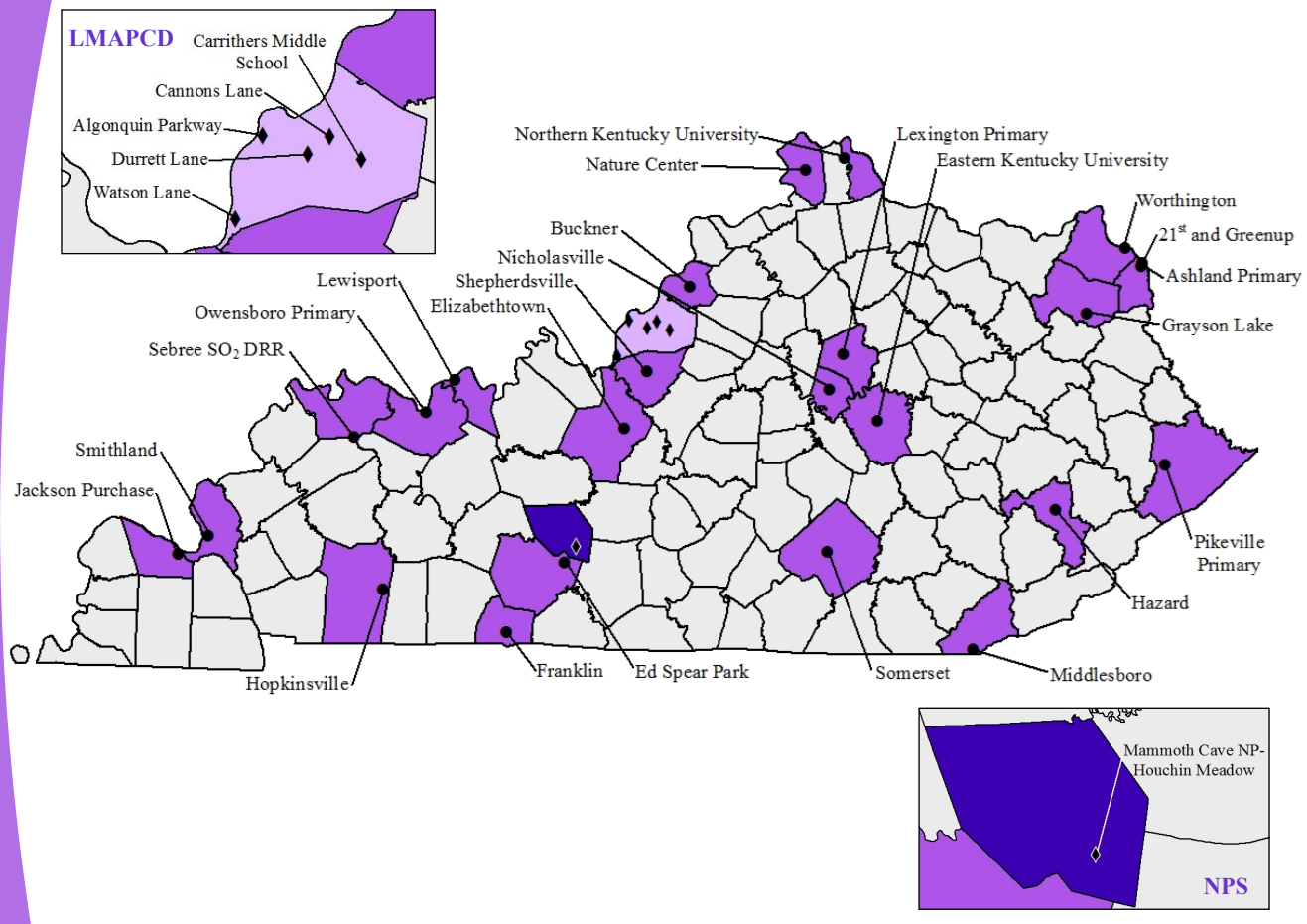
Kentucky
Annual Ambient Air Monitoring Network Plan 2021



Commonwealth of Kentucky Energy & Environment Cabinet
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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 2021 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

INTRODUCTION

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

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

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

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

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

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

1. The Air Quality System (AQS) site identification number for existing stations.

2. The location, including the street address and geographical coordinates, for each monitoring station.

3. The sampling and analysis method used for each measured parameter.

4. The operating schedule for each monitor.

5. Any proposal to remove or move a monitoring station within a period of eighteen months following the plan submittal.

6. The monitoring objective and spatial scale of representativeness for each monitor.

7. The identification of any site that is suitable for comparison against the $PM_{2.5}$ 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 2021

During the 2021-2022 monitoring year, KDAQ will operate 75 instruments, including 10 meteorological stations, located at 24 ambient air monitoring sites in 23 Kentucky counties. LMAPCD will operate an additional 32 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 112 instruments, including 16 meteorological stations, located at 30 sites across 25 counties of the Commonwealth.

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

METROPOLITAN STATISTICAL AREAS

Cincinnati, OH-KY-IN

- Due to siting issues that could not be resolved, the East Bend (21-015-0003) air monitoring station will be relocated to a new site, located at the Boone County Extension Environmental and Nature Center, as soon as feasible. The East Bend site is equipped with an ozone monitor and meteorological equipment. The new Nature Center site (21-015-0008) will be equipped with an ozone monitor but will not have meteorological equipment due to the proximity of a Kentucky Mesonet station. The East Bend site will be permanently discontinued. See Appendix H for additional information.

Huntington-Ashland, KY

- The intermittent FRM $PM_{2.5}$ primary sampler at Grayson Lake (21-043-0500) will be shutdown, effective 12/31/2021.
- A continuous FEM $PM_{2.5}$ monitor will be installed at Grayson Lake (21-043-0500), effective 1/1/2022. The FEM monitor will be designated as SLAMS and will be eligible for comparison against the NAAQS.

Louisville-Jefferson County, KY-IN

- The maximum ozone site for the CBSA will be changed from Buckner (21-185-0004) to Cannons Lane (21-111-0067) due to results from KDAQ's 2020 Five-Year Network Assessment.

SUMMARY OF KDAQ NETWORK CHANGES 2021

MICROPOLITAN STATISTICAL AREAS

Paducah, KY

- As a cost-saving measure, the intermittent FRM PM_{10} sampler at Jackson Purchase (21-145-1024) will be shutdown, effective 12/31/2021. The sampler is designated as SLAMS, but is not needed to meet minimum monitoring requirements. The sampler has never exceeded the NAAQS since establishment in 2013. In the past five years, the maximum daily 24-hour concentrations have not exceeded 30.7% of the NAAQS. KDAQ's 2020 Five-Year Network Assessment determined that the sampler is not ideally located, based upon the locations PM_{10} emission sources. The assessment also determined the sampler was a candidate for shutdown.

Annual Maximum 24-Hour PM_{10} Concentrations: Jackson Purchase (21-145-1024)					
Year	**2016**	**2017**	**2018**	**2019**	**2020**
24-Hour Concentration (ug/m^3)	32	27	46	30	32
% NAAQS (150 ug/m^3)	21.3	18.0	30.7	20.0	21.3

NOT IN A CBSA

Hazard, KY

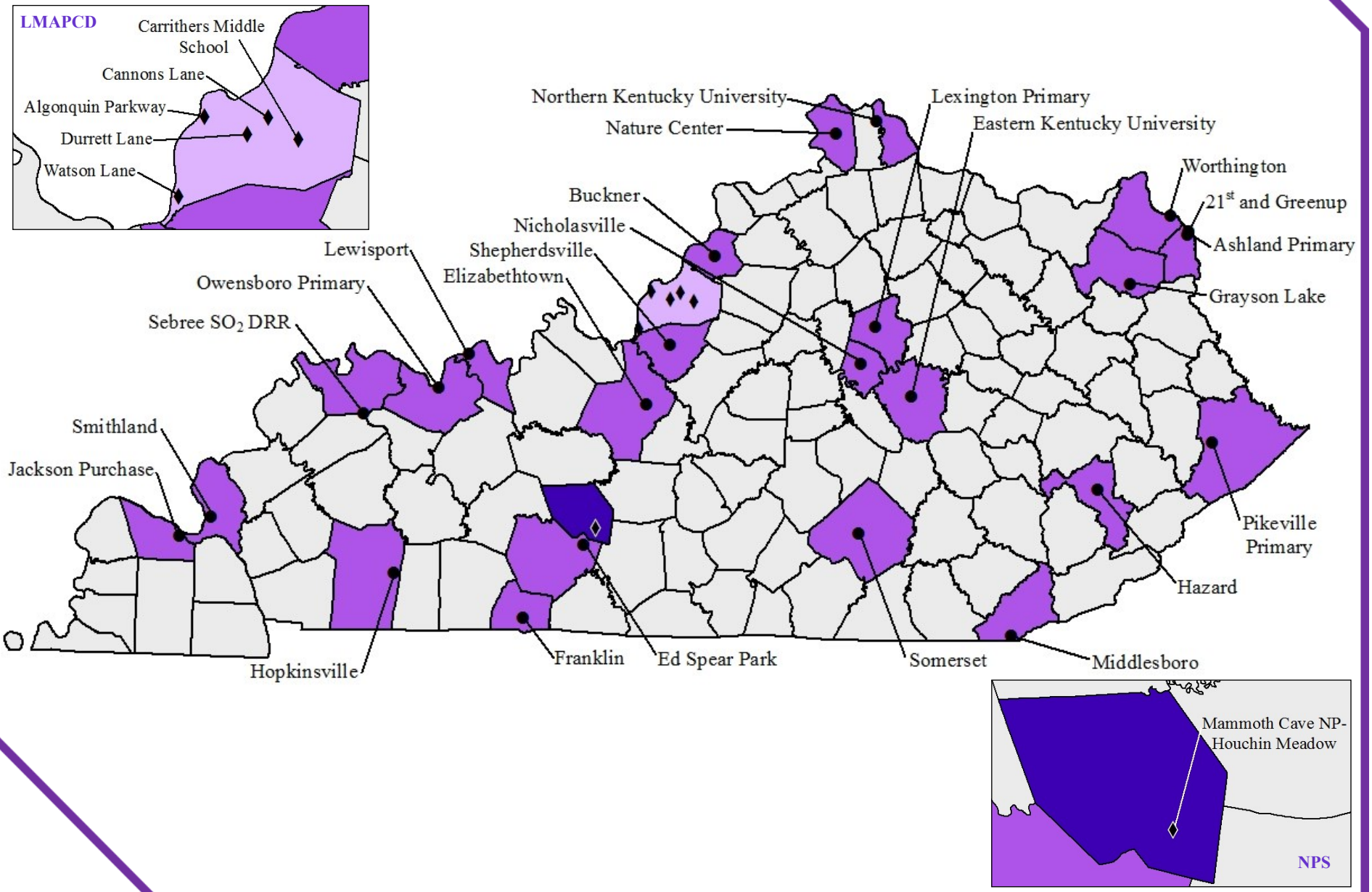
- The ozone monitor at Hazard (21-193-0003) will be changed from neighborhood scale to urban scale due to results from KDAQ's 2020 Five-Year Network Assessment.

2021 AIR MONITORING STATIONS SUMMARY

Metropolitan Statistical Area	Site Count	Filter Based $PM_{2.5}$	Continuous $PM_{2.5}$	PM_{10}	Continuous PM_{10}/PM_{coarse}	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^{i}	1^{i}			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^{i}	1^{i}			$3^{i,Max}$		2^{D}	2^{D}	1					2
Lexington-Fayette, KY (AQI)	2		1^{i}	1^{m}		2^{i}	$1^{r40,i}$			$2^{i,Max}$								1	1
Louisville-Jefferson County, KY-IN (AQI) (PWEI)	7	$2^{n,C}$	$5^{i,S}$		$2^{i,E}$	3^{i}	$2^{n,i}$	1	$2^{n,i}$	$5^{i,Max}$		2^{G}	1		1	1	1	1	6^{n}
Owensboro, KY	2		$1^{i,S}$			1^{i}	1^{i}			$2^{i,Max}$									1
Micropolitan Statistical Area																			
Paducah, KY-IL	2		$1^{i,S}$			1^{i}	1^{i}			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	10
LMAPCD Totals	5	2	5	0	2	3	2	1	2	3	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**	**25**	**2**	**4**	**3**	**1**	**1**	**1**	**1**	**3**	**16**

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)

2021 Ambient Air Monitoring Network



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STATION DESCRIPTION FORMAT

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STATION DESCRIPTION FORMAT

AQS Site Identification Information

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

Network Station Description

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

1. Site Description

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

2. Date Established

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

3. Site Approval Status

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

4. Monitoring Objectives

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

(a) To determine compliance with ambient air quality standards and to plan measures in order to attain these standards.

(b) To activate emergency control procedures in the event of an impending air pollution episode.

(c) To observe pollution trends throughout a region including rural areas and report progress made toward meeting ambient air quality standards.

(d) To provide a database for the evaluation of the effects of air quality on population, land use, and transportation planning; to provide a database for the development and evaluation of air dispersion models.

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

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

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

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

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

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

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

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

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

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

Population Weighted Emissions Index (PWEI): On June 22, 2010, the US EPA released a new SO_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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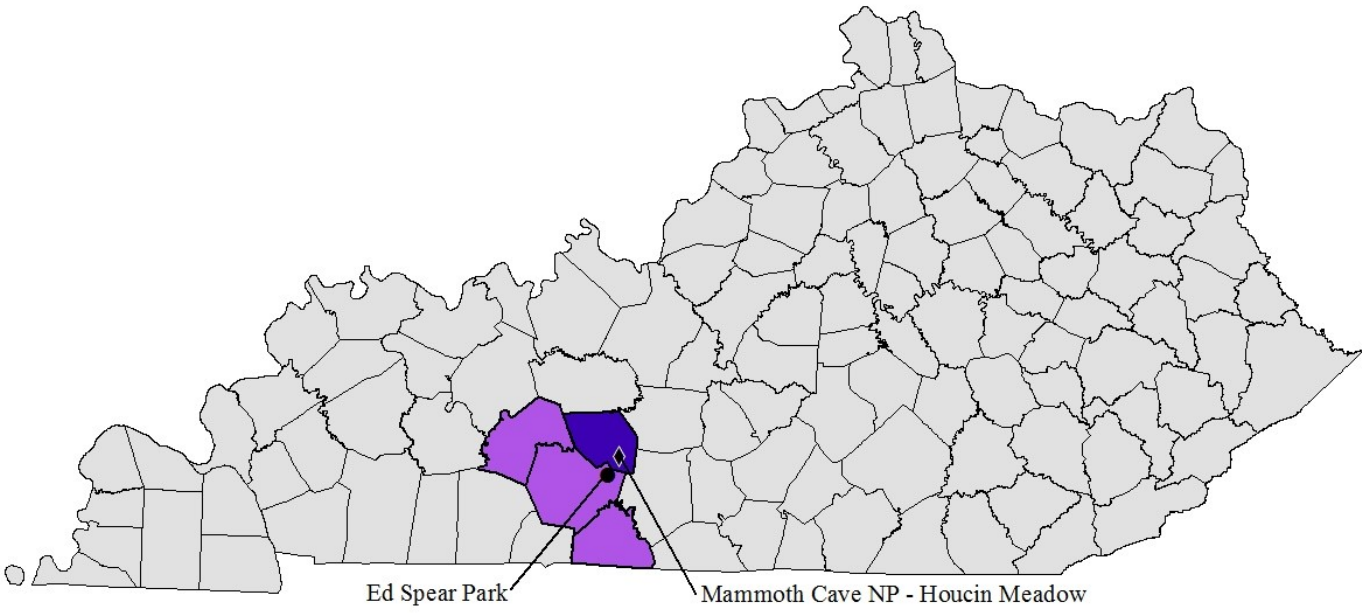
Bowling Green, KY



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

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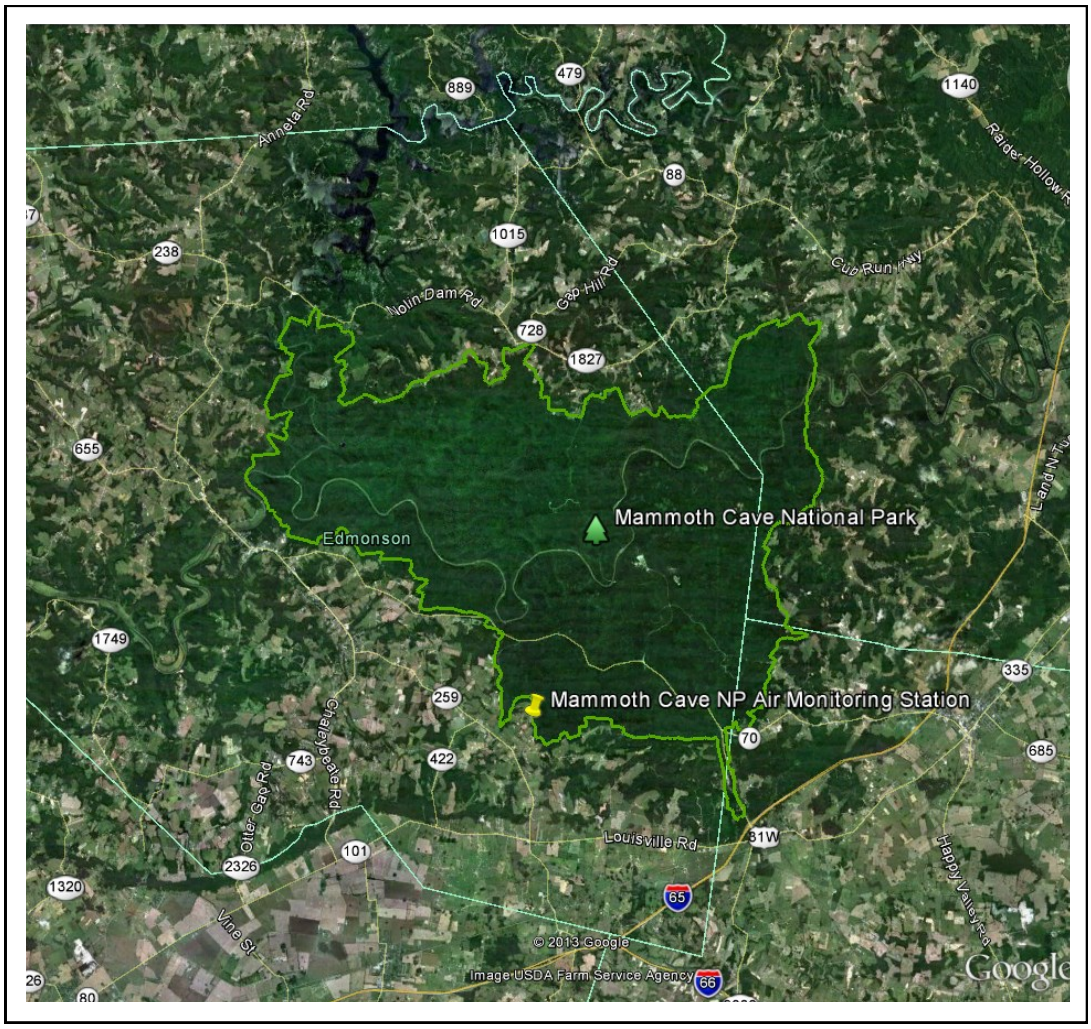
CSA/MSA: Bowling Green-Glasgow, KY CSA; Bowling Green, KY MSA
401 KAR 50:020 Air Quality Region: South Central Kentucky Intrastate (105)
Site Name: Mammoth Cave National Park-Houchin Meadow
AQS Site ID: 21-061-0501
Location: Alfred Cook Road, Park City, KY 42160
County: Edmonson
GPS Coordinates: 37.13182, -86.147944 (NAD83)
Date Established: August 1, 1997
Inspection Date: October 7, 2020
Inspection By: Jenna Nall

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	9.2	CASTNET Maximum O_3 Non-EPA Federal	Automated Equivalent Method utilizing UV photometry analysis	Continuously
Sulfur Dioxide	9.0	Non-EPA Federal	Automated Equivalent Method utilizing trace level UV fluorescence analysis	Continuously
Total Reactive Nitrogen (NO/NO_Y)	9.0	Non-EPA Federal	Automated method utilizing trace level chemiluminescence analysis	Continuously
Carbon Monoxide	9.0	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	12.4	Non-EPA Federal	AQM grade instruments for wind speed, wind direction, solar radiation, precipitation, humidity, barometric pressure, and temperature	Continuously



CSA/MSA: Bowling Green-Glasgow, KY CSA; Bowling Green, KY MSA
401 KAR 50:020 Air Quality Region: South Central Kentucky Intrastate (105)
Site Name: Ed Spear Park (Smiths Grove)
AQS Site ID: 21-227-0009
Location: 226 Sunset Street, Smiths Grove, KY 42171
County: Warren
GPS Coordinates: 37.04926, -86. 21487 (NAD83)
Date Established: May 3, 2012
Inspection Date: October 7, 2020
Inspection By: Jenna Nall
Site Approval Status: Siting and monitor design has been approved by the EPA.

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.

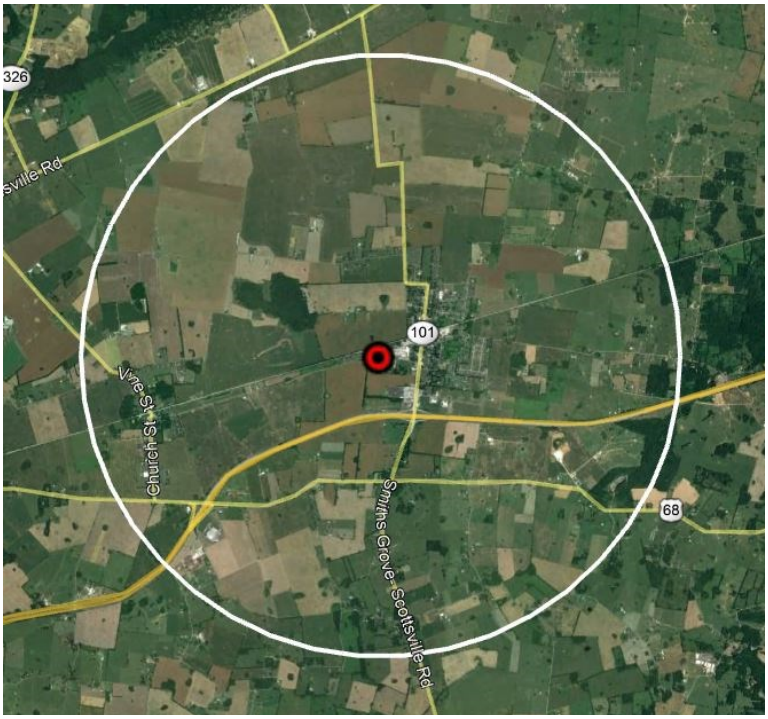
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards. While not required for the CBSA, the site also provides levels of ozone and particulate matter for daily index reporting.

