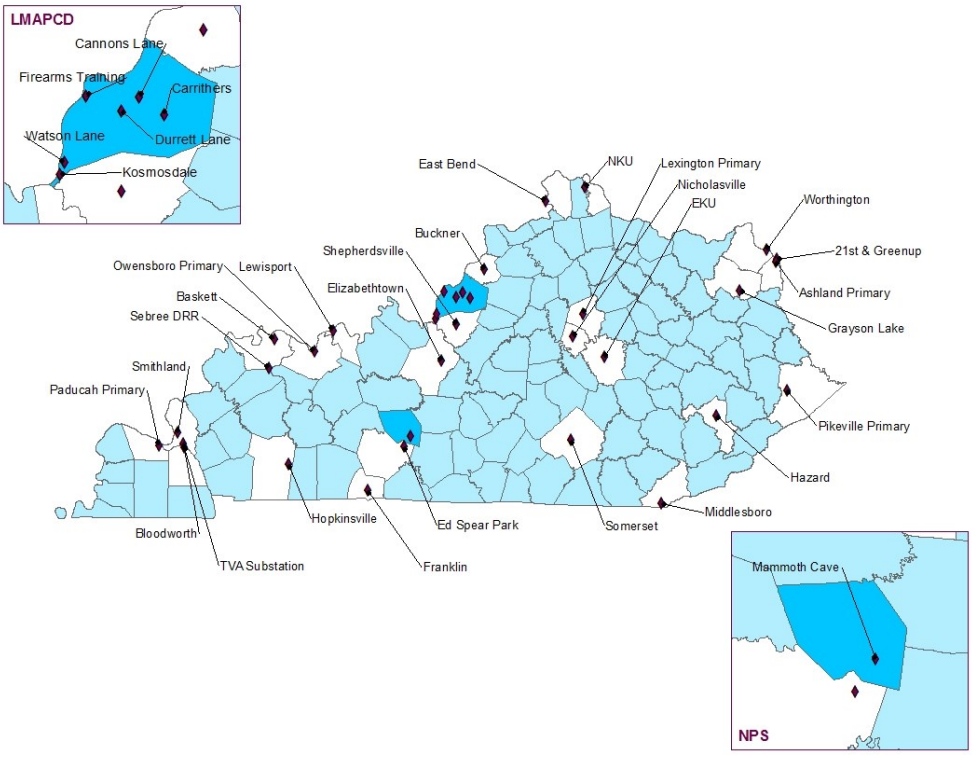
# Kentucky
# Annual Ambient Air Monitoring Network Plan 2017




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

## CERTIFICATION

By the signatures below, the Kentucky Division for Air Quality certifies that the information contained in this Surveillance Network document for sampling year 2017 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.

Print Name: Jennifer F. Miller — Environmental Control Supervisor
Signature: Jennifer F. Miller Date: 6-29-17

Print Name: John E. Gowins — Technical Services Branch Manager
Signature: John E Gowins Date: 6/29/17

Print Name: Sean O. Alteri — Division Director
Signature: Sean Alteri Date: 6/29/17

## PUBLIC NOTIFICATION AND COMMENT PERIOD

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

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### ACRONYMS

**AEM –** Automated Equivalent Method

**AQI** – Air Quality Index

**AQS** – Air Quality System

**ARM** – Automated Reference Method

**BAM** – Beta Attenuation Monitor

**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

**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 provides 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 the 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 35 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 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 2017

During the 2017-2018 monitoring year, KDAQ will operate 96 instruments, including 11 meteorological stations, located at 28 ambient air monitoring sites in 24 Kentucky counties. LMAPCD will operate an additional 34 instruments, including 6 meteorological stations, in Jefferson County. When combined with the air monitoring site operated by the NPS at Mammoth Cave National Park, the total ambient air monitoring network will consist of 136 instruments, including 18 meteorological stations, located at 35 sites across 26 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 (MSAs):**

- Cincinnati, OH-KY-IN:
    - Install a collocated FRM intermittent $PM_{2.5}$ sampler at the NKU site (21-037-3002); effective by January 1, 2018. The monitor will be designated as a SLAMS monitor.
    - Replace the chemiluminescent $NO_2$ monitor at the NKU site (21-037-3002) with a new photolytic-method monitor; effective by January 1, 2018. This change does not impact network design.
- Huntington-Ashland, WV-KY-OH:
    - Replace the SPM continuous $PM_{2.5}$ TEOM at the Ashland Primary site (21-019-0017) with a FEM broadband spectroscopy continuous $PM_{2.5}$ monitor for reporting of the AQI. The monitor will be designated as a SPM and will not be used for comparisons against the NAAQS; effective by January 1, 2018.
- Lexington-Fayette, KY:
    - Permanently discontinue special-purpose VOC sampling at the Lexington Primary site (21-067-0012); effective July 1, 2017.
    - Replace the chemiluminescent $NO_2$ monitor at the Lexington Primary site (21-067-0012) with a new photolytic-method monitor; effective by January 1, 2018. This change does not impact network design.

**MICROPOLITAN STATISTICAL AREAS:**

- Richmond-Berea, KY:
    - Shutdown the Mayfield Elementary site (21-151-0003); effective January 1, 2018. The site is equipped with a FRM intermittent $PM_{2.5}$ sampler and a FRM lead TSP sampler, both of which are designated as SLAMS monitors. Lead monitoring will continue at the nearby EKU site (21-151-0005).

## SUMMARY OF KDAQ NETWORK CHANGES 2017
## (Continued)

- Paducah-Mayfield, KY-IN:

    - Replace the SPM continuous $PM_{2.5}$ TEOM at the Jackson Purchase RECC site (21-145-1024) with a FEM broadband spectroscopy continuous $PM_{2.5}$ monitor for reporting of the AQI. The monitor will be designated as a SPM and will not be used for comparisons against the NAAQS; effective by January 1, 2018.

**NOT IN A METROPOLITAN OR MICROPOLITAN STATISTICAL AREA:**

- Pikeville, KY:

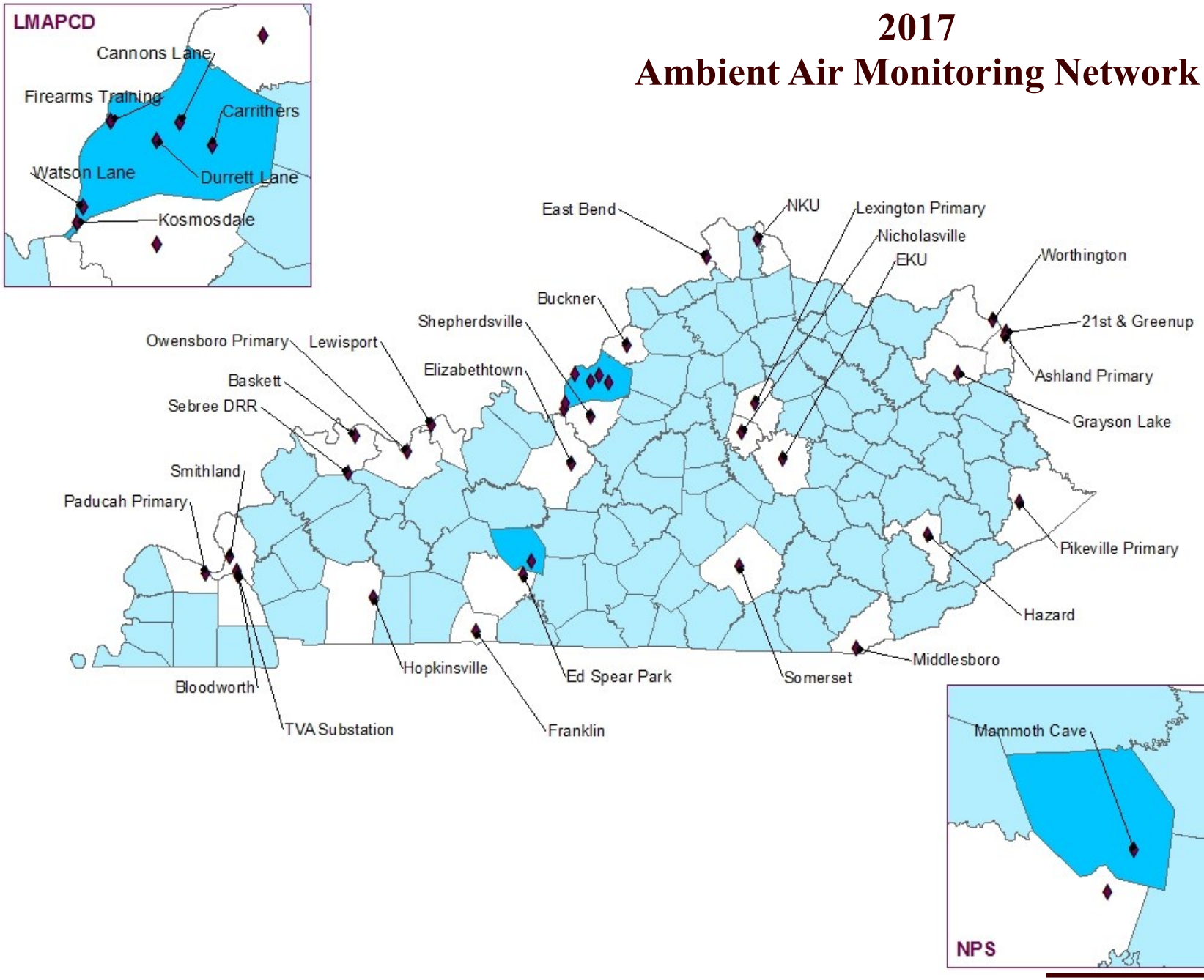
    - Shutdown the SPM collocated FRM intermittent $PM_{2.5}$ sampler located at the Pikeville site (21-195-0002); effective December 31, 2017.

# 2017 AIR MONITORING STATIONS SUMMARY

| Metropolitan Statistical Area | Site Count | PM2.5 | Continuous PM2.5 | PM10 | Continuous PM10 | SO2 | NO2 | NOy | CO | O3 | Pb | VOC | Carbonyl | PAH | PM2.5 Speciation | Carbon Speciation | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bowling Green, KY | 2 | 2[C] | 2[i] | | | 1 | | 1 | 1 | 2[i, Max] | | | | | | | | 1 |
| Cincinnati-Middletown, OH-KY-IN [(AQI) (PWEI)] | 2 | 2[C] | 1[i] | | | 1[i] | 1[i] | | | 2[i] | | | | | | | | 1 |
| Clarksville, TN-KY | 1 | 1[X] | | | | | | | | 1 | | | | | | | | 1 |
| Elizabethtown, KY | 1 | 2[C] | 1 | | | | | | | 1[Max] | | | | | | | | |
| Evansville, IN-KY [(PWEI)] | 2 | 1 | 1 | 1[m] | | 2 [DRR] | | | | 1[Max] | | | | | | | | |
| Huntington-Ashland, WV-KY-OH [(AQI) (PWEI)] | 3 | 1 | 1[i, S] | 2[C,m] | | 2[i] | 1[i] | | | 2[i, Max] | | 1 | | | | | | 1 |
| Lexington-Fayette, KY [(AQI) (PWEI)] | 2 | 1 | 1[i] | 1[m] | | 2[i] | 1[r40,i] | | | 2[i, Max] | | | | | | | 1 | 1 |
| Louisville-Jefferson County, KY-IN [(AQI) (PWEI)] | 8 | 4[n,C] | 5[i,S,B,*] | | 3[i,B] | 4[i] | 2[n,i] | 1 | 2[n,i] | 5[i, Max] | | 1[G] | | | 1[U] | 1[U] | 1 | 7[n] |
| Owensboro, KY | 2 | 1 | 1[i] | | | 1[i] | 1[i] | | | 2[i, Max] | | | | | | | | 1 |
| Micropolitan Statistical Area | | | | | | | | | | | | | | | | | | |
| Paducah, KY-IL [(PWEI)] | 3 | 1 | 1[i,S] | 2[m] | | 1[i] | 1[i] | | | 2[i] | | 1 | | | | | 1 | 1 |
| Somerset, KY | 1 | 1 | | | | | | | | 1 | | | | | | | | |
| Middlesboro, KY | 1 | 1 | | | | | | | | 1 | | | | | | | | 1 |
| Richmond-Berea, KY | 1 | 1 | | | | | | | | | 2 | | | | | | | |
| Not in a CBSA | | | | | | | | | | | | | | | | | | |
| Carter County | 1 | 1[X] | | 2[C,m] | | | | | | 1 | | 2[D] | 2[D] | 1 | | | | 1 |
| Marshall County | 2 | | | | | | | | | | | 2[C] | | | | | | |
| Perry County | 1 | 1 | 1 | | | | | | | 1 | | | | | | | | 1 |
| Pike County | 1 | 1 | 1[i] | | | | | | | 1[i] | | | | | | | | |
| Simpson County | 1 | | | | | | | | | 1 | | | | | | | | 1 |
| KDAQ Totals | 28 | 18 | 10 | 8 | 0 | 9 | 5 | 0 | 0 | 22 | 3 | 6 | 2 | 1 | 0 | 0 | 2 | 11 |
| LMAPCD Totals | 6 | 4 | 5 | 0 | 3 | 4 | 2 | 1 | 2 | 3 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| NPS Totals | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Total Network** | **35** | **22** | **16** | **8** | **3** | **14** | **7** | **2** | **3** | **26** | **3** | **7** | **2** | **1** | **1** | **1** | **3** | **18** |

Tallies are equal to the actual number of monitors present. Superscripts represent additional information about the network. PWEI= PWEI SO2 Monitoring Required in MSA; r40=RA-40 Monitor; Max= Maximum O3 Concentration Site; n=Near-Road Monitor; X= Regional PM2.5 Transport or Background Monitor; B=Continuous PM BAM; *=BAM Eligible for NAAQS Comparisons; 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; U= Additional Monitor Used for Weekend and Holiday Sampling; DRR= SO2 Data Requirements Rule Monitor

# 2017
# Ambient Air Monitoring Network



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# STATION DESCRIPTION FORMAT

## 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 Field Offices. 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 apart 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 requirement 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 designed 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 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.

