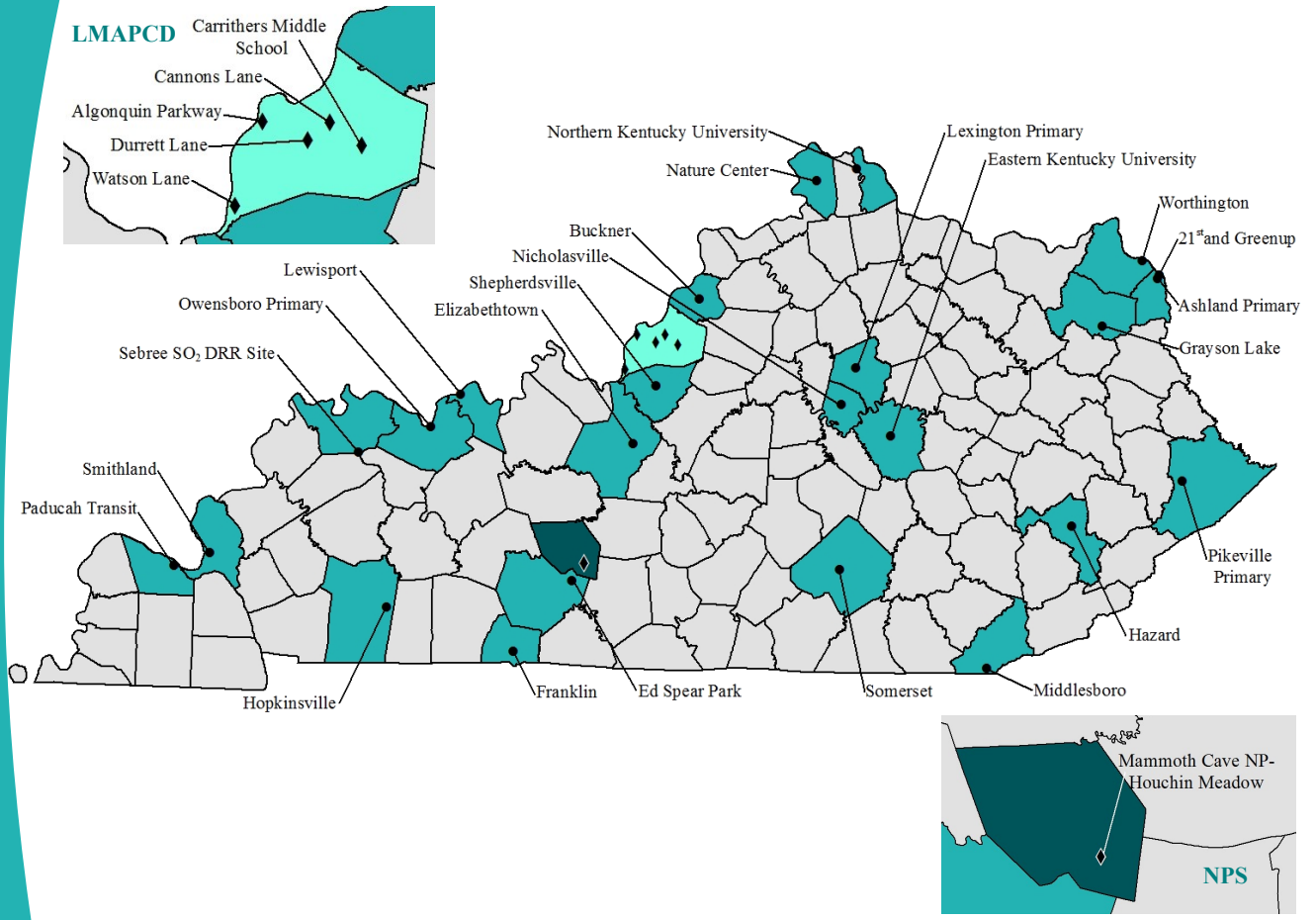


# Kentucky Annual Ambient Air Monitoring Network Plan 2023



Commonwealth of Kentucky Energy & Environment Cabinet  
Department for Environmental Protection  
Division for Air Quality  
300 Sower Boulevard  
Frankfort, Kentucky 40601



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**CERTIFICATION**

By the signatures below, the Kentucky Division for Air Quality certifies that the information contained in this Surveillance Network document for sampling year 2023 is complete and accurate at the time of submittal to EPA Region 4. However, due to circumstances that may arise during the sampling year, some network information may change. A notification of change and a request for approval will be submitted to EPA Region 4 at that time, following a 30-day public comment period.

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### **PUBLIC NOTIFICATION AND COMMENT PERIOD**

In accordance with 40 C.F.R. 58.10(a)(1), the Kentucky Energy and Environment Cabinet shall make the annual monitoring network plan available for public inspection for at least 30 days prior to submission to the US EPA. The annual monitoring network plan details the operation and location of ambient air monitors operated by the Kentucky Division for Air Quality (KDAQ), Louisville Metro Air Pollution Control District (LMAPCD), and the National Park Service (NPS).

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# **INTRODUCTION**

## INTRODUCTION

The Kentucky Division for Air Quality (KDAQ) has operated an air quality monitoring network in the Commonwealth since July 1967. The Louisville Metro Air Pollution Control District (LMAPCD), a local agency, has maintained a sub-network in its area of jurisdiction since January 1956. Since that time, the networks have been expanded in accordance with United States Environmental Protection Agency's (US EPA) regulations.

In October 1975, the US EPA established a work group to critically review and evaluate current air monitoring activities at that time. This group was named the Standing Air Monitoring Working Group (SAMWG). The review by the SAMWG indicated several areas where deficiencies existed which needed correction. The principal areas needing correction were: an excess of monitoring sites in some areas to assess air quality; existing regulations that did not allow for flexibility to conduct special purpose monitoring studies; and data reporting that was untimely and incomplete. These deficiencies were primarily caused by a lack of uniformity in station locations and probe siting, sampling methodology, quality assurance practices, and data handling procedures.

In August 1978, recommendations developed by SAMWG, to remedy the deficiencies in the existing monitoring activities, were combined with the new requirements of Section 319 of the Clean Air Act. Section 319 provided for the development of uniform air quality monitoring criteria and methodology; reporting of a uniform air quality index in major urban areas; and the establishment of an air quality monitoring system nationwide which utilized uniform monitoring criteria and provided for monitoring stations in major urban areas that supplement state-monitoring. The combination of the recommendations and requirements were included in a proposed revision to air monitoring regulations.

In May 1979, air monitoring regulations were finalized by the US EPA requiring certain modifications and additions to be included in the State Implementation Plan for air quality surveillance. These regulations require each state to operate a network of monitoring stations designated as State and Local Air Monitoring Stations (SLAMS) that measure ambient concentrations of air pollutants for which standards have been established. The SLAMS designation contains provisions concerning the conformity to specific siting and monitoring criteria not previously required. The regulations also provide for an annual review of the monitoring network to insure objectives are being met and to identify needed modification.

The current overall network consists of 30 air monitoring stations, operated by KDAQ, LMAPCD, and the National Park Service (NPS). The Commonwealth's SLAMS air monitoring network monitors criteria pollutants for which the National Ambient Air Quality Standards (NAAQS) have been issued. In addition to a SLAMS network, KDAQ's air monitoring network includes special purpose monitors (SPM) for air toxics and meteorological data.

The annual monitoring network description, as provided for in 40 CFR Part 58.10, *Annual monitoring network plan and periodic network assessment*, must contain the following information for each monitoring station in the network:

1. The Air Quality System (AQS) site identification number for existing stations.
2. The location, including the street address and geographical coordinates, for each monitoring station.
3. The sampling and analysis method used for each measured parameter.
4. The operating schedule for each monitor.
5. Any proposal to remove or move a monitoring station within a period of eighteen months following the plan submittal.



6. The monitoring objective and spatial scale of representativeness for each monitor.
7. The identification of any site that is suitable for comparison against the PM<sub>2.5</sub> NAAQS.
8. The Metropolitan Statistical Area (MSA), Core-Based Statistical Area (CBSA), Combined Statistical Area (CSA), or other area represented by the monitor.

The following document constitutes the Kentucky ambient air monitoring network description and is organized into four main parts:

1. Station Description Format: An outline of the designations, parameters, monitoring methods, and the basis for site selection.
2. Network Summaries: Presenting the total number of sites and monitors in each region and for the state. Also included is a listing of all proposed changes to the current network.
3. Air Monitoring Station Description: Each air monitor station is described in detail as per the outline in (1) above.
4. Appendices: Additional information relating to the ambient air monitoring network.

Modification to the network as determined by an annual review process will be made each year to maintain a current network description document.

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## **AIR MONITORING NETWORK SUMMARY**

## SUMMARY OF KDAQ NETWORK CHANGES 2023

During the 2023-2024 monitoring year, KDAQ will operate 67 instruments, including 3 meteorological stations, located at 24 ambient air monitoring sites in 23 Kentucky counties. LMAPCD will operate an additional 33 instruments, including 5 meteorological stations, in Jefferson County. When combined with the air monitoring site operated by the National Park Service (NPS) at Mammoth Cave National Park, the total ambient air monitoring network will consist of 105 instruments, including 9 meteorological stations, located at 30 sites across 25 counties of the Commonwealth.

KDAQ proposes to make the changes below to the ambient air monitoring network. Changes to the LMAPCD network are detailed in Appendix E.

### METROPOLITAN STATISTICAL AREAS

#### Cincinnati, OH-KY-IN

- As a cost saving measure, the collocated PM<sub>2.5</sub> FRM at Northern Kentucky University (21-037-3002) will be shut down, effective 12/31/2023. The primary PM<sub>2.5</sub> FRM will remain as the primary monitor for the site and will be collocated with the existing PM<sub>2.5</sub> FEM.

#### Clarksville, TN-KY

- As a cost saving measure, the meteorology station at Hopkinsville (21-047-0006) will be shut down, effective 12/31/2023. KDAQ plans on utilizing nearby Kentucky Mesonet sites for meteorological data, as needed.
- Due to influences from a nearby gravel drive, KDAQ plans to relocate Hopkinsville (21-047-0006) in the near future.
- The CASTNET ozone monitor at Cadiz (21-221-9991) was suspended in May 2022. Hopkinsville (21-047-0006) will replace Cadiz as the maximum ozone concentration site for the Clarksville, TN-KY MSA, effective July 1, 2023.

#### Owensboro, KY

- Owensboro Primary (21-059-0005) will have to be relocated soon due to development of the property. A new location has not been obtained.

### MICROPOLITAN STATISTICAL AREAS

#### Middlesborough, KY

- As a cost saving measure, the meteorology station at Middlesboro (21-013-0002) will be shut down, effective 12/31/2023. KDAQ plans on utilizing the nearby airport for meteorological data, as needed.

## SUMMARY OF KDAQ NETWORK CHANGES 2023

### NOT IN A MSA

#### Franklin, KY

- As a cost saving measure, the meteorology station at Franklin (21-213-0004) will be shut down, effective 12/31/2023. KDAQ plans on utilizing nearby Kentucky Mesonet sites for metrological data, as needed.

### Special Purpose Monitors (SPMs)

KDAQ has several monitors designated as SPMs that are criteria pollutant monitors comparable to the NAAQS. Since these monitors are effectively SLAMs, KDAQ concludes that these monitors should be updated to reflect the correct use and designation. The following monitors will be changed to SLAMs, effective January 1, 2024:

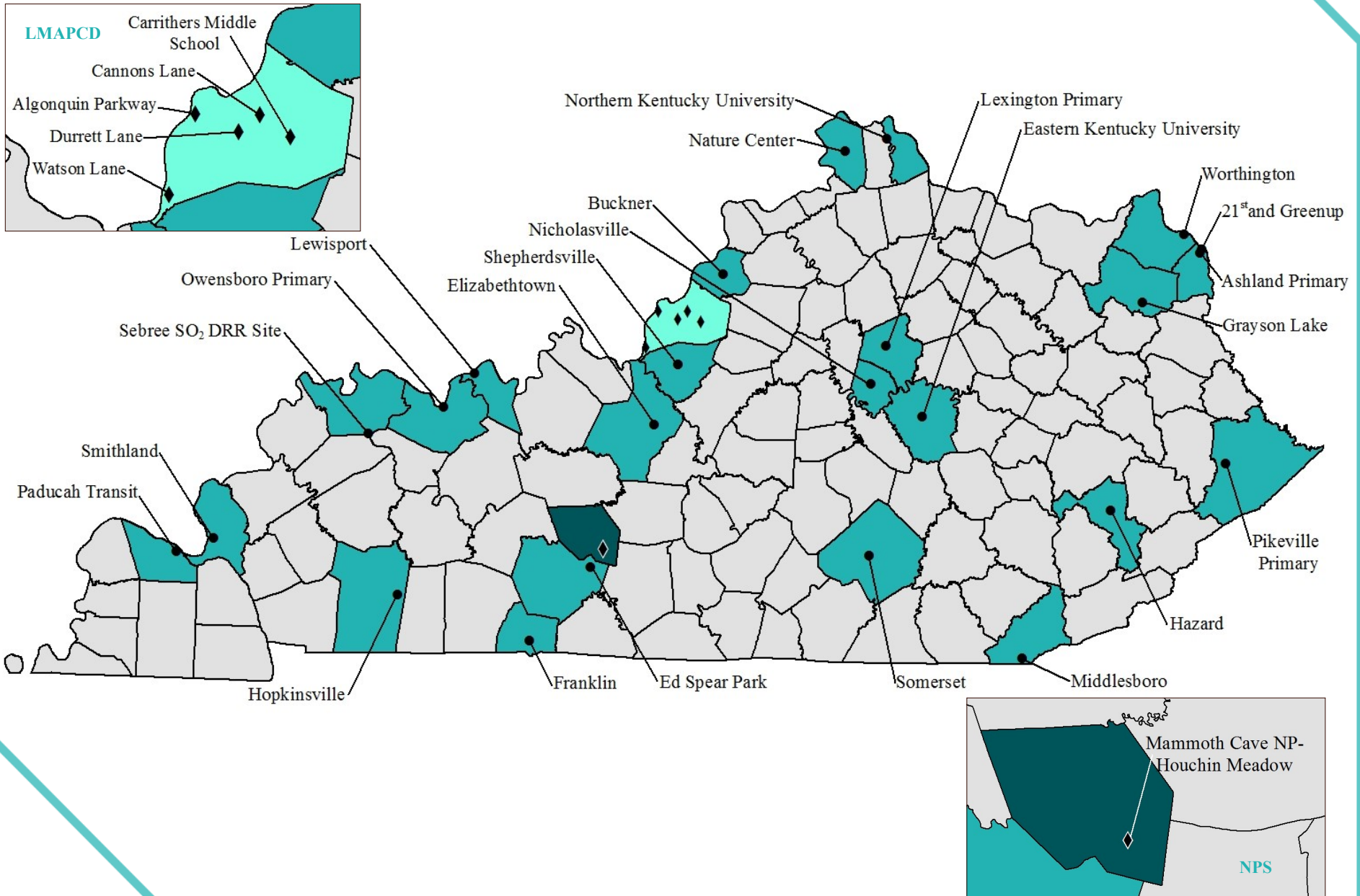
Site Name	Site ID	MSA	Monitor Type	Analysis Method	Frequency of Sampling
Grayson Lake	21-043-0500	Huntington-Ashland, WV-KY-OH	AEM Ozone	UV Photometry	Continuously March 1—October 31
Worthington	21-089-0007	Huntington-Ashland, WV-KY-OH	AEM Sulfur Dioxide	UV Fluorescence	Continuously
Nicholasville	21-113-0001	Lexington-Fayette, KY	AEM Sulfur Dioxide	UV Fluorescence	Continuously
Middlesboro	21-013-0002	Middlesborough, KY	AEM Ozone	UV Photometry	Continuously March 1—October 31
Somerset	21-199-0003	Somerset, KY	AEM Ozone	UV Photometry	Continuously March 1—October 31
Franklin	21-213-0004	Not in MSA	AEM Ozone	UV Photometry	Continuously March 1—October 31
Hazard	21-193-0003	Not in MSA	AEM Ozone	UV Photometry	Continuously March 1—October 31
Pikeville Primary	21-195-0002	Not in MSA	AEM Ozone	UV Photometry	Continuously March 1—October 31

## 2023 AIR MONITORING STATIONS SUMMARY

Metropolitan Statistical Area	Site Count	Filter Based PM <sub>2.5</sub>	Continuous PM <sub>2.5</sub>	PM <sub>10</sub>	Continuous PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NO <sub>y</sub>	CO	O <sub>3</sub>	Pb	VOC	Carbonyl	PAH	PM <sub>2.5</sub> Speciation	Carbon Speciation	Black Carbon	RadNet	Met
Bowling Green, KY	2		2 <sup>S,C,i</sup>			1		1	1	2 <sup>i,Max</sup>									1
Cincinnati-Middletown, OH-KY-IN (AQI) (PWEI)	2	1 <sup>c</sup>	1 <sup>i,S,C</sup>			1	1			2 <sup>i</sup>									
Clarksville, TN-KY	1		1 <sup>i,X,S</sup>							1 <sup>i</sup>									
Elizabethtown, KY	1	1 <sup>C</sup>	1 <sup>i,S</sup>							1 <sup>i,Max</sup>									
Evansville, IN-KY	1					1 <sup>DRR</sup>													
Huntington-Ashland, WV-KY-OH (AQI)	4		2 <sup>i,S,X</sup>	4 <sup>C,m</sup>		2	1			3 <sup>i,Max</sup>		2 <sup>D</sup>	2 <sup>D</sup>	1					2
Lexington-Fayette, KY (AQI)	2		1 <sup>i,S</sup>	1 <sup>m</sup>		2	1 <sup>r40</sup>			2 <sup>i,Max</sup>								1	
Louisville-Jefferson County, KY-IN (AQI) (PWEI)	7	2 <sup>n,C</sup>	5 <sup>e,E,i,n,S</sup>		2 <sup>i,E</sup>	3 <sup>i</sup>	2 <sup>n,i</sup>	1	2 <sup>n,i</sup>	6 <sup>i,Max</sup>		2 <sup>G</sup>	1		1	1	1	1	5 <sup>n</sup>
Owensboro, KY	2		1 <sup>i,S</sup>			1	1 <sup>i</sup>			2 <sup>i,Max</sup>									
Micropolitan Statistical Area																			
Paducah, KY-IL	2		1 <sup>i,S</sup>			1	1			2 <sup>i</sup>								1	
Somerset, KY	1		1 <sup>i,S</sup>							1 <sup>i</sup>									
Middlesborough, KY	1		1 <sup>i,S</sup>							1 <sup>i</sup>									
Richmond-Berea, KY	1										2 <sup>C</sup>								
Not in a CBSA																			
Perry County	1		1 <sup>i,S</sup>							1 <sup>i</sup>									1
Pike County	1		1 <sup>i,S</sup>							1 <sup>i</sup>									
Simpson County	1									1 <sup>i</sup>									
<b>KDAQ Totals</b>	<b>24</b>	<b>2</b>	<b>14</b>	<b>5</b>	<b>0</b>	<b>8</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>3</b>
<b>LMAPCD Totals</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>5</b>
<b>NPS Totals</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
<b>Total Network</b>	<b>30</b>	<b>4</b>	<b>19</b>	<b>5</b>	<b>2</b>	<b>12</b>	<b>7</b>	<b>2</b>	<b>3</b>	<b>26</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>9</b>

Tallies are equal to the actual number of monitors in operation. Superscripts represent additional information about the network. PWEI= PWEI SO2 Monitoring Required in MSA; r40=RA-40 Monitor; Max= Maximum O<sub>3</sub> Concentration Site; n=Near-Road Monitor; X= Regional PM<sub>2.5</sub> Transport or Background Monitor; S=Continuous PM T640; AQI=AQI Monitoring Required in CBSA; i=AQI Reported; m= PM10 Filter Analyzed for Metals; G=Continuous Auto-GC; C=Collocated Monitors ; D= Duplicate Channels; DRR= SO2 Data Requirements Rule Monitor; E= Continuous PM2.5-PM10 T640x-Coarse; (T640x samples for PM<sub>10</sub>, PM<sub>2.5</sub> and PM<sub>coarse</sub> with a single monitor)

# 2023 Ambient Air Monitoring Network



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## **STATION DESCRIPTION FORMAT**

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## **STATION DESCRIPTION FORMAT**

### **AQS Site Identification Information**

Pertinent, specific siting information for each site and monitor is stored in the US EPA's AQS data system. This information includes the exact location of the site, local and regional population, description of the site location, monitor types, and monitoring objectives. This site and monitor information is routinely updated whenever there is a change in site characteristics or pollutants monitored.

### **Network Station Description**

The network station descriptions contained in this document include the following information:

#### **1. Site Description**

Specific information is provided to show the location of the monitoring equipment at the site, the CBSA in which the site is located, the AQS identification number, the GPS coordinates, and the conformance of monitors and monitor-probes to siting criteria.

#### **2. Date Established**

The date that each existing monitoring station was established is shown in the description. For proposed air monitoring stations, the date that the station is expected to be in operation is included in the annual Summary of Network Changes.

#### **3. Site Approval Status**

Each monitoring station in the existing network has been reviewed with the purpose of determining whether it meets all design criteria for inclusion in the SLAMS network. Stations that do not meet the criteria will either be relocated in the immediate area or, when possible, re-sited at the present location. KDAQ may also seek an exemption from certain criteria from the US EPA.

#### **4. Monitoring Objectives**

The monitoring network was designed to provide information to be used as a basis for the following actions:

- (a) To determine compliance with ambient air quality standards and to plan measures in order to attain these standards.
- (b) To activate emergency control procedures in the event of an impending air pollution episode.
- (c) To observe pollution trends throughout a region including rural areas and report progress made toward meeting ambient air quality standards.
- (d) To provide a database for the evaluation of the effects of air quality on population, land use, and transportation planning; to provide a database for the development and evaluation of air dispersion models.

#### **5. Monitoring Station Designations, Monitor Types, and Network Affiliations**

The Annual Network Surveillance document must describe the types of monitors that are used to collect ambient data. Most monitors described in the air quality surveillance network are designated as SLAMS, but some monitors fulfill other requirements. Additionally, monitors

may be associated with additional networks beyond the state air program or may be used to fulfill multiple network design requirements.

**State and Local Air Monitoring Stations (SLAMS):** Requirements for air quality surveillance systems provide for the establishment of a network of monitoring stations designated as SLAMS that measure ambient concentrations of pollutants for which standards have been established. These stations must meet requirements that relate to four major areas: quality assurance, monitoring methodology, sampling interval, and siting of instruments.

**Special Purpose (SPM and SPM-Other):** Not all monitors and monitoring stations in the air quality surveillance network are included in the SLAMS network. In order to allow the capability of providing monitoring for complaint studies, modeling verification and compliance status, certain monitors are reserved for short-term studies and are designated as either Special Purpose Monitors (SPM) or Other Special Purpose Monitors (SPM-Other).

**NCore:** NCore is a multi pollutant network that integrates several advanced measurement systems for particulates, pollutant gases and meteorology.

**Air Quality Index (AQI):** The AQI is a method of reporting that converts pollutant concentrations to a simple number scale of 0-500. Intervals on the AQI scale are related to potential health effects of the daily measured concentrations of major pollutants. AQI reporting is required for all metropolitan statistical areas with a population exceeding 350,000. However, KDAQ provides this service to the general public for multiple areas within the state. KDAQ prepares the index twice daily for release to the public from the pollutant data reported from the selected sites in locations across Kentucky. The ambient air data establishing the AQI is subject to quality assurance procedures and is not considered official.

**Emergency Episode Monitoring (Episode):** Regulations provide for the operation of at least one continuous SLAMS monitor for each major pollutant in designated locations for emergency episode monitoring. These monitors are placed in areas of worst air quality and provide continual surveillance during episode conditions.

**EPA:** Monitor operated by the EPA or an EPA contractor. Monitors may be eligible for comparisons against the NAAQS and are typically a part of the CASTNET network.

**Non-EPA Federal:** Monitors operated by Federal agencies outside of the US EPA (such as the National Park Service) are designated as Non-EPA Federal monitors. These monitors are typically used for special studies, but the data may also be eligible for comparisons against the NAAQS.

**Population Weighted Emissions Index (PWEI):** On June 22, 2010, the US EPA released a new SO<sub>2</sub> Final Rule and a set of monitoring requirements. The requirements use a Population Weighted Emissions Index (PWEI) that is calculated for each Core-Based Statistical Area (CBSA). The PWEI is calculated by multiplying the population of each CBSA and the total amount of SO<sub>2</sub>, in tons per year, that is emitted within the CBSA based upon county level data from the National Emissions Inventory (NEI). The result is then divided by one million to provide the PWEI value, which is expressed in a unit of million persons-tons per year. PWEI requirements technically apply to the MSA and are not monitor specific. Any SO<sub>2</sub> used to fulfill MSA PWEI requirements must first and foremost be designated as SLAMS.

**Regional Administrator 40 (RA-40):** On February 9, 2010, the US EPA released a new NO<sub>2</sub> Final Rule and a new set of monitoring requirements. Under the new monitoring regulations, the EPA Regional Administrator must collaborate with agencies to establish or designate 40 NO<sub>2</sub> monitoring locations, with a primary focus on protecting susceptible and vulnerable populations. RA-40 NO<sub>2</sub> monitors are SLAMS monitors foremost.

**Maximum Ozone Concentration:** Each Metropolitan Statistical Area (MSA) must have at least one ozone monitor designated to record maximum expected ozone concentrations. These monitors are first and foremost SLAMS (or SLAMS-like) monitors.

## 6. **Monitoring Methods**

All sampling and analytical procedures used for NAAQS compliance in the air-monitoring network conform to Federal reference (FRM), alternate (FAM), or equivalent (FEM) methods. In case there is no federal method, procedures are described in the Kentucky Air Quality Monitoring and Quality Assurance Manuals.

### (a) **Particulate Matter 10 Microns in Size (PM<sub>10</sub>)**

All PM<sub>10</sub> samplers operated by KDAQ are certified as either FRM or FEM samplers and are operated according to the requirements set forth in 40 CFR 50 and 40 CFR 53. Intermittent samplers typically collect a 24-hour sample every sixth day on 46.2 mm PTFE filters. However, certain sites may collect samples more frequently to address local air quality concerns. Filters are sent to a contract laboratory, where they are weighed before and after a sample run. The gain in weight in relation to the volume of air sampled is calculated in micrograms per cubic meter (ug/m<sup>3</sup>). The PTFE filters are to be equilibrated before each weighing for a minimum of 24 hours at a 20-23 degrees C mean temperature and a 30-40% mean relative humidity.

For continuous PM<sub>10</sub> monitoring, LMAPCD uses Teledyne API T640x for PM<sub>10</sub> NAAQS compliance and PM<sub>coarse</sub> monitoring. TAPI T640x monitors collect PM<sub>2.5</sub>, PM<sub>10</sub>, and PM<sub>10-2.5 (coarse)</sub> data continuously via the principle of broadband particle-scattering spectroscopy. During sampling, ambient air is pulled into an inlet at a rate of 16.7 lpm and through a sample conditioner, prior to being introduced to a particle sensor equipped with a polychromatic (broadband) LED. Particles in the sample reflect light from the LED, which is measured by the analyzer and used to calculate the particle-mass of the sample.

### (b) **Particulate Matter 2.5 Microns in Size (PM<sub>2.5</sub>)**

The Division currently operates continuous Teledyne-API (TAPI) T640 continuous PM<sub>2.5</sub> spectroscopy monitors and manual intermittent samplers for monitoring particulate matter 2.5 microns in size (PM<sub>2.5</sub>). All PM<sub>2.5</sub> samplers and monitors operated by KDAQ are certified as either reference or equivalent methods. All FRM manual intermittent samplers are operated per the requirements set forth in 40 CFR 50, Appendix L. Samples are collected on 46.2 mm PTFE filters over a 24-hour sampling period, with airflow maintained at 16.7 liters per minute. Filters are sent to a contract laboratory, where they are weighed before and after a sample run. The gain in weight in relation to the volume of air sampled is calculated in micrograms per cubic meter (ug/m<sup>3</sup>). Samples must be retrieved within 177 hours of the end of the sample run and are kept cool (4 degrees C or cooler) during transit to the contract laboratory. The PTFE filters are to be equilibrated before each weighing for a minimum of 24 hours at a controlled atmosphere of 20-23 degrees C mean temperature and 30-40% mean relative humidity. Filters must be used within thirty days of initial weighing. Filters must be re-weighed within thirty days of the end of the sample run and must be kept at 4 degrees C or cooler.

TAPI T640 monitors collect PM<sub>2.5</sub> data continuously via the principle of broadband particle-scattering spectroscopy. The TAPI T640 is designated as a FEM for PM<sub>2.5</sub>. During sampling, ambient air is pulled into an inlet at a rate of 5.0 lpm and through a sample conditioner, prior to being introduced to a particle sensor equipped with a polychromatic (broadband) LED. Particles in the sample reflect light from the LED, which is measured by the analyzer and used to calculate the particle-mass of the sample.

LMAPCD uses Teledyne API T640 and T640x for NAAQS compliance monitoring. Continuous PM<sub>2.5</sub> T640s are used to provide 24-hour daily reporting for the AQI. The data obtained from continuous FEMs may or may not be used for comparison to the NAAQS. A statement on the use of continuous FEM PM<sub>2.5</sub> monitors is included in the appendices of this document.

(c) **PM<sub>2.5</sub> Speciation and Carbon Speciation Sampling and Analysis**

In addition to operating PM<sub>2.5</sub> samplers that determine only PM<sub>2.5</sub> mass values, LMAPCD also operates PM<sub>2.5</sub> speciation samplers that collect samples that are analyzed to determine the chemical makeup of PM<sub>2.5</sub>. Samples are collected on a set of two filters, one comprised of Teflon and one comprised of nylon, over a 24-hour sampling period. The filters are composed of either Teflon or nylon in order to collect specific types of toxic pollutants. A second instrument collects a sample on a quartz filter over a 24-hour sampling period. The quartz filter is used to collect a speciated carbon sample.

After collection, the samples are shipped in ice chests to an EPA contract laboratory for analysis. At the laboratory, the samples are analyzed using optical and electron microscopy, thermal-optical analysis, ion chromatography, and x-ray fluorescence to determine the presence and level of specific toxic compounds. Sample results are entered in the AQS data system.

(d) **Sulfur Dioxide (SO<sub>2</sub>)**

Instruments used to continuously monitor sulfur dioxide levels in the atmosphere employ the UV fluorescence method. The continuous data output from the instrument is transmitted by telemetry for entry into an automated central data system.

Calibration of these instruments is done dynamically using certified gas mixtures containing a known concentration of sulfur dioxide gas. This gas is then diluted in a specially designed apparatus to give varying known concentrations of sulfur dioxide. These known concentrations are supplied to the instruments, which are adjusted so that instrument output corresponds with the specific concentrations. Calibration curves are prepared for each instrument and each data point is automatically compared to this curve before entry into the data acquisition system.

(e) **Carbon Monoxide (CO)**

Continuous monitoring for carbon monoxide is performed by use of the non-dispersive infrared correlation method. Data is transmitted by telemetry for entry in an automated central data acquisition system.

Calibration of the instrument is performed periodically by using nitrogen or zero air to establish the zero baseline and NIST or NIST traceable gas mixtures of carbon monoxide in air. The span is checked daily using a certified mixture of compressed gas containing approximately 45 parts per million carbon monoxide.

(f) **Ozone (O<sub>3</sub>)**

Ozone is monitored using the UV photometry methods. The continuous data output from the instrument is transmitted by telemetry for entry into an automated central data acquisition system.

Monitors are calibrated routinely using an ozone generator, which is calibrated using the ultra violet photometry reference method. Calibration curves are prepared for each instrument and each data point is automatically compared to this curve before entry into the data acquisition system.

(g) **Nitrogen Dioxide (NO<sub>2</sub>)**

KDAQ uses the chemiluminescence method for monitoring the nitrogen dioxide level in the ambient air. The continuous data output from the instrument is transmitted by telemetry for entry into an automated central data acquisition system.

LMAPCD utilizes the Cavity-Attenuated Phase-Shift (CAPS) spectroscopy method as well as chemiluminescence to measure nitrogen dioxide and total reactive nitrogen (NO/NO<sub>y</sub>) respectively.

Calibration of these instruments is done dynamically using NIST certified gas mixtures of nitric oxide. Through the use of dilution apparatus, varying concentrations are produced and supplied to the monitors, thus producing a specific calibration curve for each instrument. Each data point is automatically compared to this curve before entry into the data acquisition system.

(h) **Lead (Pb)**

To determine lead concentrations, KDAQ uses high volume particulate samplers, which collect samples of suspended particulates onto 8 x 10 glass fiber filters. The samplers use a brushless motor and a critical flow orifice in order to achieve a sampling flow rate between 1.10 and 1.70 cubic meters per minute (m<sup>3</sup>/min) over the course of 24 hours. Upon collection, the filters are sent to an US EPA certified laboratory for analysis. The sample filters are cut into strips, acid digested according to 40 CFR Part 50, Appendix G, and analyzed by Inductively Coupled Plasma with Mass Spectroscopy Detection (ICP-MS).

(i) **Air Toxics**

Air toxics samples are classified into four categories: metals, volatile organic compounds (VOC), polycyclic aromatic hydrocarbons (PAH), and carbonyls.

Metal samples are collected on 46.2 mm PTFE filters over a 24-hour period from the PM<sub>10</sub> monitoring method. The filter is weighed before and after the sample run by a contract laboratory. The gain in weight in relation to the volume of air sampled is used to calculate the concentration in micrograms per cubic meter (ug/m<sup>3</sup>). The filter is then delivered to a separate US EPA contract laboratory for analysis by inductively coupled plasma/mass spectrometer analysis.

VOC samples are collected in a passivated vacuum canister. Ambient air is pulled into the canister over a 24-hour sampling period. The sample is shipped to an US EPA contract laboratory for analysis via gas chromatography. Additionally, LMAPCD operates a continuous automatic gas chromatographs, which continuously monitor for various VOCs and hazardous air pollutants.

PAH samples are collected by a hi-volume air sampler over a 24-hour period. The sample is collected on a polyurethane foam filter cartridge. After sampling, the filter cartridge is packed on ice and shipped to a US EPA contract laboratory for analysis via gas chromatography/mass spectrometry.

Carbonyl samples are collected on a DNPH cartridge. An ambient air stream flows through the cartridge at a one-liter per minute flow rate for a 24-hour sampling period. The cartridge is packed on ice and shipped to an US EPA contract laboratory for high-pressure liquid chromatography analysis.

(j) **Black Carbon**

LMAPCD plans to incorporate a black carbon monitor at the Durrett Lane (Near-Road) site to better characterize particulate carbon species. The analysis is performed at 7 optical wavelengths spanning the range from the near-infrared (950 nm) to the near-ultraviolet (370 nm). The sequencing of illumination and analysis is performed on a 1-Hz time base, yielding the complete spectrum of aerosol optical absorption with one data line every second.

The optical performance of the monitor is validated by a ‘Neutral Density Optical Filter Kit’, consisting of four precision optical elements whose absorbance is traceable to fundamental standards. Software routines measure the optical intensities at all wavelengths and compare the analysis at the instant with the original reference values.

(j) **RadNet**

The US EPA RadNet fixed air station consists of a high-volume sampler that pulls ambient air through a 4-inch diameter filter at a rate of 1,000 liters per minute. Filters are collected twice each week. The instrument also consists of two radiation detectors that continuously measure gamma and beta radiation from particulates collected on the air filter. Data is recorded to the monitor’s CPU and is sent hourly to the National Air and Radiation Environmental Laboratory (NAREL) for evaluation.

The RadNet network, which has stations in each State, has been used to track environmental releases of radioactivity from nuclear weapons tests and nuclear accidents. RadNet also documents the status and trends of environmental radioactivity. In general, data generated from RadNet provides the information base for making decisions necessary to ensure the protection of public health. The system helps the EPA determine whether additional sampling or other actions are needed in response to particular releases of radioactivity to the environment. RadNet can also provide supplementary information on population exposure, radiation trends, and other aspects of releases. Data is published by NAREL in a quarterly report entitled *Environmental Radiation Data*. While KDAQ and LMAPCD operate the monitors, all other aspects, including maintenance and data responsibility, are handled by the US EPA. For more information, please visit the US EPA’s RadNet website: [epa.gov/radnet](http://epa.gov/radnet).

**7. Quality Assurance Status**

The Division for Air Quality and LMAPCD both have an extensive quality assurance program to ensure that all air monitoring data collected is accurate and precise. KDAQ staff members audit air monitors on a scheduled basis, including those operated by the Louisville Metro Air Pollution Control District and the National Park Service, to ensure that each instrument is calibrated and operating properly. Agencies audit their data monthly and verify that the data reported by each instrument is recorded accurately in the computerized database.

**8. Scale of Representativeness**

Each station in the monitoring network must be described in terms of the physical dimensions of the air parcel nearest the monitoring station throughout which actual pollutant concentrations are reasonably similar. Area dimensions or scales of representativeness used in the network description are:

- (a) Microscale - defines the concentration in air volumes associated with area dimensions ranging from several meters up to about 100 meters.
- (b) Middle scale - defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.



- (c) Neighborhood scale - defines the concentrations within an extended area of a city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometers.
- (d) Urban scale - defines an overall city-sized condition with dimensions on the order of 4 to 50 kilometers.
- (e) Regional Scale - defines air quality levels over areas having dimensions of 50 to hundreds of kilometers.

The scale of representativeness is closely related to the type of air monitoring site and the objectives of that site. There are six basic types of sites supported by the ambient air monitoring network:

- (a) To determine the highest concentrations expected to occur in the area covered by the network.
- (b) To determine representative concentrations in areas of high population density.
- (c) To determine the impact on ambient pollution levels of significant sources or source categories.
- (d) To determine the extent of regional transport of pollutants.
- (e) To determine general background concentration levels.
- (f) To determine impacts on visibility, vegetation damage, or other welfare-based concerns.

The design intent in siting stations is to correctly match the area dimensions represented by the sample of monitored air with the area dimensions most appropriate for the monitoring objective of the station. The following relationship of these six basic site type and the scale of representativeness are appropriate when siting monitoring stations:

<u>Monitoring Site Type</u>	<u>Scale of Representativeness</u>
Highest Concentration	Micro, Middle, Neighborhood
Population Oriented	Neighborhood, Urban
Source Impact	Micro, Middle, Neighborhood
Regional Transport & General Background	Neighborhood, Regional
Welfare-based Impacts	Urban, Regional

## **Data Processing and Reporting**

All ambient air quality data collected by KDAQ are stored on a server located at the main office building of Commonwealth Office of Technology at 101 Cold Harbor Drive, Frankfort, Kentucky. The server runs a full database back up every night and keeps an hourly transaction log. After each month of data has passed all quality assurance checks, the data is transmitted via telemetry to the US EPA's national data storage system known as AQS.

All ambient air quality and meteorological data collected by LMAPCD are stored on a server maintained by Louisville Metro's Department of Information Technology (DoIT) located at 410 South 5th Street in Louisville, KY. The server runs a full database back up every night and those data are stored at an offsite facility for disaster recovery purposes.

Statistical data summaries are generated from the AQS database are compiled to produce the Ambient Air Quality Annual Report. This report may be accessed at the KDAQ website: <https://eec.ky.gov/Environmental-Protection/Air/Pages/Division-Reports.aspx>.

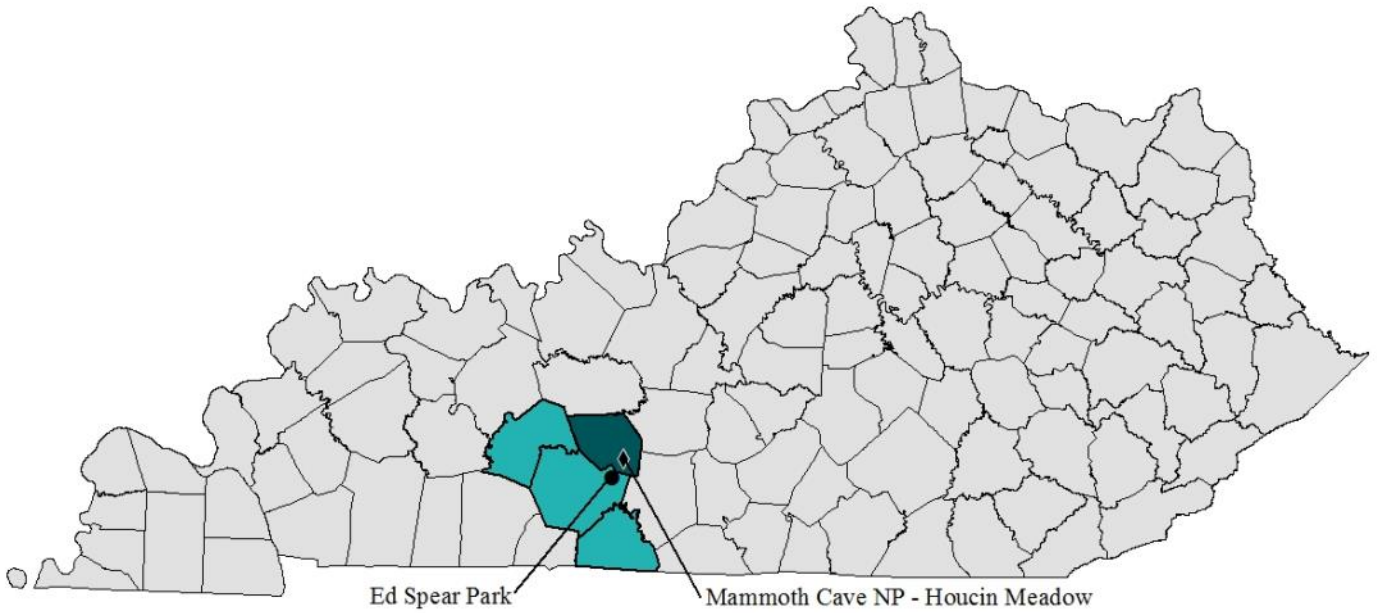
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## **AIR MONITORING STATION DESCRIPTIONS**

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# Bowling Green, KY



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-061-0501	Alfred Cook Road					1 <sup>F</sup>		1 <sup>F</sup>	1 <sup>F</sup>	1 <sup>F, M</sup>									1 <sup>F</sup>
Edmonson	Mammoth Cave (NPS)																		
21-227-0009	226 Sunset Street		2 <sup>C, S, i</sup>																
Warren	Smiths Grove																		
<b>Totals</b>	<b>2</b>		<b>2</b>			<b>1</b>		<b>1</b>	<b>1</b>	<b>2</b>									<b>1</b>

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network.