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	4.67	SLAMS	Broadband Spectroscopy	Continuously
Collocated FEM $PM_{2.5}$ Continuous	4.68	SLAMS	Broadband Spectroscopy	Continuously

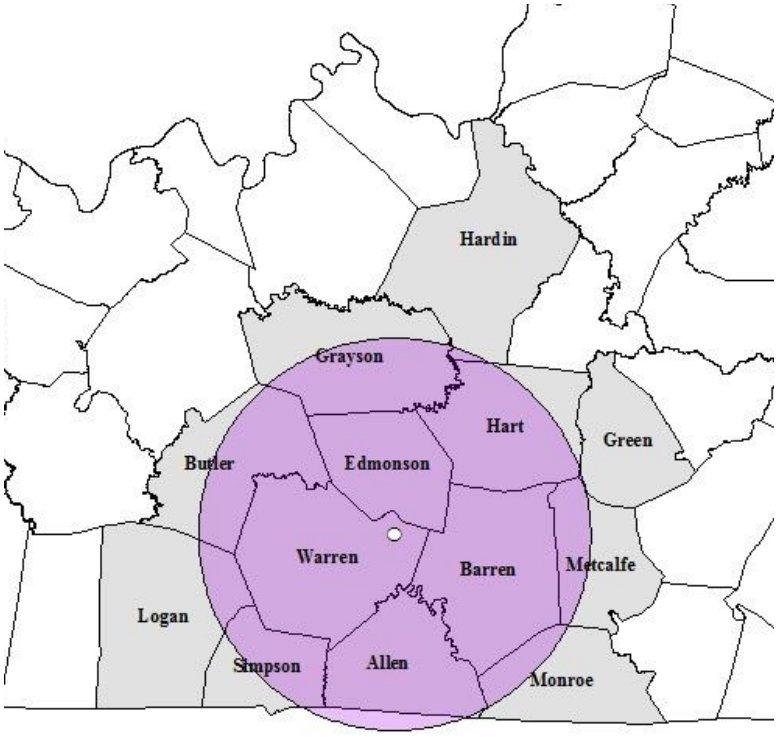
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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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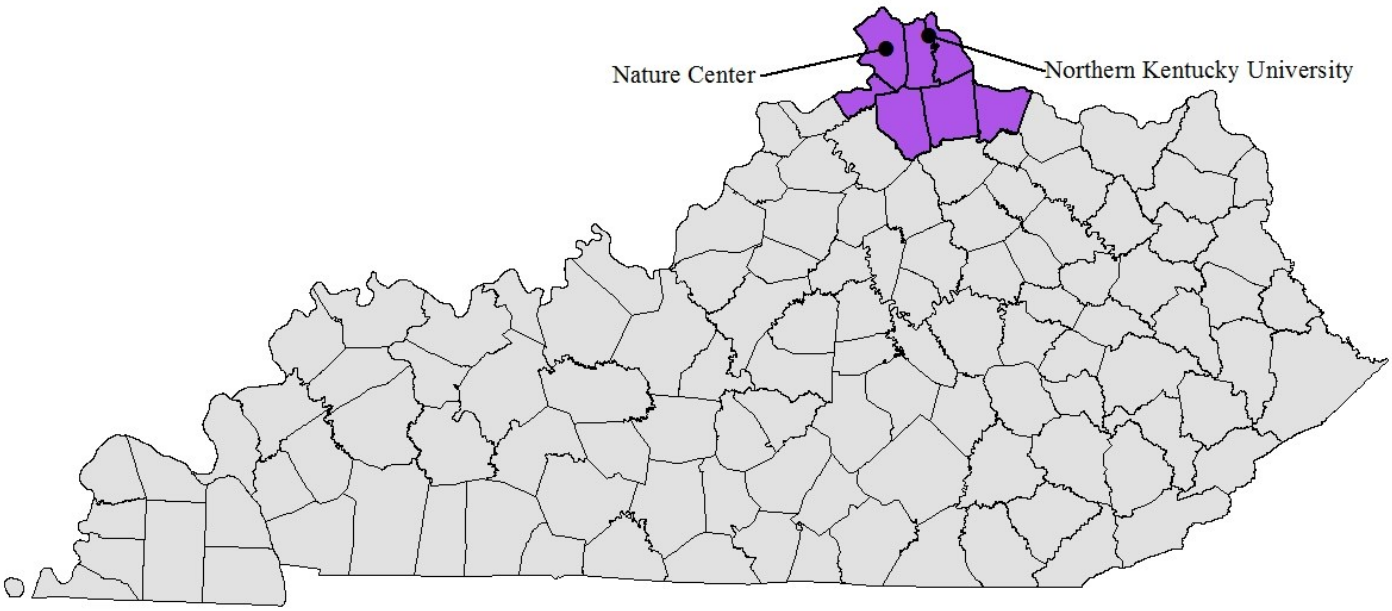
Cincinnati, OH-KY-IN



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[i]	1[i]			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: 38.967461, -84.721483 (NAD 83)
Date Established: TBD
Inspection Date: TBD
Inspection By: TBD
Site Approval Status: TDB

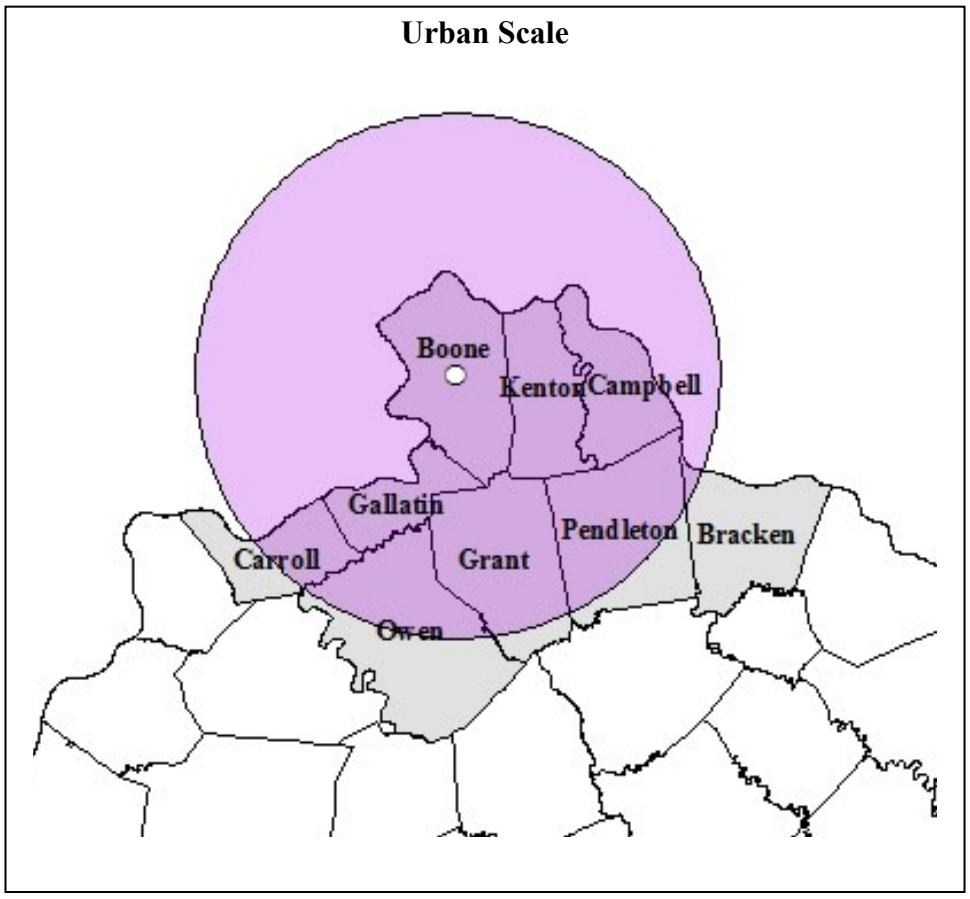
Due to siting issues that could not be resolved at East Bend (21-015-0003), the site had to be relocated. At the time of publication, KDAQ is currently working on establishing the site. The monitoring site will be a stationary equipment shelter located on the grounds of the Boone County Extension Environmental and Nature Center. Due to the proximity of a Kentucky Mesonet site, meteorological instrumentation will not carry over from the East Bend site. See Appendix H for additional information.

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	TBD	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: October 14, 2020
Inspection By: Jenna Nall and Lisa Hicks
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.

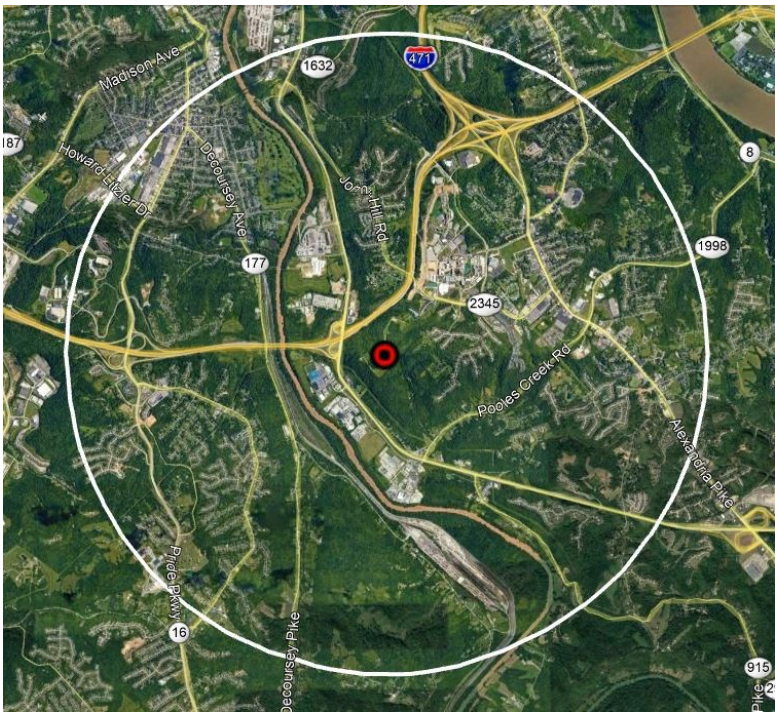
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to provide ozone, particulate, nitrogen dioxide, and sulfur dioxide levels for daily index reporting; and to detect elevated pollutant levels for activation of emergency control procedures 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 AQI	Chemiluminescence	Continuously
AEM Ozone	3.74	SLAMS AQI EPISODE	UV photometry	Continuously March 1 – October 31
FRM $PM_{2.5}$	4.58	SLAMS	Gravimetric	24-hours every third day
Collocated FRM $PM_{2.5}$	4.58	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 AQI	UV fluorescence	Continuously

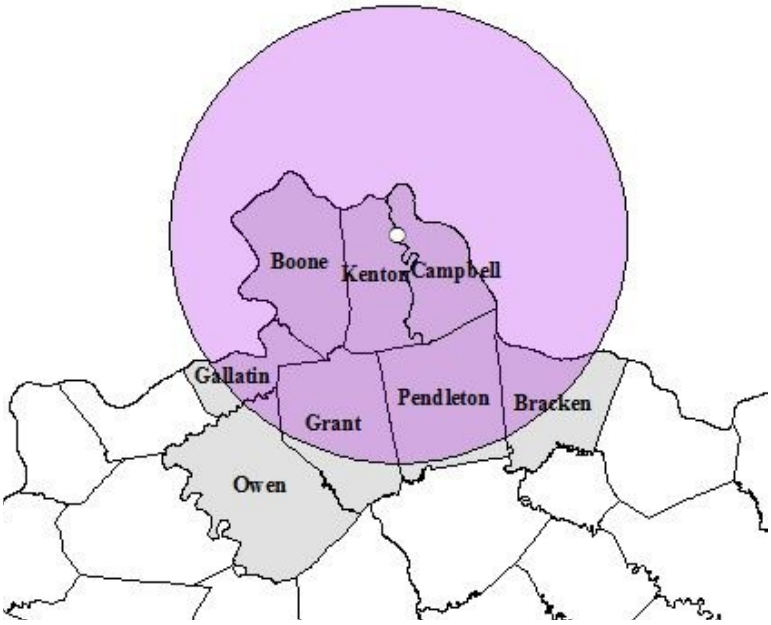
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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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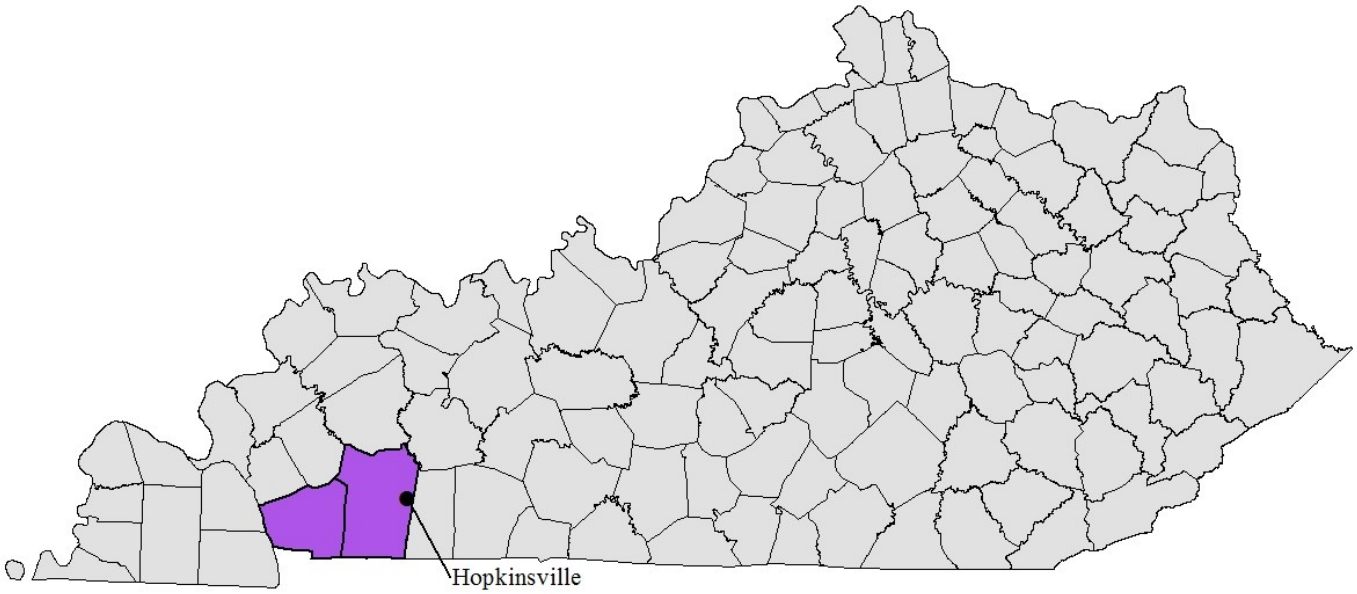
Clarksville, TN-KY



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]									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.

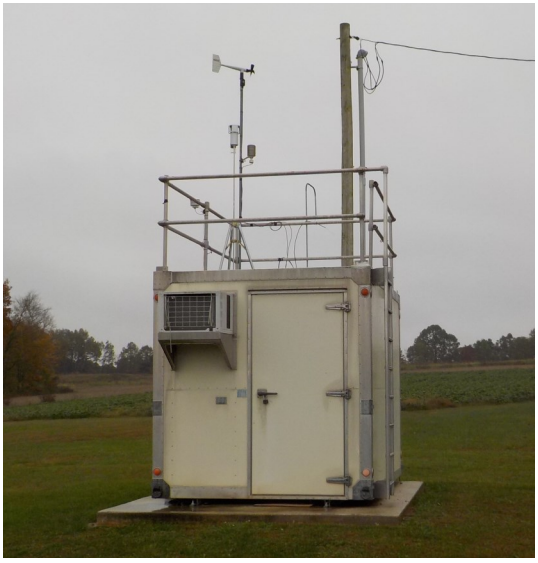
X =Regional Transport PM2.5 Monitor

i =AQI Reported

S =Continuous T640 Monitor

Rev. 5/12/2021

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: July 24, 2020
Inspection By: Jennifer Miller
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.

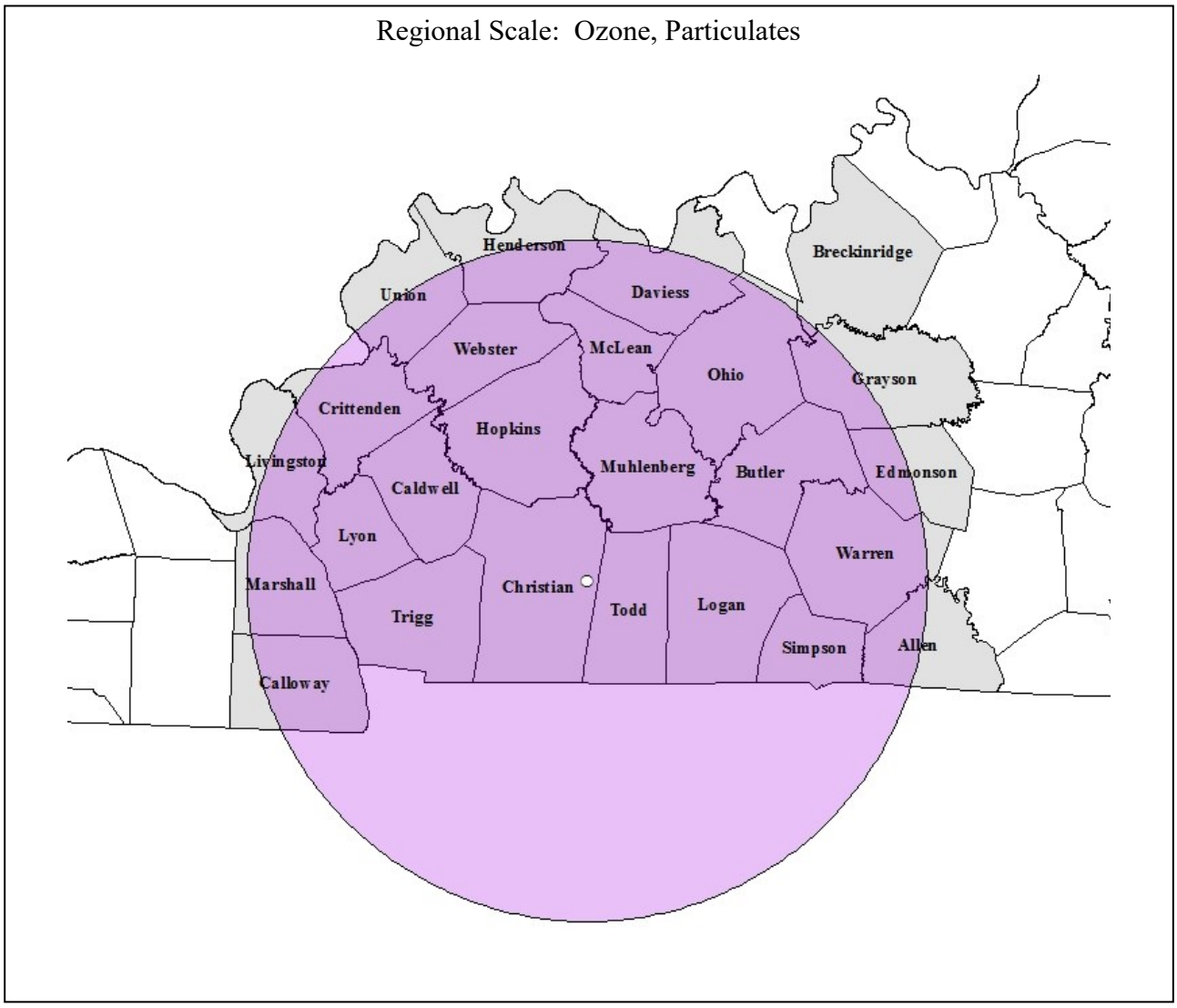
Monitoring Objective:

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	3.69	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.7	SLAMS AQI	Broadband Spectroscopy	Continuously
Meteorological	5.7	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:
This site represents population exposure on a regional scale for ozone and $PM_{2.5}$.



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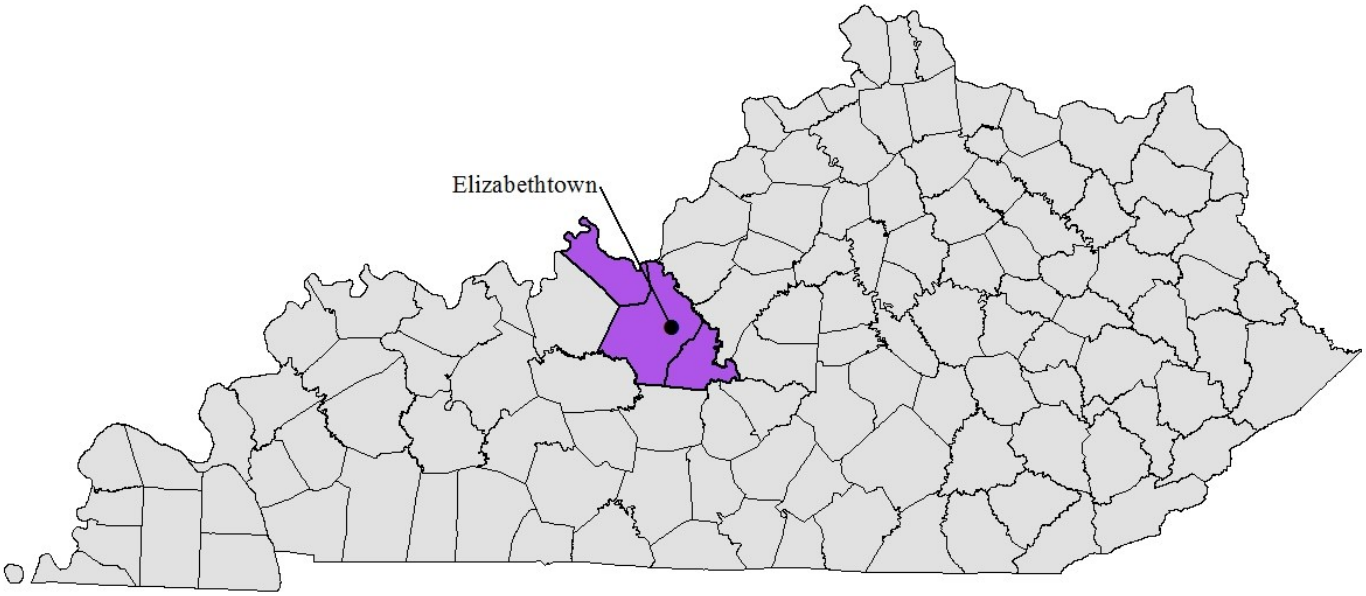
Elizabethtown-Fort Knox, KY



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 28, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

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

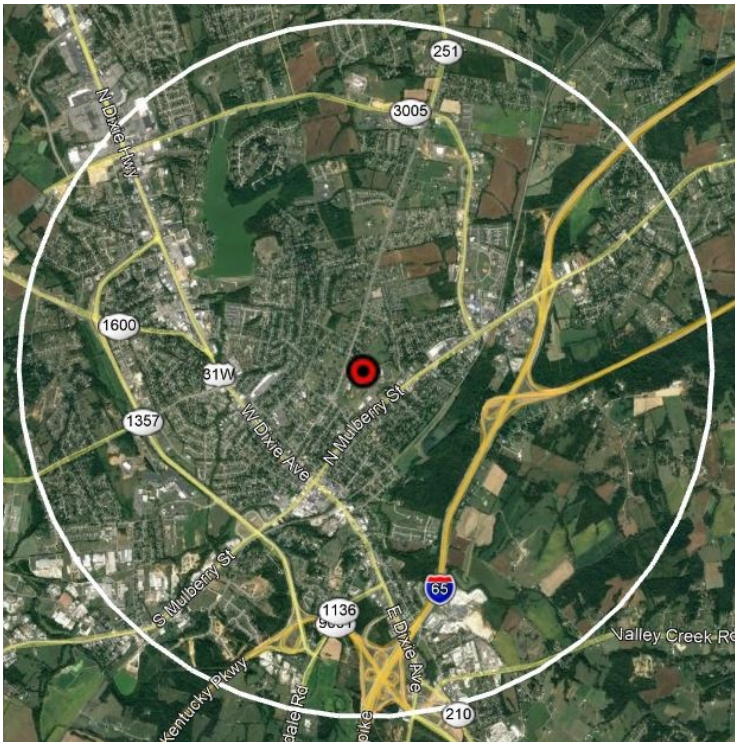
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

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 $PM_{2.5}$	4.65	SLAMS	Gravimetric	24-hours every sixth day

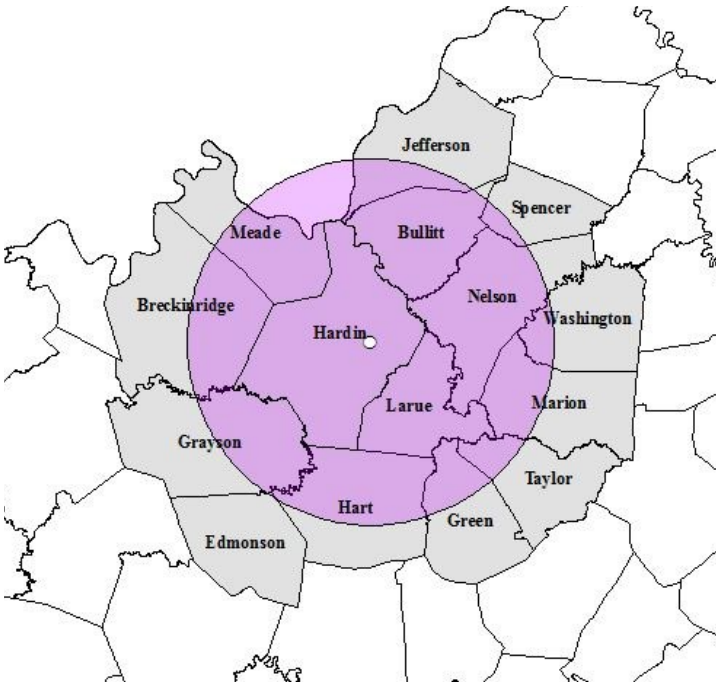
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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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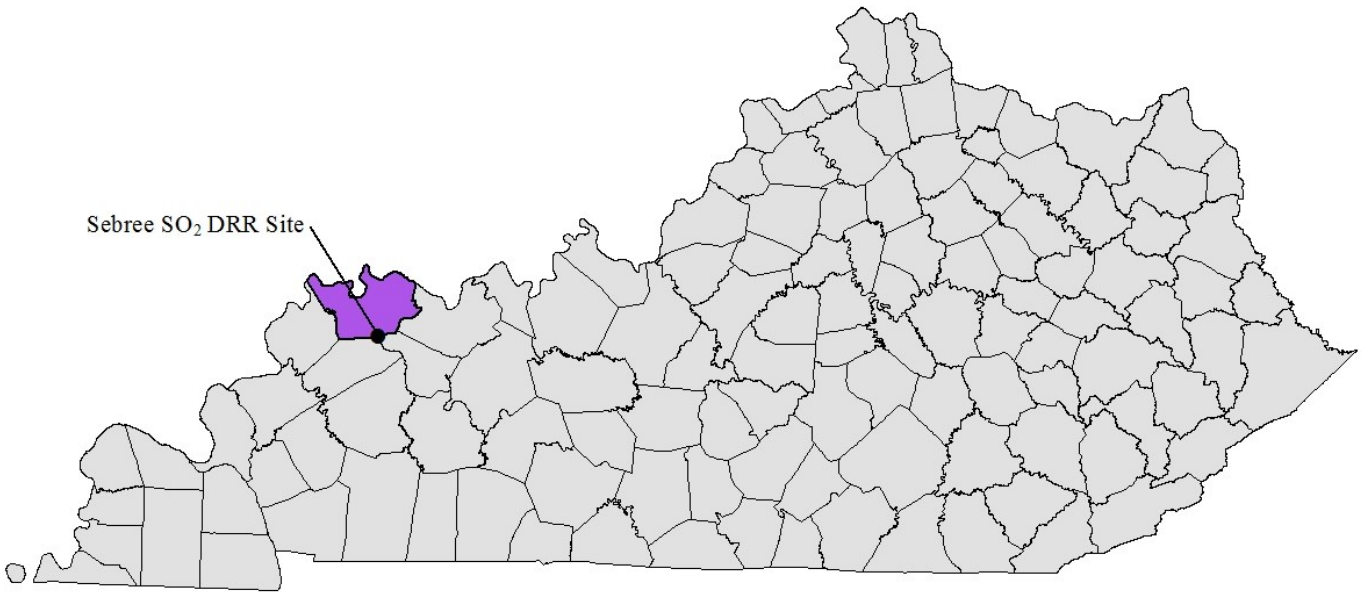
Evansville, IN-KY



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
Date Established: January 1, 2017
Inspection Date: September 29, 2020
Inspection By: Jenna Nall
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	3.91	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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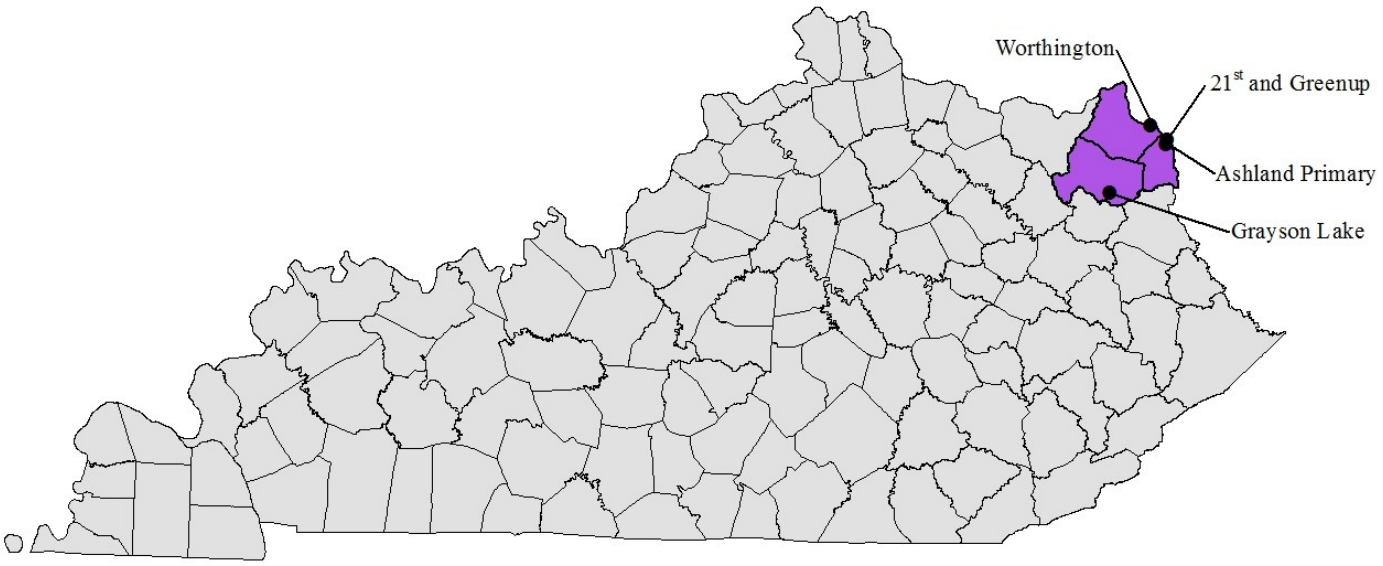
Huntington-Ashland, WV-KY-OH



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		$1^{S,i}$			$1^{e,i}$	$1^{e,i}$			$1^{e,i,M}$									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. 5/12/2021

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, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

The monitoring site is located on the west end of the roof of the Valvoline Oil complex building in Ashland, Kentucky. The building is one story tall. The sample inlets are 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 and E.