LMAPCD operates continuous $PM_{10}$ samplers that provide 24-hour samples daily for SLAMS reporting. During sampling, ambient air passes through an inlet designed to pass only particles smaller than 10 microns in diameter. In $PM_{10}$ TEOMs, the sample stream passes through a Teflon-coated glass fiber filter. This filter is weighed every two seconds. The difference between the current filter weight and the initial or installed weight gives the total mass of the collected particulate. The data is transmitted by telemetry for entry into an automated central data acquisition system.

LMAPCD also operates $PM_{10}$ BAMs, which measure $PM_{10}$ through beta ray attenuation. After passing through an inlet designed to limit the size of particulate matter to 10 microns or less, the sample stream passes through filter tape, which is then placed in between a beta source and a scintillation detector causing an attenuation of the beta particle signal. The data is transmitted by telemetry for entry into an automated central data acquisition system.

### (b) Particulate Matter 2.5 Microns in Size ($PM_{2.5}$)

The Division currently operates continuous TEOM monitors and manual intermittent samplers for monitoring particulate matter 2.5 microns in size ($PM_{2.5}$). The Division plans to install Teledyne-API (TAPI) T640 continuous $PM_{2.5}$ spectroscopy monitors in the upcoming year. With the exception of continuous TEOM monitors, 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. The flow rate must not vary more than +/-5% for five minutes over a 24-hour sample period at actual ambient temperature and pressure. Samples must be retrieved within 177 hours of the end of the sample run and must be kept cool (4 degrees C or cooler) during transit to meet the thirty-day limit for re-weighing. 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. The gain in weight in relation to the volume of air sampled is calculated in micrograms per cubic meter ($ug/m^3$).

Continuous $PM_{2.5}$ TEOM monitors provide 24-hour samples daily for AQI reporting. During sampling, ambient air passes through an inlet and very sharp cut cyclone designed to pass only particles smaller than 2.5 microns in diameter. After exiting the inlet, the sample stream is sent to a mass transducer. Inside the transducer the sample stream passes through a Teflon-coated glass fiber filter. This filter is weighed every two seconds. The difference between the current filter weight and the initial or installed weight gives the total mass of the collected particulate. The mass concentration is computed by dividing the total mass by the flow rate. Data is transmitted by telemetry for entry into the automated central data acquisition system. While usable for the AQI, $PM_{2.5}$ TEOMs are not classified as either FRM or FEM monitors; and thus, are not eligible for comparison to the NAAQS.

TAPI T640 monitors collect $PM_{2.5}$ data continuously via the principle of broadband particle-scattering spectroscopy. 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. While the TAPI T640 is designated as a FEM for $PM_{2.5}$, KDAQ is currently only using them for reporting of the AQI.

LMAPCD operates continuous $PM_{2.5}$ BAM monitors, which measure $PM_{2.5}$ through beta ray attenuation. During sampling, ambient air passes through an inlet and a cyclone designed to pass only particles smaller than 2.5 microns in diameter. The sample is collected on filter tape as the air passes through the tape. The filter tape is then placed in between a beta source and a scintillation detector causing an attenuation of the beta particle signal. Data is transmitted by telemetry for entry into the automated central data acquisition system.

Continuous $PM_{2.5}$ BAMs provide 24-hour daily reporting for the AQI. The data obtained from $PM_{2.5}$ BAMs may or may not be used for comparison to the NAAQS. $PM_{2.5}$ BAMS that are operated as FEMs, and demonstrate comparability to the data obtained from manual FRM samplers, are eligible for comparisons 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 a 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 both photolysis and chemiluminescence methods 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 photolysis method at its near-road site. In this method, an ambient

sample stream passes through a cell and is exposed to light from an LED array at a specific wavelength. The process causes nitrogen dioxide to be converted to nitrogen oxide.

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 filter over a 24-hour period from the $PM_{10}$ monitoring method. The filter is weighed before and after the sample run. 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 PTFE filter is 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. The filter is then delivered to an US EPA contract laboratory for analysis by inductively coupled plasma/mass spectrometer analysis.

KDAQ collects VOC samples in passivated vacuum-canisters. During sampling, ambient air is pulled into a canister over a 24-hour sampling period. The sample is shipped to an US EPA contract laboratory for analysis via gas chromatography.

LMAPCD plans to install an automatic gas chromatograph (auto-GC) during the upcoming year. An auto-GC is a field version of the gas chromatographs typically used in laboratory settings. Auto-GCs monitor and analyze ambient air semi-continuously for air toxics, bypassing the need for passivated summa canisters.

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 an US EPA contract laboratory for analysis via gas chromatography/mass spectrometry.

Carbonyl samples are collected on a DPNH 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) **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 operates 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 has an extensive quality assurance program to ensure that all air monitoring data collected is accurate and precise. 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 are stored in a centralized server located at the 14th floor of the Capital Plaza Tower, the Energy and Environment Cabinet (EEC) headquarters in Frankfort, Kentucky. The server is backed up on tape nightly, weekly, and monthly. The backup tape of the server is stored off site of the EEC headquarters and is cycled through use on a monthly schedule. 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. Statistical data summaries are generated from this database and compiled to produce the Ambient Air Quality Annual Report. This report may be accessed at the KDAQ website: http://air.ky.gov. The report is located under Resources.

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# AIR MONITORING STATION DESCRIPTIONS

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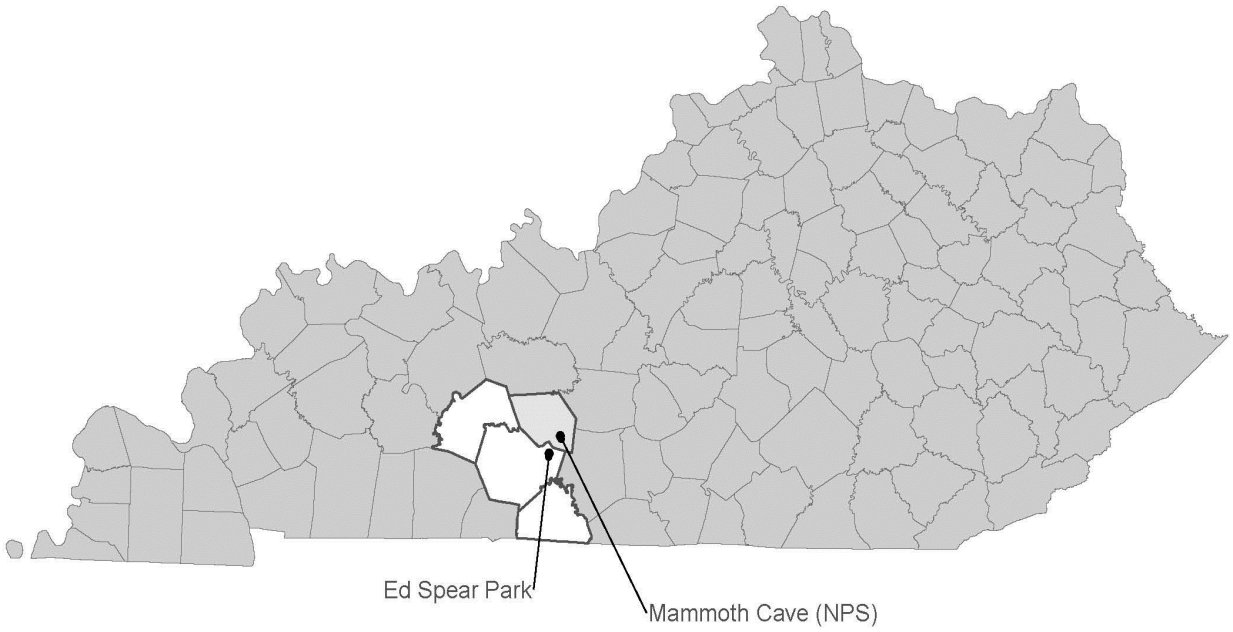
# Bowling Green, KY




| 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. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-061-0501 Edmonson | Alfred Cook Road Mammoth Cave (NPS) | | $1^{tF}$ | | | $1^{F}$ | | $1^{F}$ | $1^{F}$ | $1^{FM}$ | | | | | | | | $1^{F}$ |
| 21-227-0009 Warren | 226 Sunset Street Smiths Grove | $2^{C}$ | $1^{ti}$ | | | | | | | $1^{i}$ | | | | | | | | |
| **Totals** | **2** | **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
t =Continuous TEOM Monitor
C =Collocated
i =AQI Reported
M =Maximum Ozone Concentration Site for MSA

Rev. 5/1/16

**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:** 37.131944, -86.14778 (NAD83)
**Date Established:** August 1, 1997
**Inspection Date:** October 27, 2016
**Inspection By:** Ashley Bedel

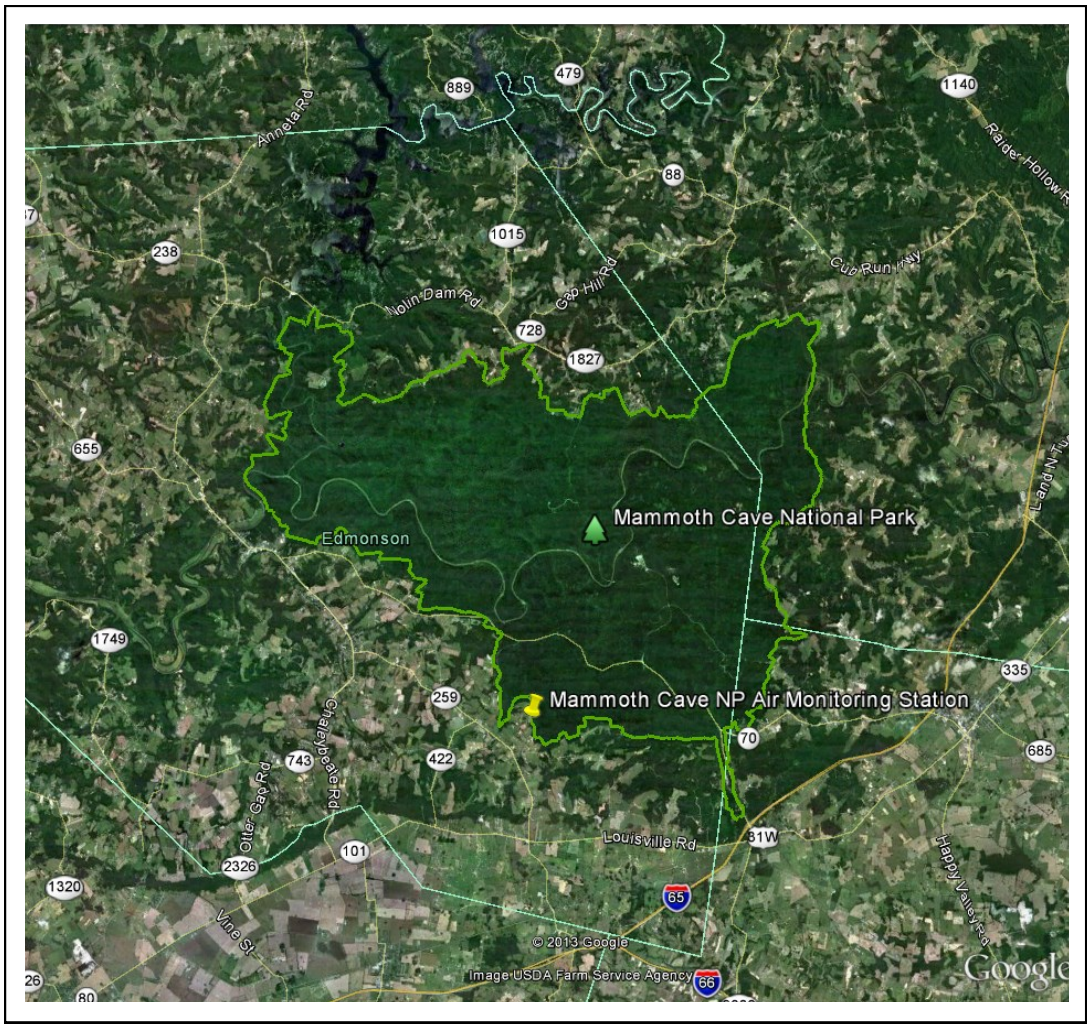
Mammoth Cave National Park was established as one of 156 mandatory Federal Class I Areas nationwide under the Clean Air Act Amendments of 1977. Class I Areas are imparted with the highest level of air quality protections, especially regarding visibility degradation (haze). The Division maintains a cooperative 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 | 11.0 | CASTNET Maximum $O_3$ Non-EPA Federal | Automated Equivalent Method utilizing UV photometry analysis | Continuously |
| Sulfur Dioxide | 10.0 | Non-EPA Federal | Automated Equivalent Method utilizing trace level UV fluorescence analysis | Continuously |
| Total Reactive Nitrogen ($NO/NO_Y$) | 10.0 | Non-EPA Federal | Automated method utilizing trace level chemiluminescence analysis | Continuously |
| Carbon Monoxide | 10.0 | 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 |
|---|---|---|---|---|
| $PM_{2.5}$ TEOM | 2.5 | Non-EPA Federal | Tapered element oscillating microbalance, gravimetric. | Continuously |
| Meteorological | 15.0 | 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
**AQS Site ID:** 21-227-0009
**Location:** 226 Sunset Street, Smiths Grove, KY 42171
**County:** Warren
**GPS Coordinates:** 37.04926, -86. 21487 (NAD83)
**Date Established:** May 3, 2012
**Inspection Date:** October 26, 2016
**Inspection By:** Ashley Bedel
**Site Approval Status:** Siting and monitor design has been approved by the EPA.

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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 42 meters from the nearest road. 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. While not required for the CBSA, the site also provides levels of ozone and particulate matter for daily index reporting.