F = Non-EPA Federal Monitor

S = Continuous T640 Monitor

C = Collocated

i = AQI Reported

M = Maximum Ozone Concentration Site for MSA

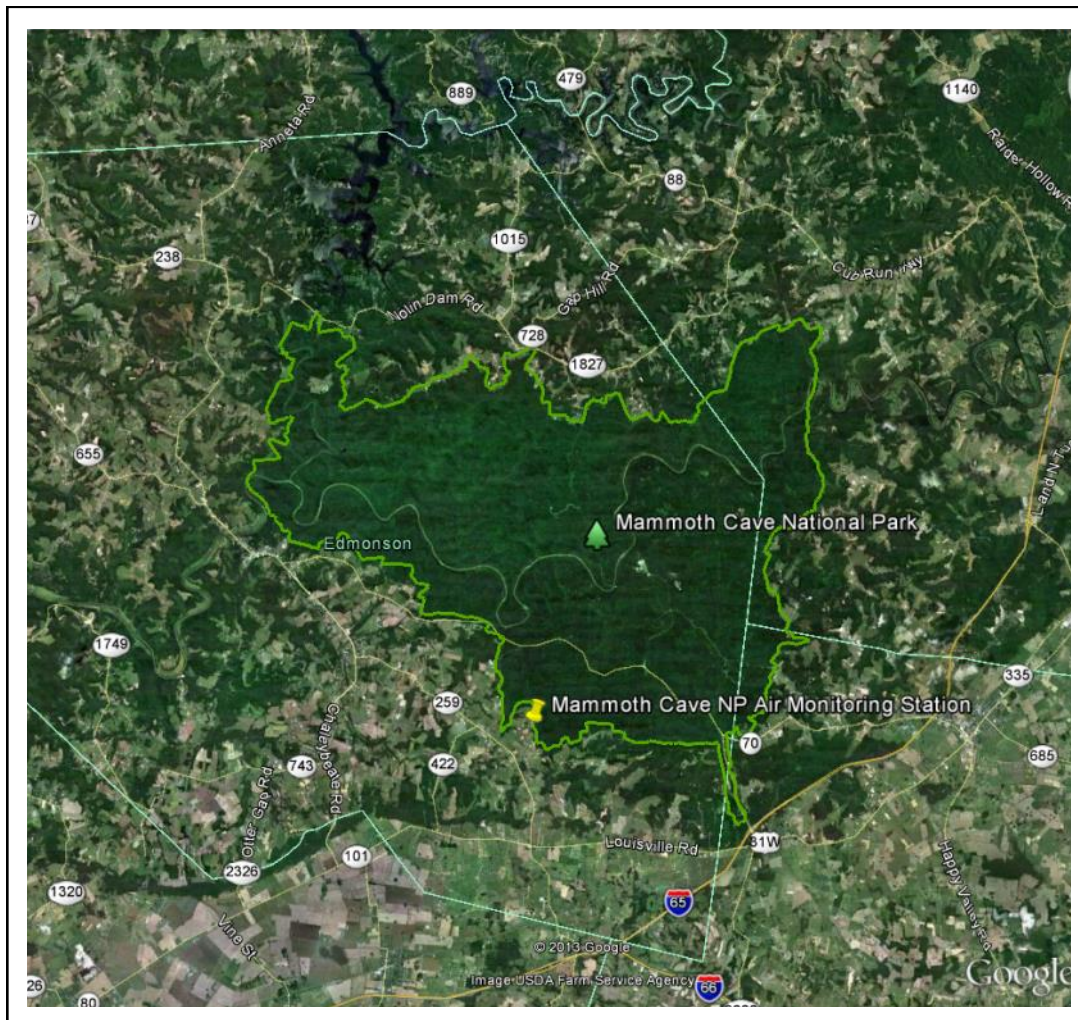
**CSA/MSA:** Bowling Green-Glasgow, KY CSA; Bowling Green, KY MSA  
**401 KAR 50:020 Air Quality Region:** South Central Kentucky Intrastate (105)  
**Site Name:** Mammoth Cave National Park-Houchin Meadow  
**AQS Site ID:** 21-061-0501  
**Location:** Alfred Cook Road, Park City, KY 42160  
**County:** Edmonson  
**GPS Coordinates:** 37.13182, -86.147944 (NAD83)  
**Date Established:** August 1, 1997  
**Inspection Date:** October 26, 2022  
**Inspection By:** Jenna Nall and Sam Guizio



Mammoth Cave National Park was established as one of 156 mandatory Federal Class I Areas nationwide under the Clean Air Act Amendments of 1977. Class I Areas are imparted with the highest level of air quality protections, especially regarding visibility degradation (haze). The Division maintains a cooperative relationship with Mammoth Cave National Park and frequently includes the site’s data in air quality analyses. Additionally, the ozone monitor is designated as the “Maximum Ozone Concentration” monitor for the Bowling Green, KY MSA. However, KDAQ does not operate the site nor certify the annual data. While the park conducts a variety of air quality studies, only certain data is reported to the EPA’s AQS database.

Monitors				
Monitor Type	Inlet Height (meters)	Designation	Analysis Method	Frequency of Sampling
AEM Ozone	10.2	CASTNET Maximum O <sub>3</sub> Non-EPA Federal	Automated Equivalent Method utilizing UV photometry analysis	Continuously
Sulfur Dioxide	10.6	Non-EPA Federal	Automated Equivalent Method utilizing trace level UV fluorescence analysis	Continuously
Total Reactive Nitrogen (NO/NO <sub>x</sub> )	10.6	Non-EPA Federal	Automated method utilizing trace level chemiluminescence analysis	Continuously
Carbon Monoxide	10.6	Non-EPA Federal	Automated Reference Method utilizing trace level non-dispersive infrared analysis	Continuously

Monitors (Continued)				
Monitor Type	Inlet Height (meters)	Designation	Analysis Method	Frequency of Sampling
Meteorological	14.1	Non-EPA Federal	AQM grade instruments for wind speed, wind direction, solar radiation, precipitation, humidity, barometric pressure, and temperature	Continuously



**CSA/MSA:** Bowling Green-Glasgow, KY CSA; Bowling Green, KY MSA  
**401 KAR 50:020 Air Quality Region:** South Central Kentucky Intrastate (105)  
**Site Name:** Ed Spear Park (Smiths Grove)  
**AQS Site ID:** 21-227-0009  
**Location:** 226 Sunset Street, Smiths Grove, KY 42171  
**County:** Warren  
**GPS Coordinates:** 37.04926, -86.21487 (NAD83)  
**Date Established:** May 3, 2012  
**Inspection Date:** October 26, 2022  
**Inspection By:** Jenna Nall and Sam Guizio  
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



This monitoring site was established as a replacement for the Oakland (Warren County) air monitoring station (21-227-0008). In October 2010, the Oakland site was found to be sitting within the doline of a sinkhole and was discontinued. Monitoring was established at the new Ed Spear Park site in May 2012. Inspections found the sample lines and equipment to be in good condition. The sample inlets are 39 meters from the nearest road. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards. While not required for the CBSA, the site also provides levels of ozone and particulate matter for daily index reporting.

Monitors				
Monitor Type	Inlet Height (meters)	Designation	Analysis Method	Frequency of Sampling
AEM Ozone	4.08	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.65	SLAMS AQI	Broadband Spectroscopy	Continuously
Collocated FEM PM <sub>2.5</sub> Continuous	4.67	SLAMS	Broadband Spectroscopy	Continuously

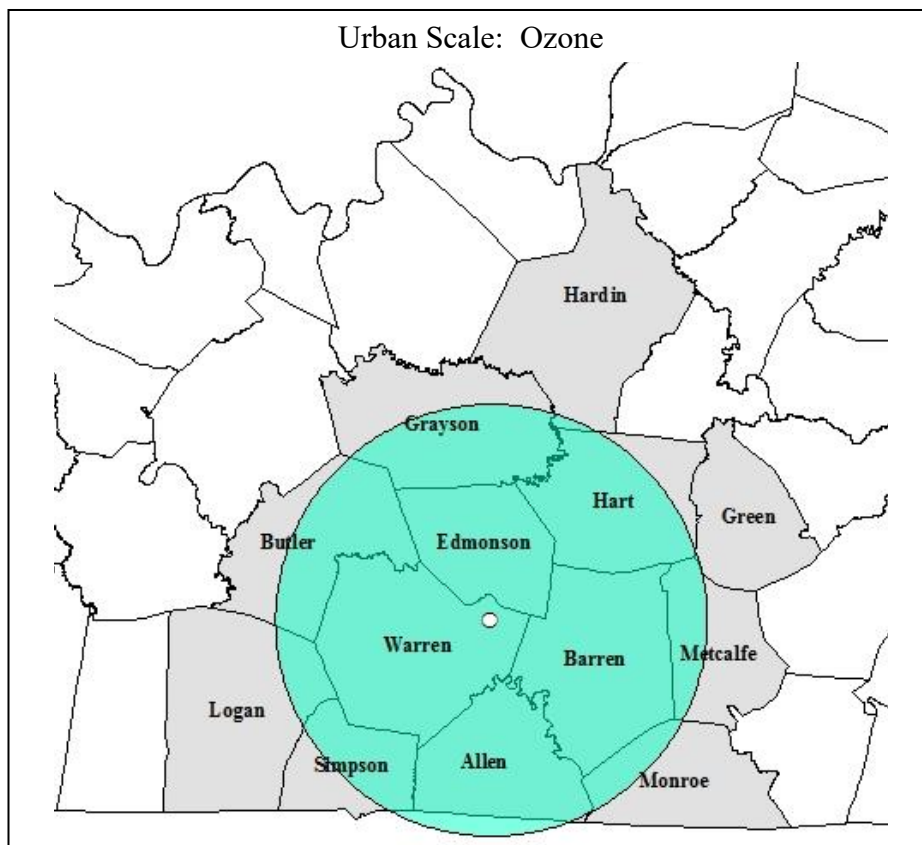
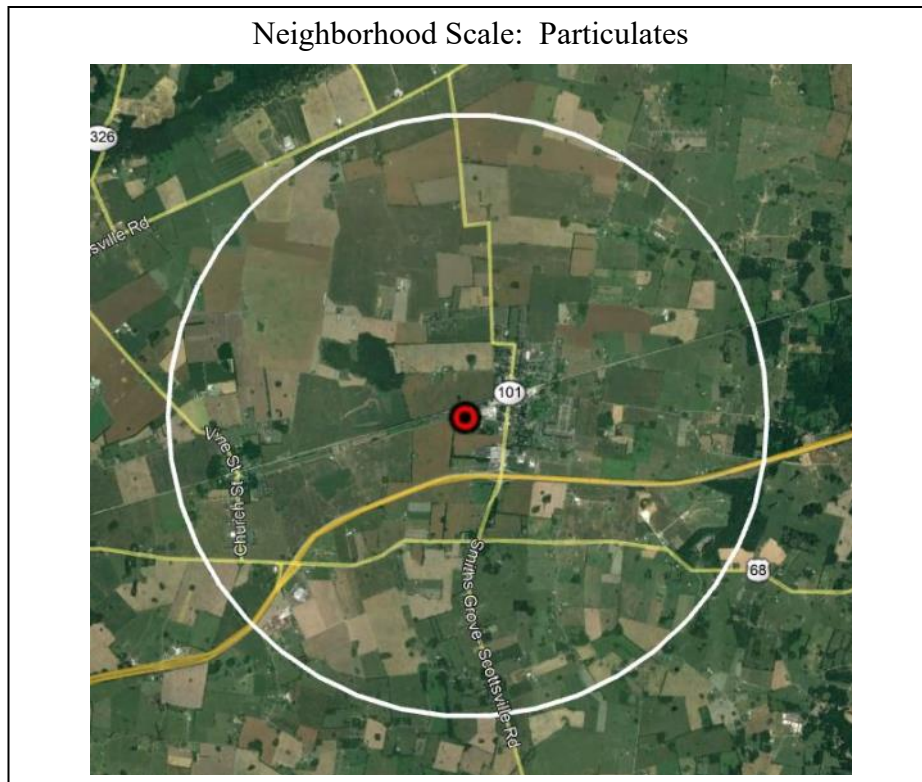
**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.



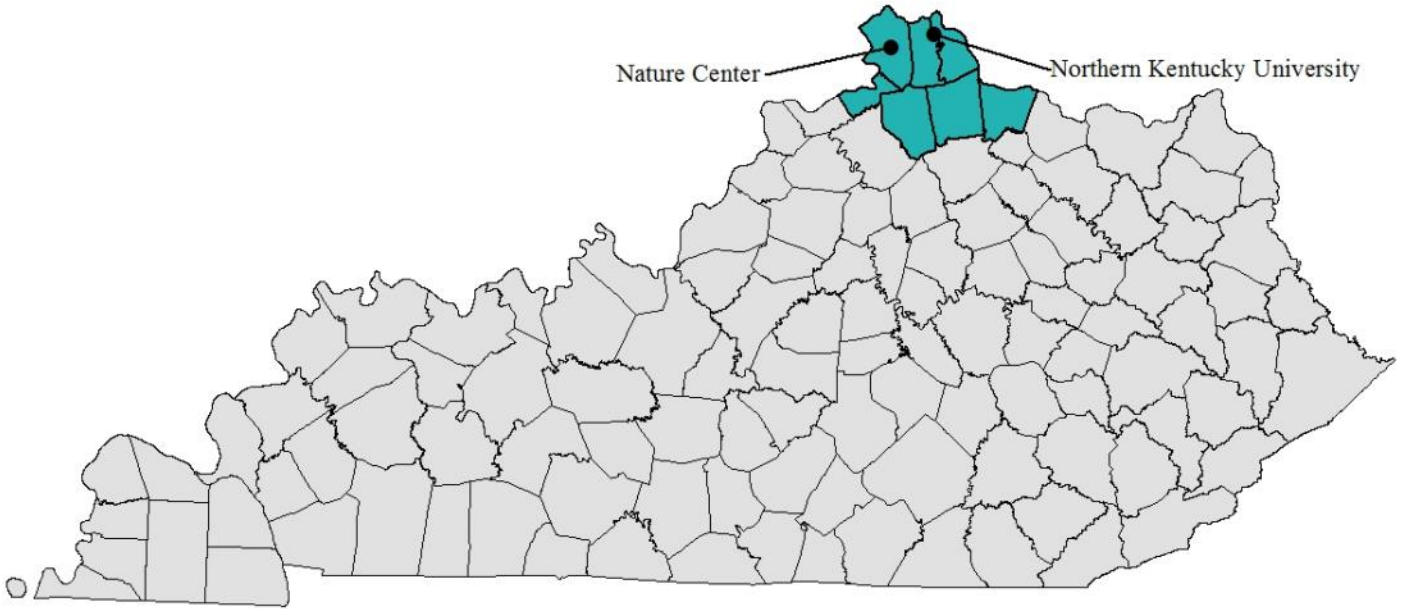
**Area Representativeness:**

This site represents population exposure on a neighborhood scale for particulates. This site also represents population exposure on an urban scale for ozone.



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# Cincinnati, OH-KY-IN



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-015-0008 Boone	9101 Camp Ernst Rd Union										1 <sup>i</sup>								
21-037-3002 Campbell	524A John's Hill Rd Highland Heights	1 <sup>C</sup>	1 <sup>S,C,i</sup>			1	1			1 <sup>e,i</sup>									
<b>Totals</b>	<b>2</b>	<b>1</b>	<b>1</b>			<b>1</b>	<b>1</b>			<b>2</b>									

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network.

i=AQI Reported  
C=Collocated Monitors

e=Emergency Episode Monitor  
S=Continuous T640 Monitor

CSA/MSA: Cincinnati-Wilmington-Maysville, OH-KY-IN CSA; Cincinnati, OH-KY-IN MSA

401 KAR 50:020 Air Quality Region: Metropolitan Cincinnati (Ohio) Interstate (079)

Site Name: Nature Center

AQS Site ID: 21-015-0008

Location: 9101 Camp Ernst Rd, Union, KY 41091

County: Boone

GPS Coordinates: 38.9674434, -84.7213627(NAD 83)

Date Established: April 13, 2022

Inspection Date: October 13, 2022

Inspection By: Jenna Nall

Site Approval Status: Site and monitor meet all design criteria for the monitoring network.



This monitoring site was established as a replacement for East Bend (21-015-0003) due to siting issues that could not be resolved. The site is located on the grounds of the Boone County Extension Environmental and Nature Center. A Kentucky Mesonet station is located approximately 45 meters SSW from the air monitoring shelter. The sample inlet is approximately 29 meters from the nearest road. Upon inspection, the sample line and monitor were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E, and G.

**Monitoring Objective:**

The monitoring objective is to determine compliance with National Ambient Air Quality Standards.

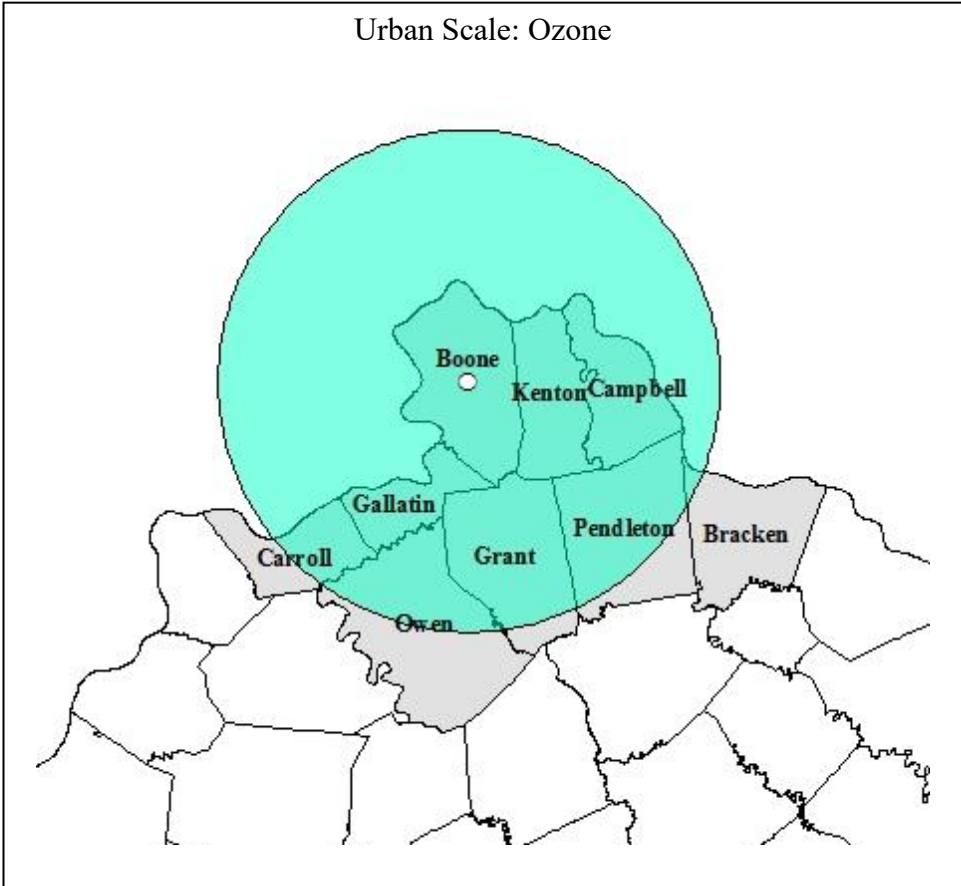
Monitors				
Monitor Type	Inlet Height (meters)	Designation	Analysis Method	Frequency of Sampling
AEM Ozone	4.09	SLAMS AQI	UV photometry	Continuously March 1 – October 31

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site will represent the upwind background levels on an urban scale for ozone.



**CSA/MSA:** Cincinnati-Wilmington-Maysville, OH-KY-IN CSA; Cincinnati, OH-KY-IN MSA  
**401 KAR 50:020 Air Quality Region:** Metropolitan Cincinnati (Ohio) Interstate (079)  
**Site Name:** Northern Kentucky University (NKU)  
**AQS Site ID:** 21-037-3002  
**Location:** 524A John's Hill Road, Highland Heights, KY 41076  
**County:** Campbell  
**GPS Coordinates:** 39.021834, -84.474436 (NAD 83)  
**Date Established:** August 1, 2007  
**Inspection Date:** October 13, 2022  
**Inspection By:** Jenna Nall  
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on farmland owned by Northern Kentucky University in Highland Heights, Kentucky. The sample inlets are 450 meters from the nearest road, which is Interstate 275. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to provide ozone, particulate, nitrogen dioxide, and sulfur dioxide levels for daily index reporting; and to detect elevated pollutant levels for activation of emergency control procedures for ozone.

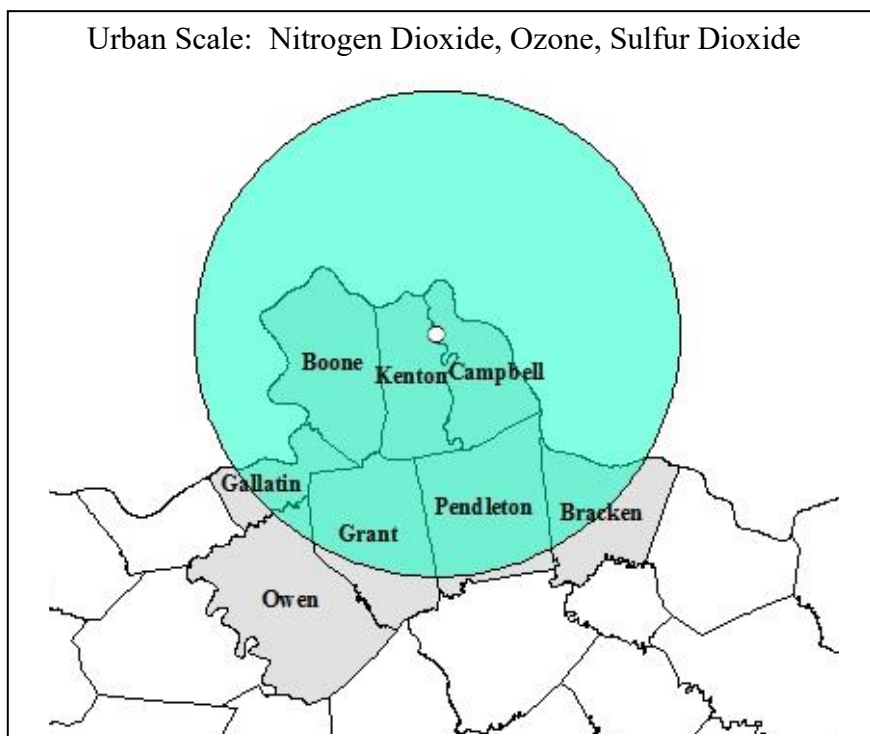
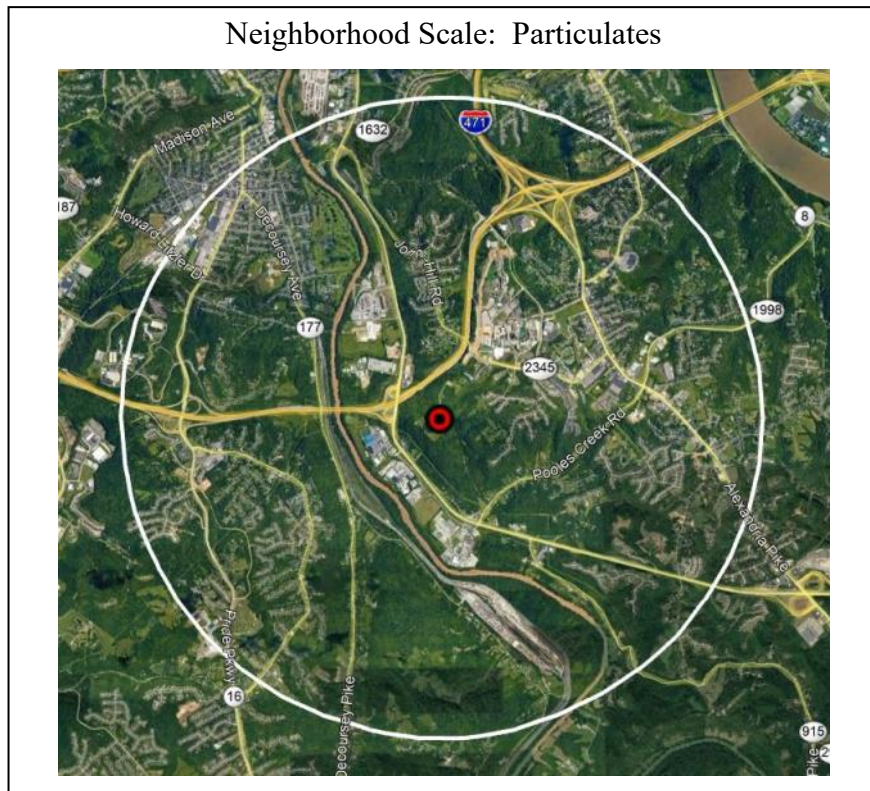
Monitors				
Monitor Type	Inlet Height (meters)	Designation	Analysis Method	Frequency of Sampling
AEM Nitrogen Dioxide (NO <sub>2</sub> , NO, NO <sub>x</sub> )	3.77	SLAMS	Chemiluminescence	Continuously
AEM Ozone	3.8	SLAMS AQI EPISODE	UV photometry	Continuously March 1 – October 31
FRM PM <sub>2.5</sub>	4.62	SLAMS	Gravimetric	24-hours every third day
FEM PM <sub>2.5</sub> Continuous	4.62	SLAMS AQI	Broadband Spectroscopy	Continuously
AEM Sulfur Dioxide	3.77	SLAMS	UV fluorescence	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

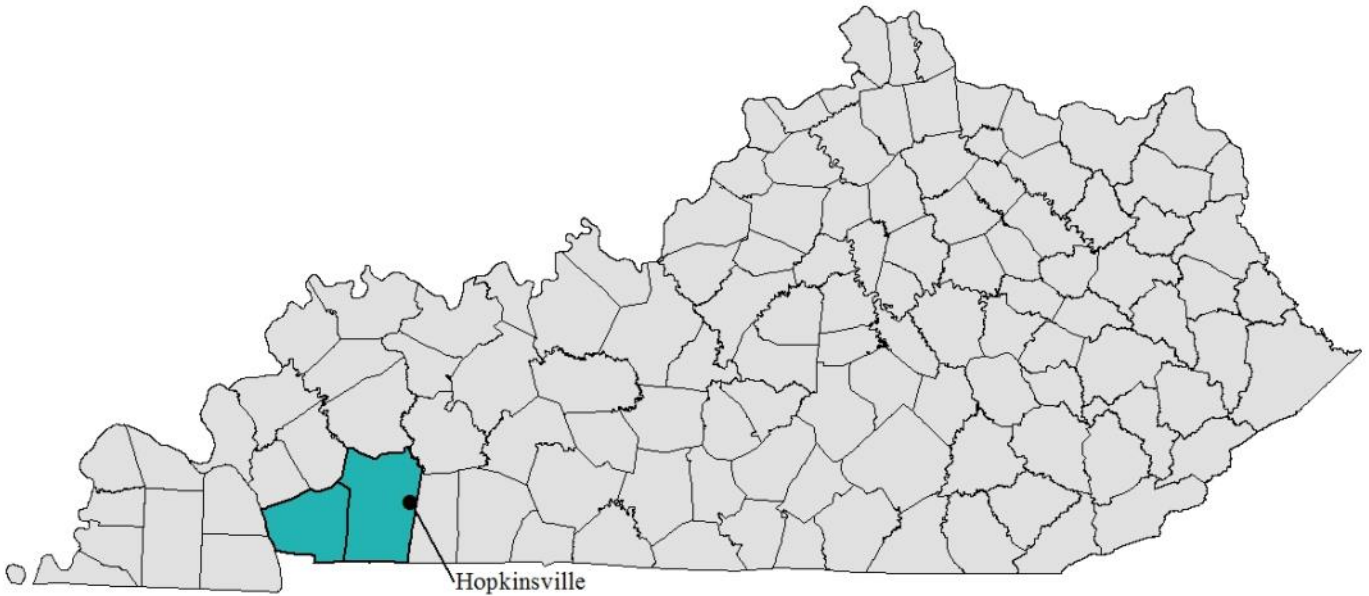
This site represents population exposure for nitrogen dioxide, ozone, and sulfur dioxide on an urban scale. This site also represents population exposure on a neighborhood scale for particulate matter.



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# Clarksville, TN-KY



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-047-0006 Christian	10800 Pilot Rock Rd Hopkinsville		1 <sup>i,S,X</sup>							1 <sup>i,M</sup>									
<b>Totals</b>	<b>1</b>		<b>1</b>							<b>1</b>									

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network.

- X =Regional Transport PM2.5 Monitor
- i =AQI Reported
- S =Continuous T640 Monitor
- M = Maximum Ozone Concentration Site for MSA

**CSA/MSA:** Clarksville, TN- KY MSA

**401 KAR 50:020 Air Quality Region:** Paducah - Cairo Interstate (072)

**Site Name:** Hopkinsville

**AQS Site ID:** 21-047-0006

**Location:** 10800 Pilot Rock Road, Hopkinsville, KY 42240

**County:** Christian

**GPS Coordinates:** 36.911678, -87.323322 (NAD 83)

**Date Established:** January 1, 1999

**Inspection Date:** November 14, 2022

**Inspection By:** Jenna Nall and Jennifer Miller

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located in a field on the property of a private residence, located at 10800 Pilot Rock Road in Hopkinsville, Kentucky. The sample inlets are 104 meters from the nearest road. Upon inspection, the sample inlets and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E, and G. Due to increased traffic from a gravel drive that runs adjacent to the site, KDAQ is currently looking to relocate the Hopkinsville site.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to determine levels of interstate regional transport of fine particulate matter and ozone.

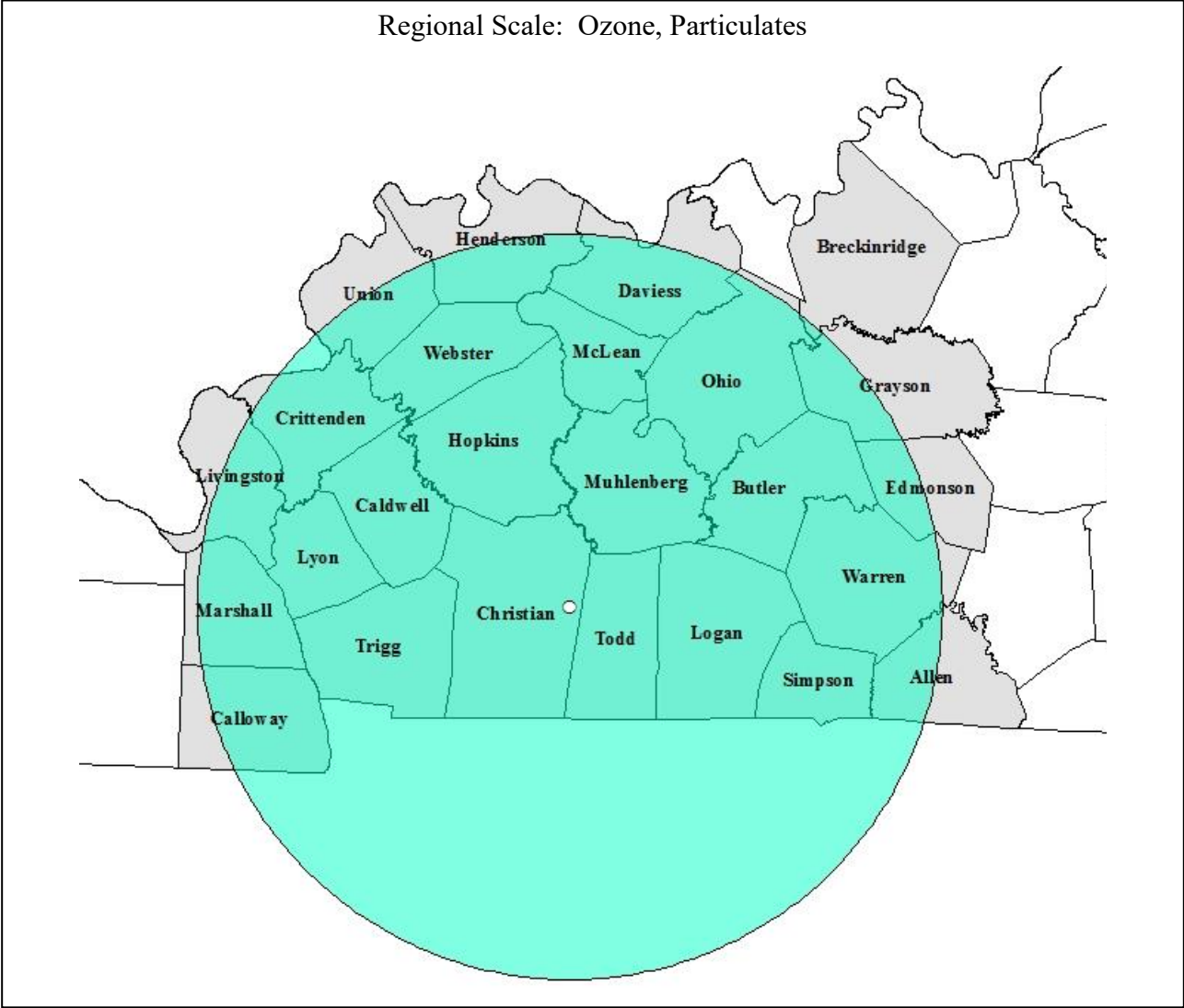
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.75	SLAMS AQI Maximum O <sub>3</sub> Transport	UV photometry	Continuously  March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.64	SLAMS AQI Transport	Broadband Spectroscopy	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site represents population exposure on a regional scale for ozone and PM<sub>2.5</sub>.



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# Elizabethtown-Fort Knox, KY



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-093-0006 Hardin	801 North Miles St. Elizabethtown	1 <sup>C</sup>	1 <sup>S,i</sup>							1 <sup>M,i</sup>									
<b>Totals</b>	<b>1</b>	<b>1</b>	<b>1</b>							<b>1</b>									

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network.

C=Collocated

M=Maximum Ozone Concentration Site for MSA

S=Continuous T640 Monitor

i=AQI Reported

**CSA/MSA:** Louisville/Jefferson County--Elizabethtown-Bardstown, KY-IN CSA; Elizabethtown-Fort Knox, KY MSA

**401 KAR 50:020 Air Quality Region:** North Central Kentucky Intrastate (104)

**Site Name:** Elizabethtown (E-town)

**AQS Site ID:** 21-093-0006

**Location:** American Legion Park, 801 North Miles Street, Elizabethtown, KY 42701

**County:** Hardin

**GPS Coordinates:** 37.70564, -85.85269 (NAD 83)

**Date Established:** February 24, 2000

**Inspection Date:** October 20, 2022

**Inspection By:** Jenna Nall

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located near the tennis courts on the grounds of the American Legion Park in Elizabethtown, Kentucky. In 2012, the site was moved approximately 23 meters due to potential expansion of a nearby park building. From the new location, the sample inlets are approximately 40 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, and E.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

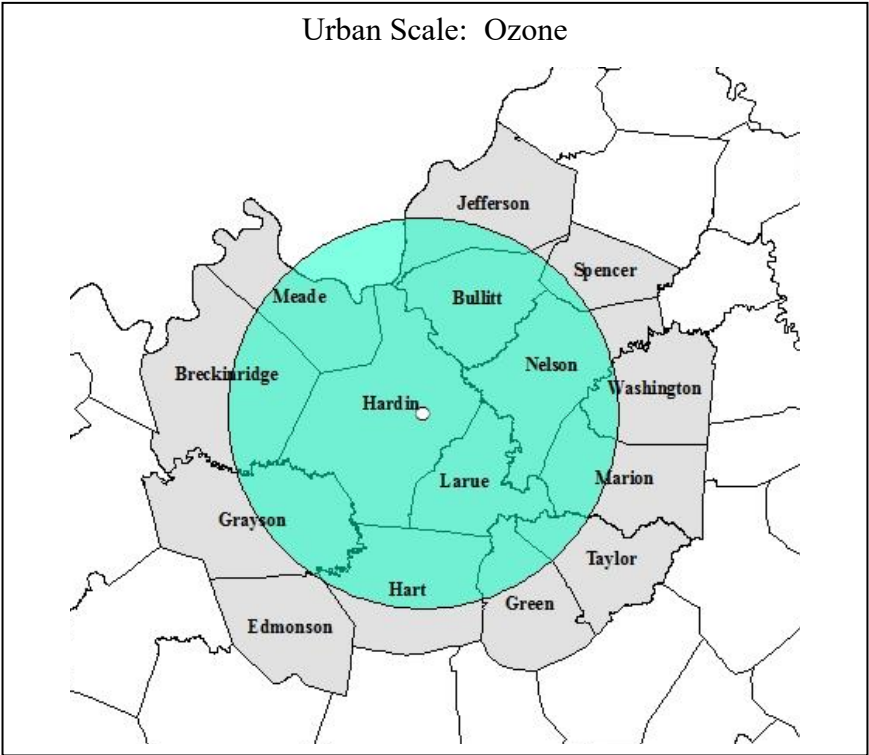
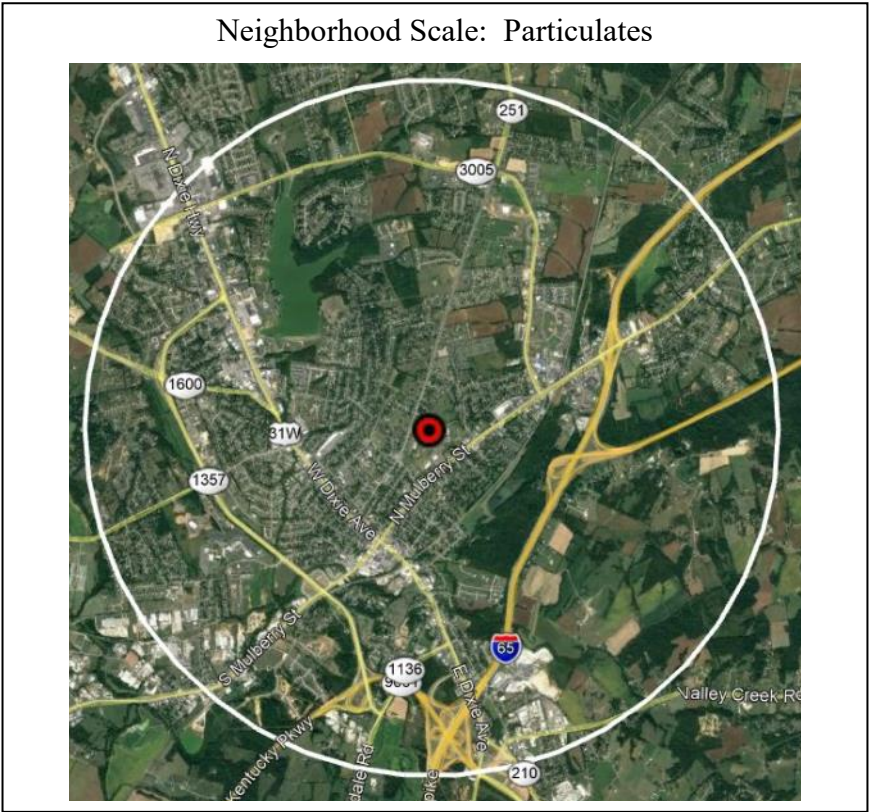
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.59	SLAMS AQI Maximum O <sub>3</sub>	UV photometry	Continuously  March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.6	SLAMS AQI	Broadband Spectroscopy	Continuously
Collocated FRM PM <sub>2.5</sub>	4.61	SLAMS	Gravimetric	24-hours every sixth day

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

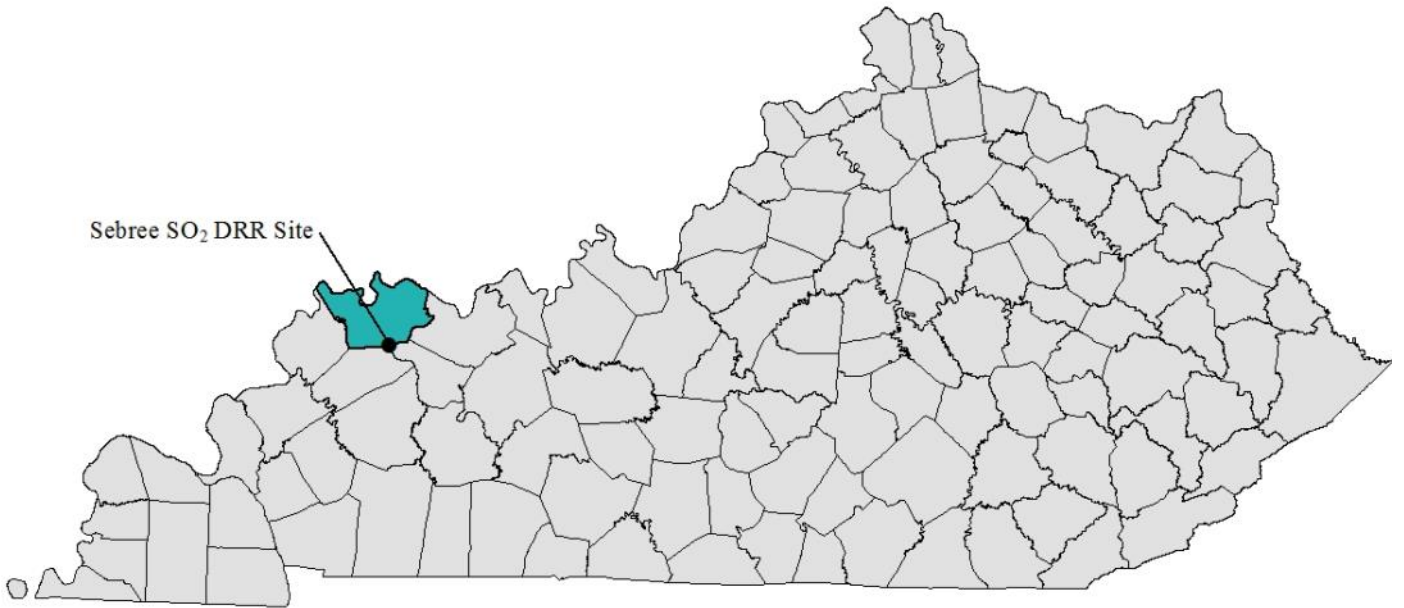
This site represents population exposure on a neighborhood scale for particulates and population exposure on an urban scale for ozone.