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

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, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

The monitoring site is a stationary equipment shelter located on the grounds of the health department building in Ashland, Kentucky. The sample inlets are 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.

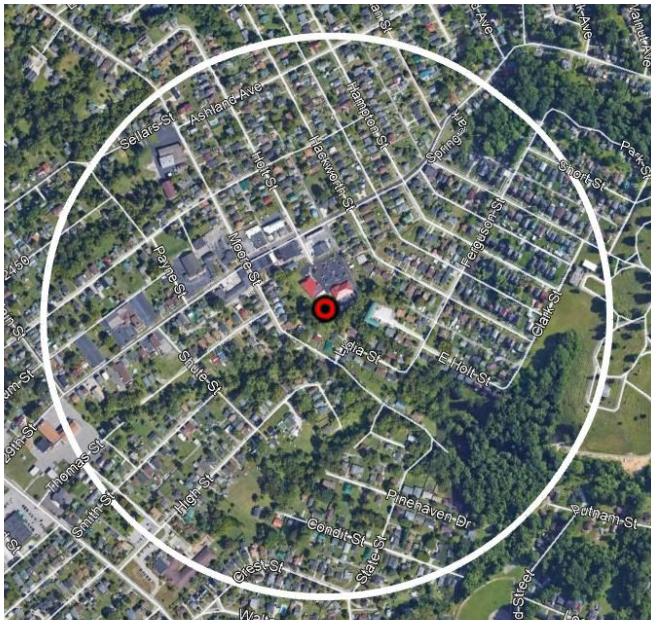
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect elevated pollutant levels for activation of emergency control procedures for nitrogen dioxide, ozone, and sulfur dioxide; and to provide pollutant levels for daily air quality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

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Nitrogen Dioxide (NO_2, NO, NO_x)	3.82	SLAMS AQI EPISODE	Chemiluminescence	Continuously
AEM Sulfur Dioxide	3.82	SLAMS AQI EPISODE	UV fluorescence	Continuously
AEM Ozone	3.82	SLAMS AQI EPISODE Maximum O^3	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.73	SLAMS AQI	Broadband spectroscopy	Continuously
Meteorological	5.9	Other	AQM grade instruments for wind speed, wind direction, humidity, barometric pressure, and temperature	Continuously

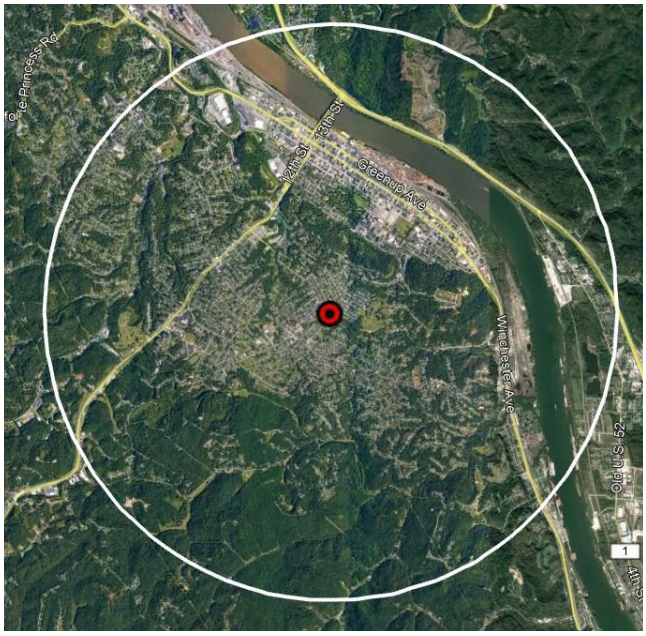
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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.

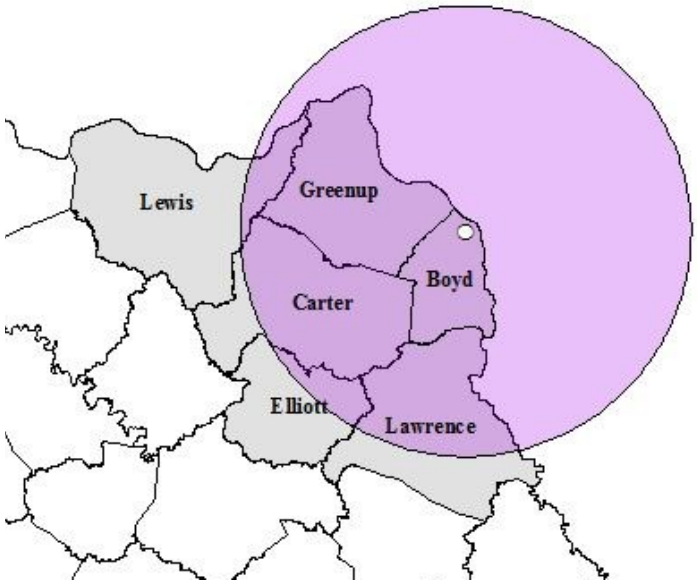
Middle Scale: Particulates



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, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

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

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.

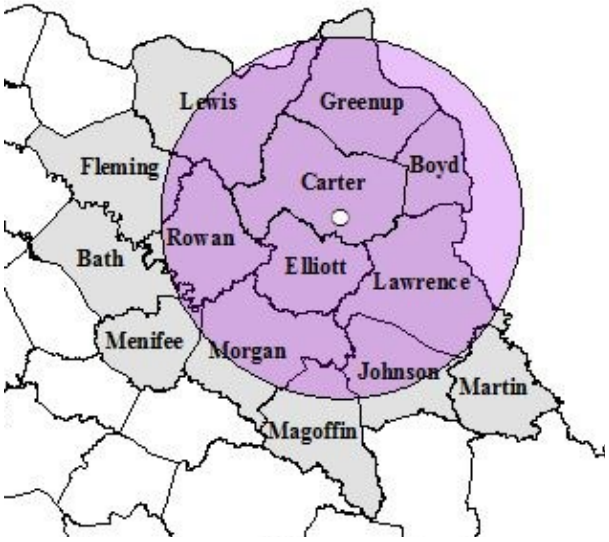
Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.75	SPM AQI	UV photometry	Continuously March 1 – October 31
FRM PM_{10}	2.21	SLAMS	Gravimetric	24-hours every sixth day
- Metals PM_{10}		NATTS SPM-Other	Determined from the PM_{10} samples using EPA method IO 3.5	Same as PM_{10}
Collocated PM_{10}	2.22	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	TBD (Install 2021)	SLAMS	Broadband Spectroscopy	Continuously
Volatile Organic Compounds	3.82	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	2.12	NATTS SPM-Other	EPA method TO-13A	24-hours every sixth day
Carbonyls	3.8	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	12.0	Other	AQM grade instruments for wind speed, wind direction, and temperature	Continuously

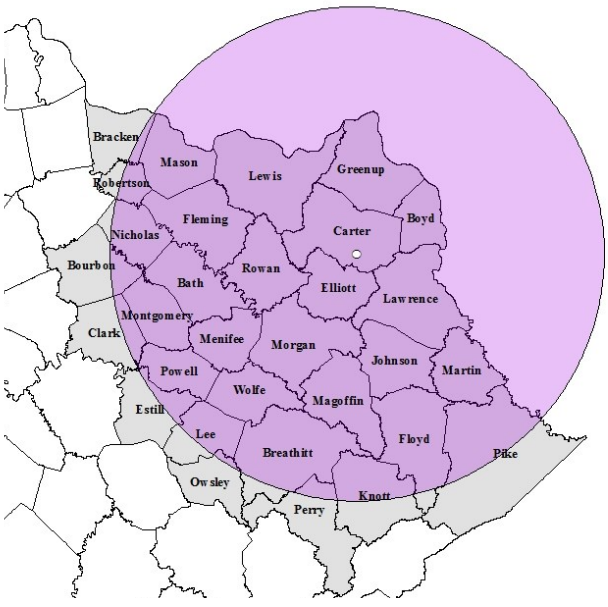
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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.

Urban Scale: Particulates & Air Toxics



Regional Scale: 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, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

The monitoring site is a stationary equipment shelter located on the grounds of a water tower near the intersection of Scott Street and Center Avenue in Worthington, Kentucky. The sample inlets are 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, and E.

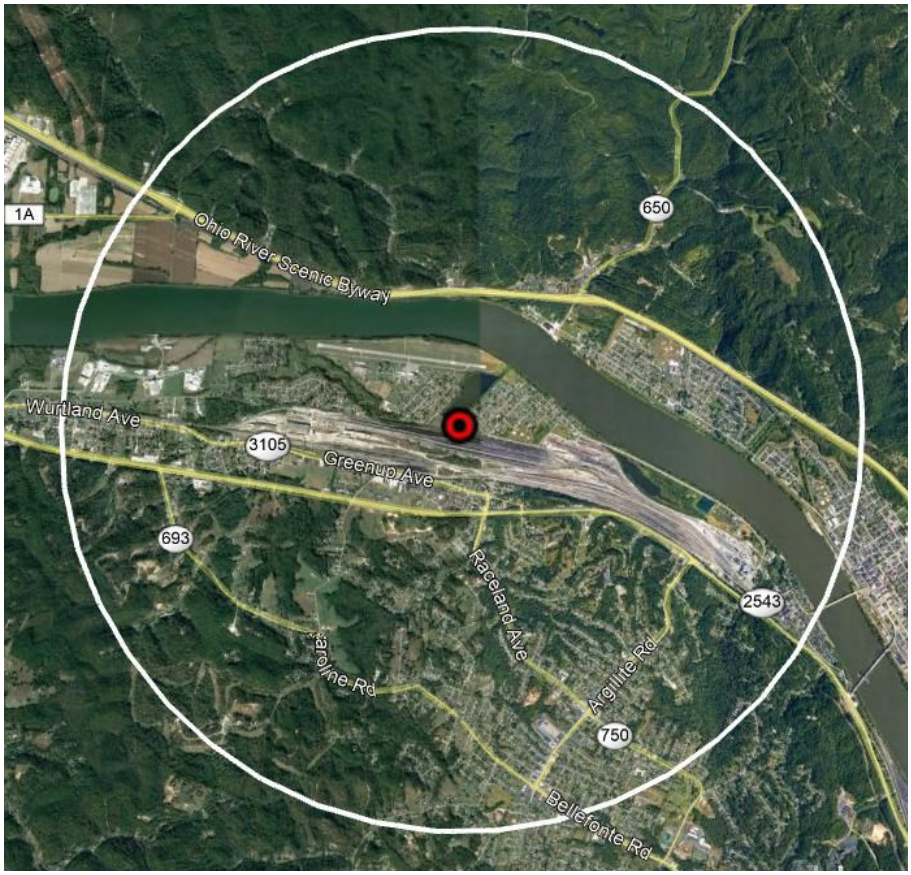
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect elevated pollutant levels for activation of emergency control procedures for ozone and sulfur

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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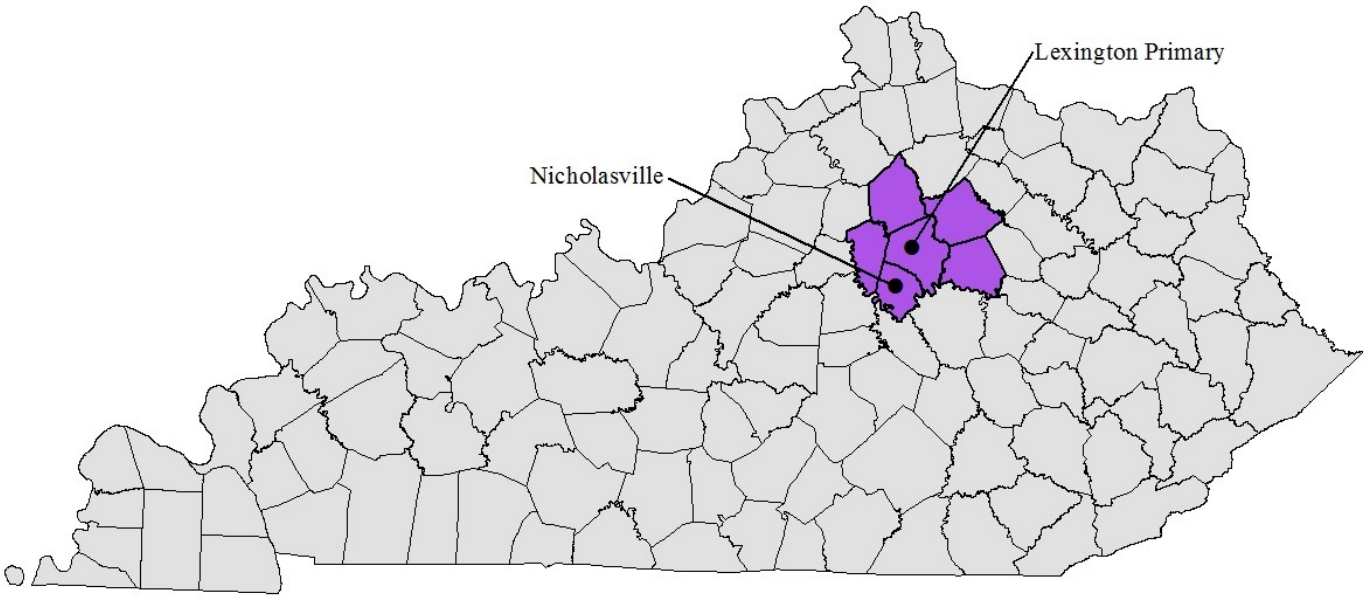
Lexington-Fayette, KY



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[i,e]	1[i,e,r]			1[i,e,M]								1	
Fayette	Lexington																		
21-113-0001	260 Wilson Drive					1				1[i]									1
Jessamine	Nicholasville																		
Totals	**2**		**1**	**1**		**2**	**1**			**2**								**1**	**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: October 15, 2020
Inspection By: 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.

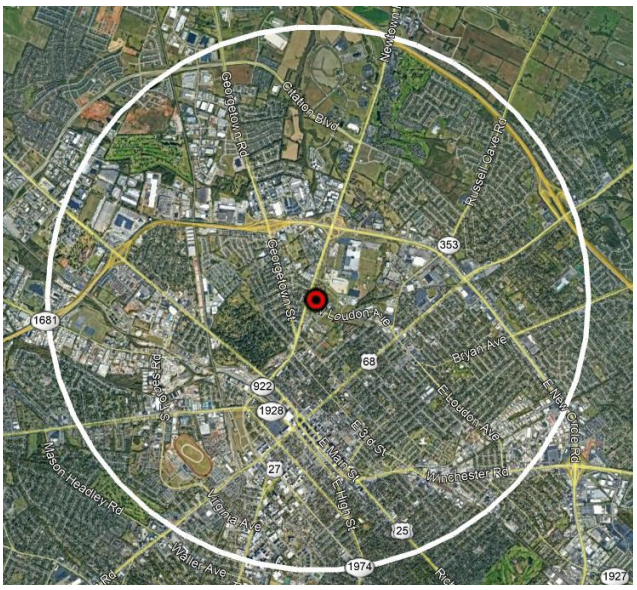
Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.8	SLAMS AQI EPISODE Maximum O^3	UV photometry	Continuously March 1 – October 31
AEM Nitrogen Dioxide (NO_2, NO, NO_x)	4.0	SLAMS (RA-40) AQI EPISODE	Chemiluminescence	Continuously
AEM Sulfur Dioxide	3.6	SLAMS AQI EPISODE	UV fluorescence	Continuously
FEM $PM_{2.5}$ Continuous	4.53	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	1.3	RadNet	RadNet fixed stationary monitor, manual and automated methods	Continuously & 2 weekly filters

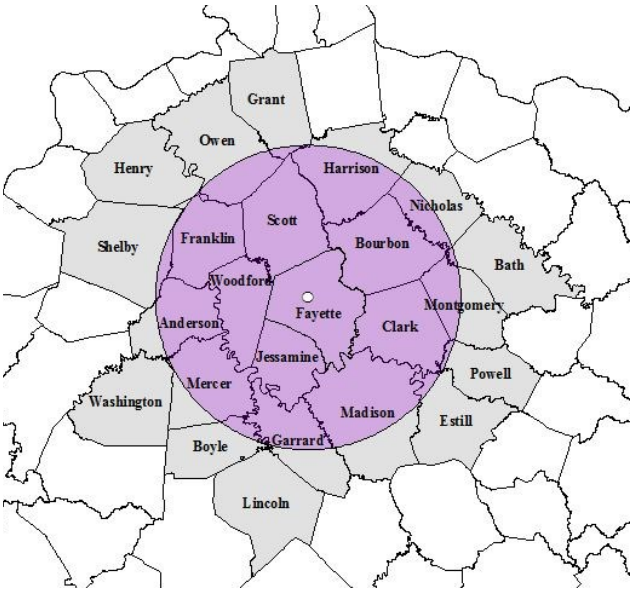
Quality Assurance Status:
All quality assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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: October 15, 2020
Inspection By: Allison Hall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

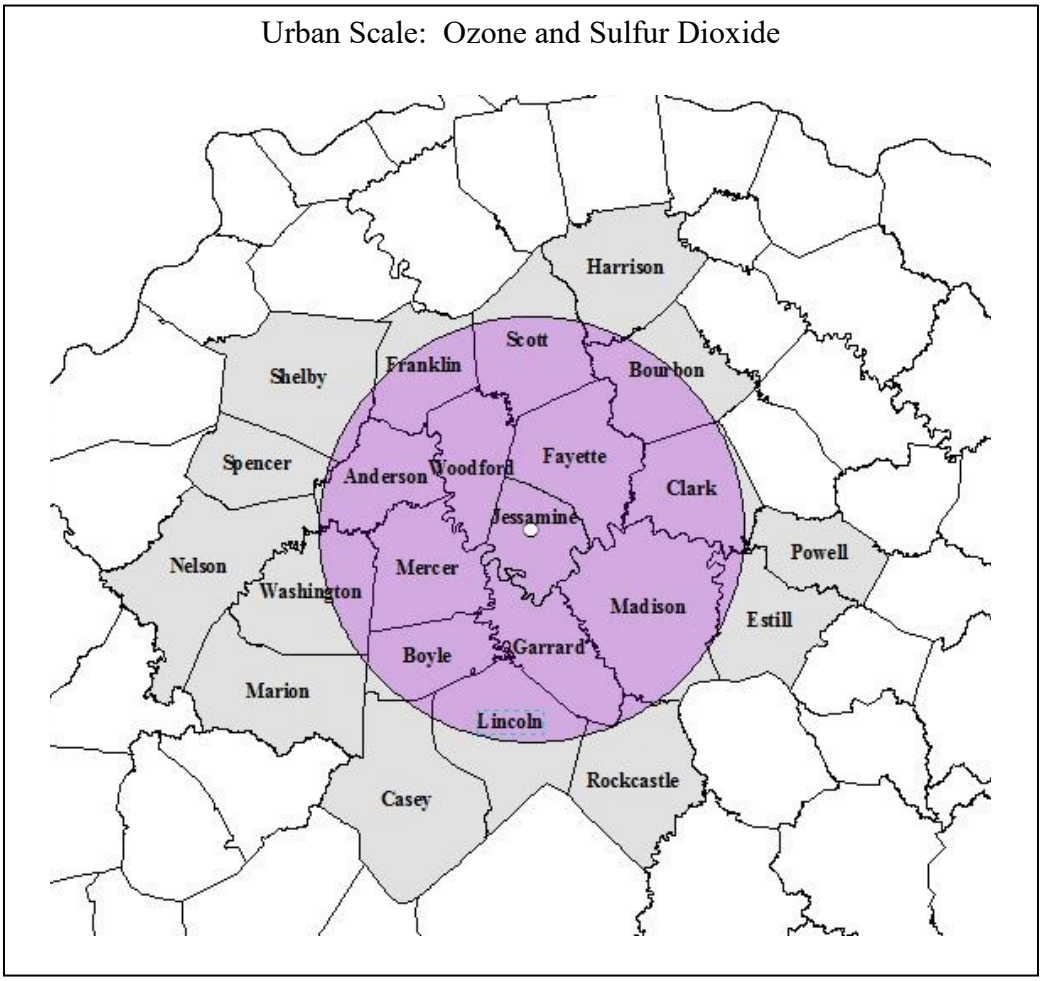
The monitoring site is a stationary equipment shelter located on the grounds of the Kentucky Transportation Cabinet garage in Nicholasville, Kentucky. The sample inlets are 113 meters from the nearest road. Upon inspection, the sample inlets and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, and E.

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	3.9	SLAMS AQI	UV photometry	Continuously March 1 – October 31
AEM Sulfur Dioxide	3.8	SPM	UV fluorescence	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 an urban scale for ozone and sulfur dioxide.



