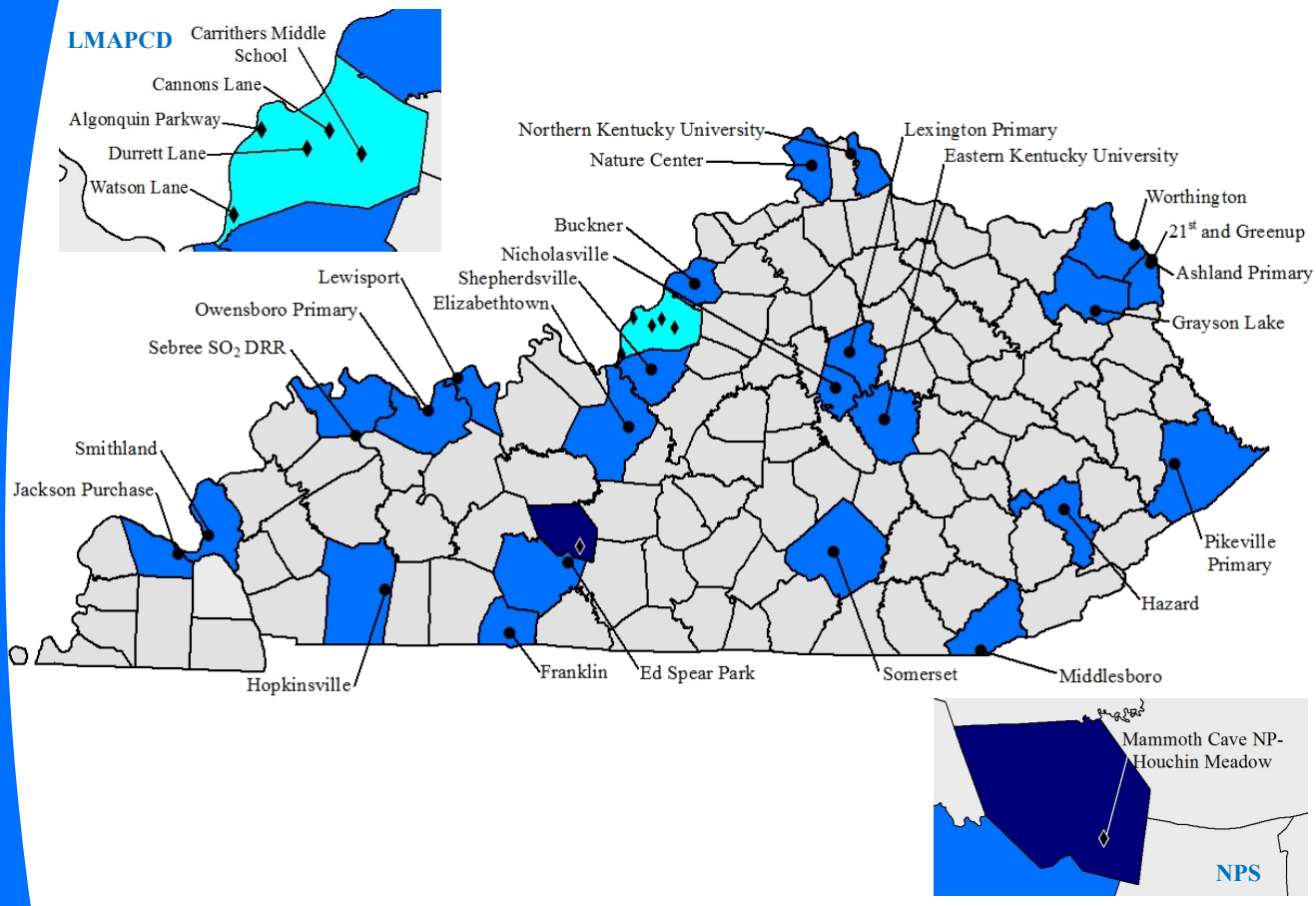
Kentucky
Annual Ambient Air Monitoring Network Plan 2022



Commonwealth of Kentucky Energy & Environment Cabinet
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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 2022 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).

ACRONYMS

AEM – Automated Equivalent Method

AQI – Air Quality Index

AQS – Air Quality System

ARM – Automated Reference Method

CBSA – Core-Based Statistical Area

CSA – Combined Statistical Area

CO – Carbon Monoxide

DRR – Data Requirements Rule

FAM – Federal Alternate Method

FEM – Federal Equivalent Method

FRM – Federal Reference Method

KDAQ – Kentucky Division for Air Quality

LMAPCD – Louisville Metro Air Pollution Control District

MSA – Metropolitan Statistical Area

NAAQS – National Ambient Air Quality Standards

NAMS – National Air Monitoring Stations

NAREL– National Air and Radiation Environmental Laboratory

NATTS – National Air Toxics Trends Stations

NIST– National Institute of Standards and Technology

NO_2 – Nitrogen Dioxide

NPS – National Park Service

O_3 – Ozone

PAH – Polycyclic Aromatic Hydrocarbons

Pb – Lead

PM – Particulate Matter

PTFE-Polytetrafluoroethylene

PWEI – Population Weighted Emissions Index

RA-40 – Regional Administrator 40

SAMWG – Standing Air Monitoring Working Group

SLAMS – State and Local Air Monitoring Stations

SO_2 – Sulfur Dioxide

SPM – Special Purpose Monitors

TBD – To Be Determined

TEOM – Tapered Elemental Oscillating Microbalance

U.S. EPA – United States Environmental Protection Agency

VOC – Volatile Organic Compounds

INTRODUCTION

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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 $PM_{2.5}$ 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 2022

During the 2022-2023 monitoring year, KDAQ will operate 71 instruments, including 6 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 109 instruments, including 12 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

Lexington-Fayette, KY

- As a cost saving measure, the meteorology station at Nicholasville (21-113-0001) will be shut down, effective 12/31/2022. KDAQ plans on utilizing nearby NOAA sites for meteorological data, as needed.

Louisville-Jefferson County, KY-IN

- As a cost saving measure, the meteorology station at Buckner (21-185-0004) will be shut down, effective 12/31/2022. KDAQ plans on utilizing nearby NOAA sites for meteorological data, as needed.

Owensboro, KY

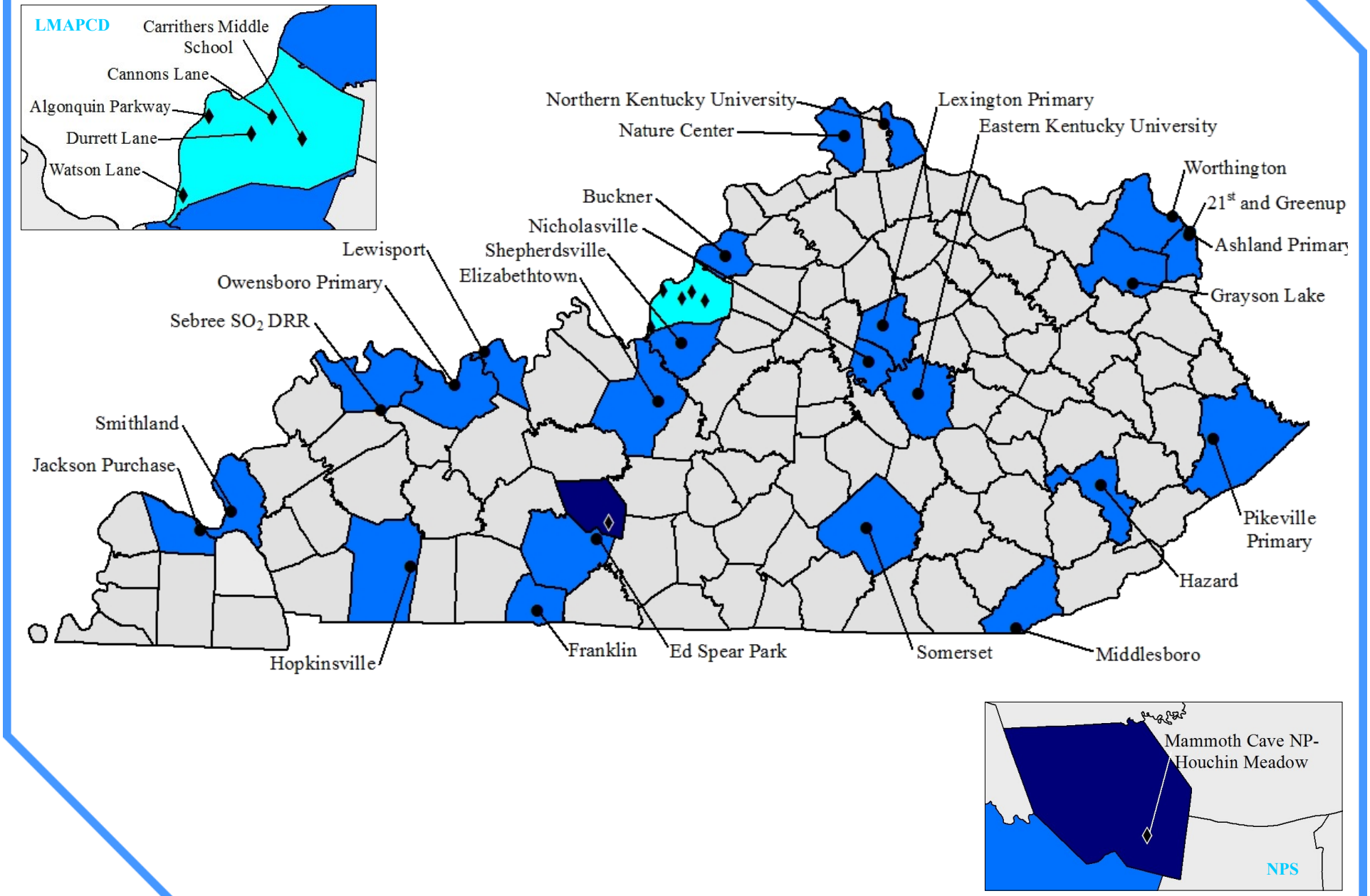
- As a cost saving measure, the meteorology station at Owensboro Primary (21-059-0005) will be shut down, effective 12/31/2022. KDAQ plans on utilizing nearby NOAA sites for meteorological data, as needed.

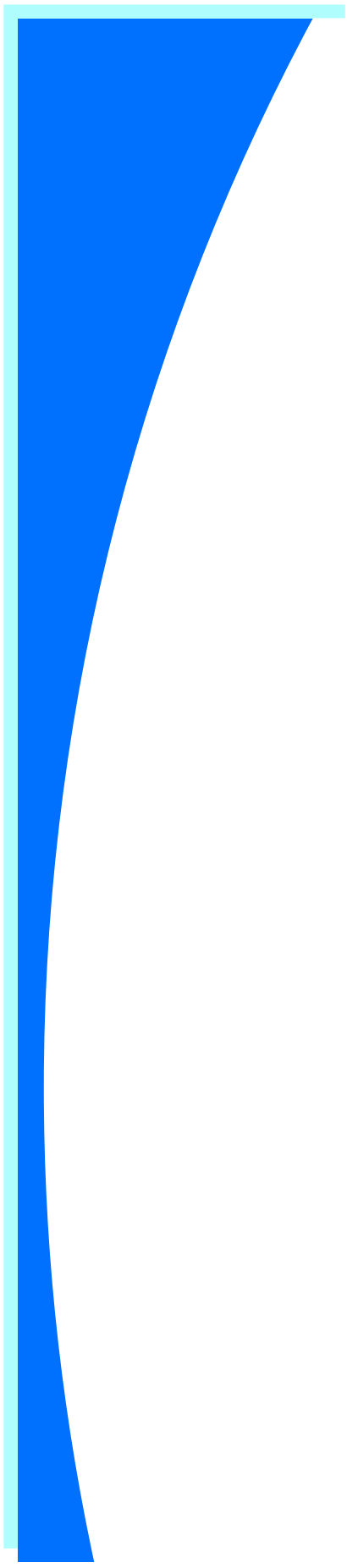
2022 AIR MONITORING STATIONS SUMMARY

Metropolitan Statistical Area	Site Count	Filter Based $PM_{2.5}$	Continuous $PM_{2.5}$	PM_{10}	Continuous PM_{10}	SO_2	NO_2	NO_y	CO	O_3	Pb	VOC	Carbonyl	PAH	$PM_{2.5}$ Speciation	Carbon Speciation	Black Carbon	RadNet	Met
Bowling Green, KY	2		$2^{S,C,i}$			1		1	1	$2^{i,Max}$									1
Cincinnati-Middletown, OH-KY-IN (AQI) (PWEI)	2	2^{c}	$1^{i,S}$			1	1			2^{i}									
Clarksville, TN-KY	1		$1^{i,X,S}$							1^{i}									1
Elizabethtown, KY	1	1^{C}	$1^{i,S}$							$1^{i,Max}$									
Evansville, IN-KY	1					1^{DRR}													
Huntington-Ashland, WV-KY-OH (AQI)	4		$2^{i,S,X}$	$4^{C,m}$		2	1			$3^{i,Max}$		2^{D}	2^{D}	1					2
Lexington-Fayette, KY (AQI)	2		$1^{i,S}$	1^{m}		2	1^{r40}			$2^{i,Max}$								1	
Louisville-Jefferson County, KY-IN (AQI) (PWEI)	7	$2^{n,C}$	$5^{e,E,i,n,S}$		$2^{i,E}$	3^{i}	$2^{n,i}$	1	$2^{n,i}$	$6^{i,Max}$		2^{G}	1		1	1	1	1	5^{n}
Owensboro, KY	2		$1^{i,S}$			1	1^{i}			$2^{i,Max}$									
Micropolitan Statistical Area																			
Paducah, KY-IL	2		$1^{i,S}$			1	1			2^{i}								1	
Somerset, KY	1		$1^{i,S}$							1^{i}									
Middlesboro, KY	1		$1^{i,S}$							1^{i}									1
Richmond-Berea, KY	1										2^{C}								
Not in a CBSA																			
Perry County	1		$1^{i,S}$							1^{i}									1
Pike County	1		$1^{i,S}$							1^{i}									
Simpson County	1									1^{i}									1
KDAQ Totals	24	3	14	5	0	8	5	0	0	21	2	2	2	1	0	0	0	2	6
LMAPCD Totals	5	2	5	0	2	3	2	1	2	4	0	2	1	0	1	1	1	1	5
NPS Totals	1	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	1
Total Network	**30**	**5**	**19**	**5**	**2**	**12**	**7**	**2**	**3**	**26**	**2**	**4**	**3**	**1**	**1**	**1**	**1**	**3**	**12**

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_3 Concentration Site; n=Near-Road Monitor; X= Regional $PM_{2.5}$ 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_{10}, $PM_{2.5}$ and PM_{coarse} with a single monitor)

2022 Ambient Air Monitoring Network





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_2 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_2, 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_2 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_2 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_2 monitoring locations, with a primary focus on protecting susceptible and vulnerable populations. RA-40 NO_2 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_{10})

All PM_{10} 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^3). 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_{10} monitoring, LMAPCD uses Teledyne API T640x for PM_{10} NAAQS compliance and PM_{coarse} monitoring. TAPI T640x monitors collect $PM_{2.5,}$ PM10, and $PM_{10\text{-}2.5\ (coarse)}$ 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 ($PM_{2.5}$)

The Division currently operates continuous Teledyne-API (TAPI) T640 continuous $PM_{2.5}$ spectroscopy monitors and manual intermittent samplers for monitoring particulate matter 2.5 microns in size ($PM_{2.5}$). All $PM_{2.5}$ 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^3). 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 $PM_{2.5}$ data continuously via the principle of broadband particle-scattering spectroscopy. The TAPI T640 is designated as a FEM for $PM_{2.5}$. 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 $PM_{2.5}$ 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 $PM_{2.5}$ monitors is included in the appendices of this document.

(c) **$PM_{2.5}$ Speciation and Carbon Speciation Sampling and Analysis**

In addition to operating $PM_{2.5}$ samplers that determine only $PM_{2.5}$ mass values, LMAPCD also operates $PM_{2.5}$ speciation samplers that collect samples that are analyzed to determine the chemical makeup of $PM_{2.5}$. 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_2)**

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_3)**

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_2)**

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/NOy) 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^3/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_{10} 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^3). 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: http://www.epa.gov/narel/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 basics 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:

Monitoring Site Type	Scale of Representativeness
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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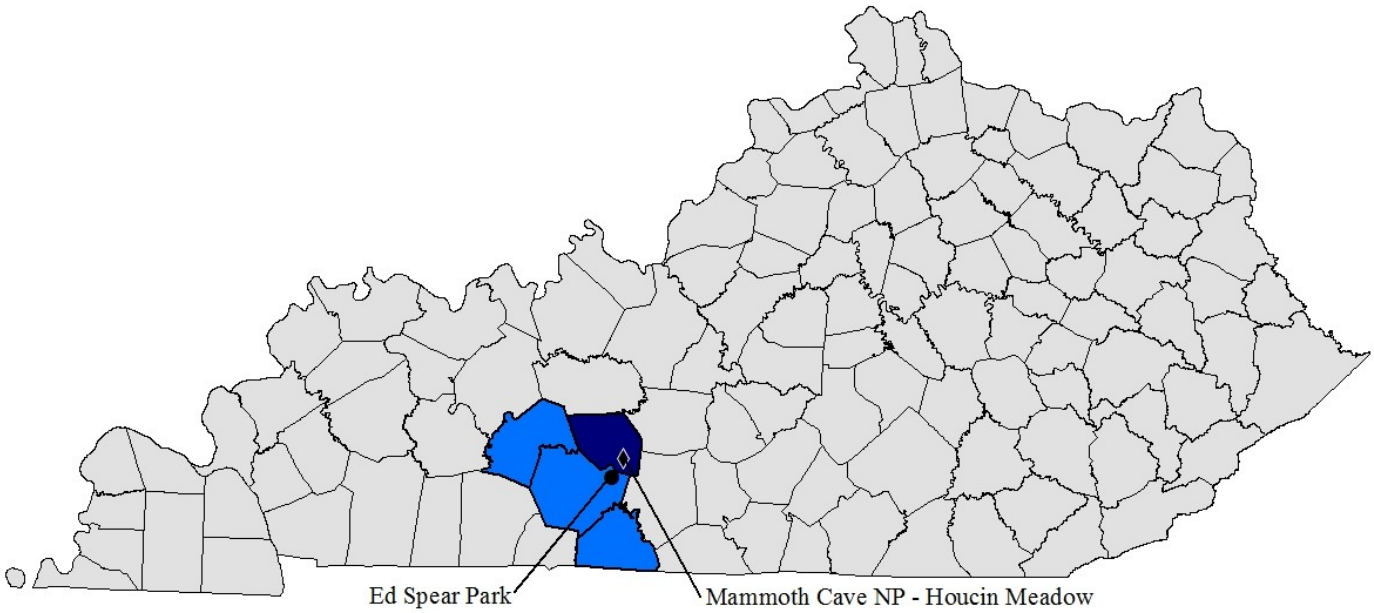
Bowling Green, KY



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^{F}		1^{F}	1^{F}	$1^{F, M}$									1^{F}
Edmonson	Mammoth Cave (NPS)																		
21-227-0009	226 Sunset Street		$2^{C,S,i}$							1^{i}									
Warren	Smiths Grove																		
Totals	**2**		**2**			**1**		**1**	**1**	**2**									**1**

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

Rev. 5/12/2021

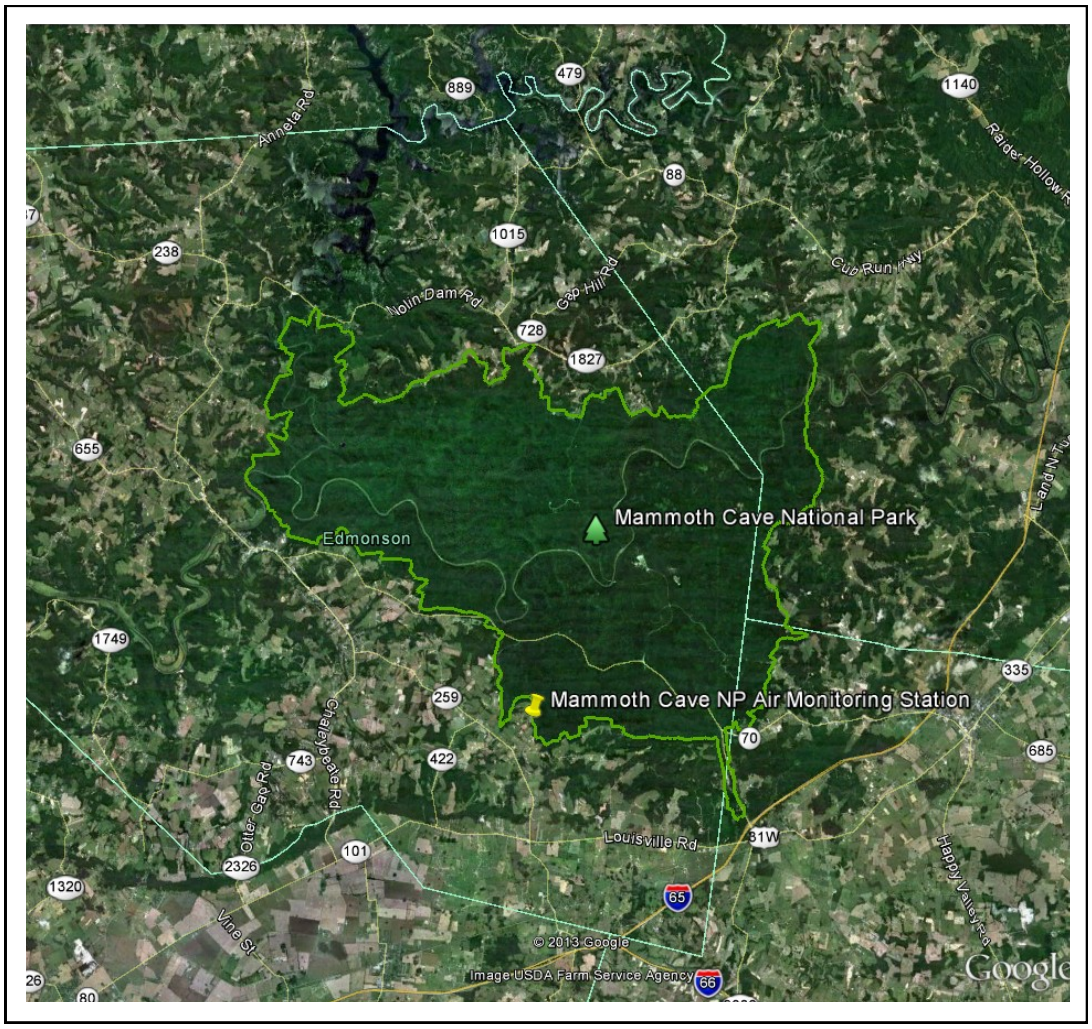
CSA/MSA: Bowling Green-Glasgow, KY CSA; Bowling Green, KY MSA
401 KAR 50:020 Air Quality Region: South Central Kentucky Intrastate (105)
Site Name: Mammoth Cave National Park-Houchin Meadow
AQS Site ID: 21-061-0501
Location: Alfred Cook Road, Park City, KY 42160
County: Edmonson
GPS Coordinates: 37.13182, -86.147944 (NAD83)
Date Established: August 1, 1997
Inspection Date: December 2, 2021
Inspection By: Jenna Nall and Nathan Puckett

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	10.5	CASTNET Maximum O_3 Non-EPA Federal	Automated Equivalent Method utilizing UV photometry analysis	Continuously
Sulfur Dioxide	10.7	Non-EPA Federal	Automated Equivalent Method utilizing trace level UV fluorescence analysis	Continuously
Total Reactive Nitrogen (NO/NO_Y)	10.7	Non-EPA Federal	Automated method utilizing trace level chemiluminescence analysis	Continuously
Carbon Monoxide	10.7	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	13.5	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: December 2, 2021
Inspection By: Jenna Nall and Nathan Puckett
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 35.9 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.

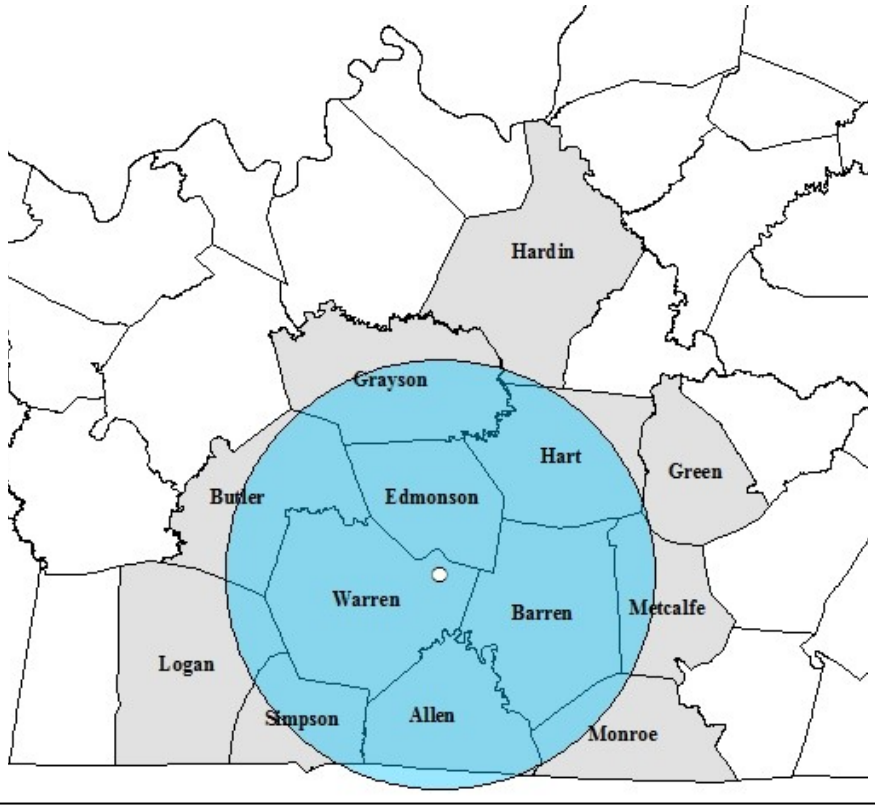
Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	4.11	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.66	SLAMS AQI	Broadband Spectroscopy	Continuously
Collocated FEM $PM_{2.5}$ Continuous	4.68	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.