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# Evansville, IN-KY



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-101-1011	Alcan Aluminum Rd. Robards, KY 42452					1 <sup>DRR</sup>													
<b>Totals</b>	<b>1</b>					<b>1</b>													

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network.

DRR = SO2 Data Requirements Rule Monitor

**CSA/MSA:** Evansville, IN-KY MSA  
**401 KAR 50:020 Air Quality Region:** Evansville-Owensboro-Henderson Interstate (077)  
**Site Name:** Sebree SO<sub>2</sub> DRR Site  
**AQS Site ID:** 21-101-1011  
**Location:** Alcan Aluminum Road  
**County:** Henderson  
**GPS Coordinates:** 37.654391, -87.511424 (NAD 83)  
**Date Established:** January 1, 2017  
**Inspection Date:** October 6, 2022  
**Inspection By:** Jenna Nall and Guizio  
**Site Approval Status:** Site and monitor meet design criteria for the monitoring network.



On August 10, 2015, the EPA finalized requirements in 40 CFR 51, Subpart BB requiring air pollution control agencies to monitor ambient sulfur dioxide (SO<sub>2</sub>) concentrations in areas with large sources of sulfur dioxide emissions in order to assist in the implementation for the one-hour SO<sub>2</sub> National Ambient Air Quality Standard (NAAQS). Known as the “Data Requirements Rule (DRR),” this action established that, at a minimum, agencies must characterize air quality around sources that emit 2,000 tons per year (tpy) or more of sulfur dioxide. The site meets the requirements of 40 CFR 58, Appendices A, C, D, and E.

As allowed by the DRR, an ambient air monitoring site has been established near Sebree, Kentucky, to characterize maximum hourly sulfur dioxide concentrations in the immediate vicinity of the Big Rivers Electric Corporation and Century Aluminum Sebree, LLC facilities. The site is located at the intersection of Alcan Aluminum Road and a facility coal-truck access road, approximately 1/2 mile south of State Route 2678.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

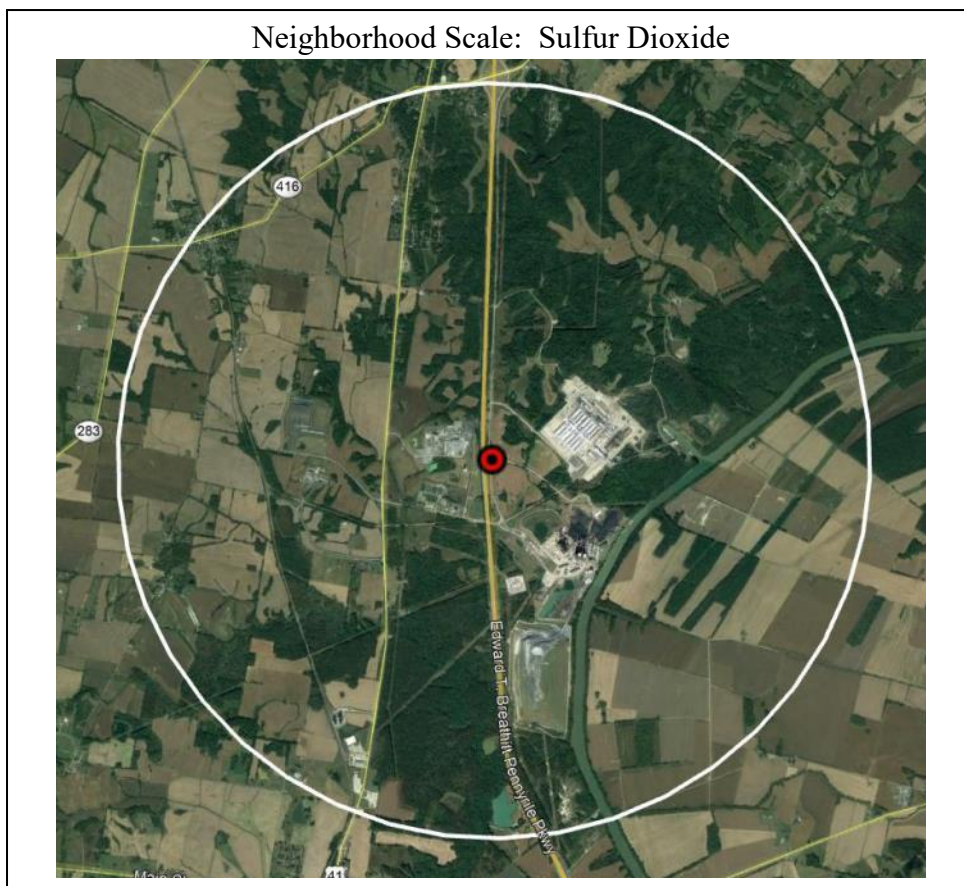
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Sulfur Dioxide	3.81	SLAMS	UV fluorescence	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site represents population exposure on a neighborhood scale for sulfur dioxide.



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# Huntington-Ashland, WV-KY-OH



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-019-0002 Boyd	122 22nd Street Ashland		2 <sup>C,m</sup>																
21-019-0017 Boyd	2924 Holt Street Ashland		1 <sup>S,i</sup>			1 <sup>e</sup>	1 <sup>e</sup>			1 <sup>e,i,M</sup>									1
21-043-0500 Carter	1486 Camp Webb Road Grayson		1 <sup>i,S,X</sup>	2 <sup>C,m</sup>						1 <sup>i</sup>		2 <sup>D</sup>	2 <sup>D</sup>	1					1
21-089-0007 Greenup	Scott St. & Center Ave. Worthington					1 <sup>e</sup>				1 <sup>e,i</sup>									
<b>Totals</b>	<b>4</b>		<b>2</b>	<b>4</b>		<b>2</b>	<b>1</b>			<b>3</b>		<b>2</b>	<b>2</b>	<b>1</b>					<b>2</b>

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network.

- |  |                                      |
|--|--------------------------------------|
| i =AQI Reported                            | m =PM10 Filter Analyzed for Metals   |
| C=Collocated                               | e =Emergency Episode Monitor         |
| S=Continuous T640 Monitor                  | X =Regional Background PM2.5 Monitor |
| M=Maximum Ozone Concentration Site for MSA | D=Duplicate                          |

**CSA/MSA:** Charleston-Huntington-Ashland, WV-OH-KY CSA; Huntington-Ashland, WV-KY-OH MSA

**401 KAR 50:020 Air Quality Region:** Huntington (WV)-Ashland (KY)-Portsmouth-Ironton (OH) Interstate (103)

**Site Name:** 21<sup>st</sup> and Greenup

**AQS Site ID:** 21-019-0002

**Location:** 121 22<sup>nd</sup> Street, Ashland, KY 41101

**County:** Boyd

**GPS Coordinates:** 38.47676, -82.63137 (NAD 83)

**Date Established:** April 2, 1978

**Inspection Date:** October 11, 2022

**Inspection By:** Jenna Nall

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is located on the west end of the roof of the Valvoline Oil complex building in Ashland, Kentucky. The building is one story tall. The sample inlets are 38 meters from the nearest road. Upon inspection, the sample inlets and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, and E.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to measure concentrations of a sub-group of air toxics.

<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
FRM PM <sub>10</sub>	6.52	SLAMS	Gravimetric	24-hours every sixth day
- Metals PM <sub>10</sub>		SPM-Other	Determined from the PM <sub>10</sub> sample using EPA method IO 3.5	Same as PM <sub>10</sub>
Collocated FRM PM <sub>10</sub>	6.52	SLAMS	Gravimetric	24-hours every twelfth day
- Collocated Metals PM <sub>10</sub>		SPM-Other	Determined from the PM <sub>10</sub> sample using EPA method IO 3.5	24-hours; six samples per year

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

The site represents maximum concentration on a middle scale for particulates and metals.



**CSA/MSA:** Charleston-Huntington-Ashland, WV-OH-KY CSA; Huntington-Ashland, WV-KY-OH MSA

**401 KAR 50:020 Air Quality Region:** Huntington (WV)-Ashland (KY)-Portsmouth-Ironton (OH) Interstate (103)

**Site Name:** Ashland Primary (FIVCO)

**AQS Site ID:** 21-019-0017

**Location:** FIVCO Health Department, 2924 Holt Street, Ashland, KY 41101

**County:** Boyd

**GPS Coordinates:** 38.459347, -82.640386 (NAD 83)

**Date Established:** January 1, 1999

**Inspection Date:** October 11, 2022

**Inspection By:** Jenna Nall

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of the health department building in Ashland, Kentucky. The sample inlets are 60 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E, and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect elevated pollutant levels for activation of emergency control procedures for nitrogen dioxide, ozone, and sulfur dioxide; and to provide pollutant levels for daily air quality index reporting.

Monitors				
Monitor Type	Inlet Height (meters)	Designation	Analysis Method	Frequency of Sampling
AEM Nitrogen Dioxide (NO <sub>2</sub> , NO, NO <sub>x</sub> )	3.85	SLAMS EPISODE	Chemiluminescence	Continuously
AEM Sulfur Dioxide	3.85	SLAMS EPISODE	UV fluorescence	Continuously
AEM Ozone	3.85	SLAMS AQI EPISODE Maximum O <sub>3</sub>	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.73	SLAMS AQI	Broadband spectroscopy	Continuously
Meteorological	5.91	Other	AQM grade instruments for wind speed, wind direction, humidity, barometric pressure, and temperature	Continuously

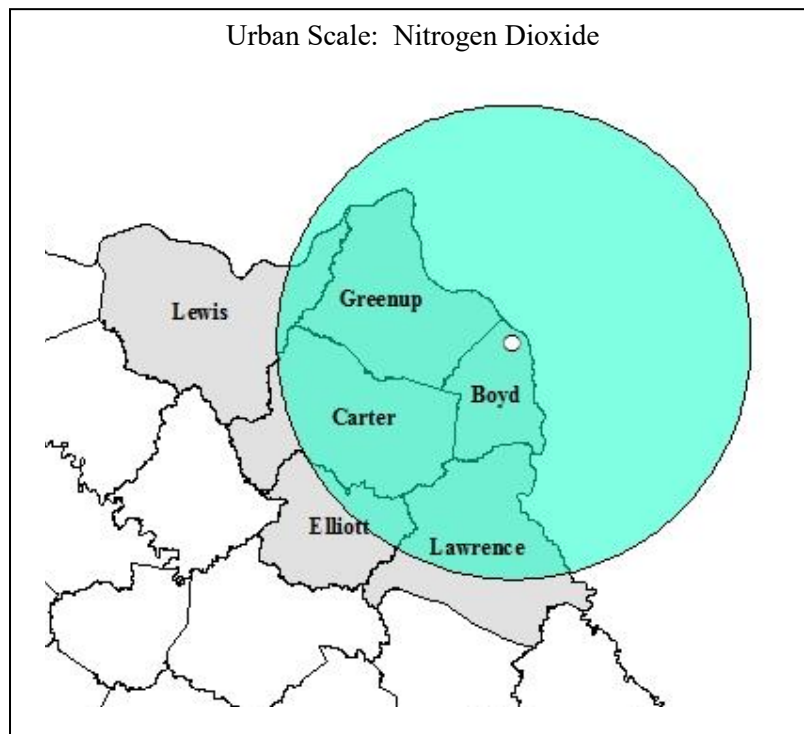


**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site represents population exposure on a neighborhood scale for air toxics, ozone, and sulfur dioxide. This site also represents maximum concentrations on a middle scale for particulates, as well as an urban scale for nitrogen dioxide.



**CSA/MSA:** Charleston-Huntington-Ashland, WV-OH-KY CSA; Huntington-Ashland, WV-KY-OH MSA

**401 KAR 50:020 Air Quality Region:** Huntington (WV)-Ashland (KY)-Portsmouth-Ironton (OH) Interstate (103)

**Site Name:** Grayson Lake

**AQS Site ID:** 21-043-0500

**Location:** Camp Robert Webb, 1486 Camp Webb Road, Grayson Lake, KY 41143

**County:** Carter

**GPS Coordinates:** 38.238876, -82.988059 (NAD 83)

**Date Established:** May 13, 1983

**Inspection Date:** October 11, 2022

**Inspection By:** Jenna Nall

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter in a fenced area located in a remote section of Camp Webb in Grayson, Kentucky. The nearest road is a service road to the site and is 106 meters from the site. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E, and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to determine background levels of PM<sub>2.5</sub> and PM<sub>10</sub>; to provide ozone data upwind of the Ashland area; and to measure rural concentrations of a sub-group of air toxics for use in a national air toxics assessment.

Monitors				
Monitor Type	Inlet Height (meters)	Designation	Analysis Method	Frequency of Sampling
AEM Ozone	3.67	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FRM PM <sub>10</sub>	2.22	SLAMS	Gravimetric	24-hours every sixth day
- Metals PM <sub>10</sub>		NATTS SPM-Other	Determined from the PM <sub>10</sub> samples using EPA method IO 3.5	Same as PM <sub>10</sub>
Collocated PM <sub>10</sub>	2.22	SLAMS	Gravimetric	24-hours every twelfth day
- Collocated metals PM <sub>10</sub>		NATTS SPM-Other	Determined from the PM <sub>10</sub> samples using EPA method IO 3.5	24-hours; six samples per year

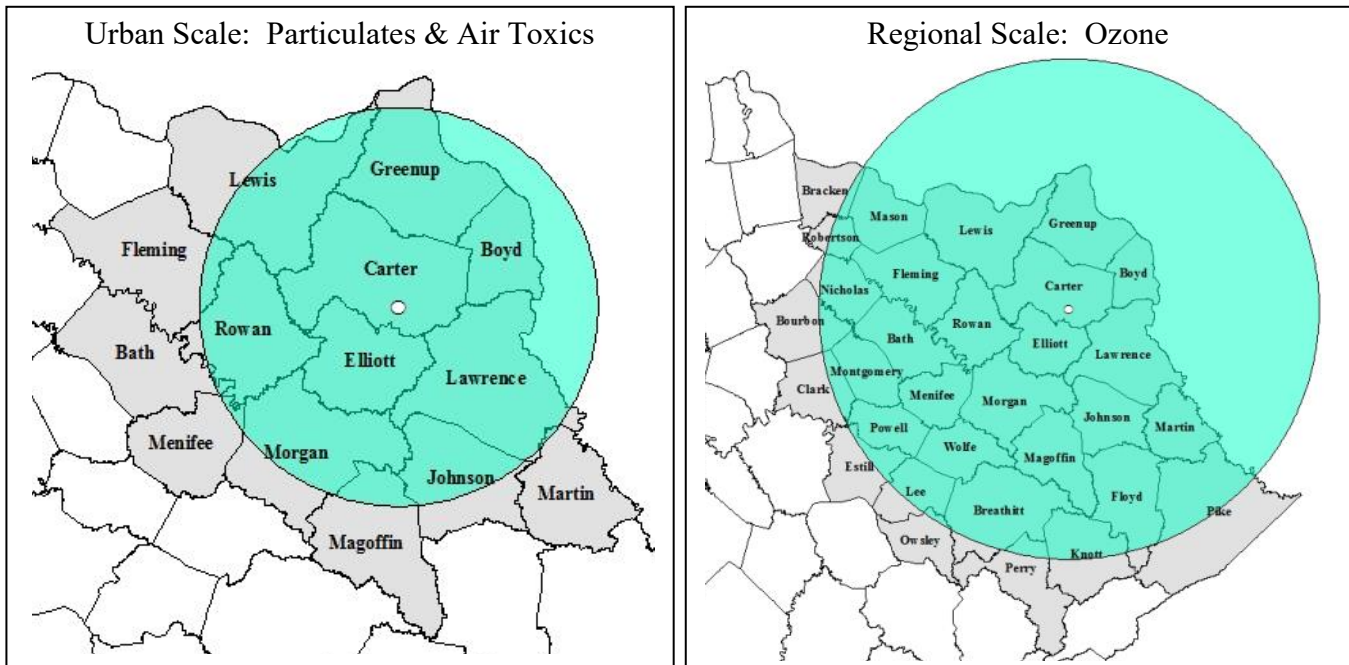
Monitors (Continued)				
FEM PM <sub>2.5</sub> Continuous	4.77	SLAMS AQI	Broadband Spectroscopy	Continuously
Volatile Organic Compounds	4.21	NATTS SPM-Other	EPA method TO-15.	24-hours every sixth day
- Duplicate Volatile Organic Compounds		NATTS SPM-Other	EPA method TO-15. Collected via same sampling system as primary VOCs.	24-hours; six samples per year
Polycyclic Aromatic Hydrocarbons	2.1	NATTS SPM-Other	EPA method TO-13A	24-hours every sixth day
Carbonyls	4.21	NATTS SPM-Other	EPA method TO-11A	24-hours every sixth day
- Duplicate Carbonyls		NATTS SPM-Other	EPA method TO-11A. Collected via same sampling system as primary carbonyls.	24-hours; six samples per year
Meteorological	13.6	Other	AQM grade instruments for wind speed, wind direction, and temperature	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

The site represents background levels on an urban scale for particulates and air toxics. This site also represents upwind/background levels on an regional scale for ozone.



**CSA/MSA:** Charleston-Huntington-Ashland, WV-OH-KY CSA; Huntington-Ashland, WV-KY-OH MSA

**401 KAR 50:020 Air Quality Region:** Huntington (WV)-Ashland (KY)-Portsmouth-Ironton (OH) Interstate (103)

**Site Name:** Worthington

**AQS Site ID:** 21-089-0007

**Location:** Scott Street & Center Avenue, Worthington, KY 41183

**County:** Greenup

**GPS Coordinates:** 38.548156, -82.731156 (NAD 83)

**Date Established:** October 12, 1980

**Inspection Date:** October 11, 2022

**Inspection By:** Jenna Nall

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of a water tower near the intersection of Scott Street and Center Avenue in Worthington, Kentucky. The sample inlets are 19 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E, and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect elevated pollutant levels for activation of emergency control procedures for ozone and sulfur dioxide.

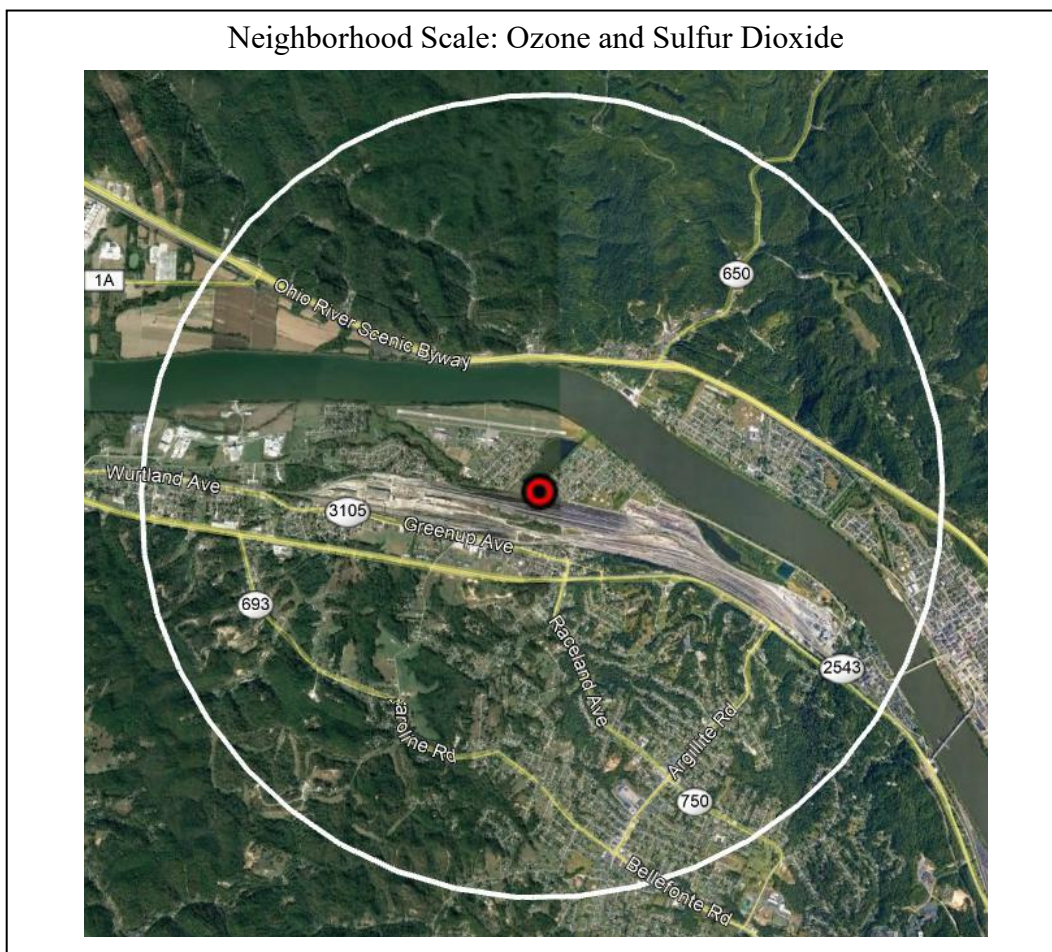
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	4.18	SLAMS EPISODE AQI	UV photometry	Continuously March 1 – October 31
AEM Sulfur Dioxide	4.18	SLAMS EPISODE	UV fluorescence	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

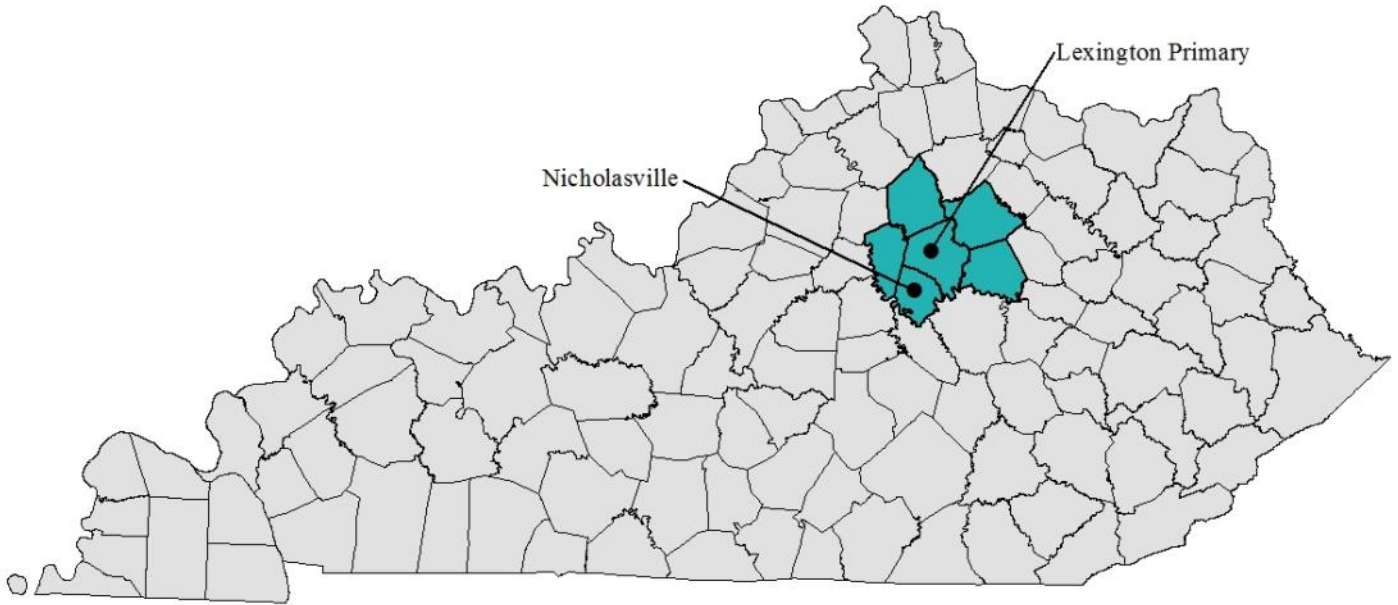
**Area Representativeness:**

This site represents population exposure on a neighborhood scale for ozone and sulfur dioxide.



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# Lexington-Fayette, KY



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-067-0012 Fayette	650 Newtown Pike Lexington		1 <sup>S,i</sup>	1 <sup>m</sup>		1 <sup>e</sup>	1 <sup>e,r</sup>			1 <sup>i,e,M</sup>								1	
21-113-0001 Jessamine	260 Wilson Drive Nicholasville					1				1 <sup>i</sup>									
<b>Totals</b>	<b>2</b>		<b>1</b>	<b>1</b>		<b>2</b>	<b>1</b>			<b>2</b>								<b>1</b>	

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network.

i=AQI

r=RA-40 Monitor

S=Continuous T640 Monitor

m=PM10 Filter Analyzed for Metals

e=Emergency Episode Monitor

M=Maximum Ozone Concentration Site for MSA

**CSA/MSA:** Lexington-Fayette-Richmond-Frankfort, KY CSA; Lexington-Fayette, KY MSA  
**401 KAR 50:020 Air Quality Region:** Bluegrass Intrastate (102)  
**Site Name:** Lexington Primary (Newtown)  
**AQS Site ID:** 21-067-0012  
**Location:** Fayette County Health Department, 650 Newtown Pike, Lexington, KY 40508  
**County:** Fayette  
**GPS Coordinates:** 38.065056, -84.497556 (NAD 83)  
**Date Established:** November 8, 1979  
**Inspection Date:** October 18, 2022  
**Inspection By:** Jenna Nall, Sam Guizio, Makenzie Payton  
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of the Fayette County Health Department building in Lexington, Kentucky. The sample inlets are 122 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect elevated pollutant levels for activation of emergency control procedures for nitrogen dioxide, ozone, particulates, and sulfur dioxide; and to provide pollutant levels for daily air quality index reporting.

Additionally, the nitrogen dioxide monitor has been approved as a RA-40 monitor. According to CFR, each EPA Regional Administrator is required to collaborate with agencies to establish or designate 40 NO<sub>2</sub> monitoring locations, with a primary focus on protecting susceptible and vulnerable populations.

<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.81	SLAMS AQI EPISODE Maximum O <sup>3</sup>	UV photometry	Continuously  March 1 – October 31
AEM Nitrogen Dioxide (NO <sub>2</sub> , NO, NO <sub>x</sub> )	4.03	SLAMS (RA-40) EPISODE	Chemiluminescence	Continuously
AEM Sulfur Dioxide	3.56	SLAMS EPISODE	UV fluorescence	Continuously
FEM PM <sub>2.5</sub> Continuous	4.58	SLAMS AQI	Broadband Spectroscopy	Continuously



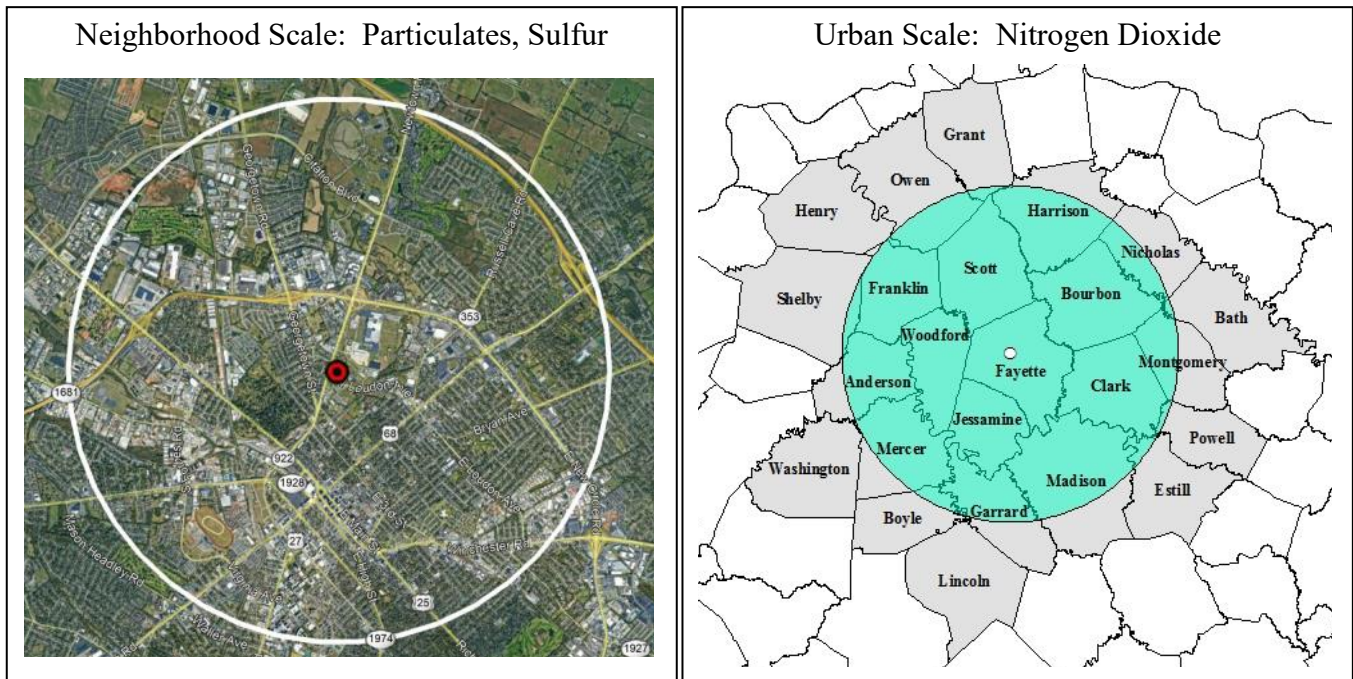
Monitors (Continued)				
PM <sub>10</sub>	2.19	SLAMS	Gravimetric	24-hours every sixth day
- PM <sub>10</sub> Metals		SPM-Other	Determined from the PM <sub>10</sub> sample using EPA method IO 3.5	Same as PM <sub>10</sub>
Radiation	1.29	RadNet	RadNet fixed stationary monitor, manual and automated methods	Continuously & 2 weekly filters

**Quality Assurance Status:**

All quality assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site represents population exposure on a neighborhood scale for particulates, sulfur dioxide and ozone. This site also represents population exposure on an urban scale for nitrogen dioxide.



**CSA/MSA:** Lexington-Fayette-Richmond-Frankfort, KY CSA; Lexington-Fayette, KY MSA  
**401 KAR 50:020 Air Quality Region:** Bluegrass Intrastate (102)

**Site Name:** Nicholasville

**AQS Site ID:** 21-113-0001

**Location:** KYTC Maintenance Garage, 260 Wilson Drive, Nicholasville, KY 40356

**County:** Jessamine

**GPS Coordinates:** 37.89147, -84.58825 (NAD 83)

**Date Established:** August 1, 1991

**Inspection Date:** October 18, 2022

**Inspection By:** Jenna Nall, Sam Guizio, and Makenzie Payton

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of the Kentucky Transportation Cabinet garage in Nicholasville, Kentucky. The sample inlets are 82 meters from the nearest road. Upon inspection, the sample inlets and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E, and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to provide ozone data upwind of the Lexington area.

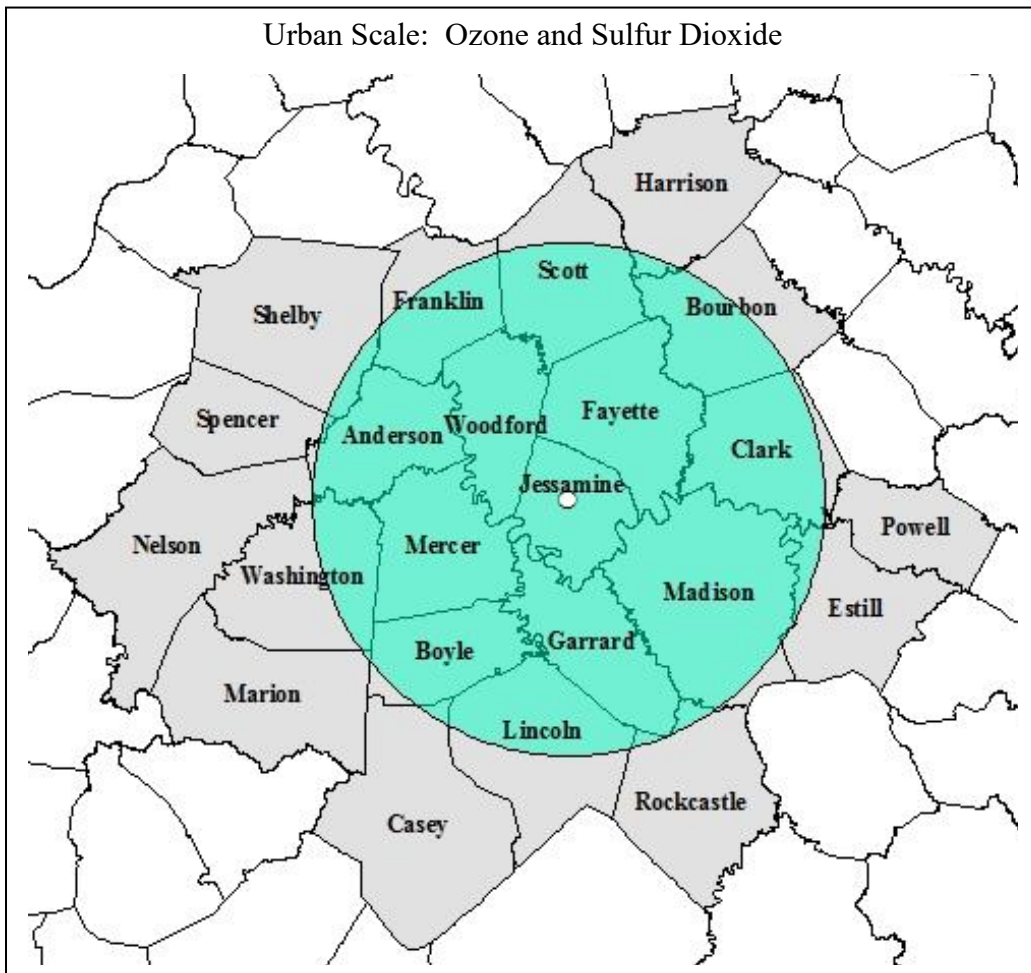
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.	SLAMS AQI	UV photometry	Continuously March 1 – October 31
AEM Sulfur Dioxide	3.9	SLAMS	UV fluorescence	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

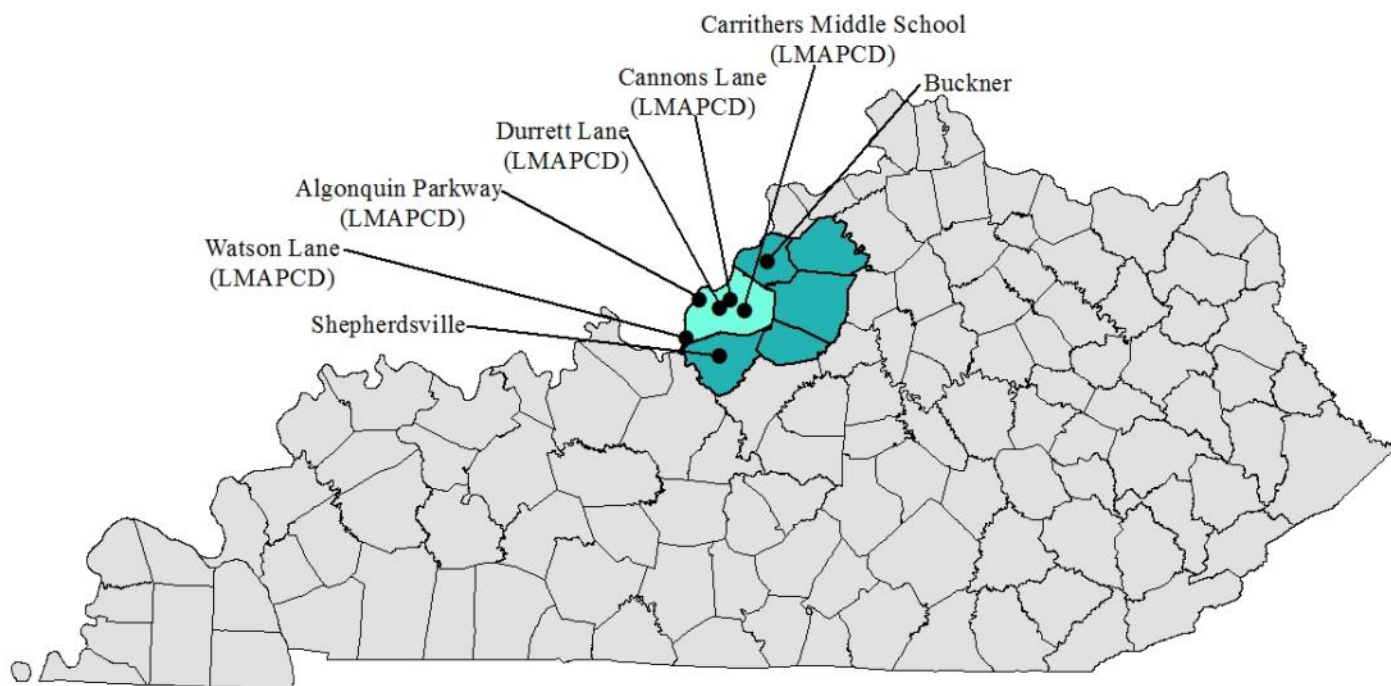
**Area Representativeness:**

The site represents population exposure on an urban scale for ozone and sulfur dioxide.



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# Louisville/Jefferson County, KY-IN



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-029-0006	2nd & Carpenter St									1 <sup>i</sup>									
Bullitt	Shepherdsville																		
21-185-0004	1601 South Hwy 393									1 <sup>i</sup>									
Oldham	LaGrange																		
21-111-0051	7201 Watson Ln	1 <sup>i,S,*</sup>				1 <sup>i</sup>				1 <sup>i</sup>									1
Jefferson	Louisville (LMAPCD)																		
21-111-0067	2730 Cannons Ln	1 <sup>C</sup>	1 <sup>i,E,*</sup>		1 <sup>i,E</sup>	1 <sup>i</sup>	1 <sup>i</sup>	1	1 <sup>i</sup>	1 <sup>i,M</sup>		1 <sup>G</sup>	1		1	1		1	1
Jefferson	Louisville (LMAPCD)																		
21-111-0075	1517 Durrett Ln	1 <sup>n,C</sup>	1 <sup>S,n,i,*</sup>				1 <sup>n,i</sup>		1 <sup>n,i</sup>								1 <sup>n</sup>		1 <sup>n</sup>
Jefferson	Louisville (LMAPCD)																		
21-111-0080	4320 Billtown Rd		1 <sup>i,*S</sup>							1 <sup>i</sup>									1
Jefferson	Louisville (LMAPCD)																		
21-111-1041	4201 Algonquin Pkwy	1 <sup>i,S*</sup>			1 <sup>i,S</sup>	1 <sup>i</sup>				1 <sup>i</sup>		1 <sup>G</sup>							1
Jefferson	Louisville (LMAPCD)																		
<b>Totals</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>6</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>5</b>

Tallies are equal to the actual number of parameters currently monitored. Superscripts represent additional information about the network.