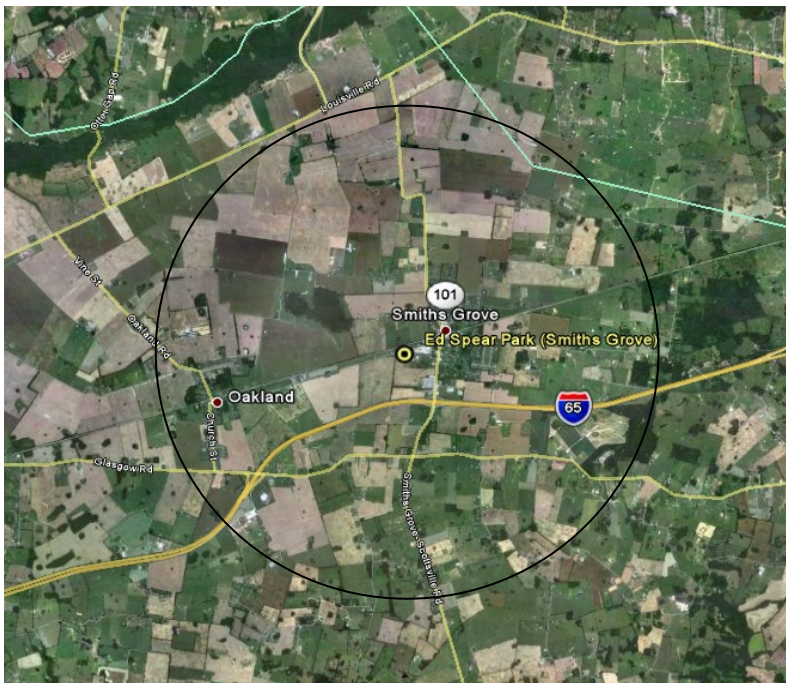
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 4.5 | SLAMS<br>AQI | UV photometry | Continuously<br>March 1 – October 31 |
| $PM_{2.5}$ TEOM | 4.6 | SPM<br>AQI | Tapered element oscillating microbalance, gravimetric | Continuously |
| FRM $PM_{2.5}$ | 2.4 | SLAMS | Gravimetric | 24-hours every third day |
| Collocated FRM $PM_{2.5}$ | 2.4 | SLAMS | Gravimetric | 24-hours every sixth day |

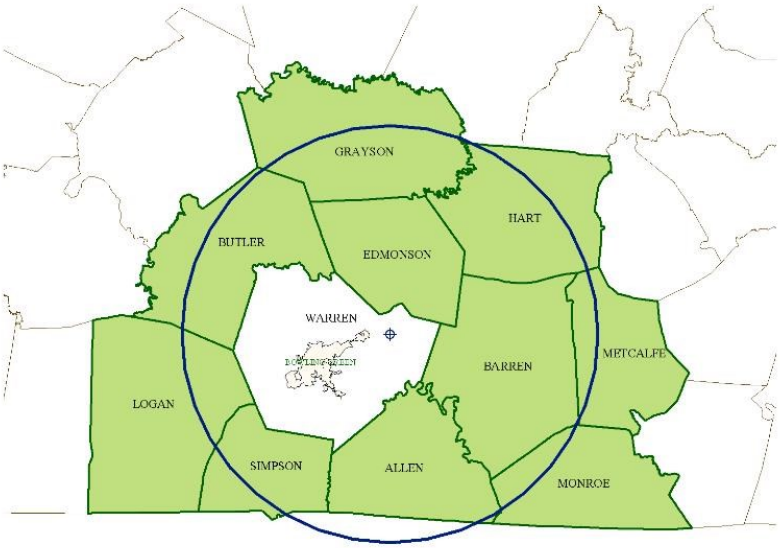
**Quality Assurance Status:**
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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

Neighborhood Scale: Particulates




Urban Scale: Ozone



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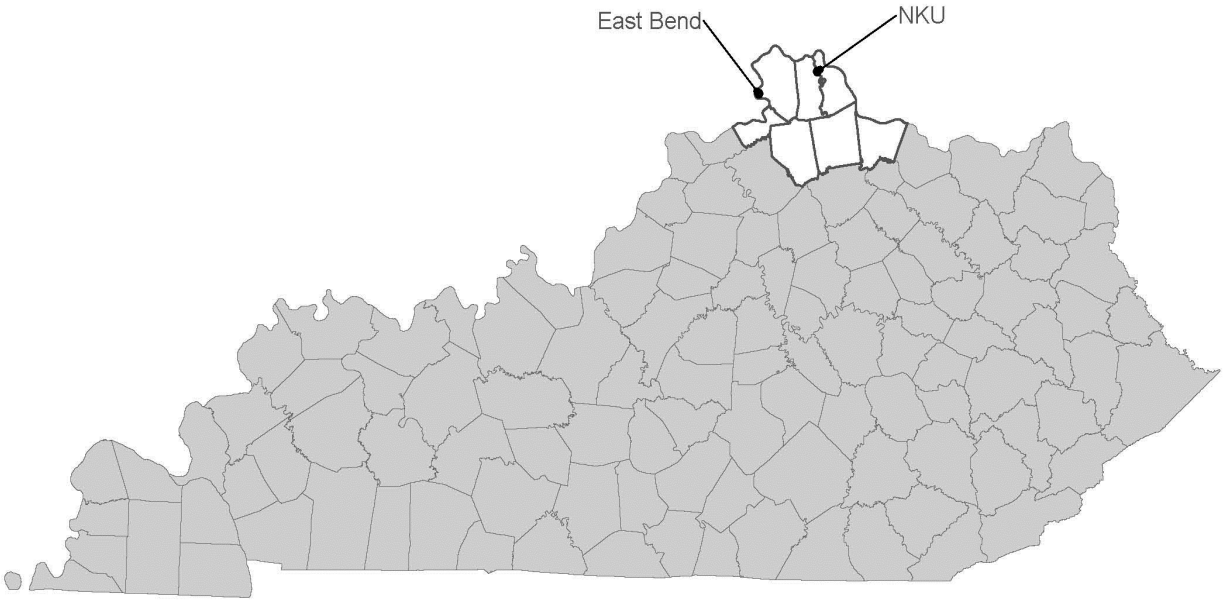
# Cincinnati, OH-KY-IN




| 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. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-015-0003 Boone | KY338 & Lower River Union | | | | | | | | | 1 | | | | | | | | 1 |
| 21-037-3002 Campbell | 524A John's Hill Rd Highland Heights | 2[C] | 1[ti] | | | 1[i] | 1[i] | | | 1[ei] | | | | | | | | |
| **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.

PWEI SO2 monitoring required in MSA

i =AQI Reported

e =Emergency Episode Monitor

t =Continuous TEOM Monitor

Rev. 5/1/17

**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:** East Bend
**AQS Site ID:** 21-015-0003
**Location:** KY 338 and Lower River Road, Union, KY 41091
**County:** Boone
**GPS Coordinates:** 38.918330, -84.852637 (NAD 83)
**Date Established:** July 1, 1977
**Inspection Date:** December 9, 2016
**Inspection By:** Ashley Bedel
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.

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The monitoring site is a stationary equipment shelter located at the intersection of KY 338 and Lower River Road near East Bend, Kentucky. The sample inlet is 15 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.

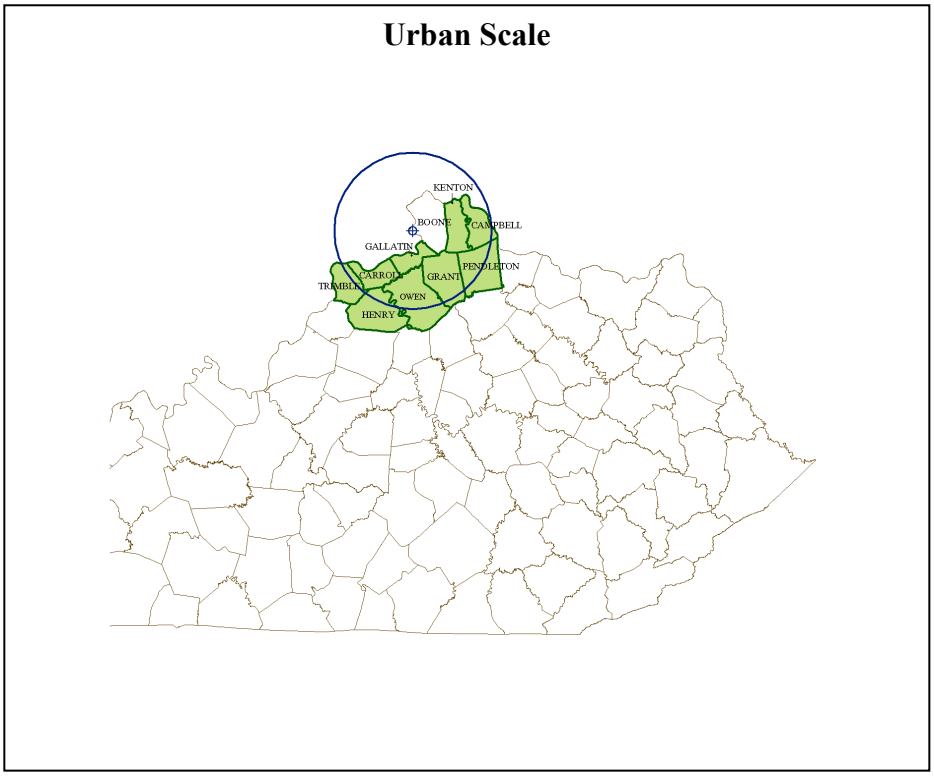
**Monitoring Objective:**
The monitoring objective is to determine compliance with National Ambient Air Quality Standards.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.5 | SLAMS | UV photometry | Continuously<br><br>March 1 – October 31 |
| Meteorological | 7.1 | 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 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:** 39.02181, -84.47445 (NAD 83)
**Date Established:** August 1, 2007
**Inspection Date:** December 9, 2016
**Inspection By:** Ashley Bedel
**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 23 meters from the nearest road, which is a gravel service-drive for a radio tower. 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.

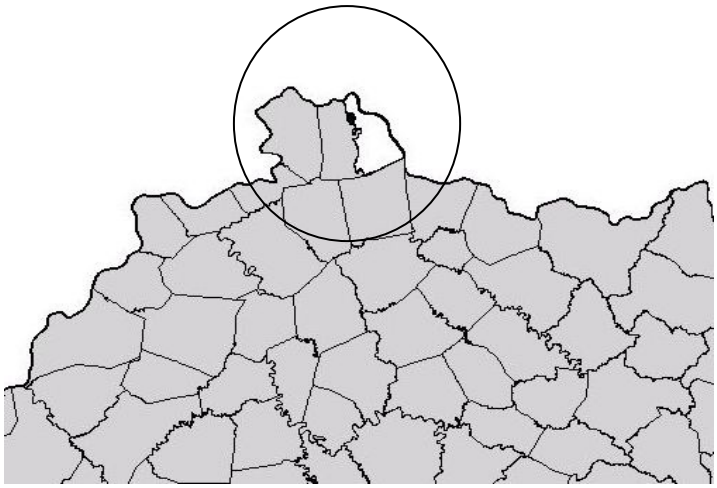
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Nitrogen Dioxide ($NO_2$, NO, $NO_x$) | 3.8 | SLAMS<br>AQI | Photolysis | Continuously |
| AEM Ozone | 3.8 | SLAMS<br>AQI<br>EPISODE | UV photometry | Continuously<br>March 1 – October 31 |
| FRM $PM_{2.5}$ | 4.6 | SLAMS | Gravimetric | 24-hours every third day |
| Collocated FRM $PM_{2.5}$ | TBD<br>Approx. 4.6 | SLAMS | Gravimetric | 24-hours every twelfth day |
| $PM_{2.5}$ TEOM | 4.6 | SPM<br>AQI | Tapered element oscillating microbalance, gravimetric | Continuously |
| AEM Sulfur Dioxide | 3.9 | SLAMS<br>AQI | UV fluorescence | Continuously |

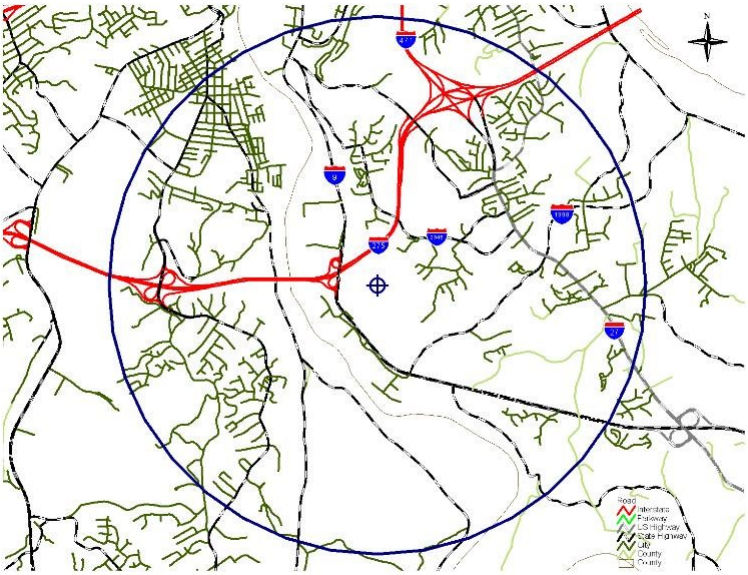
**Quality Assurance Status:**
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**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.

Urban Scale: Nitrogen Dioxide, Ozone, Sulfur Dioxide



Neighborhood Scale: Particulates



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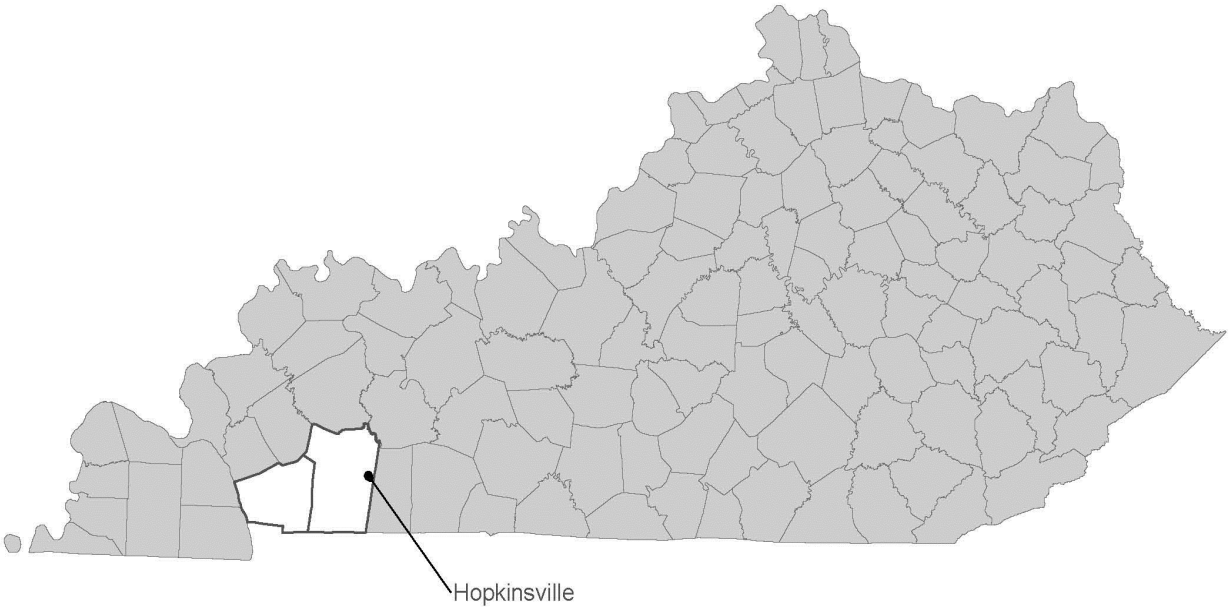
# Clarksville, TN-KY




| 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. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-047-0006 | 10800 Pilot Rock Rd | 1[X] | | | | | | | | 1 | | | | | | | | 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

Rev. 5/1/16

**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:** 36.91171, -87.32337 (NAD 83)
**Date Established:** January 1, 1999
**Inspection Date:** December 8, 2016
**Inspection By:** Jennifer F. 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 108 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 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.