Neighborhood Scale: Particulates

Urban Scale: Ozone



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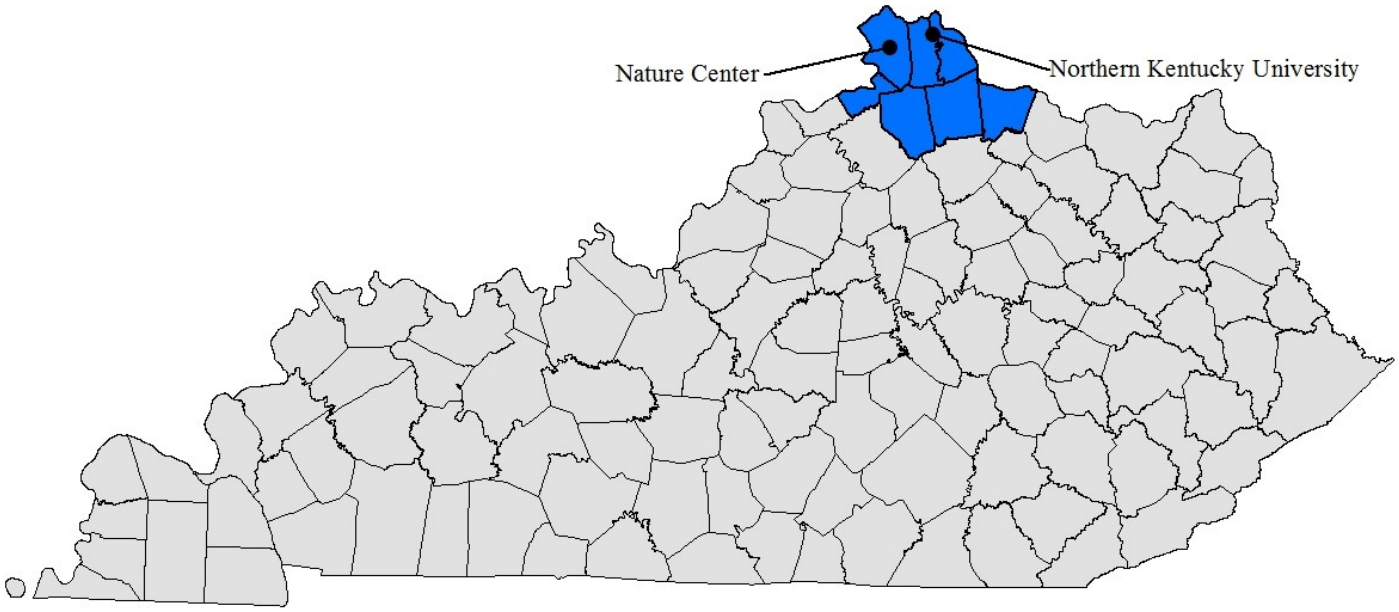
Cincinnati, OH-KY-IN



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	9101 Camp Ernst Rd									1[i]									
Boone	Union																		
21-037-3002	524A John's Hill Rd	2[C]	1[S,i]			1	1			1[e,i]									
Campbell	Highland Heights																		
Totals	**2**	**2**	**1**			**1**	**1**			**2**									

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

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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: May 4, 2022
Inspection By: Jenna Nall and Jennifer Miller
Site Approval Status: Site and monitor meet all design criteria for the monitoring network.

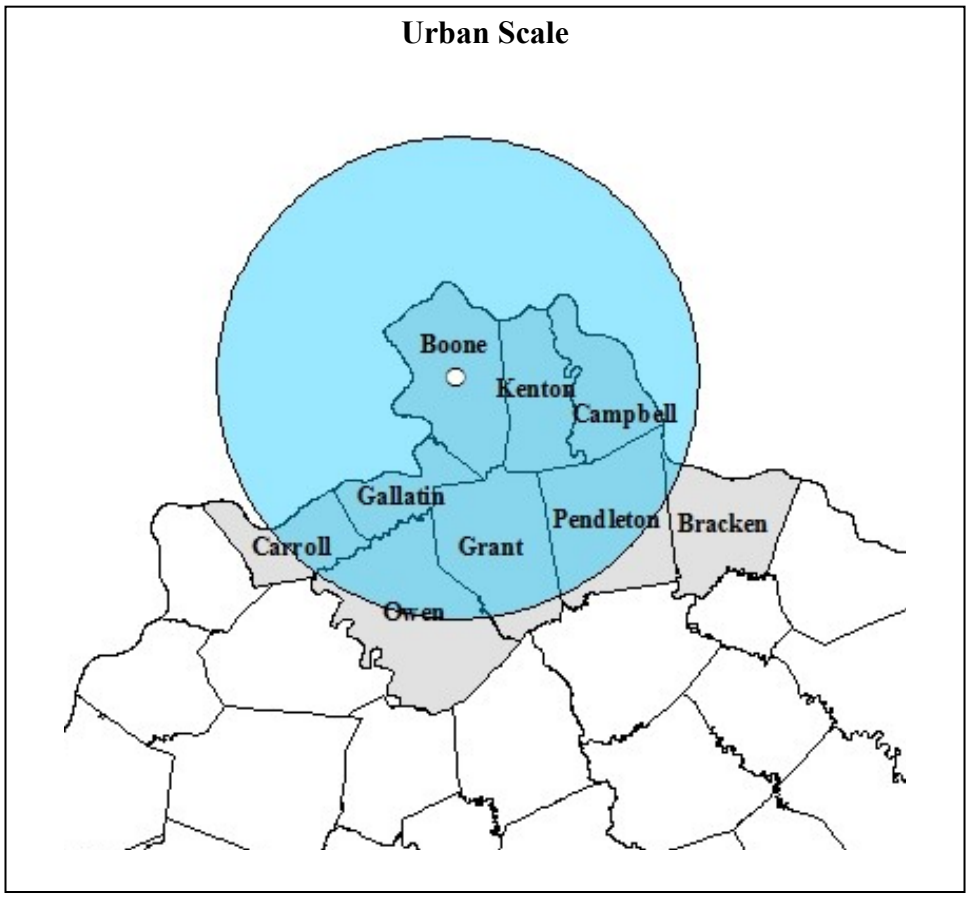
This monitoring site was established as a replacement for East Bend (21-015-0003) due to siting issues that could not be resolved. The site is located on the grounds of the Boone County Extension Environmental and Nature Center. A Kentucky Mesonet station is located approximately 45 meters SSW from the air monitoring shelter. The sample inlet is approximately 28.5 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, 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	4.06	SLAMS AQI	UV photometry	Continuously March 1 – October 31

Quality Assurance Status:
All Quality Assurance procedures will be 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: September 10, 2021
Inspection By: Jenna Nall and Nathan Puckett
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 451 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.

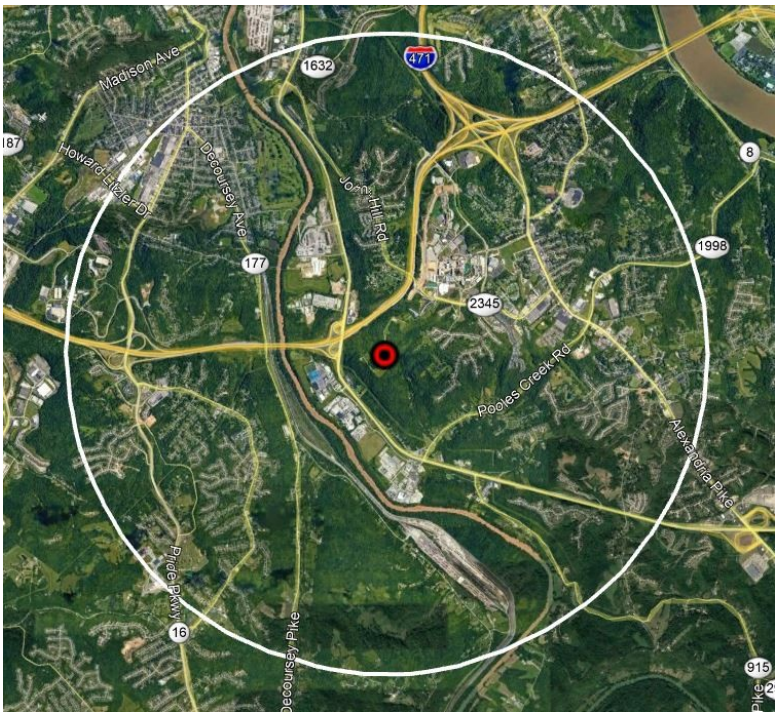
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to provide ozone, particulate, nitrogen dioxide, and sulfur dioxide levels for daily index reporting; and to detect elevated pollutant levels for activation of emergency control procedures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

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Nitrogen Dioxide (NO_2, NO, NO_x)	3.74	SLAMS	Chemiluminescence	Continuously
AEM Ozone	3.74	SLAMS AQI EPISODE	UV photometry	Continuously March 1 – October 31
FRM $PM_{2.5}$	4.6	SLAMS	Gravimetric	24-hours every third day
Collocated FRM $PM_{2.5}$	4.6	SLAMS	Gravimetric	24-hours every sixth day
FEM $PM_{2.5}$ Continuous	4.58	SLAMS AQI	Broadband Spectroscopy	Continuously
AEM Sulfur Dioxide	3.74	SLAMS	UV fluorescence	Continuously

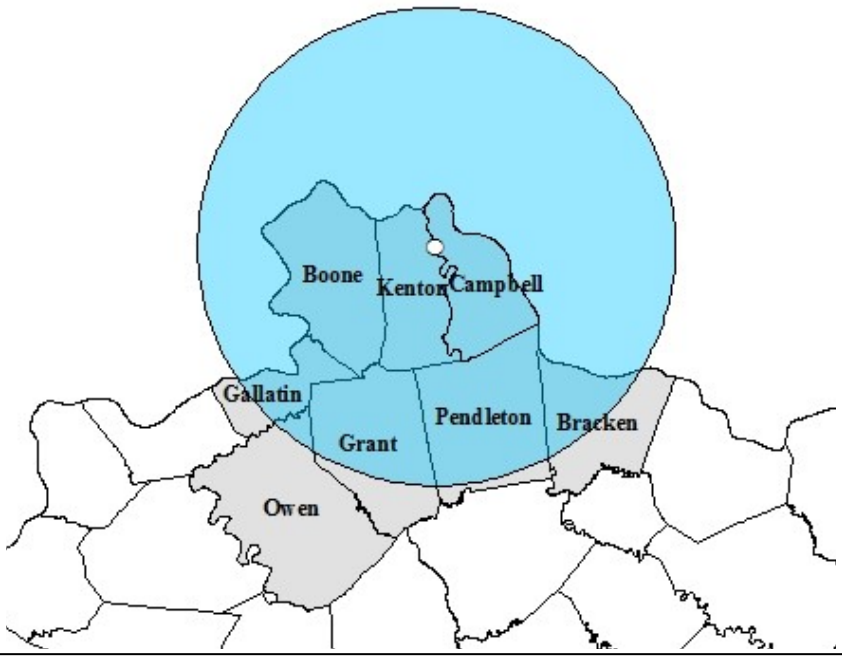
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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.

Neighborhood Scale: Particulates



Urban Scale: Nitrogen Dioxide, Ozone, Sulfur Dioxide



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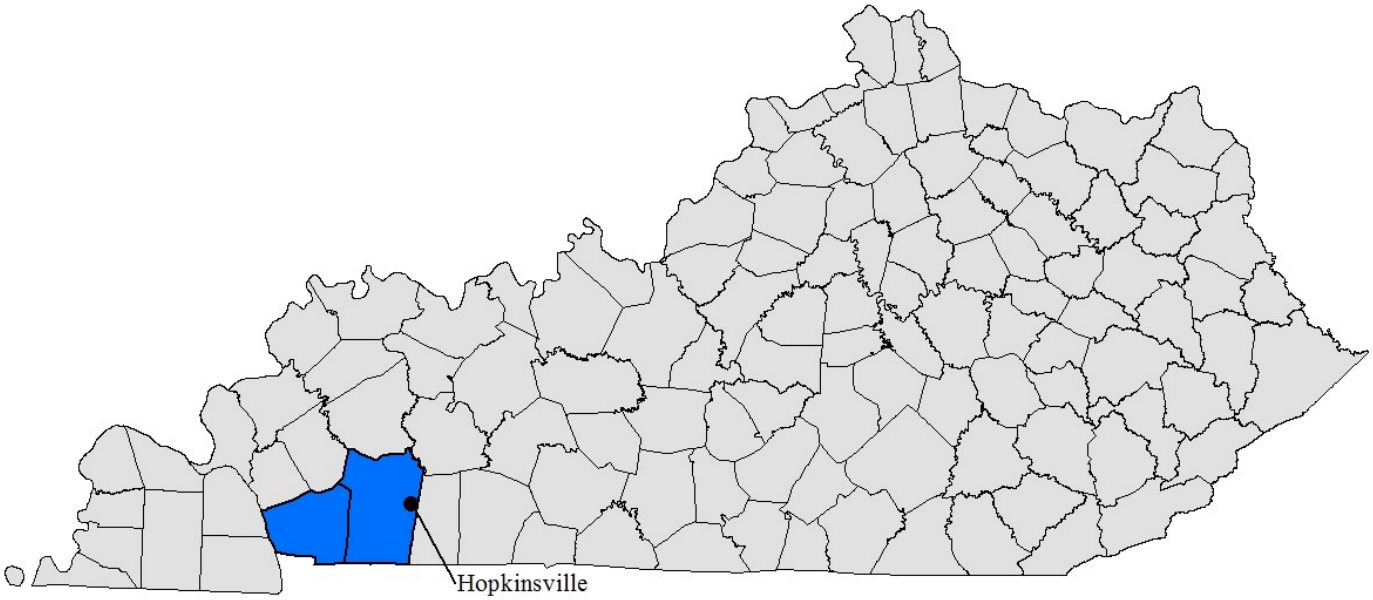
Clarksville, TN-KY



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	10800 Pilot Rock Rd		1[i,S,X]							1[i,M]									1
Christian	Hopkinsville																		
Totals	**1**		**1**							**1**									**1**

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

Rev. 6/28/2022

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: September 29, 2021
Inspection By: Jenna Nall and Allison Hall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

The monitoring site consists of a $PM_{2.5}$ monitoring platform and an adjacent stationary equipment shelter. The site is located in a field on the property of a private residence, located at 10800 Pilot Rock Road in Hopkinsville, Kentucky. The sample inlets are 116 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.

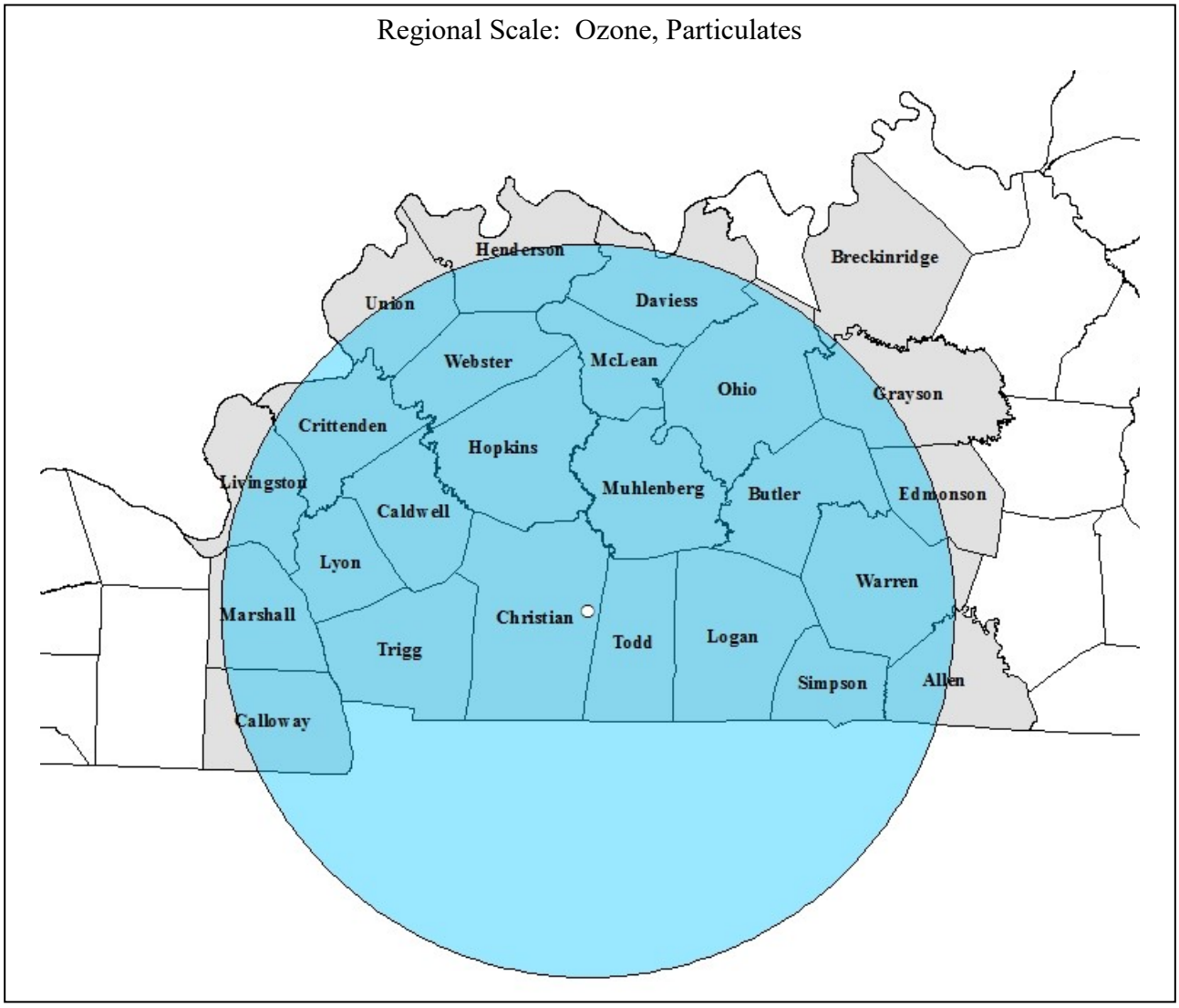
Monitoring Objective:

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

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.75	SLAMS AQI Maximum O_3 Transport	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.64	SLAMS AQI Transport	Broadband Spectroscopy	Continuously
Meteorological	5.84	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:
This site represents population exposure on a regional scale for ozone and $PM_{2.5}$.



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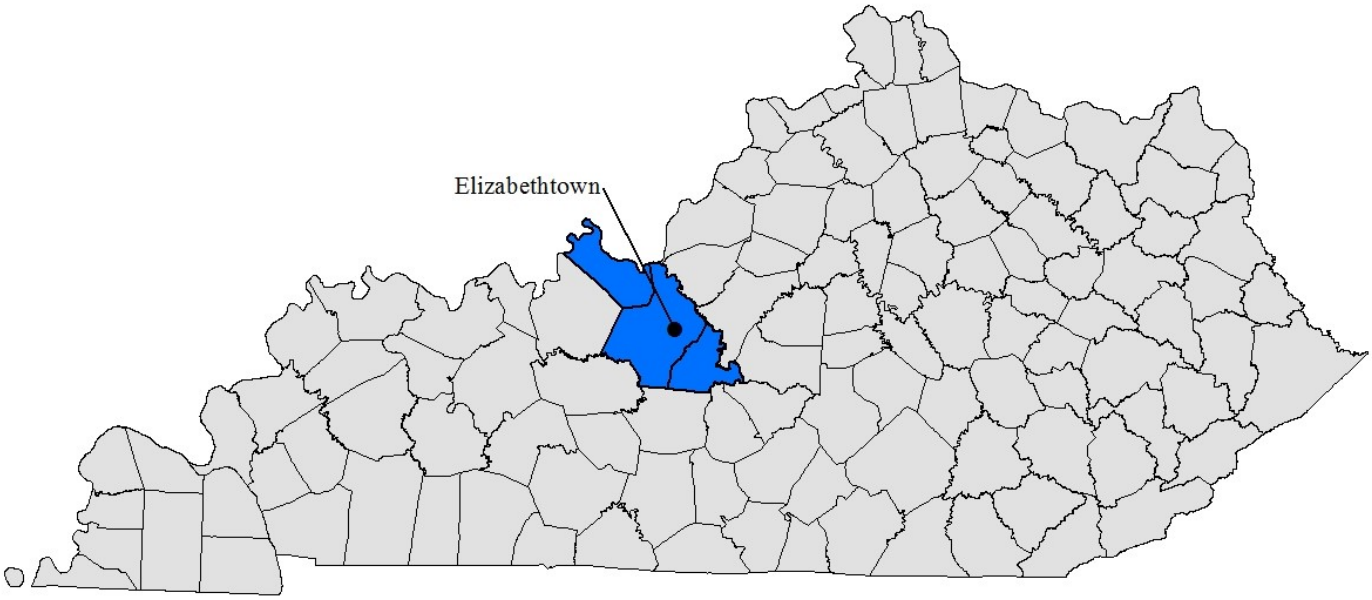
Elizabethtown-Fort Knox, KY



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	801 North Miles St.	1[C]	1[S,i]							1[M,i]									
Hardin	Elizabethtown																		
Totals	**1**	**1**	**1**							**1**									

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

C =Collocated

S =Continuous T640 Monitor

M =Maximum Ozone Concentration Site for MSA

i =AQI Reported

Rev. 5/12/2021

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 12, 2021
Inspection By: Jenna Nall and Allison Hall
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.

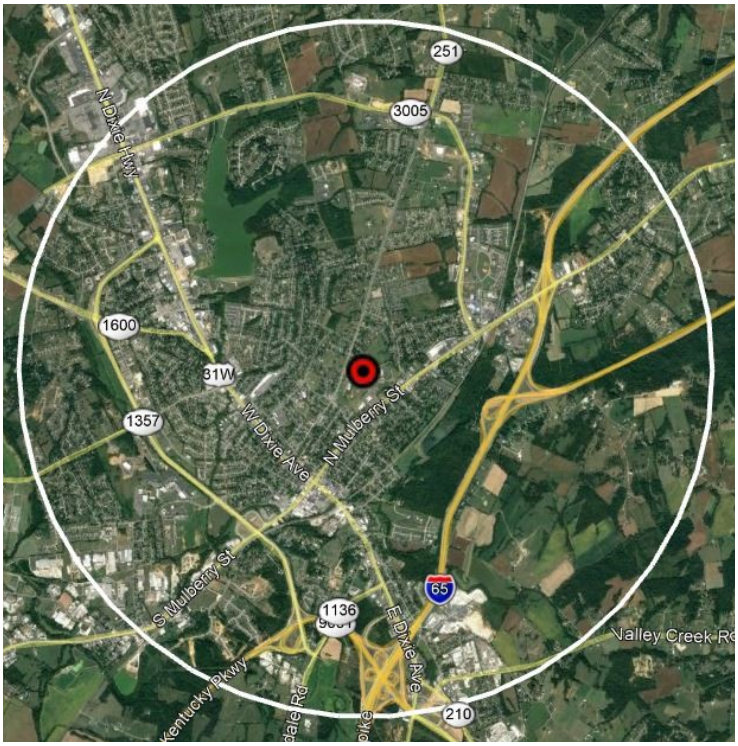
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.61	SLAMS AQI Maximum O_3	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.64	SLAMS AQI	Broadband Spectroscopy	Continuously
Collocated FRM $PM_{2.5}$	4.64	SLAMS	Gravimetric	24-hours every sixth day

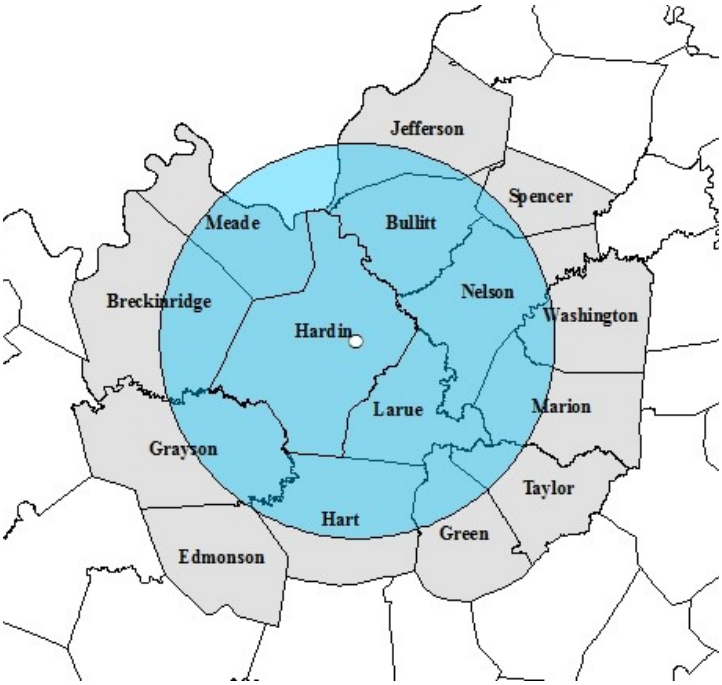
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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

Neighborhood Scale: Particulates



Urban Scale: Ozone



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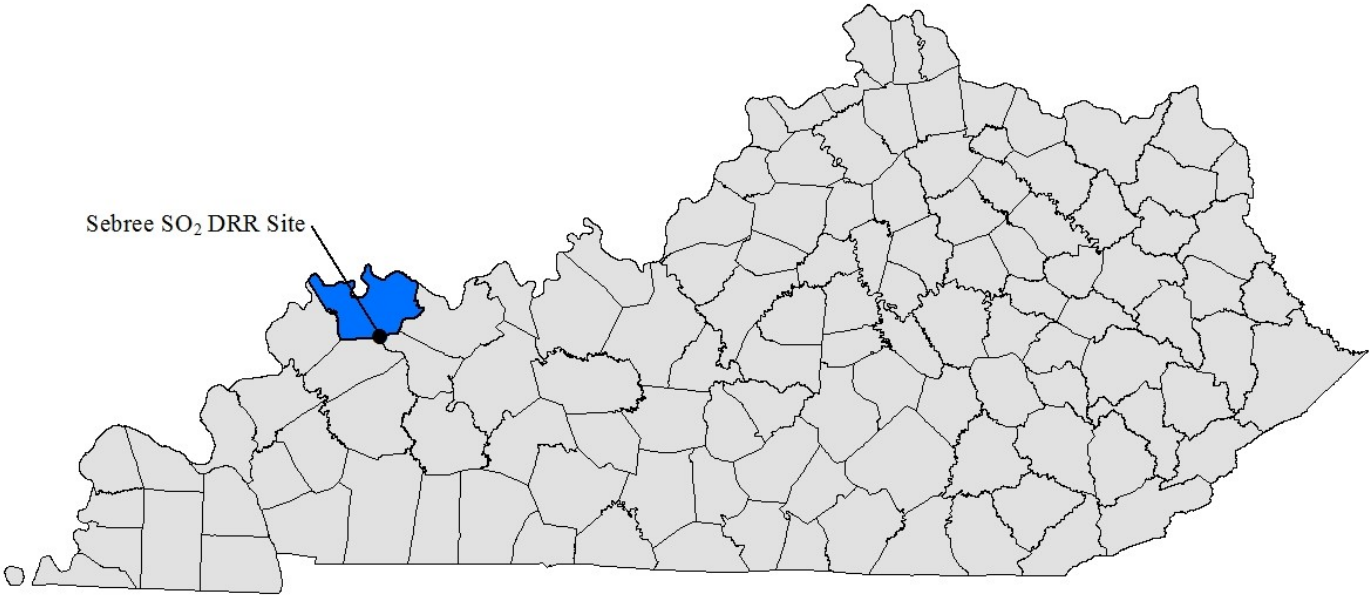
Evansville, IN-KY



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[DRR]													
Totals	**1**					**1**													

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

DRR = SO2 Data Requirements Rule Monitor

Rev. 5/12/2021

CSA/MSA: Evansville, IN-KY MSA
401 KAR 50:020 Air Quality Region: Evansville-Owensboro-Henderson Interstate (077)
Site Name: Sebree SO_2 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 26, 2021
Inspection By: Jenna Nall and Rebecca Waddle
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_2) concentrations in areas with large sources of sulfur dioxide emissions in order to assist in the implementation for the one-hour SO_2 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.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Sulfur Dioxide	3.82	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.