C=Collocated

G=Auto GC

S=Continuous T640 Monitor

i=AQI Reported

\*=Eligible for PM2.5 NAAQS Comparisons

n=Near-Road Monitor

M=Maximum Ozone Concentration Site for MSA

E=Continuous PM2.5-PM10 T640x-Coarse; (T640x samples for PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>coarse</sub> with a single monitor)

**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Bardstown, KY-IN CSA; Louisville/Jefferson County, KY-IN MSA

**401 KAR 50:020 Air Quality Region:** North Central Kentucky Intrastate (104)

**Site Name:** Shepherdsville

**AQS Site ID:** 21-029-0006

**Location:** East Joe B. Hall Avenue & Carpenter Streets, Shepherdsville, KY 40165

**County:** Bullitt

**GPS Coordinates:** 37.986275, -85.711899 (NAD 83)

**Date Established:** January 30, 1992

**Inspection Date:** October 20, 2022

**Inspection By:** Jenna Nall

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located in a fenced-in area near the intersection of Second and Carpenter Streets in Shepherdsville, Kentucky. The sample inlets are 58 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E, and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

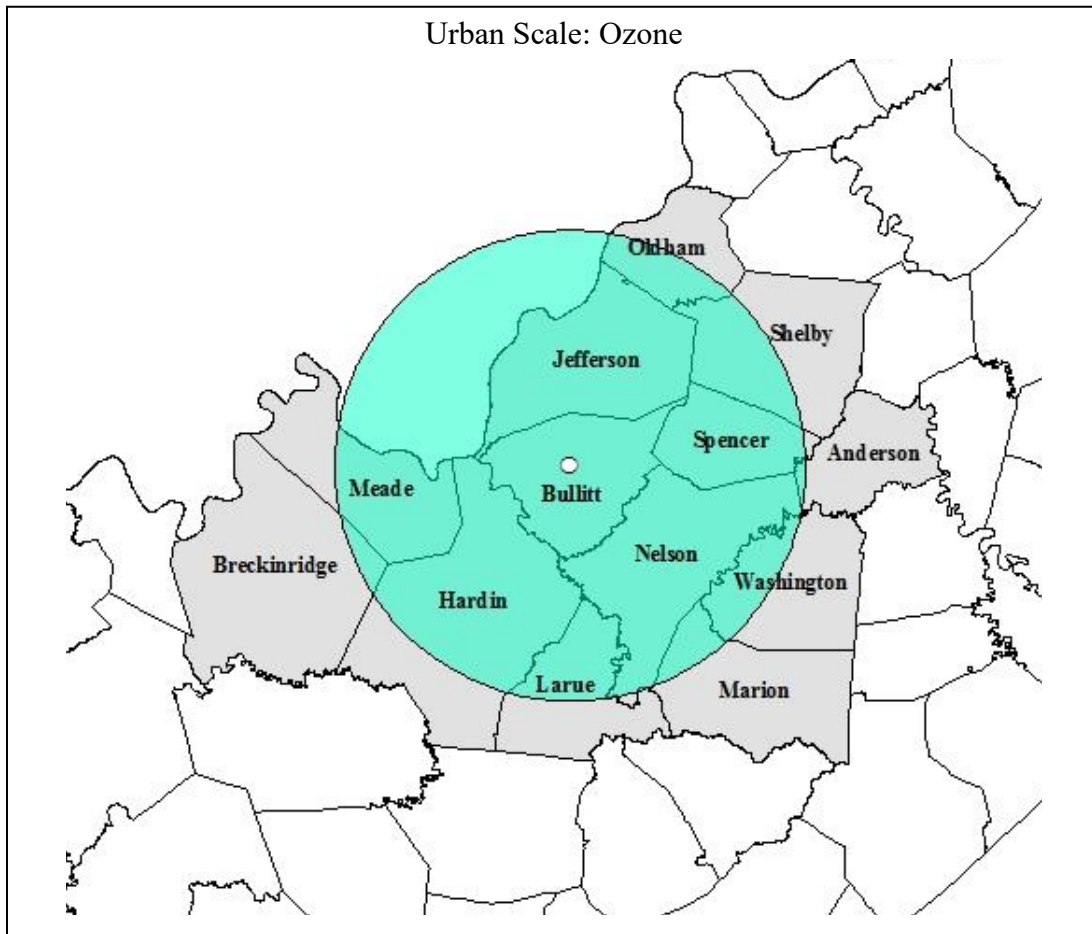
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.96	SLAMS AQI	UV photometry	Continuously March 1 – October 31

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site represents population exposure on an urban scale for ozone.



**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Bardstown, KY-IN CSA; Louisville/Jefferson County, KY-IN MSA

**401 KAR 50:020 Air Quality Region:** North Central Kentucky Intrastate (104)

**Site Name:** Buckner

**AQS Site ID:** 21-185-0004

**Location:** KYTC Maintenance Facility, 1601 South Hwy 393, LaGrange, KY 40031

**County:** Oldham

**GPS Coordinates:** 38.4001911, -85.444291 (NAD 83)

**Date Established:** May 1, 1981

**Inspection Date:** October 20, 2022

**Inspection By:** Jenna Nall

**Site Approval Status:** Site and monitor meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of the Kentucky Transportation Cabinet Highway garage in Buckner, Kentucky. The sample inlet is 51 meters from the nearest road. Upon inspection, the sample line and monitor were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E, and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.75	SLAMS AQI	UV photometry	Continuously March 1 – October 31

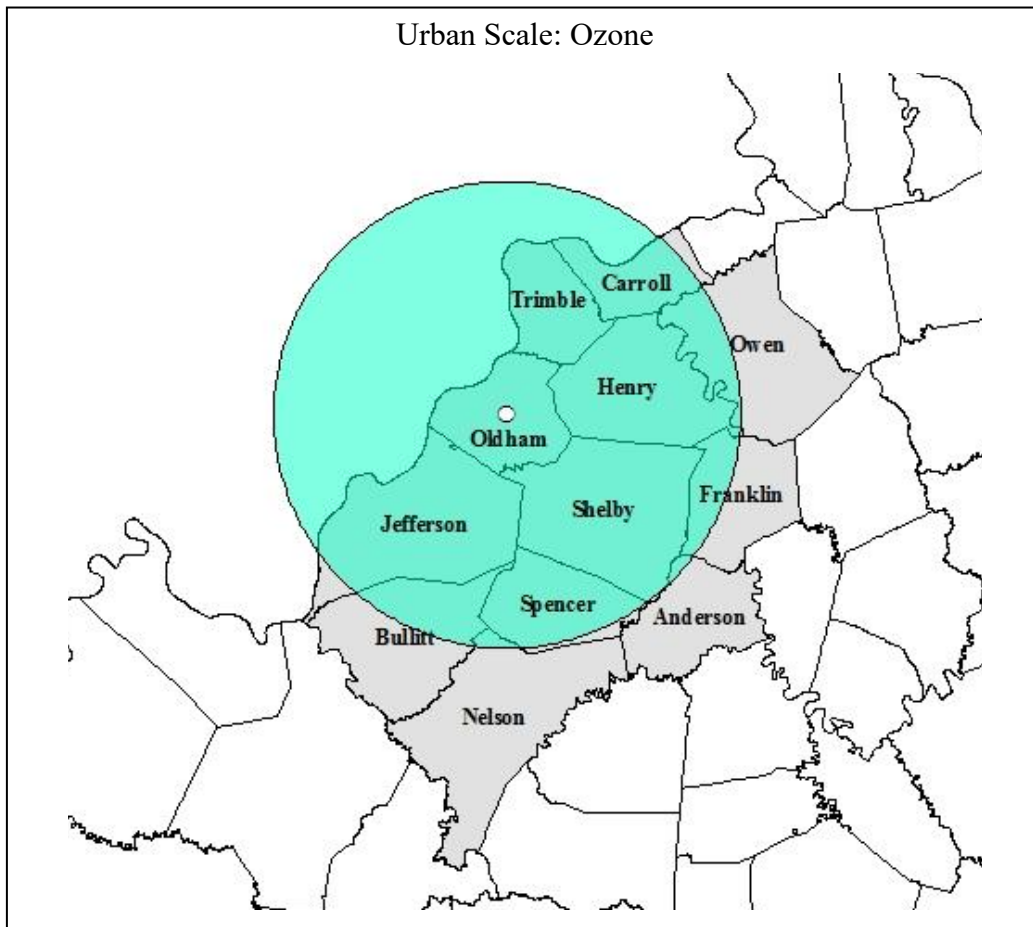
**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.



**Area Representativeness:**

This site represents maximum concentrations on an urban scale.



**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Bardstown, KY-IN CSA; Louisville/Jefferson County, KY-IN MSA

**401 KAR 50:020 Air Quality Region:** Louisville Interstate (078)

**Site Name:** Watson Lane

**AQS Site ID:** 21-111-0051

**Location:** 7201 Watson Lane, Louisville, KY 40272

**County:** Jefferson

**GPS Coordinates:** 38.06091, -85.89804 (NAD 83)

**Date Established:** July 16, 1992

**Inspection Date:** November 10, 2022

**Inspection By:** APCD Quality Assurance Staff

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of the Watson Lane Elementary School in Louisville, Kentucky. The sample inlets are 4 meters above ground level and 73.7 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The air monitoring site meets the criteria established by 40 CFR Part 58, Appendices C, D, E and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to provide pollution levels for daily index reporting.

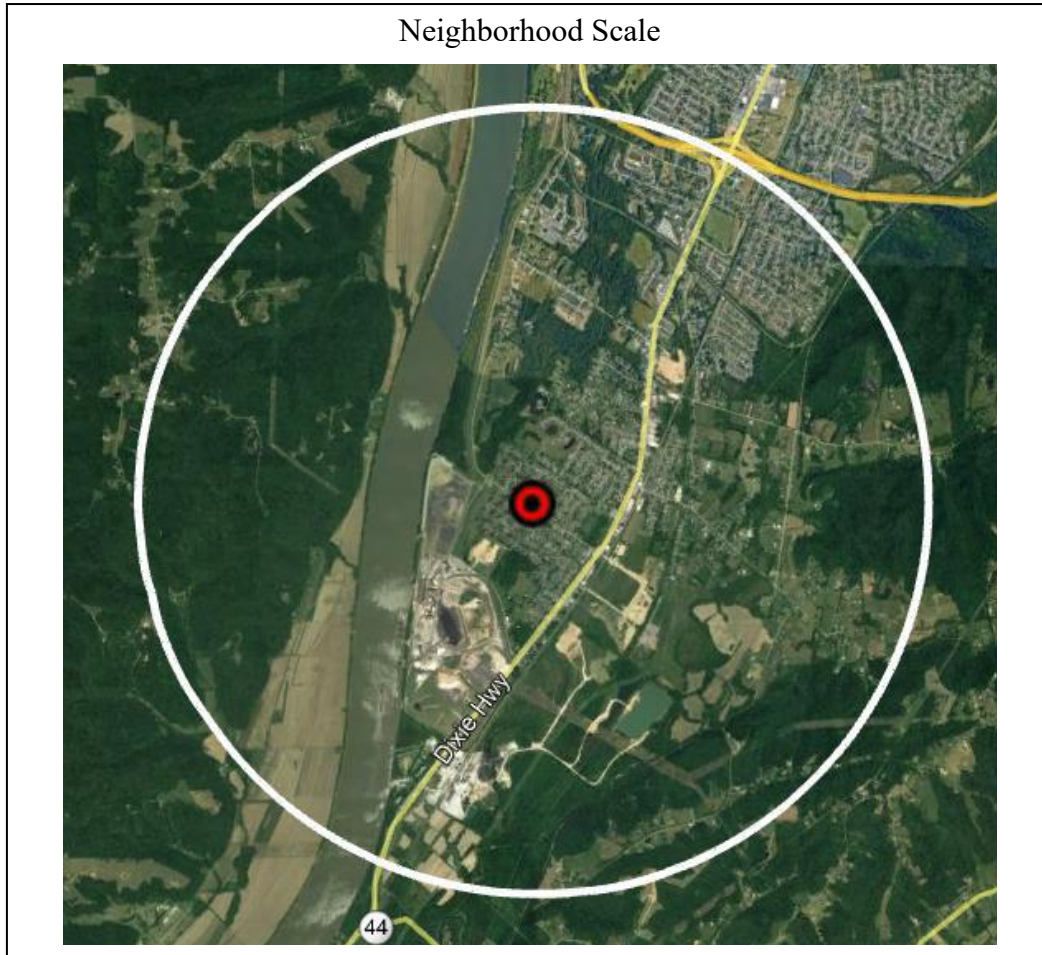
Monitors				
Monitor Type	Inlet Height (meters)	Designation	Analysis Method	Frequency of Sampling
AEM Ozone	3.7	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.6	SLAMS AQI	Broadband Spectroscopy	Continuously
AEM Sulfur Dioxide	3.6	SLAMS AQI	UV fluorescence	Continuously
Meteorological	6.0	Other	AQM grade instruments for wind speed and wind direction.	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site represents population exposure on a neighborhood scale for ozone and particulates. This site also represents maximum concentrations on a neighborhood scale for SO<sub>2</sub>.



**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Bardstown. KY-IN CSA; Louisville/Jefferson County, KY-IN MSA

**401 KAR 50:020 Air Quality Region:** Louisville Interstate (078)

**Site Name:** Cannons Lane (CLAMS)

**AQS Site ID:** 21-111-0067

**Location:** Bowman Field, 2730 Cannons Lane, Louisville, KY 40204

**County:** Jefferson

**GPS Coordinates:** 38.2288760, -85.654520 (NAD 83)

**Date Established:** July 1, 2008

**Inspection Date:** November 9, 2022

**Inspection By:** APCD Quality Assurance Staff

**Site Approval Status:** EPA SLAMS approval on December 22, 2008; EPA NCore approval on October 30, 2009.



The station is located on property leased by LMAPCD. The site is located in the NE quadrant of Jefferson County and is approximately 9 km from the urban core of Metro Louisville. The site was originally established as a SLAMS site in 2008 and became a NCore site in 2009. In December 2010, a solar electric array designed to produce approximately 6,336 kWh per year was installed. The array provides over 50% of the power used by the air monitoring station. Upon inspection, the sample lines and monitors were found to be in good condition. The air monitoring site meets the criteria of 40 CFR Part 58, Appendices A, C, D, E and G.

### **Monitoring Objective:**

The NCore Network addresses the following monitoring objectives:

- timely reporting of data to the public through AIRNow, air quality forecasting, and other public reporting mechanisms
- support development of emission strategies through air quality model evaluation and other observational methods
- accountability of emission strategy progress through tracking long-term trends of criteria and non-criteria pollutants and their precursors
- support long-term health assessments that contribute to ongoing reviews of the National Ambient Air Quality Standards (NAAQS)
- compliance through establishing nonattainment/attainment areas by comparison with the NAAQS
- support multiple disciplines of scientific research, including public health, atmospheric, and ecological.

<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
Carbon Monoxide	4.2	NCore SLAMS AQI	Automated Reference Method utilizing trace level non-dispersive infrared analysis.	Continuously
Nitrogen Dioxide (NO <sub>2</sub> )	4.2	NCore PAMS SLAMS AQI	Cavity Attenuated Phase Shift Spectrometry	Continuously
Total Reactive Nitrogen (NO/NO <sub>y</sub> )	8.1	NCore PAMS	Automated method utilizing trace level chemiluminescence analysis.	Continuously
AEM Ozone	4.1	NCore PAMS SLAMS AQI Maximum O <sub>3</sub>	UV photometry	Continuously
Sulfur Dioxide	4.2	NCore SLAMS AQI	Automated Equivalent Method utilizing trace level UV fluorescence analysis.	Continuously
FEM PM <sub>2.5</sub> and PM <sub>10</sub> Continuous - PM <sub>Coarse</sub> (PM <sub>10</sub> -PM <sub>2.5</sub> )	5.0	NCore SLAMS AQI	Broadband Spectroscopy	Continuously
PM <sub>2.5</sub> Speciation	2.1	NCore SLAMS	Multi-Species manual collection method utilizing thermal optical ion chromatography, gravimetric, and X-ray fluorescence.	24-hours every third day
PM <sub>2.5</sub> Carbon Speciation	2.0	NCore SLAMS	Multi-species manual collection method utilizing thermal optical and gravimetric analyses.	24-hours every third day
FRM PM <sub>2.5</sub> Collocated	5.0	NCore SLAMS QA Collocated	Manual reference method utilizing gravimetric analysis	24-hours every third day
Volatile Organic Compounds	4.5	PAMS	Automatic gas chromatograph with flame ionization detection	Continuously
Carbonyls	4.4	PAMS	DNPH Cartridge using TO-11A analysis	Three 8-hour samples every third day
Meteorological -Wind Speed and Direction	10.1	NCore PAMS	Air Quality Measurements approved instrumentation for wind speed, and wind direction.	Continuously
-Temperature and RH	2.7	NCore PAMS	Air Quality Measurements approved instrumentation for temperature and humidity.	Continuously
-Barometric Pressure	4.1	PAMS	Air Quality Measurements approved instrumentation for barometric pressure.	Continuously
-Ceilometer	4.1	PAMS	Pulsed diode laser light detection and ranging (LIDAR).	Continuously
-Solar Radiation	4.7	NCore PAMS	Air Quality Measurements approved instrumentation for solar radiation.	Continuously
-UV Solar	4.8	PAMS	Air Quality Measurements approved instrumentation for UV Solar.	Continuously
-Rain Gauge	1.5	NCore PAMS	Air Quality Measurements approved instrumentation for precipitation.	Continuously
Radiation	3.4	RadNet	RadNet fixed station air monitor, manual and automated methods	Continuously + 2 weekly filters

**Quality Assurance Status:**

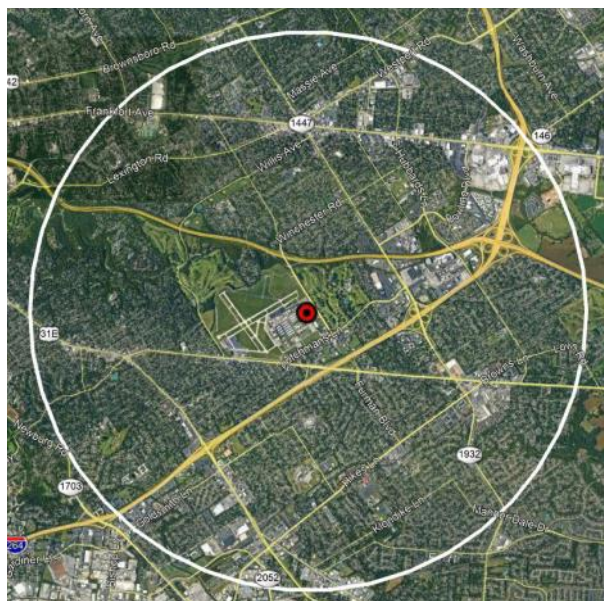
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

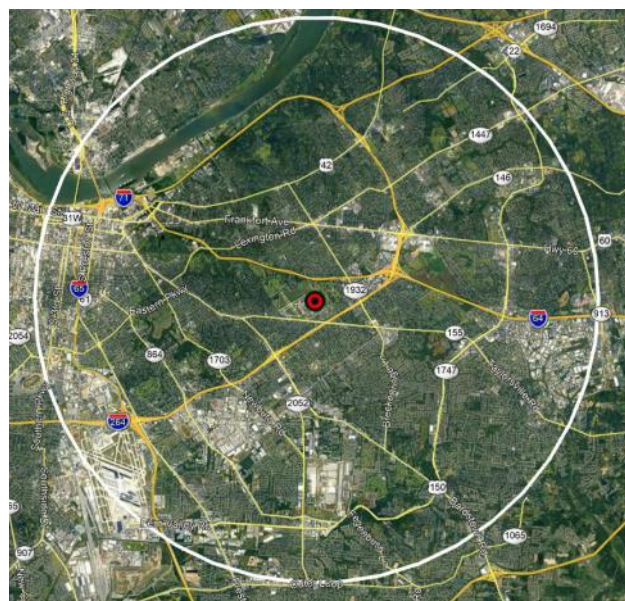
The air monitoring equipment at the Cannon’s Lane NCore station is specifically located at the urban and neighborhood scales. These scales are generally the most representative of the expected population exposures that occur throughout metropolitan areas.

Pollutant	Spatial Scale	Comments
Ozone	Neighborhood	4 km radius
Carbon Monoxide	Neighborhood Scale	4 km radius
Particulates	Neighborhood Scale	4 km radius
NO <sub>x</sub> /NO <sub>y</sub>	Neighborhood and Urban Scale	10 km radius
SO <sub>2</sub>	Urban Scale	50 km radius
Radiation	Urban	50 km radius

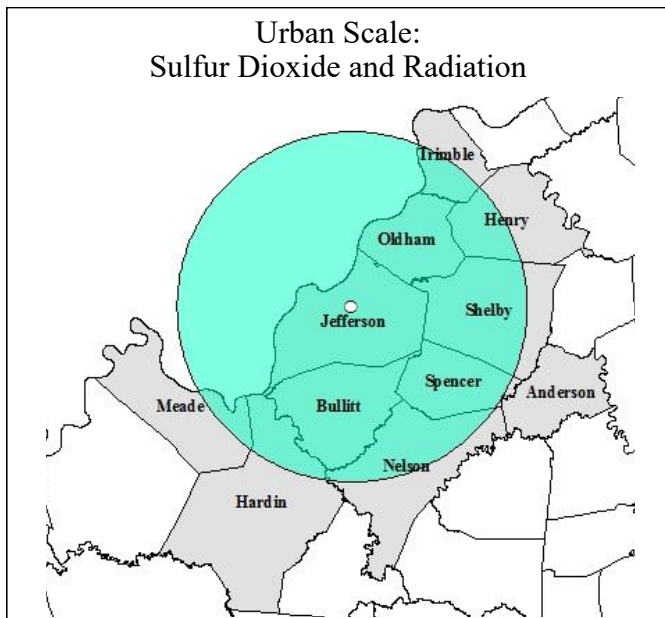
Neighborhood Scale:  
Carbon Monoxide, Ozone, and Particulates



Neighborhood and Urban Scales (10 km radius):  
Nitrogen Oxides



Urban Scale:  
Sulfur Dioxide and Radiation



**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Bardstown, KY-IN CSA; Louisville/Jefferson County, KY-IN MSA

**401 KAR 50:020 Air Quality Region:** Louisville Interstate (078)

**Site Name:** Durrett Lane (Near Road)

**AQS Site ID:** 21-111-0075

**Location:** 1517 Durrett Lane, Louisville, KY 40213

**County:** Jefferson

**GPS Coordinates:** 38.193632, -85.711950 (NAD 83)

**Date Established:** January 1, 2014

**Inspection Date:** December 1, 2022

**Inspection By:** APCD Quality Assurance Staff

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



On February 9, 2010, the EPA released a new NO<sub>2</sub> Final Rule and a new set of monitoring requirements. Under the new monitoring requirements, State and Local agencies are required to establish near-road monitoring stations based upon core based statistical area (CBSA) populations and traffic metrics. The Louisville/Jefferson County, KY-IN MSA is required to establish not only a near-road nitrogen dioxide monitor, but also near-road PM<sub>2.5</sub> and carbon monoxide monitors. In response, LMAPCD has established a multi-pollutant near-road site that includes instrumentation to measure nitrogen dioxide, PM<sub>2.5</sub>, carbon monoxide, and meteorology. The specific site was chosen following the development of a formal site proposal and a 30-day comment public period in April 2013. Data collection at the site began in January 2014. More information regarding near-road monitoring can be found in the appendices of this Annual Network Plan.

**Monitoring Objective:**

The monitoring objective will be to determine compliance with National Ambient Air Quality Standards for nitrogen dioxide, carbon monoxide, and particulate matter.

Monitors				
Monitor Type	Inlet Height (meters)	Designation	Analysis Method	Frequency of Sampling
AEM Nitrogen Dioxide (NO <sub>2</sub> )	4.34	SLAMS AQI	Cavity Attenuated Phase Shift Spectroscopy	Continuously
Carbon Monoxide	4.29	SLAMS AQI	Automated Reference Method utilizing trace-level non-dispersive infrared analysis	Continuously
FEM PM <sub>2.5</sub> Continuous	4.67	SLAMS AQI	Broadband Spectroscopy	Continuously
FRM PM <sub>2.5</sub> Collocated	4.8	SLAMS	Manual Reference Method utilizing gravimetric analysis	24-hours every third day
Meteorological - Wind Speed and Direction	10.2	Other	AQM grade instruments for wind speed and wind direction	Continuously
- Temperature and RH	9.0	Other	AQM grade instruments for temperature and humidity	Continuously
Black Carbon	4.4	SPM	Wavelength Dual Spot Optical Absorption	Continuously

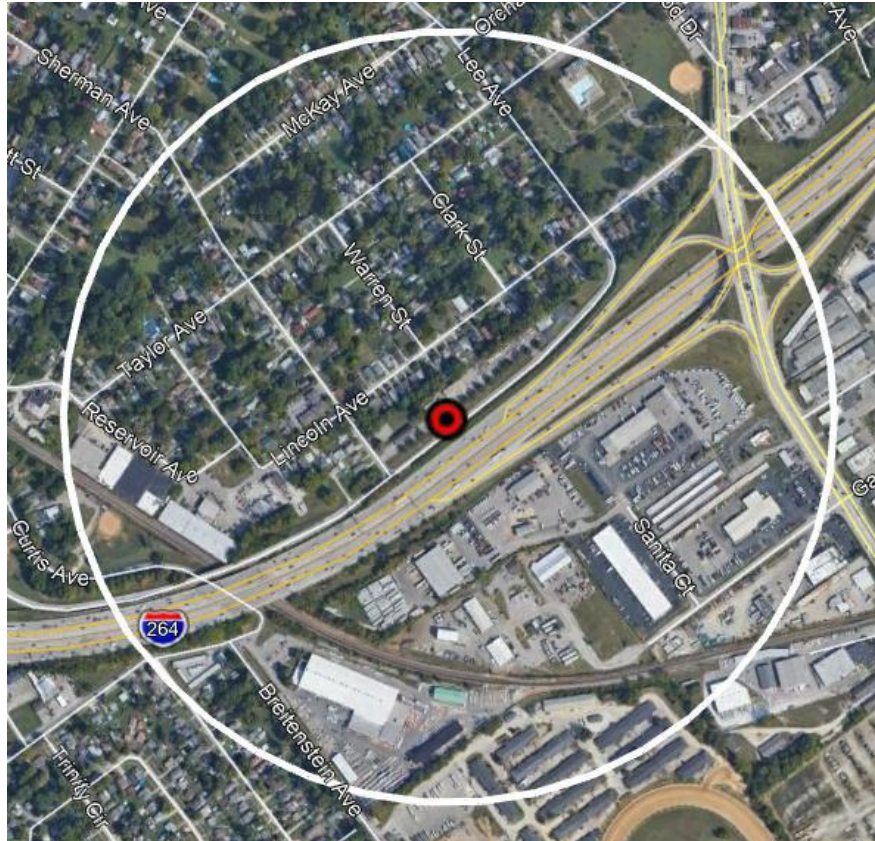
**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

The site represents maximum concentrations on a middle scale.

Middle Scale: Carbon Monoxide, Nitrogen Dioxide and Particulates





**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Bardstown, KY-IN CSA; Louisville/Jefferson County, KY-IN MSA

**401 KAR 50:020 Air Quality Region:** Louisville Interstate (078)

**Site Name:** Carrithers Middle School

**AQS Site ID:** 21-111-0080

**Location:** 4320 Billtown Road, Louisville, KY 40291

**County:** Jefferson

**GPS Coordinates:** 38.182435, -85.574361 (WGS)

**Date Established:** January 9, 2018

**Inspection Date:** November 10, 2022

**Inspection By:** APCD Quality Assurance Staff

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



Due to Jefferson County Public School's plan for significant modification to the Bates Elementary property, the Bates site was retired in early 2018. A new site was established on the grounds of Carrithers Middle School, which is located three miles to the north of the Bates Elementary School site. The instrumentation from Bates was transferred to Carrithers and the new site became operational on 1/9/2018.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to provide pollution levels for daily index reporting.

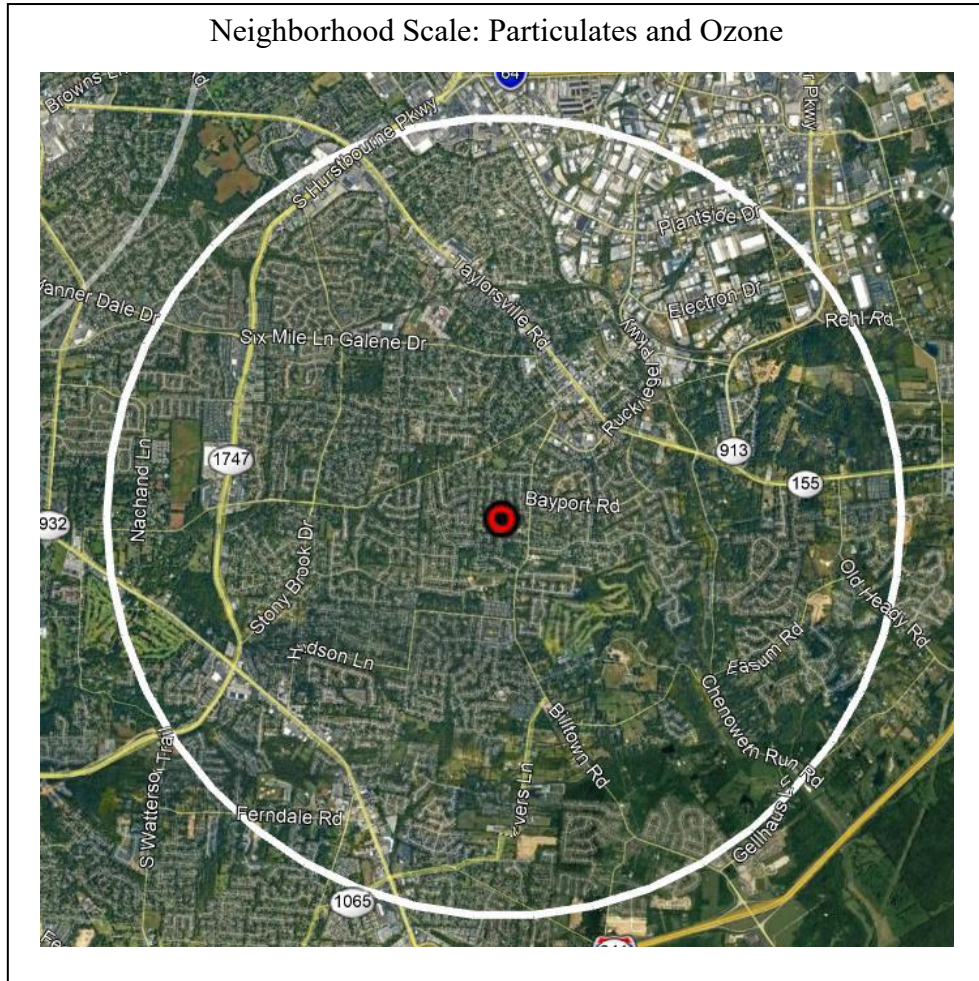
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.7	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.6	SLAMS AQI	Broadband Spectroscopy	Continuously
Meteorological - Wind Speed and Direction	5.6	Other	AQM grade instruments for wind speed and wind direction.	Continuously
- Temperature and RH	4.4	Other	AQM grade instruments for temperature and humidity.	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site represents population exposure on a neighborhood scale for ozone and fine particulates.



**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Bardstown, KY-IN CSA; Louisville/Jefferson County, KY-IN MSA

**401 KAR 50:020 Air Quality Region:** Louisville Interstate (078)

**Site Name:** Algonquin Parkway

**AQS Site ID:** 21-111-1041

**Location:** 4201 Algonquin Parkway, Louisville, KY 40211

**County:** Jefferson

**GPS Coordinates:** 38.23158, -85.82675 (NAD 83)

**Date Established:** April 13, 1978

**Inspection Date:** December 1, 2022

**Inspection By:** APCD Quality Assurance Staff

**Site Approval Status:** Site and monitor meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of the Firearms Training Center in Louisville, Kentucky. The sample inlet is 4.5 meters above ground level and 53.5 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The air monitoring site meets the criteria established by 40 CFR Part 58, Appendices C, D, E and G.

LMAPCD replaced the existing shelter with a new, larger shelter in September, 2017 to house a continuous Toxics Monitor (Auto GC) and to accommodate additional particulate instruments. Particulate instruments were installed by January 1, 2018 (transferred from Southwick Community Center site). The name of this site was changed from Firearms Training to Algonquin Parkway in 2020.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards, to provide pollution levels for daily index reporting, and to characterize VOC concentrations.

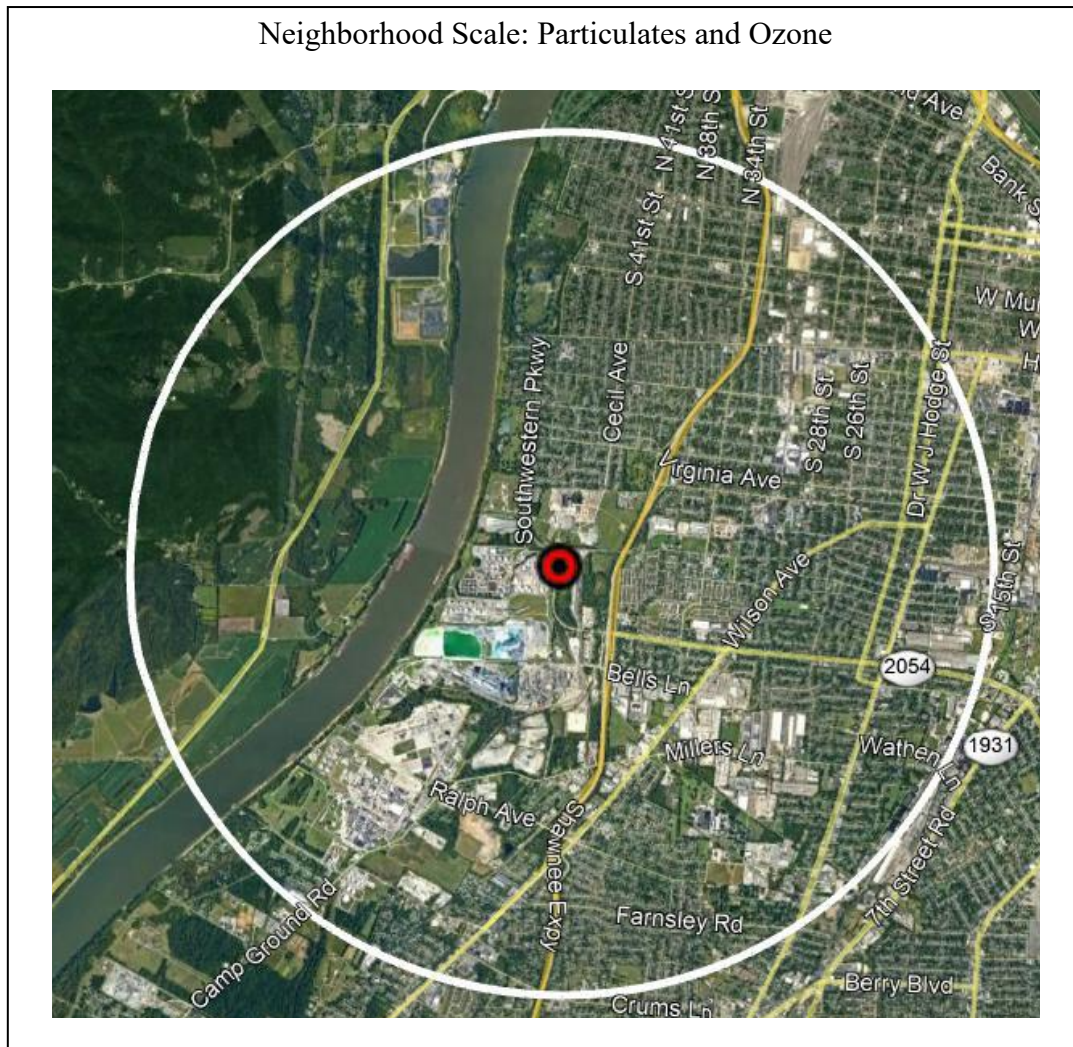
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.5	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> and PM <sub>10</sub> Continuous	4.6	SLAMS AQI	Broadband Spectroscopy	Continuously
AEM Sulfur Dioxide	4.0	SLAMS AQI	UV Fluorescence	Continuously
Volatile Organic Carbon	4.0	SPM	Automatic gas chromatograph with flame ionization detection	Continuously
Meteorological - Wind Speed and Direction	9.0	SLAMS	AQM grade instruments for wind speed and wind direction	Continuously
- Temperature and RH	2.0	SLAMS	AQM grade instruments for temperature and humidity	Continuously

**Quality Assurance Status:**

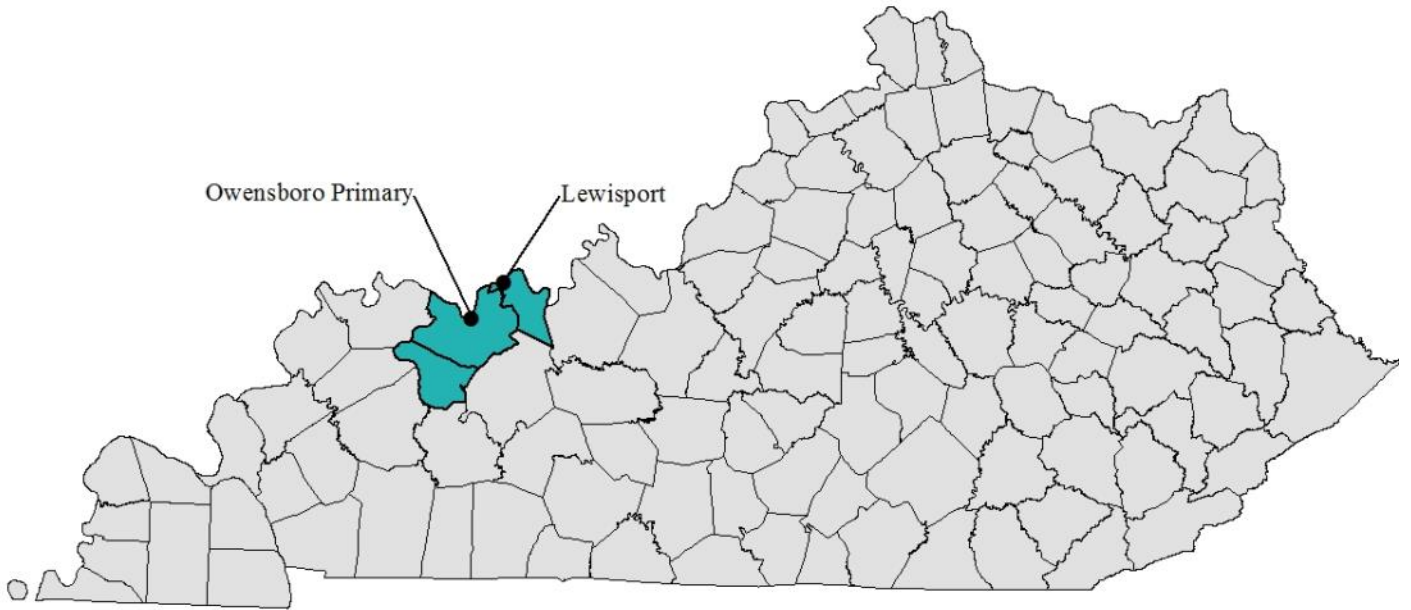
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site represents population exposure on a neighborhood scale for particulates and ozone.



# Owensboro, KY



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-059-0005 Daviess	716 Pleasant Valley Rd. Owensboro		1 <sup>S,e,i</sup>			1 <sup>e</sup>	1 <sup>e</sup>			1 <sup>e,i</sup>									
21-091-0012 Hancock	Second & Caroline St. Lewisport									1 <sup>i,M</sup>									
<b>Totals</b>	<b>2</b>		<b>1</b>			<b>1</b>	<b>1</b>			<b>2</b>									

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network.

e=Emergency Episode Monitor

S=Continuous T640 Monitor

i=AQI Reported

M=Maximum Ozone Concentration Site for MSA

**CSA/MSA:** Owensboro, KY MSA

**401 KAR 50:020 Air Quality Region:** Evansville-Owensboro-Henderson Interstate (077)

**Site Name:** Owensboro Primary

**AQS Site ID:** 21-059-0005

**Location:** 716 Pleasant Valley Road, Owensboro, KY 42303

**County:** Daviess

**GPS Coordinates:** 37.780794, -87.0753583 (NAD 83)

**Date Established:** December 1, 1970

**Inspection Date:** October 6, 2022

**Inspection By:** Jenna Nall and Sam Guizio

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds behind the Wyndall's Shopping Center in Owensboro, Kentucky. The sample inlets are 45 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E, and G. The property is about to be developed and the site must be moved soon. KDAQ is currently in the process of relocating Owensboro; we do not have a new location at the time.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect emergency pollution levels of criteria pollutants for activation of emergency control procedures. While not required for the CBSA, the site also provide levels of pollutants for daily index reporting.

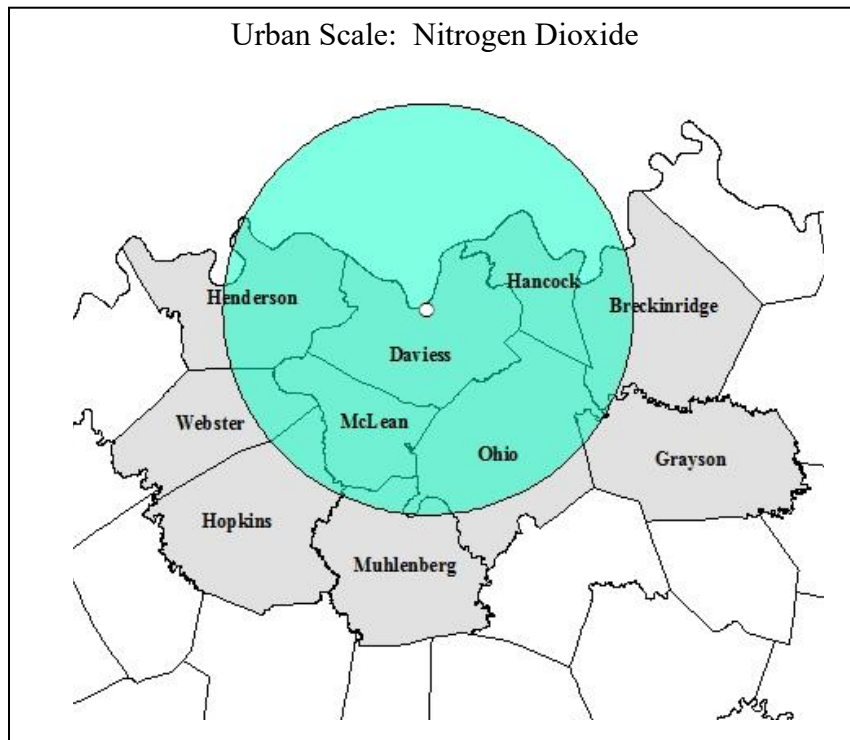
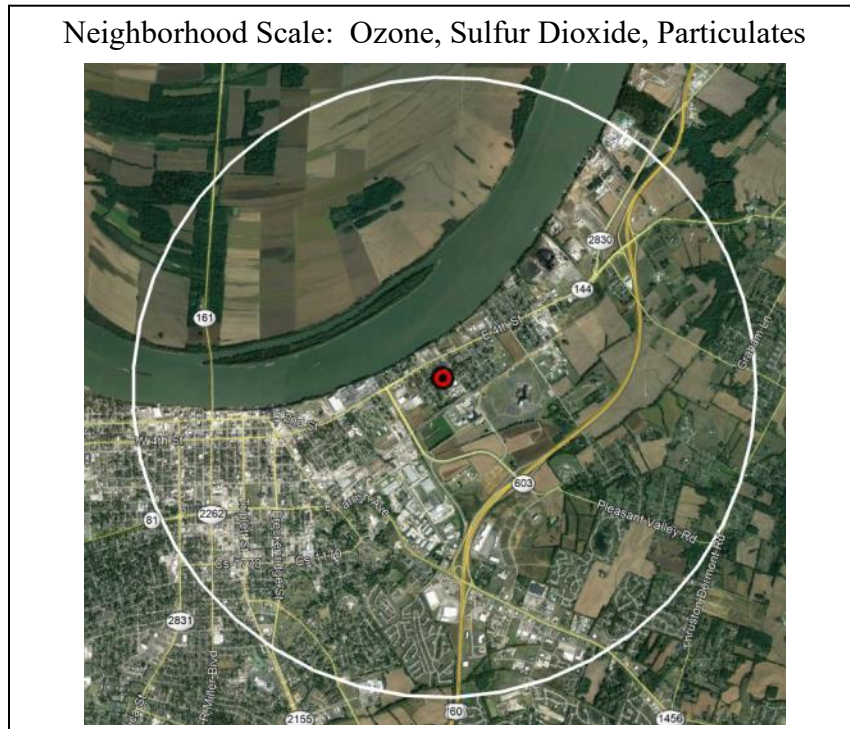
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Nitrogen Dioxide (NO <sub>2</sub> , NO, NO <sub>x</sub> )	4.48	SLAMS EPISODE	Chemiluminescence	Continuously
AEM Ozone	3.82	SLAMS EPISODE AQI	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.69	SLAMS EPISODE AQI	Broadband Spectroscopy	Continuously
AEM Sulfur Dioxide	4.46	SLAMS EPISODE	UV fluorescence	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site represents population exposure on a neighborhood scale for particulates, ozone, and sulfur dioxide. This site also represents population exposure on an urban scale for nitrogen dioxide.