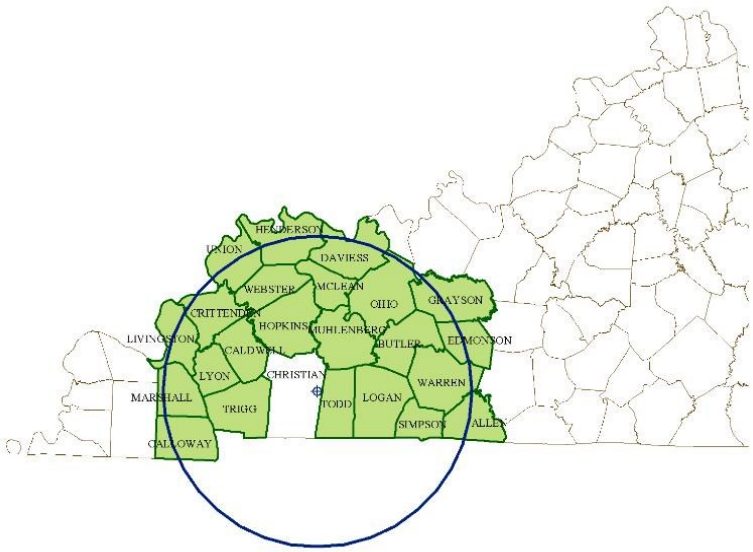
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.4 | SLAMS | UV photometry | Continuously<br>March 1 – October 31 |
| FRM $PM_{2.5}$ | 2.3 | SLAMS | Gravimetric | 24-hours every third day |
| Meteorological | 6.4 | Other | AQM grade instruments for wind speed, wind direction, relative 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 regional scale for ozone and $PM_{2.5}$.

Regional Scale: Ozone, Particulates



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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. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-093-0006 | 801 North Miles St. | $2^{C}$ | $1^{t}$ | | | | | | | $1^{M}$ | | | | | | | | |
| Hardin | Elizabethtown | | | | | | | | | | | | | | | | | |
| **Totals** | **1** | **2** | **1** | | | | | | | **1** | | | | | | | | |

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

C =Collocated

t =Continuous TEOM Monitor

M =Maximum Ozone Concentration Site for MSA

Rev. 5/1/16

**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Madison, KY-IN CSA; Elizabethtown-Fort Knox, KY MSA
**401 KAR 50:020 Air Quality Region:** North Central Kentucky Intrastate (104)
**Site Name:** Elizabethtown
**AQS Site ID:** 21-093-0006
**Location:** American Legion Park, 801 North Miles Street, Elizabethtown, KY 42701
**County:** Hardin
**GPS Coordinates:** 37.705635, -85.852656 (NAD 83)
**Date Established:** February 24, 2000
**Inspection Date:** September 16, 2016
**Inspection By:** Jennifer F. Miller
**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 35 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition. The site meets the requirements of 40 CFR 58, Appendices A, C, D, E and G.

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

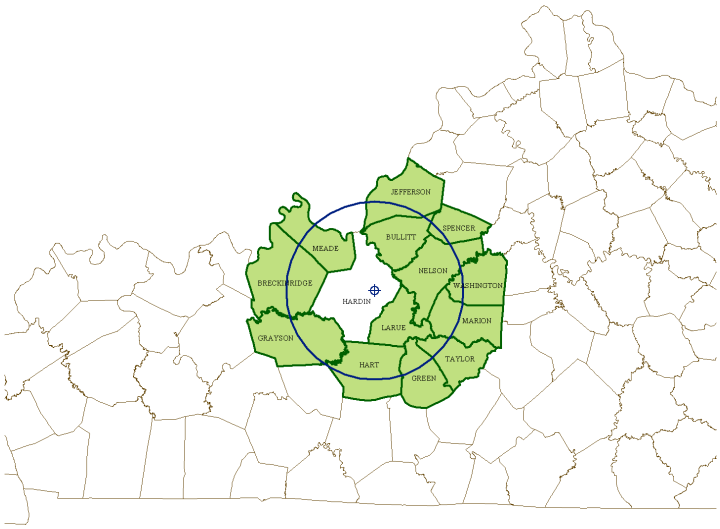
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.4 | SLAMS<br>Maximum $O_3$ | UV photometry | Continuously<br>March 1 – October 31 |
| FRM $PM_{2.5}$ | 4.6 | SLAMS | Gravimetric | 24-hours every third day |
| Collocated FRM $PM_{2.5}$ | 4.6 | SLAMS | Gravimetric | 24-hours every sixth day |
| $PM_{2.5}$ TEOM | 4.4 | SPM | Tapered elemental oscillating microbalance, gravimetric | Continuously |

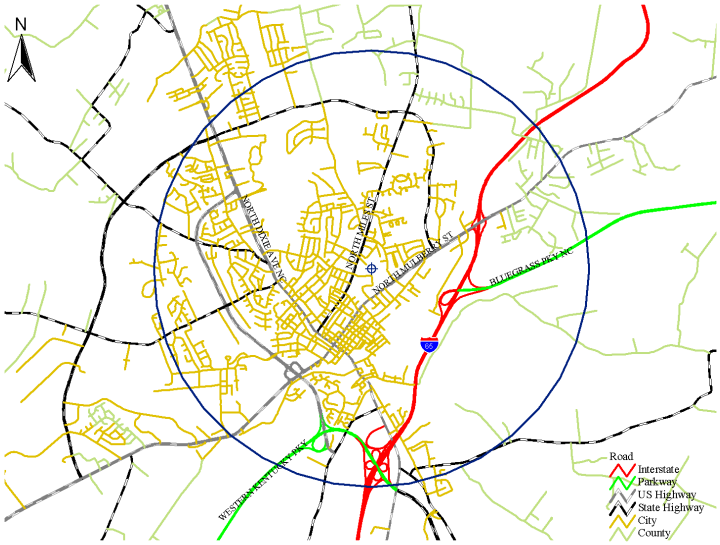
**Quality Assurance Status:**
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

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

Urban Scale: Ozone




Neighborhood Scale: Particulates



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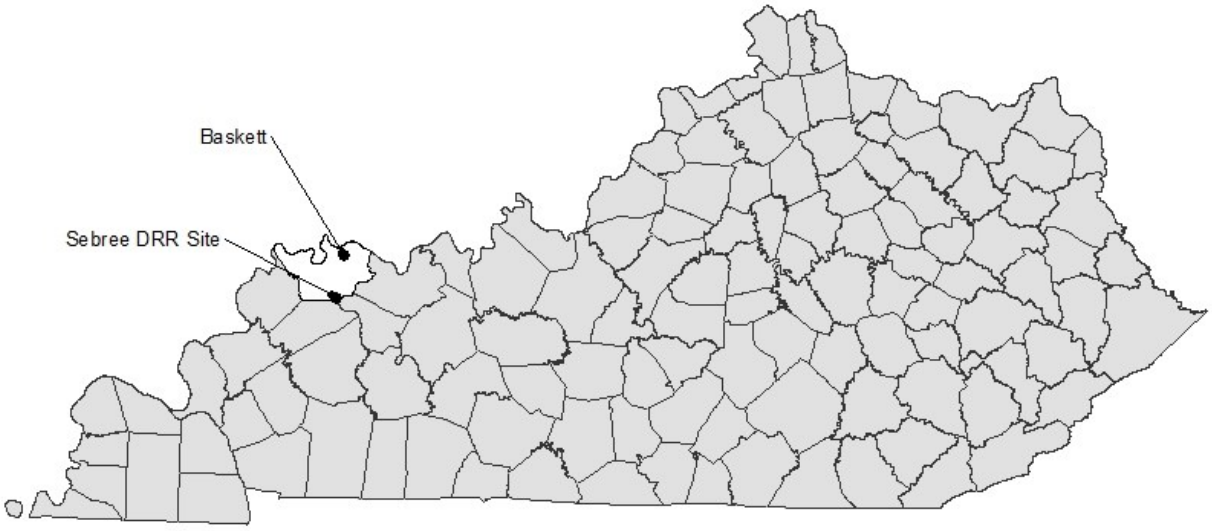
# Evansville, IN-KY




| 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. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-101-0014 Henderson | 7492 Dr. Hodge Rd. Baskett | 1 | 1[t] | 1[m] | | 1 | | | | 1[M] | | | | | | | | |
| 21-101-1011 | Alcan Aluminum Rd. Robards, KY 42452 | | | | | 1[DRR] | | | | | | | | | | | | |
| **Totals** | **2** | **1** | **1** | **1** | | **2** | | | | **1** | | | | | | | | |

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

PWEI SO2 monitoring required in MSA

t =Continuous TEOM Monitor

m =PM10 Filter Analyzed for Metals

M =Maximum Ozone Concentration Site for MSA

DRR = SO2 Data Requirements Rule Monitor

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**CSA/MSA:** Evansville, IN-KY MSA
**401 KAR 50:020 Air Quality Region:** Evansville-Owensboro-Henderson Interstate (077)
**Site Name:** Baskett
**AQS Site ID:** 21-101-0014
**Location:** Baskett Fire Department, 7492 Dr. Hodge Road, Henderson, KY 42420
**County:** Henderson
**GPS Coordinates:** 37.87120, -87.46375 (NAD 83)
**Date Established:** February 27, 1992
**Inspection Date:** November 15, 2016
**Inspection By:** Ashley Bedel
**Site Approval Status:** Site and monitors meet design criteria for the monitoring network.

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The monitoring site is a stationary equipment shelter located on the grounds of the Baskett Fire Department in Baskett, Kentucky. Upon inspection, the sample lines and monitors were found to be in good condition. The sample inlets are 6.5 meters from the nearest road, which is closer than the allowable-distances stated by CFR. Due to the small traffic count of the street and the unlikely influence of vehicles on data, KDAQ has received EPA-approval for a waiver from the required road-distances stated by 40 CFR 58, Appendix E. Otherwise, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

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

**Monitors:**

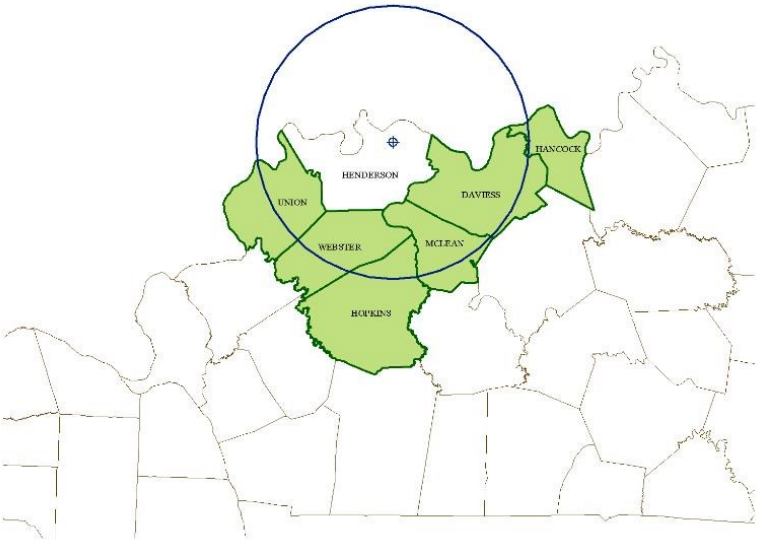
| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.9 | SLAMS<br>Maximum $O_3$ | UV photometry | Continuously<br>March 1 – October 31 |
| FRM $PM_{2.5}$ | 4.7 | SLAMS | Gravimetric | 24-hours every third day |
| $PM_{2.5}$ TEOM | 4.5 | SPM | Tapered element oscillating microbalance, gravimetric | Continuously |
| FRM $PM_{10}$ | 4.5 | 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 $PM_{10}$ |
| AEM Sulfur Dioxide | 3.5 | 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 maximum concentrations on an urban scale for ozone. This site also represents population exposure on a neighborhood scale for particulates and sulfur dioxide.

Neighborhood Scale: Particulates, Sulfur Dioxide


Urban Scale: Ozone



**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, Robards, KY 42452
**County:** Henderson
**GPS Coordinates:** 37.654381, -87.511427 (NAD 83)
**Date Established:** January 1, 2017
**Inspection Date:** December 8, 2016
**Inspection By:** Jennifer F. Miller
**Site Approval Status:** Site and monitor meet design criteria for the monitoring network.

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On August 10, 2015, the EPA finalized requirements in 40 CFR 51, Subpart BB requiring air pollution control agencies to monitor or model ambient sulfur dioxide ($SO_2$) concentrations in areas with large sources of sulfur dioxide emissions in order to assist in the implementation of the one-hour $SO_2$ National Air Ambient 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.

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 ½ 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 | 3.8 | 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 maximum-concentration population exposure on a neighborhood scale for sulfur dioxide.