Neighborhood Scale: Sulfur Dioxide

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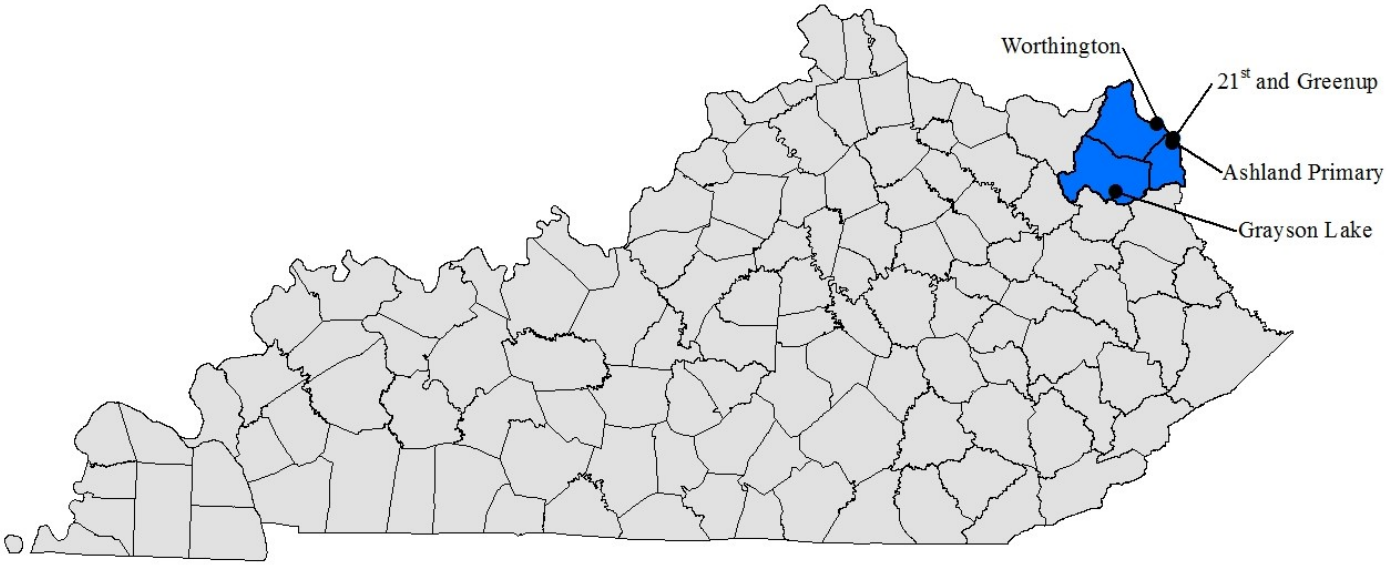
Huntington-Ashland, WV-KY-OH



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	122 22nd Street			$2^{C,m}$															
Boyd	Ashland																		
21-019-0017	2924 Holt Street		$1^{S,i}$			1^{e}	1^{e}			$1^{e,i,M}$									1
Boyd	Ashland																		
21-043-0500	1486 Camp Webb Road		$1^{i,S,X}$	$2^{C,m}$						1^{i}		2^{D}	2^{D}	1					1
Carter	Grayson																		
21-089-0007	Scott St. & Center Ave.					1^{e}				$1^{e,i}$									
Greenup	Worthington																		
Totals	**4**		**2**	**4**		**2**	**1**			**3**		**2**	**2**	**1**					**2**

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

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

Rev. 5/12/2022

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: 21st and Greenup
AQS Site ID: 21-019-0002
Location: 122 22nd Street, Ashland, KY 41101
County: Boyd
GPS Coordinates: 38.47676, -82.63137 (NAD 83)
Date Established: April 2, 1978
Inspection Date: October 19, 2021
Inspection By: Jenna Nall and Allison Hall
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 76.6 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 measure concentrations of a sub-group of air toxics.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
FRM PM_{10}	6.5	SLAMS	Gravimetric	24-hours every sixth day
- Metals PM_{10}		SPM-Other	Determined from the PM_{10} sample using EPA method IO 3.5	Same as PM_{10}
Collocated FRM PM_{10}	6.5	SLAMS	Gravimetric	24-hours every twelfth day
- Collocated Metals PM_{10}		SPM-Other	Determined from the PM_{10} 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.

Middle Scale: 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 19, 2021
Inspection By: Jenna Nall and Allison Hall
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 70.7 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.

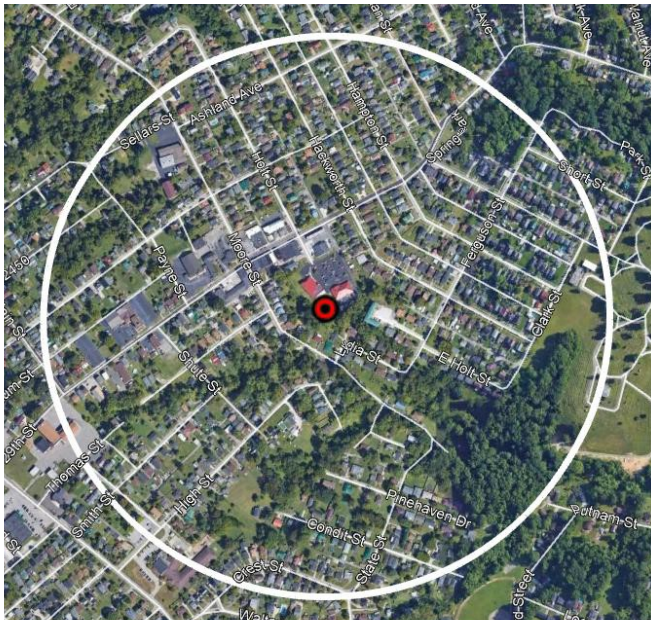
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect elevated pollutant levels for activation of emergency control procedures for nitrogen dioxide, ozone, and sulfur dioxide; and to provide pollutant levels for daily air quality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

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Nitrogen Dioxide (NO_2, NO, NO_x)	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^3	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.75	SLAMS AQI	Broadband spectroscopy	Continuously
Meteorological	7.9	Other	AQM grade instruments for wind speed, wind direction, humidity, barometric pressure, and temperature	Continuously

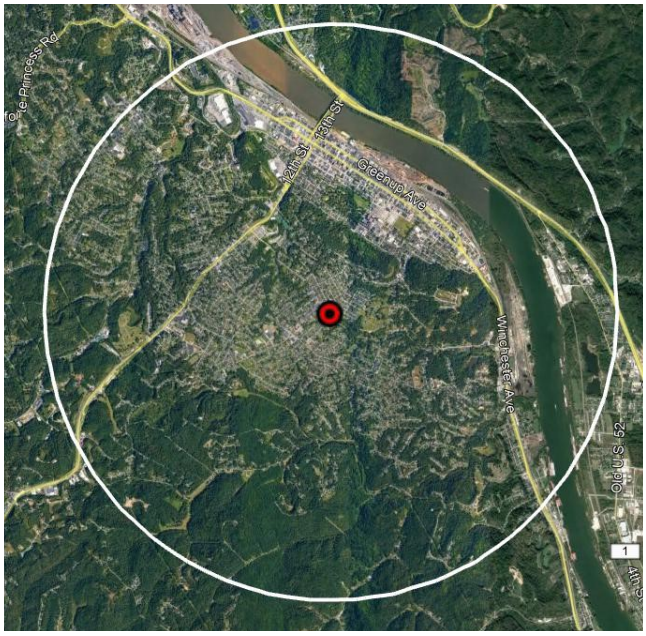
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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.

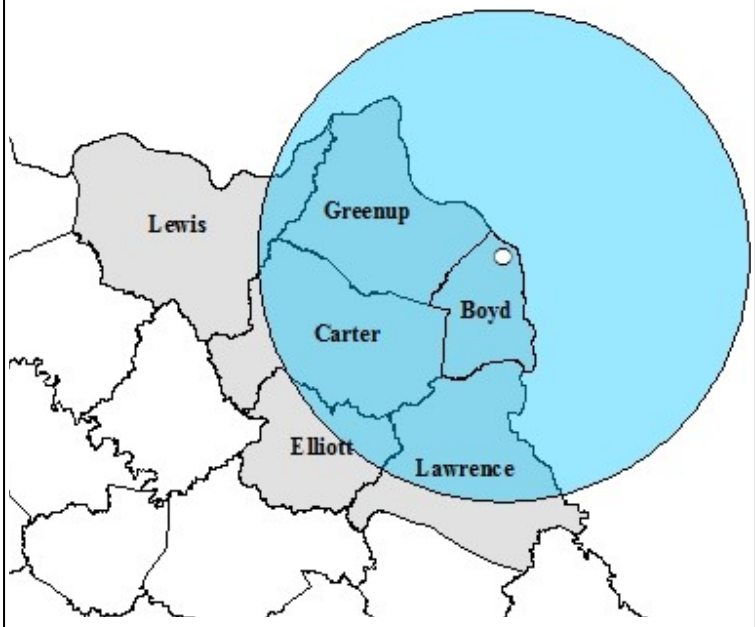
Middle Scale: Particulates



Neighborhood Scale: Ozone, Sulfur Dioxide



Urban Scale: 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 19, 2021
Inspection By: Jenna Nall and Allison Hall
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.

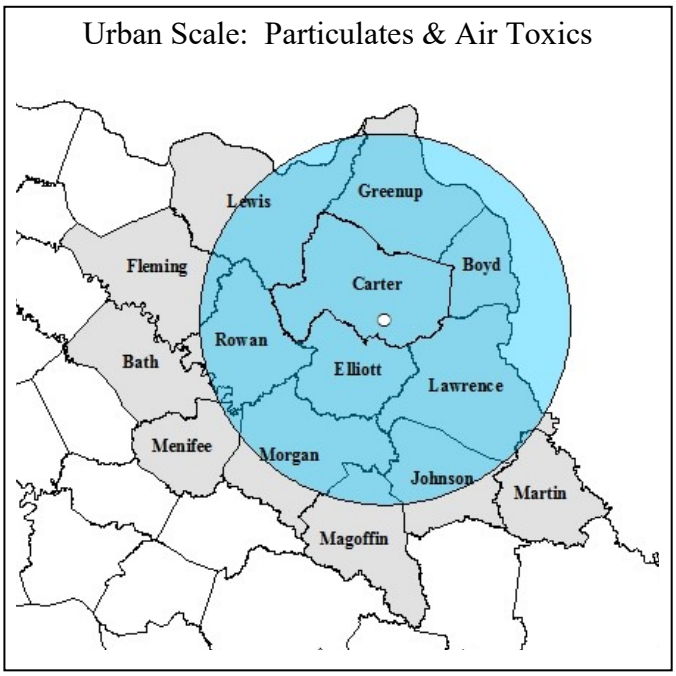
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to determine background levels of $PM_{2.5}$ and PM_{10}; to provide ozone data upwind of the Ashland area; and to measure rural concentrations of a sub-group of air toxics for use in a national air toxics assessment.

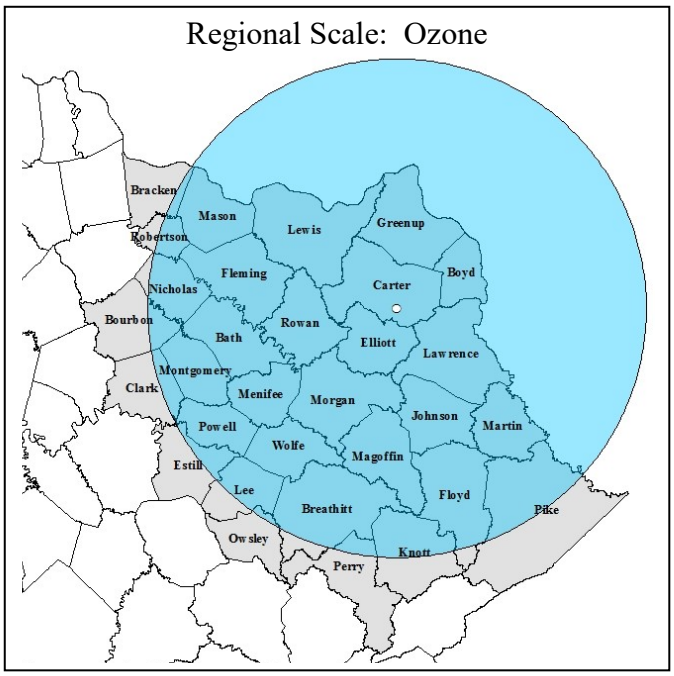
Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.72	SPM AQI	UV photometry	Continuously March 1 – October 31
FRM PM_{10}	2.2	SLAMS	Gravimetric	24-hours every sixth day
- Metals PM_{10}		NATTS SPM-Other	Determined from the PM_{10} samples using EPA method IO 3.5	Same as PM_{10}
Collocated PM_{10}	2.2	SLAMS	Gravimetric	24-hours every twelfth day
- Collocated metals PM_{10}		NATTS SPM-Other	Determined from the PM_{10} samples using EPA method IO 3.5	24-hours; six samples per year

Monitors (Continued)				
FEM $PM_{2.5}$ Continuous	4.57	SLAMS AQI	Broadband Spectroscopy	Continuously
Volatile Organic Compounds	4.45	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	2.13	NATTS SPM-Other	EPA method TO-13A	24-hours every sixth day
Carbonyls	4.5	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	13.7	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 19, 2021
Inspection By: Jenna Nall and Allison Hall
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 16.6 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.

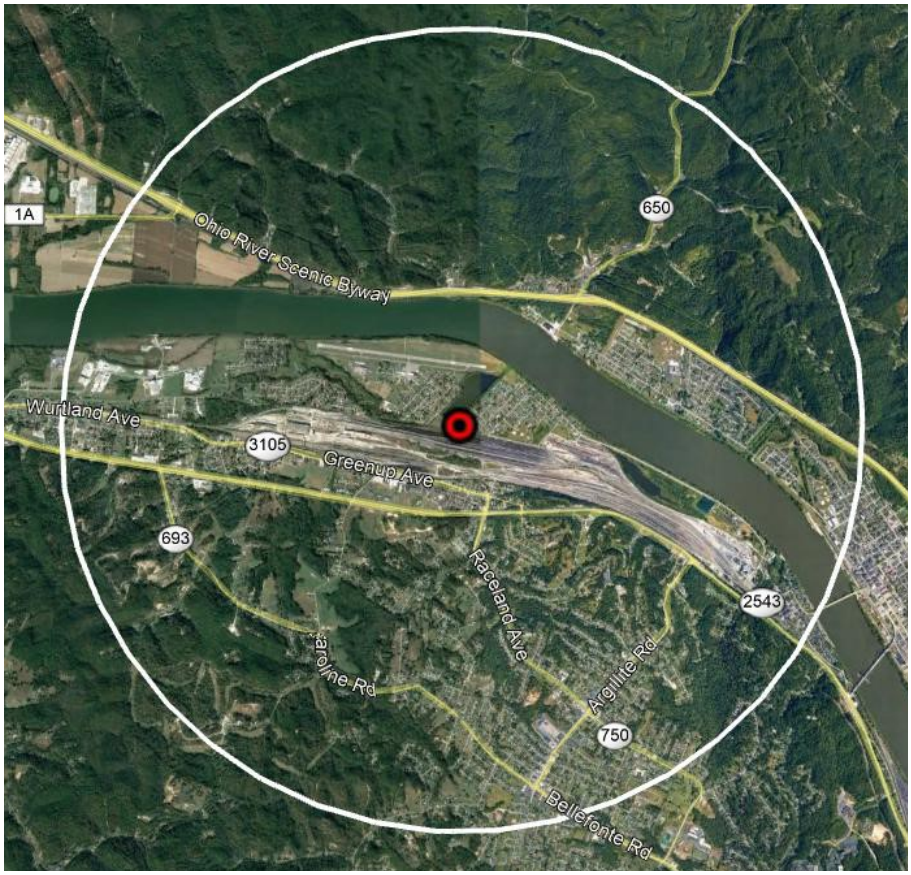
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect elevated pollutant levels for activation of emergency control procedures for ozone and sulfur dioxide.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	4.17	SLAMS EPISODE AQI	UV photometry	Continuously March 1 – October 31
AEM Sulfur Dioxide	4.17	SPM 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.

Neighborhood Scale



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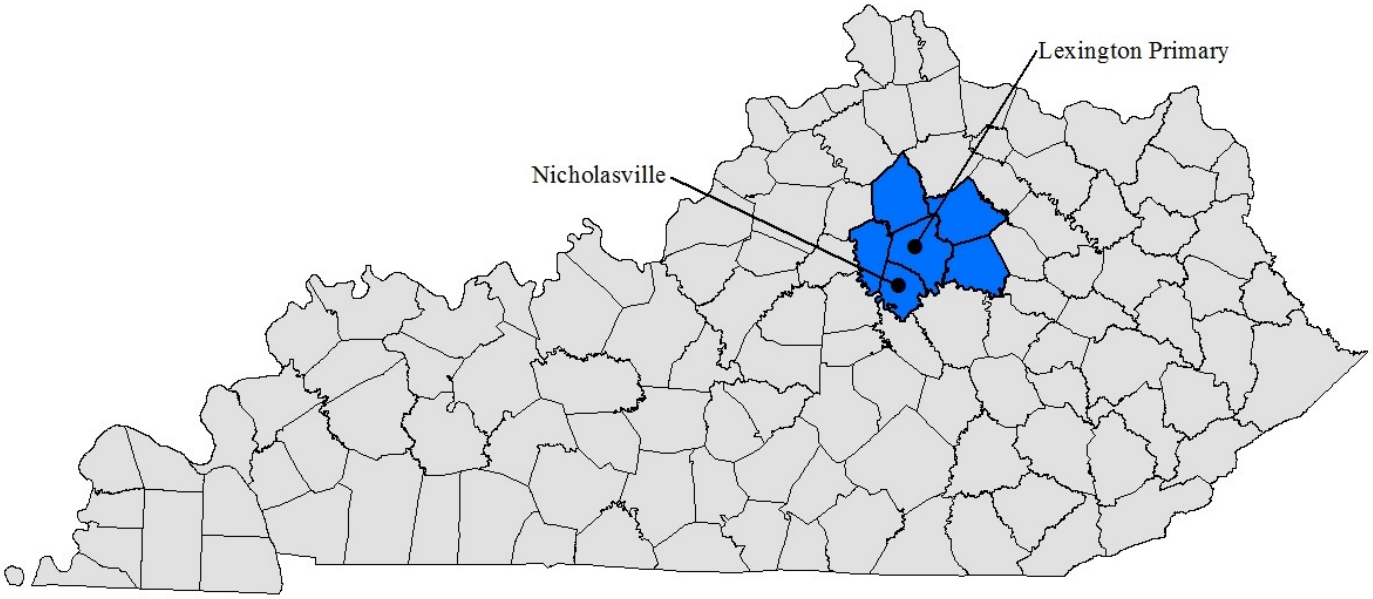
Lexington-Fayette, KY



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	650 Newtown Pike		1[S,i]	1[m]		1[e]	1[e,r]			1[i,e,M]								1	
Fayette	Lexington																		
21-113-0001	260 Wilson Drive					1				1[i]									
Jessamine	Nicholasville																		
Totals	**2**		**1**	**1**		**2**	**1**			**2**								**1**	

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

i =AQI
m =PM10 Filter Analyzed for Metals
r =RA-40 Monitor
e =Emergency Episode Monitor
S =Continuous T640 Monitor
M =Maximum Ozone Concentration Site for MSA

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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: November 2, 2021
Inspection By: Jenna Nall and Allison Hall
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 119 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_2 monitoring locations, with a primary focus on protecting susceptible and vulnerable populations.

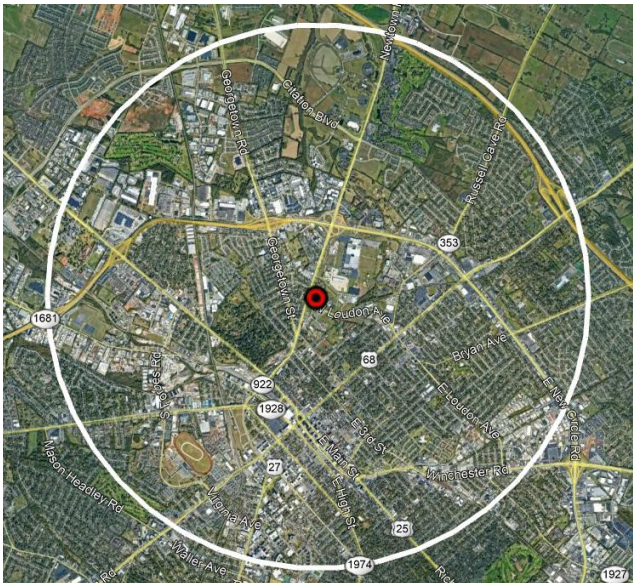
Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.8	SLAMS AQI EPISODE Maximum O^3	UV photometry	Continuously March 1 – October 31
AEM Nitrogen Dioxide (NO_2, NO, NO_x)	4.0	SLAMS (RA-40) EPISODE	Chemiluminescence	Continuously
AEM Sulfur Dioxide	3.6	SLAMS EPISODE	UV fluorescence	Continuously
FEM $PM_{2.5}$ Continuous	4.56	SLAMS AQI	Broadband Spectroscopy	Continuously

Monitors (Continued)				
PM_{10}	2.24	SLAMS	Gravimetric	24-hours every sixth day
- PM_{10} Metals		SPM-Other	Determined from the PM_{10} sample using EPA method IO 3.5	Same as PM_{10}
Radiation	1.31	RadNet	RadNet fixed stationary monitor, manual and automated methods	Continuously & 2 weekly filters

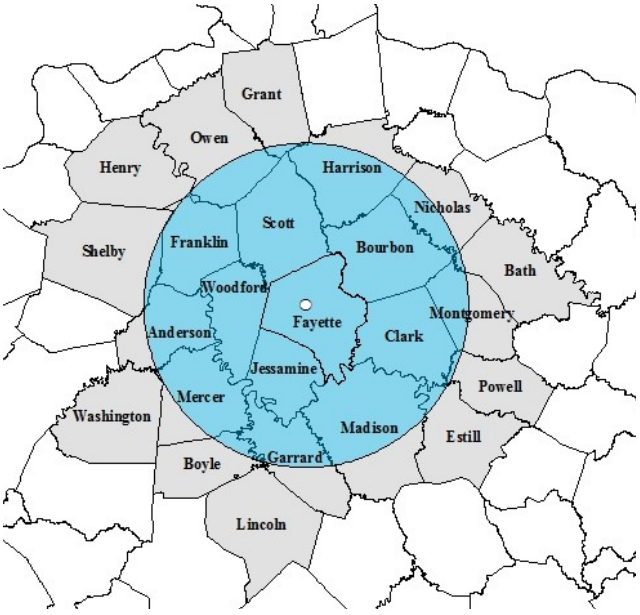
Quality Assurance Status:
All quality assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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.

Neighborhood Scale: Particulates, Sulfur



Urban Scale: 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: November 2, 2021
Inspection By: Jenna Nall and Allison Hall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

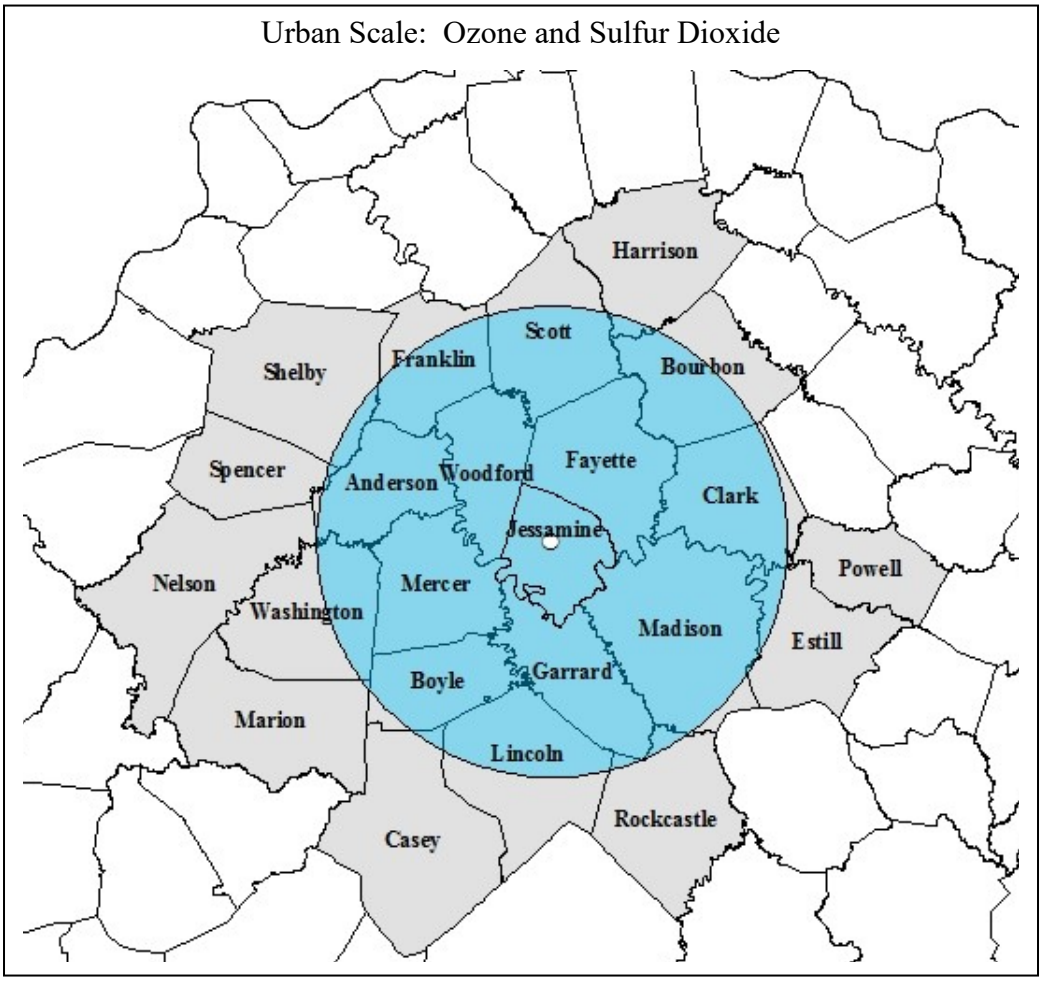
The monitoring site is a stationary equipment shelter located on the grounds of the Kentucky Transportation Cabinet garage in Nicholasville, Kentucky. The sample inlets are 113 meters from the nearest road. Upon inspection, the sample inlets and monitors were found to be in good condition. The site meets 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.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.86	SLAMS AQI	UV photometry	Continuously March 1 – October 31
AEM Sulfur Dioxide	3.86	SPM	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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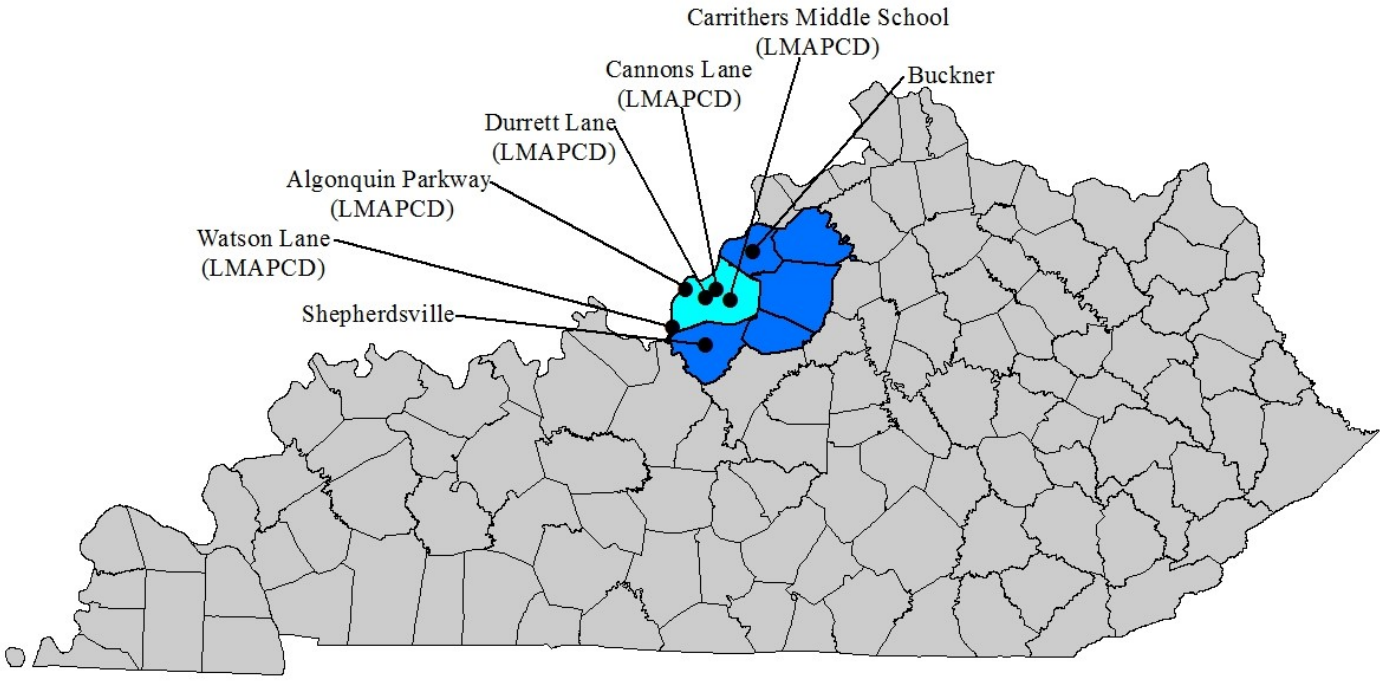
Louisville/Jefferson County, KY-IN



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[i]									
Bullitt	Shepherdsville																		
21-185-0004	1601 South Hwy 393									1[i]									
Oldham	LaGrange																		
21-111-0051	7201 Watson Ln		1[i,S,*]			1[i]				1[i]									1
Jefferson	Louisville (LMAPCD)																		
21-111-0067	2730 Cannons Ln	1[C]	1[i,E,*]		1[i,E]	1[i]	1[i]	1	1[i]	1[i,M]		1[G]	1		1	1		1	1
Jefferson	Louisville (LMAPCD)																		
21-111-0075	1517 Durrett Ln	1[n,C]	1[S,n,i,*]				1[n,i]		1[n,i]								1[n]		1[n]
Jefferson	Louisville (LMAPCD)																		
21-111-0080	4320 Billtown Rd		1[i,*,S]							1[i]									1
Jefferson	Louisville (LMAPCD)																		
21-111-1041	4201 Algonquin Pkwy		1[i,S*]		1[i,S]	1[i]				1[i]		1[G]							1
Jefferson	Louisville (LMAPCD)																		
Totals	**7**	**2**	**5**		**2**	**3**	**2**	**1**	**2**	**6**		**2**	**1**		**1**	**1**	**1**	**1**	**5**

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_{10}, $PM_{2.5}$, and PM_{coarse} with a single monitor)

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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 12, 2021
Inspection By: Jenna Nall and Allison Hall
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 66.4 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.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
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 12, 2021
Inspection By: Jenna Nall and Allison Hall
Site Approval Status: Site and monitor meet all design criteria for the monitoring network.