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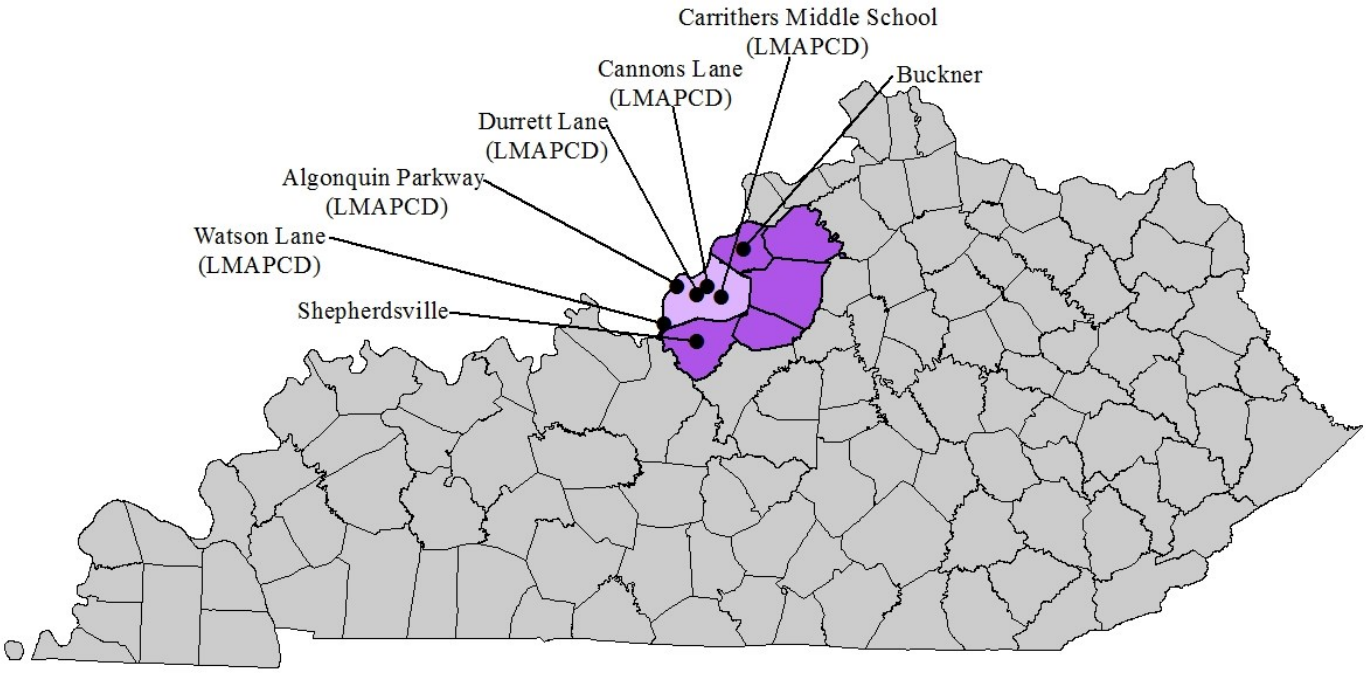
Louisville/Jefferson County, KY-IN



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

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

C =Collocated
S =Continuous T640 Monitor
* =Eligible for PM2.5 NAAQS Comparisons
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)
G =Auto GC
i =AQI Reported
n =Near-Road 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 28, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

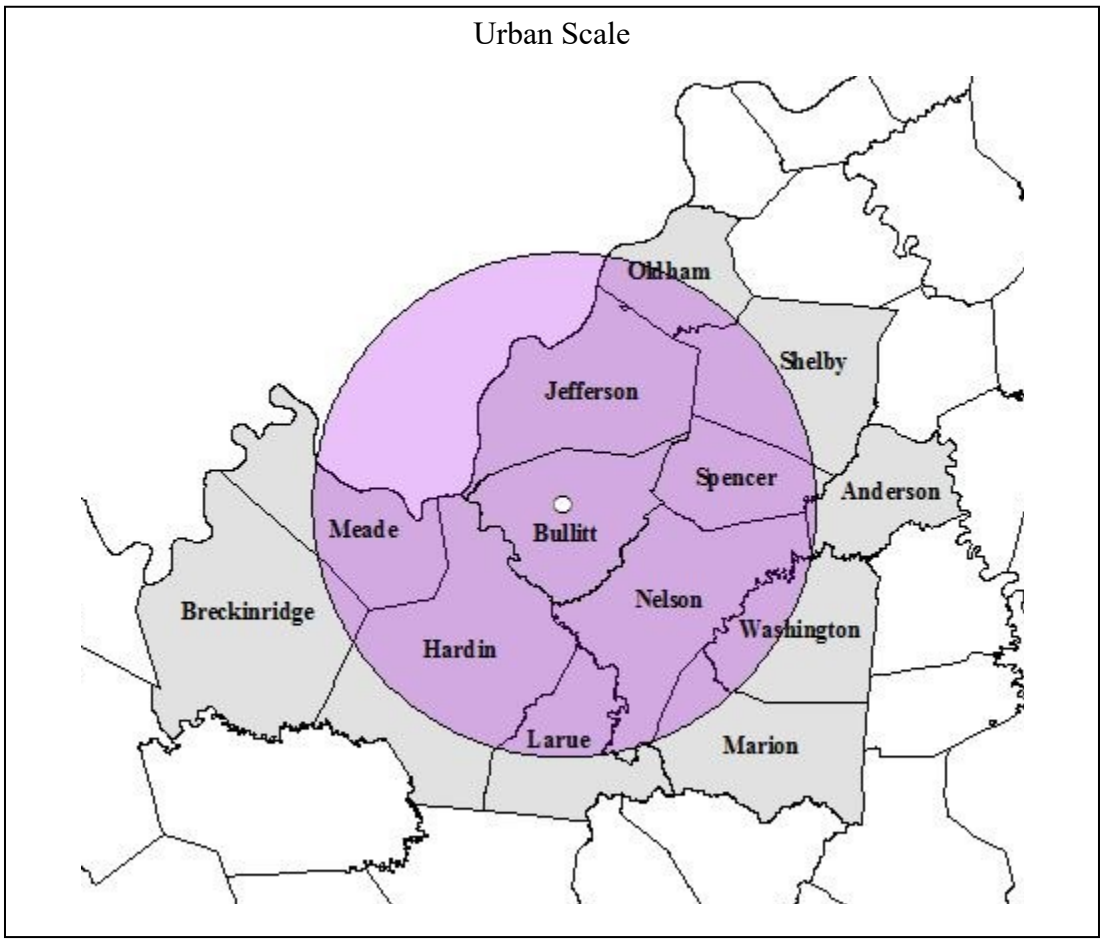
The monitoring site is a stationary equipment shelter located in a fenced-in area near the intersection of Second and Carpenter Streets in Shepherdsville, Kentucky. The sample inlets are 66.4 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, 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	3.99	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 28, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitor meet all design criteria for the monitoring network.

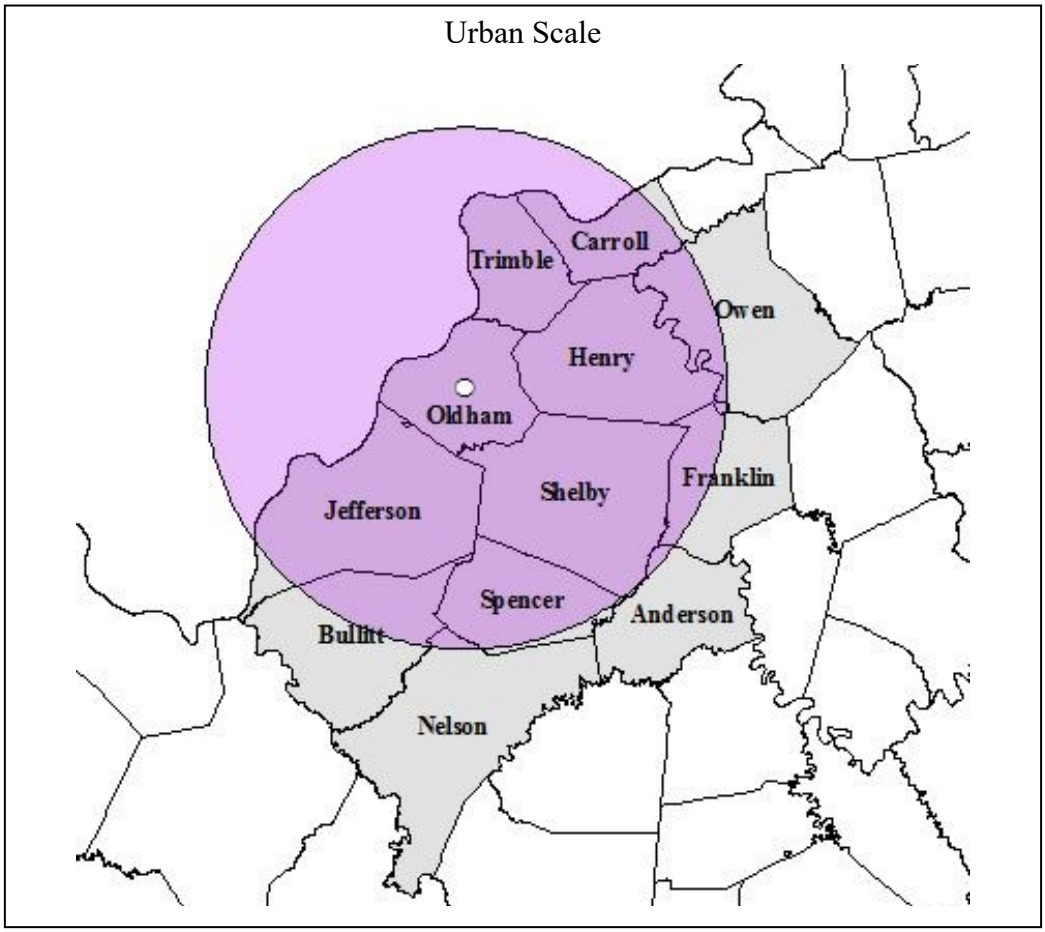
The monitoring site is a stationary equipment shelter located on the grounds of the Kentucky Transportation Cabinet Highway garage in Buckner, Kentucky. The sample inlet is 51 meters from the nearest road. Upon inspection, the sample line and monitor were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices 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	3.83	SLAMS AQI	UV photometry	Continuously March 1 – October 31
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 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: October 14, 2020
Inspection By: Colette McConville
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.

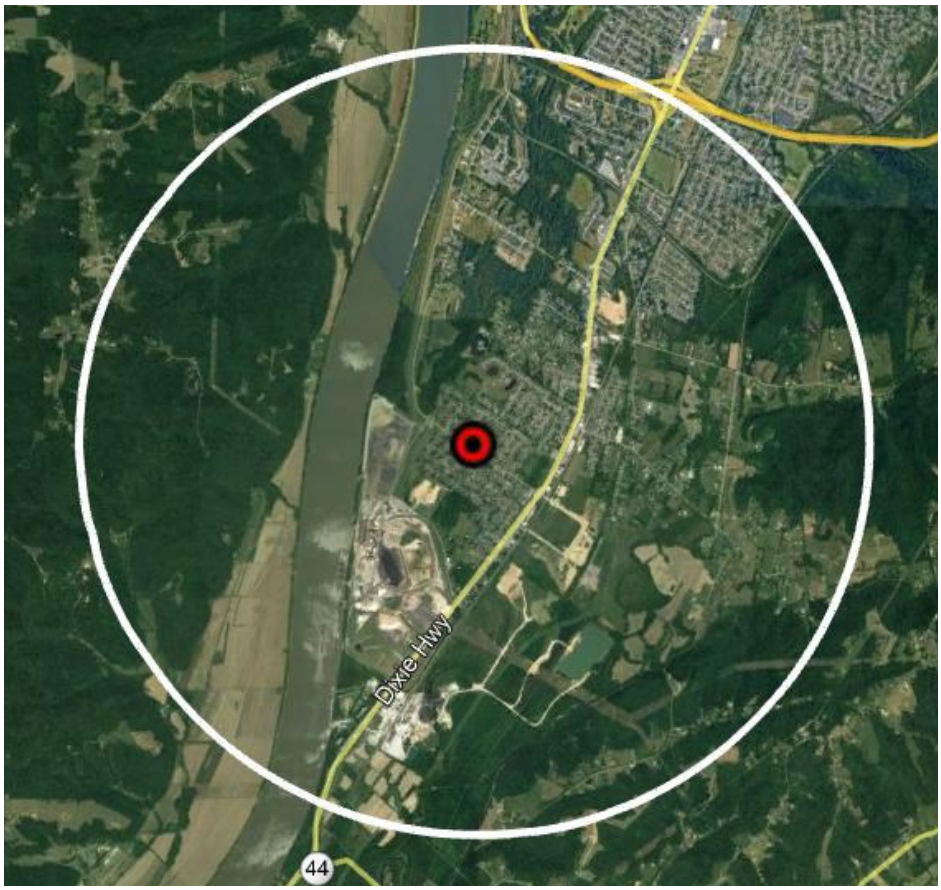
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to provide pollution levels for daily index reporting.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	4.0	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.8	SLAMS AQI	Broadband Spectroscopy	Continuously
AEM Sulfur Dioxide	4.0	SLAMS AQI	UV fluorescence	Continuously
Meteorological	7.6	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: November 3, 2020
Inspection By: Colette McConville
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.

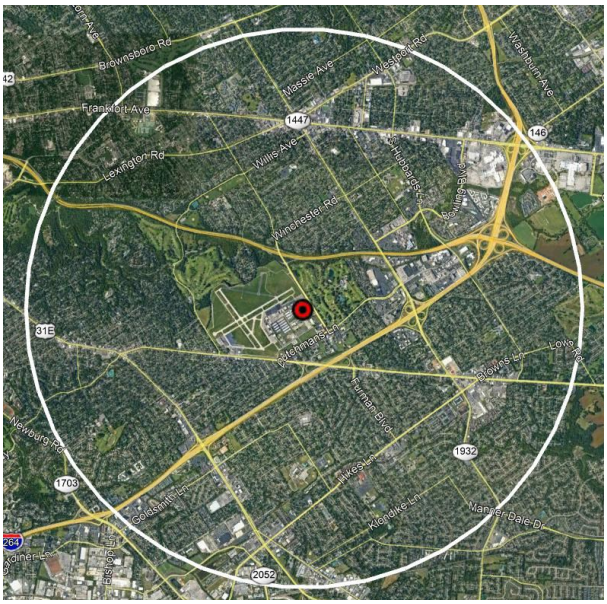
Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
Carbon Monoxide	4.2	NCore SLAMS AQI	Automated Reference Method utilizing trace level non-dispersive infrared analysis.	Continuously
Nitrogen Dioxide (NO_2)	4.2	NCore PAMS SLAMS AQI	Cavity Attenuated Phase Shift Spectrometry	Continuously
Total Reactive Nitrogen (NO/NO_y)	8.0	NCore PAMS	Automated method utilizing trace level chemiluminescence analysis.	Continuously
Ozone	4.2	NCore PAMS SLAMS AQI Maximum O_3	Automated Equivalent Method utilizing UV photometry analysis.	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}-$PM_{2.5}$)	4.9	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	2.3	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	5.0	PAMS	Automatic gas chromatograph with flame ionization detection	Continuously
Carbonyls	TBD (Install 2021)	PAMS	DNPH Cartridge using TO-11A analysis	Three 8-hour samples every third day
Meteorological -Wind Speed and Direction	10.0	NCore PAMS	Air Quality Measurements approved instrumentation for wind speed, and wind direction.	Continuously
-Temperature and RH	2.5	NCore PAMS	Air Quality Measurements approved instrumentation for temperature and humidity.	Continuously
-Barometric Pressure	4.4	PAMS	Air Quality Measurements approved instrumentation for barometric pressure.	Continuously
-Ceilometer	4.0	PAMS	Pulsed diode laser light detection and ranging (LIDAR).	Continuously
-Solar Radiation	5.0	NCore PAMS	Air Quality Measurements approved instrumentation for solar radiation.	Continuously
-UV Solar	TBD (Install 2021)	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	3.9	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.

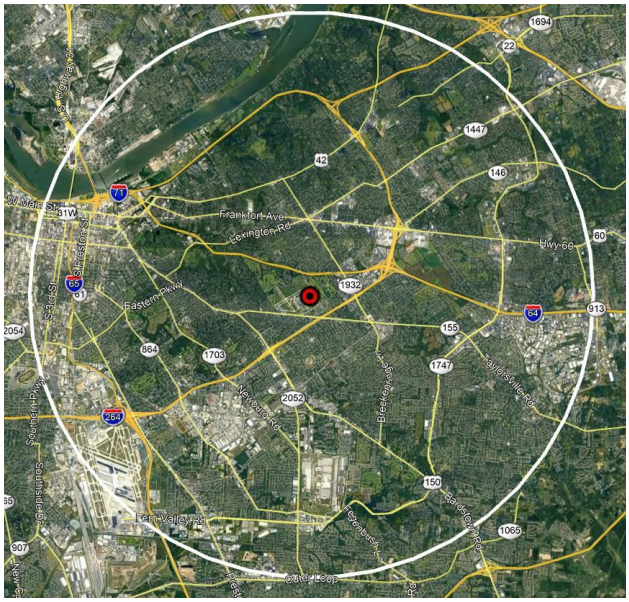
Area Representativeness:
The air monitoring equipment at the Cannon's Lane NCore station is specifically located at the urban and neighborhood scales. These scales are generally the most representative of the expected population exposures that occur throughout metropolitan areas.

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

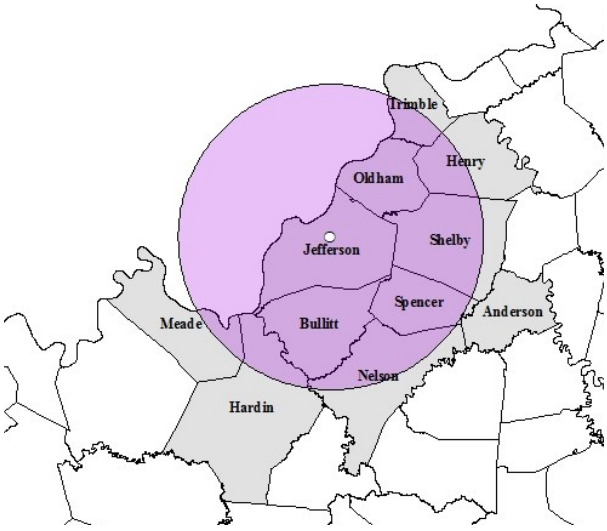
Neighborhood Scale:
Carbon Monoxide, Ozone, and Particulates



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: October 28, 2020
Inspection By: Colette McConville
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.

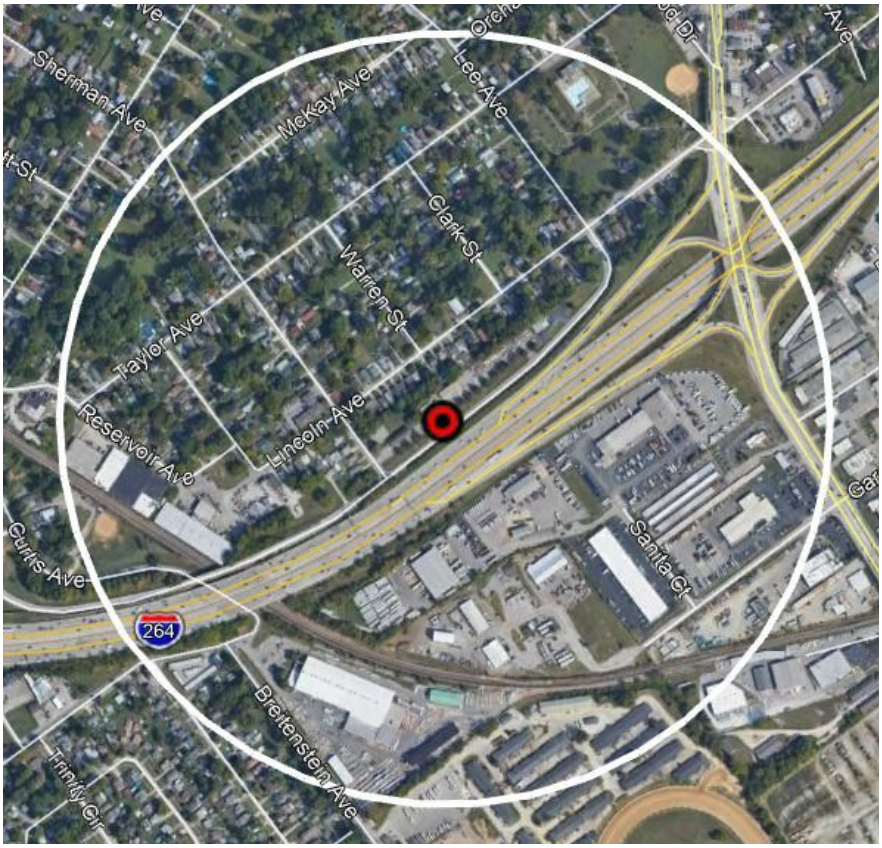
Monitoring Objective:
The monitoring objective will be to determine compliance with National Ambient Air Quality Standards for nitrogen dioxide, carbon monoxide, and particulate matter.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Nitrogen Dioxide (NO_2)	4.22	SLAMS AQI	Cavity Attenuated Phase Shift Spectroscopy	Continuously
Carbon Monoxide	4.22	SLAMS AQI	Automated Reference Method utilizing trace-level non-dispersive infrared analysis	Continuously
FEM $PM_{2.5}$ Continuous	4.47	SLAMS AQI	Broadband Spectroscopy	Continuously
FRM $PM_{2.5}$ Collocated	4.66	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 2021)	SPM	Wavelength Dual Spot Optical Absorption	Continuously

Area Representativeness:
The site represents maximum concentrations on a middle scale.

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

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: 38.182511, -85.574167 (NAD 83)
Date Established: January 9, 2018
Inspection Date: October 23, 2020
Inspection By: Colette McConville
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.

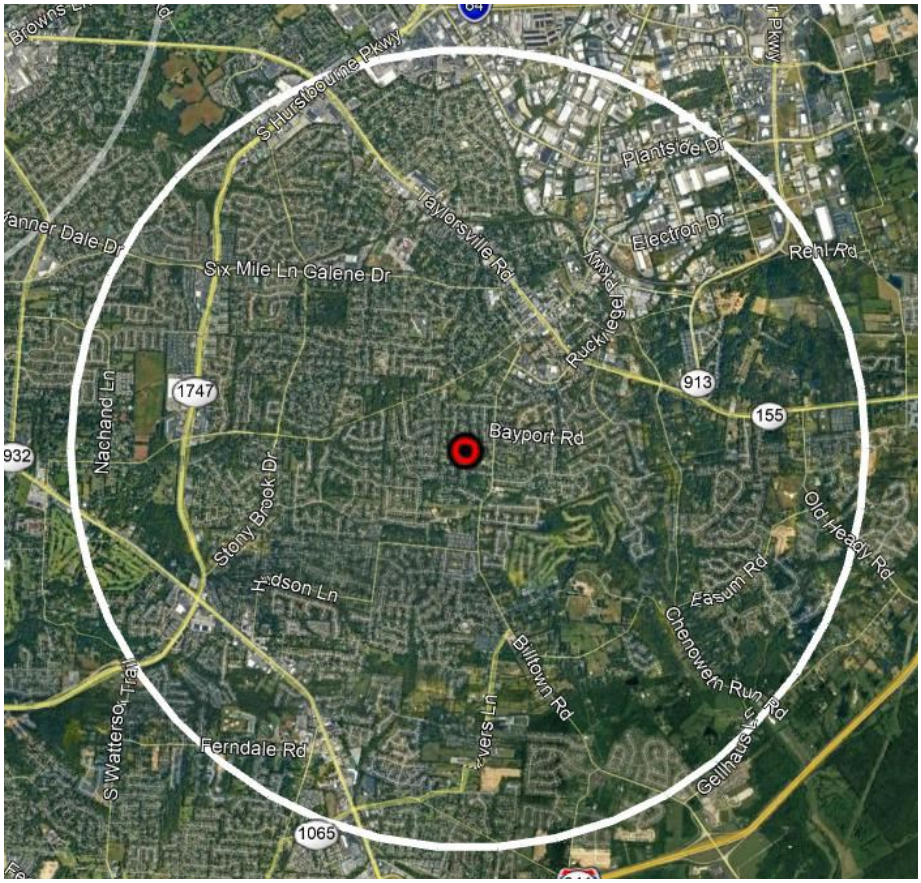
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to provide pollution levels for daily index reporting.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.75	SLAMS AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.5	SLAMS AQI	Broadband Spectroscopy	Continuously
Meteorological -Wind Speed and Direction	5.9	Other	AQM grade instruments for wind speed and wind direction.	Continuously
- Temperature and RH	4.5	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: October 21, 2020
Inspection By: Colette McConville
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.