Neighborhood Scale: Sulfur Dioxide

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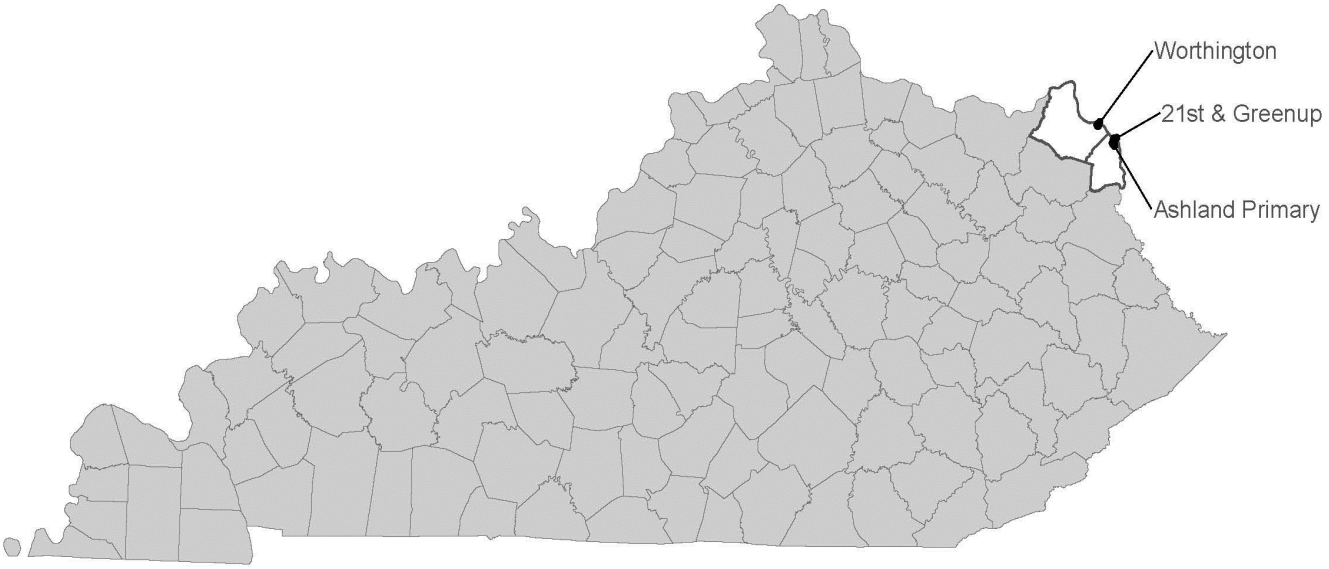
# Huntington-Ashland, WV-KY-OH




| 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. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-019-0002 | 122 22nd Street | | | 2[Cm] | | | | | | | | | | | | | | |
| Boyd | Ashland | | | | | | | | | | | | | | | | | |
| 21-019-0017 | 2924 Holt Street | 1 | 1[Si] | | | 1[ei] | 1[ei] | | | 1[eiM] | | 1 | | | | | | 1 |
| Boyd | Ashland | | | | | | | | | | | | | | | | | |
| 21-089-0007 | Scott St. & Center Ave. | | | | | 1[e] | | | | 1[e] | | | | | | | | |
| Greenup | Worthington | | | | | | | | | | | | | | | | | |
| **Totals** | **3** | **1** | **1** | **2** | | **2** | **1** | | | **2** | | **1** | | | | | | **1** |

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

PWEI SO2 monitoring required in MSA

m =PM10 Filter Analyzed for Metals

C =Collocated

e =Emergency Episode Monitor

S = Continuous T640 Monitor

i =AQI Reported

M =Maximum Ozone Concentration Site for MSA

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**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 13, 2016
**Inspection By:** Jennifer F. Miller
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.

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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 71.3 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.

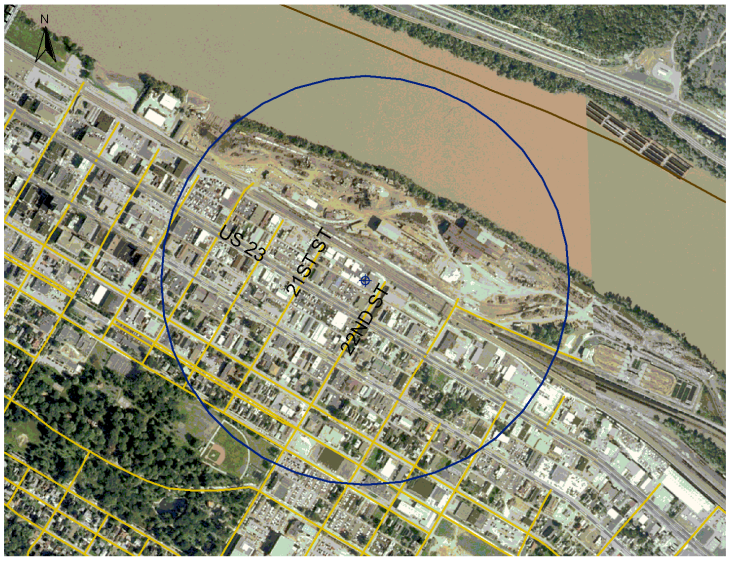
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| FEM $PM_{10}$ | 7.7 | 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 FEM $PM_{10}$ | 7.6 | 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:** 38.45934, -82.64041 (NAD 83)
**Date Established:** January 1, 1999
**Inspection Date:** November 9, 2016
**Inspection By:** Jennifer F. Miller & Ashley Bedel
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.

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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 meters from the nearest road. Upon inspection, the sample lines and monitors were found to be in good condition.

Previously, airflow at the site was partially obstructed by tall trees. However, KDAQ and the FIVCO Health Department invested in significant tree removal in November 2016, alleviating siting criteria concerns. The site is operated in accordance with all criteria required by 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 nitrogen dioxide, ozone, and sulfur dioxide; and to provide pollutant levels for daily air quality index reporting.

**Monitors:**

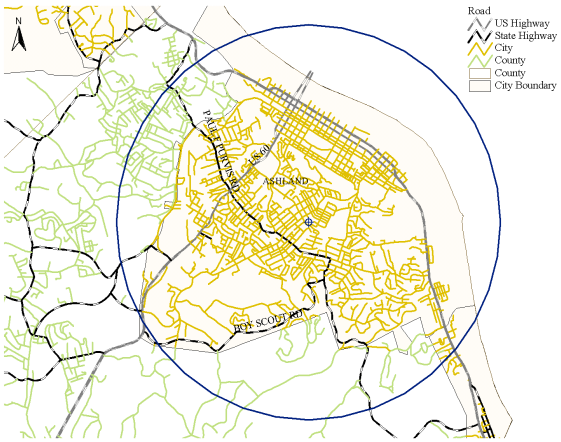
| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Nitrogen Dioxide ($NO_2$, NO, $NO_x$) | 4.3 | SLAMS<br>AQI<br>EPISODE | Chemiluminescence | Continuously |
| AEM Sulfur Dioxide | 4.3 | SLAMS<br>AQI<br>EPISODE | UV fluorescence | Continuously |
| AEM Ozone | 4.3 | SLAMS<br>AQI<br>EPISODE<br>Maximum $O^3$ | UV photometry | Continuously<br>March 1 – October 31 |
| FRM $PM_{2.5}$ | 4.8 | SLAMS | Gravimetric | 24-hours every third day |
| $PM_{2.5}$ Continuous | 4.7 | SPM<br>AQI | Broadband spectroscopy | Continuously |

| | | | | |
|---|---|---|---|---|
| Volatile Organic Compounds | 3.8 | SPM-Other | EPA method TO-15 | 24-hours every sixth day |
| Meteorological | 5.9 | Other | AQM grade instruments for wind speed, wind direction, humidity, barometric pressure, and temperature | Continuously |

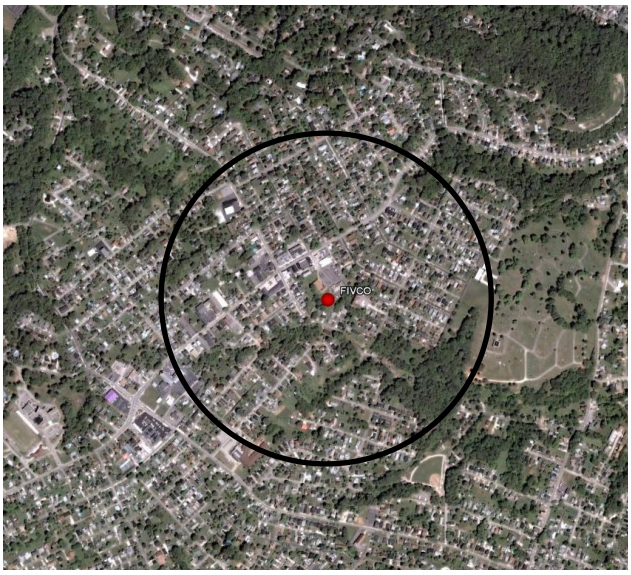
**Quality Assurance Status:**
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**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.

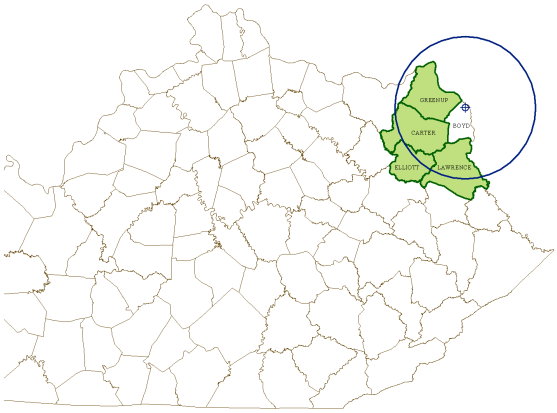
Neighborhood Scale: Air Toxics, Ozone, Sulfur Dioxide




Middle Scale: Particulates




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:** Worthington
**AQS Site ID:** 21-089-0007
**Location:** Scott Street & Center Avenue, Worthington, KY 41183
**County:** Greenup
**GPS Coordinates:** 38.548136, -82.731163 (NAD 83)
**Date Established:** October 12, 1980
**Inspection Date:** October 13, 2016
**Inspection By:** Jennifer F. 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 a water tower near the intersection of Scott Street and Center Avenue in Worthington, Kentucky. The sample inlets are 18 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 C, D, E and G.

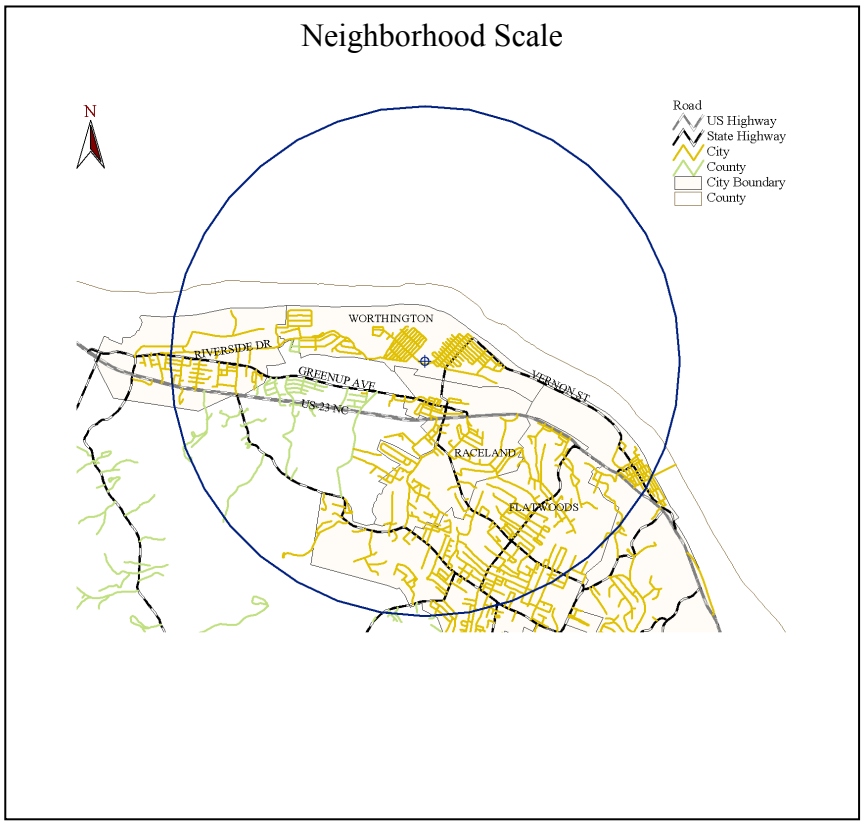
**Monitoring Objective:**
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to detect elevated pollutant levels for activation of emergency control procedures for ozone and sulfur dioxide.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 4.2 | SLAMS<br>EPISODE | UV photometry | Continuously<br>March 1 – October 31 |
| AEM Sulfur Dioxide | 4.2 | SPM<br>EPISODE | UV fluorescence | Continuously |

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

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



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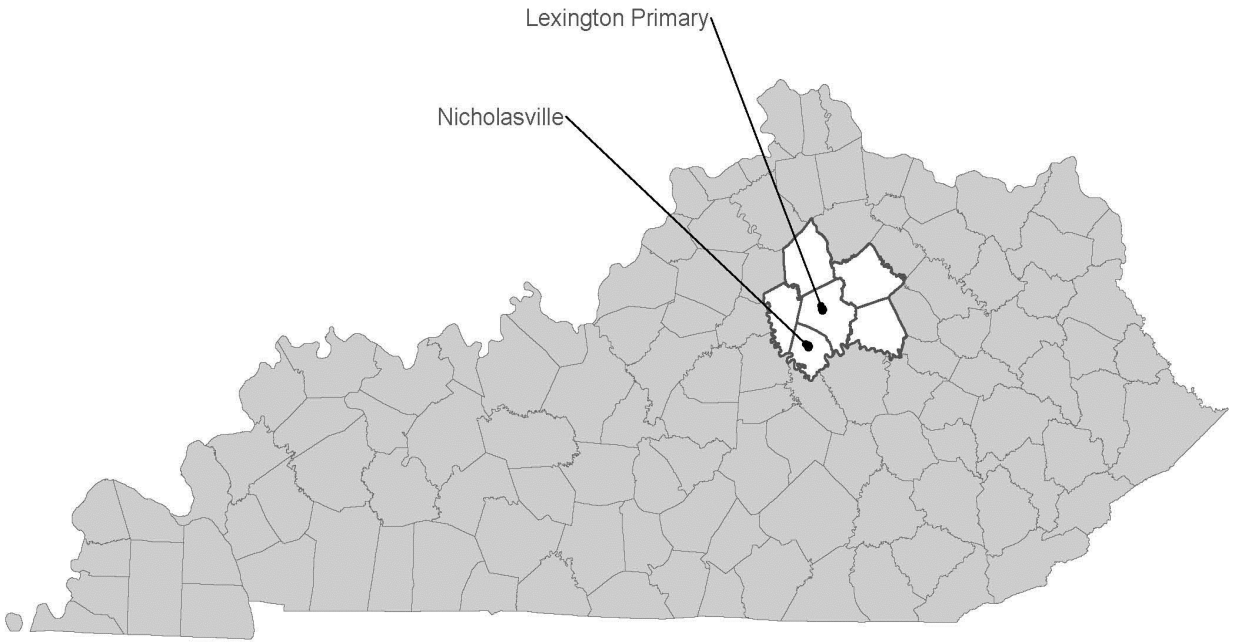
# Lexington-Fayette, KY




| AQS ID / County | Site Address | PM2.5 | Cont. PM2.5 | PM10 | Cont. PM10 | SO2 | NO2 | NOy | CO | O3 | Pb | VOC | Carbonyl | PAH | PM2.5 Spec. | Carbon Spec. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-067-0012 | 650 Newtown Pike | 1 | 1[ti] | 1[m] | | 1[ie] | 1[ier] | | | 1[ieM] | | | | | | | 1 | |
| Fayette | Lexington | | | | | | | | | | | | | | | | | |
| 21-113-0001 | 260 Wilson Drive | | | | | 1 | | | | 1 | | | | | | | | 1 |
| Jessamine | Nicholasville | | | | | | | | | | | | | | | | | |
| **Totals** | **2** | **1** | **1** | **1** | | **2** | **1** | | | **2** | | | | | | | **1** | **1** |

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

PWEI SO2 monitoring required in CBSA.