**CSA/MSA:** Owensboro, KY MSA  
**401 KAR 50:020 Air Quality Region:** Evansville-Owensboro-Henderson Interstate (077)  
**Site Name:** Lewisport  
**AQS Site ID:** 21-091-0012  
**Location:** Community Center Drive & First Street, Lewisport, KY 42351  
**County:** Hancock  
**GPS Coordinates:** 37.938316, -86.897194 (NAD 83)  
**Date Established:** September 5, 1980  
**Inspection Date:** October 6, 2022  
**Inspection By:** Jenna Nall and Sam Guizio  
**Site Approval Status:** Site and monitor meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the athletic fields of the former Lewisport Consolidated Elementary School in Lewisport, Kentucky. The sample inlet is 56 meters from the nearest road. Upon inspection, the sample line and monitor were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A,

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.71	SLAMS Maximum O <sub>3</sub> AQI	UV photometry	Continuously  March 1 – October 31

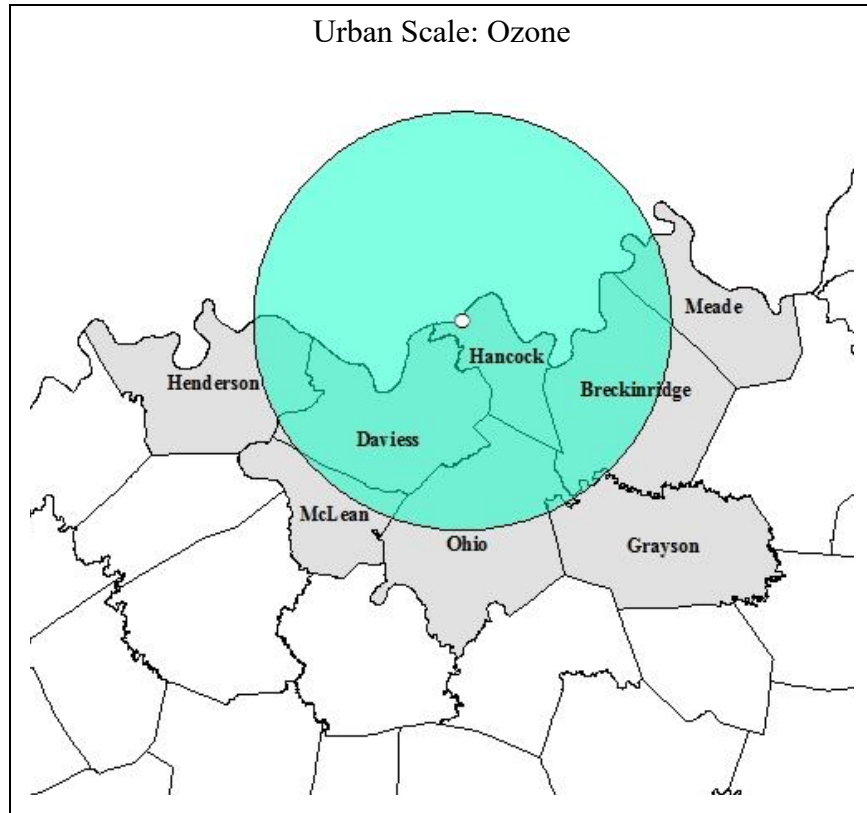
**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.



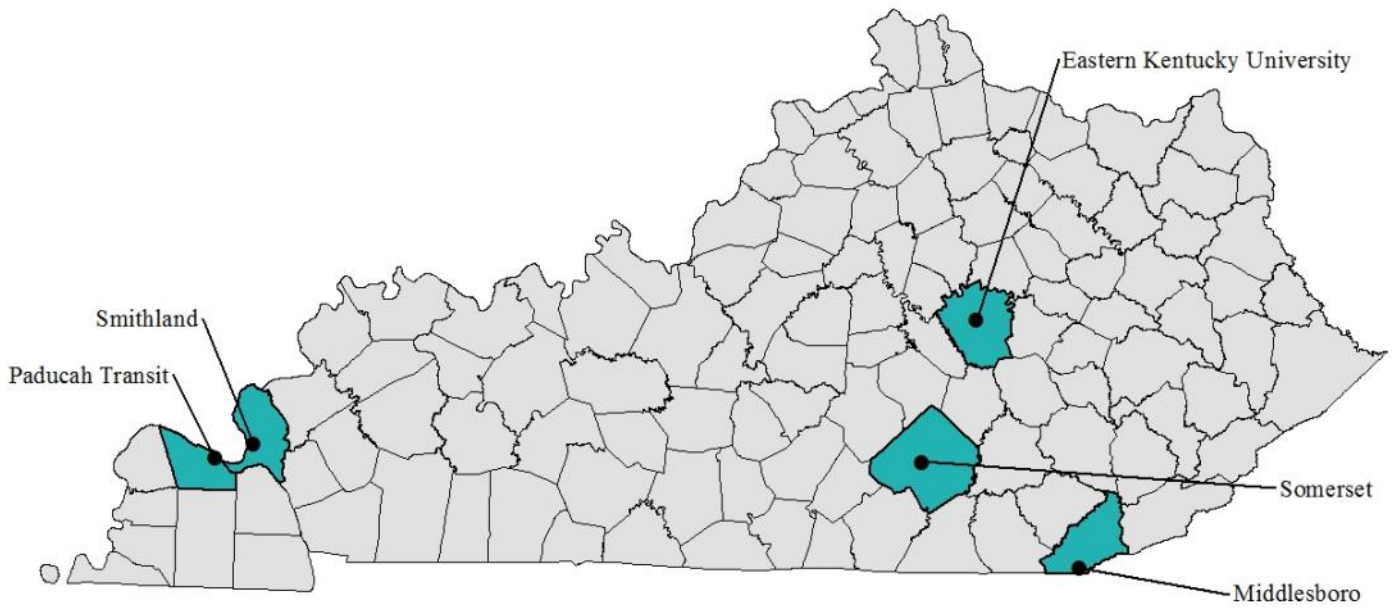
**Area Representativeness:**

This site represents maximum concentrations on an urban scale.



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# Micropolitan Statistical Areas



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-013-0002 Bell	1420 Dorchester Ave. Middlesboro		1 <sup>i,S</sup>							1 <sup>i</sup>									
21-139-0003 Livingston	706 State Drive Smithland									1 <sup>i</sup>								1	
21-145-1027 McCracken	920 Harrison Street Paducah		1 <sup>S,i</sup>			1 <sup>e</sup>	1 <sup>e</sup>			1 <sup>e,i</sup>									
21-151-0005 Madison	Van Hoose Drive Richmond										2 <sup>C</sup>								
21-199-0003 Pulaski	305 Clifty Street Somerset		1 <sup>i,S</sup>							1 <sup>i</sup>									
<b>Totals</b>	<b>5</b>		<b>3</b>			<b>1</b>	<b>1</b>			<b>4</b>	<b>2</b>							<b>1</b>	

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network.

C=Collocated

m=PM10 Filter Analyzed for Metals

i=AQI Reported

e=Emergency Episode Monitor

S=Continuous T640 Monitor

**CSA/MSA:** Middlesborough, KY Micropolitan Statistical Area  
**401 KAR 50:020 Air Quality Region:** Appalachian Intrastate (101)  
**Site Name:** Middlesboro  
**AQS Site ID:** 21-013-0002  
**Location:** Middlesboro Airport, 1420 Dorchester Avenue, Middlesboro, KY 40965  
**County:** Bell  
**GPS Coordinates:** 36.608475, -83.736939 (NAD 83)  
**Date Established:** February 14, 1992  
**Inspection Date:** October 4, 2022  
**Inspection By:** Jenna Nall, Nathan Puckett, and Josh Gillespie  
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of the Middlesboro Airport in Middlesboro, Kentucky. The sample inlets are 96 meters from the nearest road. Upon inspection the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to provide information on the transport of ozone into the region.

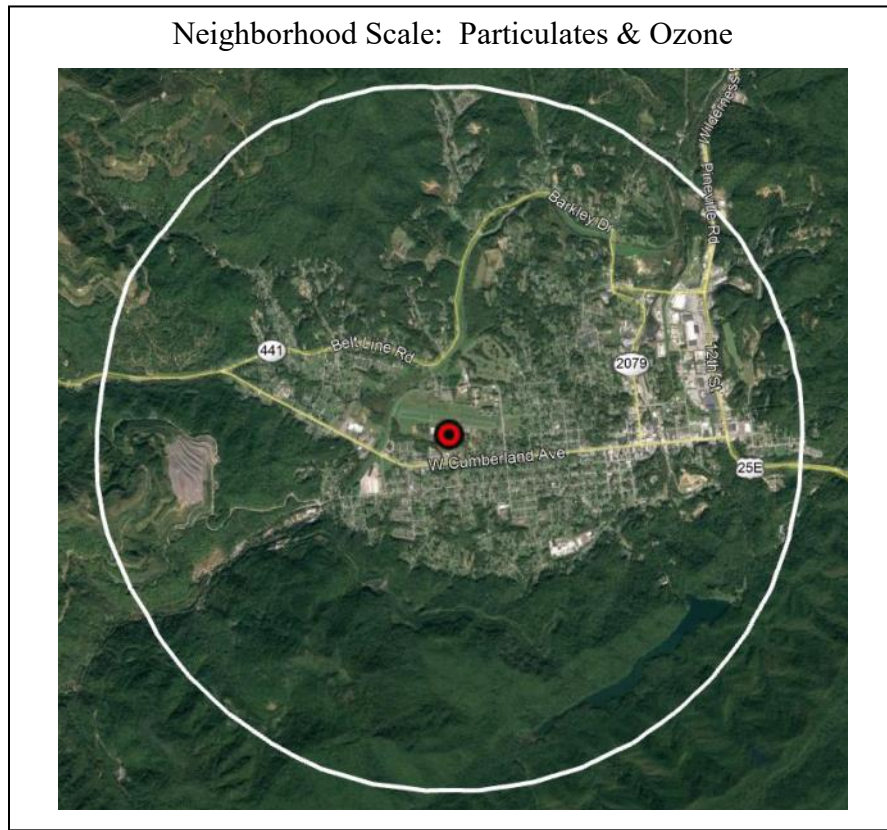
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	4.05	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.93	SLAMS AQI	Broadband Spectroscopy	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

The site represents population exposure on a neighborhood scale for particulates and ozone.



**CSA/MSA:** Paducah-Mayfield, KY-IL CSA; Paducah, KY-IL Micropolitan Statistical Area

**401 KAR 50:020 Air Quality Region:** Paducah-Cairo Interstate (072)

**Site Name:** Smithland

**AQS Site ID:** 21-139-0003

**Location:** Livingston County Road Dept., 730 State Drive, Smithland, KY 42081

**County:** Livingston

**GPS Coordinates:** 37.155417, -88.393972 (NAD 83)

**Date Established:** April 1, 1988

**Inspection Date:** November 15, 2022

**Inspection By:** Jenna Nall and Jennifer Miller

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of the Livingston County Road Dept. facility in Smithland, Kentucky. The sample inlets are 136 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, and E.

**Monitoring Objective:**

The monitoring objective is to determine compliance with National Ambient Air Quality Standards.

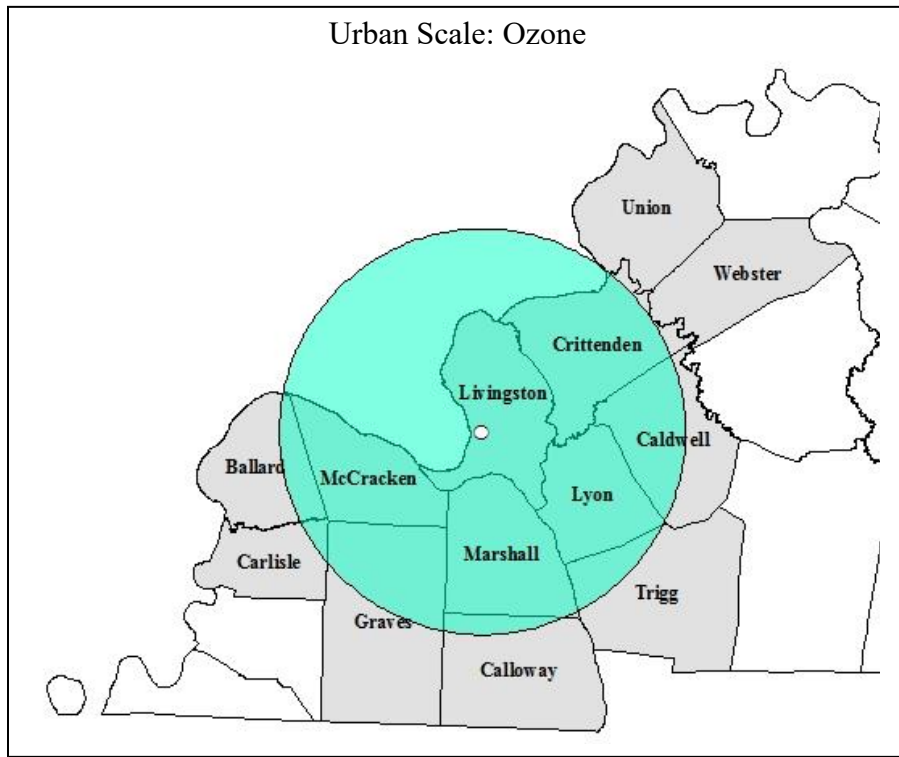
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.88	SLAMS AQI	UV photometry	Continuously
Radiation	1.33	RadNet	RadNet fixed stationary monitor, manual and automated methods	Continuously & 2 weekly filters

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

This site represents maximum concentrations on an urban scale.



**CSA/MSA:** Paducah-Mayfield, KY-IL CSA; Paducah, KY-IL Micropolitan Statistical Area

**401 KAR 50:020 Air Quality Region:** Paducah-Cairo Interstate (072)

**Site Name:** Paducah Transit

**AQS Site ID:** 21-145-1027

**Location:** 920 Harrison Street, Paducah, KY 42001

**County:** McCracken

**GPS Coordinates:** 37.08727, -88.60801 (NAD 83)

**Date Established:** January 10, 2023

**Inspection Date:** January 30, 2023

**Inspection By:** Jenna Nall and Nathan Puckett

**Site Approval Status:** Site and monitors meet design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of Paducah Area Transit System in Paducah, Kentucky. The sample inlets are 30 meters from the nearest road. The site meets the requirements established by 40 CFR 58, Appendices A, C, D, E, and G. This site was formally Jackson Purchase (21-145-1024). The property owners were expanding operations and the site had to be relocated as quickly as possible. Paducah Transit is 2.8 miles NW of the Jackson Purchase site.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to detect elevated pollutant levels for activation of emergency control procedures for nitrogen dioxide, ozone, and sulfur dioxide. While not required for the CBSA, the site also provides pollutant levels for daily air quality index reporting.

<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Nitrogen Dioxide (NO <sub>2</sub> , NO, NO <sub>x</sub> )	4.34	SLAMS EPISODE	Chemiluminescence	Continuously
AEM Sulfur Dioxide	4.32	SLAMS EPISODE	UV fluorescence	Continuously
AEM Ozone	4.18	SLAMS AQI EPISODE	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.85	SLAMS AQI	Broadband Spectroscopy	Continuously

**Quality Assurance Status:**

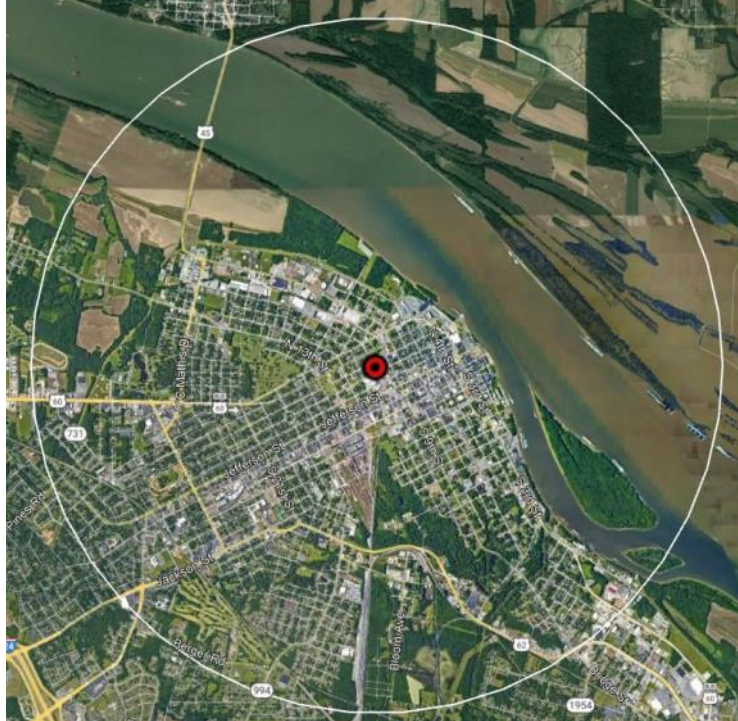
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.



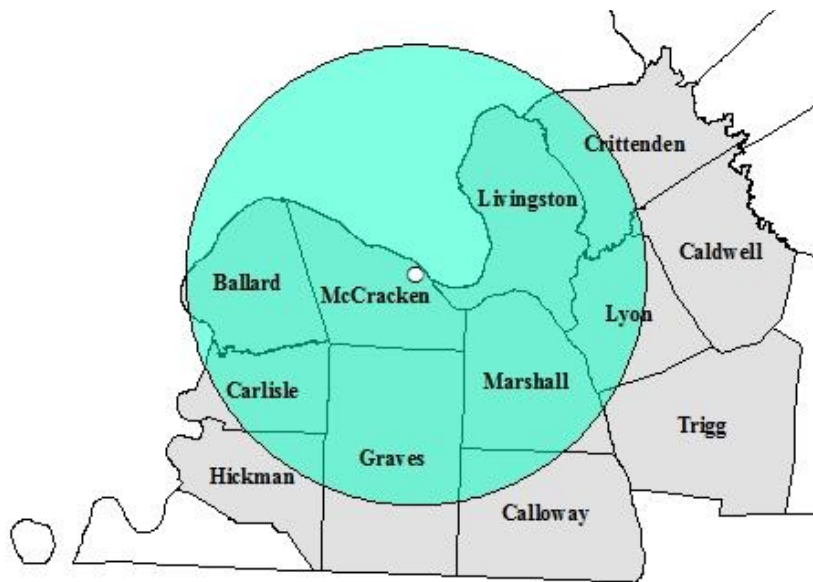
**Area Representativeness:**

This site represents population exposure on a neighborhood scale for ozone, particulates, and sulfur dioxide. This site also represents population exposure on an urban scale for nitrogen dioxide.

Neighborhood Scale: Ozone, Particulates, Sulfur Dioxide



Urban Scale: Nitrogen Dioxide



**CSA/MSA:** Lexington-Fayette-Richmond-Frankfort KY CSA; Richmond-Berea, KY Micropolitan Statistical Area

**401 KAR 50:020 Air Quality Region:** Bluegrass Intrastate (102)

**Site Name:** Eastern Kentucky University (EKU)

**AQS Site ID:** 21-151-0005

**Location:** Eastern Kentucky University, Van Hoose Drive, Richmond, KY 40475

**County:** Madison

**GPS Coordinates:** 37.73636, -84.29167 (NAD 83)

**Date Established:** March 10, 2012

**Inspection Date:** October 18, 2022

**Inspection By:** Jenna Nall, Sam Guizio, and Makenzie Payton

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The site is located behind the Gentry Facilities Services building and is adjacent to Eastern Kentucky University's athletic fields. The sample inlets are 3.0 meters from the nearest road. Upon inspection, the sample inlet and monitor were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D and E.

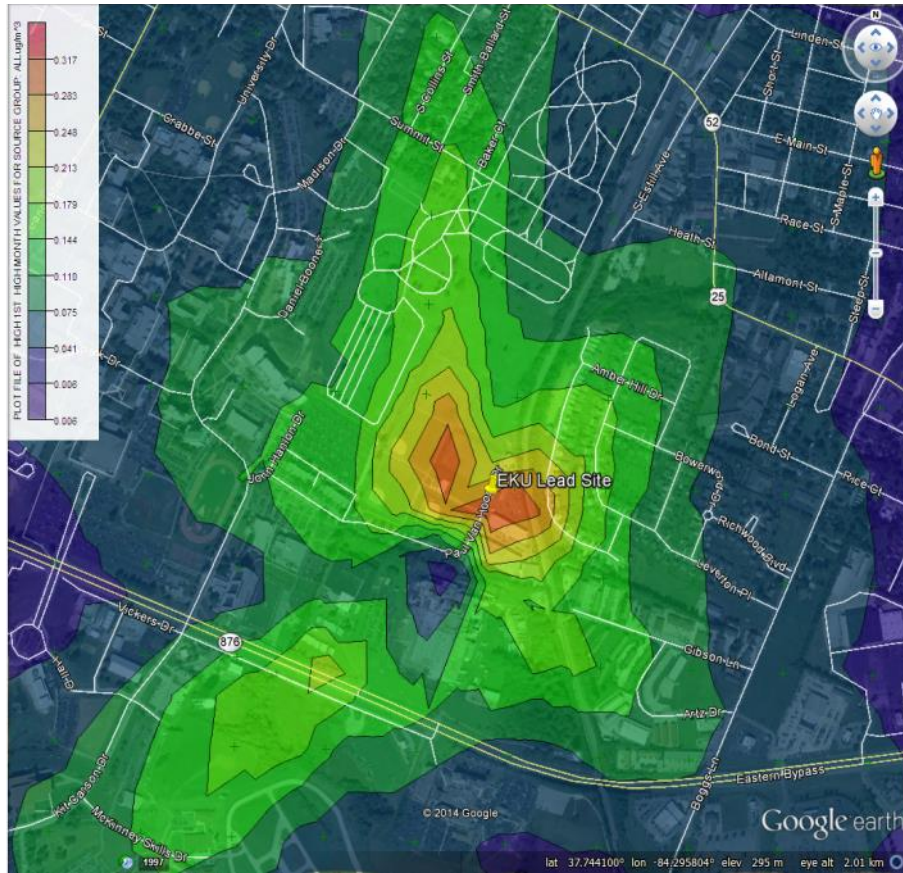
**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
FRM Lead	2.21	SLAMS	High volume air sampler. Analysis via ICP-MS.	24-hours every sixth day
Collocated FRM Lead	2.23	SLAMS	High volume air sampler. Analysis via ICP-MS.	24-hours every twelfth day

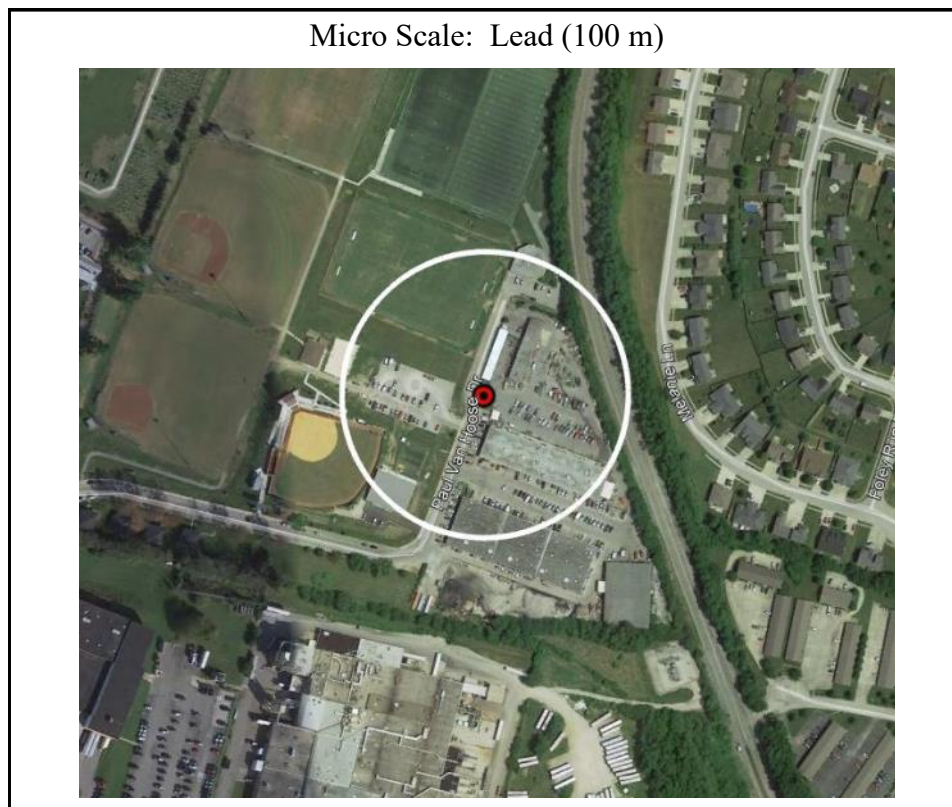
**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.



**Area Representativeness:**

This site represents source impacts on a micro scale for lead.



**CSA/MSA:** Somerset, KY Micropolitan Statistical Area  
**401 KAR 50:020 Air Quality Control Region:** South Central Kentucky Intrastate (105)  
**Site Name:** Somerset  
**AQS Site ID:** 21-199-0003  
**Location:** Somerset Gas Company Warehouse, 305 Clifty Street, Somerset, KY 42501  
**County:** Pulaski  
**GPS Coordinates:** 37.097952, -84.611534 (NAD 83)  
**Date Established:** February 14, 1992  
**Inspection Date:** October 4, 2022  
**Inspection By:** Jenna Nall, Nathan Puckett, Josh Gillespie  
**Site Approval Status:** The site is obstructed by trees and a waiver request for road proximity is included in Appendix L



The monitoring site is a stationary equipment shelter located on the grounds of the Somerset Gas Company Warehouse on Clifty Street in Somerset, KY. The site is obstructed by trees and a waiver request for road proximity is included in Appendix L. The trees which are obstructing the site are about to be removed. Otherwise, the site meets the requirements of 40 CFR 58, Appendices A, C, D, E and G.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

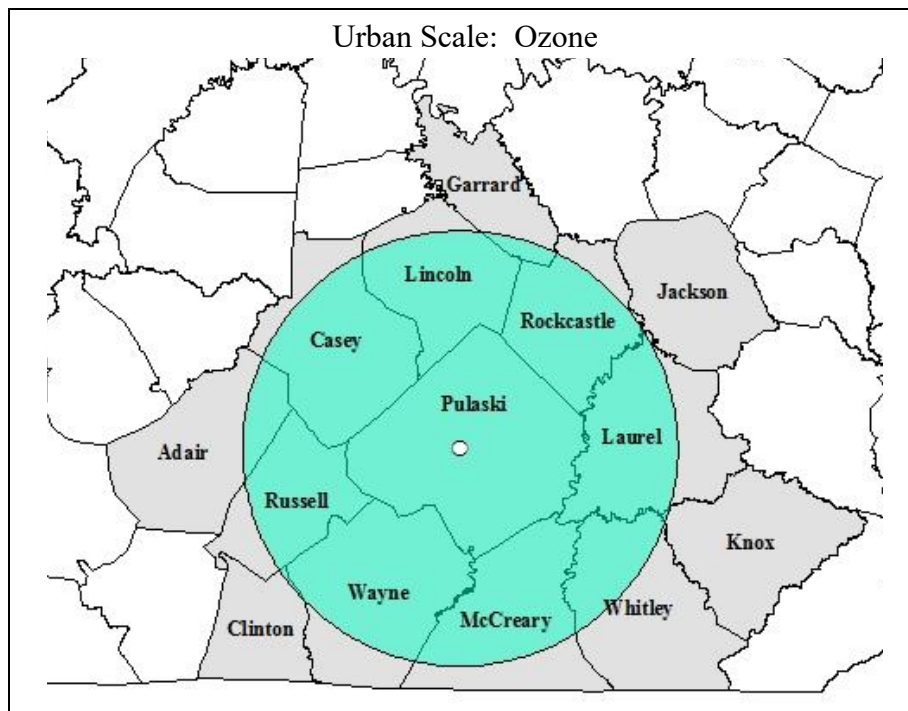
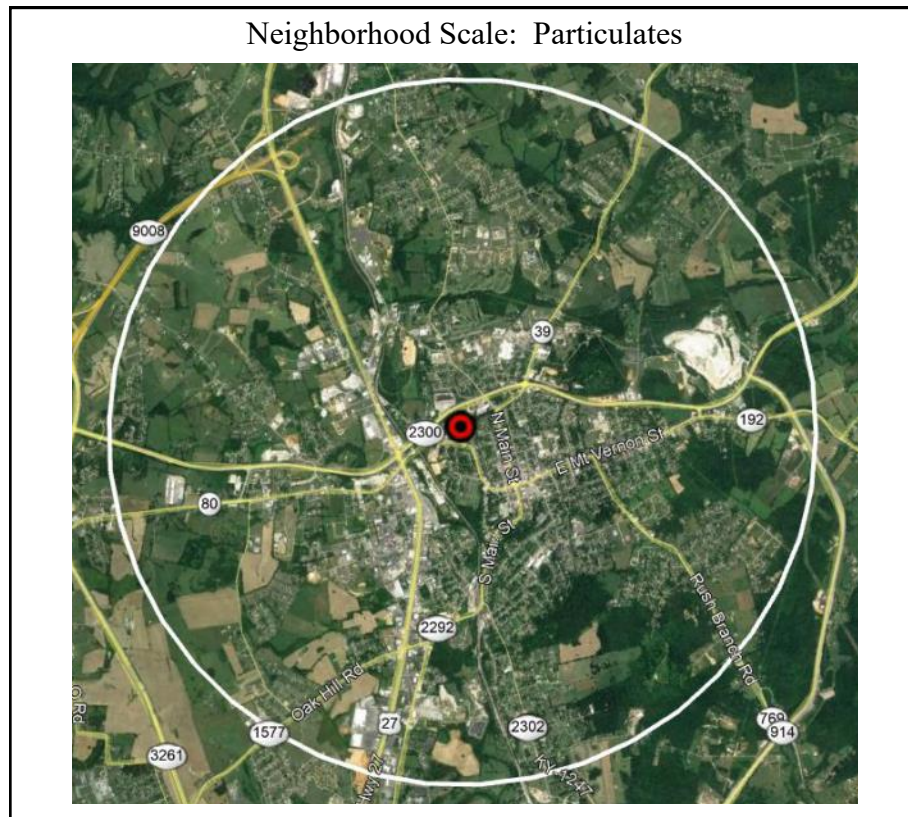
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	4.41	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.77	SLAMS AQI	Broadband Spectroscopy	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

The site represents population exposure on an urban scale for ozone. This site also represents population exposure on a neighborhood scale for particulates.



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## Not in a Metropolitan or Micropolitan Statistical Area



AQS ID / County	Site Address	PM2.5	Cont. PM2.5	PM10	Cont. PM10	SO2	NO2	NOy	CO	O3	Pb	VOC	Carbonyl	PAH	PM2.5 Spec.	Carbon Spec.	Black Carbon	RadNet	Met
21-193-0003 Perry	354 Perry Park Road Hazard		1 <sup>S,i</sup>							1 <sup>i,e</sup>									1
21-195-0002 Pike	109 Loraine Street Pikeville		1 <sup>S,i</sup>							1 <sup>i</sup>									
21-213-0004 Simpson	573 Harding Road Franklin									1 <sup>i</sup>									
<b>Totals</b>	<b>3</b>		<b>2</b>							<b>3</b>									<b>1</b>

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network.

S=Continuous PM T640

i=AQI Reported

e=Emergency Episode Monitor

**CSA/MSA:** Not in a MSA - Rural

**401 KAR 50:020 Air Quality Control Region:** South Central Kentucky Intrastate (105)

**Site Name:** Franklin

**AQS Site ID:** 21-213-0004

**Location:** KYTC Maintenance Facility, 573 Harding Road (KY1008), Franklin, KY 42134

**County:** Simpson

**GPS Coordinates:** 36.708607, -86.566284 (NAD 83)

**Date Established:** June 19, 1991

**Inspection Date:** October 26, 2022

**Inspection By:** Jenna Nall and Sam Guizio

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located on the grounds of the KYTC Garage on Harding Road (KY1008) in Franklin, Kentucky. The sample inlet is 42.5 meters from the nearest road. Upon inspection, the sample line and monitor were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, and E.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to measure ozone levels upwind of Bowling Green; and to provide data on interstate ozone transport.

<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	4.445	SLAMS AQI	UV photometry	Continuously March 1 – October 31

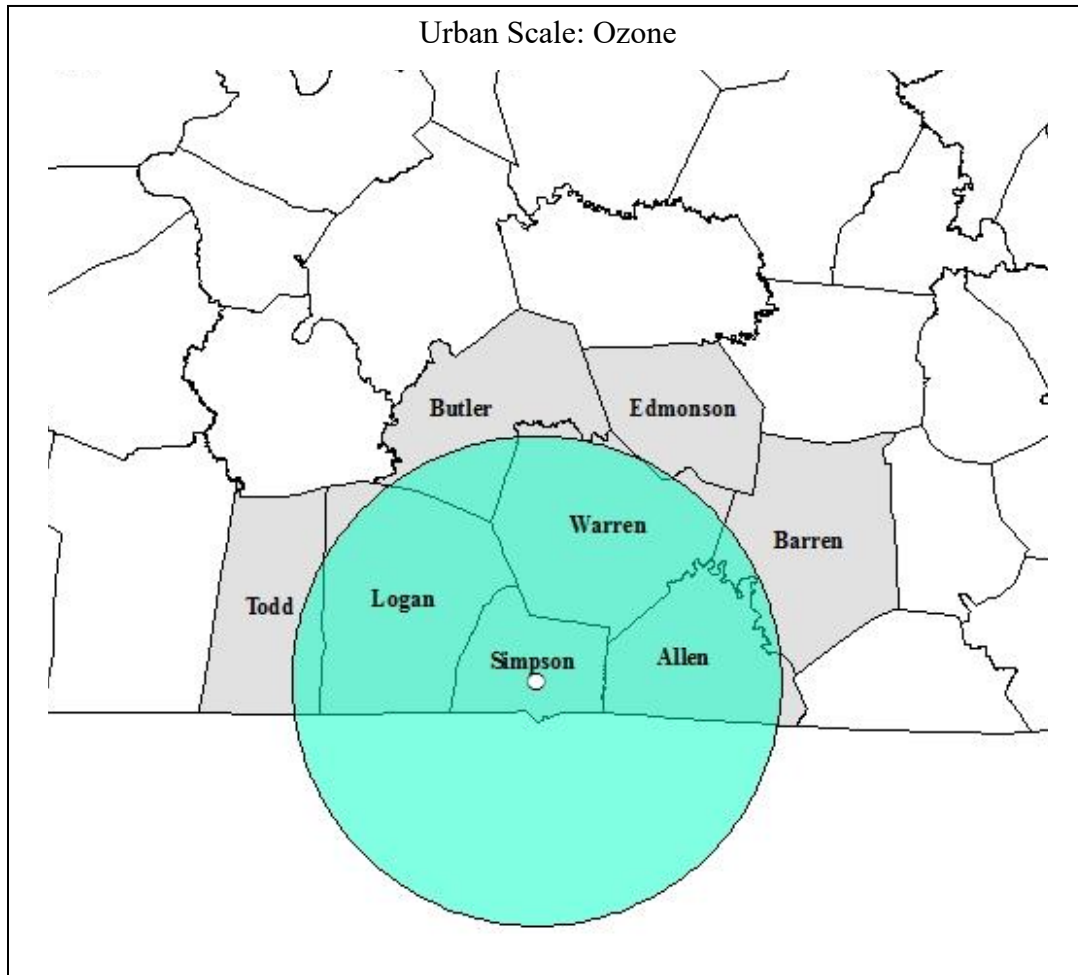
**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.



**Area Representativeness:**

The site represents population exposure on an urban scale.



**CSA/MSA:** Not in a MSA - Rural

**401 KAR 50:020 Air Quality Control Region:** Appalachian Intrastate (101)

**Site Name:** Hazard

**AQS Site ID:** 21-193-0003

**Location:** Perry County Horse Park, 354 Perry Park Road, Hazard, KY 41701

**County:** Perry

**GPS Coordinates:** 37.283247, -83.209311 (NAD 83)

**Date Established:** April 1, 2000

**Inspection Date:** October 24, 2022

**Inspection By:** Jenna Nall and Rebecca Waddle

**Site Approval Status:** A waiver request for road proximity is included in Appendix L



The monitoring site is a stationary equipment shelter located on the grounds of Perry County Park in Hazard, Kentucky. The sample inlets are just over 10 meters from the nearest road and a waiver request for road proximity is included in Appendix L. Otherwise, this site meets the requirements of 40 CFR 58, Appendices A, C, D, E, and G. Beginning in August 2022, Perry County Park became a temporary FEMA site after historic flooding that occurred in July 2022.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to detect elevated pollutant levels for activation of emergency control procedures for ozone.

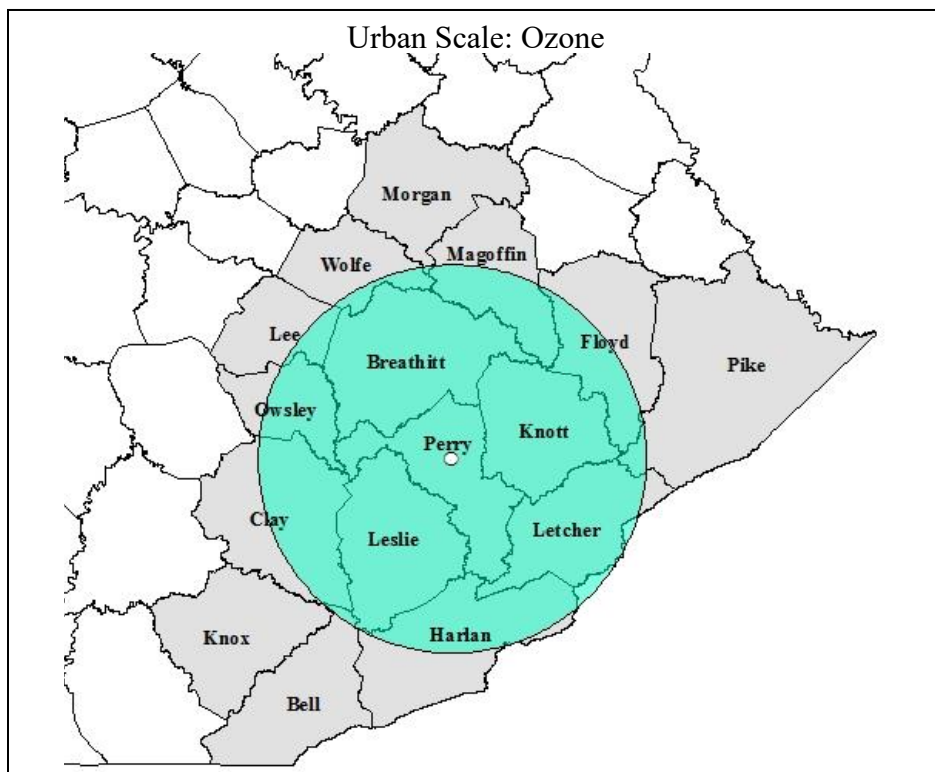
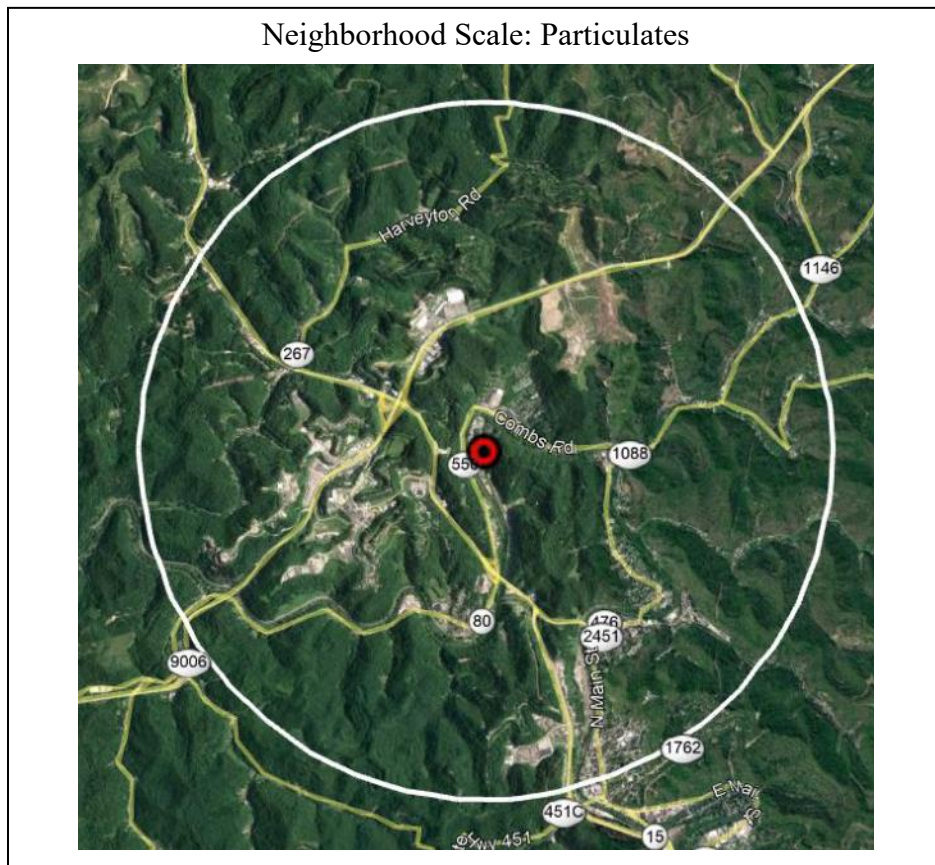
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.68	SLAMS AQI EPISODE	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.62	SLAMS AQI	Broadband Spectroscopy	Continuously
Meteorological	5.74	Other	AQM grade instruments for wind speed, wind direction, and temperature	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

The site represents population exposure on a neighborhood scale for particulates and urban for ozone.