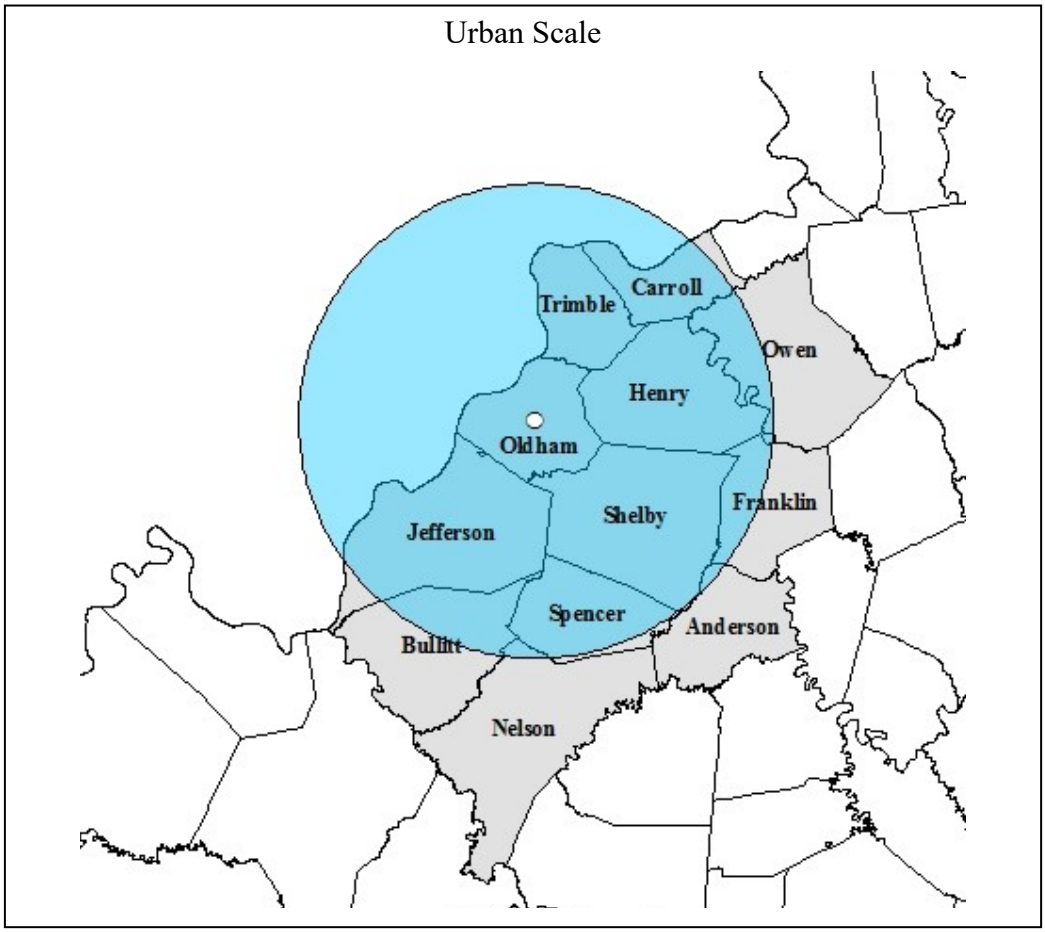
The monitoring site is a stationary equipment shelter located on the grounds of the Kentucky Transportation Cabinet Highway garage in Buckner, Kentucky. The sample inlet is 51 meters from the nearest road. Upon inspection, the sample line and monitor were found to be in good condition. The site meets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

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.81	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: December 3, 2021
Inspection By: Bryan Paris, Starlet Raj, and Shane Stiles
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.

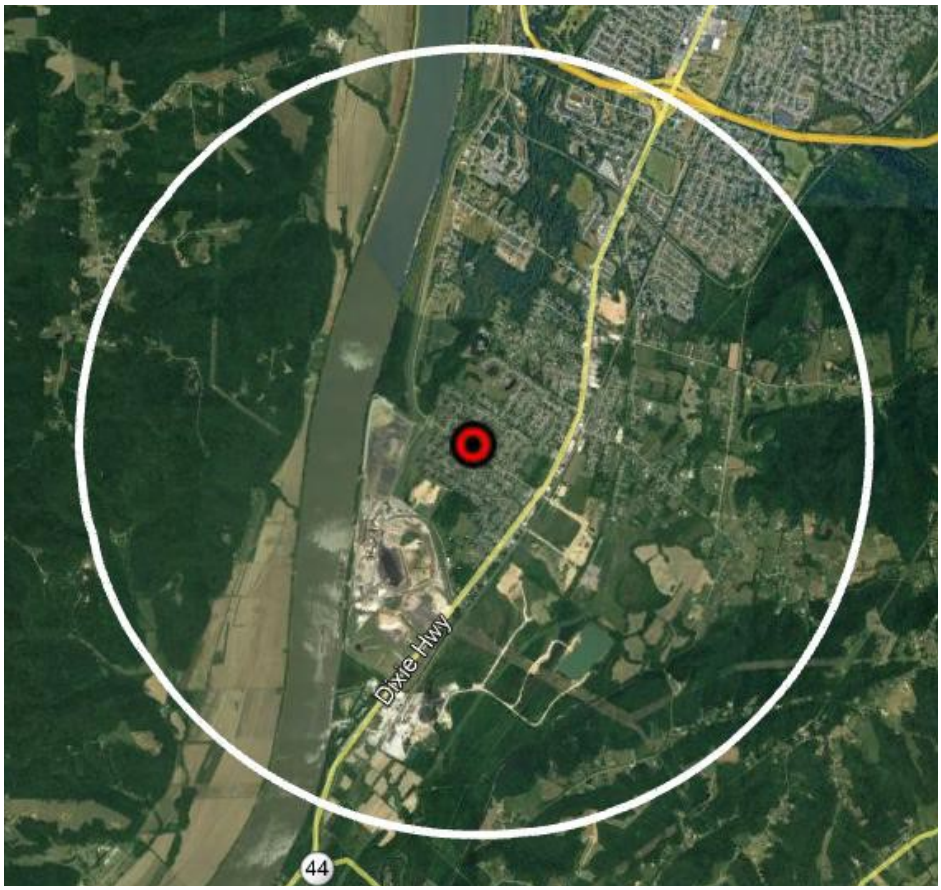
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to provide pollution levels for daily index reporting.

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 $PM_{2.5}$ 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_2.

Neighborhood 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: 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: December 1, 2021
Inspection By: Bryan Paris, Shane Stiles, Andrea Cooley, and Starlet Raj
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.

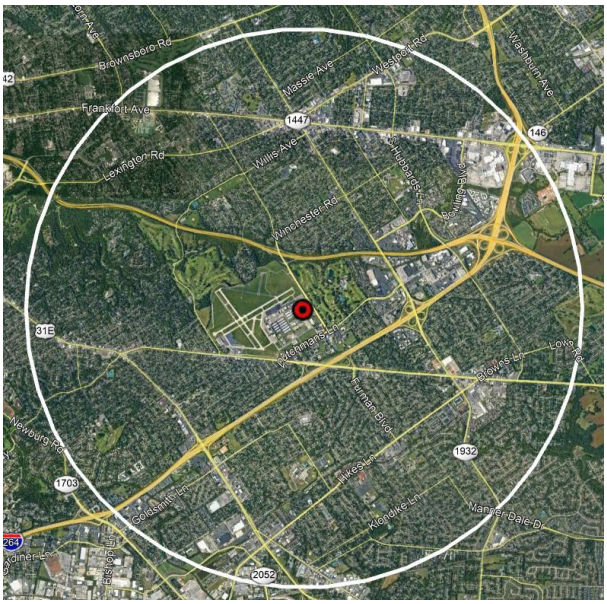
Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
Carbon Monoxide	4.2	NCore SLAMS AQI	Automated Reference Method utilizing trace level non-dispersive infrared analysis.	Continuously
Nitrogen Dioxide (NO_2)	4.2	NCore PAMS SLAMS AQI	Cavity Attenuated Phase Shift Spectrometry	Continuously
Total Reactive Nitrogen (NO/NO_y)	8.1	NCore PAMS	Automated method utilizing trace level chemiluminescence analysis.	Continuously
AEM Ozone	4.1	NCore PAMS SLAMS AQI Maximum O_3	UV photometry	Continuously
Sulfur Dioxide	4.2	NCore SLAMS AQI	Automated Equivalent Method utilizing trace level UV fluorescence analysis.	Continuously
FEM $PM_{2.5}$ and PM_{10} Continuous - PM_{Coarse} (PM_{10}-$PM_{2.5}$)	5.0	NCore SLAMS AQI	Broadband Spectroscopy	Continuously
$PM_{2.5}$ 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
$PM_{2.5}$ Carbon Speciation	2.0	NCore SLAMS	Multi-species manual collection method utilizing thermal optical and gravimetric analyses.	24-hours every third day
FRM $PM_{2.5}$ 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.

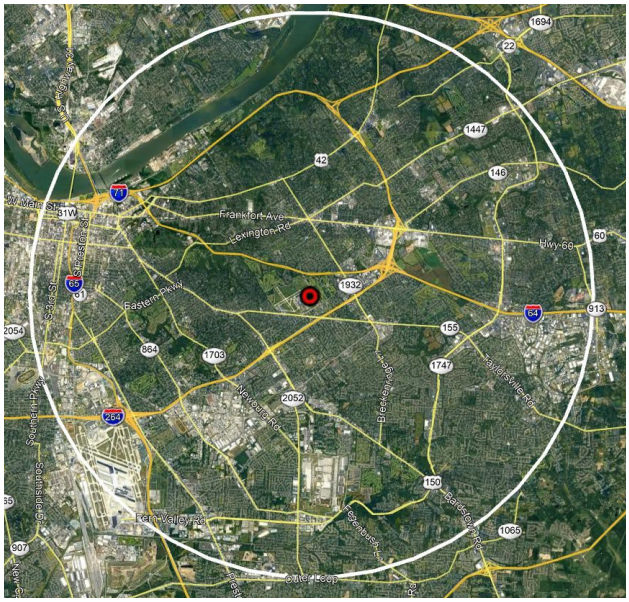
Area Representativeness:
The air monitoring equipment at the Cannon's Lane NCore station is specifically located at the urban and neighborhood scales. These scales are generally the most representative of the expected population exposures that occur throughout metropolitan areas.

Pollutant	Spatial Scale	Comments
Ozone	Neighborhood	4 km radius
Carbon Monoxide	Neighborhood Scale	4 km radius
Particulates	Neighborhood Scale	4 km radius
NO_x /NO_y	Neighborhood and Urban Scale	10 km radius
SO_2	Urban Scale	50 km radius
Radiation	Urban	50 km radius

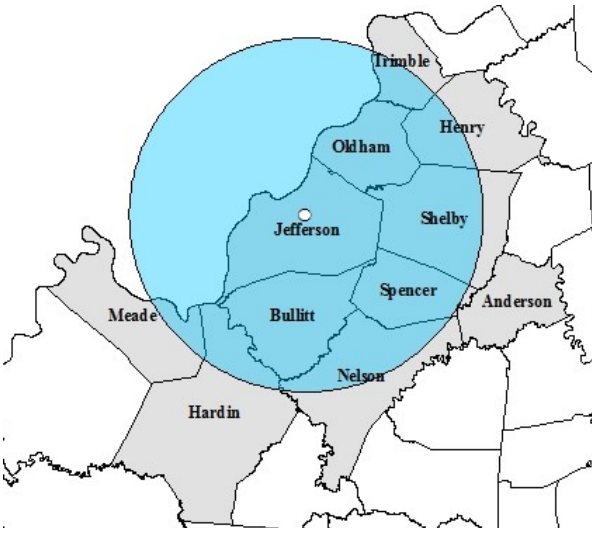
Neighborhood Scale:
Carbon Monoxide, Ozone, and Particulates



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 2, 2021
Inspection By: Starlet Raj, Bryan Paris, Shane Stiles
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

On February 9, 2010, the EPA released a new NO_2 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 $PM_{2.5}$ and carbon monoxide monitors. In response, LMAPCD has established a multi-pollutant near-road site that includes instrumentation to measure nitrogen dioxide, $PM_{2.5}$, 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.

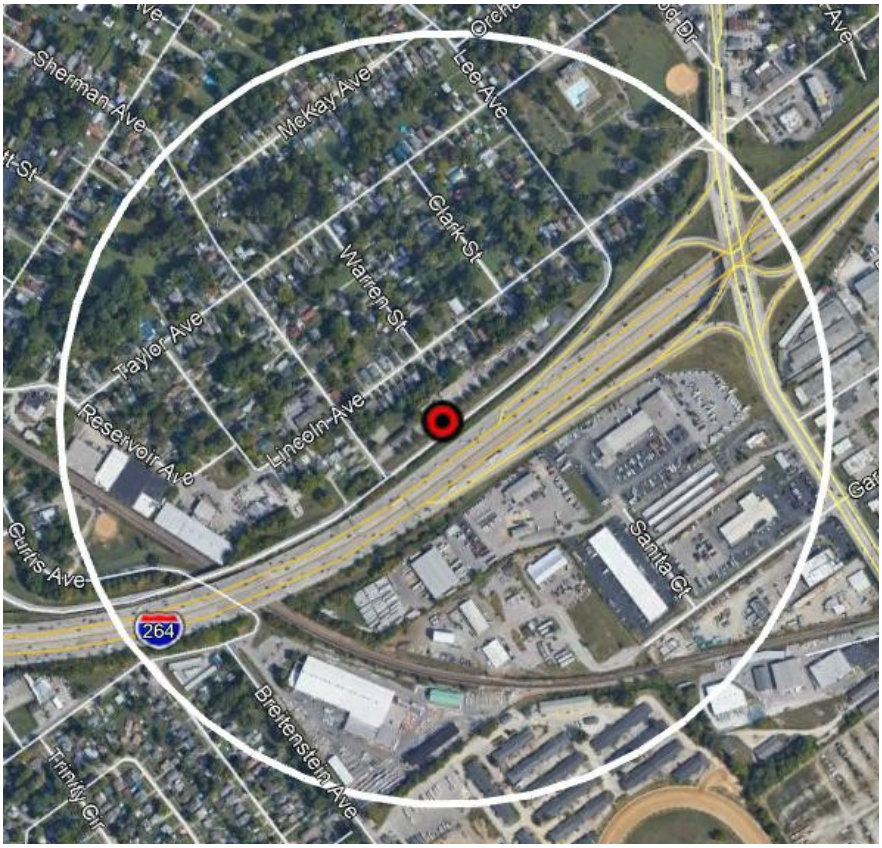
Monitoring Objective:
The monitoring objective will be to determine compliance with National Ambient Air Quality Standards for nitrogen dioxide, carbon monoxide, and particulate matter.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Nitrogen Dioxide (NO_2)	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 $PM_{2.5}$ Continuous	4.67	SLAMS AQI	Broadband Spectroscopy	Continuously
FRM $PM_{2.5}$ Collocated	4.8	SLAMS	Manual Reference Method utilizing gravi-metric 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	TBD (Install 2022)	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: December 3, 2021
Inspection By: Starlet Raj, Bryan Paris, Shane Stiles
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.

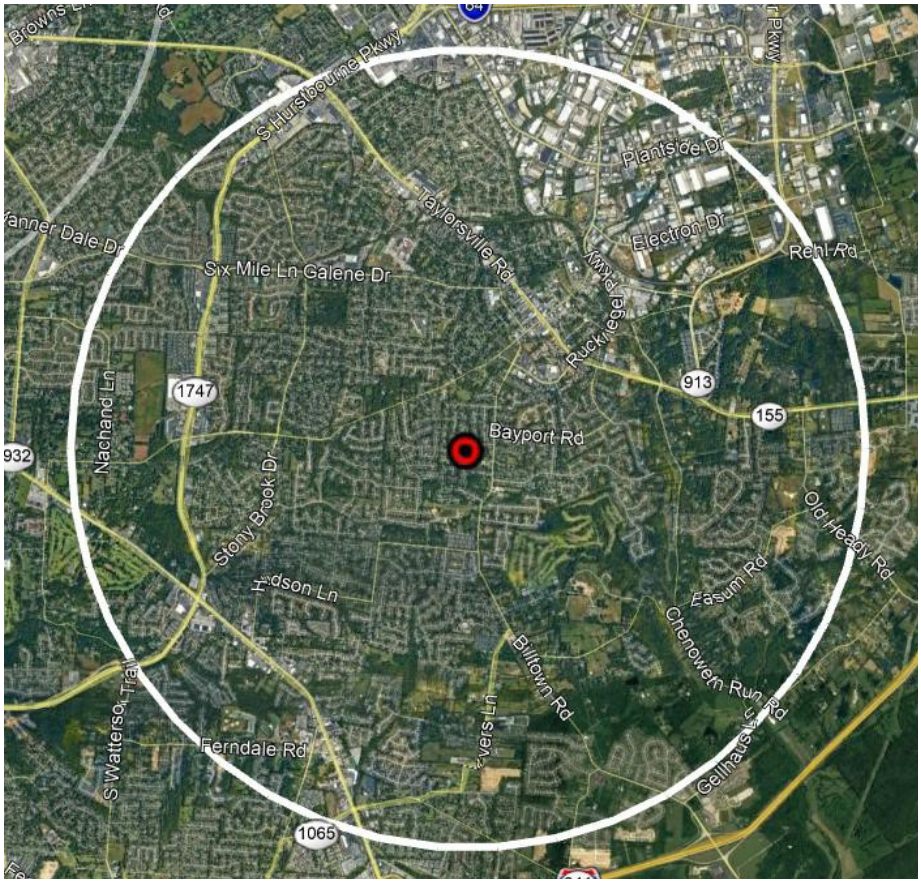
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to provide pollution levels for daily index reporting.

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 $PM_{2.5}$ 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.

Neighborhood Scale: Particulates and Ozone



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 3, 2021
Inspection By: Starlet Raj, Bryan Paris, Shane Stiles
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.

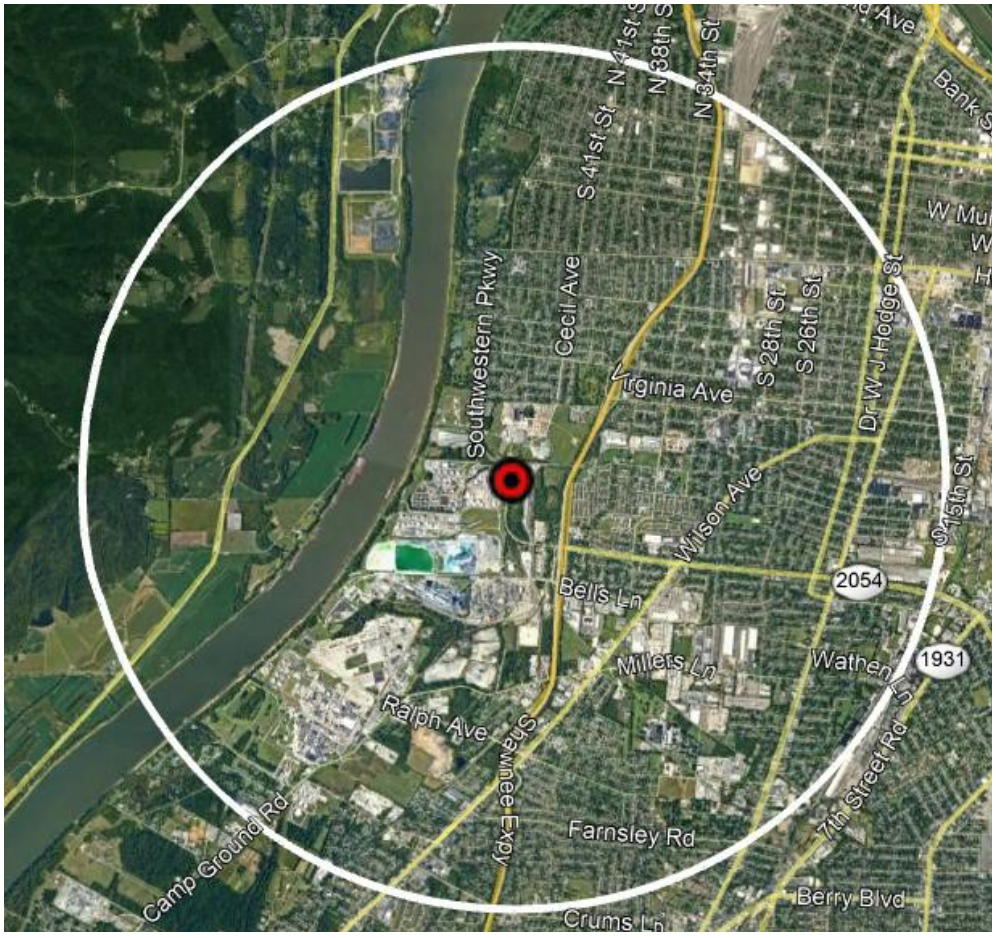
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards, to provide pollution levels for daily index reporting, and to characterize VOC concentrations.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	TBD (Install 2023)	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ and PM_{10} 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 - Temperature and RH	9.0 2.0	SLAMS SLAMS	AQM grade instruments for wind speed and wind direction AQM grade instruments for temperature and humidity	Continuously Continuously

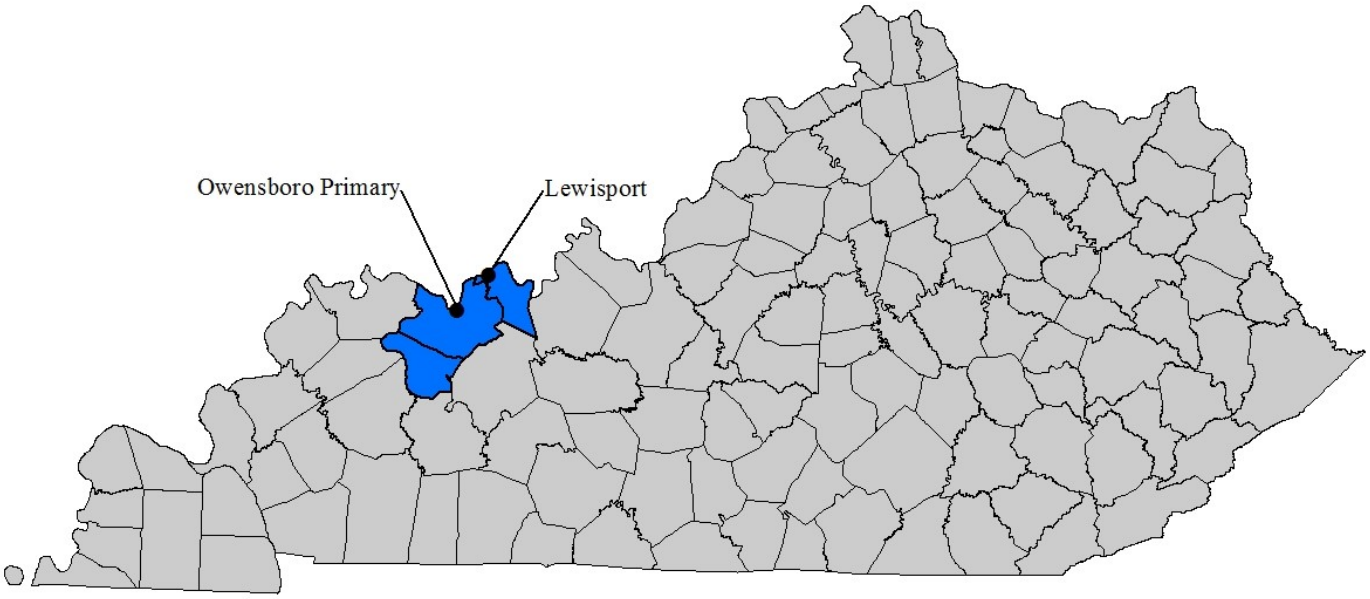
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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

Neighborhood Scale: 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	716 Pleasant Valley Rd.		1[S,e,i]			1[e]	1[e]			1[e,i]									
Daviess	Owensboro																		
21-091-0012	Second & Caroline St.									1[i,M]									
Hancock	Lewisport																		
Totals	**2**		**1**			**1**	**1**			**2**									

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

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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 26, 2021
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 on the grounds behind the Wyndall's Shopping Center in Owensboro, Kentucky. The sample inlets are 45.8 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.