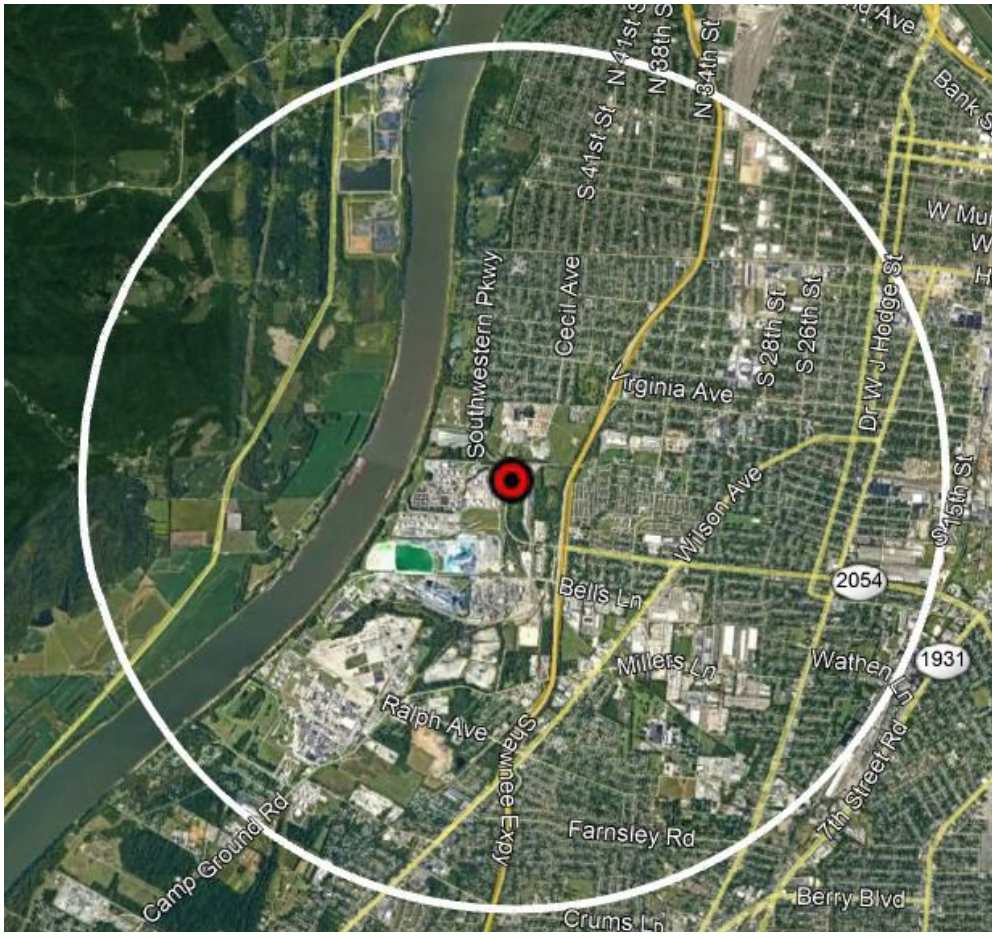
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards, to provide pollution levels for daily index reporting, and to characterize VOC concentrations.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
FEM $PM_{2.5}$ and PM_{10} Continuous	4.5	SLAMS AQI	Broadband Spectroscopy	Continuously
AEM Sulfur Dioxide	4.0	SLAMS AQI	UV Fluorescence	Continuously
Volatile Organic Carbon	3.9	SPM	Automatic gas chromatograph with flame ionization detection	Continuously
Meteorological -Wind Speed and Direction	9.1	SLAMS	AQM grade instruments for wind speed and wind direction	Continuously
- Temperature and RH	2.0	SLAMS	AQM grade instruments for temperature and humidity	Continuously

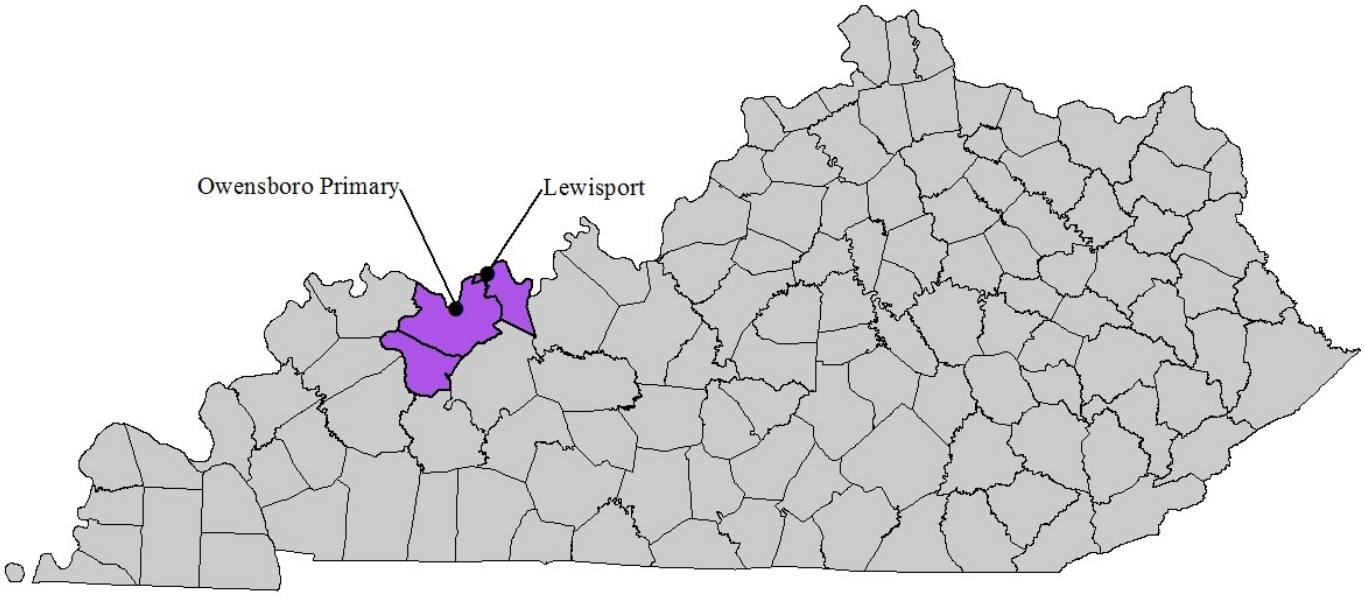
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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

Neighborhood Scale



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,i]	1[e,i]			1[e,I]									1
Daviess	Owensboro																		
21-091-0012	Second & Caroline St.									1[i,M]									
Hancock	Lewisport																		
Totals	**2**		**1**			**1**	**1**			**2**									**1**

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: September 29, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

The monitoring site is a stationary equipment shelter located on the grounds 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, E and G.

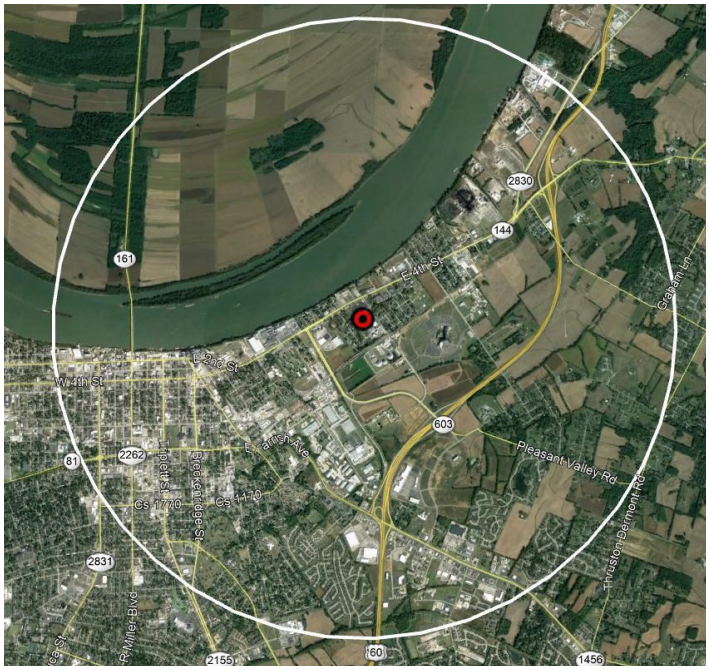
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect emergency pollution levels of criteria pollutants for activation of emergency control procedures. While not required for the CBSA, the site also provide levels of pollutants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

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Nitrogen Dioxide (NO_2, NO, NO_x)	4.5	SLAMS EPISODE AQI	Chemiluminescence	Continuously
AEM Ozone	3.78	SLAMS EPISODE AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.69	SLAMS EPISODE AQI	Broadband Spectroscopy	Continuously
AEM Sulfur Dioxide	4.5	SLAMS EPISODE AQI	UV fluorescence	Continuously
Meteorological	5.68	Other	AQM grade instruments for wind speed, wind direction, and temperature	Continuously

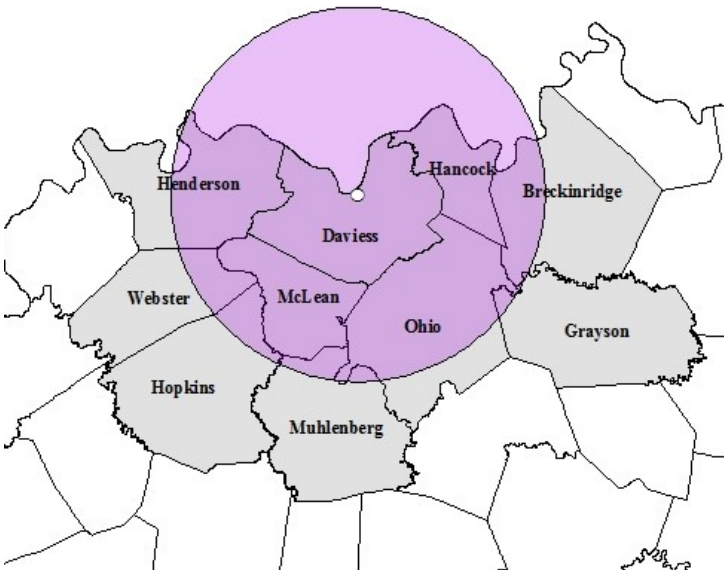
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

Area Representativeness:
This site represents population exposure on a 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: September 29, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitor meet all design criteria for the monitoring network.

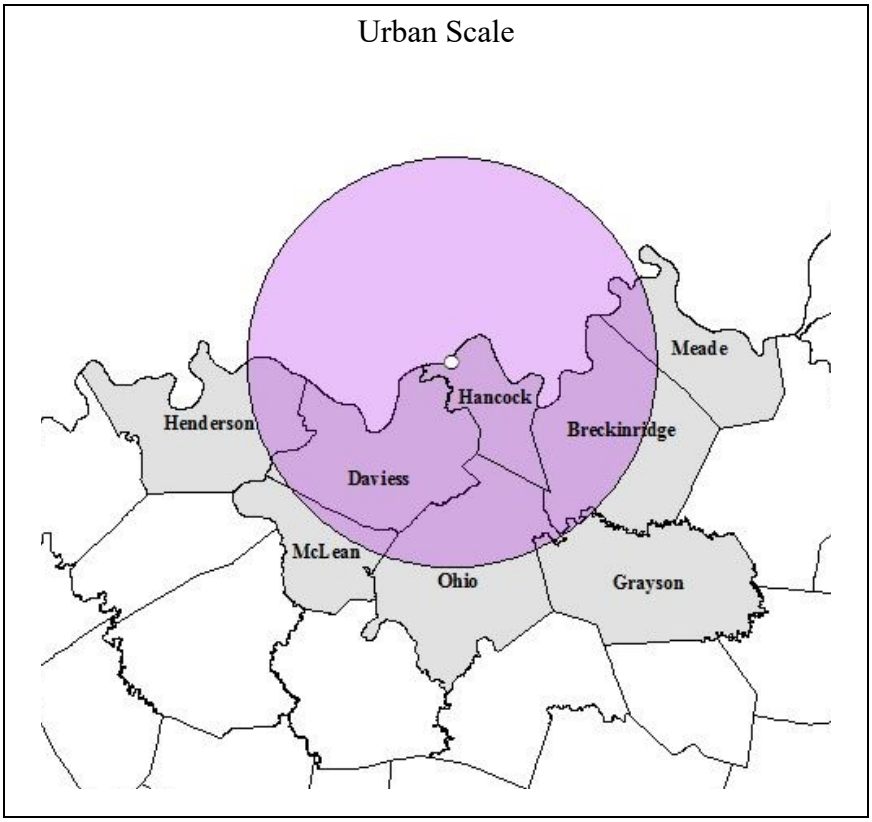
The monitoring site is a stationary equipment shelter located on the athletic fields of the former Lewisport Consolidated Elementary School in Lewisport, Kentucky. The sample inlet is 54.8 meters from the nearest road. Upon inspection, the sample line and monitor were found to be in good condition. The 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	3.65	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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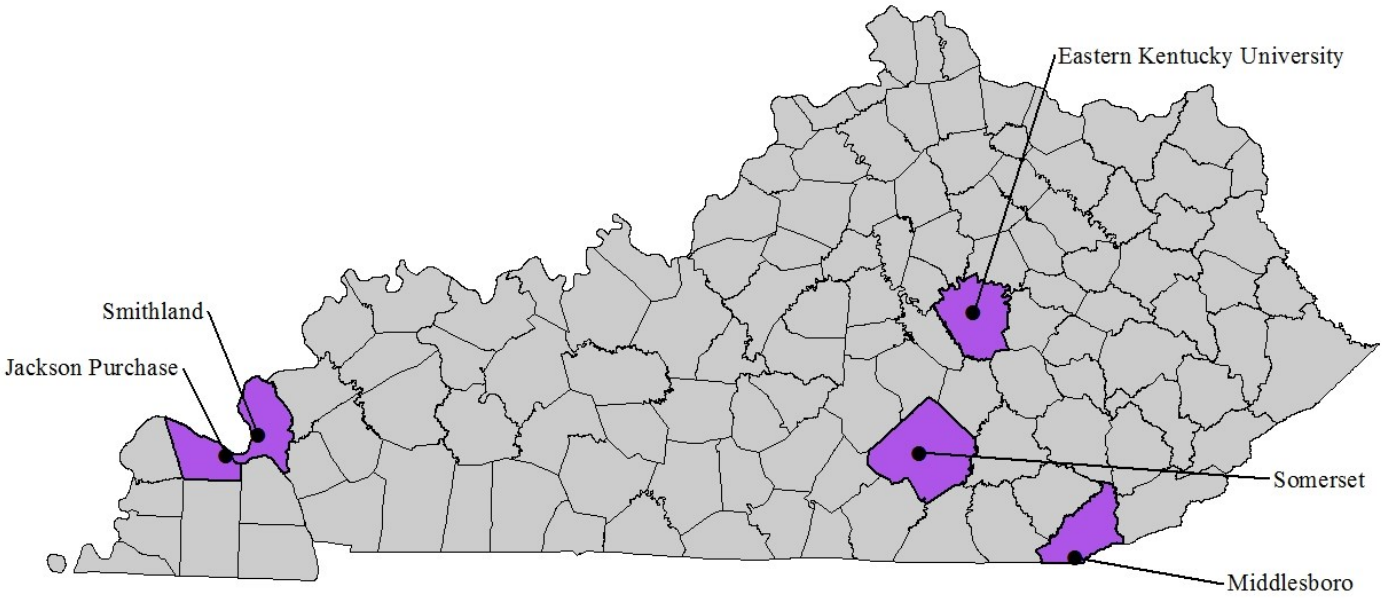
Micropolitan Statistical Areas



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	1420 Dorchester Ave.		1[i]							1[i]									1
Bell	Middlesboro																		
21-139-0003	706 State Drive									1[i]								1	
Livingston	Smithland																		
21-145-1024	2901 Powell Street		1[S,i]			1[e,i]	1[e,i]			1[e,I]									
McCracken	Paducah																		
21-151-0005	Van Hoose Drive										2[C]								
Madison	Richmond																		
21-199-0003	305 Clifty Street		1[i]							1[i]									
Pulaski	Somerset																		
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: November 9, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

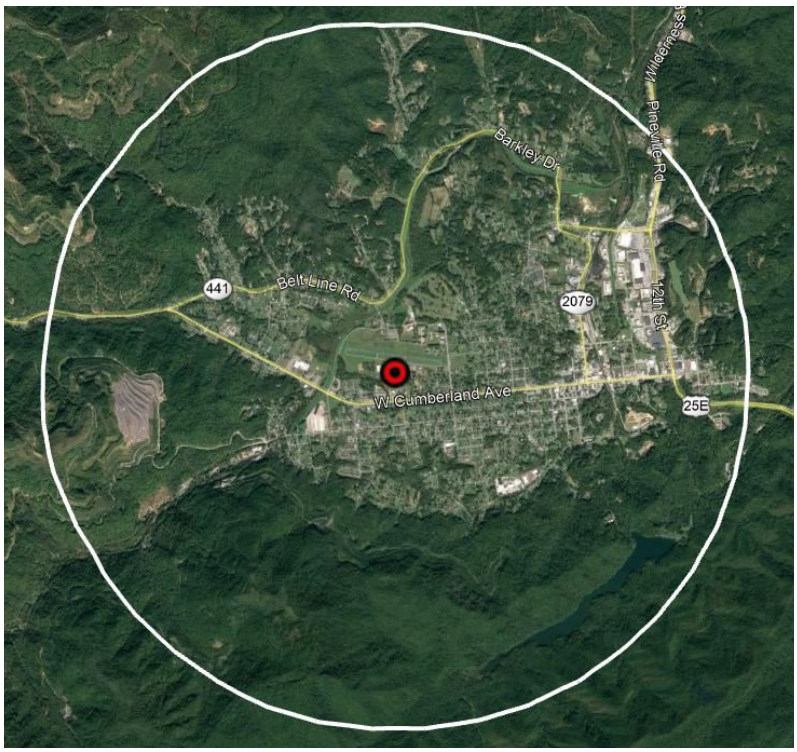
The monitoring site is a stationary equipment shelter located on the grounds of the Middlesboro Airport in Middlesboro, Kentucky. The sample inlets are 94.2 meters from the nearest road. Upon inspection the sample lines and monitors were found to be in good condition. The site meets the requirements 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	3.85	SPM AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.72	SLAMS AQI	Broadband Spectroscopy	Continuously
Meteorological	5.92	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: 37.097952, -84.611534 (NAD 83)
Date Established: April 1, 1988
Inspection Date: July 23, 2020
Inspection By: Jennifer Miller
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

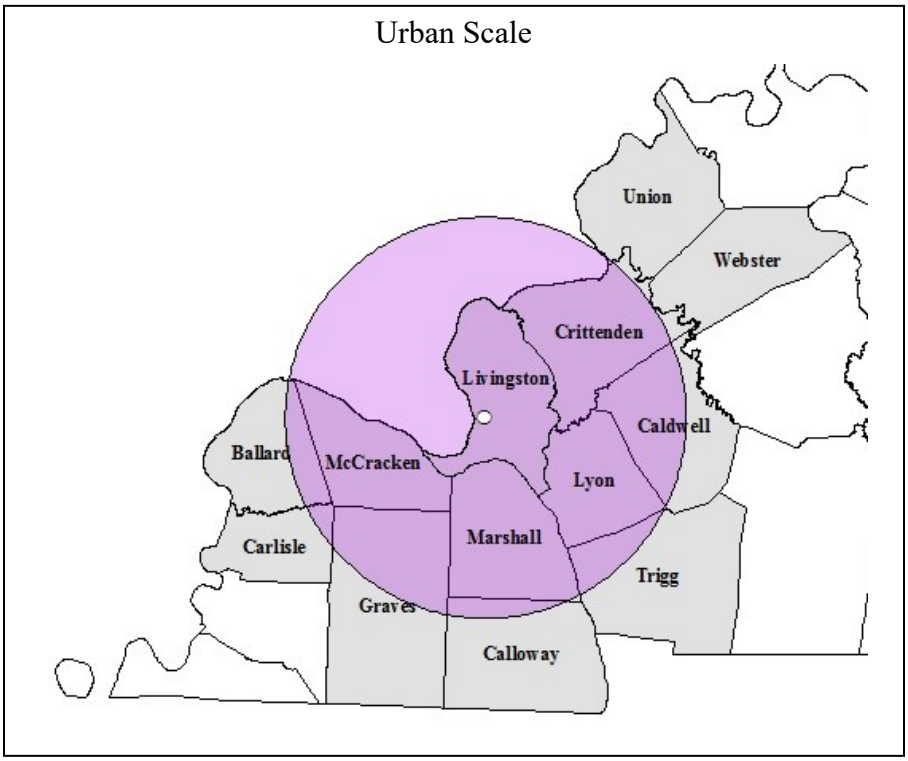
The monitoring site is a stationary equipment shelter located on the grounds of the Livingston County Road Dept. facility in Smithland, Kentucky. The sample inlets are 138.7 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets 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	3.77	SLAMS AQI	UV photometry	Continuously
Radiation	1.4	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: July 23, 2020
Inspection By: Jennifer Miller
Site Approval Status: Site and monitors meet design criteria for the monitoring network.

The monitoring site is a stationary equipment shelter located on the grounds of the Jackson Purchase RECC in Paducah, Kentucky. The site meets the requirements established by 40 CFR 58, Appendices C, D, E and G. Due to a new shelter installation in 2018, the sample inlets are now 20.7 meters from the nearest road.

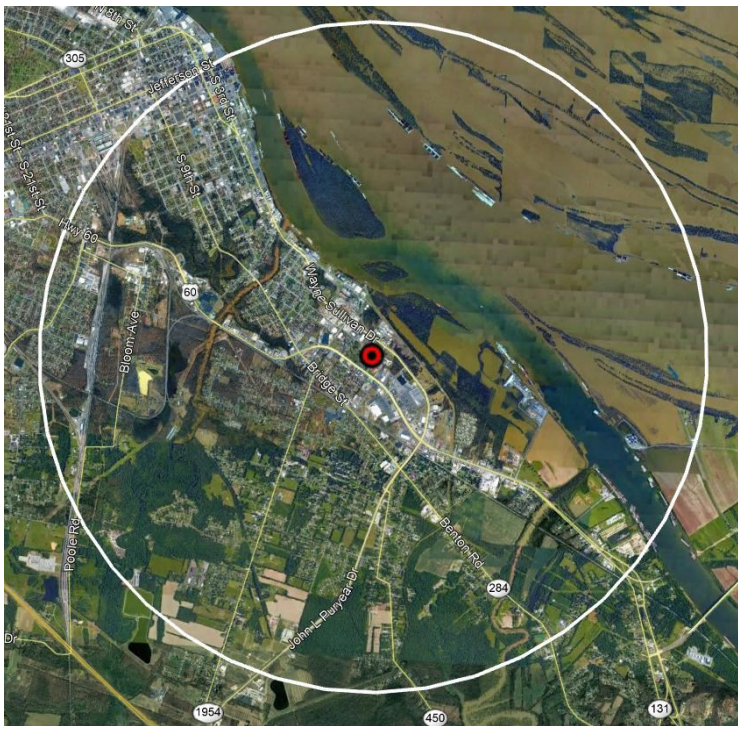
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to detect elevated pollutant levels for activation of emergency control procedures for nitrogen dioxide, ozone, and sulfur dioxide. While not required for the CBSA, the site also 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)	4.1	SLAMS EPISODE AQI	Chemiluminescence	Continuously
AEM Sulfur Dioxide	4.1	SLAMS AQI EPISODE	UV fluorescence	Continuously
AEM Ozone	3.9	SLAMS AQI EPISODE	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.7	SLAMS AQI	Broadband Spectroscopy	Continuously

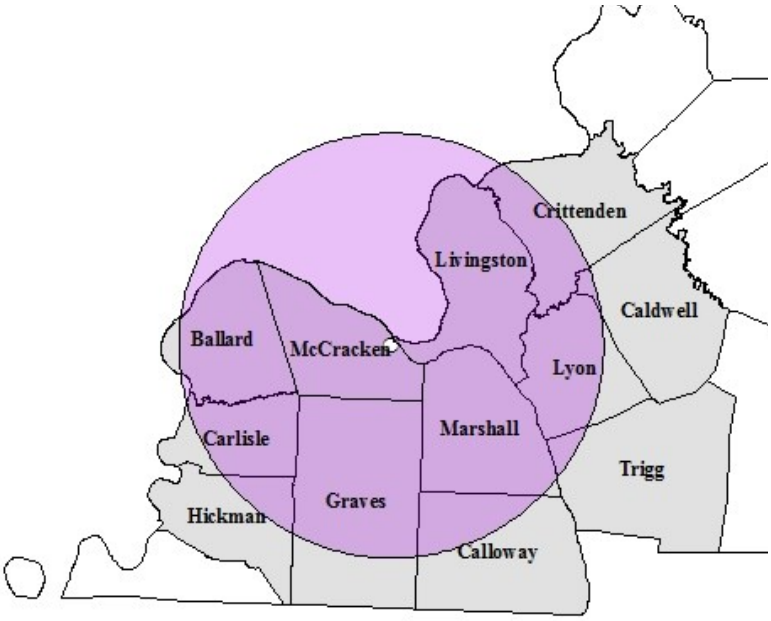
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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

Neighborhood Scale: Ozone, Particulates, Sulfur Dioxide



Urban Scale: Nitrogen Dioxide



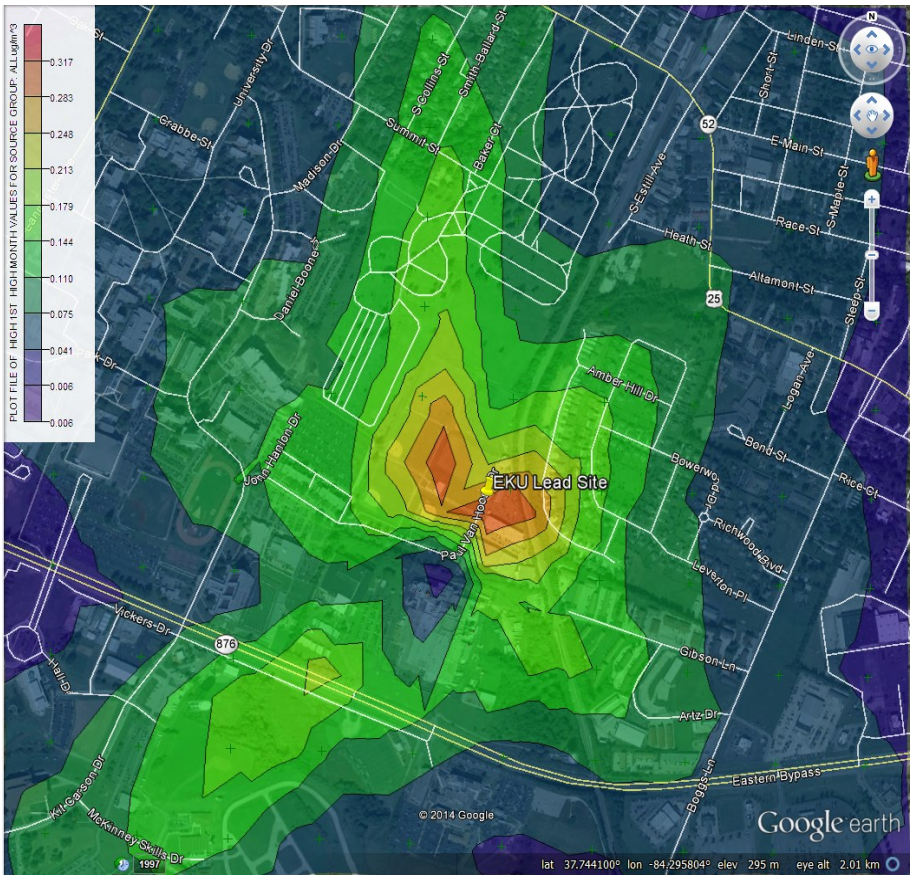
CSA/MSA: Lexington-Fayette-Richmond-Frankfort KY CSA; Richmond-Berea, KY Micropolitan Statistical Area
401 KAR 50:020 Air Quality Region: Bluegrass Intrastate (102)
Site Name: Eastern Kentucky University **(**EKU)
AQS Site ID: 21-151-0005
Location: Eastern Kentucky University, Van Hoose Drive, Richmond, KY 40475
County: Madison
GPS Coordinates: 37.73636, -84.29167 (NAD 83)
Date Established: March 10, 2012
Inspection Date: October 15, 2020
Inspection By: 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.