**CSA/MSA:** Not in a MSA - Rural

**401 KAR 50:020 Air Quality Control Region:** Appalachian Intrastate (101)

**Site Name:** Pikeville Primary

**AQS Site ID:** 21-195-0002

**Location:** KYTC District Office, 109 Loraine Street, Pikeville, KY 41501

**County:** Pike

**GPS Coordinates:** 37.482575, -82.535319 (NAD 83)

**Date Established:** May 1, 1994

**Inspection Date:** October 24, 2022

**Inspection By:** Jenna Nall and Rebecca Waddle

**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.



The monitoring site is a stationary equipment shelter located behind the KYTC District Office building in Pikeville, KY. The sample inlets are 96 meters from the nearest road. Upon inspection the sample lines and monitors were found to be in good condition. This site meets the requirements of 40 CFR 58, Appendices A, C, D, and E.

**Monitoring Objective:**

The monitoring objectives are to determine compliance with National Ambient Air Quality Standards. While not required, the site also provides pollutant levels for daily air quality index reporting.

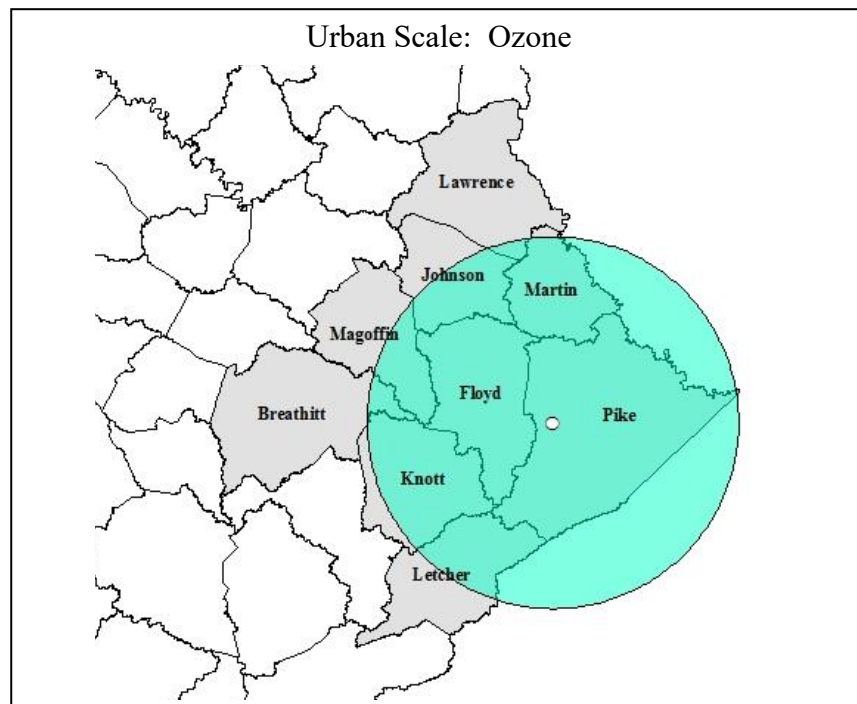
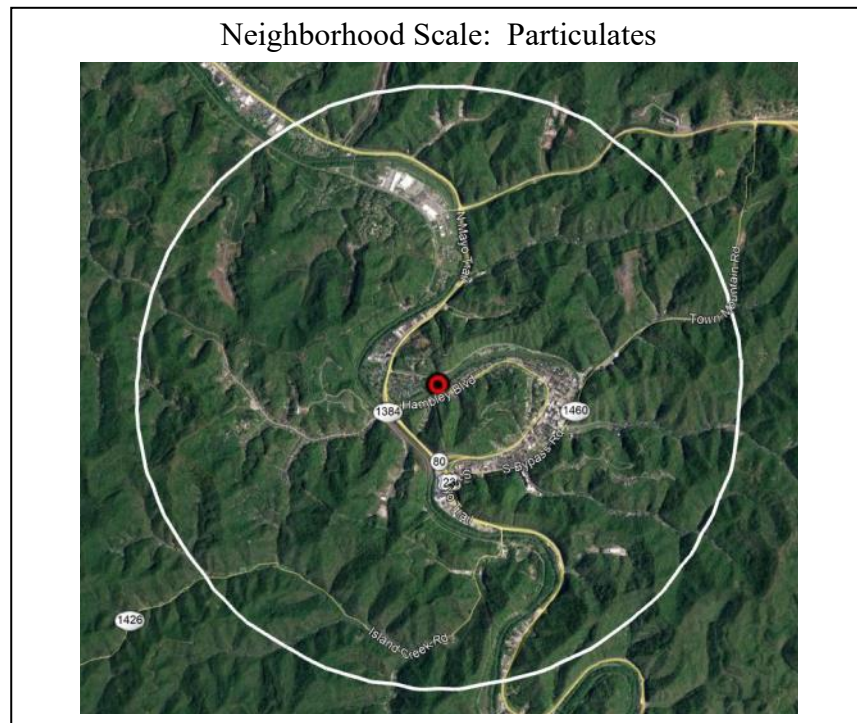
<b>Monitors</b>				
<b>Monitor Type</b>	<b>Inlet Height (meters)</b>	<b>Designation</b>	<b>Analysis Method</b>	<b>Frequency of Sampling</b>
AEM Ozone	3.53	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM PM <sub>2.5</sub> Continuous	4.75	SLAMS AQI	Broadband Spectroscopy	Continuously

**Quality Assurance Status:**

All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**

The site represents population exposure on a neighborhood scale for particulates. This site also represents population exposure on an urban scale for ozone.



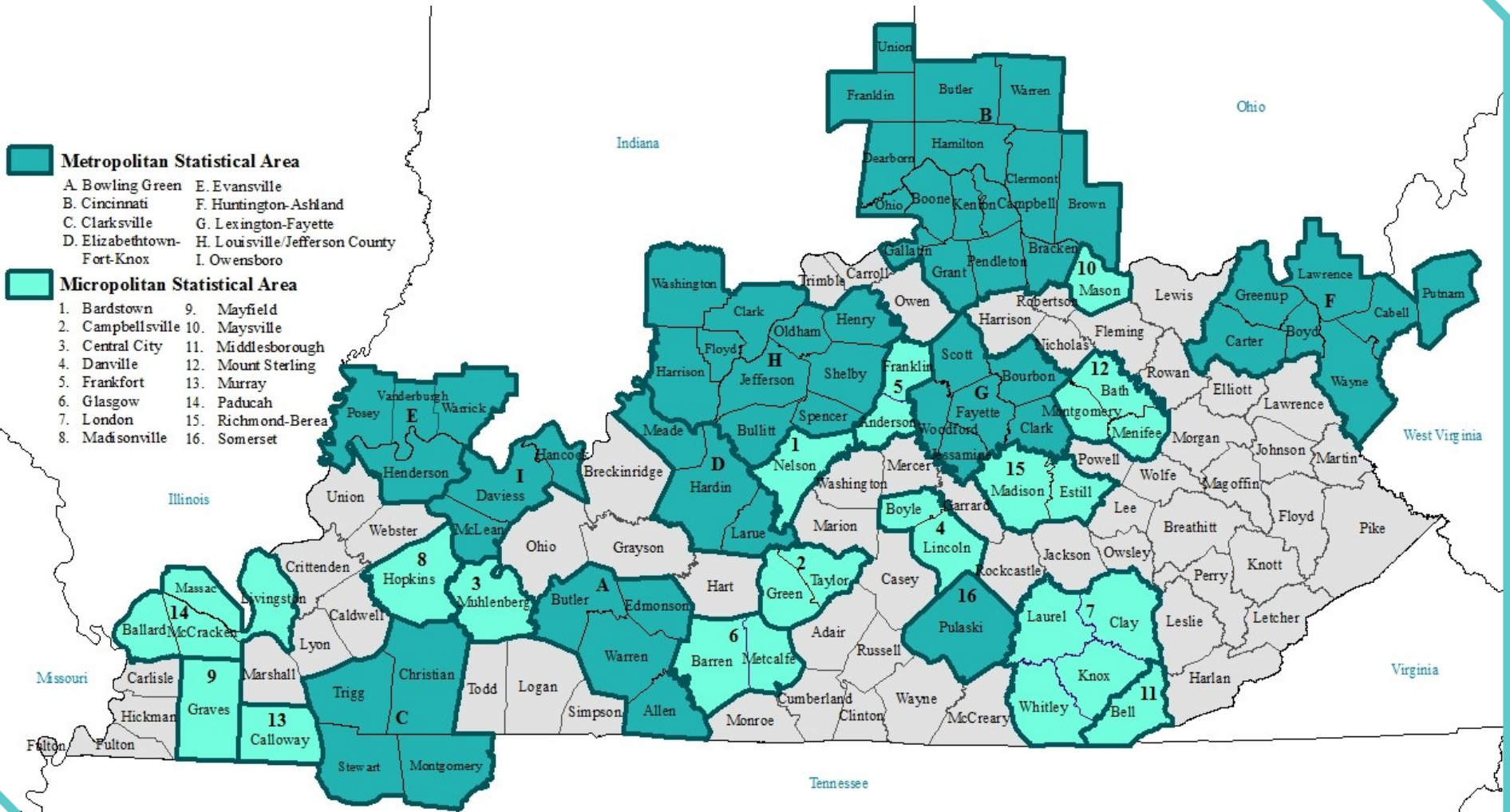
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**APPENDIX A**

**KENTUCKY CORE-BASED STATISTICAL  
AREAS MAP AND CBSA TABLES**

# Kentucky—Core Based Statistical Areas





CBSAs - Metropolitan Statistical Areas							
CBSA Title	CBSA Code	County	State	State Code	County Code	Count Population	CBSA Population
Bowling Green, KY	14540	Allen County	Kentucky	21	003	20,797	182,594
		Butler County	Kentucky	21	031	12,294	
		Edmonson County	Kentucky	21	061	12,291	
		Warren County	Kentucky	21	227	137,212	
Cincinnati, OH-KY-IN	17140	Dearborn County	Indiana	18	029	50,816	2,259,935
		Franklin County	Indiana	18	047	22,842	
		Ohio County	Indiana	18	115	5,978	
		Union County	Indiana	18	161	7,047	
		Boone County	Kentucky	21	015	137,412	
		Bracken County	Kentucky	21	023	8,439	
		Campbell County	Kentucky	21	037	93,050	
		Gallatin County	Kentucky	21	077	8,775	
		Grant County	Kentucky	21	081	25,244	
		Kenton County	Kentucky	21	117	169,495	
		Pendleton County	Kentucky	21	191	14,607	
		Brown County	Ohio	39	015	43,662	
		Butler County	Ohio	39	017	390,234	
		Clermont County	Ohio	39	025	209,642	
		Hamilton County	Ohio	39	061	826,139	
		Warren County	Ohio	39	165	246,553	
Clarksville, TN-KY	17300	Christian County	Kentucky	21	047	72,357	328,304
		Trigg County	Kentucky	21	221	14,192	
		Montgomery County	Tennessee	47	125	227,900	
		Stewart County	Tennessee	47	161	13,855	
Elizabethtown-Fort Knox, KY	21060	Hardin County	Kentucky	21	093	111,607	156,766
		Larue County	Kentucky	21	123	15,028	
		Meade County	Kentucky	21	163	30,131	
Evansville, IN-KY	21780	Posey County	Indiana	18	129	25,116	313,946
		Vanderburgh County	Indiana	18	163	179,987	
		Warrick County	Indiana	18	173	64,514	
		Henderson County	Kentucky	21	101	44,329	
Huntington-Ashland, WV-KY-OH	26580	Boyd County	Kentucky	21	019	47,899	356,581
		Carter County	Kentucky	21	043	26,412	
		Greenup County	Kentucky	21	089	35,649	
		Lawrence County	Ohio	39	087	57,445	
		Cabell County	West Virginia	54	011	93,418	
		Putnam County	West Virginia	54	079	57,260	
		Wayne County	West Virginia	54	099	38,498	
Lexington-Fayette, KY	30460	Bourbon County	Kentucky	21	017	20,229	517,846
		Clark County	Kentucky	21	049	36,871	
		Fayette County	Kentucky	21	067	321,793	
		Jessamine County	Kentucky	21	113	53,626	
		Scott County	Kentucky	21	209	58,252	
		Woodford County	Kentucky	21	239	27,075	
Louisville/Jefferson County, KY-IN	31140	Clark County	Indiana	18	019	122,738	1,284,566
		Floyd County	Indiana	18	043	80,454	
		Harrison County	Indiana	18	061	39,761	
		Washington County	Indiana	18	175	28,102	
		Bullitt County	Kentucky	21	029	82,918	
		Henry County	Kentucky	21	103	15,657	
		Jefferson County	Kentucky	21	111	777,874	
		Oldham County	Kentucky	21	185	68,685	
		Shelby County	Kentucky	21	211	48,461	
		Spencer County	Kentucky	21	215	19,916	
Owensboro, KY	36980	Daviess County	Kentucky	21	059	103,063	121,227
		Hancock County	Kentucky	21	091	9,064	
		McLean County	Kentucky	21	149	9,100	

CBSAs - Micropolitan Statistical Areas							
CBSA Title	CBSA Code	County	State Name	State Code	County Code	County Population	CBSA Population
Bardstown, KY	12680	Nelson County	Kentucky	21	179	47,098	47,098
Campbellsville, KY	15820	Green County	Kentucky	21	087	11,291	37,526
		Taylor County	Kentucky	21	217	26,235	
Central City, KY	16420	Muhlenberg County	Kentucky	21	177	30,694	30,694
Danville, KY	19220	Boyle County	Kentucky	21	021	30,747	54,990
		Lincoln County	Kentucky	21	137	24,243	
Frankfort, KY	23180	Anderson County	Kentucky	21	005	24,035	75,717
		Franklin County	Kentucky	21	073	51,682	
Glasgow, KY	23980	Barren County	Kentucky	21	009	44,544	54,893
		Metcalfe County	Kentucky	21	169	10,349	
London, KY	30940	Clay County	Kentucky	21	051	20,206	149,615
		Knox County	Kentucky	21	121	29,909	
		Laurel County	Kentucky	21	125	62,561	
		Whitley County	Kentucky	21	235	36,939	
Madisonville, KY	31580	Hopkins County	Kentucky	21	107	45,138	45,138
Mayfield, KY	32460	Graves County	Kentucky	21	083	36,615	36,615
Maysville, KY	32500	Mason County	Kentucky	21	161	16,931	16,931
Middlesborough, KY	33180	Bell County	Kentucky	21	013	23,858	23,858
Mount Sterling, KY	34460	Bath County	Kentucky	21	011	12,778	47,191
		Menifee County	Kentucky	21	165	6,194	
		Montgomery County	Kentucky	21	173	28,219	
Murray, KY	34660	Calloway County	Kentucky	21	035	37,560	37,560
Paducah, KY-IL	37140	Massac County	Illinois	17	127	13,960	98,068
		Ballard County	Kentucky	21	007	7,695	
		Livingston County	Kentucky	21	139	8,959	
		McCracken County	Kentucky	21	145	67,454	
Richmond-Berea, KY	40080	Estill County	Kentucky	21	065	14,092	108,758
		Madison County	Kentucky	21	151	94,666	
Somerset, KY	43700	Pulaski County	Kentucky	21	199	65,423	65,423

CBSA 2021 population estimate data obtained from the US Census Bureau. Annual Resident Population Estimates and Estimated Components of Resident Population Change for Metropolitan and Micropolitan Statistical Areas and Their Geographic Components: April 1, 2020 to July 1, 2021 (CBSA-EST2021-ALLDATA). Accessed 4/14/2022.



**APPENDIX B**

**MEMORANDUM OF AGREEMENT  
CINCINNATI, OH-KY-IN MSA**

MEMORANDUM OF AGREEMENT  
ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR  
THE CINCINNATI OH-KY-IN  
METROPOLITAN STATISTICAL AREA (MSA)

Participating Agencies:

Kentucky Department for Environmental Protection (KDEP)  
Division for Air Quality (DAQ)

Hamilton County Department of Environmental Services (HCDOES)

Indiana Department of Environmental Management (IDEM)  
Office of Air Quality (OAQ)

**PURPOSE/OBJECTIVES/GOALS**

The purpose of this Memorandum of Agreement (MOA) is to establish the Cincinnati OH-KY-IN Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement among KDEP, IDEM, and HCDOES to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone; as well as other criteria pollutant air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. According to 40 CFR Part 58, Appendix D, the Cincinnati OH-KY-IN MSA minimum monitoring requirements (based on a population of 2,172,000) are (2) ozone monitors, (2-4) PM-10 monitors, (3) FRM PM-2.5 monitors, and (2) collocated continuous PM-2.5 monitors with the FRM PM-2.5 monitors. This MOA will formalize and reaffirm the collective agreement in order to provide adequate criteria pollutant monitoring for the Cincinnati OH-KY-IN MSA as required by 40 CFR 58 Appendix D, Section 2(e).

PM2.5 MSA monitoring network includes:

County	Federal Reference Method PM2.5	Continuous PM2.5	Speciation PM2.5	Collocated PM2.5
Campbell County, KY KDEP	1	1	0	0
Boone County, KY KDEP	0	0	0	0
Hamilton County, OH HCDOES	4	2	1	1
Butler County, OH HCDOES	2	0	0	1
Clermont County, OH HCDOES	1	1	0	0
Warren County, OH HCDOES	1	1	0	0
Franklin County, IN IDEM	0	0	0	0
Dearborn County, IN IDEM	0	0	0	0
Ohio County, IN IDEM	0	0	0	0

Criteria Air Pollutant MSA monitoring network includes:

County	PM10	O <sub>3</sub>	NO <sub>x</sub> /NO/NO <sub>2</sub>	CO	SO <sub>2</sub>
Campbell County, KY KDEP	0	1	1	0	1
Boone County, KY KDEP	0	1	0	0	0
Hamilton County, OH HCDOES	3	3	1	1	1
Butler County, OH HCDOES	2	2	0	0	0
Clermont County, OH HCDOES	0	1	0	0	0
Warren County, OH HCDOES	0	1	0	0	0
Franklin County, IN IDEM	0	0	0	0	0
Dearborn County, IN IDEM	0	0	0	0	0
Ohio County, IN IDEM	0	0	0	0	0

## RESPONSIBILITIES/ACTIONS

Each of the parties to this Agreement is responsible for ensuring that its obligations under the MOA are met. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies via telephone or email of any monitoring changes occurring within its jurisdiction of the MSA at its earliest convenience, after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or any occurrences that result in an extended (greater than one quarter) or permanent change in the monitoring network.

## LIMITATIONS

- All commitments made in this MOA are subject to the availability of appropriated funds and each agency's budget priorities. Nothing in this MOA obligates KDEP, IDEM, or HCDOES to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.
- This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this agreement will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate agreements that will be affected in writing by representatives of the parties.
- This MOA does not create any right or benefit enforceable by law or equity against KDEP, IDEM, or HCDOES, their officers or employees, or any other person. This MOA does not apply to any entity outside KDEP, IDEM, or HCDOES.
- No proprietary information or intellectual property is anticipated to arise out of this MOA.

## TERMINATION

This Memorandum of Agreement may be revised upon the mutual consent of KDEP, IDEM, and HCDOES. Each party reserves the right to terminate this MOA. A thirty (30) day written notice must be given prior to the date of termination.

### APPROVALS

We agree with the provisions outlined in this Memorandum of Agreement and commit our agencies to implement them in a spirit of cooperation and mutual support.

Kentucky Department for Environmental Protection  
Division for Air Quality

BY: John Lyons

TITLE: Director, Division for Air Quality

DATE: 5/13/10

Hamilton County Department of Environmental Services

BY: Cory Chadwick

TITLE: Director

DATE: 5/13/10

Indiana Department of Environmental Management  
Office of Air Quality

BY: Keith Baugues

TITLE: Assistant Commissioner, Office of Air Quality

DATE: 5/19/10

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**APPENDIX C**

**MEMORANDUM OF AGREEMENT  
EVANSVILLE, IN-KY MSA**

**MEMORANDUM OF AGREEMENT  
ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR  
THE EVANSVILLE, IN-HENDERSON, KY  
METROPOLITAN STATISTICAL AREA (MSA)**

**Participating Agencies:**

Kentucky Department for Environmental Protection (KDEP)  
Division for Air Quality (DAQ)

Indiana Department of Environmental Management (IDEM)  
Office of Air Quality (OAQ)

**PURPOSE/OBJECTIVES/GOALS**

The purpose of this Memorandum of Agreement (MOA) is to establish the Evansville, IN-Henderson, KY Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement among KDEP and IDEM to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM 10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone; as well as other criteria pollutant air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. According to 40 CFR Part 58, Appendix D, the Evansville, IN-Henderson, KY MSA minimum monitoring requirements (based on a population of 350,000) are (2) ozone monitors, (0-1) PM-10 monitors, (1) FRM PM-2.5 monitor, and (1) collocated continuous PM-2.5 monitor with the FRM pm-2.5 monitor. This MOA will formalize and reaffirm the collective agreement in order to provide adequate criteria pollutant monitoring for the Evansville, IN-Henderson, KY MSA as required by 40 CFR 58 Appendix D, Section 2, (e).

PM 2.5 MSA monitoring network includes:

<b>County</b>	<b>Federal Reference Method PM2.5</b>	<b>Continuous PM2.5</b>	<b>Speciation PM2.5</b>	<b>Collocated PM2.5</b>
<b>Henderson County, KY KDEP</b>	1	1	0	0
<b>Vanderburgh County, IN IDEM</b>	3	1	1	1

Criteria Air Pollutant MSA monitoring network includes:

County	PM10	O <sub>3</sub>	NO <sub>x</sub> /NO/NO <sub>2</sub>	CO	SO <sub>2</sub>
Henderson County, KY KDEP	1	1	0	0	1
Vanderburgh County, IN IDEM	1	2	1	1	1

### RESPONSIBILITIES/ACTIONS

Each of the parties to this Agreement is responsible for ensuring that its obligations under the MOA are met. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies via telephone or email of any monitoring changes occurring within its jurisdiction of the MSA at its earliest convenience, after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or any occurrences that result in an extended (greater than one quarter) or permanent change in the monitoring network.

### LIMITATIONS

- All commitments made in this MOA are subject to the availability of appropriated funds and each agency's budget priorities. Nothing in this MOA obligates KDEP or IDEM to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.
- This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this agreement will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate agreements that will be affected in writing by representatives of the parties.
- This MOA does not create any right or benefit enforceable by law or equity against KDEP or IDEM, their officers or employees, or any other person. This MOA does not apply to any entity outside KDEP or IDEM.
- No proprietary information or intellectual property is anticipated to arise out of this MOA.

## TERMINATION

This Memorandum of Agreement may be revised upon the mutual consent of KDEP and IDEM. Each party reserves the right to terminate this MOA. A thirty (30) day written notice must be given prior to the date of termination.

### APPROVALS

We agree with the provisions outlined in this Memorandum of Agreement and commit our agencies to implement them in a spirit of cooperation and mutual support.

Kentucky Department for Environmental Protection  
Division for Air Quality

BY: John. S. Lyons

TITLE: Director, Division for Air Quality

DATE: 5/14/10

Indiana Department of Environmental Management  
Office of Air Quality

BY: Keith Baugues

TITLE: Assistant Commissioner, Office of Air Quality

DATE: 5/24/10



**APPENDIX D**

**MEMORANDA OF AGREEMENT  
CLARKSVILLE, TN-KY MSA**

February 16, 2021

Ms. Melissa Duff  
 Director  
 Kentucky Division for Air Quality  
 Kentucky Department for Environmental Protection  
 300 Sower Boulevard  
 2<sup>nd</sup> Floor  
 Frankfort, KY 40601

Dear Ms. Duff:

The United States Environmental Protection Agency’s (EPA) revised monitoring regulations found in 40 CFR Part 58, Appendix D states in part “The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.” This revision of the CFR also describes the minimum monitoring requirements for the NAAQS pollutants. Tennessee and Kentucky share the Clarksville, TN-KY MSA, which is comprised of Trigg and Christian counties in Kentucky and Montgomery and Stewart counties in Tennessee.

CBSA Code	Geographic Area	Legal/Statistical Area Description	2019 Pop Estimate	2010 Census
17300	Clarksville, TN-KY	Metropolitan Statistical Area	307820	273949

The Tennessee Division of Air Pollution Control (TDEC DAPC) currently operates one (1) PM2.5 FEM continuous monitor at site 47-125-2001. This provides sufficient characterization of the particulate air quality in the entire Clarksville, TN-KY MSA and complies with the requirements for both population and concentration-based monitoring identified in the regulations found at 40 CFR 58, Appendix D.

The Kentucky for Air Quality currently operates one (1) seasonal ozone monitor at site 21-047-0006. This site characterizes the ozone air quality in the entire Clarksville, TN-KY MSA and complies with the requirements for both population concentration-based monitoring identified in 40 CFR Part 58, Appendix D.

TDEC DAPC would like to invite Kentucky’s Division for Air Quality to participate in Tennessee’s annual ambient air monitoring network review. Tennessee commits to notifying Kentucky in advance of any proposed relocations or monitor shutdowns in the Clarksville, TN-KY MSA and respectfully requests that Kentucky provide

---

Division of Air Pollution Control  
 William Snodgrass Tennessee Tower • 15<sup>th</sup> Floor • Nashville, TN 37243  
 312 Rosa L. Parks Avenue • Nashville, TN 37243  
 Tel: 615-532-0554 • Fax: 615-532-0614  
 Air.Pollution.Control@tn.gov



notification to Tennessee in advance of any proposed equipment shutdowns or relocations within the Clarksville, TN-KY MSA. Advanced notice would allow both parties to make adequate monitoring arrangements to ensure the MSA monitoring requirements are being met. If you have technical questions, contact Bradley King at 615-687-7042 or [Bradley.King@tn.gov](mailto:Bradley.King@tn.gov). I may be contacted at 615-532-9668 or [Michelle.B.Walker@tn.gov](mailto:Michelle.B.Walker@tn.gov).

Sincerely,

A handwritten signature in blue ink that reads "Michelle W. Owenby". The signature is written in a cursive style.

Michelle Walker Owenby  
Director  
Division of Air Pollution Control  
Department of Environment and Conservation



ANDY BESHEAR  
GOVERNOR

REBECCA W. GOODMAN  
SECRETARY

**ENERGY AND ENVIRONMENT CABINET  
DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

300 SOWER BOULEVARD  
FRANKFORT, KENTUCKY 40601  
TELEPHONE: 502-564-2150  
TELEFAX: 502-564-4245

ANTHONY R. HATTON  
COMMISSIONER

June 21, 2021

Ms. Michelle Walker Owenby  
Director  
Tennessee Division of Air Pollution Control  
William Snodgrass Tennessee Tower, 15<sup>th</sup> Floor  
312 Rosa L. Parks Avenue  
Nashville, TN 37243

**RE: Clarksville, TN-KY MSA Monitoring Agreement**

Dear Ms. Owensby:

In a letter from your office dated February 16, 2021, the Tennessee Division of Air Pollution Control (TDAPC) agreed to operate a continuous PM<sub>2.5</sub> monitor in order to meet the minimum network design requirements stated in 40 CFR 58, Appendix D for the Clarksville, TN-KY metropolitan statistical area (MSA). The Kentucky Division for Air Quality (KDAQ) appreciates TDAPC's cooperation and appreciates the invitation to participate in TDAPC's annual air monitoring network review.

KDAQ currently operates one (1) continuous PM<sub>2.5</sub> FEM monitor and one (1) continuous ozone monitor at the Hopkinsville site (21-047-0006) in Christian County, KY. In accordance with Table D-2 of 40 CFR 58, Appendix D, one (1) ozone monitor is required to be operated in the Clarksville, TN-KY MSA, based upon currently available population estimates from the US Census Bureau, as well 2018-2020 three-year ozone design values (DV). PM<sub>2.5</sub> monitoring is not currently required in the MSA, based upon the minimum monitoring requirements found in 40 CFR 58, Appendix D.

Geographic Area	Code	2019 USCB Population Est.	2018-2020 3-Year O <sub>3</sub> DV	2018-2020 3-Year PM <sub>2.5</sub> DV
Christian County, KY	21-047	70,461	0.058	8.1
Trigg County, KY	21-221	14,651	0.061 (CASTNET)	-
Montgomery County, TN	47-125	208,993	-	7.3 *
Stewart County, TN	47-161	13,715	-	6.8 *
<b>Clarksville, TN-KY MSA</b>	<b>17300</b>	<b>307,820</b>	<b>0.061</b>	<b>8.1</b>

*\*Does not meet data completeness requirements*

An Equal Opportunity Employer M/F/D



To satisfy regulatory requirements, KDAQ agrees to continue to operate one (1) ozone monitor at the Hopkinsville site. While PM<sub>2.5</sub> monitoring is not currently required for the MSA, KDAQ will continue to operate the continuous PM<sub>2.5</sub> FEM at the Hopkinsville site, as it is currently the design value monitor for the MSA. When possible, KDAQ agrees to provide advanced notification to TDAPC in the event that shutdown or relocation of either the ozone or PM<sub>2.5</sub> monitor is necessary.

KDAQ commits to sharing with TDAPC all quality-assured ambient air monitoring data collected in the Kentucky portion of the Clarksville, TN-KY MSA. KDAQ also welcomes TDAPC's participation in Kentucky's annual network review process. If you have any questions or concerns, please contact Jennifer Miller at 502-782-6708.

Sincerely,



for  
Melissa Duff,  
Director

MKD/jfm

Electronic cc:

- Bradley King, TDAPC
- Jenna Nall, KDAQ

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**APPENDIX E**

**LMAPCD  
AMBIENT AIR MONITORING  
NETWORK 2023**



# Louisville Metro Air Pollution Control District’s Proposed Changes to the Ambient Air Quality Monitoring Network

May 2023

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## LMAPCD Proposed Network Changes – Overview

The Louisville Metro Air Pollution Control District (LMAPCD) is not proposing any significant changes to the ambient monitoring network during the 2023 Network Planning period (July 2023 through June 2024). Some minor modifications may occur depending on available time and resources. This document serves to provide general information about LMAPCD’s ambient air monitoring network and updates on proposed changes mentioned in prior network plans. Additional details and clarifications on various aspects of the monitoring network are presented below.

## Particulate Matter Network Update & Intended Use of PM2.5 Monitors

As discussed in prior network plans, LMAPCD has fully completed implementation of new monitoring technologies for PM2.5. **All LMAPCD monitoring sites contain a Teledyne API T640 or T640x PM2.5 FEM monitor. These continuous PM2.5 analyzers serve as the primary monitors for those sites and are intended to assess compliance with the PM2.5 NAAQS.** LMAPCD still operates two FRM samplers, but these samplers serve as collocated monitors to assess and evaluate the comparability between FEM continuous methods and the FRM filter-based method. Table 1 serves to clarify the intended use of PM<sub>2.5</sub> data for calendar year 2020 and beyond.

PM <sub>2.5</sub> Monitors Operated by LMAPCD – Current								
Site Name	AQS ID	Parameter Code	POC	Monitor Type	Method	Primary Monitor?	Compare to NAAQS?	Eligible for AQI?
Watson Lane	21-111-0051	88101	3	SLAMS	API T640	Yes	Yes	Yes
Cannons Lane	21-111-0067	88101	3	SLAMS	API T640x	Yes	Yes	Yes
Cannons Lane	21-111-0067	88101	1	Colloc	FRM	No	Yes	NA
Carrithers Middle School	21-111-0080	88101	3	SLAMS	API T640	Yes	Yes	Yes
Durrett Lane	21-111-0075	88101	3	SLAMS	API T640	Yes	Yes	Yes
Durrett Lane	21-111-0075	88101	1	Colloc	FRM	No	Yes	NA
Algonquin Parkway	21-111-1041	88101	3	SLAMS	API T640x	Yes	Yes	Yes

Table 1 - List of LMAPCD PM<sub>2.5</sub> monitors that are currently in place and will remain in place for the foreseeable future.

## Photochemical Assessment Monitoring Station (PAMS)

Based on updated monitoring regulations in 40 CFR Part 58, Appendix D, state and local air monitoring agencies were to begin PAMS monitoring at their NCore location by June 1, 2021. Due to delays in the procurement of equipment, several of the PAMS required parameters were not ready to be collected at the start of the 2021 PAMS season. While most PAMS instrumentation was physically in place by July 1, 2021, the procurement delays did not provide sufficient time to perform adequate acceptance testing to ensure that quality data could be obtained for the 2021 PAMS season. This was particularly true for mixing height, carbonyls, and continuous VOC monitoring. As such, APCD did not find it appropriate to report the 2021 PAMS data to EPA’s AQS database. While some procurement delays also occurred in 2022 that impacted the data quality for a portion of the 2022 PAMS season, some data will be reported to EPA for the 2022 PAMS season. While technical and staffing challenges remain for APCD’s PAMS

program, APCD is hopeful that a full suite of PAMS data is collected and reported for the 2023 PAMS season.

Mixing height data via the ceilometer has been collected on an intermittent basis, but the quality of the data has not been confirmed due to resource limitations and significant delays in the data validation process via the Unified Ceilometer Network<sup>1</sup> (UCN). Table 2 provides a listing of all required PAMS parameters and their status at APCD’s Cannons Lane NCore site as of May 2023. LMAPCD continues to work as diligently as possible to evaluate the new PAMS instrumentation so that meaningful, valid data can be collected and reported to EPA’s AQS database.

<b>Status of PAMS Parameters at APCD’s Cannons Lane NCore Site</b>			
<i>Required PAMS Measurement</i>	<i>Instrumentation</i>	<i>Status</i>	<i>Date</i>
<b>Hourly VOCs</b>	CAS / Chromatotec Auto GC	Operational	7/15/2021
<b>Carbonyls</b>	ATEC 8000-2 Carbonyl Sampler	Operational	6/1/2022
<b>Hourly Ozone</b>	Teledyne API T400 <sup>2</sup>	Operational	2/27/2016
<b>True NO2</b>	Teledyne API T500U	Operational	6/15/2017
<b>NOy</b>	Teledyne API T200U NOy <sup>2</sup>	Operational	6/12/2018
<b>Ambient Temp</b>	Vaisala HMW93D Temp/RH Probe	Operational	1/1/2010
<b>Wind</b>	RM Young 85000 Ultrasonic	Operational	1/19/2010
<b>Ambient Pressure</b>	RM Young 61302V	Operational	10/8/2018
<b>Precipitation</b>	Met One 370 Tipping Bucket <sup>2</sup>	Operational	6/23/2016
<b>Hourly Mixing Height</b>	Vaisala Ceilometer CL51	UCN Delay	6/1/2021
<b>Solar Radiation</b>	Eppley PS Pyranometer	Operational	3/1/2009
<b>UV Radiation</b>	Eppley TUVR Radiometer	Operational	6/2/2021

Table 2 - List of PAMS parameters required by 40 CFR Part 58 Appendix D and the status of those parameters at APCD's Cannons Lane NCore site.

## Air Toxics Monitoring

LMAPCD also performs Air Toxics monitoring at the Algonquin Parkway site using similar technology to that of the Consolidated Analytical System’s (CAS) Chromatotec Auto GC that is used for PAMS monitoring of hourly VOCs. The Auto GC at Algonquin Parkway underwent numerous upgrades in previous years and significant effort has been put forth to improve the system and sync it with LMAPCD’s central data collection system and database. Routine collection and validation of a subset of Volatile Organic Compounds (VOCs) began in July 2020. The Auto GC system will have some continued limitations in assessing all Toxics compounds of interest. Furthermore, LMAPCD continues to experience some data management challenges due to the combined volume of data from the Algonquin Parkway Auto GC and Cannons Lane Auto GC. This data management challenge along with the significant time

<sup>1</sup> LMAPCD continued to experience significant communication delays with the UCN team throughout 2022 and into 2023. LMAPCD is currently in the process of working with the UCN team and LMAPCD’s IT department to work through some technical / security concerns.

<sup>2</sup> Operational date listed is for this specific method. Parameter has been collected for several years prior to the operational date listed using different instrumentation / method.

and resources needed to produce data of sufficient quality have resulted in some gaps and delays in the reporting of these data.

### Black Carbon Monitoring at Durrett Lane Near Road Site

As discussed in prior network plan documents, LMAPCD planned to install the Magee Scientific AE33 Aethalometer at the Durrett Lane Near Road site in the Fall of 2020 to better characterize particulate carbon species. Due to the COVID-19 pandemic and staff / resource limitations, this process was delayed. However, the Magee Scientific AE33 Aethalometer was installed at the Durrett Lane Near Road site in June 2022 and the instrument underwent initial evaluation and performance testing. Development of QA/QC procedures occurred throughout the winter of 2022 – 2023. While SOPs are still in development, the confidence in the quality of the data has increased. When it has been determined that the data collection and data validation process is providing quality data, the data will be made more widely available.

### Ozone Monitoring at Algonquin Parkway

As discussed in the 2022 Network Plan, LMAPCD planned to add an ozone monitor to the Algonquin Parkway site to improve the spatial coverage of ozone monitoring in West Louisville. LMAPCD installed an ozone analyzer and related calibration equipment at the Algonquin Parkway site in February 2023 and generation of valid ozone data commenced by the start of ozone season on March 1, 2023. This addition will better serve the population of West Louisville, which experiences disproportionate health impacts from air pollution and other environmental hazards. While prevailing winds most often result in higher ozone concentrations in the central, northern, and eastern portion of the Louisville area, elevated ozone can occur throughout any portion of the metro area under the right meteorological conditions.

### Ozone Analyzer Upgrades to Install Nafion Dryers

Per EPA's Office of Air Quality Planning and Standard's memo titled 'Use of Nafion Dryers for Ultraviolet (UV) Ozone Analyzer (February 19, 2021), LMAPCD upgraded their ozone monitoring network during the winter of 2022 – 2023 to add Nafion dryers as part of the sample lines within the Teledyne API T400 ozone analyzers. Per EPA's memo, the use of Nafion dryers for humidity control had shown improvement in the response times and noise of ozone data. While the issue was minor relative to overall ozone data quality, LMAPCD had experienced similar response time and noise issues in the past and associated these issues with humid ambient conditions. This was particularly an issue when performing quality control checks as the sampling system had challenges when transitioning from humid ambient air to dry ozone test gas from the calibrators. Upon installation of Nafion dryers prior to the start of the 2023 ozone season, LMAPCD has seen noticeable improvement in the response time and noise of ozone data when quality control checks are performed. Per EPA's memo, the addition of the Nafion dryers as part of the sample line within ozone analyzers represents "a suitable equivalent material", therefore no modifications were needed to the UV-based FEM designations nor were any method code changes required as part of this implementation.

## Meteorological & Low-Cost Sensors

LMAPCD has acquired some additional meteorological instruments to aid in characterizing and better understanding some of the complex meteorological conditions that can occur in the Louisville area, which is situated within the Ohio River Valley. These additional instruments include temperature sensors that can be installed at different heights to help identify vertical temperature gradients (i.e. lapse rate). The ‘temperature lapse rate’ data can be used to identify periods of stable or unstable atmospheric conditions, which could aid in further understanding of pollutant dispersion and air quality forecasting. The temperature lapse rate data may also provide some additional insight into microclimate effects at sites in close proximity to the Ohio River. Additionally, LMAPCD was granted a Sensor Collocation Shelter by EPA Region 4 that can be used to collocate low-cost sensors with federally approved methods at the Cannons Lane NCore site to help assess the accuracy of low-cost sensors. This collocation shelter was installed in May 2022. LMAPCD has installed some low-cost sensors at the Durrett Lane Near Road site for evaluation and continues to evaluate ways to promote low-cost sensor technology in a responsible manner. Since many of these meteorological instruments and low-cost sensors are not required State and Local Air Monitoring Station (SLAMS) monitors for NAAQS compliance, these devices will be installed as time and resources allow.

## Conclusion

Much of the information presented in this document is intended to provide clarifications on minor network modifications and updates on previously proposed changes. Table 3 provides a summary of the number of ambient air quality monitoring sites in operation for each pollutant group within the Louisville MSA. As indicated in Table 3, the Louisville MSA continues to meet the EPA minimum monitoring requirements through the collective efforts of the Indiana Department of Environmental Management (IDEM), KDAQ, and the LMAPCD. It should also be noted that the operation of ambient air quality monitors by the LMAPCD alone meets the EPA minimum monitoring requirements for the Louisville MSA.