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

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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
**AQS Site ID:** 21-067-0012
**Location:** Fayette County Health Department, 650 Newtown Pike, Lexington, KY 40508
**County:** Fayette
**GPS Coordinates:** 38.06503, -84.49761 (NAD 83)
**Date Established:** November 8, 1979
**Inspection Date:** July 8, 2016
**Inspection By:** Jennifer F. Miller & Ashley Bedel
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.

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

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

Additionally, the nitrogen dioxide monitor has been approved as a RA-40 monitor. According to CFR, each EPA Regional Administrator is required to collaborate with agencies to establish or designate 40 $NO_2$ monitoring locations, with a primary focus on protecting susceptible and vulnerable populations.

**Monitors:**

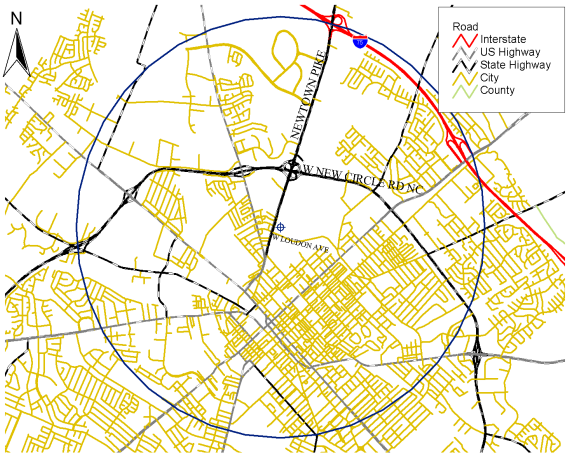
| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.8 | SLAMS<br>AQI<br>EPISODE<br>Maximum $O^3$ | UV photometry | Continuously<br><br>March 1 – October 31 |
| AEM Nitrogen Dioxide ($NO_2$, NO, $NO_x$) | 4.1 | SLAMS<br>(RA-40)<br>AQI<br>EPISODE | Photolysis | Continuously |
| AEM Sulfur Dioxide | 3.6 | SLAMS<br>AQI<br>EPISODE | UV fluorescence | Continuously |
| $PM_{2.5}$ TEOM | 4.6 | SPM<br>AQI | Tapered element oscillating microbalance, gravimetric | Continuously |

| | | | | |
|---|---|---|---|---|
| FRM $PM_{2.5}$ | 4.7 | SLAMS | Gravimetric | 24-hours every third day |
| $PM_{10}$ | 4.5 | 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 | 2.0 | RadNet | RadNet fixed stationary monitor, manual and automated methods | Continuously & 2 weekly filters |

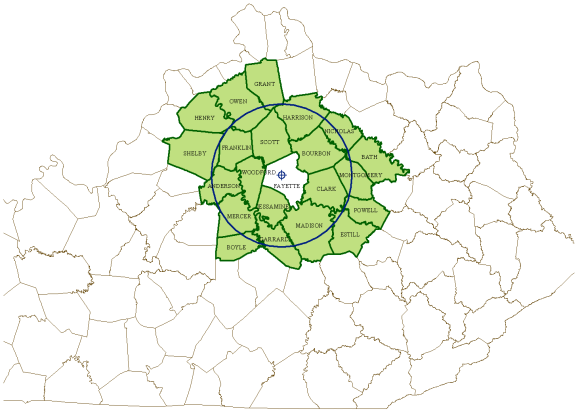
**Quality Assurance Status:**
All quality assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**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 Dioxide, Ozone




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:** July 8, 2016
**Inspection By:** Jennifer F. Miller & Ashley Bedel
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.

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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 110 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 C, D, E and G.

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

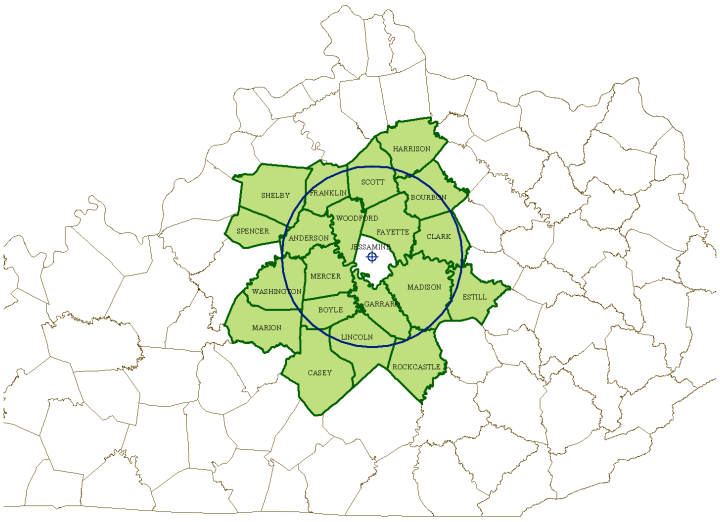
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.9 | SLAMS | UV photometry | Continuously<br>March 1 – October 31 |
| AEM Sulfur Dioxide | 3.9 | SPM | UV fluorescence | Continuously |
| Meteorological | 5.9 | Other | AQM grade instruments for wind speed, wind direction, temperature, and barometric pressure | 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 an urban scale.

Urban Scale: Ozone and Sulfur Dioxide



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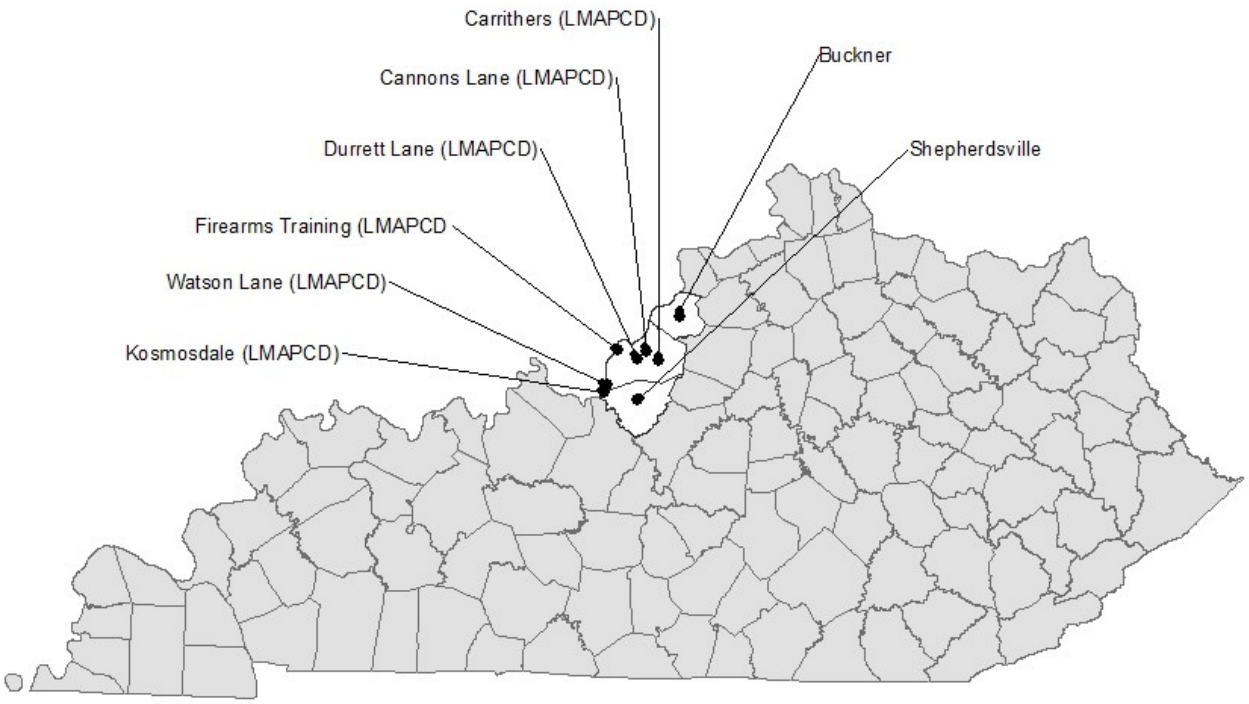
# Louisville/Jefferson County, KY-IN




| AQS ID / County | Site Address | PM2.5 | Cont. PM2.5 | PM10 | Cont. PM10 | SO2 | NO2 | NOy | CO | O3 | Pb | VOC | Carbonyl | PAH | PM2.5 Spec. | Carbon Spec. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-029-0006 | 2nd & Carpenter St | | | | | | | | | 1 | | | | | | | | |
| Bullitt | Shepherdsville | | | | | | | | | | | | | | | | | |
| 21-185-0004 | 1601 South Hwy 393 | | | | | | | | | 1[M] | | | | | | | | 1 |
| Oldham | LaGrange | | | | | | | | | | | | | | | | | |
| 21-111-0051 | 7201 Watson Ln | | 1[iB]* | | 1[iB] | 1[i] | | | | 1[i] | | | | | | | | 1 |
| Jefferson | Louisville (LMAPCD) | | | | | | | | | | | | | | | | | |
| 21-111-0065 | 15501R Dixie Hwy | | | | | 1[i] | | | | | | | | | | | | 1 |
| Jefferson | Louisville (LMAPCD) | | | | | | | | | | | | | | | | | |
| 21-111-0067 | 2730 Cannons Ln | 1 | 1[iB]* | | 1[iB] | 1[i] | 1[i] | 1 | 1[i] | 1[i] | | | | | 1[U] | 1[U] | 1 | 1 |
| Jefferson | Louisville (LMAPCD) | | | | | | | | | | | | | | | | | |
| 21-111-0075 | 1517 Durrett Ln | 1[n] | | | | | 1[n] | | 1[n] | | | | | | | | | 1[n] |
| Jefferson | Louisville (LMAPCD) | | | | | | | | | | | | | | | | | |
| 21-111-0080 | 4320 Billtown Rd | | 1[iB] | | | | | | | 1[i] | | | | | | | | 1 |
| Jefferson | Louisville (LMAPCD) | | | | | | | | | | | | | | | | | |
| 21-111-1041 | 4201 Algonquin Pkwy | 2[C] | 2[iSB]* | | 1[iB] | 1[i] | | | | | | 1[G] | | | | | | 1 |
| Jefferson | Louisville (LMAPCD) | | | | | | | | | | | | | | | | | |
| **Totals** | **8** | **4** | **5** | | **3** | **4** | **2** | **1** | **2** | **5** | | **1** | | | **1** | **1** | **1** | **7** |

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

.PWEI SO2 monitoring required in CBSA

G =Auto GC

C =Collocated

U =Auxiliary Monitor On Site

S =Continuous T640 Monitor

i =AQI Reported

B =Continuous BAM Monitor

n =Near-Road Monitor

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* =BAM Eligible for PM2.5 NAAQS Comparisons

M =Maximum Ozone Concentration Site for MSA

**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Madison, 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:** 37.98629, -85.71192 (NAD 83)
**Date Established:** January 30, 1992
**Inspection Date:** September 16, 2016
**Inspection By:** Jennifer F. Miller
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.

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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 56 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 C, D, E and G.

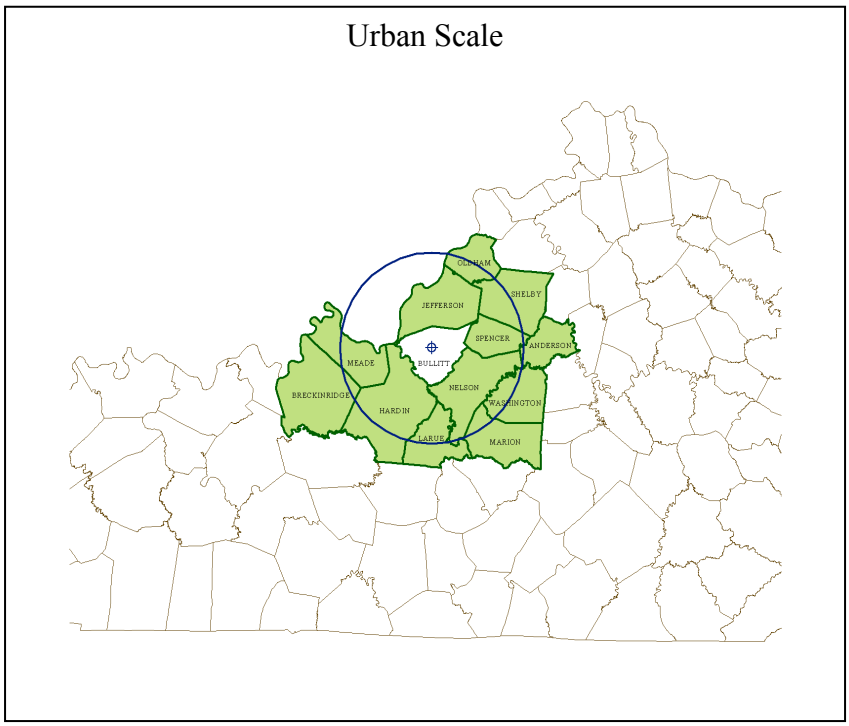
**Monitoring Objective:**
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 4.0 | SLAMS | UV photometry | Continuously<br>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-Madison, 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:** 38.40020, -85.44428 (NAD 83)
**Date Established:** May 1, 1981
**Inspection Date:** September 16, 2016
**Inspection By:** Jennifer F. Miller
**Site Approval Status:** Site and monitor meet all design criteria for the monitoring network.