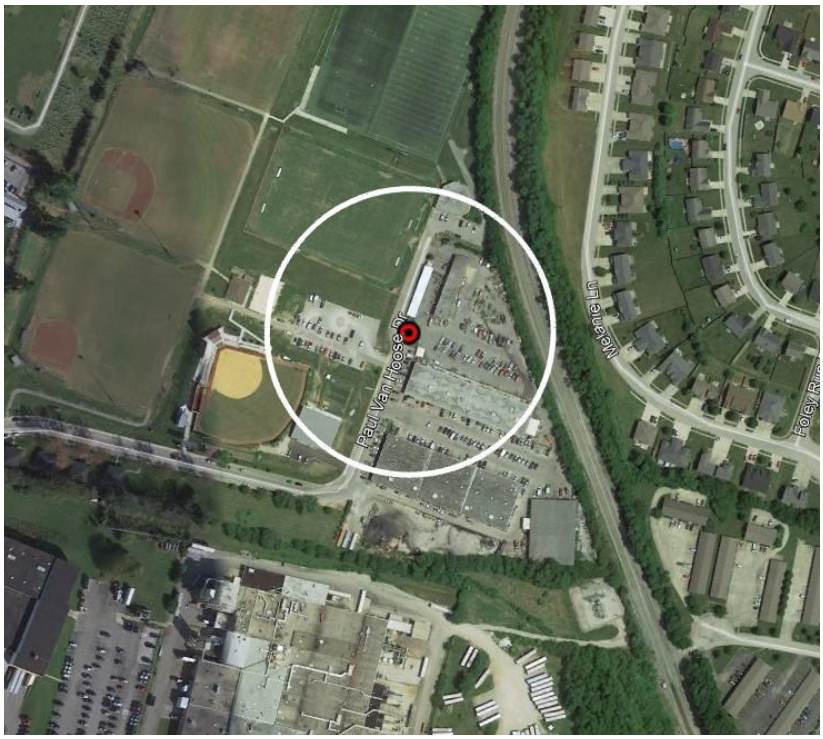
Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
FRM Lead	2.2	SLAMS	High volume air sampler. Analysis via ICP-MS.	24-hours every sixth day
Collocated FRM Lead	2.2	SLAMS	High volume air sampler. Analysis via ICP-MS.	24-hours every twelfth 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: November 9, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

The monitoring site is a stationary equipment shelter located on the grounds of the 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.

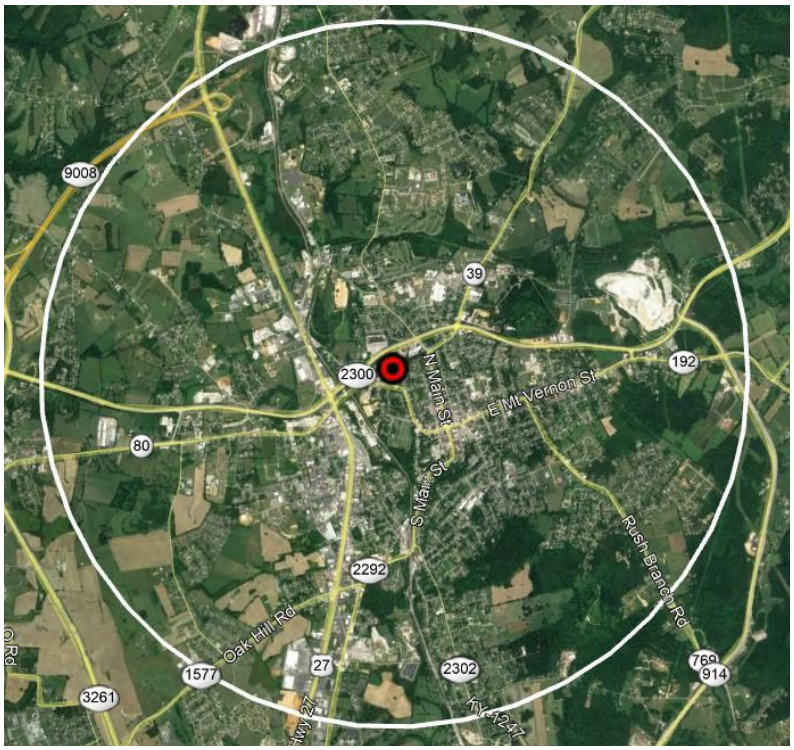
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	4.4	SPM AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.77	SLAMS AQI	Broadband Spectroscopy	Continuously

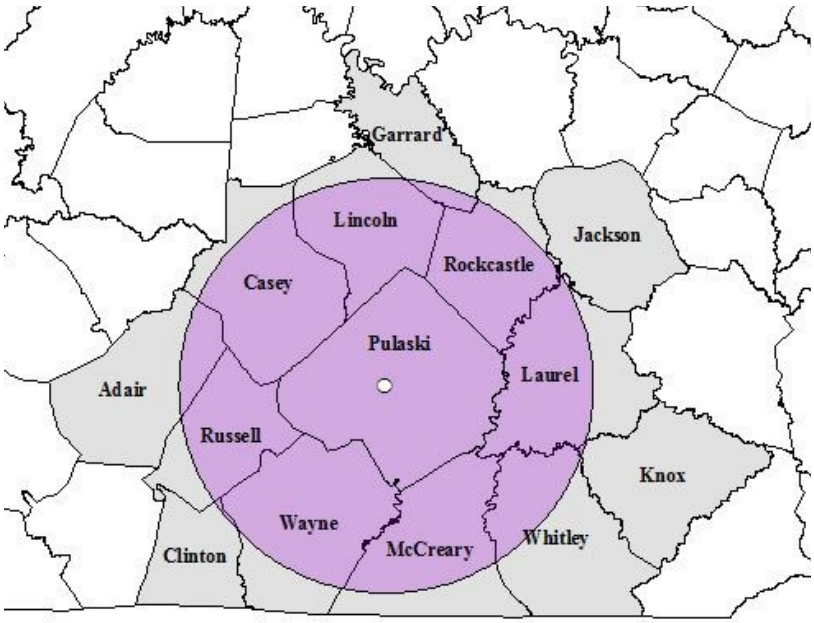
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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

Neighborhood Scale: Particulates



Urban Scale: Ozone



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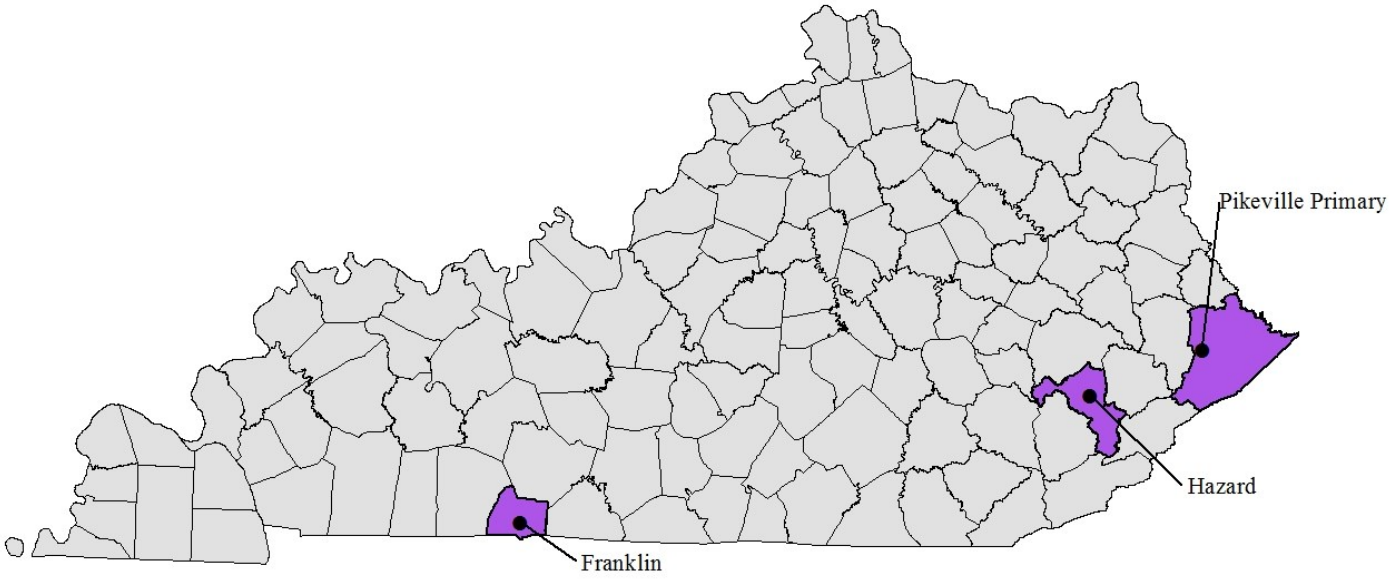
Not in a Metropolitan or Micropolitan Statistical Area



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: October 7, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

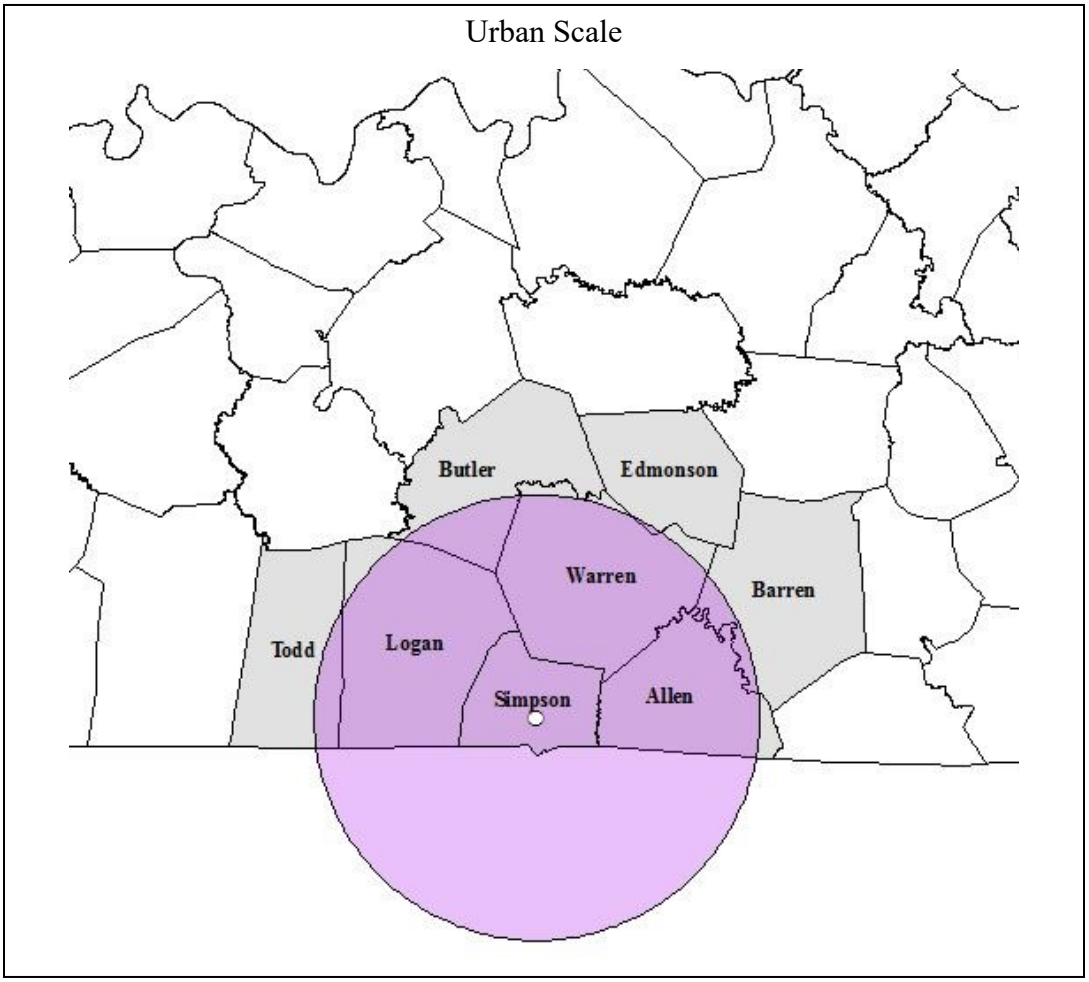
The monitoring site is a stationary equipment shelter located on the grounds of the KYTC Garage on Harding Road (KY1008) in Franklin, Kentucky. The sample inlet is 42.5 meters from the nearest road. Upon inspection, the sample line and monitor were found to be in good condition. The site meets the requirements 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	4.42	SPM AQI	UV photometry	Continuously March 1 – October 31
Meteorological	6.0	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: November 17, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

The monitoring site is a stationary equipment shelter located on the grounds of the 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.

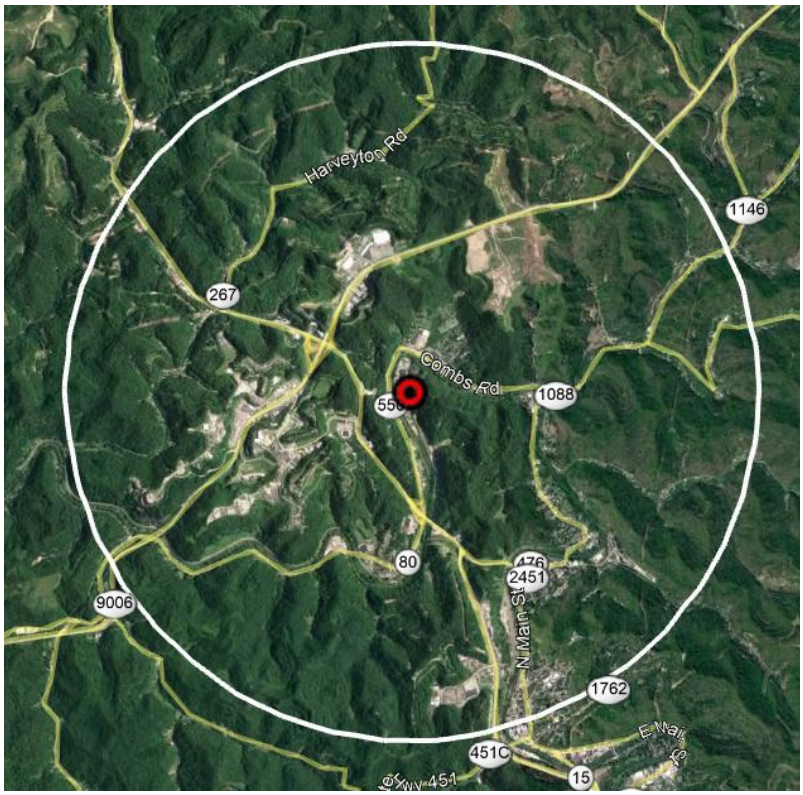
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to detect elevated pollutant levels for activation of emergency control procedures for ozone.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.71	SPM AQI EPISODE	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.6	SLAMS AQI	Broadband Spectroscopy	Continuously
Meteorological	5.8	Other	AQM grade instruments for wind speed, wind direction, and temperature	Continuously

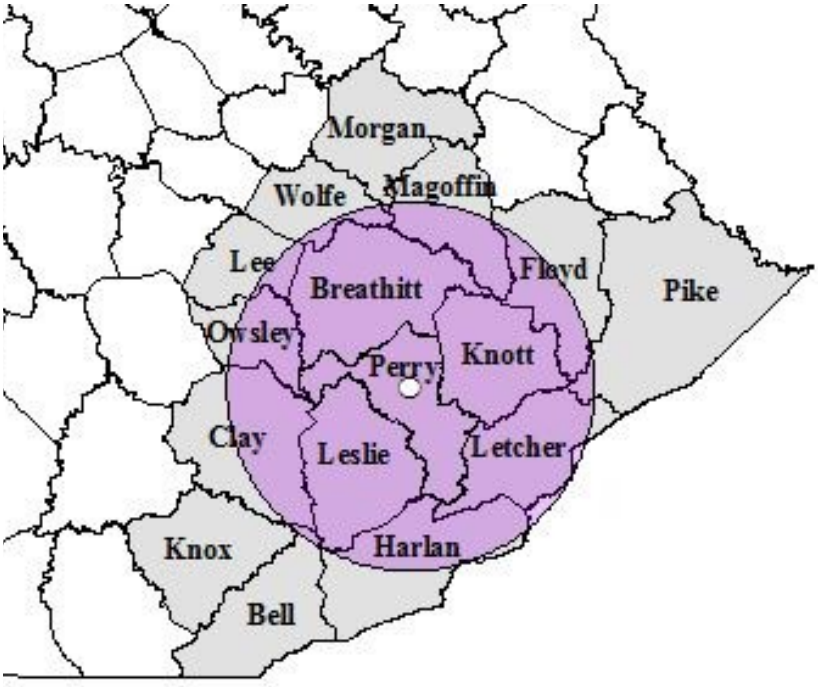
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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: November 17, 2020
Inspection By: Jenna Nall
Site Approval Status: Site and monitors meet all design criteria for the monitoring network.

The monitoring site is a stationary equipment shelter located 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, E and G.

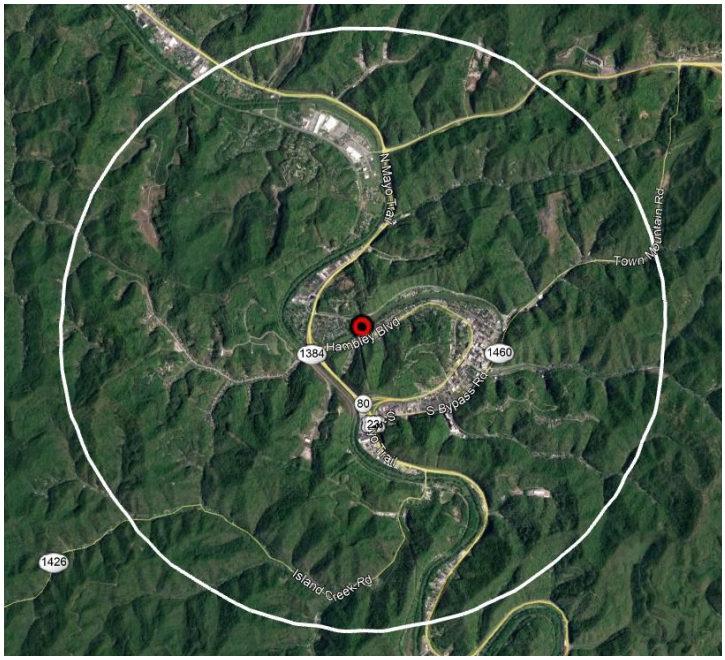
Monitoring Objective:
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards. While not required, the site also provides pollutant levels for daily air quality index reporting.

Monitors				
Monitor Type	**Inlet Height (meters)**	**Designation**	**Analysis Method**	**Frequency of Sampling**
AEM Ozone	3.57	SPM AQI	UV photometry	Continuously March 1 – October 31
FEM $PM_{2.5}$ Continuous	4.74	SLAMS AQI	Broadband Spectroscopy	Continuously

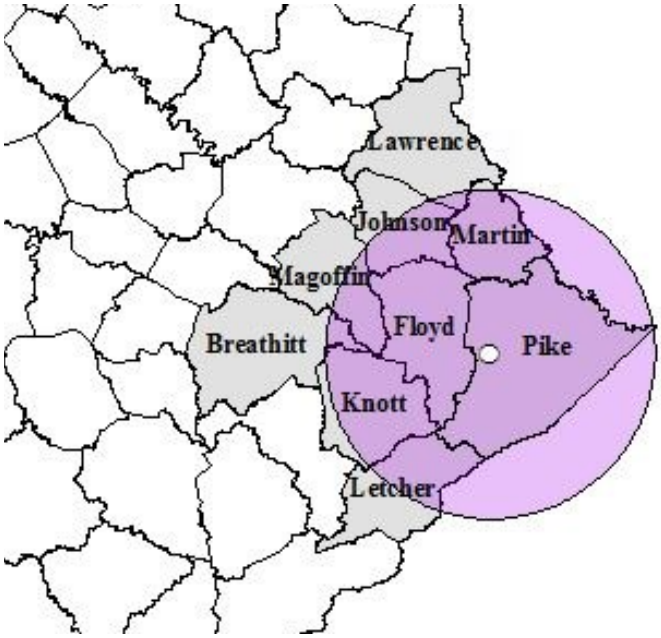
Quality Assurance Status:
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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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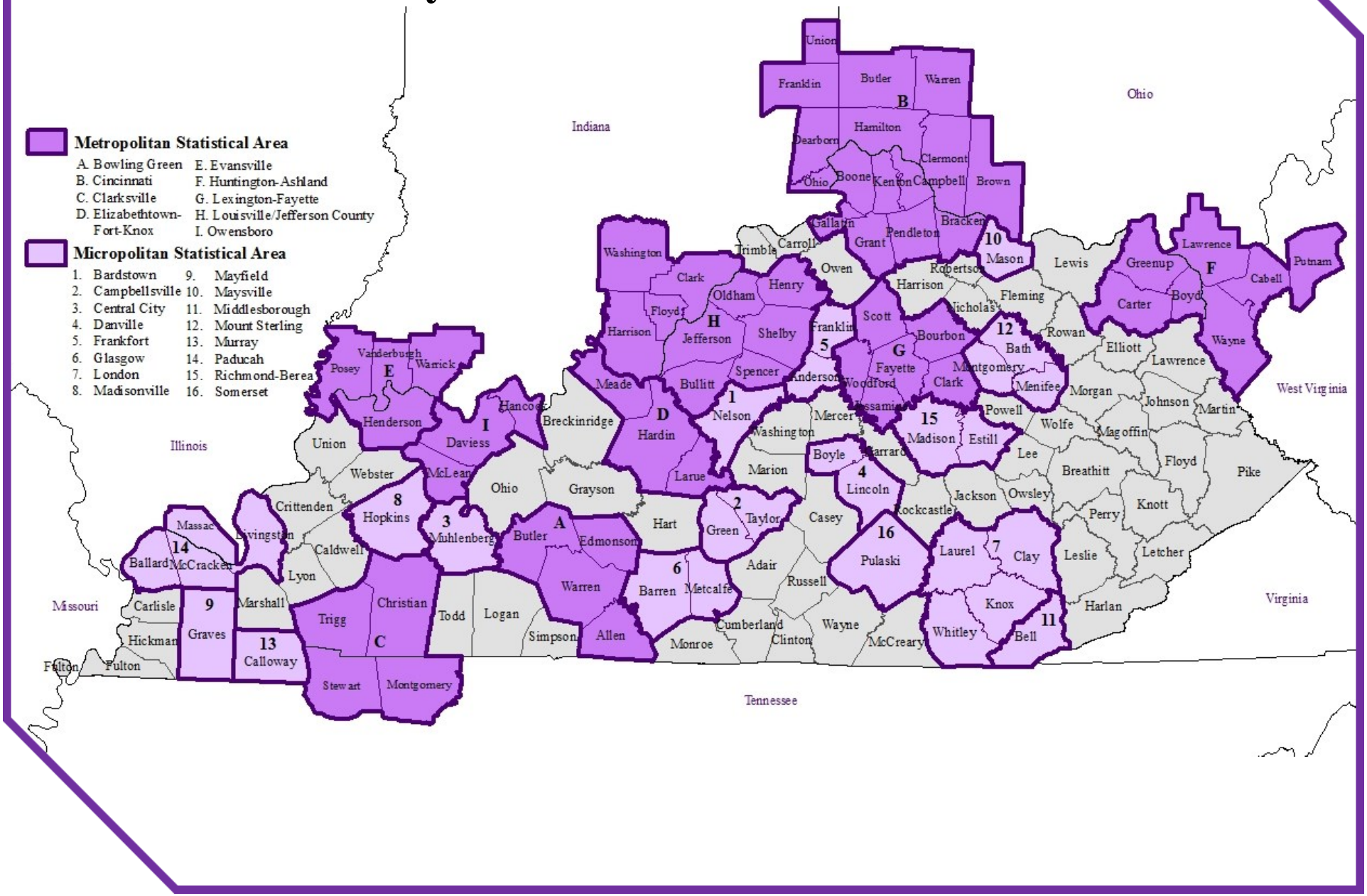
APPENDIX A

KENTUCKY CORE-BASED STATISTICAL AREAS MAP AND CBSA TABLES

Kentucky—Core Based Statistical Areas



CBSAs - Metropolitan Statistical Areas							
CBSA Title	CBSA Code	County	State	State Code	County Code	Count Population	CBSA Population
Bowling Green, KY	14540	Allen County	Kentucky	21	003	21,315	179,240
		Butler County	Kentucky	21	031	12,879	
		Edmonson County	Kentucky	21	061	12,150	
		Warren County	Kentucky	21	227	132,896	
Cincinnati, OH-KY-IN	17140	Dearborn County	Indiana	18	029	49,458	2,221,208
		Franklin County	Indiana	18	047	22,758	
		Ohio County	Indiana	18	115	5,875	
		Union County	Indiana	18	161	7,054	
		Boone County	Kentucky	21	015	133,581	
		Bracken County	Kentucky	21	023	8,303	
		Campbell County	Kentucky	21	037	93,584	
		Gallatin County	Kentucky	21	077	8,869	
		Grant County	Kentucky	21	081	25,069	
		Kenton County	Kentucky	21	117	166,998	
		Pendleton County	Kentucky	21	191	14,590	
		Brown County	Ohio	39	015	43,432	
		Butler County	Ohio	39	017	383,134	
		Clermont County	Ohio	39	025	206,428	
		Hamilton County	Ohio	39	061	817,473	
		Warren County	Ohio	39	165	234,602	
Clarksville, TN-KY	17300	Christian County	Kentucky	21	047	70,461	307,820
		Trigg County	Kentucky	21	221	14,651	
		Montgomery County	Tennessee	47	125	208,993	
		Stewart County	Tennessee	47	161	13,715	
Elizabethtown-Fort Knox, KY	21060	Hardin County	Kentucky	21	093	110,958	153,928
		Larue County	Kentucky	21	123	14,398	
		Meade County	Kentucky	21	163	28,572	
Evansville, IN-KY	21780	Posey County	Indiana	18	129	25,427	315,086
		Vanderburgh County	Indiana	18	163	181,451	
		Warrick County	Indiana	18	173	62,998	
		Henderson County	Kentucky	21	101	45,210	
Huntington-Ashland, WV-KY-OH	26580	Boyd County	Kentucky	21	019	46,718	355,873
		Carter County	Kentucky	21	043	26,797	
		Greenup County	Kentucky	21	089	35,098	
		Lawrence County	Ohio	39	087	59,463	
		Cabell County	West Virginia	54	011	91,945	
		Putnam County	West Virginia	54	079	56,450	
		Wayne County	West Virginia	54	099	39,402	
Lexington-Fayette, KY	30460	Bourbon County	Kentucky	21	017	19,788	517,056
		Clark County	Kentucky	21	049	36,263	
		Fayette County	Kentucky	21	067	323,152	
		Jessamine County	Kentucky	21	113	54,115	
		Scott County	Kentucky	21	209	57,004	
		Woodford County	Kentucky	21	239	26,734	
Louisville/Jefferson County, KY-IN	31140	Clark County	Indiana	18	019	118,302	1,265,108
		Floyd County	Indiana	18	043	78,522	
		Harrison County	Indiana	18	061	40,515	
		Washington County	Indiana	18	175	28,036	
		Bullitt County	Kentucky	21	029	81,676	
		Henry County	Kentucky	21	103	16,126	
		Jefferson County	Kentucky	21	111	766,757	
		Oldham County	Kentucky	21	185	66,799	
		Shelby County	Kentucky	21	211	49,024	
		Spencer County	Kentucky	21	215	19,351	
Owensboro, KY	36980	Daviess County	Kentucky	21	059	101,511	119,440
		Hancock County	Kentucky	21	091	8,722	
		McLean County	Kentucky	21	149	9,207	

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	46,233	46,233
Campbellsville, KY	15820	Green County	Kentucky	21	087	10,941	36,710
		Taylor County	Kentucky	21	217	25,769	
Central City, KY	16420	Muhlenberg County	Kentucky	21	177	30,622	30,622
Danville, KY	19220	Boyle County	Kentucky	21	021	30,060	54,609
		Lincoln County	Kentucky	21	137	24,549	
Frankfort, KY	23180	Anderson County	Kentucky	21	005	22,747	73,738
		Franklin County	Kentucky	21	073	50,991	
Glasgow, KY	23980	Barren County	Kentucky	21	009	44,249	54,320
		Metcalfe County	Kentucky	21	169	10,071	
London, KY	30940	Clay County	Kentucky	21	051	19,901	148,123
		Knox County	Kentucky	21	121	31,145	
		Laurel County	Kentucky	21	125	60,813	
		Whitley County	Kentucky	21	235	36,264	
Madisonville, KY	31580	Hopkins County	Kentucky	21	107	44,686	44,686
Mayfield, KY	32460	Graves County	Kentucky	21	083	37,266	37,266
Maysville, KY	32500	Mason County	Kentucky	21	161	17,070	17,070
Middlesborough, KY	33180	Bell County	Kentucky	21	013	26,032	26,032
Mount Sterling, KY	34460	Bath County	Kentucky	21	011	12,500	47,146
		Menifee County	Kentucky	21	165	6,489	
		Montgomery County	Kentucky	21	173	28,157	
Murray, KY	34660	Calloway County	Kentucky	21	035	39,001	39,001
Paducah, KY-IL	37140	Massac County	Illinois	17	127	13,772	96,272
		Ballard County	Kentucky	21	007	7,888	
		Livingston County	Kentucky	21	139	9,194	
		McCracken County	Kentucky	21	145	65,418	
Richmond-Berea, KY	40080	Estill County	Kentucky	21	065	14,106	107,093
		Madison County	Kentucky	21	151	92,987	
Somerset, KY	43700	Pulaski County	Kentucky	21	199	64,979	64,979

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.