Louisville / Jefferson County MSA Monitoring Requirements											
	O <sub>3</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>c</sub>	PM <sub>BC</sub>	CSN	SO <sub>2</sub>	NO <sub>2</sub>	CO	Toxics	PAMS
<b># Sites Required by CFR</b>	2	3	2-4	1	0	0	1	2	2	0	1
<b># Current Sites</b>	8 (4)	7 (5)	3 (2)	1 (1)	2 (1)	2 (1)	4 (3)	2 (2)	2 (2)	2 (1)	1 (1)
<b># Sites After proposed Changes</b>	8 (4)	7 (5)	3 (2)	1 (1)	2 (1)	2 (1)	4 (3)	2 (2)	2 (2)	2 (1)	1 (1)

Table 3 - Summary of monitoring requirements in Louisville / Jefferson County MSA compared to number of monitors / sites before and after proposed network changes. Numbers in parenthesis represents number of sites that APCD operates (versus total number in MSA).



**Louisville, KY APCD Equipment Inventory - May 2023**

Site	Asset Type	Manufacturer	Model	Serial Number	Current Status	Condition
ALGONQUIN	Analyzer	Chromatotec/CAS	airmoVOC C2C6	56410717	Active	GOOD
ALGONQUIN	Analyzer	Chromatotec/CAS	airmoVOC C6C12	26400717	Active	GOOD
ALGONQUIN	Analyzer	Teledyne API	T640x	592	Active	GOOD
ALGONQUIN	Analyzer	Teledyne API	T640	151	Spare	GOOD
ALGONQUIN	Analyzer	Thermo Fisher Scientific	2025i	20612	Spare	GOOD
ALGONQUIN	Analyzer	Thermo Fisher Scientific	2025i	20614	Spare	GOOD
ALGONQUIN	Analyzer	Teledyne API	T100U	81	Active	FAIR
ALGONQUIN	Analyzer	Teledyne API	T400	315	Active	GOOD
ALGONQUIN	Cal Standard	AIRGAS	Protocol Gas - SO2	LL127106	Active	GOOD
ALGONQUIN	Cal Standard	Linde/ERG	PAMS Cylinder	CC741201	Retired	FAIR
ALGONQUIN	Cal Standard	AIRGAS	Toxics Cylinder	EA0031391	Active	GOOD
ALGONQUIN	Cal Standard	Chromatotec/CAS	airmoCAL	56440717	Active	GOOD
ALGONQUIN	Cal Standard	Chromatotec/CAS	Hydroxychrom	56420717	Active	GOOD
ALGONQUIN	Cal Standard	AIRGAS	PAMS Cylinder	CC746551	Active	GOOD
ALGONQUIN	Cal Standard	Chromatotec/CAS	n-butane permeation tube	20220304-1961	Active	FAIR
ALGONQUIN	Cal Standard	Chromatotec/CAS	n-hexane permeation tube	20220304-1953	Active	FAIR
ALGONQUIN	Cal Standard	Chromatotec/CAS	benzene permeation tube	20220328-1875	Active	FAIR
ALGONQUIN	Cal Standard	Chromatotec/CAS	n-decane permeation tube	20220114-1849	Active	FAIR
ALGONQUIN	Cal Standard	Teledyne API	T700U	106	Active	GOOD
ALGONQUIN	Cal Standard	Teledyne API	T701H	802	Active	GOOD
ALGONQUIN	Instrument	RM Young	41372VC	Y4940092	Active	FAIR
ALGONQUIN	Instrument	RM Young	85000	UB3773	Active	GOOD
ALGONQUIN	Instrument	Vaisala	HMW93D	H052001	Active	GOOD
ALGONQUIN	Logger	ESC Agilaire	8832	4294	Active	FAIR
ALGONQUIN	Unspecified	Consolidated Analytical Systems (CAS)	9001	4222	Active	GOOD
CARRITHERS	Analyzer	Teledyne API	T400	5405	Active	GOOD
CARRITHERS	Analyzer	Teledyne API	T640	457	Active	GOOD
CARRITHERS	Cal Standard	Teledyne API	T703	255	Active	GOOD
CARRITHERS	Cal Standard	Teledyne API	T701M	648	Active	FAIR
CARRITHERS	Instrument	RM Young	05103VM	WM47808	Active	FAIR
CARRITHERS	Instrument	RM Young	41382	n/a	Active	GOOD

**Louisville, KY APCD Equipment Inventory - May 2023**

Site	Asset Type	Manufacturer	Model	Serial Number	Current Status	Condition
CARRITHERS	Instrument	Vaisala	HMW93D	N1540018	Active	GOOD
CARRITHERS	Logger	ESC Agilaire	8832	4411	Active	FAIR
CARRITHERS	Unspecified	EKTO Mfg.	81012	4234-1	Active	FAIR
CLAMS	Analyzer	HI-Q	HVP-4004BRL-S	17603	Active	FAIR
CLAMS	Analyzer	Teledyne API	T640x	975	Active	GOOD
CLAMS	Analyzer	Chromatotec/CAS	airmoVOC C6C12	27361219	Active	GOOD
CLAMS	Analyzer	Chromatotec/CAS	airmoVOC C2C6	57351219	Active	GOOD
CLAMS	Analyzer	Teledyne API	T500U	169	Active	GOOD
CLAMS	Analyzer	URG	3000N	BN-251	Active	FAIR
CLAMS	Analyzer	Met One	Super SASS	1046	Active	GOOD
CLAMS	Analyzer	URG	3000N	BN-933	Active	FAIR
CLAMS	Analyzer	Thermo Fisher Scientific	2025i	21317	Active	GOOD
CLAMS	Analyzer	Teledyne API	T300U	483	Active	GOOD
CLAMS	Analyzer	Teledyne API	T200U	316	Active	FAIR
CLAMS	Analyzer	Teledyne API	T100U	276	Active	GOOD
CLAMS	Analyzer	Teledyne API	T400	1468	Active	GOOD
CLAMS	Analyzer	ATEC	8000	41732	Active	GOOD
CLAMS	Cal Standard	AIRGAS	Toxics Cylinder	FF33608	Active	GOOD
CLAMS	Cal Standard	Chromatotec/CAS	airmoCAL	57381219	Active	GOOD
CLAMS	Cal Standard	Chromatotec/CAS	Hydroxychrom	57371219	Active	GOOD
CLAMS	Cal Standard	AIRGAS	PAMS Cylinder	CC746573	Active	GOOD
CLAMS	Cal Standard	AIRGAS	Protocol Gas - NO	CC714681	Active	GOOD
CLAMS	Cal Standard	AIRGAS	Protocol Gas - SO2	LL54194	Active	GOOD
CLAMS	Cal Standard	Linde/ERG	PAMS Cylinder	CC745524	Retired	FAIR
CLAMS	Cal Standard	Chromatotec/CAS	n-decane permeation tube	20220114-1847	Active	FAIR
CLAMS	Cal Standard	Chromatotec/CAS	n-butane permeation tube	20220304-1959	Active	FAIR
CLAMS	Cal Standard	Teledyne API	T701H	747	Active	GOOD
CLAMS	Cal Standard	AIRGAS	Protocol Gas - CO	BR001720	Active	GOOD
CLAMS	Cal Standard	Teledyne API	T700U	107	Active	GOOD
CLAMS	Cal Standard	Chromatotec/CAS	n-hexane permeation tube	20220304-1951	Active	FAIR
CLAMS	Cal Standard	Chromatotec/CAS	benzene permeation tube	20220304-1949	Active	FAIR

**Louisville, KY APCD Equipment Inventory - May 2023**

Site	Asset Type	Manufacturer	Model	Serial Number	Current Status	Condition
CLAMS	Instrument	RM Young	41382	28298	Active	GOOD
CLAMS	Instrument	Met One	370	U10772	Active	GOOD
CLAMS	Instrument	RM Young	43502	n/a	Active	GOOD
CLAMS	Instrument	RM Young	5305AQ	135267	Needs Repair	FAIR
CLAMS	Instrument	RM Young	61302V	BPA1240	Active	FAIR
CLAMS	Instrument	RM Young	85000	UB1390	Active	GOOD
CLAMS	Instrument	Vaisala	CL51	R4640540	Active	GOOD
CLAMS	Instrument	Eppley	PSP	34257F3	Active	GOOD
CLAMS	Instrument	Eppley	TUVR	38938	Active	GOOD
CLAMS	Instrument	Vaisala	HMW93D	H0520002	Active	GOOD
CLAMS	Instrument	Vaisala	HMW93D	T2411401	Active	GOOD
CLAMS	Logger	ESC Agilaire	8832	4292	Active	FAIR
CLAMS	Logger	ESC Agilaire	8832	4410	Active	FAIR
CLAMS	Unspecified	EKTO Mfg.	432-SP	3535-6	Active	GOOD
CLAMS	Unspecified	Alumna Tower	T-35H	AP-29071-U-4	Active	GOOD
CLAMS	Unspecified	Modular Connections	MCP-296	MC2519	Active	GOOD
CLAMS	Unspecified	Consolidated Analytical Systems (CAS)	9001	4419	Active	GOOD
CLAMS	Unspecified	EPA	Sensor Shelter	38/06	Active	GOOD
NEARROAD	Analyzer	Magee Scientific	AE33	AE33-S08-01017	Active	GOOD
NEARROAD	Analyzer	Thermo Fisher Scientific	2025i	20608	Active	GOOD
NEARROAD	Analyzer	Teledyne API	T300U	155	Active	FAIR
NEARROAD	Analyzer	Teledyne API	T640	458	Active	GOOD
NEARROAD	Analyzer	Teledyne API	T500U	168	Active	GOOD
NEARROAD	Cal Standard	AIRGAS	Protocol Gas - CO	CC234573	Active	GOOD
NEARROAD	Cal Standard	AIRGAS	Protocol Gas - NO	CC462632	Active	GOOD
NEARROAD	Cal Standard	Teledyne API	T701H	773	Active	FAIR
NEARROAD	Cal Standard	Teledyne API	T700U	457	Active	GOOD
NEARROAD	Instrument	RM Young	05305V	128356	Active	FAIR
NEARROAD	Instrument	RM Young	41382	25029	Active	FAIR
NEARROAD	Instrument	RM Young	85000	4675	Needs Repair	POOR
NEARROAD	Instrument	Vaisala	HMW93D	H0520004	Active	GOOD

**Louisville, KY APCD Equipment Inventory - May 2023**

Site	Asset Type	Manufacturer	Model	Serial Number	Current Status	Condition
NEARROAD	Logger	ESC Agilair	8832	4293	Active	FAIR
NEARROAD	Unspecified	Alumna Tower	T-135	AT-213072-Y-6-1	Active	GOOD
NEARROAD	Unspecified	Consolidated Analytical Systems (CAS)	9001	3200-7	Active	GOOD
WATSON	Analyzer	Teledyne API	T100U	406	Active	GOOD
WATSON	Analyzer	Teledyne API	T640	456	Active	GOOD
WATSON	Analyzer	Teledyne API	T400	316	Active	GOOD
WATSON	Cal Standard	AIRGAS	Protocol Gas - SO2	CC285085	Active	GOOD
WATSON	Cal Standard	Teledyne API	T701H	604	Active	GOOD
WATSON	Cal Standard	Teledyne API	T700	1620	Active	GOOD
WATSON	Instrument	RM Young	85000	2568	Active	GOOD
WATSON	Instrument	Vaisala	HMW93D	H0520003	Active	GOOD
WATSON	Logger	ESC Agilair	8832	4291	Active	FAIR
WATSON	Unspecified	Consolidated Analytical Systems (CAS)	9001	4434	Active	GOOD
APCD_SHOP	Analyzer	Thermo Fisher Scientific	Miran Sapphire	79545411	Retired	
APCD_SHOP	Analyzer	Thermo Fisher Scientific	2025B	22560	Spare	FAIR
APCD_SHOP	Analyzer	Thermo Fisher Scientific	48i-TLE	0814429-062	Spare	FAIR
APCD_SHOP	Analyzer	Thermo Fisher Scientific	43i-TLE	814428-732	Spare	FAIR
APCD_SHOP	Analyzer	URG	3000N	1045	Spare	FAIR
APCD_SHOP	Analyzer	Teledyne API	T640x	591	Needs Repair	FAIR
APCD_SHOP	Analyzer	Teledyne API	T100	1321	Spare	GOOD
APCD_SHOP	Analyzer	Teledyne API	T640	459	Spare	GOOD
APCD_SHOP	Analyzer	Thermo Fisher Scientific	2025i	20607	Spare	GOOD
APCD_SHOP	Analyzer	Thermo Fisher Scientific	2025i	21318	Spare	FAIR
APCD_SHOP	Analyzer	Teledyne API	T400	1467	Retired	POOR
APCD_SHOP	Analyzer	Teledyne API	T100	1322	Needs Repair	FAIR
APCD_SHOP	Analyzer	Teledyne API	T300U	281	Needs Repair	FAIR
APCD_SHOP	Analyzer	Teledyne API	T500U	170	Spare	GOOD
APCD_SHOP	Cal Standard	AIRGAS	28419	WCL 175376	Retired	
APCD_SHOP	Cal Standard	AIRGAS	51016118BA01N	S450	Active	GOOD
APCD_SHOP	Cal Standard	Vaisala	HMP75	R2830602	Active	GOOD
APCD_SHOP	Cal Standard	Vaisala	HMP46	J0871073	Spare	FAIR

**Louisville, KY APCD Equipment Inventory - May 2023**

Site	Asset Type	Manufacturer	Model	Serial Number	Current Status	Condition
APCD_SHOP	Cal Standard	Vaisala	HMP46	X3810013	Spare	FAIR
APCD_SHOP	Cal Standard	Chinook	SLP	HL041007	Retired	FAIR
APCD_SHOP	Cal Standard	MesaLab	Bios Dry Cal	105393	Retired	FAIR
APCD_SHOP	Cal Standard	MesaLab	Delta Cal	465	Retired	FAIR
APCD_SHOP	Cal Standard	Teledyne API	T750U	166	Active	GOOD
APCD_SHOP	Cal Standard	Teledyne API	751H	336	Active	GOOD
APCD_SHOP	Cal Standard	Teledyne API	Span Dust	8	Retired	GOOD
APCD_SHOP	Cal Standard	Teledyne API	Span Dust	9	Active	GOOD
APCD_SHOP	Cal Standard	Teledyne API	Span Dust	10	Active	GOOD
APCD_SHOP	Cal Standard	Alicat Scientific	M-200SCCM-D	297535	Active	GOOD
APCD_SHOP	Cal Standard	Alicat Scientific	M-50SCCM-D	297536	Active	FAIR
APCD_SHOP	Cal Standard	Alicat Scientific	M-20SLPM-D	297534	Active	GOOD
APCD_SHOP	Cal Standard	Alicat Scientific	M-10SCCM-D	297537	Active	GOOD
APCD_SHOP	Cal Standard	Thermo Fisher Scientific	49iPS	617817-229	Active	GOOD
APCD_SHOP	Cal Standard	Teledyne API	T703	731	Active	FAIR
APCD_SHOP	Cal Standard	Thermo Fisher Scientific	49CPS	70020-364	Retired	FAIR
APCD_SHOP	Cal Standard	Chromatotec/CAS	n-butane permeation tube	20200828-H341	Retired	FAIR
APCD_SHOP	Cal Standard	Chromatotec/CAS	n-hexane permeation tube	20200317-H021	Retired	FAIR
APCD_SHOP	Cal Standard	Chromatotec/CAS	benzene permeation tube	20191216-G711	Retired	FAIR
APCD_SHOP	Cal Standard	Chromatotec/CAS	n-decane permeation tube	20200317-H033	Retired	FAIR
APCD_SHOP	Cal Standard	Teledyne API	T700U	174	Needs Repair	FAIR
APCD_SHOP	Cal Standard	Teledyne API	T700	289	Spare	GOOD
APCD_SHOP	Cal Standard	AIRGAS	Protocol Gas - SO2	LL59975	Active	GOOD
APCD_SHOP	Cal Standard	AIRGAS	Protocol Gas - CO	LL10004	Active	GOOD
APCD_SHOP	Cal Standard	AIRGAS	Protocol Gas - CO	LL25438	Spare	GOOD
APCD_SHOP	Cal Standard	Chinook	SLP	HL170606	Retired	FAIR
APCD_SHOP	Cal Standard	Chinook	SLP	HM041006	Retired	FAIR
APCD_SHOP	Cal Standard	MesaLab	Delta Cal	466	Retired	FAIR
APCD_SHOP	Cal Standard	Chinook	SLP	HM70204	Retired	FAIR
APCD_SHOP	Cal Standard	Alicat Scientific	FP-25BT	148162	Active	GOOD
APCD_SHOP	Cal Standard	AIRGAS	Protocol Gas - Mixed	LL192220	Retired	FAIR

**Louisville, KY APCD Equipment Inventory - May 2023**

Site	Asset Type	Manufacturer	Model	Serial Number	Current Status	Condition
APCD_SHOP	Cal Standard	Alicat Scientific	MWB-500SCCM-D	228259	Active	GOOD
APCD_SHOP	Cal Standard	Teledyne API	T701H	839	Needs Repair	FAIR
APCD_SHOP	Cal Standard	Alicat Scientific	FP-25BT	212953	Active	GOOD
APCD_SHOP	Cal Standard	Alicat Scientific	FP-25BT	212954	Active	GOOD
APCD_SHOP	Cal Standard	Alicat Scientific	FP-25BT	212955	Active	GOOD
APCD_SHOP	Cal Standard	Alicat Scientific	FP-25BT	212956	Active	GOOD
APCD_SHOP	Cal Standard	Alicat Scientific	FP-25BT	212957	Active	GOOD
APCD_SHOP	Cal Standard	Alicat Scientific	MWB-2SLPM-D	189496	Active	GOOD
APCD_SHOP	Cal Standard	Teledyne API	T701H	801	Active	GOOD
APCD_SHOP	Cal Standard	Teledyne API	T701M	647	Needs Repair	FAIR
APCD_SHOP	Cal Standard	Teledyne API	T700	290	Retired	POOR
APCD_SHOP	Cal Standard	Fluke	Molbox1+A700k-A	2213	Active	GOOD
APCD_SHOP	Cal Standard	Teledyne API	T700	1619	Needs Repair	FAIR
APCD_SHOP	Cal Standard	Teledyne API	T750	54	Active	FAIR
APCD_SHOP	Cal Standard	Teledyne API	T751H	62	Active	GOOD
APCD_SHOP	Cal Standard	Chinook	SLP	HM041005	Retired	FAIR
APCD_SHOP	Cal Standard	Chinook	SLP	HL170607	Retired	FAIR
APCD_SHOP	Instrument	Met One	50.5	B-1031	Spare	POOR
APCD_SHOP	Instrument	Met One	50.5	Y3338	Spare	GOOD
APCD_SHOP	Instrument	Met One	Portable	E5678	Spare	GOOD
APCD_SHOP	Instrument	Met One	SASS	6080	Spare	FAIR
APCD_SHOP	Instrument	RM Young	05103VM	WM101749	Spare	FAIR
APCD_SHOP	Instrument	RM Young	05103VM-42	118039	Spare	GOOD
APCD_SHOP	Instrument	RM Young	05305V	WM00101749	Spare	FAIR
APCD_SHOP	Instrument	RM Young	41342VF	41376A	Unspecified	FAIR
APCD_SHOP	Instrument	RM Young	41342VF	xxx41376A	Unspecified	FAIR
APCD_SHOP	Instrument	RM Young	41342VF	TS05123	Spare	GOOD
APCD_SHOP	Instrument	RM Young	41382	21011	Needs Repair	FAIR
APCD_SHOP	Instrument	RM Young	41382	126462	Unspecified	FAIR
APCD_SHOP	Instrument	RM Young	43502	n/a	Spare	GOOD
APCD_SHOP	Instrument	RM Young	52202	TB03206	Spare	FAIR

**Louisville, KY APCD Equipment Inventory - May 2023**

Site	Asset Type	Manufacturer	Model	Serial Number	Current Status	Condition
APCD_SHOP	Instrument	RM Young	5305AQ	VW101749	Spare	GOOD
APCD_SHOP	Instrument	RM Young	85000	n/a	Unspecified	FAIR
APCD_SHOP	Instrument	RM Young	85000	UB-1309	Unspecified	FAIR
APCD_SHOP	Instrument	RM Young	86000	UD00003877	Spare	GOOD
APCD_SHOP	Instrument	Met One	Portable	5876	Spare	FAIR
APCD_SHOP	Instrument	Vaisala	HMW71Y	W3650008	Unspecified	FAIR
APCD_SHOP	Instrument	Vaisala	HMW71Y	X0840020	Unspecified	FAIR
APCD_SHOP	Instrument	RM Young	41342VC	32182	Spare	GOOD
APCD_SHOP	Instrument	Vaisala	HMW93D	T2411403	Spare	GOOD
APCD_SHOP	Instrument	RM Young	41342VC	32179	Spare	GOOD
APCD_SHOP	Instrument	Eppley	PSP	33927F3	Spare	FAIR
APCD_SHOP	Instrument	Vaisala	HMW93D	N1540017	Active	FAIR
APCD_SHOP	Instrument	RM Young	41342VC	32180	Spare	GOOD
APCD_SHOP	Instrument	Vaisala	HMW93D	T2411402	Spare	GOOD
APCD_SHOP	Instrument	RM Young	41342VC	32181	Spare	GOOD
APCD_SHOP	Logger	ESC Agilaire LLC	8832	2713K	Active	FAIR
APCD_SHOP	Logger	ESC Agilaire	8832	A4691K	Active	FAIR
APCD_SHOP	Logger	ESC Agilaire	8872	731	Spare	GOOD
APCD_SHOP	Unspecified	Thermo Fisher Scientific	REL1204A	1.55473E+ 14	Active	GOOD
APCD_SHOP	Unspecified	Ford	F350 (big van)	2966	Active	POOR
APCD_SHOP	Unspecified	Ford	F250 (big truck)	1268	Active	GOOD
APCD_SHOP	Unspecified	Ford	Transit	2116	Active	GOOD
APCD_SHOP	Unspecified	Ford	Escape	4221	Active	GOOD
APCD_SHOP	Unspecified	Ford	Escape	3116	Active	GOOD
APCD_SHOP	Unspecified	Ford	Escape	4237	Active	GOOD
APCD_SHOP	Unspecified	Ford	Escape	4220	Active	GOOD
APCD_SHOP	Cal Standard	Chromatotec/CAS	n-butane permeation tube	20191018-G641	Retired	FAIR
APCD_SHOP	Cal Standard	Chromatotec/CAS	n-hexane permeation tube	20191004-G559	Retired	FAIR
APCD_SHOP	Cal Standard	Chromatotec/CAS	benzene permeation tube	20191120-G655	Retired	FAIR
APCD_SHOP	Cal Standard	Chromatotec/CAS	n-decane permeation tube	20191018-G621	Retired	FAIR
APCD_EXTERNAL	Cal Standard	Welders Supply	Protocol Gas	LL24342	Retired	

**Louisville, KY APCD Equipment Inventory - May 2023**

Site	Asset Type	Manufacturer	Model	Serial Number	Current Status	Condition
APCD_EXTERNAL	Cal Standard	Chromatotec/CAS	airmoPure D	56430717	Retired	
APCD_EXTERNAL	Cal Standard	AIRGAS	Toxics Cylinder	EA0023759	Active	FAIR
APCD_EXTERNAL	Cal Standard	Alicat Scientific	MWB-2SLPM-D	228258	Active	GOOD
APCD_EXTERNAL	Unspecified	Ford	Escape	3700	Retired	FAIR
APCD_EXTERNAL	Unspecified	EKTO Mfg.	8812	3728-1	Retired	POOR
APCD_EXTERNAL	Unspecified	Ford	Ranger	3114	Retired	POOR
APCD_WAREHOUSE	Analyzer	EcoTech	300	1586	Retired	
APCD_WAREHOUSE	Analyzer	EcoTech	Ecotech Serinus	40-10-51	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400a	24601	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	43C	518612-095	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	43C	69873-364	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	48C	351	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	48C	68840-361	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	49C	43374-269	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	49C	47646-280	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	N2946	Retired	
APCD_WAREHOUSE	Analyzer	Met One	SASS	3567	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400a	230750005	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	2025B	21310	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	49C	64282-342	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	48C	67474-356	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	42C	070415-365	Retired	
APCD_WAREHOUSE	Analyzer	Met One	SASS	3565	Retired	
APCD_WAREHOUSE	Analyzer	Met One	SASS	6079	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	42C	70979-367	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400a	23746	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	49C	74462-376	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400ab	24097	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	2025B	21656	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400ab	24926	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	2025B	21666	Retired	



**Louisville, KY APCD Equipment Inventory - May 2023**

Site	Asset Type	Manufacturer	Model	Serial Number	Current Status	Condition
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	49C	417007-061	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	48C	417007-060	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	49C	413906-381	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	43C	436610-205	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	49i	617817-230	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	48i-TLE	617817-228	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	42i-Y	0814428-734	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	H1710	Retired	
APCD_WAREHOUSE	Analyzer	IMACC	M-ZSE12-180	M0015	Retired	
APCD_WAREHOUSE	Analyzer	IMACC	Air Toxics UV	Air Toxics UV	Retired	
APCD_WAREHOUSE	Analyzer	API	T200	341	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	K19862	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	K19863	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	T18977	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	T18984	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400ab	24885	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400a	23748	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	T18981	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	N3593	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	N3596	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400ab	24059	Retired	
APCD_WAREHOUSE	Cal Standard	API	T701M	835	Retired	
APCD_WAREHOUSE	Cal Standard	API	T701M	837	Retired	
APCD_WAREHOUSE	Cal Standard	EcoTech	6100	4012	Retired	
APCD_WAREHOUSE	Cal Standard	Thermo Fisher Scientific	146C	0417007-062	Retired	
APCD_WAREHOUSE	Cal Standard	Thermo Fisher Scientific	146C	382	Retired	
APCD_WAREHOUSE	Cal Standard	Thermo Fisher Scientific	146i	0814428-735	Retired	
APCD_WAREHOUSE	Logger	ESC Agilair	8816	1917	Retired	
APCD_WAREHOUSE	Logger	ESC Agilair	8832	5058	Retired	
APCD_WAREHOUSE	Logger	ESC Agilair	8832	A1014	Retired	
APCD_WAREHOUSE	Logger	ESC Agilair	8816	2764	Retired	

**Louisville, KY APCD Equipment Inventory - May 2023**

Site	Asset Type	Manufacturer	Model	Serial Number	Current Status	Condition
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	3307	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	4422	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	3801	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	4424	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	3308	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	3304	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	2423	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8832	4291	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	1973	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	1972	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	4423	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	1971	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	3305	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	3303	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	3306	Retired	
APCD_WAREHOUSE	Unspecified	EKTO Mfg.	432-SP	3200-7	Retired	
APCD_WAREHOUSE	Unspecified	EKTO Mfg.	432-SP	3278-10	Retired	
APCD_WAREHOUSE	Unspecified	EKTO Mfg.	432-SP	3278-9	Retired	
APCD_WAREHOUSE	Unspecified	EKTO Mfg.	432-SP	3408-6	Retired	
APCD_WAREHOUSE	Unspecified	EKTO Mfg.	432-SP	3408-7	Retired	
APCD_WAREHOUSE	Unspecified	EKTO Mfg.	8812	3876-1	Retired	
APCD_WAREHOUSE	Unspecified	Unknown	Meteorology Tower	n/a	Retired	
APCD_WAREHOUSE	Unspecified	Mobile Structures	Mobile Trailer	5WJVN14238L000673	Retired	
APCD_WAREHOUSE	Unspecified	Met One	BAM Shelter	n/a	Retired	



**APPENDIX F**

**KDAQ INTENDED  
USE OF CONTINUOUS PM<sub>2.5</sub> FEMS**

## Appendix F KDAQ Intended Use of Continuous PM<sub>2.5</sub> FEMs

Historically, continuous PM<sub>2.5</sub> monitors that are designated as Federal Equivalent Methods (FEMs) have been excluded from comparisons to the NAAQS, as long as these monitors were specified as special-purpose monitors (SPMs). Data from these monitors were used for reporting of the AQI. Monitors could remain designated as SPMs for a period of two years of operation at each site. However, after that two-year period, the data were eligible for comparison to the NAAQS, regardless of monitor type designation.

In December 2012, a new PM NAAQS and set of monitoring rules were finalized. These new monitoring rules amended the previous requirement to compare all data from FEMs collected after a period of two-years to the NAAQS. Instead, agencies could operate a continuous PM<sub>2.5</sub> FEM for longer than two years and could elect to exclude the data from NAAQS-comparisons, provided that the monitor did not meet certain performance specifications. Data from monitors established for less than two years and designated as SPM remain ineligible for attainment decisions.

Specifically, the final rule allows certain continuous PM<sub>2.5</sub> FEM data to be excluded if:

- the monitor does not meet performance criteria when compared to the data collected from collocated Federal Reference Methods (FRMs);
- the monitoring agency requests exclusion of data; and,
- the EPA Regional Office approves exclusion of the data.

Regardless of whether an exclusion is sought, each agency must address the use of all continuous PM<sub>2.5</sub> FEMs in the network. Each monitor must be properly referenced by a set of parameter codes, primary monitor designations, and monitor types.

KDAQ currently operates 14 FEM PM<sub>2.5</sub> continuous T640 monitors in the field; of which, all 14 are eligible for NAAQS comparisons. The following sites have T640 monitors:

- Elizabethtown
- Northern Kentucky University
- Ashland Primary
- Grayson Lake
- Owensboro Primary
- Paducah Transit
- Pikeville
- Smiths Grove (Primary and Collocated)
- Lexington Primary
- Hazard
- Hopkinsville
- Somerset
- Middlesboro

**Appendix F**  
**KDAQ Intended Use of Continuous PM<sub>2.5</sub> FEMs**

KDAQ will operate a total of 14 FEM PM<sub>2.5</sub> continuous T640 monitors in the field during the 2023-2024 monitoring year, all of which, will be usable for NAAQS determinations. All NAAQS-eligible monitors are designated as SLAMS. The tables that follow provide a summary of KDAQ's use of the T640 continuous PM<sub>2.5</sub> FEMs, collocation scenarios, and dates of operation.

Northern Kentucky University (21-037-3002)									
<b>Scenario: Continuous PM<sub>2.5</sub> FEM is eligible for NAAQS comparisons and is collocated with a filter-based FRM.</b>									
FEM Parameter	FEM Pollution Occurrence Code (POC)	FEM Monitor Type	Primary Monitor	Collocated Monitor	FEM used for substitutions of missing primary data?	FEM used for NAAQS comparisons?	FEM eligible for AQI?	Date FEM Installed at Site	Date FEM Eligible for NAAQS Comparisons
PM2.5 Local Conditions (88101)	POC 3	SLAMS	Filter-Based FRM (POC 1)	Continuous FEM (POC 3)	Yes	Yes	Yes	2/12/2018	2/13/2020

Elizabethtown (21-093-0006)									
<b>Scenario: Continuous PM<sub>2.5</sub> FEM is eligible for NAAQS comparisons and is collocated with a filter-based FRM.</b>									
FEM Parameter	FEM Pollution Occurrence Code (POC)	FEM Monitor Type	Primary Monitor	Collocated Monitor	FEM used for substitutions of missing primary data?	FEM used for NAAQS comparisons?	FEM eligible for AQI?	Date FEM Installed at Site	Date FEM Eligible for NAAQS Comparisons
PM2.5 Local Conditions (88101)	POC 3	SLAMS	Continuous FEM (POC 3)	Filter-Based FRM (POC 2)	Yes	Yes	Yes	4/1/2019	4/1/2019

Smiths Grove and Smiths Grove Collocated (21-227-0009)									
<b>Scenario: Continuous PM<sub>2.5</sub> FEMs are collocated and are eligible for NAAQS comparisons.</b>									
FEM Parameter	FEM Pollution Occurrence Code (POC)	FEM Monitor Type	Primary Monitor	Collocated Monitor	FEM used for substitutions of missing primary data?	FEM used for NAAQS comparisons?	FEM eligible for AQI?	Date FEM Installed at Site	Date FEM Eligible for NAAQS Comparisons
PM2.5 Local Conditions (88101)	POC 3 (Primary)	SLAMS	Continuous FEM (POC 3)	Continuous FEM (POC 4)	Yes	Yes	Yes	Primary: 2/17/2019	Primary: 1/1/2021
	POC 4 (Collocated)							Collocated: 10/29/2019	Collocated: 1/1/2021

**Appendix F**  
**KDAQ Intended Use of Continuous PM<sub>2.5</sub> FEMs**

Multiple Sites									
Scenario: Continuous PM <sub>2.5</sub> FEMs will be eligible for NAAQS comparisons during monitoring year. No other PM <sub>2.5</sub> monitors located on site.									
FEM Parameter	FEM Pollution Occurrence Code (POC)	FEM Monitor Type	Primary Monitor	Collocated Monitor	FEM used for substitutions of missing primary data?	FEM used for NAAQS comparisons?	FEM eligible for AQI?	Date FEM Installed at Site	Date FEM Eligible for NAAQS Comparisons
PM <sub>2.5</sub> Local Conditions (88101)	POC 3	SLAMS	Continuous FEM (POC 3)	n/a	n/a	Yes	Yes	Middlesboro (21-013-0002)	1/1/2021   1/1/2021
								Ashland Primary (21-019-0017)	7/26/2017   7/27/2019
								Grayson Lake (21-043-0500)	1/1/2022   1/1/2022
								Hopkinsville (21-047-0006)	1/1/2021   1/1/2021
								Owensboro Primary (21-059-0005)	10/19/2017   10/20/2019
								Lexington Primary (21-067-0012)	12/4/2018   1/1/2021
								Paducah Transit (21-145-1027)	1/10/2023   1/10/2023
								Hazard (21-193-0003)	2/28/2019   1/1/2021
								Pikeville (21-195-0002)	2/8/2018   2/9/2020
								Somerset (21-199-0003)	1/1/2021   1/1/2021



**APPENDIX G**

**CALVERT CITY SPECIAL-PURPOSE  
MONITORING**

**Appendix G**  
**Calvert City Special-Purpose Monitoring**

With the cooperation of EPA, KDAQ has established a special-purpose monitoring study of volatile organic compounds (VOCs) near Calvert City, KY. The measurement goal of the study is to estimate the 24-hour concentrations of VOCs in ambient air, over the course of one-year of sampling, with a focus on five pollutants of interest:

- Ethylene Dichloride
- Vinyl Chloride
- 1,3-Butadiene
- Acrylonitrile
- Benzene

VOC sampling consists of twenty-four hour samples collected in a 6-liter stainless steel canisters (sub-atmospheric) on a predetermined sampling frequency. Samples are analyzed for the full-suite of Tier I and Tier II VOCs by EPA’s national contract laboratory, Eastern Research Group. Monitoring and analysis of samples are conducted in-accordance with EPA Method TO-15. Ultimately, the data collected will be used to conduct a health-risk assessment by EPA.

To determine the best potential locations for ambient monitoring sites near the Calvert City Industrial Complex, KDAQ and US EPA utilized air dispersion modeling conducted by EPA Region 4. The modeling was performed with KDAQ emissions data from 2013-2017 for ethylene dichloride and vinyl chloride. Ultimately, it was determined, that the study would necessitate that three sites be established in the vicinity of Calvert City. Additionally, EPA and KDAQ agreed that the study would incorporate meteorological instrumentation and collocated VOC sampling for precision estimates.

KDAQ began collecting VOC samples on October 24, 2020. Since the QAPP required one full year of sampling, with 12 complete months, EPA and KDAQ agreed that the risk assessment should encompass data collected between October 24, 2020, and October 31, 2021. KDAQ will continue to collect VOC samples at all three monitoring sites until the results of the risk assessment are released. However, the meteorological instrumentation was shut down on December 31, 2021, due to safety concerns. The results of the EPA risk assessment will be made available to the general public.

Study sites are summarized below:

<b>Calvert City Study: Site &amp; Monitor Summary</b>						
<b>Site/AQS ID/ Coordinates</b>	<b>Objective</b>	<b>Sampling Instru- ments</b>	<b>Sampling Media</b>	<b>Monitor Type</b>	<b>Sampling Schedule</b>	<b>Monitor Purpose</b>
<b>LWD Collocated &amp; Meteorological Site (LWD)</b> 21-157-0021 37.047906, -88.338347	Maximum Expected Ethylene Dichloride Concentration and Meteorology	Xonteck 911a	6-Liter stainless steel canister	Primary and collocated	Primary-Every 6 days; Collocated- Every 12 days	Characterization of maximum EDC concentration
		RM Young 05305V	n/a	n/a	Continuous	Characterization of wind speed/direction, representative of entire study area (Terminated 12/31/21)
<b>Johnson-Riley Road (JRR)</b> 21-157-0020 37.041179, -88.351889	Maximum Expected Vinyl Chloride Concentration	Xonteck 911a	6-Liter stainless steel canister	Primary	Every 6 days	Characterization of maximum vinyl chloride concentration
<b>Calvert City Elementary (CCE)</b> 21-157-0018 37.026746, -88.343747	High Air Toxics Concentration in Area of Expected Population Exposure	Xonteck 911a	6-Liter stainless steel canister	Primary	Every 6 days	Characterization of air quality in more heavily populated area





**APPENDIX H**

**NEAR-ROAD MONITORING**

## Appendix H Near-Road Monitoring

On February 9, 2010, the EPA released a new NO<sub>2</sub> Final Rule and a new set of monitoring requirements. Under the new monitoring requirements, State and Local agencies are required to establish NO<sub>2</sub> near-road monitoring stations based upon core based statistical area (CBSA) populations and traffic metrics.

Specifically, the final rule required:

- 1 near-road monitor in CBSAs with populations greater than or equal to 500,000; and
- 2 near-road monitors in CBSAs with populations greater than or equal to 2,500,000.

Additionally, the final rule required:

- 2 near-road monitors for any road segment that has an annual average daily traffic (AADT) count of 250,000 or more.

Similarly, the EPA revised the PM<sub>2.5</sub> NAAQS and monitoring rule on December 14, 2012, and the CO monitoring rule on August 31, 2011. Together, these rules require CO and PM<sub>2.5</sub> monitoring to be established at near-road sites for any CBSA with a population of one-million or greater. Ultimately, near-road sites are intended to be multi-pollutant sites. These sites are used to characterize the impacts vehicle exhaust and traffic patterns on public health.

In March 2013, the EPA finalized the use of a “phased” approach for establishing NO<sub>2</sub> near-road monitoring sites across the Nation. The phased approach necessitates:

- Phase 1: One required near-road monitor in CBSAs with a population of 1,000,000 or more must be established by January 1, 2014.
- Phase 2: Any second required near-road monitor in CBSAs that have a population greater than 2,500,000, or have a population of 500,000 or greater and have a traffic segment with an AADT of 250,000 or more, must be established by January 1, 2015.
- Phase 3: Required sites in remaining CBSAs with populations of 500,000 or more were to be established by January 1, 2017. However, Phase 3 monitoring requirements were revoked on January 19, 2017.

Based upon population estimates and AADT counts, near-road monitors were required to be established in the following CBSAs during the implementation of Phase 1. No Phase 2 monitors are required in Kentucky.

CBSA Name (500,000 or more people)	2019 CBSA Population Estimate*	Highest Road Segment 2- Way AADT for CBSA**	Number of Monitors Required in CBSA
Cincinnati-Middletown, OH-KY-IN	2,221,208	210,707	1
Louisville-Jefferson County, KY-IN	1,265,108	176,632	1

\*CBSA 2019 population estimate data obtained from the US Census Bureau. Annual Resident Population Estimates and Estimated Components of Resident Population Change for Metropolitan and Micropolitan Statistical Areas and Their Geographic Components: April 1, 2010 to July 1, 2019 (cbsa-est2019-alldata). Accessed 4/7/2020.

\*\*Source: KYTC Traffic Database. [http://datamart.business.transportation.ky.gov/EDSB\\_SOLUTIONS/CTS/](http://datamart.business.transportation.ky.gov/EDSB_SOLUTIONS/CTS/). Last accessed: July 2020

## Appendix H Near-Road Monitoring

The determination of the final locations of near-road monitoring locations within these CBSAs was a cooperative effort between multiple State and Local Agencies. The exact location of each site was determined using the following criteria:

- Fleet mix
- Roadway design
- Traffic congestion patterns
- Local topography
- Meteorology
- Population exposure
- Employee and public safety
- Site logistics

The requirement for a near-road site in the Cincinnati, OH-KY-IN MSA is fulfilled by a Memorandum of Agreement (MOA). The site is located in Ohio and is operated by the Southwest Ohio Air Quality Agency.

The near-road site in the Louisville-Jefferson County, KY-IN MSA has been established and is operated by the Louisville Metro Air Pollution Control District (LMAPCD). Specifics regarding this site are included in the site detail pages of this Annual Network Plan.

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**APPENDIX I**

**KENTUCKY SO<sub>2</sub> PWEI VALUES**

## Appendix I Kentucky SO<sub>2</sub> PWEI Values

Section 4.4 of Appendix D to 40 CFR Part 58, requires that a population weighted emissions index (PWEI) be calculated by States for each core based statistical area (CBSA) in order to determine the minimum number of SO<sub>2</sub> monitors required. Monitors satisfy minimum requirements if the monitor is sited within the boundaries of the CBSA and is one of the following site types: population exposure, maximum concentration, source-oriented, general background, or regional transport. PWEI based monitors were originally required to be established in the Annual Network Plan (ANP), which was to be submitted to the EPA no later than July 1, 2011. New monitors were to be operational no later than January 2013.

The PWEI is calculated by multiplying the population of each CBSA and the total amount of SO<sub>2</sub>, in tons per year, that is emitted within the CBSA, based upon aggregated county level emissions data from the National Emissions Inventory (NEI). The result is then divided by one million to provide the PWEI value, which is expressed in a unit of million persons-tons per year.

The minimum number of monitors required are:

- 3 monitors in CBSAs with index values of 1,000,000 or more;
- 2 monitors in CBSAs with index values less than 1,000,000 but greater than 100,000; and
- 1 monitor in CBSAs with index values greater than 5,000.