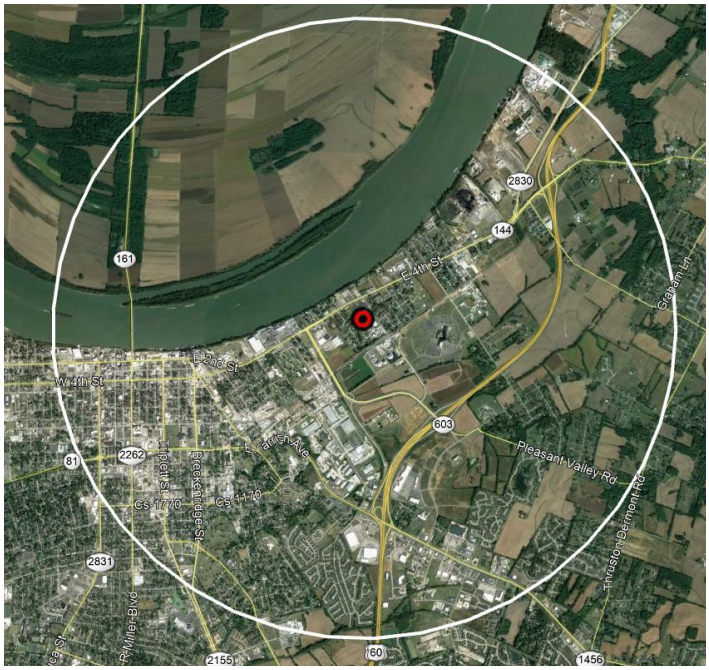
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect emergency pollution levels of criteria pollutants for activation of emergency control procedures. While not required for the CBSA, the site also provide levels of pollutants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

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Nitrogen Dioxide (NO_2, NO, NO_x)	4.54	SLAMS EPISODE	Chemiluminescence	Continuously
AEM Ozone	3.84	SLAMS EPISODE AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.71	SLAMS EPISODE AQI	Broadband Spectroscopy	Continuously
AEM Sulfur Dioxide	4.54	SLAMS EPISODE	UV fluorescence	Continuously

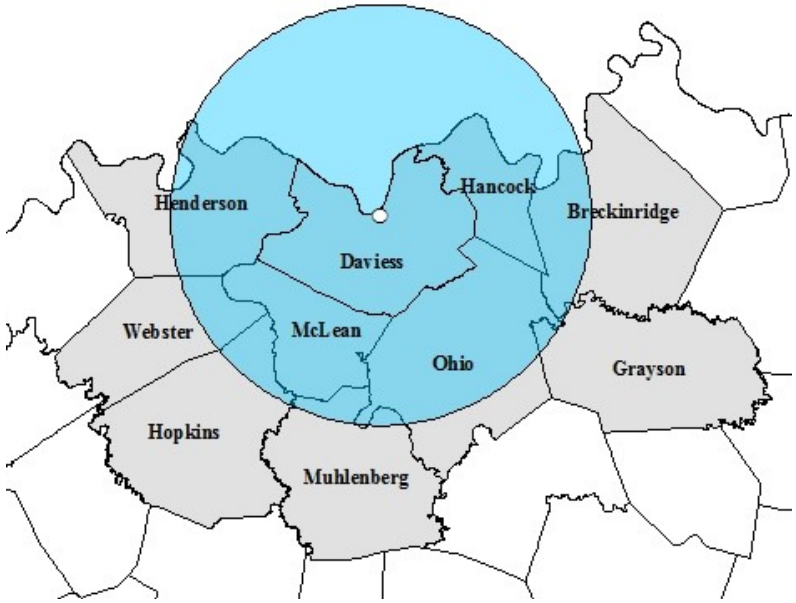
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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.

Neighborhood Scale: Ozone, Sulfur Dioxide, Particulates



Urban Scale: 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 26, 2021
Inspection By: Jenna Nall and Rebecca Waddle
Site Approval Status: Site and monitor meet all design criteria for the monitoring network.

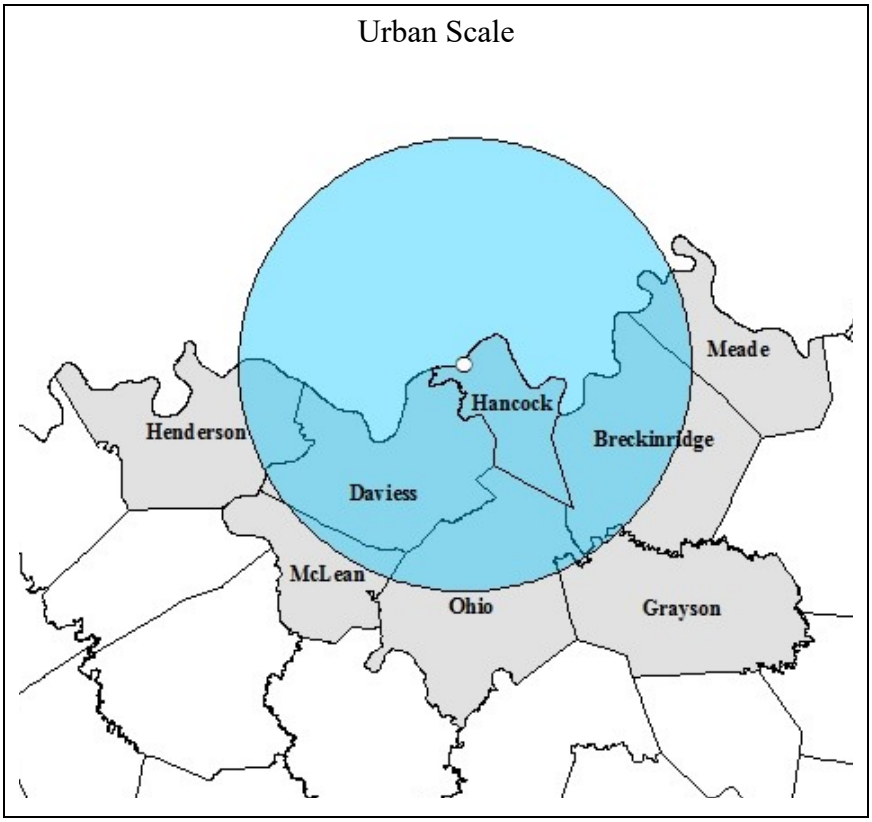
The monitoring site is a stationary equipment shelter located on the athletic fields of the former Lewisport Consolidated Elementary School in Lewisport, Kentucky. The sample inlet is 54.8 meters from the nearest road. Upon inspection, the sample line and monitor were found to be in good condition. The 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.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.7	SLAMS Maximum O_3 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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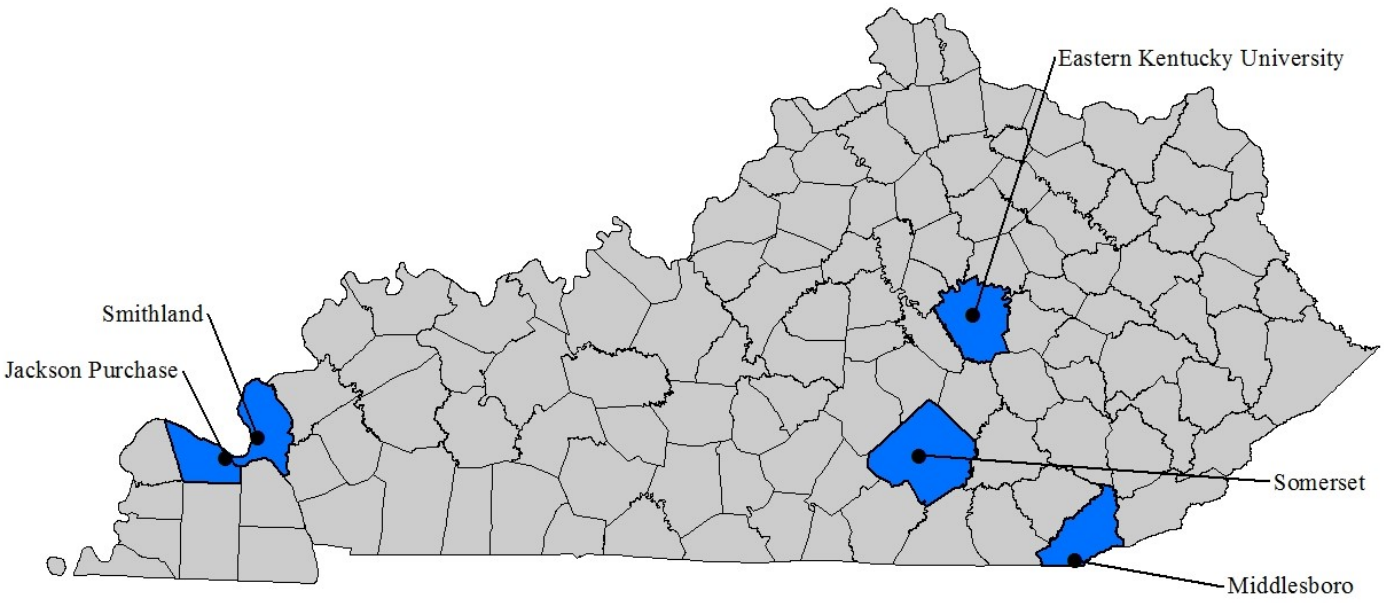
Micropolitan Statistical Areas



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[i,S]							1[i]									1
21-139-0003 Livingston	706 State Drive Smithland									1[i]								1	
21-145-1024 McCracken	2901 Powell Street Paducah		1[S,i]			1[e]	1[e]			1[e,i]									
21-151-0005 Madison	Van Hoose Drive Richmond										2[C]								
21-199-0003 Pulaski	305 Clifty Street Somerset		1[i,S]							1[i]									
Totals	**5**		**3**			**1**	**1**			**4**	**2**							**1**	**1**

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

C =Collocated
i =AQI Reported
S =Continuous T640 Monitor
m =PM10 Filter Analyzed for Metals
e =Emergency Episode Monitor

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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 8, 2021
Inspection By: Jenna Nall and Rebecca Waddle
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

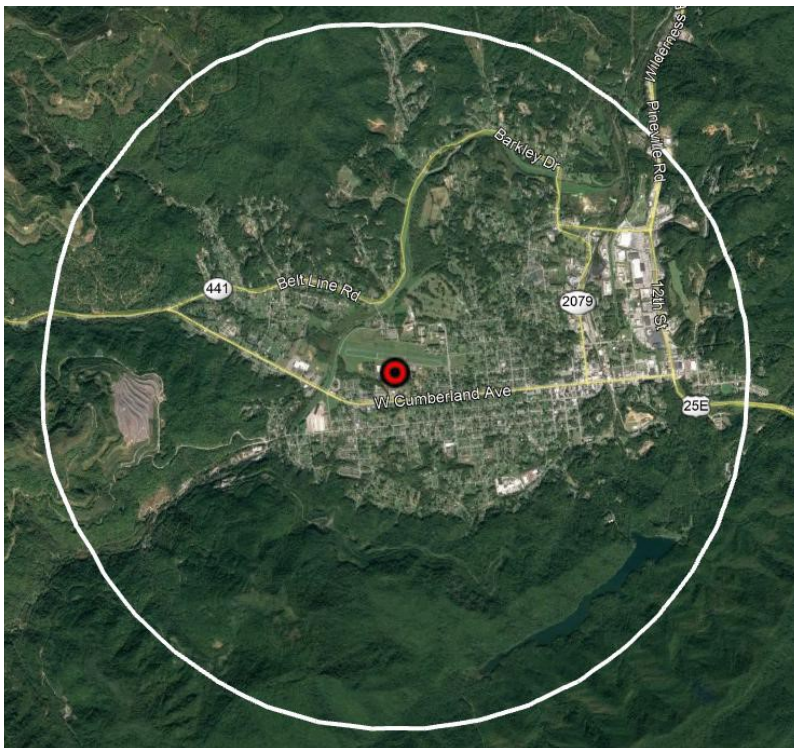
The monitoring site is a stationary equipment shelter located on the grounds of the Middlesboro Airport in Middlesboro, Kentucky. The sample inlets are 94.2 meters from the nearest road. Upon inspection the sample lines and monitors were found to be in good condition. The site meets the requirements 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 and to provide information on the transport of ozone into the region.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	4.0	SPM AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.88	SLAMS AQI	Broadband Spectroscopy	Continuously
Meteorological	6.14	Other	AQM grade instruments for wind speed, wind direction, and temperature	Continuously

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

Neighborhood Scale: Particulates & 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: September 29, 2021
Inspection By: Jenna Nall and Allison Hall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

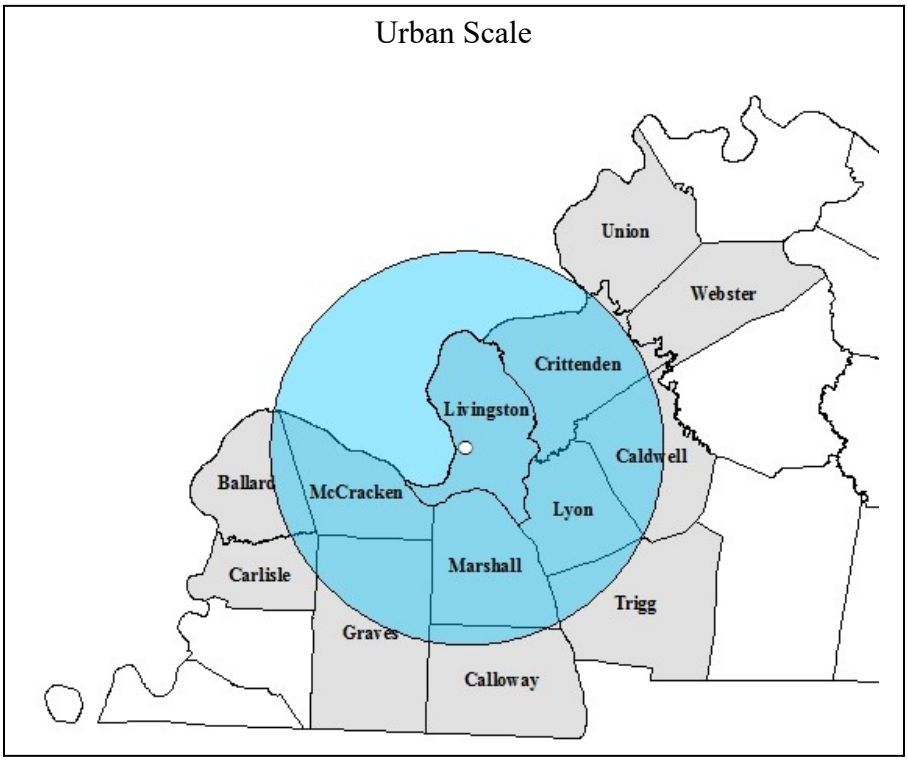
The monitoring site is a stationary equipment shelter located on the grounds of the Livingston County Road Dept. facility in Smithland, Kentucky. The sample inlets are 138.7 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets 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.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.9	SLAMS AQI	UV photometry	Continuously
Radiation	1.31	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: Jackson Purchase (Paducah Primary) (JPRECC)
AQS Site ID: 21-145-1024
Location: Jackson Purchase RECC, 2901 Powell Street, Paducah, KY 42003
County: McCracken
GPS Coordinates: 37.058083, -88.57250 (NAD 83)
Date Established: August 15, 1980
Inspection Date: September 29, 2021
Inspection By: Jenna Nall and Allison Hall
Site Approval Status: Site and monitors meet design criteria for the monitoring network.

The monitoring site is a stationary equipment shelter located on the former grounds of the Jackson Purchase RECC in Paducah, Kentucky. The sample inlets are 20.7 meters from the nearest road. The site meets the requirements established by 40 CFR 58, Appendices C, D, and E. Due to the current property owners expanding their operations, KDAQ is currently in the process of relocating the site within Paducah, Kentucky.

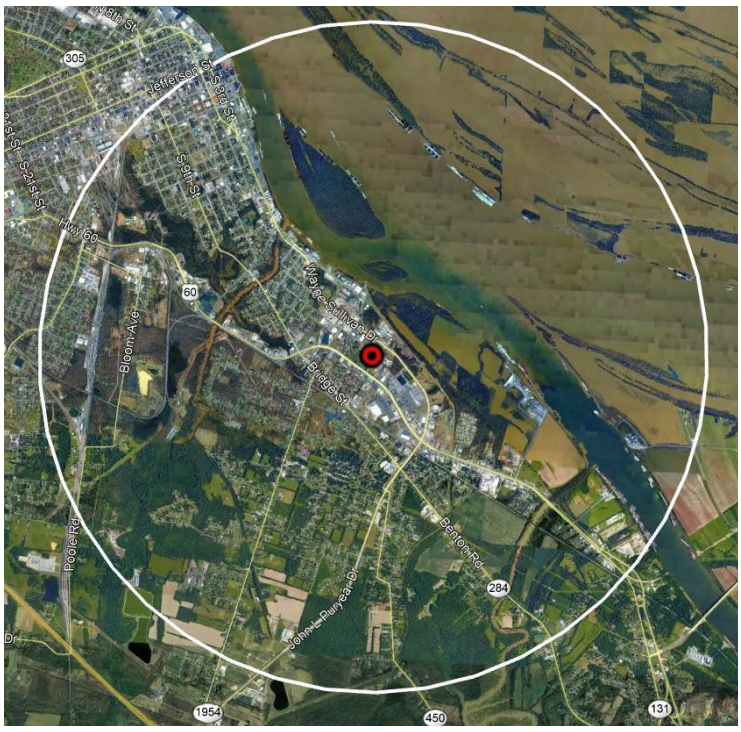
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to detect elevated pollutant levels for activation of emergency control procedures for nitrogen dioxide, ozone, and sulfur dioxide. While not required for the CBSA, the site also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

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Nitrogen Dioxide (NO_2, NO, NO_x)	4.06	SLAMS EPISODE	Chemiluminescence	Continuously
AEM Sulfur Dioxide	4.06	SLAMS EPISODE	UV fluorescence	Continuously
AEM Ozone	3.94	SLAMS AQI EPISODE	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.61	SLAMS AQI	Broadband Spectroscopy	Continuously

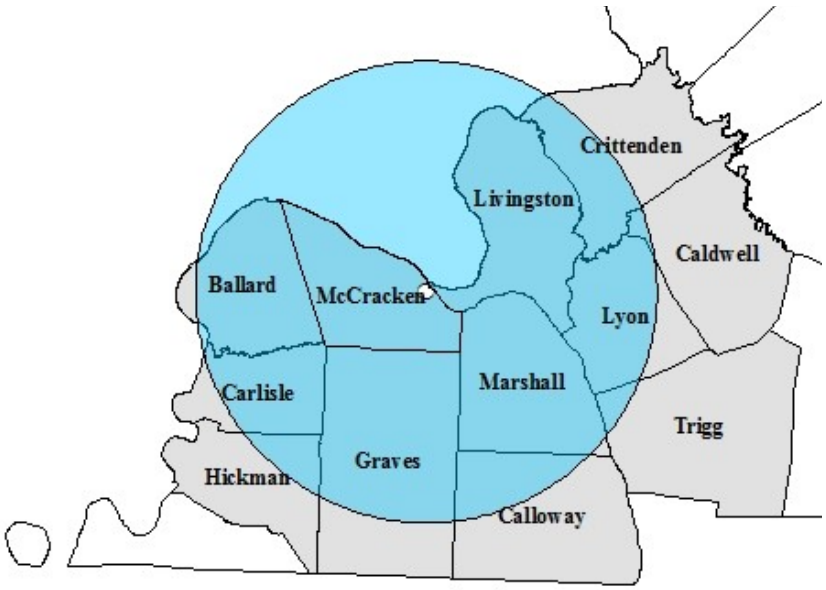
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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



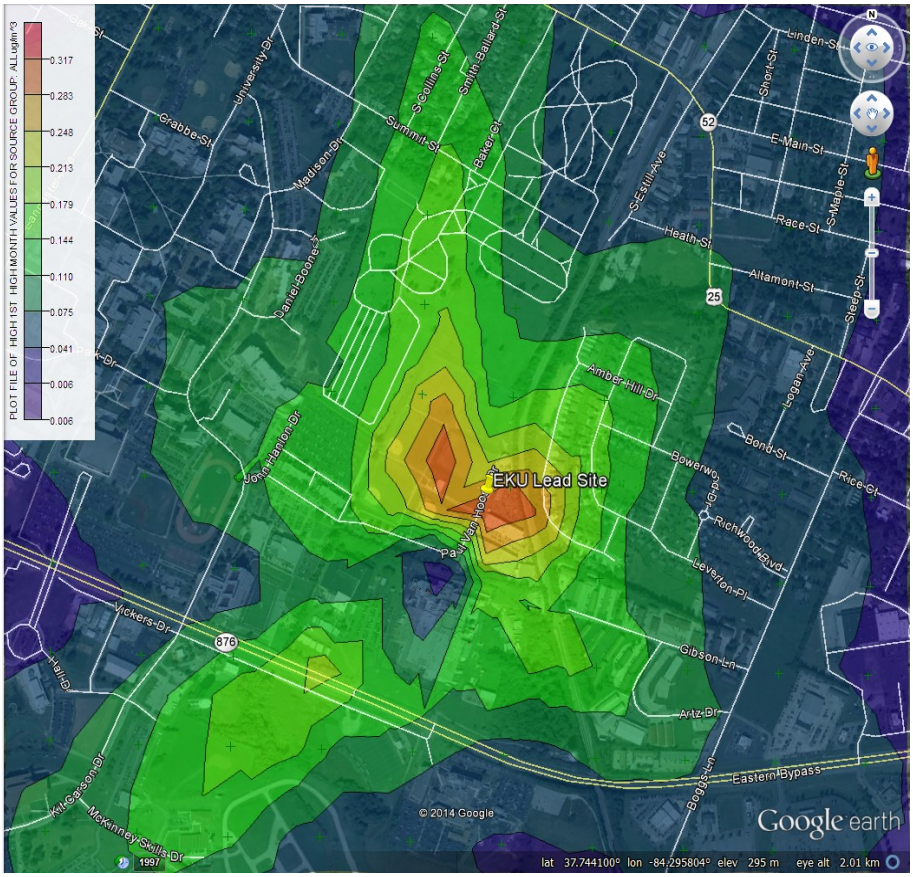
CSA/MSA: Lexington-Fayette-Richmond-Frankfort KY CSA; Richmond-Berea, KY Micropolitan Statistical Area
401 KAR 50:020 Air Quality Region: Bluegrass Intrastate (102)
Site Name: Eastern Kentucky University **(**EKU)
AQS Site ID: 21-151-0005
Location: Eastern Kentucky University, Van Hoose Drive, Richmond, KY 40475
County: Madison
GPS Coordinates: 37.73636, -84.29167 (NAD 83)
Date Established: March 10, 2012
Inspection Date: November 2, 2021
Inspection By: Jenna Nall and Allison Hall
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.

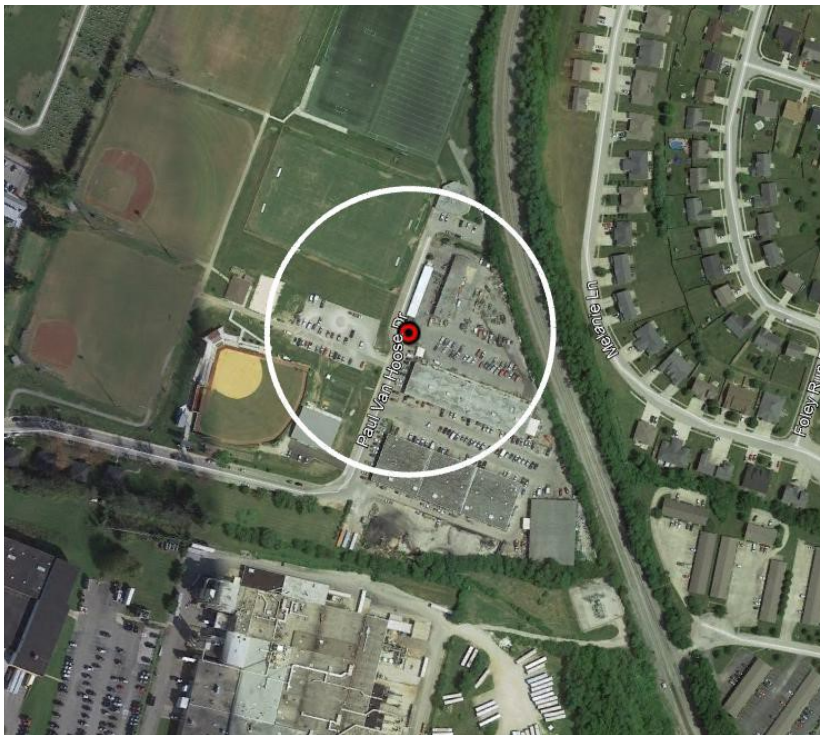
Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
FRM Lead	2.23	SLAMS	High volume air sampler. Analysis via ICP-MS.	24-hours every sixth day
Collocated FRM Lead	2.23	SLAMS	High volume air sampler. Analysis via ICP-MS.	24-hours every twelfth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

Micro Scale: Lead (100 m)



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 8, 2021
Inspection By: Jenna Nall and Rebecca Waddle
Site Approval Status: Site and monitors meet all design criteria with the exception that the instrumentation is obstructed by trees.

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 sample inlets are 10 meters from the nearest road, which is a dead -end street with little traffic. Upon inspection the sample line and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, and E, with the exception that the site is obstructed by trees. KDAQ is currently in the process of reassessing the site to see if tree removal or site relocation would be more beneficial.