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	PM10	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 2021

AIR POLLUTION CONTROL DISTRICT

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

May, 2021

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 2021 Network Planning period (July 2021 through June 2022). 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. Given some of the changes that have occurred to the $PM_{2.5}$ monitoring network over the last several years, Table 2 provides a summary of the changes that have occurred, as well as some clarifications to the monitoring objectives of PM monitors.

$PM_{2.5}$ 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
Firearms Training	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.

Clarifications on $PM_{2.5}$ Monitor Objectives Operated by LMAPCD	
Watson Lane 21-111-0051	PM2.5 FRM sampling was terminated in December, 2017. The continuous PM2.5 BAM served as primary monitor starting January, 2018, then transitioned to the T640 method in January, 2019. It should also be noted that PM10 NAAQS compliance monitoring was terminated at this site in December, 2018. The PM10 NAAQS compliance responsibility was transferred to Cannons Lane for 2019 and beyond.
Cannons Lane 21-111-0067	The continuous PM2.5 BAM served as the primary monitor starting January, 2018, with FRM sampling serving as a collocated monitor for the continuous method. Initial FRM collocation sampling did not meet the required collocation distance, but this was resolved in March, 2019 when the FRM sampler was moved to the roof of the shelter. The T640x analyzer replaced the BAM instruments in late January, 2019. It should also be noted that upon installation of the T640x in January, 2019, this site served as a NAAQS compliance monitor for PM10 as well.
Carrithers Middle School 21-111-0080	This site was established in early 2018 and served as a replacement site for Bates Elementary (AQI ID 21-111-0027). The initial objective of the PM2.5 monitoring served as a special purpose monitor for AQI determination. However, with a change from BAM1020 method to API Teledyne T640 method in early 2019, the monitoring objective changed to NAAQS Compliance. As such, the parameter changed from 88501 to 88101.
Durrett Lane 21-111-0075	Initial PM2.5 monitoring at this Near Road site was performed using filter-based FRM samplers. In early 2019, a Teledyne API T640 instrument was installed and served as the primary PM2.5 monitor for the purpose of NAAQS compliance. The FRM sampler remains at the site and operates as a QA collocated monitor (as of 1/1/2019).
Algonquin Parkway 21-111-1041	PM2.5 monitoring began at Algonquin Parkway (formerly known as Firearms Training) in early 2018 when the Southwick Community Center site (AQS ID 21-111-0043) was shut down and much of the monitoring equipment was relocated to Algonquin Parkway (PM and Meteorology). In addition to PM2.5 NAAQS compliance monitoring, this site also represents a NAAQS compliance monitoring site for PM10 starting in 2018.

Table 2 - List of LMAPCD $PM_{2.5}$ monitoring sites and clarifications on the intended use of those monitors.

Photochemical Assessment Monitoring Station (PAMS)

Based on updated monitoring regulations in 40 CFR Part 58, Appendix D, state and local air monitoring agencies are to begin PAMS monitoring at their NCore location by June 1, 2021. APCD has acquired most PAMS instrumentation and while some delays have occurred, APCD will be making best efforts to implement PAMS monitoring by the June 1, 2021 start date. In order to accommodate the new instrumentation for PAMS, an additional shelter was installed at the Cannons Lane site in early 2021. Table 3 provides a listing of all required PAMS parameters and their status at APCD's Cannons Lane NCore site.

Status of PAMS Parameters at APCD's Cannons Lane NCore Site			
Required PAMS Measurement	*Status*	*Current / Expected Instrumentation*	*Operational Date / Estimated Date*
Hourly VOCs	Performance Testing	CAS / Chromatotec Auto GC	6/1/2021
Carbonyls	Acquiring	ATEC 8000-2 Carbonyl Sampler	ASAP
Hourly Ozone	Operational	Teledyne API T400[1]	2/27/2016
True NO2	Operational	Teledyne API T500U	6/15/2017
NOy	Operational	Teledyne API T200U NOy[1]	6/12/2018
Ambient Temp	Operational	Vaisala HMW93D Temp/RH Probe	1/1/2010
Wind	Operational	RM Young 85000 Ultrasonic	1/19/2010
Ambient Pressure	Operational	RM Young 61302V	10/8/2018
Precipitation	Operational	Met One 370 Tipping Bucket[1]	6/23/2016
Hourly Mixing Height	Performance Testing	Vaisala Ceilometer CL51	6/1/2021
Solar Radiation	Operational	Eppley PS Pyranometer	3/1/2009
UV Radiation	Acquired	Eppley TUVR Radiometer	6/1/2021

Table 3 - 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.

LMAPCD will work as diligently as possible to evaluate and test the new PAMS instrumentation so that meaningful, valid data can be collected and reported to EPA's AQS database. LMAPCD does not plan to report these PAMS data to EPA's AQS database until there is adequate confidence in the data being collected.

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 will be used for PAMS monitoring of hourly VOCs. The Auto GC at Algonquin Parkway has undergone numerous upgrades over the last several 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] 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.

Update on Characterization of Ambient SO_2 Concentrations in Vicinity of Kosmosdale in Southwestern Jefferson County

On February 19, 2020, LMAPCD and the permitted facility revised a Board Order to allow for construction of a new stack as an alternative to ambient air quality monitoring. On March 16, 2020, the permitted facility notified LMAPCD in accordance with the revised Board Order that it would construct a new stack consistent with the parameters evaluated by LMAPCD, the Environmental Protection Agency (EPA), and the Kentucky Division for Air Quality (KDAQ) during the Fall of 2019. Based on ongoing discussions between LMAPCD, EPA, KDAQ, and the permitted facility, the previously planned Kosmosdale site was officially proposed for discontinuation in an addendum to the 2020 network plan. This addendum was made available for public comment during the Spring of 2021. Following conclusion of the public comment period, and per approval from EPA, the Kosmosdale site will no longer be included in the KDAQ Network plan.

Black Carbon Monitoring at Durrett Lane Near Road Site

LMAPCD plans to install a Magee Scientific AE33 Aethalometer at the Durrett Lane Near Road site to better characterize particulate carbon species. The site's proximity to heavy traffic congestion on the nearby I-264 Watterson Expressway & I-65 interchange makes the Durrett Lane Near Road site a good candidate site for carbon monitoring. Additionally, intermittent localized peaks of $PM_{2.5}$ concentrations from suspected residential wood burning or other biomass burning may allow for a mix of carbon species to be monitored and assessed. With the full spectrum 7-wavelength analysis capability, the AE33 Aethalometer has the ability to measure a mix of carbon species. While LMAPCD planned to install the AE33 Aethalometer at the Durrett Lane site by Fall, 2020, the COVID-19 pandemic resulted in delays to this process. The AE33 Aethalometer will be installed as soon as possible based on available staffing and resources.

Cannons Lane Monitor Metadata Modifications

Some minor modifications and clarifications are provided for select parameters at the Cannons Lane site (AQS Site ID 21-111-0067). These metadata modifications and clarifications are provided below.

- Ozone Spatial Scale – A discrepancy was noted between the spatial scale listed in prior network plans and that listed in EPA's AQS database. The spatial scale for ozone at the Cannons Lane site shall be listed as Neighborhood Scale as the area of representativeness for ozone measurements at this site is expected to be on the order of 4 km.
- Ozone Objective / Designation – Per evaluation of ambient ozone data and design values, and in coordination with KDAQ, the Cannons Lane ozone monitor (44201-1) will be designated as the Maximum Ozone Concentration site for the Louisville/Jefferson County, KY-IN CBSA
- PM2.5 Spatial Scale – Upon evaluating spatial scales for PM2.5 and Ozone, it was determined that the Cannons Lane PM2.5 monitors (88101-1 and 88101-3) would be better

represented as Neighborhood Scale to be consistent with spatial scales for other Louisville area PM2.5 monitors.

Conclusion

The majority of the changes being proposed for the Network Planning period (July 2021 – June 2022) 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 change to LMAPCD's network involves the completion of equipment installations at the Cannons Lane NCore station to implement the required PAMS monitoring. The PAMS instrumentation is new to most state, local, and tribal agencies, and as such, additional effort will likely be needed to make sure that the instrumentation is producing meaningful, valid data. In an effort to ensure that the Louisville Metropolitan Statistical Area (MSA) continues to meet minimum monitoring requirements, Table 4 provides a summary of the number of ambient air quality monitoring sites in operation for each pollutant group within the Louisville MSA. As can be seen in Table 4, 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)	0 (0)
# Sites After proposed Changes	7 (3)	7 (5)	3 (2)	1 (1)	2 (1)	2 (1)	4 (3)	2 (2)	2 (2)	2 (1)	1 (1)

Table 4 - 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 Air Pollution Control District Ambient Monitoring Group Instrument & Equipment Inventory - May, 2021						
Location	Instrument Type	Manufacturer	Model	Serial Number	Condition	Status
Algonquin	Anemometer	RM Young	85000	UB3773	Good	In Use
Algonquin	Auto GC C2-C6	Chromatotec	airmoVOC C2-C6 A21022	56410717	Good	In Use
Algonquin	Auto GC C6-C12	Chromatotec	airmoVOC C6-C12 A21022	26400717	Good	In Use
Algonquin	Auto GC Calibrator	Chromatotec	airmoCal	56440717	Good	In Use
Algonquin	Auto GC H2 Generator	Chromatotec	Hydroxychrom	56420717	Good	In Use
Algonquin	Calibrator	API	T700	289	Good	In Use
Algonquin	Datalogger	ESC Agilaire LLC	8832	4294	Fair	In Use
Algonquin	PM	Thermo	2025i	20612	Good	Spare
Algonquin	PM	Thermo	2025i	20614	Good	Spare
Algonquin	PM	API	T640	151	Good	In Use
Algonquin	PM	API	T640x	592	Good	In Use
Algonquin	RH/Temp Probe	RM Young	41372VC	Y490092	Fair	In Use
Algonquin	RH/Temp Sensor	Vaisala	HMW93D	H052001	Good	In Use
Algonquin	Site Shelter	CAS			Good	In Use
Algonquin	SO2 Analyzer	API	T100U	081	Fair	In Use
Algonquin	Zero Air	API	T701H	802	Good	In Use
Carrithers	Anemometer	RM Young	05103VM	WM47808	Fair	In Use
Carrithers	Calibrator	API	T703	255	Good	In Use
Carrithers	Datalogger	ESC Agilaire LLC	8832	4411	Fair	In Use
Carrithers	O3 Analyzer	API	T400	5405	Good	In Use
Carrithers	PM	API	T640	457	Good	In Use
Carrithers	RH/Temp Probe	RM Young	41382	n/a	Good	In Use
Carrithers	RH/Temp Sensor	Vaisala	HMW93D	N1540018	Good	In Use
Carrithers	Site Shelter	EKTO Mfg.	81012	4234-1	Fair	In Use
CLAMS	Anemometer	RM Young	5305AQ	135267	Good	In Use
CLAMS	Anemometer	RM Young	85000	UB1390	Good	In Use
CLAMS	Aspirated Radiation Shield	RM Young	43502	n/a	Good	In Use
CLAMS	Auto GC C2-C6	Chromatotec	airmoVOC C2-C6 A12000	57351219	Good	In Use
CLAMS	Auto GC C6-C12	Chromatotec	airmoVOC C6-C12 A23022	27361219	Good	In Use
CLAMS	Auto GC Calibrator	Chromatotec	airmoCal XXX922	57381219	Good	In Use
CLAMS	Auto GC H2 Generator	Chromatotec	Hydroxychrom XXX916	57371219	Good	In Use

Louisville Air Pollution Control District Ambient Monitoring Group Instrument & Equipment Inventory - May, 2021						
Location	Instrument Type	Manufacturer	Model	Serial Number	Condition	Status
CLAMS	Baro Pressure	RM Young	61302V	BPA1240	Good	In Use
CLAMS	Calibrator	API	T700U	457	Good	In Use
CLAMS	Ceilometer	Vaisala	CL51	R4640540	Good	In Use
CLAMS	CO Analyzer	API	T300U	281	Good	In Use
CLAMS	Datalogger	ESC Agilaire LLC	8832	4410	Good	In Use
CLAMS	Datalogger	ESC Agilaire LLC	8832	4292	Fair	In Use
CLAMS	Meteorology Tower	Aluma Tower	T-35H	AP-29071-U-4	Good	In Use
CLAMS	NO2 Analyzer	API	T500U	169	Good	In Use
CLAMS	Noy Analyzer	API	T200U	316	Good	In Use
CLAMS	O3 Analyzer	API	T400	1468	Good	In Use
CLAMS	PM	Met One	Super SASS	1046	Good	In Use
CLAMS	PM	URG	3000N	BN-251	Fair	In Use
CLAMS	PM	URG	3000N	BN-933	Fair	In Use
CLAMS	PM	Thermo	2025i	21317	Good	Spare
CLAMS	PM	Thermo	2025i	21318	Good	In Use
CLAMS	PM	API	T640x	591	Good	In Use
CLAMS	Pyranometer	Eppley	PSP	34257F3	Good	In Use
CLAMS	RadNet	HI-Q	HVP-4004BRL-S	17603	Fair	In Use
CLAMS	Rain	Met One	370	U10772	Good	In Use
CLAMS	RH/Temp Probe	RM Young	41382	021011	Good	In Use
CLAMS	RH/Temp Sensor	Vaisala	HMW93D	H05200002	Good	In Use
CLAMS	Site Shelter	CAS	9001	4419	Good	In Use
CLAMS	Site Shelter	Modular Connections	MCP-296	MC2519	Good	In Use
CLAMS	SO2 Analyzer	API	T100U	276	Good	In Use
CLAMS	TEOM shelter	EKTO Mfg.	432-SP	3535-6	Good	In Use
CLAMS	Zero Air	API	T701H	747	Good	In Use
Near Road	Anemometer	RM Young	05305V	128356	Fair	In Use
Near Road	Anemometer	RM Young	85000	4675	Fair	In Use
Near Road	Calibrator	API	T700U	106	Good	In Use
Near Road	CO Analyzer	API	T300U	155	Fair	In Use
Near Road	Datalogger	ESC Agilaire LLC	8832	4293	Fair	In Use

Louisville Air Pollution Control District Ambient Monitoring Group Instrument & Equipment Inventory - May, 2021						
Location	Instrument Type	Manufacturer	Model	Serial Number	Condition	Status
Near Road	Meteorology Tower	Aluma Tower	T-135	AT-213072-Y-6-1	Good	In Use
Near Road	NO2 Analyzer	API	T500U	168	Good	In Use
Near Road	PM	API	T640	458	Good	In Use
Near Road	PM	Thermo	2025i	20608	Good	In Use
Near Road	RH/Temp Probe	RM Young	41382	25029	Fair	In Use
Near Road	RH/Temp Sensor	Vaisala	HMW93D	H052004	Good	In Use
Near Road	Site Shelter	CAS	CAS	3200-7	Good	In Use
Near Road	Zero Air	API	T701H	773	Fair	In Use
Watson	Anemometer	RM Young	85000	002568	Good	In Use
Watson	Calibrator	API	T700	1620	Good	In Use
Watson	Datalogger	ESC Agilaire LLC	8832	4291	Fair	In Use
Watson	O3 Analyzer	API	T400	1467	Good	In Use
Watson	PM	API	T640	456	Good	In Use
Watson	RH/Temp Sensor	Vaisala	HMW93D	H0520003	Good	In Use
Watson	Site Shelter	CAS		4434	Good	In Use
Watson	SO2 Analyzer	API	T100U	406	Good	In Use
Watson	Zero Air	API	T701H	604	Good	In Use
Shop	Air Toxics Sampler	Thermo	Miran Saphire	79545411	Fair	Not In Use
Shop	Anemometer	Met One	50.5	B-1031	Poor	Spare
Shop	Anemometer	Met One	50.5	Y3338	Good	Spare
Shop	Anemometer	RM Young	05103VM	WM101749	Fair	Spare
Shop	Anemometer	RM Young	05103VM-42	118039	Good	Spare
Shop	Anemometer	RM Young	05305V	WM00101749	Fair	Spare
Shop	Anemometer	RM Young	5305AQ	VW101749	Good	Spare
Shop	Anemometer	RM Young	85000	n/a	Good	Spare
Shop	Anemometer	RM Young	85000	UB-1309	Good	Spare
Shop	Anemometer	RM Young	86000	UD00003877	Good	Spare
Shop	Aspirated Radiation Shield	RM Young	43502	n/a	Good	Spare
Shop	Calibrator	API	T700U	174	Good	In Use
Shop	Calibrator	API	T700	290	Good	Spare
Shop	Calibrator	API	T700U	107	Good	In Use

Louisville Air Pollution Control District Ambient Monitoring Group Instrument & Equipment Inventory - May, 2021						
Location	Instrument Type	Manufacturer	Model	Serial Number	Condition	Status
Shop	Calibrator	API	T700	1619	Good	Spare
Shop	Calibrator	API	T750	054	Good	In Use
Shop	Calibrator	API	T703	731	Good	In Use
Shop	CO Analyzer	Thermo	48i-TLE	0814429-062	Fair	Spare
Shop	CO Analyzer	API	T300U	483	Good	Spare
Shop	Datalogger	ESC Agilaire LLC	8832	4691K	Fair	In Use
Shop	Datalogger	ESC Agilaire LLC	8872	0731	Good	Spare
Shop	Datalogger	ESC Agilaire LLC	8832	2713K	Fair	In Use
Shop	Flow Standard	AliCat	MWB-2SLPM-D	228258	Good	In Use
Shop	Flow Standard	AliCat	MWB-500SCCM-D	228259	Good	In Use
Shop	Flow Standard	AliCat	FP-25BT	148162	Good	In Use
Shop	Flow Standard	AliCat	FP-25BT	212953	Good	In Use
Shop	Flow Standard	AliCat	FP-25BT	212954	Good	In Use
Shop	Flow Standard	AliCat	FP-25BT	212955	Good	In Use
Shop	Flow Standard	AliCat	FP-25BT	212956	Good	In Use
Shop	Flow Standard	AliCat	FP-25BT	212957	Good	In Use
Shop	Flow Standard	AliCat	MWB-2SLPM-D	189496	Good	In Use
Shop	Flow Standard	Chinook	SLP	HL041007	Fair	Spare
Shop	Flow Standard	Chinook	SLP	HL170606	Good	Spare
Shop	Flow Standard	Chinook	SLP	HL170607	Good	Spare
Shop	Flow Standard	Chinook	SLP	HM041005	Poor	Spare
Shop	Flow Standard	Chinook	SLP	HM041006	Fair	Spare
Shop	Flow Standard	Chinook	SLP	HM70204	Fair	Spare
Shop	Flow Standard	MesaLab	Bios Dry Cal	105393	Fair	Spare
Shop	Flow Standard	MesaLab	Delta Cal	465	Fair	Spare
Shop	Flow Standard	MesaLab	Delta Cal	466	Fair	Spare
Shop	Flow Standard	Fluke	Fluke	2213	Good	In Use
Shop	Lab Fridge	Thermo	REL1204A	155472601160526	Good	In Use
Shop	Met Station	Met One	Portable	E5678	Good	Spare
Shop	Met Station	Met One	Portable	5876	Fair	Spare
Shop	NO2 Analyzer	API	T500U	170	Good	Spare

Louisville Air Pollution Control District Ambient Monitoring Group Instrument & Equipment Inventory - May, 2021						
Location	Instrument Type	Manufacturer	Model	Serial Number	Condition	Status
Shop	O3 Analyzer	Thermo	49iPS	617817-229	Good	In Use
Shop	O3 Analyzer	API	T400	315	Good	Spare
Shop	O3 Analyzer	API	T400	316	Good	Spare
Shop	Photometer Calibrator	Thermo	49CPS	70020-364	Good	In Use
Shop	PM	Met One	SASS	6080	Fair	Spare
Shop	PM	API	T640	459	Good	Spare
Shop	PM	Thermo	2025i	20607	Good	Spare
Shop	PM	Thermo	2025B	22560	Fair	Spare
Shop	PM	URG	3000N	1045	Fair	Spare
Shop	Pyranometer	Eppley	PSP	33927F3	Fair	Spare
Shop	Rain	RM Young	52202	TB03206	Fair	Spare
Shop	RH/Temp Probe	RM Young	41382	126462	Good	Spare
Shop	RH/Temp Sensor	Vaisala	HMW93D	N1540017	Fair	Spare
Shop	RH/Temp Standard	Vaisala	HM75	R2830602	Good	In Use
Shop	RH/Temp Standard	Vaisala	HPM	J0871073	Fair	Spare
Shop	RH/Temp Standard	Vaisala	HPM	x3810013	Fair	Spare
Shop	RH/Temp Transmitter	Vaisala	HMW71Y	W3650008	Fair	Spare
Shop	RH/Temp Transmitter	Vaisala	HMW71Y	X0840020	Fair	Spare
Shop	SO2 Analyzer	Thermo	43i-TLE	814428-732	Fair	Spare
Shop	SO2 Analyzer	API	T100	1321	Good	Spare
Shop	SO2 Analyzer	API	T100	1322	Good	Spare
Shop	Temp Probe	RM Young	41342VF	41376A	Fair	Spare
Shop	Temp Probe	RM Young	41342VF	41376A	Fair	Spare
Shop	Temp Probe	RM Young	41342VF	TS05123	Good	Spare
Shop	UV Radiometer	Eppley	TUVR	38938	Good	Not In Use
Shop	Vehicle	Ford	Ranger	3114	Poor	In Use
Shop	Vehicle	Ford	Escape	3700	Fair	In Use
Shop	Vehicle	Ford	Escape	4237	Good	In Use
Shop	Vehicle	Ford	F350 (big van)	2966	Poor	In Use
Shop	Vehicle	Ford	F250 (big truck)	1268	Good	In Use
Shop	Vehicle	Ford	Transit	2116	Good	In Use