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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, E and G.

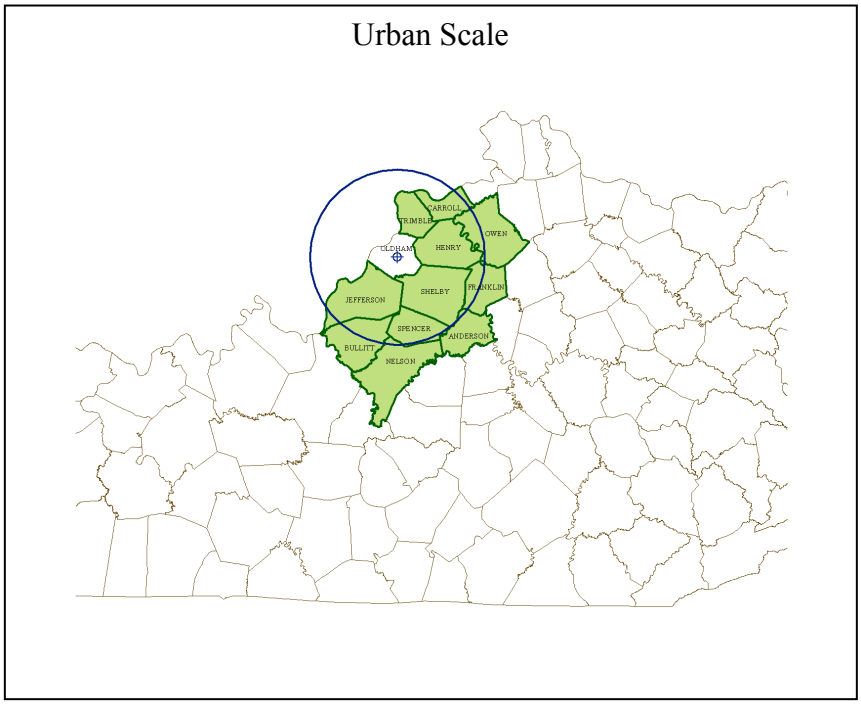
**Monitoring Objective:**
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.8 | SLAMS<br>Maximum $O^3$ | UV photometry | Continuously<br>March 1 – October 31 |
| Meteorological | 6.2 | Other | AQM grad 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 maximum concentrations on an urban scale.



**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Madison, KY-IN CSA; Louisville/Jefferson County, KY-IN MSA
**401 KAR 50:020 Air Quality Region:** Louisville Interstate (078)
**Site Name:** Watson Lane
**AQS Site ID:** 21-111-0051
**Location:** 7201 Watson Lane, Louisville, KY 40272
**County:** Jefferson
**GPS Coordinates:** 38.06091, -85.89804 (NAD 83)
**Date Established:** July 16, 1992
**Inspection Date:** November 4, 2016
**Inspection By:** Jennifer F. Miller & Ashley Bedel
**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 34 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.

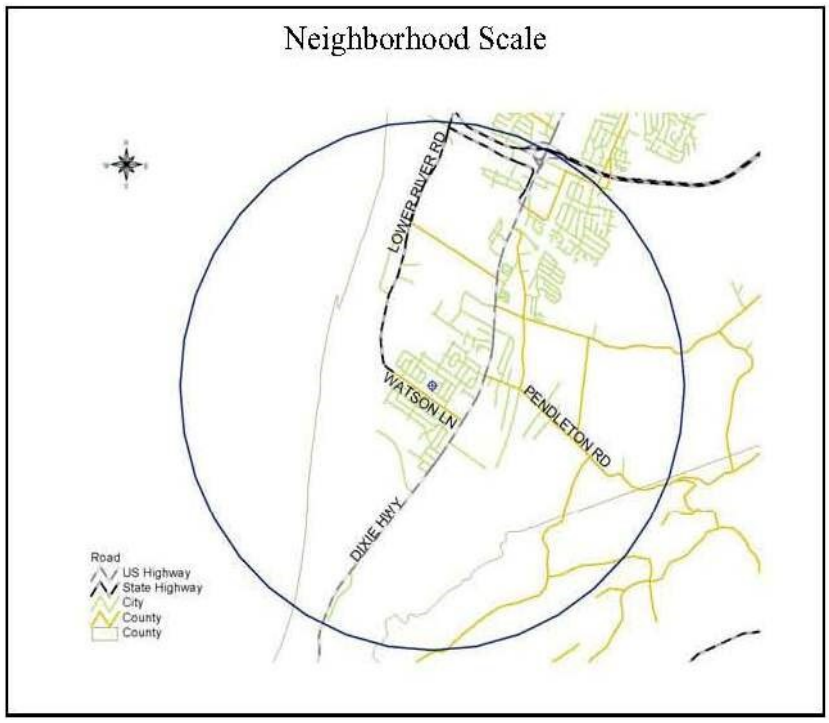
**Monitoring Objective:**
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to provide pollution levels for daily index reporting.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 4.3 | SLAMS<br><br>AQI | UV photometry | Continuously<br><br>March 1 – October 31 |
| $PM_{2.5}$ BAM | 4.6 | SLAMS<br>AQI | Automated Equivalent Method utilizing Beta Attenuation. | Continuously |
| $PM_{10}$ BAM | 4.6 | SLAMS<br>AQI | Automated Equivalent Method utilizing Beta Attenuation. | Continuously |
| AEM Sulfur Dioxide | 4.3 | SLAMS | UV fluorescence | Continuously |
| Meteorological | 6.0 | Other | AQM grade instruments for wind speed and wind direction. Not reported to AQS. | 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 $SO_2$.



**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Madison, KY-IN CSA; Louisville/Jefferson County, KY-IN MSA
**401 KAR 50:020 Air Quality Region:** Louisville Interstate (078)
**Site Name:** Kosmosdale
**AQS Site ID:** 21-111-0065
**Location:** 15501R Dixie Highway, Louisville, KY 40272
**County:** Jefferson
**GPS Coordinates:** 38.0296139, -85.911389 (NAD 83)
**Date Established:** TBD
**Inspection Date:** TBD
**Inspection By:** TBD
**Site Approval Status:** TBD

Due to the need for additional characterization of ambient air quality in the vicinity of the Jefferson County $SO_2$ nonattainment area in southwestern Jefferson County, a new site will be established. This site, named Kosmosdale, will be located approximately ¼ mile south-southwest of the Kosmos Cement Co. facility, and approximately one mile south of the Jefferson County $SO_2$ nonattainment area. The estimated operational date for this site is January 1, 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.

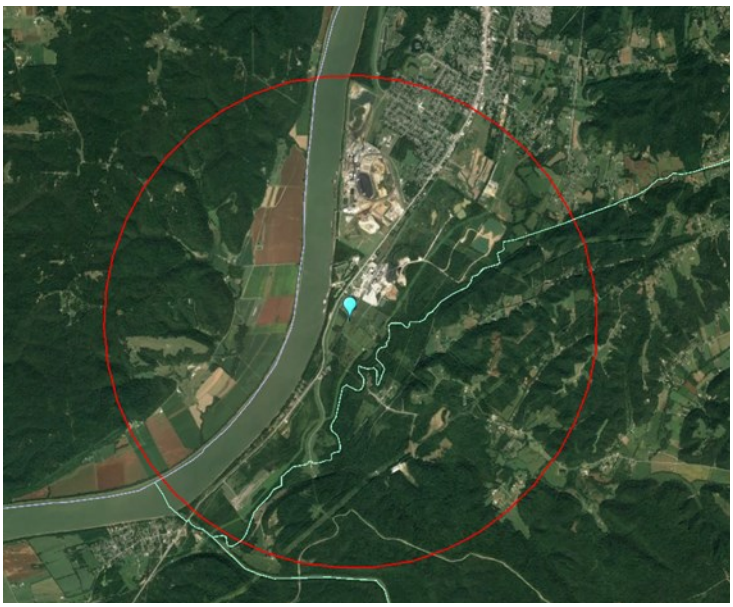
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Sulfur Dioxide | 4.5 | SLAMS<br>AQI | UV fluorescence | Continuously |
| Meteorological | 10.0 | Other | AQM grade instruments for wind speed, wind direction, temperature, and humidity. Not reported to AQS; thus, there is no designation. | Continuously |

**Quality Assurance Status:**
All Quality Assurance procedures will be implemented in accordance with 40 CFR 58, Appendix A.

**Area Representativeness:**
This site will represent population exposure on a neighborhood scale for sulfur dioxide.

Neighborhood Scale:  Sulfur Dioxide



**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Madison, KY-IN CSA; Louisville/Jefferson County, KY-IN MSA
**401 KAR 50:020 Air Quality Region:** Louisville Interstate (078)
**Site Name:** Cannons Lane
**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 4, 2016
**Inspection By:** Jennifer F. Miller & Ashley Bedel
**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 | 4.6 | NCore<br>SLAMS<br>AQI | Automated Reference Method utilizing trace level non-dispersive infrared analysis. | Continuously |
| Nitrogen Dioxide ($NO$, $NO_2$, $NO_x$) | 4.6 | NCore<br>SLAMS<br>AQI | Automated Reference Method utilizing chemiluminescence analysis. | Continuously |
| Total Reactive Nitrogen ($NO/NO_y$) | 8.8 | NCore | Automated method utilizing trace level chemiluminescence analysis. | Continuously |
| Ozone | 4.6 | NCore<br>SLAMS<br>AQI | Automated Equivalent Method utilizing UV photometry analysis. | Continuously |
| Sulfur Dioxide | 4.6 | NCore<br>SLAMS<br>AQI | Automated Equivalent Method utilizing trace level UV fluorescence analysis. | Continuously |
| $PM_{2.5}$<br>BAM | 4.6 | NCore<br>SLAMS<br>AQI | Automated Equivalent Method utilizing Beta Attenuation. | Continuously |
| $PM_{10}$<br>BAM<br><br>- $PM_{Coarse}$ ($PM_{10}$-$PM_{2.5}$) BAM | 4.6 | NCore<br>SPM<br>AQI | Automated Equivalent Method utilizing Beta Attenuation.<br><br>Differential Automated Equivalent Method utilizing Beta Attenuation. | Continuously<br><br>Continuously |
| $PM_{2.5}$ Speciation | 2.2 | NCore<br>SLAMS | Multi-Species manual collection method utilizing thermal optical ion chromatography, gravimetric, and X-ray fluorescence. | 1/3 days |
| -Auxiliary $PM_{2.5}$ Speciation | 2.2 | NCore<br>SLAMS | Multi-Species manual collection method utilizing thermal optical ion chromatography, gravimetric, and X-ray fluorescence. Data is reported to POC2, but is not used for precision. Sampler provides 1/3 day sampling coverage for weekends and holidays. | Supplements the primary monitor's 1/3 sampling schedule on weekends and holidays |
| $PM_{2.5}$ Carbon Speciation | 2.4 | NCore<br>SLAMS | Multi-species manual collection method utilizing thermal optical and gravimetric analyses. | 1/3 days |
| -Auxiliary $PM_{2.5}$ Carbon Speciation | 2.4 | NCore<br>SLAMS | Multi-species manual collection method utilizing thermal optical and gravimetric analyses. Data is reported to POC2, but is not used for precision. Sampler provides 1/3 day sampling coverage for weekends and holidays. | Supplements the primary monitor's 1/3 sampling schedule on weekends and holidays |

**Monitors (Continued):**

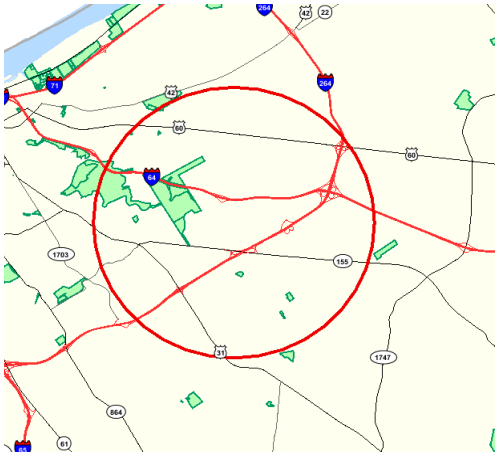
| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| FRM $PM_{2.5}$ | 2.4 | NCore<br>SLAMS | Manual reference method utilizing gravimetric analysis | 1/3 days |
| Meteorological | 9.3 | NCore<br>Other | Air Quality Measurements approved instrumentation for wind speed, wind direction, humidity, and temperature | Continuously |
| -Solar Radiation | 5.0 | NCore<br>Other | Air Quality Measurements approved instrumentation for solar radiation | Continuously |
| -Rain Gauge | 1.8 | NCore<br>Other | Air Quality Measurements approved instrumentation for precipitation | Continuously |
| Radiation | 1.5 | 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. The District's current Quality Assurance Project Plan covers trace-level $O_3$, $NO_x$, $SO_2$, and CO, as well as $PM_{2.5}$ speciation, lead, and meteorological measurements. Standard operating procedures for trace-level CO, $NO_x$, $NO_y$, $SO_2$, $O_3$, $PM_{2.5}$ BAM, and meteorological measurements have been developed. Additional standard operating procedures manuals will be adopted or developed for new instrumentation.