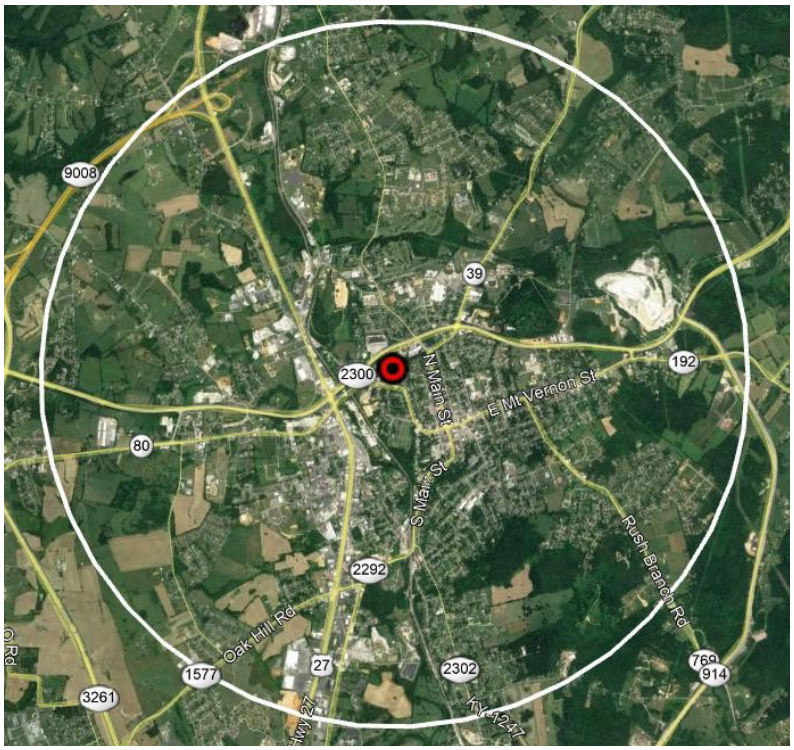
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	4.42	SPM AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.76	SLAMS AQI	Broadband Spectroscopy	Continuously

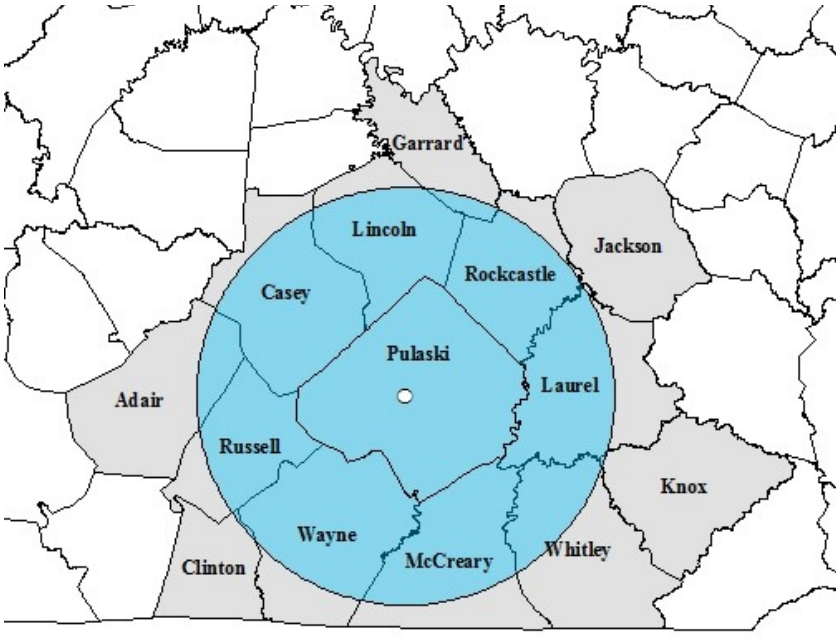
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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.

Neighborhood Scale: Particulates



Urban Scale: Ozone



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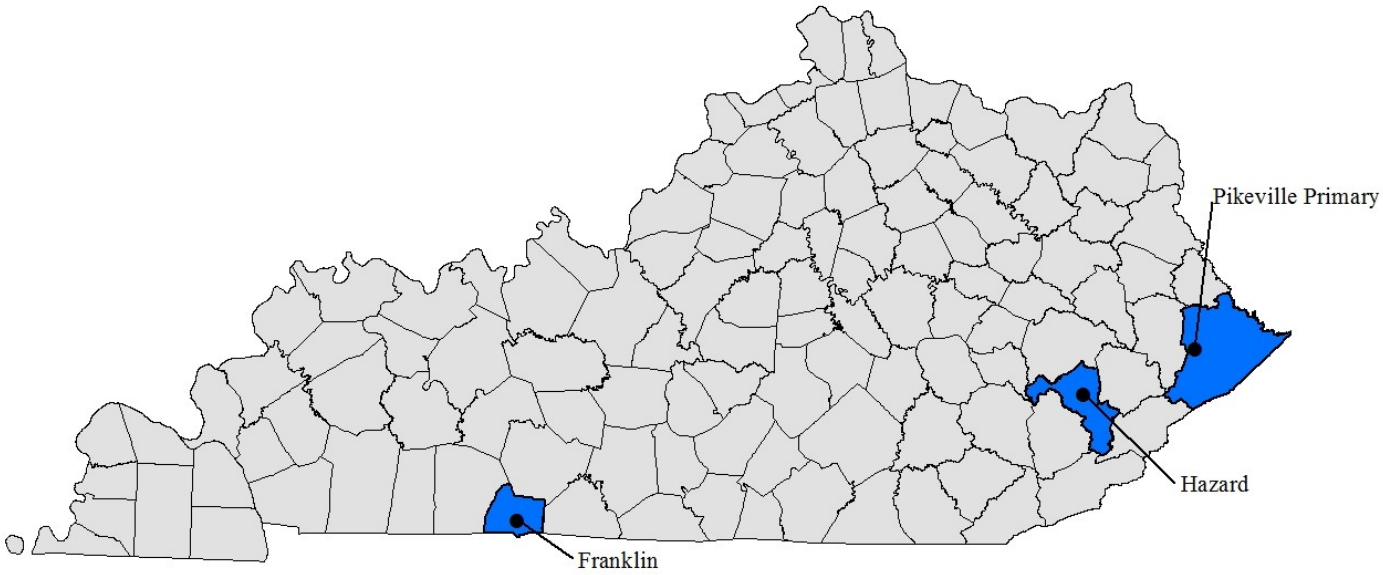
Not in a Metropolitan or Micropolitan Statistical Area



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	354 Perry Park Road		1 S,i							1 i,e									1
Perry	Hazard																		
21-195-0002	109 Loraine Street		1 S,i							1 i									
Pike	Pikeville																		
21-213-0004	573 Harding Road									1 i									1
Simpson	Franklin																		
Totals	**3**		**2**							**3**									**2**

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

Rev. 5/12/2021

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: December 2, 2021
Inspection By: Jenna Nall and Nathan Puckett
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

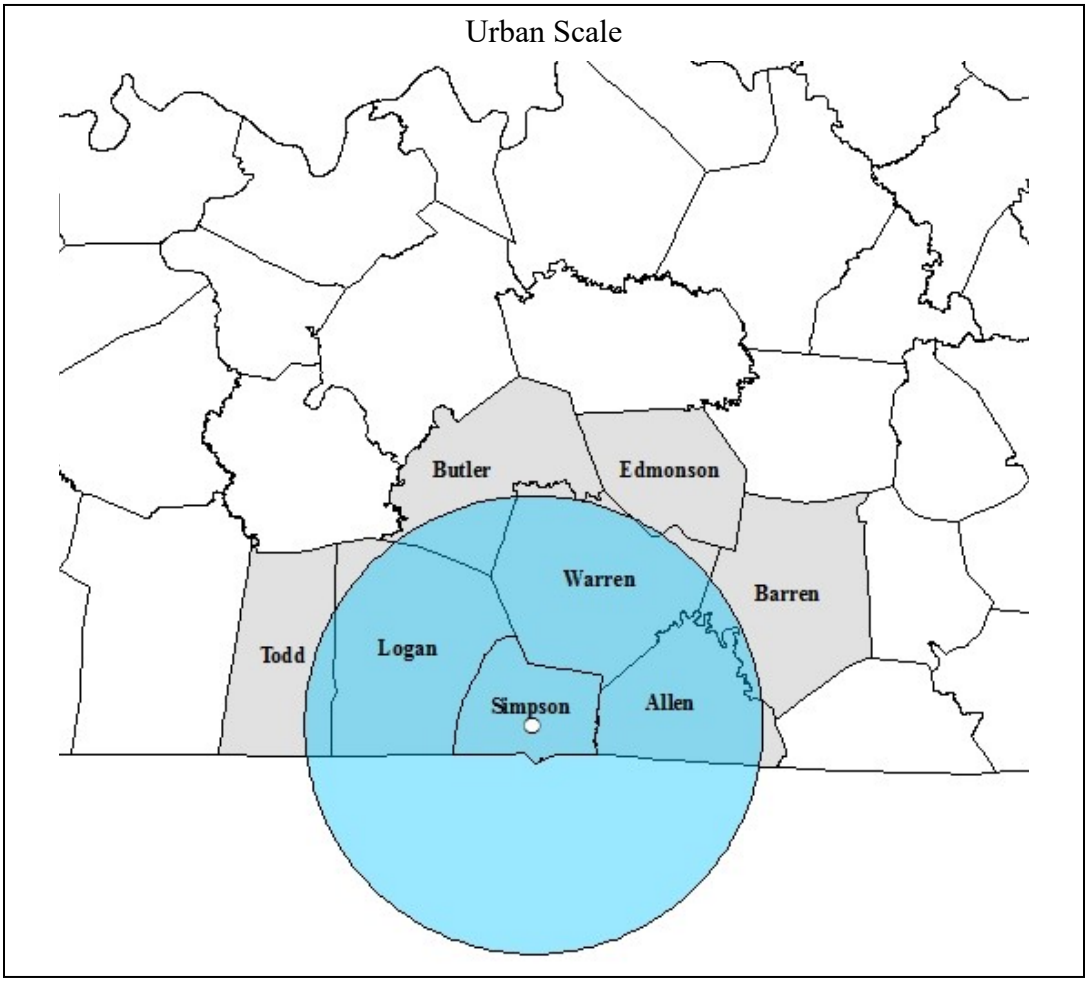
The monitoring site is a stationary equipment shelter located on the grounds of the KYTC Garage on Harding Road (KY1008) in Franklin, Kentucky. The sample inlet is 42.5 meters from the nearest road. Upon inspection, the sample line and monitor were found to be in good condition. The site meets the requirements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

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	4.44	SPM AQI	UV photometry	Continuously March 1 – October 31
Meteorological	5.9	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 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 13, 2021
Inspection By: Jenna Nall and Christopher Maynard
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 Perry County Horse Park in Hazard, Kentucky. The sample inlets 29.2 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.

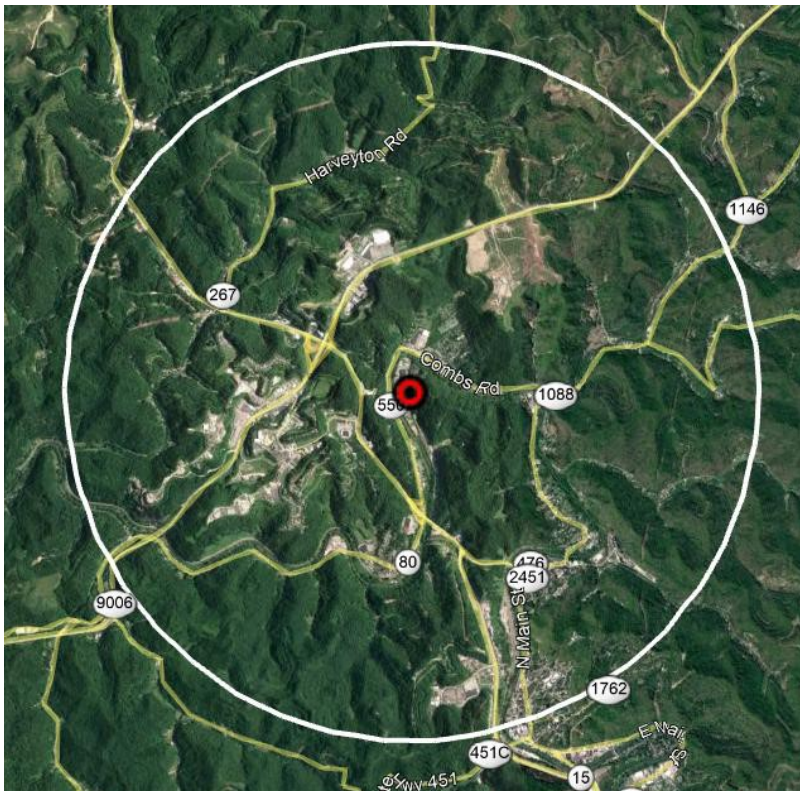
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to detect elevated pollutant levels for activation of emergency control procedures for ozone.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.73	SPM AQI EPISODE	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.61	SLAMS AQI	Broadband Spectroscopy	Continuously
Meteorological	5.8	Other	AQM grade instruments for wind speed, wind direction, and temperature	Continuously

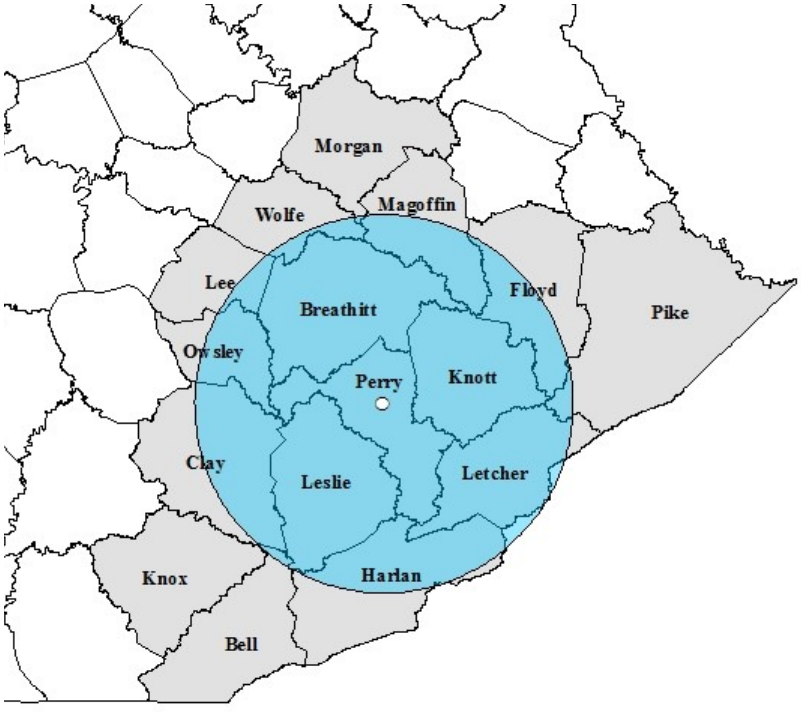
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

Area Representativeness:
The site represents population exposure on a neighborhood scale.

Neighborhood Scale



Urban Scale



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 13, 2021
Inspection By: Jenna Nall and Christopher Maynard
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 91.9 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.

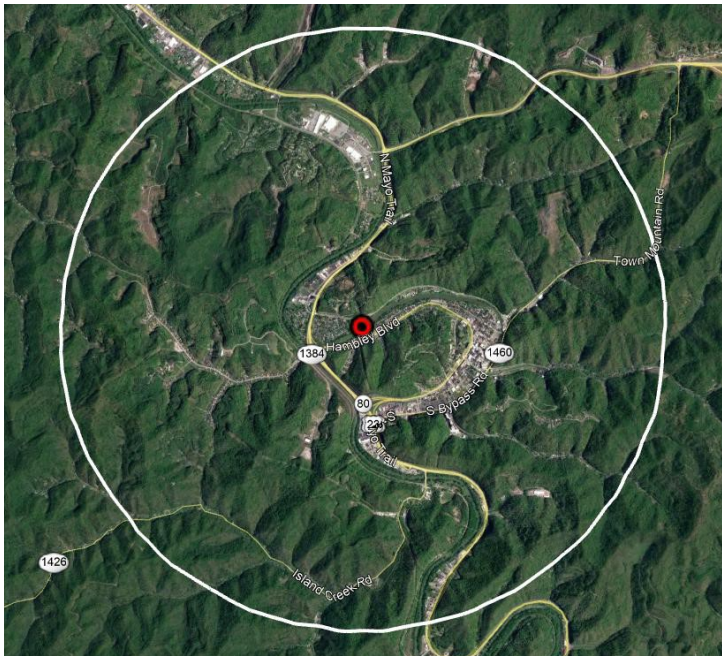
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards. While not required, the site also provides pollutant levels for daily air quality index reporting.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.55	SPM AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.74	SLAMS AQI	Broadband Spectroscopy	Continuously

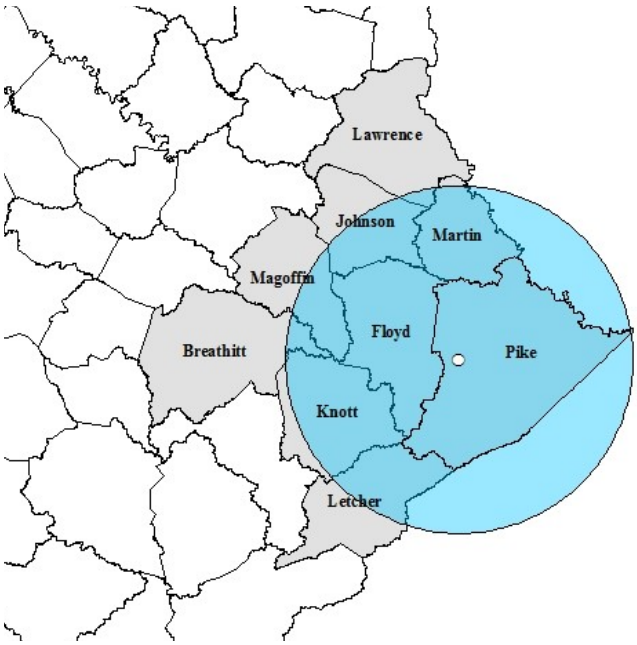
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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.

Neighborhood Scale: Particulates



Urban Scale: Ozone



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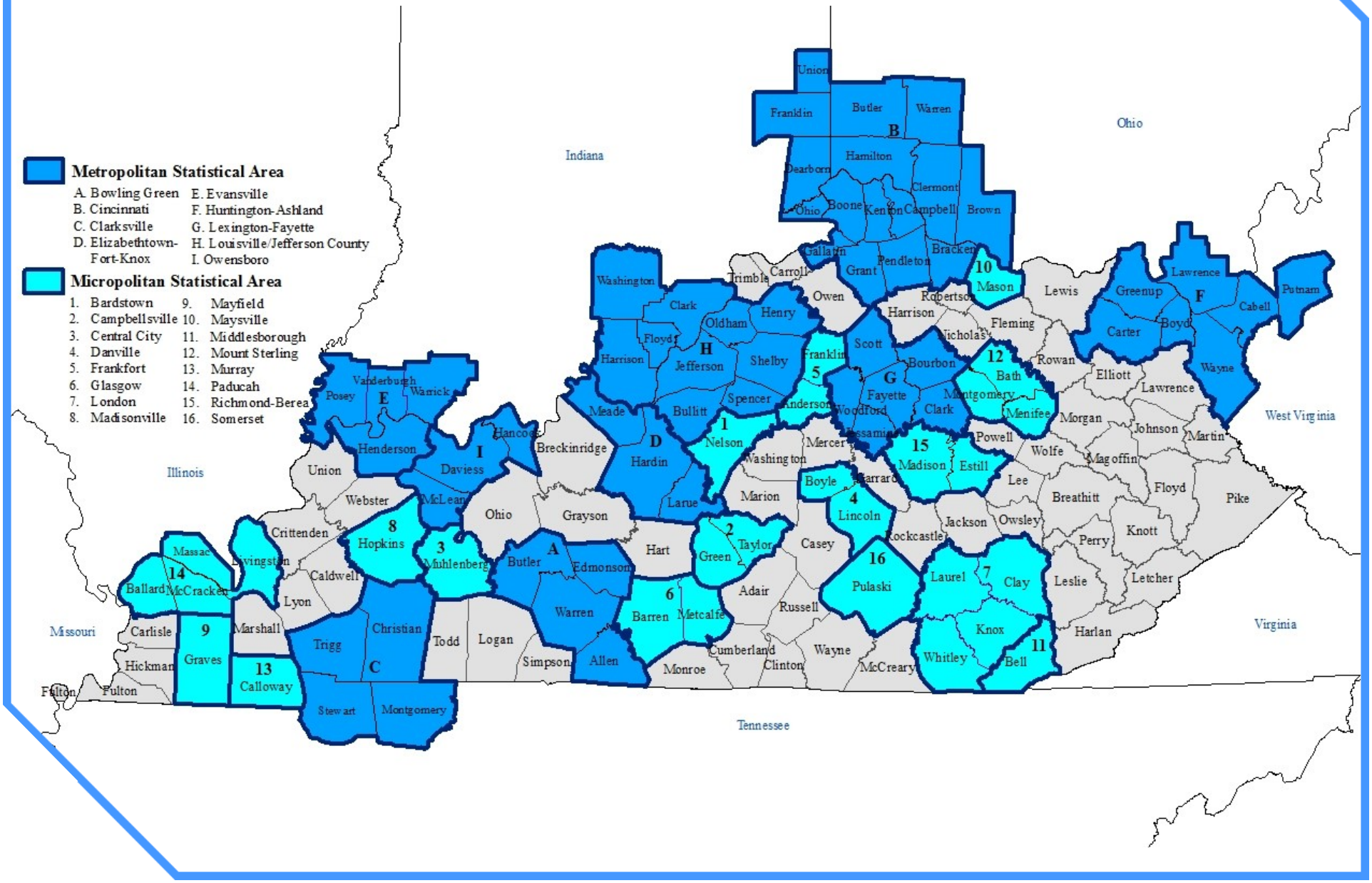
APPENDIX A

KENTUCKY CORE-BASED STATISTICAL AREAS MAP AND CBSA TABLES

Kentucky—Core Based Statistical Areas



CBSAs - Metropolitan Statistical Areas							
CBSA Title	CBSA	County	State	State	County	Count	CBSA
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_3	NO_y/NO/NO2	CO	SO_2
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

RESPONSIBLITIES/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 John S. Lyons

TITLE: Director, Division for Air Quality

DATE: 5/13/10

Hamilton County Department of Environmental Services

BY: Cory Chadwick Cory R. Chadwick

TITLE: Director

DATE: 5/13/10

Indiana Department of Environmental Management
Office of Air Quality

BY: Keith Baugues Keith Baugues

TITLE: Assistant Commissioner, Office of Air Quality

DATE: 5/14/10

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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:

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

Criteria Air Pollutant MSA monitoring network includes:

County	PM_{10}	O_3	NO_x/NO/NO_2	CO	SO_2
Henderson County, KY **KDEP**	1	1	0	0	1
Vanderburgh County, IN **IDEM**	1	2	1	1	1

RESPONSIBLITIES/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 IODEM 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 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 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
2nd 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

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. I may be contacted at 615-532-9668 or Michelle.B.Walker@tn.gov.

Sincerely,

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

ANDY BESHEAR
GOVERNOR

REBECCA W. GOODMAN
SECRETARY

ANTHONY R. HATTON
COMMISSIONER

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

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

June 21, 2021

Ms. Michelle Walker Owenby
Director
Tennessee Division of Air Pollution Control
William Snodgrass Tennessee Tower, 15th 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 $PM_{2.5}$ 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 $PM_{2.5}$ 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). $PM_{2.5}$ 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_3 DV	2018-2020 3-Year $PM_{2.5}$ 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 *
Clarksville, TN-KY MSA	**17300**	**307,820**	**0.061**	**8.1**

**Does not meet data completeness requirements*

To satisfy regulatory requirements, KDAQ agrees to continue to operate one (1) ozone monitor at the Hopkinsville site. While $PM_{2.5}$ monitoring is not currently required for the MSA, KDAQ will continue to operate the continuous $PM_{2.5}$ 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 $PM_{2.5}$ 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 2022

AIR POLLUTION CONTROL DISTRICT

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

May 2022

Table of Contents

LMAPCD Proposed Network Changes – Overview

The Louisville Metro Air Pollution Control District (LMAPCD) is proposing some minor changes to the ambient monitoring network during the 2022 Network Planning period (July 2022 through June 2023). Most of the changes presented in this document serve to provide updates on proposed changes mentioned in prior network plans as implementation of those proposed changes have not been completed due to COVID-19 pandemic challenges or other delays. Additional details concerning LMAPCD monitoring proposed changes 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 now 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 $PM_{2.5}$ data for calendar year 2020 and beyond.

$PM_{2.5}$ 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 $PM_{2.5}$ 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, these data that were collected for a portion of the 2021 PAMS season are still being evaluated to determine if the data quality is sufficient for reporting to the EPA AQS database. Acceptance testing has been completed for Carbonyls

monitoring and LMAPCD expects carbonyls monitoring to be fully operational for the start of the 2022 PAMS season. Several challenges continue to occur for the continuous VOC monitoring at the Cannons Lane PAMS site. As of May 2022, APCD is in the process of performing annual maintenance on the PAMS Auto GC system. APCD is hopeful that continuous VOC data will be ready for the 2022 PAMS season, but based on past challenges, cannot guarantee full functionality of the Auto GC system. 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[1]. Table 2 provides a listing of all required PAMS parameters and their status at APCD's Cannons Lane NCore site as of May 2022. 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.

Status of PAMS Parameters at APCD's Cannons Lane NCore Site			
Required PAMS Measurement	*Instrumentation*	*Status*	*Date*
Hourly VOCs	CAS / Chromatotec Auto GC	Operational	7/15/2021
Carbonyls	ATEC 8000-2 Carbonyl Sampler	Operational	6/1/2022
Hourly Ozone	Teledyne API T400[2]	Operational	2/27/2016
True NO2	Teledyne API T500U	Operational	6/15/2017
NOy	Teledyne API T200U NOy[2]	Operational	6/12/2018
Ambient Temp	Vaisala HMW93D Temp/RH Probe	Operational	1/1/2010
Wind	RM Young 85000 Ultrasonic	Operational	1/19/2010
Ambient Pressure	RM Young 61302V	Operational	10/8/2018
Precipitation	Met One 370 Tipping Bucket[2]	Operational	6/23/2016
Hourly Mixing Height	Vaisala Ceilometer CL51	Performance Testing	6/1/2021
Solar Radiation	Eppley PS Pyranometer	Operational	3/1/2009
UV Radiation	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. While the Auto GC system will have some continued limitations in assessing all compounds of interest, the Auto GC data from Algonquin Parkway

[1] LMAPCD has been in communication with the University of Maryland Baltimore County (UMBC) about transferring data via the Unified Ceilometer Network. This process has been delayed, which has also delayed our ability to fully test the ceilometer and evaluate data quality.

[2] 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.

will continue to be evaluated to see if additional compounds are determined to be of acceptable data quality.

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. As of May 2022, LMAPCD is in the process of installing the Magee Scientific AE33 Aethalometer at the Durrett Lane Near Road site. After installation, a period of performance testing will be performed to establish a data transfer process, gain familiarity with the instrument, and develop QA/QC procedures. 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 LMAPCD's 2015 Network Assessment, improvements in the spatial coverage of ozone monitoring could be realized in Jefferson County. West Jefferson County and East Jefferson County were two areas identified as possible additions to LMAPCD's ozone monitoring network if funds and resources allowed. Improving the spatial coverage would be most practically resolved by adding an ozone monitor to an existing site located in the western portion of the county. As such, LMAPCD is proposing the installation of an ozone monitor at the Algonquin Parkway site. 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 has historically been one of the more difficult pollutants to curtail in Louisville/Jefferson County and filling this gap in the network will improve the understanding of the spatial variability of ozone concentrations. This addition will also better serve the population of western Louisville/Jefferson County, which experiences disproportionate health impacts from air pollution and other environmental hazards. LMAPCD intends to purchase the newly proposed ozone analyzer and calibration equipment with American Rescue Plan funds. Installation of this equipment is anticipated to occur during the 2022 – 2023 ozone off season, with full implementation in time for the 2023 ozone season. Exact time frames may vary based on receipt of funds and procurement of equipment.