Additionally, the EPA Regional Administrator (RA) may at their discretion require additional SO<sub>2</sub> monitors, beyond the minimum number required by PWEI calculations. Additional monitors may be required in situations where an area has the potential to violate or contribute to a violation, in areas that are impacted by sources that cannot be modeled, and in areas with sensitive populations. Kentucky currently does not have any Regional Administrator required SO<sub>2</sub> monitors.

Based upon Kentucky's calculated PWEI values, the following CBSAs require SO<sub>2</sub> monitors:

Kentucky CBSAs	2020 PWEI <sup>1*</sup> (10 <sup>6</sup> persons-tons per year)	Number of SO <sub>2</sub> Monitors Required	Number of SO <sub>2</sub> Monitors Present	2020 Kentucky Site Name	Site ID
Cincinnati-Middletown, OH-KY-IN	74,211.1	1	6**	Northern Kentucky University	21-037-3002
Louisville-Jefferson County, KY-IN	8,126.9	1	4***	Algonquin Parkway (LMAPCD)	21-111-1041
				Watson Lane (LMAPCD)	21-111-0051
				Cannons Lane (LMAPCD)	21-111-0067

\* 2020 PWEI calculated from 2019 USCB Population Estimates and 2017 NEI.

\*\* Additional monitors operated by SWOAQA in Ohio.

\*\*\*Monitors operated by the Louisville Metro Air Pollution Control District and by IDEM in Indiana.



**APPENDIX J**

**EPA CASTNET STATIONS IN KENTUCKY**

**Appendix J**  
**EPA CASTNET Stations in Kentucky**

The Clean Air Status and Trends Network (CASTNET) is a nation-wide, long-term monitoring network designed to measure acidic pollutants and ambient ozone concentrations in rural areas. CASTNET is managed collaboratively by the Environmental Protection Agency – Clean Air Markets Division (EPA), the National Park Service – Air Resources Division (NPS), and the Bureau of Land Management – Wyoming State Office (BLM-WSO). In addition to EPA, NPS, and BLM-WSO, numerous other participants provide network support including tribes, other federal agencies, States, private land owners, and universities. More information about CASTNET can be found at: <https://www.epa.gov/castnet>

KDAQ does not operate nor serve as the Primary Quality Assurance Organization for any site in the CASTNET network. However, KDAQ does maintain a cooperative relationship with the staff of Mammoth Cave National Park. At the request of KDAQ, the NPS has designated the ozone monitor as the “Maximum O<sub>3</sub> Concentration” site for the Bowling Green, KY MSA. More information about the Mammoth Cave site can be found in the site detail pages of the Annual Network Plan.

**Clean Air Status & Trends Network (CASTNET)**

**Kentucky Ozone Monitors**

<b>Monitor ID</b>	<b>Monitor Name</b>	<b>County/ Metropolitan Statistical Area</b>	<b>Designation</b>	<b>Monitoring Scale</b>
21-061-0501	Mammoth Cave National Park	Edmonson/ Bowling Green, KY MSA	CASTNET Non-EPA Federal Maximum O <sub>3</sub> Concentration*	Regional
21-175-9991	Crockett	Morgan/ Not in a MSA	CASTNET EPA	Regional
21-229-9991	Mackville (POC 1)	Washington/ Not in a MSA	CASTNET EPA	Regional
21-229-9991	Mackville Collocated (POC 2)	Washington/ Not in a MSA	CASTNET- QA Collocated** EPA	Regional

\* Maximum Ozone Concentration Site for the Bowling Green, KY MSA

\*\*Not usable for NAAQS comparisons





**APPENDIX K**

**ENVIRONMENTAL JUSTICE**

## Appendix K Environmental Justice

The Kentucky Department for Environmental Protection (KDEP) defines environmental justice (EJ) as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies. Meaningful involvement means that people have an opportunity to participate in decisions about activities that may affect their environment and/or health regardless of community demographics or social determinants of environmental health; the public's contribution can influence the regulatory agency's decision; community concerns will be considered in the decision making process; and decision makers will seek out and facilitate the involvement of those potentially affected.

KDEP has developed an EJ website for public participation and community engagement. The department is also working on an EJ hub and an outline to better incorporate EJ areas in decision making. With an enhanced emphasis on considering demographics that indicate susceptible and vulnerable populations, the commonwealth's air monitoring stations were evaluated for their proximity to communities that meet potential EJ demographics.

KDEP evaluated all sites with the KDAQ network, as well as LMAPCD and NPS. The majority of the areas in Kentucky that EPA's EJScreen identified as being in the 90<sup>th</sup> to 95<sup>th</sup> percentile for the demographic index are in proximity to an air monitoring site. The demographic index is an average of percent low-income and percent minority. Additionally, sites were analyzed using a one-mile radius for demographic index using EJScreen. KDEP identified four sites within KDAQ and LMAPCD that were in the top three categories for demographic index (80<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup> percentiles). Those sites are Algonquin Parkway, Paducah Transit, Lexington Primary, and Eastern Kentucky University. Percentiles for all sites are listed in the table below.

Site Name	1 mile Demographic Index Percentile	Site Name	1 mile Demographic Index Percentile
Algonquin Parkway	99	Lewisport	50
Lexington Primary	94	Hazard	48
Paducah Transit	90	Nicholasville	48
Eastern Kentucky University	83	Grayson Lake	45
21st and Greenup	77	Ashland Primary	43
Elizabethtown	77	Carrithers Middle School	43
Buckner	75	Durrett Lane	43
Pikeville	72	Ed Spear Park	41
Watson Lane	72	Cannons Lane	39
Middlesboro	70	Worthington	39
Mammoth Cave	63	Shepherdsville	35
Somerset	62	Hopkinsville	31
Franklin	61	Owensboro	28
LWD	56	Sebree	28
Johnson-Riley Road	55	Smithland	25
Northern Kentucky University	54	Nature Center	2
Calvert City Elementary	50		



**APPENDIX L**

**WAIVER REQUESTS**

## Appendix L Waiver Requests

### Hazard (21-193-0003)

The Hazard site is equipped with ozone, a continuous PM<sub>2.5</sub> FEM (T640), and meteorological equipment. The ozone and T640 are both housed inside a shelter with inlets extending above the roof, while the meteorological equipment is on a pole that extends above the roof of the shelter (Figure 1). The shelter is slightly elevated from the ground on blocks, which sits on a mixture on gravel and vegetative ground cover. The site is located near the horse ring on the grounds of the Perry County Park located at 354 Perry Park Road, Hazard, KY. Horse Park Road, an access road to the horse ring, approximately 100m in length, runs west of the site (Figure 2). The T640 and ozone inlets are, respectively, 11.8m and 12.2m, from the edge of Horse Park Road. Road distance limits can be found in 40 CFR Part 58, Appendix E, Figure E-1 and Table E-1. Since meteorological equipment is not explicitly addressed, it will not be included for evaluation. Distances from the road for both inlets, monitor designation, spatial scale, and allowable road distance is shown in Table 1. The T640 violates the distance limits specified in Appendix E.



**Figure 1: Picture of the Hazard air monitoring station.**



**Figure 2: Google Earth image of the Hazard site in relation to Horse Park Road.**

Monitor	Designation	Spatial Scale	Road Distance	Minimum Road Distance Requirement
Ozone	SPM* AQI Episode	Urban	12.2m	10m
T640	SLAMS AQI	Neighborhood	11.8m	15m

**Table 1: Monitor information for the Hazard site.**

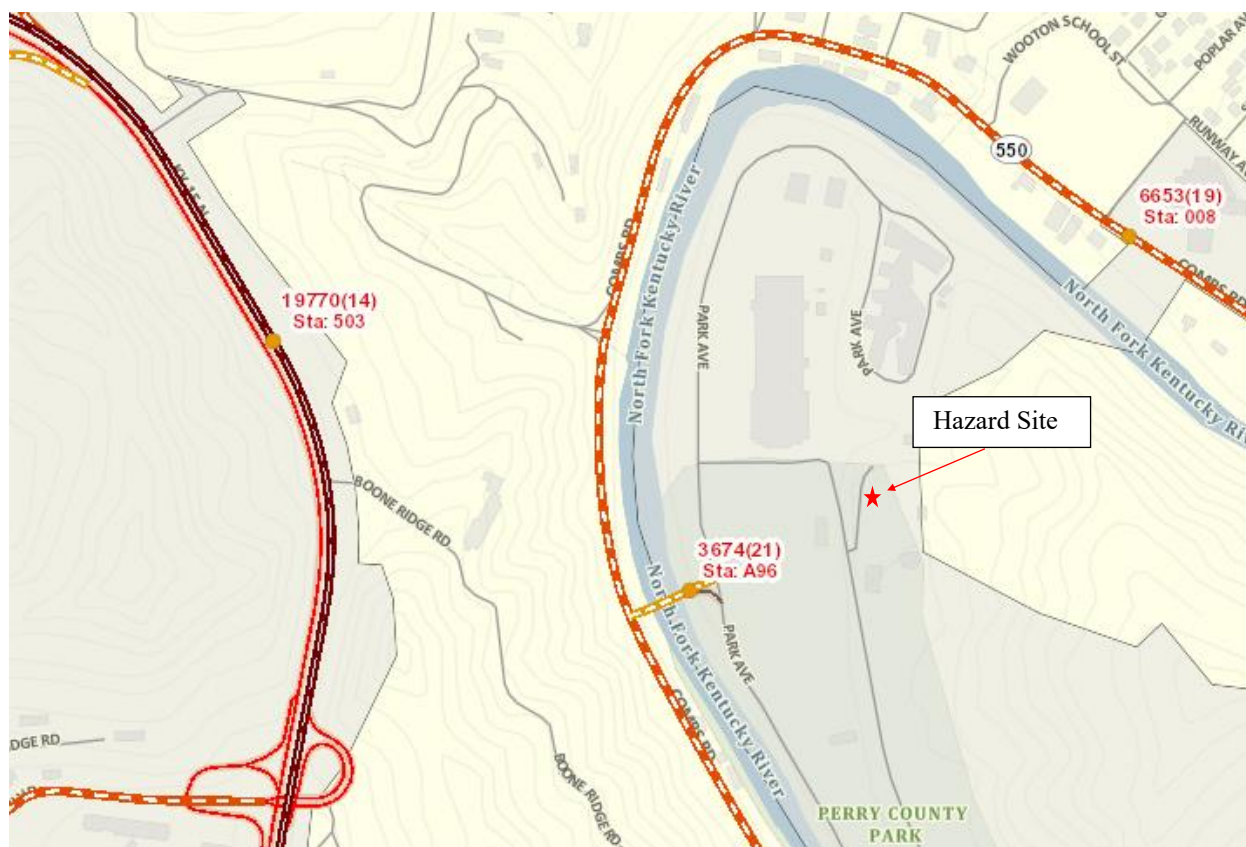
*\*updating to SLAMS*

## Appendix L Waiver Requests

### Hazard (21-193-0003) Continued

A traffic count is not available for Horse Park Road. Until recently, traffic on Horse Park Road was minimal, as it only leads to a pavilion and the horse ring. At the end of August 2022, trailers were installed near the shelter, as the park had become a temporary FEMA site after the historic flooding that occurred in July 2022.

The closest road with a traffic count is Park Avenue (138m) with a traffic count of 3,671 (Figure 3). Appendix E does not clearly define what is considered a road. Upon site setup and until recently, what is now known as Perry Park Road (previously West Davidson Road), was considered the closest road to the site at around 32m. Perry Park Road runs the length of the park, giving people access to its amenities. Horse Park Road is a small offshoot of Perry Park Road, giving access to a small area at the northernmost end of the park. After discussion with EPA Region 4, it was concluded that a waiver request should be submitted with the 2023 Network Plan as a precaution.



**Figure 3: Traffic counts for roads near the Hazard site. Obtained from the Kentucky Transportation Cabinet website.**

**Appendix L**  
**Waiver Requests**

**Hazard (21-193-0003) Continued**

The shelter cannot be relocated on the property due to limited space, siting obstructions, complex geography, and pre-established use. The T640 cannot be repositioned in the shelter to meet the 15m minimum distance requirement. Establishment of a new site would take considerable time, resources, and would be costly. Of greater significance would be the loss of a well-established site, as Hazard began operation on April 1, 2000. Questions have been raised about the impact from traffic and the trailers, however, the only notable impacts have been during the initial set up of the trailers and a burning event where a representative of the Hazard Field Office talked to the residents. Therefore, KDAQ is requesting a waiver for minimum road distance requirements stated in 40 CFR Part 58, Appendix E Figure E-1 for the continuous PM<sub>2.5</sub> FEM (T640) monitor.

## Appendix L Waiver Requests

### Somerset (21-199-0003)

The Somerset site is equipped with ozone and a continuous PM<sub>2.5</sub> FEM (T640) monitor. Both monitors are housed inside a shelter with inlets extending above the roof (Figure 1). The shelter is stationed on a concrete pad located on the property edge of the Somerset Gas Service Storage Building located at 305 Clifty Street, Somerset, KY. A dead end road that is approximately 100m in length, Johnson Street, runs east of the site (Figure 2). The T640 and ozone inlets are, respectively, 10.05m and 11m from the edge of Johnson Street. Road distance limits can be found in 40 CFR Part 58, Appendix E, Figure E-1 and Table E-1. Distances from the road for both inlets, monitor designation, spatial scale, and allowable road distance is shown in Table 1. The T640 violates the distance limits specified in Appendix E.



**Figure 1: Picture of the Somerset air monitoring station.**



**Figure 2: Google Earth image of the Somerset site in relation to Johnson Street. The road dead ends just past two houses located northeast of the site.**

Monitor	Designation	Spatial Scale	Road Distance	Minimum Road Distance Requirement
Ozone	SPM* AQI	Urban	11m	10m
T640	SLAMS AQI	Neighborhood	10.05m	15m

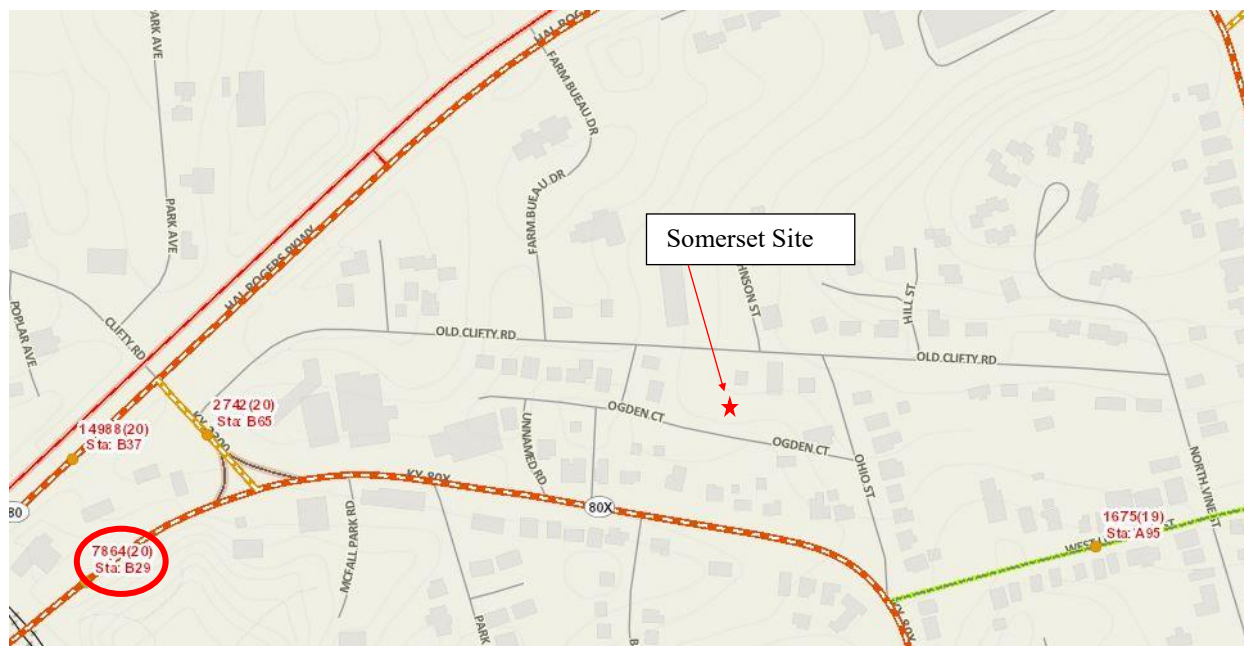
**Table 1: Monitor information for the Somerset site.**

*\*updating to SLAMS*

## Appendix L Waiver Requests

### Somerset (21-199-0003) Continued

A traffic count is not available for Johnson Street; however, since it does not have an outlet and there are only two houses on the street, the traffic count is negligible. Realistically, traffic in and out of the warehouse compound is higher than the traffic on Johnson Street. The closest road with a traffic count is Ogden Street (177m) with a traffic count of 7,864 (Figure 3). Appendix E does not clearly define what is considered a road. KDAQ has considered Johnson Street to act as a driveway since it dead-ends and only leads to two houses. Historically, the closest road was considered Clifty Street at around 47m. After discussion with EPA Region 4, it was concluded that a waiver request should be submitted with the 2023 Network Plan as a precaution.



**Figure 3: Traffic counts for roads near the Somerset site. Obtained from the Kentucky Transportation Cabinet website.**

The shelter cannot be relocated on the property due to other use and low-lying ground. The inlets are already positioned on the side of the shelter opposite the road and cannot be moved to increase road distance. Establishment of a new site would take considerable time, resources, and would be costly. Of greater significance would be the loss of a well-established site, as Somerset began operation on February 14, 1992. Impact from Johnson Street is minimal to negligible, as such, KDAQ is requesting a waiver for minimum road distance requirements stated in 40 CFR Part 58, Appendix E Figure E-1 for the continuous PM<sub>2.5</sub> FEM (T640) monitor.





**APPENDIX M**

**KDAQ EQUIPMENT INVENTORY**

**Appendix M**  
**KDAQ Equipment Inventory**

Site Name	Item Description	Item Model	Condition*	Status
21st & Greenup	PM2.5 Sampler (PM10)	Partisol Plus 2025i Sequential	F	In-Use
21st & Greenup	PM2.5 Sampler (PM10)	Partisol Plus 2025i Sequential	F	In-Use
Ashland Primary-FIVCO	Calibrator	Teledyne-API T700	G	In-Use
Ashland Primary-FIVCO	Datalogger-Digital	Agilaire 8872	G	In-Use
Ashland Primary-FIVCO	Meteorological	RM Young Met (wind/temp)	F	In-Use
Ashland Primary-FIVCO	NOx Analyzer	Teledyne-API T200	G	In-Use
Ashland Primary-FIVCO	O3 Analyzer	Teledyne-API T400	G	In-Use
Ashland Primary-FIVCO	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Ashland Primary-FIVCO	SO2 Analyzer	Teledyne-API T100	G	In-Use
Ashland Primary-FIVCO	Zero Air Unit	Teledyne-API 701	G	In-Use
Ashland Regional Office	Flow Meter	Sierra MFM	G	In-Use
Ashland Regional Office	PM2.5 Sampler	Partisol Plus 2025i Sequential	F	Spare
Buckner	Datalogger-Digital	Agilaire 8872	G	In-Use
Buckner	Meteorological	RM Young Met (wind/temp)	G	Idle
Buckner	O3 Analyzer	Teledyne-API T400	G	In-Use
Buckner	Ozone Photometer	Teledyne-API T703	G	In-Use
Buckner	Zero Air Unit	Teledyne-API 701	G	In-Use
EKU	Lead Sampler	Tisch Model TE-5170DV-BL TSP	G	In-Use
EKU	Lead Sampler	Tisch Model TE-5170DV-BL TSP	G	In-Use
EKU	PM10 Sampler (met)	Partisol 2000	P	In-Use
E-town	Datalogger-Digital	Agilaire 8872	G	In-Use
E-town	O3 Analyzer	Teledyne-API T400	G	In-Use
E-town	Ozone Photometer	Teledyne-API T703	G	In-Use
E-town	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
E-town	PM2.5 Sampler	Partisol Plus 2025i Sequential	F	In-Use
E-town	Zero Air Unit	Teledyne-API 701	G	In-Use
Franklin	Datalogger (met)	ESC 8832	G	In-Use
Franklin	Datalogger-Digital	Agilaire 8872	G	In-Use
Franklin	Meteorological	RM Young Met (wind/temp)	F	In-Use
Franklin	O3 Analyzer	Teledyne-API T400	G	In-Use
Franklin	Ozone Photometer	Teledyne-API T703	G	In-Use
Franklin	Zero Air Unit	Teledyne-API 701	G	In-Use
Grayson Lake	Datalogger (met)	ESC 8832	G	In-Use
Grayson Lake	Datalogger-Digital	Agilaire 8872	G	In-Use
Grayson Lake	Meteorological	RM Young Met (wind/temp/RH/BP)	G	In-Use
Grayson Lake	O3 Analyzer	Teledyne-API T400	G	In-Use
Grayson Lake	Ozone Photometer	Teledyne-API T703	G	In-Use
Grayson Lake	PM10 Sampler	Partisol 2000i	G	In-Use
Grayson Lake	PM10 Sampler	Partisol 2000i	G	In-Use
Grayson Lake	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	In-Use
Grayson Lake	PUF-PAH Sampler	Tisch TE-1000	G	In-Use

\* G= Good, F= Fair, P= Poor

**Appendix M**  
**KDAQ Equipment Inventory**

Site Name	Item Description	Item Model	Condition*	Status
Grayson lake	VOC/Carbonyls Sampler	ATEC 2200	G	In-Use
Hazard	Datalogger-Digital	Agilaire 8872	G	In-Use
Hazard	Meteorological	RM Young Met (wind/temp)	F	In-Use
Hazard	O3 Analyzer	Teledyne-API T400	G	In-Use
Hazard	Ozone Photometer	Teledyne-API T703	G	In-Use
Hazard	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Hazard	Zero Air Unit	Teledyne-API 701	G	In-Use
Hopkinsville	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Hopkinsville	Datalogger (met)	ESC 8832	G	In-Use
Hopkinsville	Datalogger-Digital	Agilaire 8872	G	In-Use
Hopkinsville	Meteorological	RM Young Met (wind/temp)	F	In-Use
Hopkinsville	O3 Analyzer	Teledyne-API T400	G	In-Use
Hopkinsville	Ozone Photometer	Teledyne-API T703	G	In-Use
Hopkinsville	Zero Air Unit	Teledyne-API 701	G	In-Use
Lewisport	Datalogger-Digital	Agilaire 8872	G	In-Use
Lewisport	O3 Analyzer	Teledyne-API T400	G	In-Use
Lewisport	Ozone Photometer	Teledyne-API T703	G	In-Use
Lewisport	Zero Air Unit	Teledyne-API 701	G	In-Use
Lexington Health	Datalogger-Digital	Agilaire 8872	G	In-Use
Lexington Health	NOx Analyzer	Teledyne-API T200	G	In-Use
Lexington Health	O3 Analyzer	Teledyne-API T400	G	In-Use
Lexington Health	PM10 Sampler	Partisol 2000i	F	In-Use
Lexington Health	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Lexington Health	SO2 Analyzer	Teledyne-API T100	G	In-Use
Lexington Health	Zero Air Unit	Teledyne-API 701	G	In-Use
Mammoth Cave	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
Middlesboro	Datalogger (met)	ESC 8832	G	In-Use
Middlesboro	Datalogger- Digital	Agilaire 8872	G	In-Use
Middlesboro	Meteorological	RM Young Met (wind/temp)	F	In-Use
Middlesboro	O3 Analyzer	Teledyne-API T400	G	In-Use
Middlesboro	Ozone Photometer	Teledyne-API T703	G	In-Use
Middlesboro	Zero Air Unit	Teledyne-API 701	G	In-Use
Middlesboro	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Nature Center	Datalogger-Digital	Agilaire 8872	G	In-Use
Nature Center	O3 Analyzer	Teledyne-API T400	G	In-Use
Nature Center	Ozone Photometer	Teledyne-API T703	G	In-Use
Nature Center	Zero Air Unit	Teledyne-API 701	G	In-Use
Nicholasville	Calibrator	Teledyne-API T700	G	In-Use
Nicholasville	Datalogger-Digital	Agilaire 8872	G	In-Use
Nicholasville	Meteorological	RM Young Met (wind/temp)	F	Idle
Nicholasville	O3 Analyzer	Teledyne-API T400	G	In-Use

\* G= Good, F= Fair, P= Poor

**Appendix M**  
**KDAQ Equipment Inventory**

Site Name	Item Description	Item Model	Condition*	Status
Nicholasville	SO2 Analyzer	Teledyne-API T100	G	In-Use
Nicholasville	Zero Air Unit	Teledyne-API 701	G	In-Use
NKU	Auto-GC	CAS-Chromatotech Auto-GC	F	Idle
NKU	Calibrator	Teledyne-API T700	G	In-Use
NKU	Datalogger-Digital	Agilaire 8872	G	In-Use
NKU	Datalogger-Digital (GC)	Agilaire 8872	G	In-Use
NKU	NOx Analyzer	Teledyne-API T200	G	In-Use
NKU	O3 Analyzer	Teledyne-API T400	G	In-Use
NKU	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
NKU	PM2.5 Sampler	Partisol Plus 2025i Sequential	F	In-Use
NKU	PM2.5 Sampler	Partisol Plus 2025i Sequential	F	In-Use
NKU	SO2 Analyzer	Teledyne-API T100	G	In-Use
NKU	Zero Air Unit	Teledyne-API 701	G	In-Use
Owensboro	Calibrator	Teledyne-API T700	G	In-Use
Owensboro	Datalogger-Digital	Agilaire 8872	G	In-Use
Owensboro	Meteorological	RM Young Met (wind/temp)	F	Idle
Owensboro	NOx Analyzer	Teledyne-API T200	G	In-Use
Owensboro	O3 Analyzer	Teledyne-API T400	G	In-Use
Owensboro	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Owensboro	SO2 Analyzer	Teledyne-API T100	G	In-Use
Owensboro	Zero Air Unit	Teledyne-API 701	G	In-Use
Paducah Transit	Calibrator	Teledyne-API T700	G	In-Use
Paducah Transit	Datalogger- Digital	Agilaire 8872	G	In-Use
Paducah Transit	NOx Analyzer	Teledyne-API T200	G	In-Use
Paducah Transit	O3 Analyzer	Teledyne-API T400	G	In-Use
Paducah Transit	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Paducah Transit	SO2 Analyzer	Teledyne-API T100	G	In-Use
Pikeville	Datalogger-Digital	Agilaire 8872	G	In-Use
Pikeville	O3 Analyzer	Teledyne-API T400	G	In-Use
Pikeville	Ozone Photometer	Teledyne-API T703	G	In-Use
Pikeville	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Pikeville	Zero Air Unit	Teledyne-API 701	G	In-Use
Sebree	Datalogger-Digital	Agilaire 8872	G	In-Use
Sebree	SO2 Analyzer	Teledyne-API T100	G	In-Use
Sebree	Calibrator	Teledyne-API T700	G	In-Use
Sebree	Zero Air Unit	Teledyne-API 701	G	In-Use
Shepherdsville	Datalogger-Digital	Agilaire 8872	G	In-Use
Shepherdsville	O3 Analyzer	Teledyne-API T400	G	In-Use
Shepherdsville	Ozone Photometer	Teledyne-API T703	G	In-Use
Shepherdsville	Zero Air Unit	Teledyne-API 701	G	In-Use
Smithland	Datalogger- Digital	Agilaire 8872	G	In-Use

\* G= Good, F= Fair, P= Poor

**Appendix M**  
**KDAQ Equipment Inventory**

Site Name	Item Description	Item Model	Condition*	Status
Smithland	Zero Air Unit	Teledyne-API 701	G	In-Use
Smithland	O3 Analyzer	Teledyne-API T400	G	In-Use
Smithland	Ozone Photometer	Teledyne-API T703	G	In-Use
Smiths Grove-Ed Spear Park	Datalogger-Digital	Agilaire 8872	G	In-Use
Smiths Grove-Ed Spear Park	O3 Analyzer	Teledyne-API T400	G	In-Use
Smiths Grove-Ed Spear Park	Ozone Photometer	Teledyne-API T703	G	In-Use
Smiths Grove-Ed Spear Park	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Smiths Grove-Ed Spear Park	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Smiths Grove-Ed Spear Park	Zero Air Unit	Teledyne-API 701	G	In-Use
Somerset	Datalogger-Digital	Agilaire 8872	G	In-Use
Somerset	O3 Analyzer	Teledyne-API T400	G	In-Use
Somerset	Ozone Photometer	Teledyne-API T703	G	In-Use
Somerset	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Somerset	Zero Air Unit	Teledyne-API 701	G	In-Use
Worthington	Calibrator	Teledyne-API T700	G	In-Use
Worthington	Datalogger-Digital	Agilaire 8872	G	In-Use
Worthington	O3 Analyzer	Teledyne-API T400	G	In-Use
Worthington	SO2 Analyzer	Teledyne-API T100	G	In-Use
Worthington	Zero Air Unit	Teledyne-API T701H	G	In-Use
x-QA	Calibrator	EnviroNics 6100 Portable	F	Spare
x-QA	Calibrator	EnviroNics 6100 Portable	G	In-Use
x-QA	Calibrator	EnviroNics 6103 Portable	F	Spare
x-QA	Calibrator	EnviroNics 6103 Portable	F	Spare
x-QA	Calibrator	EnviroNics 6103 Portable	G	In-Use
x-QA	Calibrator	EnviroNics 6103 Portable	G	In-Use
x-QA	Calibrator	EnviroNics 6103 Portable	G	In-Use
x-QA	Calibrator	Teledyne T750U Portable	G	In-Use
x-QA	Calibrator	Teledyne T750U Portable	G	In-Use
x-QA	Calibrator	Teledyne T750U Portable	G	In-Use
x-QA	Calibrator	Teledyne T750U Portable	G	In-Use
x-QA	Flowmeter	Alicat	G	In-Use
x-QA	Flowmeter	Alicat	G	In-Use
x-QA	Flowmeter	Bios Defender 530 HF	G	In-Use
x-QA	Flowmeter	Bios Defender 530 LF	G	In-Use
x-QA	Flowmeter	Hastings MiniFlow L	G	In-Use
x-QA	Flowmeter	Sierra 821 MFM	G	In-Use
x-QA	Flowmeter	Sierra 821 MFM	G	In-Use
x-QA	Flowmeter	Sierra Digital Blue Box	F	In-Use
x-QA	Flowmeter	Sierra Digital Blue Box	F	In-Use
x-QA	Flowmeter	Streamline Pro 0.9-19 LPM	G	In-Use
x-QA	Flowmeter	Streamline Pro 0.9-19 LPM	G	In-Use

\* G= Good, F= Fair, P= Poor

**Appendix M**  
**KDAQ Equipment Inventory**

Site Name	Item Description	Item Model	Condition*	Status
x-QA	Flowmeter	Streamline Pro 0.9-19 LPM	G	In-Use
x-QA	Flowmeter	Streamline Pro 0.9-19 LPM	G	In-Use
x-QA	Flowmeter	Streamline Pro 2-25 LPM	G	In-Use
x-QA	Flowmeter	Streamline Pro Model M	G	In-Use
x-QA	Flowmeter	Streamline Pro Model M	G	In-Use
x-QA	Flowmeter	Streamline Pro Model M	G	In-Use
x-QA	Ozone Photometer	Thermo 49C	G	In-Use
x-QA	Ozone Photometer	Thermo 49C	G	In-Use
x-QA	Ozone Photometer	Thermo 49C	P	Spare
x-QA	Ozone Photometer	Thermo 49C	P	Spare
x-QA	Zero Air Unit	EnviroNics 7000 Series	F	In-Use
x-QA	Zero Air Unit	EnviroNics 7000 Series	F	In-Use
x-QA	Zero Air Unit	Teledyne-API Portable 751H	F	In-Use
x-QA	Zero Air Unit	Teledyne-API Portable 751H	F	In-Use
x-QA	Zero Air Unit	Teledyne-API Portable 751H	G	In-Use
x-QA	Zero Air Unit	Teledyne-API Portable 751H	G	In-Use
x-QA	Zero Air Unit	Teledyne-API Portable 751H	G	In-Use
x-QA	Zero Air Unit	Teledyne-API Portable 751H	G	In-Use
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	F	Surplus
x-Shop	Calibrator	Teledyne-API 700E	G	Surplus
x-Shop	Calibrator	Teledyne-API 700E	G	Surplus
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare
x-Shop	Calibrator	Teledyne-API T700	G	Spare

\* G= Good, F= Fair, P= Poor







**Appendix M**  
**KDAQ Equipment Inventory**

Site Name	Item Description	Item Model	Condition*	Status
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Surplus
x-Shop	Ozone Photometer	Teledyne-API T703	G	Spare
x-Shop	Ozone Photometer	Teledyne-API T703	G	Spare
x-Shop	Ozone Photometer	Teledyne-API T703	G	Spare
x-Shop	Ozone Photometer	Teledyne-API T703	G	Spare
x-Shop	Ozone Photometer	Teledyne-API T703	G	Spare
x-Shop	Ozone Photometer	Teledyne-API T703	G	Spare
x-Shop	Ozone Photometer	Teledyne-API T703	G	Spare
x-Shop	Ozone Photometer	Teledyne-API T703	G	Spare
x-Shop	Ozone Photometer	Teledyne-API T703	G	Spare
x-Shop	Ozone Photometer	Teledyne-API T703	G	Spare
x-Shop	PM10 Sampler	Partisol 2000	F	Surplus
x-Shop	PM10 Sampler	Partisol 2000	F	Surplus
x-Shop	PM10 Sampler	Partisol 2000	F	Surplus
x-Shop	PM10 Sampler	Partisol 2000	F	Surplus
x-Shop	PM10 Sampler	Partisol 2000	F	Surplus
x-Shop	PM10 Sampler	Partisol 2000	F	Surplus
x-Shop	PM10 Sampler	Partisol 2000	F	Surplus
x-Shop	PM10 Sampler	Partisol 2000	F	Surplus

\* G= Good, F= Fair, P= Poor

**Appendix M**  
**KDAQ Equipment Inventory**

Site Name	Item Description	Item Model	Condition*	Status
x-Shop	PM10 Sampler	Partisol 2000	F	Surplus
x-Shop	PM10 Sampler	Thermo Partisol 2000i	G	Spare
x-Shop	PM10 Sampler	Thermo Partisol 2000i	G	Spare
x-Shop	PM10 Sampler	Thermo Partisol 2000i	G	Spare
x-Shop	PM10 Sampler	Partisol 2000i	G	Spare
x-Shop	PM10 Sampler	Partisol 2000i	G	Spare
x-Shop	PM10 Sampler	Thermo Partisol 2000i	G	Spare
x-Shop	PM10 Sampler	Thermo Partisol 2000i	G	Spare
x-Shop	PM10 Sampler	Thermo Partisol 2000i	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Surplus
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Continuous FEM	Teledyne-API T640	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Surplus
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Surplus
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Surplus
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Surplus
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Surplus
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Surplus

\* G= Good, F= Fair, P= Poor



**Appendix M**  
**KDAQ Equipment Inventory**

Site Name	Item Description	Item Model	Condition*	Status
x-Shop	VOC Sampler	Xonteck 911A	G	Spare
x-Shop	VOC Sampler	Xonteck 911A	G	Spare
x-Shop	VOC Sampler	Xonteck 911A	G	Spare
x-Shop	VOC Sampler	Xonteck 911A	G	Spare
x-Shop	VOC Sampler	Xonteck 911A	P	Spare
x-Shop	VOC Sampler	Xonteck 911A	P	Spare
x-Shop	VOC Sampler	Xonteck 911A	P	Spare
x-Shop	VOC Sampler	Xonteck 911A	P	Spare
x-Shop	VOC Sampler	Xonteck 911A	P	Spare
x-Shop	VOC/Carbonyls Sampler	ATEC 2200	F	Spare
x-Shop	VOC/Carbonyls Sampler	ATEC 2200	F	Spare
x-Shop	VOC/Carbonyls Sampler	ATEC 2200	G	Surplus
x-Shop	VOC/Carbonyls Sampler	ATEC 2200	P	Surplus
x-Shop	VOC/Carbonyls Sampler	ATEC 2200	P	Surplus
x-Shop	VOC/Carbonyls Sampler	ATEC 2200	P	Surplus
x-Shop	Zero Air Unit	Teledyne-API 701	F	Surplus
x-Shop	Zero Air Unit	Teledyne-API 701	F	Surplus
x-Shop	Zero Air Unit	Teledyne-API 701	F	Surplus
x-Shop	Zero Air Unit	Teledyne-API 701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API 701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API 701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API 701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701H	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701H	G	Spare
x-Shop	Zero Air Unit	Teledyne-API 701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API 701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API T701	G	Spare

\* G= Good, F= Fair, P= Poor



**APPENDIX N**

**PUBLIC COMMENTS**

**KENTUCKY DIVISION FOR AIR QUALITY  
AMBIENT AIR MONITORING NETWORK  
Comments Received 6/22/2023**

**Energy and Environment Cabinet  
Department for Environmental Protection  
Division for Air Quality**

A public comment period on the KENTUCKY DIVISION FOR AIR QUALITY AMBIENT AIR MONITORING NETWORK PLAN 2023 was held from May 23, 2023 through June 22, 2023.

The following groups submitted comments regarding the Kentucky Division for Air Quality (KDAQ) network during the public comment period:

- Calvert City Environmental Consortium
- Westlake

The comments received from the Consortium and Westlake were identical and related to the Calvert City Special Study described in Appendix G of this plan. As such, only one set of responses was drafted.

**Summary of Comments**

1. **Comment:** KDAQ's response to comment 1 submitted by the Consortium/Westlake on June 16, 2022, on the 2022 KDAQ Ambient Air Monitoring Network Plan stated that the Quality Assurance Project Plan (QAPP) would be revised to clarify KDAQ's monitoring intentions. The response to the comment also stated that the Consortium/Westlake would be provided with the study's revised QA documents. These documents were not provided. Please provide the revised QA documents.

**Response:** The updated QAPP was fully approved on 6/12/23. The Consortium and Westlake received an electronic copy of the updated QAPP on 6/20/23. While not specifically requested, KDAQ also provided the SOP, which was approved on 10/16/20.

2. **Comment:** When will the Risk Assessment be completed?

**Response:** KDAQ is not conducting the risk assessment. The risk assessment is being performed by EPA Region 4. As such, KDAQ cannot provide a completion date. However, the risk assessment will be available to the public once completed.

June 19, 2023

Kentucky Division for Air Quality  
Ms. Jenna Nall, Environmental Scientist IV  
300 Sower Boulevard, 2<sup>nd</sup> Floor  
Frankfort, KY 40601  
Email: [jenna.nall@ky.gov](mailto:jenna.nall@ky.gov)

Re: Comments on Kentucky Division for Air Quality's Annual Ambient Air Monitoring Network Plan 2023

Dear Ms. Nall:

The Calvert City Environmental Consortium (the Consortium) is comprised of individuals and organizations that represent the regulated community in the Calvert City, KY area. The Consortium includes representatives from Arkema, Inc.; Ashland, Inc.; Calvert City Metals and Alloys; Carbide Industries LLC; City of Calvert City; Cymetech Corporation; Estron Chemical, Inc.; Evonik Corporation; Ingevity; Lubrizol Advanced Materials, Inc.; Phoenix Paper Wickliffe LLC; Sekisui SC; Vanderbilt Chemicals, LLC; Wacker Chemical Corporation; Waste Path Sanitary Landfill; and Westlake Vinyls, Inc.

Thank you for the opportunity to submit comments and questions on the 2023 Ambient Air Monitoring Network Plan.

Appendix G, Calvert City Special-Purpose Monitoring

- KDAQ's response to comment 1 submitted by the Consortium on June 16, 2022, on the 2022 KDAQ Ambient Air Monitoring Network Plan stated that the Quality Assurance Project Plan (QAPP) would be revised to clarify KDAQ's monitoring intentions. The response to the comment also stated that the Consortium would be provided with the study's revised QA documents. These documents were not provided. Please provide the revised QA documents.
- When will the Risk Assessment be completed?

The Consortium appreciates the opportunity to submit these questions and looks forward to KDAQ's responses.

Please contact me at (270) 395-3344 or [tdarnall@westlake.com](mailto:tdarnall@westlake.com) if you have any questions.

Sincerely,



Toni G. Darnall  
Chair – Calvert City Environmental Consortium

cc: Environmental Consortium members



June 19, 2023

Kentucky Division for Air Quality  
Ms. Jenna Nall, Environmental Scientist IV  
300 Sower Boulevard, 2<sup>nd</sup> Floor  
Frankfort, KY 40601  
Email: [jenna.nall@ky.gov](mailto:jenna.nall@ky.gov)

Re: Comments on Kentucky Division for Air Quality's Annual Ambient Air Monitoring Network Plan 2023

Dear Ms. Nall:

Westlake Vinyls, Inc. ("Westlake") appreciates the opportunity to submit comments and questions on the Kentucky Division for Air Quality's (KDAQ's) Annual Ambient Air Monitoring Network Plan 2023.

Appendix G, Calvert City Special-Purpose Monitoring

- KDAQ's 2022 response to comment 1 submitted by Westlake on June 15, 2022, on the 2022 KDAQ Ambient Air Monitoring Network Plan stated that the Quality Assurance Project Plan (QAPP) would be revised to clarify KDAQ's monitoring intentions. The response to the comment also stated that Westlake would be provided with the study's revised QA documents. These documents were not provided. Please provide the revised QA documents.
- When will the Risk Assessment be completed?

Westlake appreciates the opportunity to submit these questions and looks forward to KDAQ's responses.

Please contact me at (270) 395-3362 or [ksheridan@westlake.com](mailto:ksheridan@westlake.com) if you have any questions.

Sincerely,

Kevin P. Sheridan  
Senior Regional Manager – HSE

cc: Toni G. Darnall – Westlake Vinyls, Inc. ([tdarnall@westlake.com](mailto:tdarnall@westlake.com))





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**KDAQ AIR MONITORING STATIONS  
BY  
REGIONAL OFFICE**

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