Louisville Air Pollution Control District Ambient Monitoring Group Instrument & Equipment Inventory - May, 2021						
Location	Instrument Type	Manufacturer	Model	Serial Number	Condition	Status
Shop	Vehicle	Ford	Escape	4221	Good	In Use
Shop	Vehicle	Ford	Escape	4220	Good	In Use
Shop	Zero Air	API	T701H	839	Good	Spare
Shop	Zero Air	API	T701H	801	Good	In Use
Shop	Zero Air	API	T701M	647	Good	Spare
Shop	Zero Air	API	T701M	648	Good	Spare
Shop	Zero Air	API	T751H	62	Good	In Use
Southwick	BAM shelter	Met One	BAM Shelter	n/a	Good	Not In Use
Southwick	Meteorology Tower	Unknown/Misc	Meteorology Tower		Good	Not In Use
Southwick	PM	Thermo	2025B	20450	Fair	Not In Use
Southwick	PM	Thermo	2025B	21665	Fair	Not In Use
Southwick	PM	Met One	BAM	T18983	Good	Not In Use
Southwick	Rain	Met One	370	E5009	Fair	Not In Use
Southwick	TEOM shelter	EKTO Mfg.	432-SP	3408-6	Good	Not In Use
Southwick	TEOM shelter	EKTO Mfg.	432-SP	3408-7	Good	Not In Use
Warehouse	Air Toxics FTIR	IMACC	M-ZSE12-180	M0015	Fair	Not In Use
Warehouse	Air Toxics UV	IMACC	Air Toxics UV	Air Toxics UV	Fair	Not In Use
Warehouse	Analyzer	EcoTech	300	1586	Poor	Not In Use
Warehouse	BAM shelter	Met One	BAM Shelter	n/a	Good	Not In Use
Warehouse	Calibrator	EcoTech	6100	4012	Poor	Not In Use
Warehouse	Calibrator	Thermo	146C	0417007-062	Poor	Not In Use
Warehouse	Calibrator	Thermo	146C	382	Poor	Not In Use
Warehouse	Calibrator	Thermo	146i	0814428-735	Fair	Not In Use
Warehouse	CO Analyzer	Thermo	48C	351	Poor	Not In Use
Warehouse	CO Analyzer	Thermo	48C	68840-361	Poor	Not In Use
Warehouse	CO Analyzer	Thermo	48C	67474-356	Poor	Not In Use
Warehouse	CO Analyzer	Thermo	48C	417007-060	Poor	Not In Use
Warehouse	CO Analyzer	Thermo	48i-TLE	617817-228	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	1917	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	1971	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	1972	Fair	Not In Use

Louisville Air Pollution Control District Ambient Monitoring Group Instrument & Equipment Inventory - May, 2021						
Location	Instrument Type	Manufacturer	Model	Serial Number	Condition	Status
Warehouse	Datalogger	ESC Agilaire LLC	8816	1973	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	2423	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	2764	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	3303	Poor	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	3304	Poor	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	3305	Poor	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	3306	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	3307	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	3308	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	3801	Good	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	4422	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	4423	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8816	4424	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8832	4291	Fair	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8832	5058	Poor	Not In Use
Warehouse	Datalogger	ESC Agilaire LLC	8832	A1014	Good	Not In Use
Warehouse	Meteorology Tower	Unknown/Misc	Meteorology Tower	n/a	Good	Not In Use
Warehouse	NO2 Analyzer	EcoTech	Ecotech Serinus	40-10-51	Poor	Not In Use
Warehouse	NO2 Analyzer	Thermo	42C	070415-365	Poor	Not In Use
Warehouse	NO2 Analyzer	Thermo	42C	70979-367	Poor	Not In Use
Warehouse	NO2 Analyzer	API	T200	341	Fair	Not In Use
Warehouse	Noy Analyzer	Thermo	42i-Y	0814428-734	Poor	Not In Use
Warehouse	O3 Analyzer	Thermo	49C	43374-269	Poor	Not In Use
Warehouse	O3 Analyzer	Thermo	49C	47646-280	Poor	Not In Use
Warehouse	O3 Analyzer	Thermo	49C	64282-342	Poor	Not In Use
Warehouse	O3 Analyzer	Thermo	49C	74462-376	Poor	Not In Use
Warehouse	O3 Analyzer	Thermo	49C	417007-061	Poor	Not In Use
Warehouse	O3 Analyzer	Thermo	49C	413906-381	Poor	Not In Use
Warehouse	O3 Analyzer	Thermo	49i	617817-230	Fair	Not In Use
Warehouse	PM	Met One	BAM	N2946	Fair	Not In Use
Warehouse	PM	Met One	BAM	N3593	Fair	Not In Use

Louisville Air Pollution Control District Ambient Monitoring Group Instrument & Equipment Inventory - May, 2021						
Location	Instrument Type	Manufacturer	Model	Serial Number	Condition	Status
Warehouse	PM	Met One	BAM	N3596	Fair	Not In Use
Warehouse	PM	Met One	SASS	3567	Fair	Not In Use
Warehouse	PM	Thermo	2025B	21310	Fair	Not In Use
Warehouse	PM	Met One	SASS	3565	Fair	Not In Use
Warehouse	PM	Met One	SASS	6079	Fair	Not In Use
Warehouse	PM	Thermo	2025B	21656	Fair	Not In Use
Warehouse	PM	Thermo	2025B	21666	Fair	Not In Use
Warehouse	PM	Met One	BAM	K19862	Fair	Not In Use
Warehouse	PM	Met One	BAM	K19863	Fair	Not In Use
Warehouse	PM	Met One	BAM	H1710	Fair	Not In Use
Warehouse	PM	Met One	BAM	T18977	Good	Not In Use
Warehouse	PM	Met One	BAM	T18981	Good	Not In Use
Warehouse	PM	Met One	BAM	T18984	Good	Not In Use
Warehouse	Shelter (mobile)	Mobile Structures	Mobile Trailer	5WJVN14238L000673	Fair	Not In Use
Warehouse	Site Shelter	EKTO Mfg.	8812	3876-1	Fair	Not In Use
Warehouse	SO2 Analyzer	Thermo	43C	518612-095	Poor	Not In Use
Warehouse	SO2 Analyzer	Thermo	43C	69873-364	Poor	Not In Use
Warehouse	SO2 Analyzer	Thermo	43C	436610-205	Poor	Not In Use
Warehouse	TEOM	R&P	1400a	24601	Poor	Not In Use
Warehouse	TEOM	R&P	1400a	230750005	Poor	Not In Use
Warehouse	TEOM	R&P	1400a	23746	Poor	Not In Use
Warehouse	TEOM	R&P	1400a	23748	Poor	Not In Use
Warehouse	TEOM	R&P	1400ab	24059	Poor	Not In Use
Warehouse	TEOM	R&P	1400ab	24097	Poor	Not In Use
Warehouse	TEOM	R&P	1400ab	24885	Poor	Not In Use
Warehouse	TEOM	R&P	1400ab	24926	Poor	Not In Use
Warehouse	TEOM shelter	EKTO Mfg.	432-SP	3200-7	Poor	Not In Use
Warehouse	TEOM shelter	EKTO Mfg.	432-SP	3278-10	Good	Not In Use
Warehouse	TEOM shelter	EKTO Mfg.	432-SP	3278-9	Good	Not In Use
Warehouse	Zero Air	API	T701M	835	Poor	Not In Use
Warehouse	Zero Air	API	T701M	837	Poor	Not In Use

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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 13 FEM $PM_{2.5}$ continuous T640 monitors in the field; of which, all 13 are eligible for NAAQS comparisons. The following sites have T640 monitors:

- Elizabethtown
- Northern Kentucky University
- Ashland Primary
- Owensboro Primary
- Jackson Purchase
- Pikeville
- Smiths Grove (Primary and Collocated)
- Lexington Primary
- Hazard
- Hopkinsville
- Somerset
- Middlesboro

KDAQ plans to install a T640 at Grayson Lake starting 1/1/2022, with filter-based FRMs operating until 12/31/2021. This FEM monitor will be immediately usable for NAAQS comparisons.

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

A such, KDAQ will operate a total of 13 FEM $PM_{2.5}$ continuous T640 monitors in the field during the 2021-2022 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

Sampling began in October 2020. Twenty-four hour samples are collected in 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.

- Site #1: Characterization of maximum vinyl chloride concentrations
- Site #2: Characterization of maximum ethylene dichloride concentrations
- Site #3: Characterization of air quality in a more heavily populated area

Additionally, EPA and KDAQ agreed that the study would incorporate meteorological instrumentation and collocated VOC sampling for precision estimates. Study-sites are summarized below:

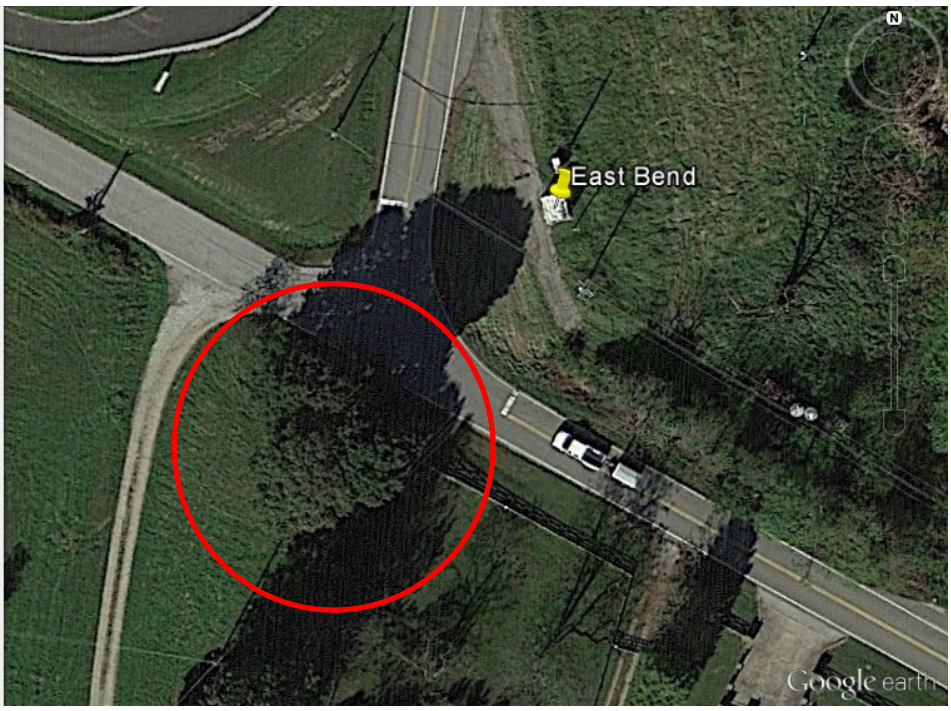
Study Site	Monitor Type	Designation	Analysis Method	Frequency of Sampling
Maximum Expected Vinyl Chloride Site (Site #1)	Volatile Organic Compounds	SPM-Other	EPA method TO-15	24-hours every sixth day
	Collocated Volatile Organic Compounds	SPM-Other	EPA method TO-15	24-hours every twelfth day
	Meteorological	Other	Anemometer & Wind Vane (wind speed & direction)	Continuously
Maximum Expected Ethylene Dichloride Site (Site #2)	Volatile Organic Compounds	SPM-Other	EPA method TO-15	24-hours every sixth day
Calvert City Elementary - Population Exposure Site (Site #3)	Volatile Organic Compounds	SPM-Other	EPA method TO-15	24-hours every sixth day

APPENDIX H

EAST BEND SITE RELOCATION - NATURE CENTER

Appendix H
East Bend Site Relocation - Nature Center

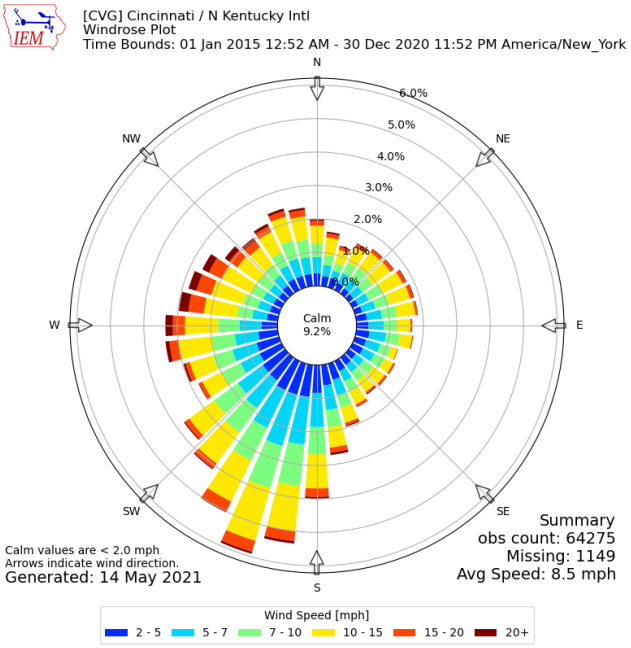
KDAQ determined that the East Bend Site (21-015-0003) in Boone County was partially obstructed. A cluster of tall trees, circled in red, located on private property southwest of the site was obstructing the predominant wind direction. Originally, KDAQ pursed removal of the trees, but began looking for a new site when removal of all the trees was impossible. Over the course of a year, KDAQ scouted and assessed various locations within Boone County, KY. KDAQ wanted to ensure that the new site would remain upwind of the Cincinnati area and would meet all requirements of 40 CFR 58, Appendix E.



Appendix H
East Bend Site Relocation - Nature Center

KDAQ is currently working with the Boone County Extension Environmental and Nature Center to relocate the East Bend ambient air monitoring site. The new site would continue to monitor ozone but would cease with meteorological instrumentation due to the proximity of a Kentucky Mesonet site.

Trees northeast of the site are approximately 33 meters away and roughly 16 meters tall at their maximum height. The ozone inlet is expected to be approximately 3.5 meters above the ground. The nearest road is Camp Ernst Rd at 37 meters away with a KYTC AADT of 7,093 (2019). A wind rose created from the Cincinnati/Northern Kentucky International Airport, around 6.67 miles northeast from the Nature Center, shows a predominantly south southwest wind.

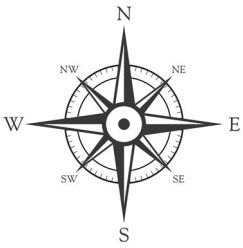


Wind Rose obtained from: https://mesonet.agron.iastate.edu/sites/dyn_windrose.phtml?station=MSN&network=WI_ASOS

Kentucky Mesonet Station on the grounds of the Boone County Nature Center located southwest of the site.

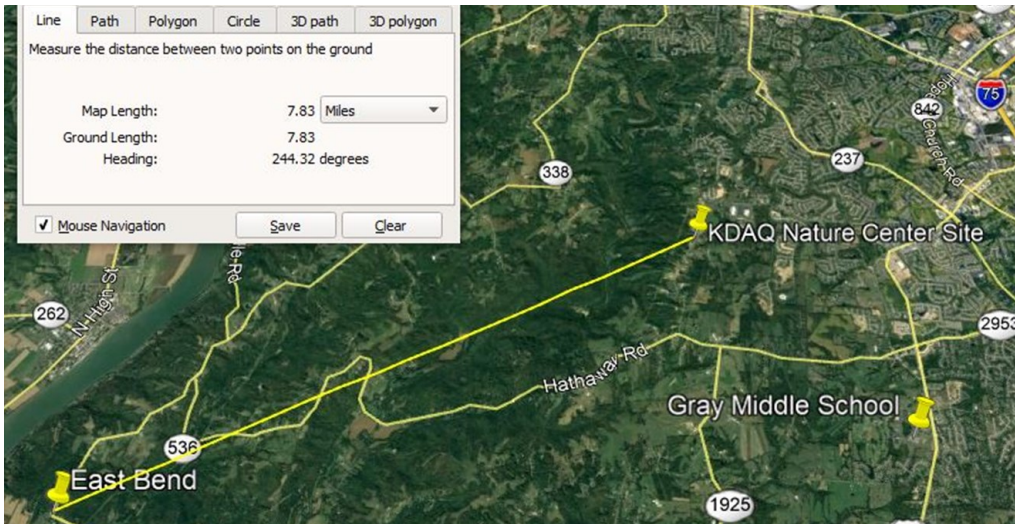
Appendix H
East Bend Site Relocation- Nature Center

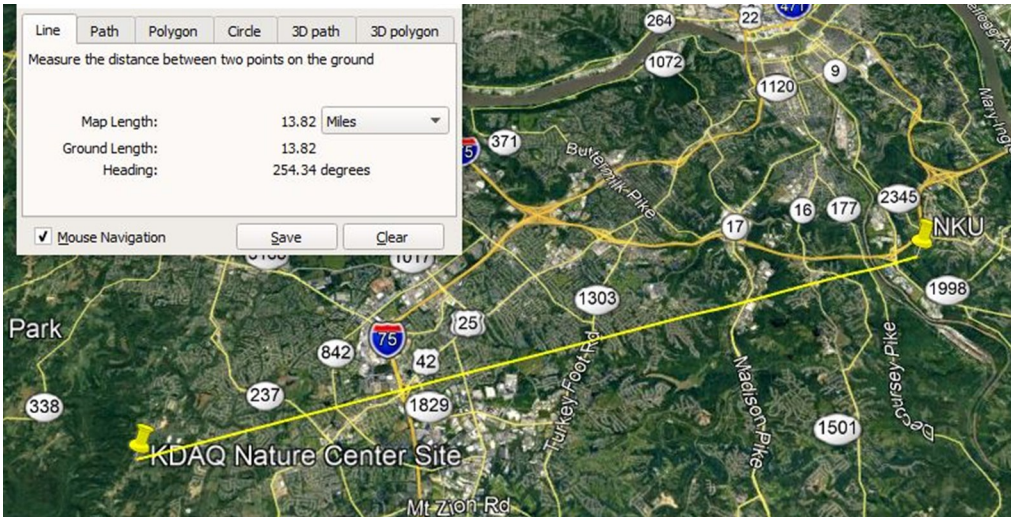
Approximate Cardinal Direction



Appendix H
East Bend Site Relocation- Nature Center

The new site is roughly 7.83 miles northeast of the current East Bend site and roughly 13.82 miles west southwest of the Northern Kentucky University site. The new site is also within the bounds of the non-attainment area for the 2015 ozone standard.





The blue shading represents the Cincinnati, OH nonattainment area for the 2015 ozone 8 hour standard.

Image obtained from https://www.arcgis.com/apps/MapSeries/index.html?appid=d37c4a84a023422e8a24272dd8875f56

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APPENDIX I

NEAR-ROAD MONITORING

Appendix I
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

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 J

KENTUCKY SO_2 PWEI VALUES

Appendix J
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 K

EPA CASTNET STATIONS IN KENTUCKY

Appendix K
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 Maximum O_3 Concentration**	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

** Maximum Ozone Concentration site for the Clarksville, TN-KY MSA

***Not usable for NAAQS comparisons

APPENDIX L

KDAQ EQUIPMENT INVENTORY

Appendix L
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	Calibrator	Teledyne-API T700	G	In-Use
Ashland Primary	Datalogger-Digital	Agilaire 8872	G	In-Use
Ashland Primary	Meteorological	RM Young Met (wind/temp)	F	In-Use
Ashland Primary	NOx Analyzer	Teledyne-API T200	G	In-Use
Ashland Primary	O3 Analyzer	Teledyne-API T400	G	In-Use
Ashland Primary	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Ashland Primary	SO2 Analyzer	Teledyne-API T100	G	In-Use
Ashland Primary	Zero Air Unit	Teledyne-API 701	G	In-Use
Ashland Regional Off.	Flow Meter	Sierra MFM	G	In-Use
Ashland Regional Off.	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
East Bend	Datalogger (met)	ESC 8832	G	In-Use
East Bend	Datalogger-Digital	Agilaire 8872	G	In-Use
East Bend	Meteorological	RM Young Met (wind/temp)	F	In-Use
East Bend	O3 Analyzer	Teledyne-API T400	G	In-Use
East Bend	Ozone Photometer	Teledyne-API T703	G	In-Use
East Bend	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

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

Appendix L
KDAQ Equipment Inventory (Continued)

Site Name	Item Description	Item Model	Condition*	Status
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
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	Calibrator	Teledyne-API T700	G	In-Use
Jackson Purchase	Datalogger- Digital	Agilaire 8872	G	In-Use
Jackson Purchase	NOx Analyzer	Teledyne-API T200	G	In-Use
Jackson Purchase	O3 Analyzer	Teledyne-API T400	G	In-Use
Jackson Purchase	PM10 Sampler	Partisol 2000i	F	In-Use
Jackson Purchase	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Jackson Purchase	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)	F	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	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use

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

Appendix L
KDAQ Equipment Inventory (Continued)

Site Name	Item Description	Item Model	Condition*	Status
Middlesboro	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
Smithland	O3 Analyzer	Teledyne-API T400	G	In-Use
Smithland	Ozone Photometer	Teledyne-API T703	G	In-Use

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

Appendix L
KDAQ Equipment Inventory (Continued)

Site Name	Item Description	Item Model	Condition*	Status
Smiths Grove	Datalogger-Digital	Agilaire 8872	G	In-Use
Smiths Grove	O3 Analyzer	Teledyne-API T400	G	In-Use
Smiths Grove	Ozone Photometer	Teledyne-API T703	G	In-Use
Smiths Grove	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Smiths Grove	PM2.5 Continuous FEM	Teledyne-API T640	G	In-Use
Smiths Grove	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	G	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	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	Environics 6103 Portable	P	Not in Use
x-QA	Flow Meter	Alicat (0-10 cc)	G	In Use
x-QA	Flow Meter	Bios Defender 530 HF	G	In Use
x-QA	Flow Meter	Bios Defender 530 LF	G	In Use
x-QA	Flow Meter	Bios Defender 530 LF	G	In Use
x-QA	Flow Meter	Bios Defender 530 LF	G	In Use
x-QA	Flow Meter	Hastings MiniFlow LG	P	Not in Use
x-QA	Flow Meter	Sierra (0-10 cc)	G	In Use
x-QA	Flow Meter	Sierra (0-10 cc)	G	In Use
x-QA	Flow Meter	Sierra (0-10 cc)	G	In Use
x-QA	Flow Meter	Sierra (0-10 cc)	G	In Use
x-QA	Flow Meter	Sierra (0-10 cc)	G	In Use
x-QA	Flow Meter	Streamline Pro	G	In Use
x-QA	Flow Meter	Streamline Pro	G	In Use
x-QA	Flow Meter	Streamline Pro	G	In Use
x-QA	Flow Meter	Streamline Pro	G	In Use
x-QA	Flow Meter	Streamline Pro	G	In Use
x-QA	Photometer	Thermo 49C	G	In Use

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

Appendix L
KDAQ Equipment Inventory (Continued)

Site Name	Item Description	Item Model	Condition*	Status
x-QA	Photometer	Thermo 49C	G	In Use
x-QA	Photometer	Thermo 49C	G	In Use
x-QA	Photometer	Thermo 49C	G	In Use
x-QA	Zero Air	Environics 7000	F	In Use
x-QA	Zero Air	Environics 7000	F	In Use
x-QA	Zero Air	Teledyne 751H Portable	F	In Use
x-QA	Zero Air	Teledyne 751H Portable	F	In Use
x-QA	Zero Air	Teledyne 751H Portable	G	In Use
x-QA	Zero Air	Teledyne 751H Portable	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	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
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

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

Appendix L
KDAQ Equipment Inventory (Continued)

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	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
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

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

Appendix L
KDAQ Equipment Inventory (Continued)

Site Name	Item Description	Item Model	Condition*	Status
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
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

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

Appendix L
KDAQ Equipment Inventory (Continued)

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	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	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	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	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

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

Appendix L
KDAQ Equipment Inventory (Continued)

Site Name	Item Description	Item Model	Condition*	Status
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 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

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

Appendix L
KDAQ Equipment Inventory (Continued)

Site Name	Item Description	Item Model	Condition*	Status
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
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

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

Appendix L
KDAQ Equipment Inventory (Continued)

Site Name	Item Description	Item Model	Condition*	Status
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 M

PUBLIC COMMENTS

Appendix M
Notice of Public Comment Period

KENTUCKY DIVISION FOR AIR QUALITY
AMBIENT AIR MONITORING NETWORK
Comments Received 6/18/2021

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

A public comment period on the KENTUCKY DIVISION FOR AIR QUALITY AMBIENT AIR MONITROING NETWORK PLAN 2021 was held from May 19, 2021 through June 18, 2021.

No comments were received during the public comment period.

INDEX

KDAQ AIR MONITORING STATIONS
BY
REGIONAL OFFICE

2021 KDAQ Monitoring Network Stations by Regional Office

AQS ID	SITE NAME	COUNTY	PAGE
Region 1 - Hazard Regional Office			
21-193-0003	Hazard	Perry	106
21-195-0002	Pikeville Primary	Pike	108
Region 2 - Frankfort Regional Office (Bluegrass Area)			
21-067-0012	Lexington Primary (Newtown)	Fayette	64
21-113-0001	Nicholasville	Jessamine	66
21-151-0005	Eastern Kentucky University (EKU)	Madison	98
Region 3 - Florence Regional Office			
21-015-0008	Nature Center	Boone	36
21-037-3002	Northern Kentucky University (NKU)	Campbell	38
Region 4 - Owensboro Regional Office			
21-059-0005	Owensboro Primary	Daviess	86
21-091-0012	Lewisport	Hancock	88
21-101-1011	Sebree SO_2 DRR Site	Henderson	50
Region 5 - Ashland Regional Office			
21-019-0002	21st and Greenup	Boyd	54
21-019-0017	Ashland Primary (FIVCO)	Boyd	56
21-043-0500	Grayson Lake	Carter	58
21-089-0007	Worthington	Greenup	60
Region 7 - Frankfort Regional Office (North Central Area)			
21-029-0006	Shepherdsville	Bullitt	70
21-093-0006	Elizabethtown (E-town)	Hardin	46
21-185-0004	Buckner	Oldham	72
Region 8 - Paducah Regional Office			
21-047-0006	Hopkinsville	Christian	42
21-139-0003	Smithland	Livingston	94
21-145-1024	Jackson Purchase (Paducah Primary)(JPRECC)	McCracken	96
Region 9 - Bowling Green Regional Office			
21-213-0004	Franklin	Simpson	104
21-227-0009	Ed Spear Park (Smiths Grove)	Warren	32
Region 10 - London Regional Office			
21-013-0002	Middlesboro	Bell	92
21-199-0003	Somerset	Pulaski	100