Carrithers Middle School Site Coordinates

During the 2021 Site Evaluation process, it was determined that the coordinates listed in the EPA AQS database for the Carrithers Middle School site contained some minor error. The previous coordinates were 38.182511, -85.574167 (NAD 83). The correct coordinates are 38.182435, -85.574361 (WGS). The coordinates were corrected in AQS on May 4, 2022 and will be updated in the KDAQ Network Plan.

Meteorological & Low Cost Sensors

LMAPCD has acquired some additional meteorological instruments to aide 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 aide in further understanding of pollutant dispersion and air quality forecasting. Additionally, LMPACD has acquired a Collocated Sensor Shelter 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. These additional devices / support structures will be installed as time and resources allow.

Conclusion

The majority of the changes being proposed for the Network Planning period (July 2022 – June 2023) are intended to provide an update on previously proposed changes that have not been fully implemented or to modify / clarify monitor or site metadata such as spatial scales of representative and monitoring objectives. The most substantial changes to LMAPCD's network include the proposal of a new ozone monitor at Algonquin Parkway, and the completion of equipment installations at the Cannons Lane PAMS site and Durrett Lane Near Road site. The PAMS instrumentation is new to most state, local, and tribal agencies, and as such, LMAPCD will continue to put forth best efforts to ensure that the instrumentation is producing meaningful, valid data.

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_3	$PM_{2.5}$	PM_{10}	PM_c	PM_{BC}	CSN	SO_2	NO_2	CO	Toxics	PAMS
# Sites Required by CFR	2	3	2-4	1	0	0	1	2	2	0	1
# Current Sites	7 (3)	7 (5)	3 (2)	1 (1)	1 (0)	2 (1)	4 (3)	2 (2)	2 (2)	2 (1)	1 (1)
# Sites After proposed Changes	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 2022						
Site	**Asset Type**	**Manufacturer**	**Model**	**Serial Number**	**Current Status**	**Condition**
ALGONQUIN	Unspecified	AIRGAS	Regulator/Gauge	4	Active	GOOD
ALGONQUIN	Instrument	RM Young	41372VC	Y4940092	Active	FAIR
ALGONQUIN	Instrument	RM Young	85000	UB3773	Active	GOOD
ALGONQUIN	Unspecified	Consolidated Analytical Systems (CAS)	9001	4222	Active	GOOD
ALGONQUIN	Cal Standard/Bottle	AIRGAS	Protocol Gas - SO2	LL127106	Active	GOOD
ALGONQUIN	Cal Standard/Bottle	EPA	PAMS Cylinder	CC741201	Active	GOOD
ALGONQUIN	Cal Standard/Bottle	AIRGAS	Toxics Cylinder	EA0031391	Active	GOOD
ALGONQUIN	Analyzer	Chromatotec/CAS	airmoVOC C2C6	56410717	Active	GOOD
ALGONQUIN	Cal Standard/Bottle	Chromatotec/CAS	airmoCAL	56440717	Active	GOOD
ALGONQUIN	Cal Standard/Bottle	Chromatotec/CAS	Hydroxychrom	56420717	Active	GOOD
ALGONQUIN	Cal Standard/Bottle	Chromatotec/CAS	n-butane permeation tube	20200828-H341	Active	GOOD
ALGONQUIN	Cal Standard/Bottle	Chromatotec/CAS	n-hexane permeation tube	20200317-H021	Active	GOOD
ALGONQUIN	Cal Standard/Bottle	Chromatotec/CAS	benzene permeation tube	20191216-G711	Active	GOOD
ALGONQUIN	Cal Standard/Bottle	Chromatotec/CAS	n-decane permeation tube	20200317-H033	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	Instrument	Vaisala	HMW93D	H052001	Active	GOOD
ALGONQUIN	Cal Standard/Bottle	AIRGAS	Protocol Gas - SO2	CC234344	Active	GOOD
ALGONQUIN	Logger	ESC Agilaire	8832	4294	Active	FAIR
ALGONQUIN	Cal Standard/Bottle	Teledyne API	T701H	802	Active	GOOD
ALGONQUIN	Analyzer	Thermo Fisher Scientific	2025i	20612	Spare	GOOD
ALGONQUIN	Analyzer	Thermo Fisher Scientific	2025i	20614	Spare	GOOD
ALGONQUIN	Cal Standard/Bottle	Teledyne API	T700	289	Active	GOOD
ALGONQUIN	Analyzer	Teledyne API	T100U	081	Active	FAIR
CARRITHERS	Instrument	RM Young	05103VM	WM47808	Active	FAIR
CARRITHERS	Instrument	RM Young	41382	n/a	Active	GOOD
CARRITHERS	Unspecified	EKTO Mfg.	81012	4234-1	Active	FAIR
CARRITHERS	Analyzer	Teledyne API	T400	5405	Active	GOOD
CARRITHERS	Logger	ESC Agilaire	8832	4411	Active	FAIR
CARRITHERS	Instrument	Vaisala	HMW93D	N1540018	Active	GOOD

Louisville, KY APCD Equipment Inventory - May 2022						
Site	**Asset Type**	**Manufacturer**	**Model**	**Serial Number**	**Current Status**	**Condition**
CARRITHERS	Analyzer	Teledyne API	T640	457	Active	GOOD
CARRITHERS	Cal Standard/Bottle	Teledyne API	T703	255	Active	GOOD
CLAMS	Unspecified	AIRGAS	Regulator/Gauge	5	Active	GOOD
CLAMS	Analyzer	HI-Q	HVP-4004BRL-S	17603	Active	FAIR
CLAMS	Instrument	Met One	370	U10772	Active	GOOD
CLAMS	Instrument	RM Young	41382	021011	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	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	Logger	ESC Agilaire	8832	4292	Active	FAIR
CLAMS	Unspecified	Consolidated Analytical Systems (CAS)	9001	4419	Active	GOOD
CLAMS	Instrument	Vaisala	CL51	R4640540	Active	GOOD
CLAMS	Cal Standard/Bottle	EPA	PAMS Cylinder	CC745524	Active	GOOD
CLAMS	Cal Standard/Bottle	Chromatotec/CAS	airmoCAL	57381219	Active	GOOD
CLAMS	Cal Standard/Bottle	Chromatotec/CAS	Hydroxychrom	57371219	Active	GOOD
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	Cal Standard/Bottle	Chromatotec/CAS	n-butane permeation tube	20191018-G641	Active	GOOD
CLAMS	Cal Standard/Bottle	Chromatotec/CAS	n-hexane permeation tube	20191004-G559	Active	GOOD
CLAMS	Cal Standard/Bottle	Chromatotec/CAS	Benzene permeation tube	20191120-G655	Active	GOOD
CLAMS	Cal Standard/Bottle	Chromatotec/CAS	n-decane permeation tube	20191018-G621	Active	GOOD
CLAMS	Cal Standard/Bottle	Teledyne API	T701H	747	Active	GOOD
CLAMS	Instrument	Eppley	PSP	34257F3	Active	GOOD
CLAMS	Instrument	Eppley	TUVR	38938	Active	GOOD
CLAMS	Analyzer	Teledyne API	T500U	169	Active	GOOD
CLAMS	Cal Standard/Bottle	AIRGAS	Protocol Gas - CO	BR001720	Active	GOOD

Louisville, KY APCD Equipment Inventory - May 2022						
Site	**Asset Type**	**Manufacturer**	**Model**	**Serial Number**	**Current Status**	**Condition**
CLAMS	Analyzer	URG	3000N	BN-251	Active	FAIR
CLAMS	Instrument	Vaisala	HMW93D	H0520002	Active	GOOD
CLAMS	Cal Standard/Bottle	AIRGAS	Protocol Gas - NO	CC281423	Active	GOOD
CLAMS	Logger	ESC Agilaire	8832	4410	Active	FAIR
CLAMS	Instrument	Vaisala	HMW93D	T2411401	Active	GOOD
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	Cal Standard/Bottle	Teledyne API	T700U	107	Active	GOOD
CLAMS	Analyzer	Teledyne API	T300U	281	Active	GOOD
CLAMS	Analyzer	Teledyne API	T200U	316	Needs Repair	FAIR
CLAMS	Analyzer	Teledyne API	T100U	276	Active	GOOD
CLAMS	Cal Standard/Bottle	AIRGAS	Protocol Gas - SO2	LL63080	Active	GOOD
CLAMS	Analyzer	Teledyne API	T400	1468	Active	GOOD
CLAMS	Analyzer	ATEC	8000	41732	Active	GOOD
NEARROAD	Cal Standard/Bottle	AIRGAS	Protocol Gas - NO	CC259379	Active	GOOD
NEARROAD	Unspecified	AIRGAS	Regulator/Gauge	8	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	Unspecified	Alumna Tower	T-135	AT-213072-Y-6-1	Active	GOOD
NEARROAD	Unspecified	Consolidated Analytical Systems (CAS)	9001	3200-7	Active	GOOD
NEARROAD	Cal Standard/Bottle	AIRGAS	Protocol Gas - CO	CC234573	Active	GOOD
NEARROAD	Analyzer	Thermo Fisher Scientific	2025i	20608	Active	GOOD
NEARROAD	Analyzer	Teledyne API	T300U	155	Active	FAIR
NEARROAD	Cal Standard/Bottle	Teledyne API	T701H	773	Active	FAIR
NEARROAD	Logger	ESC Agilaire	8832	4293	Active	FAIR
NEARROAD	Instrument	Vaisala	HMW93D	H0520004	Active	GOOD
NEARROAD	Analyzer	Teledyne API	T640	458	Active	GOOD
NEARROAD	Cal Standard/Bottle	Teledyne API	T700U	457	Active	GOOD
NEARROAD	Analyzer	Teledyne API	T500U	168	Active	GOOD

Louisville, KY APCD Equipment Inventory - May 2022						
Site	**Asset Type**	**Manufacturer**	**Model**	**Serial Number**	**Current Status**	**Condition**
WATSON	Unspecified	AIRGAS	Regulator/Gauge	6	Active	GOOD
WATSON	Instrument	RM Young	85000	002568	Active	GOOD
WATSON	Unspecified	Consolidated Analytical Systems (CAS)	9001	4434	Active	GOOD
WATSON	Cal Standard/Bottle	AIRGAS	Protocol Gas - SO2	CC285085	Active	GOOD
WATSON	Analyzer	Teledyne API	T100U	406	Active	GOOD
WATSON	Logger	ESC Agilaire	8832	4291	Active	FAIR
WATSON	Instrument	Vaisala	HMW93D	H0520003	Active	GOOD
WATSON	Analyzer	Teledyne API	T640	456	Active	GOOD
WATSON	Analyzer	Teledyne API	T400	316	Active	GOOD
WATSON	Cal Standard/Bottle	Teledyne API	T701H	604	Active	GOOD
WATSON	Cal Standard/Bottle	Teledyne API	T700	1620	Active	GOOD
APCD_SHOP	Unspecified	AIRGAS	Regulator/Gauge	2	Active	GOOD
APCD_SHOP	Unspecified	AIRGAS	Regulator/Gauge	3	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	AIRGAS	Protocol Gas	ET0017048	Retired	POOR
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	Spare	FAIR
APCD_SHOP	Instrument	RM Young	41342VF	41376A	Spare	FAIR
APCD_SHOP	Instrument	RM Young	41342VF	TS05123	Spare	GOOD
APCD_SHOP	Instrument	RM Young	41382	126462	Spare	GOOD
APCD_SHOP	Instrument	RM Young	43502	n/a	Spare	GOOD
APCD_SHOP	Instrument	RM Young	52202	TB03206	Spare	FAIR
APCD_SHOP	Instrument	RM Young	5305AQ	VW101749	Spare	GOOD
APCD_SHOP	Instrument	RM Young	85000	n/a	Spare	GOOD
APCD_SHOP	Instrument	RM Young	85000	UB-1309	Spare	GOOD
APCD_SHOP	Instrument	RM Young	86000	UD00003877	Spare	GOOD

Louisville, KY APCD Equipment Inventory - May 2022						
Site	**Asset Type**	**Manufacturer**	**Model**	**Serial Number**	**Current Status**	**Condition**
APCD_SHOP	Unspecified	Thermo Fisher Scientific	REL1204A	155472601160526	Active	GOOD
APCD_SHOP	Instrument	Vaisala	HM75	R2830602	Active	GOOD
APCD_SHOP	Instrument	Vaisala	HPM	J0871073	Spare	FAIR
APCD_SHOP	Instrument	Vaisala	HPM	x3810013	Spare	FAIR
APCD_SHOP	Instrument	Met One	Portable	5876	Spare	FAIR
APCD_SHOP	Analyzer	Thermo Fisher Scientific	Miran Saphire	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	Logger	ESC Agilaire LLC	8832	2713K	Needs Repair	FAIR
APCD_SHOP	Analyzer	URG	3000N	1045	Spare	FAIR
APCD_SHOP	Cal Standard/Bottle	Chinook	SLP	HL041007	Retired	FAIR
APCD_SHOP	Cal Standard/Bottle	MesaLab	Bios Dry Cal	105393	Retired	FAIR
APCD_SHOP	Cal Standard/Bottle	MesaLab	Delta Cal	465	Retired	FAIR
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	Instrument	Vaisala	HMW71Y	W3650008	Spare	FAIR
APCD_SHOP	Instrument	Vaisala	HMW71Y	X0840020	Spare	FAIR
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T750U	166	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	751H	336	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	Span Dust	8	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	Span Dust	9	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	Span Dust	10	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	M-200SCCM-D	297535	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	M-50SCCM-D	297536	Active	FAIR
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	M-20SLPM-D	297534	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	M-10SCCM-D	297537	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Thermo Fisher Scientific	49iPS	617817-229	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T703	731	Active	FAIR

Louisville, KY APCD Equipment Inventory - May 2022						
Site	**Asset Type**	**Manufacturer**	**Model**	**Serial Number**	**Current Status**	**Condition**
APCD_SHOP	Cal Standard/Bottle	Thermo Fisher Scientific	49CPS	70020-364	Unspecified	FAIR
APCD_SHOP	Unspecified	Ford	Escape	4237	Active	GOOD
APCD_SHOP	Instrument	Vaisala	HMW93D	T2411403	Spare	GOOD
APCD_SHOP	Cal Standard/Bottle	Chinook	SLP	HL170606	Retired	FAIR
APCD_SHOP	Cal Standard/Bottle	Chinook	SLP	HM041006	Retired	FAIR
APCD_SHOP	Cal Standard/Bottle	MesaLab	Delta Cal	466	Retired	FAIR
APCD_SHOP	Cal Standard/Bottle	Chinook	SLP	HM70204	Retired	FAIR
APCD_SHOP	Analyzer	Teledyne API	T640x	591	Needs Repair	FAIR
APCD_SHOP	Instrument	Eppley	PSP	33927F3	Spare	FAIR
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T700U	106	Needs Repair	GOOD
APCD_SHOP	Analyzer	Teledyne API	T100	1321	Spare	GOOD
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	FP-25BT	148162	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	AIRGAS	Protocol Gas	LL192220	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	MWB-500SCCM-D	228259	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T701H	839	Needs Repair	FAIR
APCD_SHOP	Logger	ESC Agilaire	8832	A4691K	Active	FAIR
APCD_SHOP	Logger	ESC Agilaire	8872	0731	Spare	GOOD
APCD_SHOP	Instrument	Vaisala	HMW93D	N1540017	Spare	FAIR
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	FP-25BT	212953	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	FP-25BT	212954	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	FP-25BT	212955	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	FP-25BT	212956	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	FP-25BT	212957	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Alicat Scientific	MWB-2SLPM-D	189496	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T701H	801	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T701M	647	Needs Repair	FAIR
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T701M	648	Needs Repair	FAIR
APCD_SHOP	Analyzer	Teledyne API	T640	459	Spare	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T700U	174	Needs Repair	FAIR
APCD_SHOP	Analyzer	Thermo Fisher Scientific	2025i	20607	Spare	GOOD
APCD_SHOP	Analyzer	Thermo Fisher Scientific	2025i	21318	Spare	FAIR

Louisville, KY APCD Equipment Inventory - May 2022						
Site	**Asset Type**	**Manufacturer**	**Model**	**Serial Number**	**Current Status**	**Condition**
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T700	290	Needs Repair	GOOD
APCD_SHOP	Analyzer	Teledyne API	T400	315	Needs Repair	GOOD
APCD_SHOP	Cal Standard/Bottle	Fluke	Molbox1+A700k-A	2213	Active	GOOD
APCD_SHOP	Analyzer	Teledyne API	T400	1467	Needs Repair	GOOD
APCD_SHOP	Analyzer	Teledyne API	T100	1322	Needs Repair	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T700	1619	Needs Repair	GOOD
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T750	054	Active	FAIR
APCD_SHOP	Cal Standard/Bottle	Teledyne API	T751H	62	Active	GOOD
APCD_SHOP	Analyzer	Teledyne API	T300U	483	Spare	GOOD
APCD_SHOP	Analyzer	Teledyne API	T500U	170	Spare	GOOD
APCD_SHOP	Cal Standard/Bottle	Chinook	SLP	HM041005	Retired	FAIR
APCD_SHOP	Unspecified	Ford	Escape	4220	Active	GOOD
APCD_SHOP	Cal Standard/Bottle	Chinook	SLP	HL170607	Retired	FAIR
APCD_SHOP	Instrument	Vaisala	HMW93D	T2411402	Spare	GOOD
APCD_EXTERNAL	Cal Standard/Bottle	Alicat Scientific	MWB-2SLPM-D	228258	Active	GOOD
APCD_WAREHOUSE	Cal Standard/Bottle	API	T701M	835	Retired	
APCD_WAREHOUSE	Cal Standard/Bottle	API	T701M	837	Retired	
APCD_WAREHOUSE	Analyzer	EcoTech	300	1586	Retired	
APCD_WAREHOUSE	Cal Standard/Bottle	EcoTech	6100	4012	Retired	
APCD_WAREHOUSE	Analyzer	EcoTech	Ecotech Serinus	40-10-51	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	Logger	ESC Agilaire	8816	1917	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	

Louisville, KY APCD Equipment Inventory - May 2022						
Site	**Asset Type**	**Manufacturer**	**Model**	**Serial Number**	**Current Status**	**Condition**
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	Unspecified	Unknown	Meteorology Tower	n/a	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	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	49C	417007-061	Retired	
APCD_WAREHOUSE	Cal Standard/Bottle	Thermo Fisher Scientific	146C	0417007-062	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	48C	417007-060	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	49C	413906-381	Retired	
APCD_WAREHOUSE	Cal Standard/Bottle	Thermo Fisher Scientific	146C	382	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	Cal Standard/Bottle	Thermo Fisher Scientific	146i	0814428-735	Retired	
APCD_WAREHOUSE	Analyzer	Thermo Fisher Scientific	42i-Y	0814428-734	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	H1710	Retired	

Louisville, KY APCD Equipment Inventory - May 2022						
Site	**Asset Type**	**Manufacturer**	**Model**	**Serial Number**	**Current Status**	**Condition**
APCD_WAREHOUSE	Analyzer	IMACC	M-ZSE12-180	M0015	Retired	
APCD_WAREHOUSE	Analyzer	IMACC	Air Toxics UV	Air Toxics UV	Retired	
APCD_WAREHOUSE	Unspecified	Mobile Structures	Mobile Trailer	5WJVN14238L000673	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	Unspecified	Met One	BAM Shelter	n/a	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	T18977	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8832	5058	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8832	A1014	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	2764	Retired	
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	Analyzer	Met One	BAM	T18984	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400ab	24885	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400a	23748	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	2423	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8832	4291	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	T18981	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	1973	Retired	
APCD_WAREHOUSE	Analyzer	Met One	BAM	N3593	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	Analyzer	Met One	BAM	N3596	Retired	
APCD_WAREHOUSE	Analyzer	R&P	1400ab	24059	Retired	

Louisville, KY APCD Equipment Inventory - May 2022						
Site	**Asset Type**	**Manufacturer**	**Model**	**Serial Number**	**Current Status**	**Condition**
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	3303	Retired	
APCD_WAREHOUSE	Logger	ESC Agilaire	8816	3306	Retired	

APPENDIX F

KDAQ INTENDED USE OF CONTINUOUS $PM_{2.5}$ FEMS

Appendix F
KDAQ Intended Use of Continuous $PM_{2.5}$ FEMs

Historically, continuous $PM_{2.5}$ 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 $PM_{2.5}$ 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 $PM_{2.5}$ 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 $PM_{2.5}$ 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 $PM_{2.5}$ 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
- Jackson Purchase
- Pikeville
- Smiths Grove (Primary and Collocated)
- Lexington Primary
- Hazard
- Hopkinsville
- Somerset
- Middlesboro

Appendix F
KDAQ Intended Use of Continuous $PM_{2.5}$ FEMs

A such, KDAQ will operate a total of 14 FEM $PM_{2.5}$ continuous T640 monitors in the field during the 2022-2023 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 $PM_{2.5}$ FEMs, collocation scenarios, and dates of operation.

Northern Kentucky University (21-037-3002) **Scenario: Continuous PM2.5 FEM is eligible for NAAQS comparisons. Collocated filter-based FRMs are 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 compari-sons?**	**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)	Filter-Based FRM (POC 2)	Yes	Yes	Yes	2/12/2018	2/13/2020

Elizabethtown (21-093-0006) **Scenario: Continuous PM2.5 FEM is eligible for NAAQS comparisons and is collocated with a filter-based FRM.**									
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 compari-sons?**	**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) **Scenario: Continuous PM2.5 FEMs are collocated and are eligible for NAQQS comparisons.**									
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 compari-sons?**	**FEM eligible for AQI?**	**Date FEM Installed at Site**	**Date FEM Eligible for NAAQS Comparisons**
PM2.5 Local Conditions (88101)	POC 3 (Primary) POC 4 (Collocated)	SLAMS	Continuous FEM (POC 3)	Continuous FEM (POC 4)	Yes	Yes	Yes	Primary: 2/17/2019 Collocated: 10/29/2019	Primary: 1/1/2021 Collocated: 1/1/2021

Appendix F
KDAQ Intended Use of Continuous $PM_{2.5}$ FEMs

Multiple Sites **Scenario: Continuous PM2.5 FEMs will be eligible for NAAQS comparisons during monitoring year. No other PM2.5 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 compari-sons?**	**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)	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
								Jackson Purchase (21-145-1024)	
								8/17/2017	8/18/2019
								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:

Calvert City Study: Site & Monitor Summary						
Site/AQS ID/ Coordinates	**Objective**	**Sampling Instruments**	**Sampling Media**	**Monitor Type**	**Sampling Schedule**	**Monitor Purpose**
LWD Collocated & Meteorological Site (LWD) 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)
Johnson-Riley Road (JRR) 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
Calvert City Elementary (CCE) 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_2 Final Rule and a new set of monitoring requirements. Under the new monitoring requirements, State and Local agencies are required to establish NO_2 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 $PM_{2.5}$ NAAQS and monitoring rule on December 14, 2012, and the CO monitoring rule on August 31, 2011. Together, these rules require CO and $PM_{2.5}$ 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_2 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/. 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_2 PWEI VALUES

Appendix I
Kentucky SO_2 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_2 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_2, 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_2 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_2 monitors.

Based upon Kentucky's calculated PWEI values, the following CBSAs require SO_2 monitors:

Kentucky CBSAs	2020 PWEI[1]* (10^6 persons-tons per year)	Number of SO_2 Monitors Required	Number of SO_2 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) Watson Lane (LMAPCD) Cannons Lane (LMAPCD)	21-111-1041 21-111-0051 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_3 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.

KDAQ requested that EPA designate the CASTNET ozone monitor at the Cadiz site (21-221-9991) as the "Maximum O_3 Concentration" site for the Clarksville, TN-KY MSA. EPA agreed to the change and has since updated the metadata for the monitor in AQS.

Clean Air Status & Trends Network (CASTNET)

Kentucky Ozone Monitors

Monitor ID	Monitor Name	County/ Metropolitan Statistical Area	Designation	Monitoring Scale
21-061-0501	Mammoth Cave National Park	Edmonson/ Bowling Green, KY MSA	CASTNET Non-EPA Federal Maximum O_3 Concentration*	Regional
21-175-9991	Crockett	Morgan/ Not in a MSA	CASTNET EPA	Regional
21-221-9991	Cadiz**	Trigg/ Clarksville, TN-KY 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

** Cadiz was the previous Maximum Ozone Concentration site for the Clarksville, TN-KY MSA. Cadiz was suspended in May 2022. Hopkinsville will replace Cadiz as the Maximum Ozone Concentration site for the Clarksville, TN-KY MSA.

***Not usable for NAAQS comparisons

APPENDIX K

KDAQ EQUIPMENT INVENTORY

Appendix K
KDAQ Equipment Inventory

Site Name	Item Description	Item Model	Condition	Status
21st & Greenup	PM2.5 Sampler (PM10)	Partisol Plus 2025 Sequential	F	In-Use
21st & Greenup	PM2.5 Sampler (PM10)	Partisol Plus 2025 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 2025 Sequential	F	Spare
Buckner	Datalogger (met)	ESC 8832	G	In-Use
Buckner	Datalogger-Digital	Agilaire 8872	G	In-Use
Buckner	Meteorological	RM Young Met (wind/temp)	G	In-Use
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 2025 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 K
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
Jackson Purchase RECC	Calibrator	Teledyne-API T700	G	In-Use
Jackson Purchase RECC	Datalogger- Digital	Agilaire 8872	G	In-Use
Jackson Purchase RECC	NOx Analyzer	Teledyne-API T200	G	In-Use
Jackson Purchase RECC	O3 Analyzer	Teledyne-API T400	G	In-Use
Jackson Purchase RECC	PM10 Sampler	Partisol 2000i	F	In-Use
Jackson Purchase RECC	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Jackson Purchase RECC	SO2 Analyzer	Teledyne-API T100	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 (idle)	G	Idle
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

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

Appendix K
KDAQ Equipment Inventory

Site Name	Item Description	Item Model	Condition	Status
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	In-Use
Nicholasville	O3 Analyzer	Teledyne-API T400	G	In-Use
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 2025 Sequential	F	In-Use
NKU	PM2.5 Sampler	Partisol Plus 2025 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	In-Use
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
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	ESC 8832	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
Smithland	Zero Air Unit	Teledyne-API 701	G	In-Use

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

Appendix K
KDAQ Equipment Inventory

Site Name	Item Description	Item Model	Condition	Status
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 701	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	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
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

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

Appendix K
KDAQ Equipment Inventory

Site Name	Item Description	Item Model	Condition	Status
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	Spare
x-Shop	Calibrator	Teledyne-API 700E	F	Spare
x-Shop	Calibrator	Teledyne-API 700E	F	Spare
x-Shop	Calibrator	Teledyne-API 700E	F	Spare
x-Shop	Calibrator	Teledyne-API 700E	F	Spare
x-Shop	Calibrator	Teledyne-API 700E	F	Spare
x-Shop	Calibrator	Teledyne-API 700E	F	Spare
x-Shop	Calibrator	Teledyne-API 700E	F	Spare
x-Shop	Calibrator	Teledyne-API 700E	F	Spare
x-Shop	Calibrator	Teledyne-API 700E	F	Spare
x-Shop	Calibrator	Teledyne-API 700E	G	Spare
x-Shop	Calibrator	Teledyne-API 700E	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
x-Shop	CO Monitor	Monitor Labs 9830B	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus

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

Appendix K
KDAQ Equipment Inventory

Site Name	Item Description	Item Model	Condition	Status
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	F	Surplus
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger	ESC 8832	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare

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

Appendix K
KDAQ Equipment Inventory

Site Name	Item Description	Item Model	Condition	Status
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Datalogger-Digital	Agilaire 8872	G	Spare
x-Shop	Lead Sampler	Tisch Model TE-5170DV-BL TSP	F	Spare
x-Shop	Lead Sampler	Tisch Model TE-5170DV-BL TSP	F	Spare
x-Shop	Lead Sampler	Tisch Model TE-5170DV-BL TSP	F	Spare
x-Shop	Lead Sampler	Tisch Model TE-5170DV-BL TSP	G	Spare
x-Shop	Lead Sampler	Tisch Model TE-5170DV-BL TSP	G	Spare
x-Shop	Meteorological	Solar Radiation Sensor- CMP4	F	Spare
x-Shop	Microbalance	Mettler XP6 Microbalance	F	Surplus
x-Shop	NOx Analyzer	Teledyne-API 200E	F	Spare
x-Shop	NOx Analyzer	Teledyne-API 200E	F	Spare
x-Shop	NOx Analyzer	Teledyne-API 200E	F	Spare
x-Shop	NOx Analyzer	Teledyne-API 200E	F	Spare
x-Shop	NOx Analyzer	Teledyne-API 200E	F	Spare
x-Shop	NOx Analyzer	Teledyne-API 200E	F	Spare
x-Shop	NOx Analyzer	Teledyne-API 200E	G	Spare
x-Shop	NOx Analyzer	Teledyne-API 200E	P	Surplus
x-Shop	NOx Analyzer	Teledyne-API 200E	P	Surplus
x-Shop	NOx Analyzer	Teledyne-API 200E	P	Surplus
x-Shop	NOx Analyzer	Teledyne-API 200E	P	Surplus
x-Shop	NOx Analyzer	Teledyne-API T200	G	Spare
x-Shop	NOx Analyzer	Teledyne-API T200	G	Spare
x-Shop	NOx Analyzer	Teledyne-API T200	G	Spare
x-Shop	NOx Analyzer	Teledyne-API T200	G	Spare
x-Shop	NOx Analyzer	Teledyne-API T200	G	Spare
x-Shop	NOx Analyzer	Teledyne-API T200P	P	Surplus
x-Shop	NOx Analyzer	Teledyne-API T200P	P	Surplus
x-Shop	NOx Analyzer	Teledyne-API T200P	P	Surplus
x-Shop	O3 Analyzer	Teledyne-API 400E	F	Spare
x-Shop	O3 Analyzer	Teledyne-API 400E	F	Spare
x-Shop	O3 Analyzer	Teledyne-API 400E	F	Spare
x-Shop	O3 Analyzer	Teledyne-API 400E	F	Spare
x-Shop	O3 Analyzer	Teledyne-API 400E	F	Spare
x-Shop	O3 Analyzer	Teledyne-API 400E	F	Spare
x-Shop	O3 Analyzer	Teledyne-API 400E	F	Spare
x-Shop	O3 Analyzer	Teledyne-API 400E	F	Spare
x-Shop	O3 Analyzer	Teledyne-API 400E	F	Spare
x-Shop	O3 Analyzer	Teledyne-API 400E	F	Spare
x-Shop	O3 Analyzer	Teledyne-API T400	G	Spare

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

Appendix K
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	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	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	G	Spare
x-Shop	Ozone Photometer	Teledyne-API 703E	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	Spare

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

Appendix K
KDAQ Equipment Inventory

Site Name	Item Description	Item Model	Condition	Status
x-Shop	PM10 Sampler	Partisol 2000	F	Spare
x-Shop	PM10 Sampler	Partisol 2000	F	Spare
x-Shop	PM10 Sampler	Partisol 2000	F	Spare
x-Shop	PM10 Sampler	Partisol 2000	F	Spare
x-Shop	PM10 Sampler	Partisol 2000	F	Spare
x-Shop	PM10 Sampler	Partisol 2000	F	Spare
x-Shop	PM10 Sampler	Partisol 2000	F	Spare
x-Shop	PM10 Sampler	Partisol 2000	P	Surplus
x-Shop	PM10 Sampler	Partisol 2000	P	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	Thermo Partisol 2000i	G	Spare
x-Shop	PM10 Sampler	Thermo Partisol 2000i	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1400A TEOM	F	Surplus
x-Shop	PM2.5 Continuous	Thermo 1400A TEOM	F	Surplus
x-Shop	PM2.5 Continuous	Thermo 1400A TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1400A TEOM	G	Surplus
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	G	Spare
x-Shop	PM2.5 Continuous	Thermo 1405 TEOM	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

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

Appendix K
KDAQ Equipment Inventory

Site Name	Item Description	Item Model	Condition	Status
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025 Sequential	F	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	PM2.5 Sampler	Partisol Plus 2025i Sequential	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API 100E	P	Surplus
x-Shop	SO2 Analyzer	Teledyne-API 100E	P	Surplus
x-Shop	SO2 Analyzer	Teledyne-API 100E	P	Surplus
x-Shop	SO2 Analyzer	Teledyne-API 100E	P	Surplus
x-Shop	SO2 Analyzer	Teledyne-API 100E	P	Surplus
x-Shop	SO2 Analyzer	Teledyne-API 100E	P	Surplus
x-Shop	SO2 Analyzer	Teledyne-API 100E	P	Surplus
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare

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

Appendix K
KDAQ Equipment Inventory

Site Name	Item Description	Item Model	Condition	Status
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API T100	G	Spare
x-Shop	SO2 Analyzer	Teledyne-API T100	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	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	G	Spare
x-Shop	VOC/Carbonyls Sampler	ATEC 2200	P	Spare
x-Shop	VOC/Carbonyls Sampler	ATEC 2200	P	Spare
x-Shop	VOC/Carbonyls Sampler	ATEC 2200	P	Spare
x-Shop	Zero Air Unit	Teledyne-API 701	F	Spare
x-Shop	Zero Air Unit	Teledyne-API 701	F	Spare
x-Shop	Zero Air Unit	Teledyne-API 701	F	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 701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API 701	G	Spare
x-Shop	Zero Air Unit	Teledyne-API 701	P	Surplus
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 L

PUBLIC COMMENTS

KENTUCKY DIVISION FOR AIR QUALITY
AMBIENT AIR MONITORING NETWORK
Comments Received 6/19/2022

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

A public comment period on the KENTUCKY DISVION FOR AIR QUALITY AMBIENT AIR MONITORING NETWORK PLAN 2022 was held from May 20, 2022 through June 19, 2022.

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

Name:
Westlake
Calvert City Environmental Consortium (Consortium)

The comments received from Westlake and the Consortium were related to the Calvert City Special Study described in Appendix G of this plan, as well as Near-Road Monitoring described in Appendix H of this plan. The comments received from Westlake and the Consortium are identical; as such, only one set of responses was drafted.

Summary of Comments

(1) **Comment:** Page 86 of KDAQ's July 2021 QAPP for Volatile Organic Compound Monitoring near the Calvert City Industrial Complex (Category II) states that after one-year of data collection KDAQ may either stop monitoring or may continue to monitor under updated project objectives and QA documents. As KDAQ plans to continue data collection, please provide the:

- Updated project objectives, including the intended purpose of the additional data, and
- Updated QA documents for the addition data collection.

Response: KDAQ is currently working with EPA to determine the appropriate course of action. A revision of the project's objectives and associated QA documents will be completed once EPA's risk assessment is completed and future data-needs are identified. In order to ensure continuity of the data, KDAQ and EPA have agreed that VOC monitoring should continue until the risk assessment is complete due to detections over the screening levels noted in the QAPP for certain chemicals monitored during the one-year study. Monitoring for VOCs is continuing under the general and primary data quality objectives found in Sections 8.1.3 and 8.1.4 of the QAPP. The measurement quality objectives for VOCs, found in Sections 8.2 and Appendix A of the QAPP, remain unchanged. A minor revision of the QAPP will be completed to clarify these intentions. All revisions of the study's QA documents will be provided.

(2) **Comment**: Appendix G further states that the meteorological instrumentation was shut down on December 31, 2021, due to safety concerns. What safety concerns did KDAQ have that resulted in shutting down the meteorological instrumentation?

Response: The meteorological equipment was located at the top of a 10 meter telescopic tower. When auditing or maintaining the instruments, the tower had to be slowly lowered with an attached mechanical crank-and-pulley system. There were multiple hazardous "pinch points" that staff had to avoid when lowering the tower. The tower also had the potential to lower too quickly, if safety catches did not engage. Finally, the tower did not fully lower to ground level; thus, a tall extension ladder had to be used to reach the instruments.

(3) **Comment:** How will the requirement for meteorological data for the additional data collection be met since the meteorological instrumentation was shut down?

Response: Meteorological data was collected during the one year period that will be used for the risk assessment. After the risk assessment has been completed, EPA and KDAQ will discuss the necessity of meteorological data and the appropriate data-source.

(4) **Comment:** Will the updated QA documents be amended to describe the new meteorological data source?

Response: Once the risk assessment has been completed, KDAQ plans to work with EPA on updating documents, which will include information on meteorological data.

(5) **Comment:** The stated objective in the LWD Site is "maximum expected ethylene dichloride concentration and meteorology". However, the LWD Site's monitor purpose is described as "characterization of maximum vinyl chloride concentration". Should the objective and the monitor purpose have the same chemical listed?

Response: The objective and monitor-purpose should be the same. The draft Network Plan contains an error. The Network Plan should state that the monitor purpose for LWD is the characterization of maximum ethylene dichloride concentration. This discrepancy has been corrected in the finalized Network Plan.

(6) **Comment:** The stated objective of the Johnson-Riley Road (JRR) Site is "maximum expected vinyl chloride concentration". However, the JRR Site's monitor purpose is described as "characterization of maximum ethylene dichloride concentration". Should the objective and monitor purpose have the same chemical listed?

Response: The objective and monitor purpose should be the same. The draft Network Plan contains an error. The Network Plan should state that the monitor purpose for Johnson-Riley Road is the characterization of maximum vinyl chloride concentration. This discrepancy has been corrected in the finalized Network Plan.

(7) **Comment:** Appendix H, Near-Road Monitoring: The Consortium/Westlake suggests adding VOCs to the list of constituents monitored since VOCs are a component of vehicle exhaust.

Response: The minimum monitoring requirements for near-road sites are established by 40 CFR part 58, which states "Near-road monitor means any approved monitor meeting the applicable specifications described in 40 CFR part 58, appendix D (sections 4.2.1, 4.3.2, 4.7.1(b)(2)) and appendix E (section 6.4(a), Table E-4) for near-road measurement of $PM_{2.5}$, CO, or NO_2." Kentucky is meeting near-road requirements per 40 CFR part 58. KDAQ has forwarded your recommendation for inclusion of VOCs in near-road requirements to EPA Region 4.

B. The Division received comments from one individual regarding heavy motor vehicle traffic near residences and schools in Middletown, KY.

Name:
Terry Wetherby

The comments received are directed towards to the network operated by LMAPCD in Jefferson County, as such LMPACD is responsible for providing the response. The LMAPCD network is outlined in Appendix E of this plan.

Comment: Please be advised that my primary interest is in drawing attention to Middletown, Kentucky, part of the Louisville area. We are the location of "multiple family apartment" housing units which represented, according to the 2020 census, just under one-half of our total housing units. Now, with more multi-family apartment developments under construction in Middletown, the "multiple family" apartments will soon exceed the number of single family detached homes, and their residents will drive their motor vehicles on Shelbyville Road, emitting exhaust, after all trees, if any exist on site, will all be removed with all other vegetation, most likely, following City of Middletown's usual approval.

We have one public high school and two public elementary schools in Middletown. We all think out-door sports, marching band, recess are good for our children. But how can that be true when the traffic one short block from each school is more and more congested and backed-up on Shelbyville Road, a major transportation and commercial corridor? Does anyone care to determine if the ambient air is something these young people should be breathing during soccer practice and games, while running track, while band members perform and practice out-of-doors, while grade school children "enjoy" recess, run track or just try to "enjoy" time outside?

Numerous schools are in Middletown and just outside Middle-town's boundaries. A Middle School is about one mile away, Crosby Middle School. A large Christian School is near-by. In Middletown and just outside its borders are parochial schools, more private schools, pre-schools, day-cares, home-schooled students, all breathing the ambient air. What will their fate be?

Particularly of note is Louisville Metro zoning case, 21-ZONE-0157, for 340 more apartments—550 bedrooms. A most "unfortunate" traffic count, for this case, was conducted utilizing very shortened hours for morning "peak" hours and curtailed hours for rush hour afternoon "peak" hours. This undermines public confidence in all layers of government and flies in the face of common sense and actual observation of the backed up traffic during hours ignored in those curtailed counts. Does anyone care?

Highway 60 (Shelbyville Road) is a major transportation corridor, running through Middletown, with I-264 nearby, and the Gene Snyder overpassing Shelbyville Road, in Middletown, all congested by on-ramps/off ramps narrow one-lane each way broken down roads feeding Shelbyville Road, further plaguing the area, with too much high traffic generating development nearby being sources of constantly escalating numbers of motor vehicles on Shelbyville Road, which will not be expanded (for a few short blocks) until (maybe) 2028.

Planning and infrastructure should precede development. Here, they never do. Anything, it appears, can be approved in Middletown, Kentucky, despite horrific consequences to the nearby communities and Middletown residents. In Middletown, the delayed, too-late "fixes" just trail development, obsolete before they are even planned, much less before the actual beginning of endless years of construction delays and more congestion while obsolete "infrastructure" comes to irrelevant fruition and developers continue what they do, gaining approvals, most likely taking out all trees (if any are still standing to remove) encountering little to no development impediment for the benefit of any public good such as community health.

Many other apartment units have been developed in the last year or so near Middletown. Middletown and Shelbyville Road are points of access to the interstates and Snyder Freeway, to actually well-planned housing and commercial developments east of the Snyder, to shopping in Middletown's commercial area on Shelbyville Road, just two blocks from the Snyder. Rezoning for apartment

complexes is rampant in this part of Jefferson County, and Middletown has a major traffic artery running through it.

Middletown needs air monitoring with the best equipment. We believe that we are ripe for mitigation, despite what some traffic "studies" appear to illustrate, referenced above. Surely Shelbyville Road at the Snyder has more ambient air pollution than Cannons Lane. It also has wind currents bringing pollutants from Bullitt County, through Middletown.

My apologies if this is not relevant to the objective of the comments.

- *Terry Wetherby*

Response: The Louisville Metro Air Pollution Control District (District) appreciates the opportunity to respond to this comment on the 2022 Kentucky Annual Ambient Air Monitoring Network Plan. At the outset, the District notes that it lacks authority to address issues related to zoning, so it has shared the Commenter's concerns with Louisville Metro Planning and Design Services, which is responsible for administering the policies, programs and regulations that guide Metro's development, and invites the Commenter to consider participating in the ongoing equity review of the Land Development Code (LDC); see https://louisvilleky.gov/government/planning-design/land-development-code-reform for more information. The LDC regulates how land throughout Louisville Metro is used and built upon. The LDC Reform is an equity focused approach to revise the LDC consistently with Plan 2040 to allow for increased housing choices and opportunities in new and existing neighborhoods, to create procedures and regulations that are easier to use, and increase the quality of life by reducing the concentration of environmental hazards near housing.

With respect to air quality, monitors in Jefferson County are sited to address compliance with the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. Criteria pollutants associated with mobile source emissions include particulate matter ($PM_{2.5}$) and ozone, which is formed when oxides of nitrogen (NOx) and Volatile Organic Compounds (VOCs) – both emitted from cars and other sources -- combine during the summer ozone season. Compliance with EPA siting criteria for the District's air monitoring network is evaluated every year and included in the Kentucky Division for Air Quality's (KyDAQ) Annual Ambient Air Monitoring Network Plan. At this point, each monitoring station in the existing network has been reviewed by the District and determined to meet all design criteria for inclusion in the 2022 Kentucky Ambient Air Monitoring Network.

In addition to the annual review, the District's ambient air monitoring network periodically undergoes a multi-year assessment to determine if additional monitoring sites are needed or if existing sites have met their monitoring objectives and may be discontinued. This evaluation takes into account changes in EPA regulations, population shifts, changes in emission sources, and revisions to the NAAQS. The purpose of this assessment is to determine if, over the next several years, the network will continue to meet the monitoring requirements as defined in 40 CFR Part 58, Appendix, D, new sites are needed in the network, existing sites can be eliminated, or new technologies are needed to determine ambient air quality. In the District's 2015 assessment, the District determined that the particulate matter and ozone monitoring network within Louisville Metro exceeds the EPA minimum monitoring requirements. Additionally, the spatial distribution of the monitoring network was found to be adequate, with each monitor representing a reasonably consistent portion of the population.

The District is currently preparing its next multi-year assessment, which will take into account EPA's proposed revision to the NAAQS for particulate matter expected later this summer, the change from the Buckner monitor to the Cannons Lane monitor as the site measuring the highest ozone concentrations, and the factors listed above, including population shifts, such as those raised by the Commenter regarding possible increases in population in and around Middletown, and evaluate whether additional monitoring sites should be stablished.

Westlake

June 15, 2022

Kentucky Division for Air Quality
Ms. Jenna Nall, Environmental Scientist III
300 Sower Boulevard, 2nd Floor
Frankfort, KY 40601
Email: jenna.nall@ky.gov

Re: Comments on Kentucky Annual Ambient Air Monitoring Network Plan 2022

Dear Ms. Nall:

Westlake appreciates the opportunity to submit comments and questions on the Kentucky Annual Ambient Air Monitoring Network Plan 2022.

Appendix G, Calvert City Special-Purpose Monitoring

In Appendix G of the Kentucky Annual Ambient Air Monitoring Network Plan 2022, the Kentucky Division for Air Quality (KDAQ) states that it will conduct a special-purpose monitoring study to collect one-year of data for EPA to perform a health-risk assessment. Appendix G further states that the 12 months of data collection required by the Quality Assurance Project Plan (QAPP) occurred between October 24, 2020 and October 31, 2021. Even though Appendix G states that data collection for the risk assessment is complete, KDAQ plans to continue VOC sample collection at the three special-purpose monitoring sites until the risk assessment results are released.

Page 86 of KDAQ's July 2021 QAPP for Volatile Organic Compound Monitoring near the Calvert City Industrial Complex (Category II) states that after one-year of data collection KDAQ may either stop monitoring or may continue to monitor under updated project objectives and QA documents. As KDAQ plans to continue data collection, please provide the:

- Updated project objectives, including the intended purpose of the additional data, and
- Updated QA documents for the additional data collection.

Appendix G further states that the meteorological instrumentation was shut down on December 31, 2021, due to safety concerns.

- What safety concerns did KDAQ have that resulted in shutting down the meteorological instrumentation?
- How will the requirement for meteorological data for the additional data collection be met since the meteorological instrumentation was shut down?
- Will the updated QA documents be amended to describe the new meteorological data source?

Westlake

Appendix G Table, Calvert City Study: Site & Monitor Summary

- The stated objective of the LWD Site is "maximum expected ethylene dichloride concentration and meteorology". However, the LWD Site's monitor purpose is described as "characterization of maximum vinyl chloride concentration". Should the objective and monitor purpose have the same chemical listed?
- The stated objective of the Johnson-Riley Road (JRR) Site is "maximum expected vinyl chloride concentration". However, the JRR Site's monitor purpose is described as "characterization of maximum ethylene dichloride concentration". Should the objective and monitor purpose have the same chemical listed?

Appendix H, Near-Road Monitoring

- Westlake suggests adding VOCs to the list of constituents monitored since VOCs are a component of vehicle exhaust.

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 if you have any questions.

Sincerely,

Kevin P. Sheridan
Senior Regional Manager – HSE

cc: Toni G. Darnall – Westlake Vinyls, Inc.

June 16, 2022

Kentucky Division for Air Quality
Ms. Jenna Nall, Environmental Scientist III
300 Sower Boulevard, 2nd Floor
Frankfort, KY 40601
Email: jenna.nall@ky.gov

Re: Comments on Kentucky Annual Ambient Air Monitoring Network Plan 2022

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 2022 Ambient Air Monitoring Network Plan.

Appendix G, Calvert City Special-Purpose Monitoring

In Appendix G of the Kentucky Annual Ambient Air Monitoring Network Plan 2022, the Kentucky Division for Air Quality (KDAQ) states that it will conduct a special-purpose monitoring study to collect one-year of data for EPA to perform a health-risk assessment. Appendix G further states that the 12 months of data collection required by the Quality Assurance Project Plan (QAPP) occurred between October 24, 2020 and October 31, 2021. Even though Appendix G states that data collection for the risk assessment is complete, KDAQ plans to continue VOC sample collection at the three special-purpose monitoring sites until the risk assessment results are released.

Page 86 of KDAQ's July 2021 QAPP for Volatile Organic Compound Monitoring near the Calvert City Industrial Complex (Category II) states that after one-year of data collection KDAQ may either stop monitoring or may continue to monitor under updated project objectives and QA documents. As KDAQ plans to continue data collection, please provide the:

- Updated project objectives, including the intended purpose of the additional data, and
- Updated QA documents for the additional data collection.

Appendix G further states that the meteorological instrumentation was shut down on December 31, 2021, due to safety concerns.

- What safety concerns did KDAQ have that resulted in shutting down the meteorological instrumentation?
- How will the requirement for meteorological data for the additional data collection be met since the meteorological instrumentation was shut down?
- Will the updated QA documents be amended to describe the new meteorological data source?

Appendix G, Table, Calvert City Study: Site & Monitor Summary

- The stated objective of the LWD Site is "maximum expected ethylene dichloride concentration and meteorology". However, the LWD Site's monitor purpose is described as "characterization of maximum vinyl chloride concentration". Should the objective and monitor purpose have the same chemical listed?
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Appendix H, Near-Road Monitoring

- The Consortium suggests adding VOCs to the list of constituents monitored since VOCs are a component of vehicle exhaust.

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 if you have any questions.

Sincerely,

Toni G Darnall

Toni G. Darnall
Chair – Calvert City Environmental Consortium

cc: Environmental Consortium members

Please be advised that my primary interest is in drawing attention to Middletown, Kentucky, part of the Louisville area. We are the location of "multiple family apartment" housing units which represented, according to the 2020 census, just under one-half of our total housing units. Now, with more multi-family apartment developments under construction in Middletown, the "multiple family" apartments will soon exceed the number of single family detached homes, and their residents will drive their motor vehicles on Shelbyville Road, emitting exhaust, after all trees, if any exist on site, will all be removed with all other vegetation, most likely, following City of Middletown's usual approval.

We have one public high school and two public elementary schools in Middletown. We all think out-door sports, marching band, recess are good for our children. But how can that be true when the traffic one short block from each school is more and more congested and backed-up on Shelbyville Road, a major transportation and commercial corridor? Does anyone care to determine if the ambient air is something these young people should be breathing during soccer practice and games, while running track, while band members perform and practice out-of-doors, while grade school children "enjoy" recess, run track or just try to "enjoy" time outside?

Numerous schools are in Middletown and just outside Middle-town's boundaries. A Middle School is about one mile away, Crosby Middle School. A large Christian School is near-by. In Middletown and just outside its borders are parochial schools, more private schools, pre-schools, day-cares, home-schooled students, all breathing the ambient air. What will their fate be?

Particularly of note is Louisville Metro zoning case, 21-ZONE-0157, for 340 more apartments—550 bedrooms. A most "unfortunate" traffic count, for this case, was conducted utilizing very shortened hours for morning "peak" hours and curtailed hours for rush hour afternoon "peak" hours. This undermines public confidence in all layers of government and flies in the face of common sense and actual observation of the backed up traffic during hours ignored in those curtailed counts. Does anyone care?

Highway 60 (Shelbyville Road) is a major transportation corridor, running through Middletown, with I-264 nearby, and the Gene Snyder overpassing Shelbyville Road, in Middletown, all congested by on-ramps/off ramps narrow one-lane each way broken down roads feeding Shelbyville Road, further plaguing the area, with too much high traffic generating development nearby being sources of constantly escalating numbers of motor vehicles on Shelbyville Road, which will not be expanded (for a few short blocks) until (maybe) 2028.

Planning and infrastructure should precede development. Here, they never do. Anything, it appears, can be approved in Middletown, Kentucky, despite horrific consequences to the nearby communities and Middletown residents. In Middletown, the delayed, too-late "fixes" just trail development, obsolete before they are even planned, much less before the actual beginning of endless years of construction delays and more congestion while obsolete "infrastructure" comes to irrelevant fruition and developers continue what they do, gaining approvals, most likely taking out all trees (if any are still standing to remove) encountering little to no development impediment for the benefit of any public good such as community health.

Many other apartment units have been developed in the last year or so near Middletown. Middletown and Shelbyville Road are points of access to the interstates and Snyder Freeway, to actually well-planned housing and commercial developments east of the Snyder, to shopping in Middletown's commercial area on Shelbyville Road, just two blocks from the Snyder. Rezoning for apartment

complexes is rampant in this part of Jefferson County, and Middletown has a major traffic artery running through it.

Middletown needs air monitoring with the best equipment. We believe that we are ripe for mitigation, despite what some traffic “studies” appear to illustrate, referenced above. Surely Shelbyville Road at the Snyder has more ambient air pollution than Cannons Lane. It also has wind currents bringing pollutants from Bullitt County, through Middletown.

My apologies if this is not relevant to the objective of the comments.

Terry Wetherby

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KDAQ AIR MONITORING STATIONS
BY
REGIONAL OFFICE

2022 KDAQ Monitoring Network Stations by Regional Office

AQS ID	SITE NAME	COUNTY	PAGE
Region 1 - Hazard Regional Office			
21-193-0003	Hazard	Perry	104
21-195-0002	Pikeville Primary	Pike	106
Region 2 - Frankfort Regional Office (Bluegrass Area)			
21-067-0012	Lexington Primary (Newtown)	Fayette	62
21-113-0001	Nicholasville	Jessamine	64
21-151-0005	Eastern Kentucky University (EKU)	Madison	96
Region 3 - Florence Regional Office			
21-015-0008	Nature Center	Boone	34
21-037-3002	Northern Kentucky University (NKU)	Campbell	36
Region 4 - Owensboro Regional Office			
21-059-0005	Owensboro Primary	Daviess	84
21-091-0012	Lewisport	Hancock	86
21-101-1011	Sebree SO_2 DRR Site	Henderson	48
Region 5 - Ashland Regional Office			
21-019-0002	21st and Greenup	Boyd	52
21-019-0017	Ashland Primary (FIVCO)	Boyd	54
21-043-0500	Grayson Lake	Carter	56
21-089-0007	Worthington	Greenup	58
Region 7 - Frankfort Regional Office (North Central Area)			
21-029-0006	Shepherdsville	Bullitt	68
21-093-0006	Elizabethtown (E-town)	Hardin	44
21-185-0004	Buckner	Oldham	70
Region 8 - Paducah Regional Office			
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21-139-0003	Smithland	Livingston	92
21-145-1024	Jackson Purchase (Paducah Primary)(JPRECC)	McCracken	94
Region 9 - Bowling Green Regional Office			
21-213-0004	Franklin	Simpson	102
21-227-0009	Ed Spear Park (Smiths Grove)	Warren	30
Region 10 - London Regional Office			
21-013-0002	Middlesboro	Bell	90
21-199-0003	Somerset	Pulaski	98