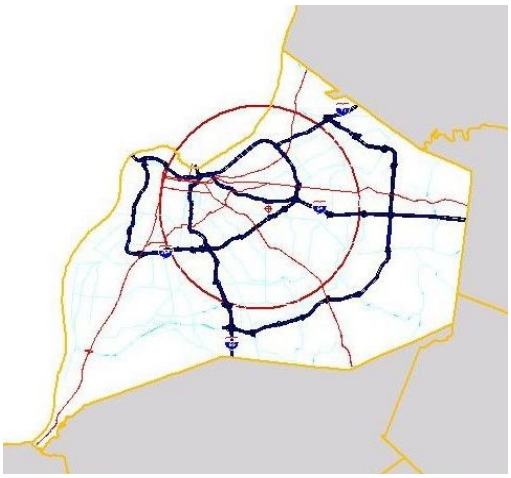
**Area Representativeness:**
The air monitoring equipment at the Cannon's Lane NCore station is specifically located at the urban and neighborhood scales. These scales are generally the most representative of the expected population exposures that occur throughout metropolitan areas.

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

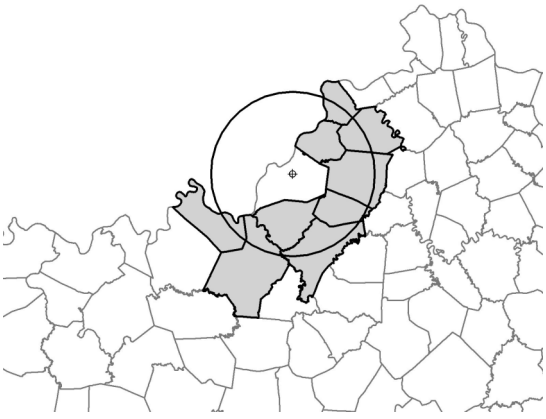
Neighborhood Scale:
(4 km radius)
Carbon Monoxide



Neighborhood Scale:
(10 km radius)
Nitrogen Oxides and Ozone



Urban Scale:
Particulates, Sulfur Dioxide, and Radiation



**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Madison, 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 Site)
**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:** November 4, 2016
**Inspection By:** Jennifer F. Miller & Ashley Bedel
**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 the 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 ($NO_2$, NO, $NO_x$) | 4.6 | SLAMS | Photolysis | Continuously |
| Carbon Monoxide | 4.6 | SLAMS | Automated Reference Method utilizing trace-level non-dispersive infrared analysis | Continuously |
| FRM $PM_{2.5}$ | 4.7 | SLAMS | Manual Reference Method utilizing gravimetric analysis | One sample every third day |
| Meteorological | 10.0 | Other | AQM grade instruments for wind speed, wind direction, humidity, and temperature | Continuously |

**Quality Assurance Status:**
All Quality Assurance procedures will be implemented in accordance with 40 CFR 58, Appendix A.

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

Middle Scale

**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Madison, 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:** 430 Billtown Road, Louisville, KY 40291
**County:** Jefferson
**GPS Coordinates:** 38.182511, -85.574167 (NAD 83)
**Date Established:** TBD
**Inspection Date:** TBD
**Inspection By:** TBD
**Site Approval Status:** TBD

Due to Jefferson County Public School District's plan for significant modification to the Bates Elementary property, the Bates site will no longer be suitable for ambient air quality monitoring. A new site will be 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 will be transferred to Carrithers upon completion of the Carrithers shelter. The estimated completion date is September 1, 2017.

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

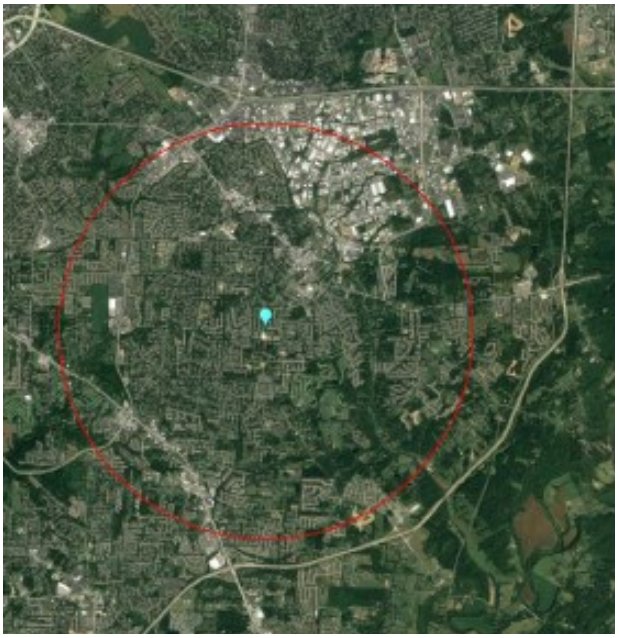
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 4.5 | SLAMS<br>AQI | UV photometry | Continuously<br>March 1 – October 31 |
| $PM_{2.5}$ BAM | 4.5 | SPM<br>AQI | Automated non-equivalent Beta Attenuation method. | Continuously |
| Meteorological | 6.5 | Other | AQM grade instruments for wind speed, wind direction, temperature, and humidity. Not reported to AQS; thus, there is no designation. | Continuously |

**Quality Assurance Status:**
All Quality Assurance procedures will be implemented in accordance with 40 CFR 58, Appendix A.

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

Neighborhood Scale:  Particulates and Ozone



**CSA/MSA:** Louisville/Jefferson County-Elizabethtown-Madison, KY-IN CSA; Louisville/Jefferson County, KY-IN MSA
**401 KAR 50:020 Air Quality Region:** Louisville Interstate (078)
**Site Name:** Firearms Training
**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:** November 4, 2016
**Inspection By:** Jennifer F. Miller & Ashley Bedel
**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 52 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 plans to expand the site to accommodate particulate matter monitors that will be relocated upon shutdown of the Southwick Community Center site. A continuous air toxics monitor will also be installed.

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

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| $PM_{10}$ BAM | 4.5 | SLAMS<br>AQI | Automated Equivalent Method utilizing Beta Attenuation. | Continuously |
| $PM_{2.5}$ BAM | 4.5 | SLAMS<br>AQI | Automated Equivalent Method utilizing Beta Attenuation. | Continuously |
| FRM $PM_{2.5}$ | 4.5 | SLAMS | Gravimetric | 24-hours every third day |
| Collocated FRM $PM_{2.5}$ | 4.5 | SLAMS | Gravimetric | 24-hours every sixth day |
| $PM_{2.5}$ Continuous | 4.5 | SPM | Broadband spectroscopy (TAPI T640) | Continuously |

**Monitors (Continued):**

| | | | | |
|---|---|---|---|---|
| AEM Sulfur Dioxide | 4.5 | SLAMS AQI | UV Fluorescence | Continuously |
| Toxics | 4.5 | SPM | Automatic gas chromatography | Continuously |
| Meteorological | 10.0 | Other | AQM grade instruments for wind speed, wind direction, temperature, barometric pressure, 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.

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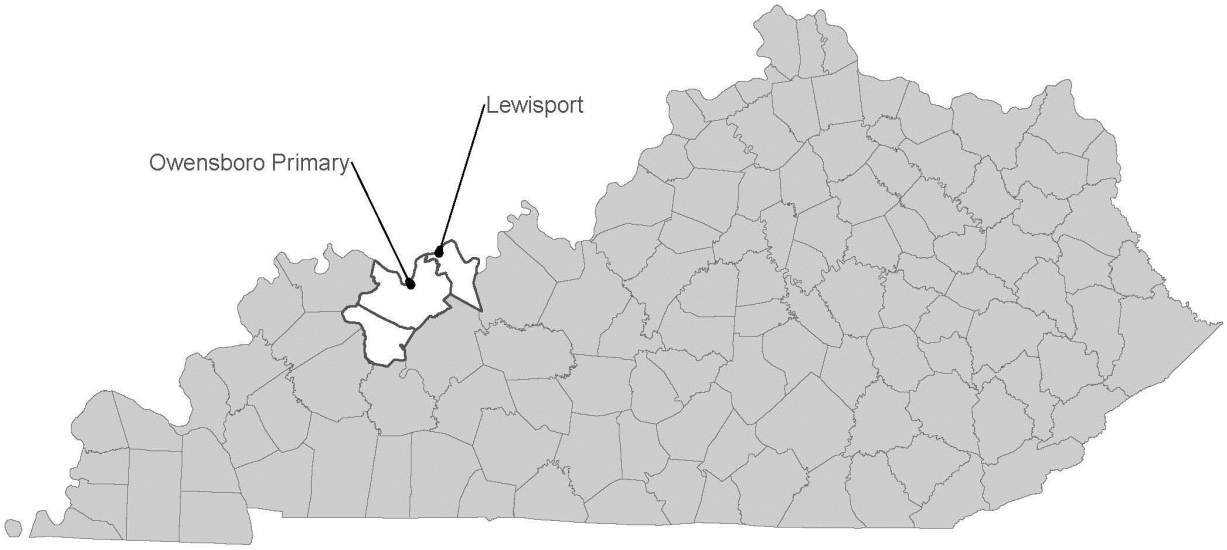
# Owensboro, KY




| 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. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-059-0005 Daviess | 716 Pleasant Valley Rd. Owensboro | 1 | 1[tei] | | | 1[ei] | 1[ei] | | | 1[ei] | | | | | | | | 1 |
| 21-091-0012 Hancock | Second & Caroline St. Lewisport | | | | | | | | | 1[M] | | | | | | | | |
| **Totals** | **2** | **1** | **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

t =Continuous TEOM 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:** 37.780776, -87.075307 (NAD 83)
**Date Established:** December 1, 1970
**Inspection Date:** November 14, 2016
**Inspection By:** Ashley Bedel
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.

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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 48 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 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:**

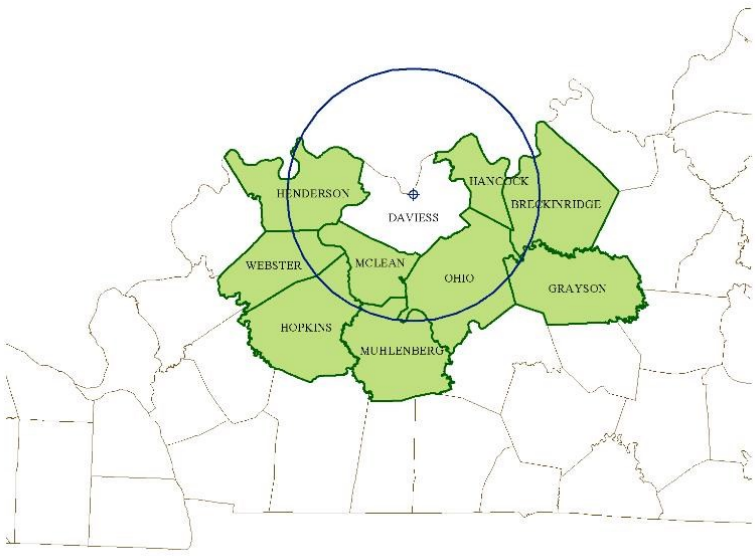
| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Nitrogen Dioxide ($NO_2$, NO, $NO_x$) | 3.5 | SLAMS<br>EPISODE<br>AQI | Chemiluminescence | Continuously |
| AEM Ozone | 3.5 | SLAMS<br>EPISODE<br>AQI | UV photometry | Continuously<br>March 1 – October 31 |
| FRM $PM_{2.5}$ | 2.2 | SLAMS | Gravimetric | 24-hours every third day |
| $PM_{2.5}$ TEOM | 4.6 | SPM<br>EPISODE<br>AQI | Tapered element oscillating microbalance, gravimetric | Continuously |
| AEM Sulfur Dioxide | 3.5 | SLAMS<br>EPISODE<br>AQI | UV fluorescence | Continuously |
| Meteorological | 7.5 | 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 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:** 37.93829, -86.89719 (NAD 83)
**Date Established:** September 5, 1980
**Inspection Date:** November 14, 2016
**Inspection By:** Ashley Bedel
**Site Approval Status:** Site and monitor meet all design criteria for the monitoring network.

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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 57 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, E and G.

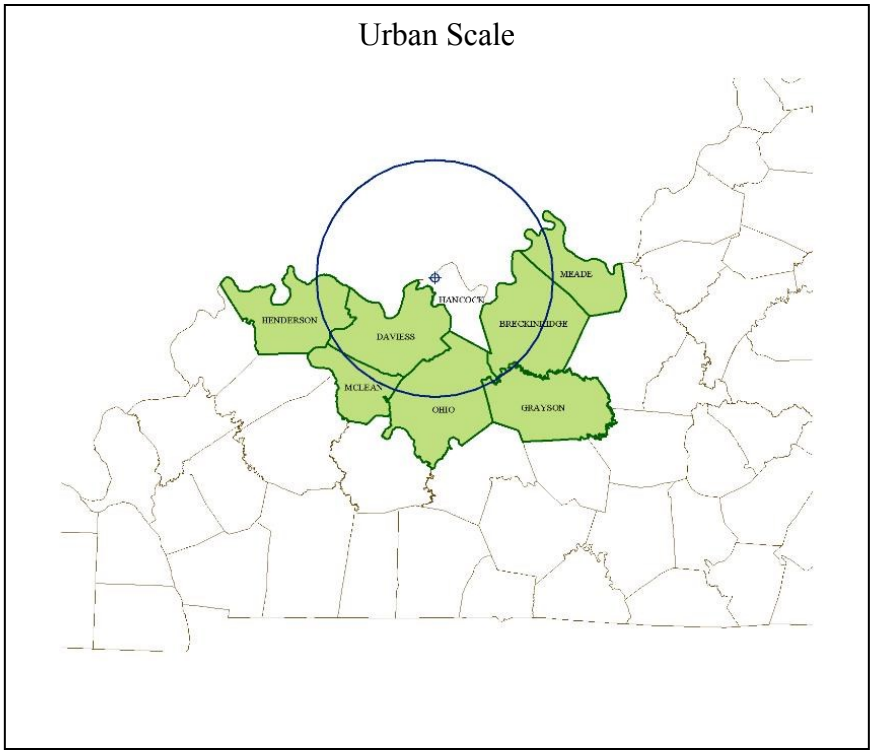
**Monitoring Objective:**
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.5 | SLAMS<br>Maximum $O_3$ | UV photometry | Continuously<br>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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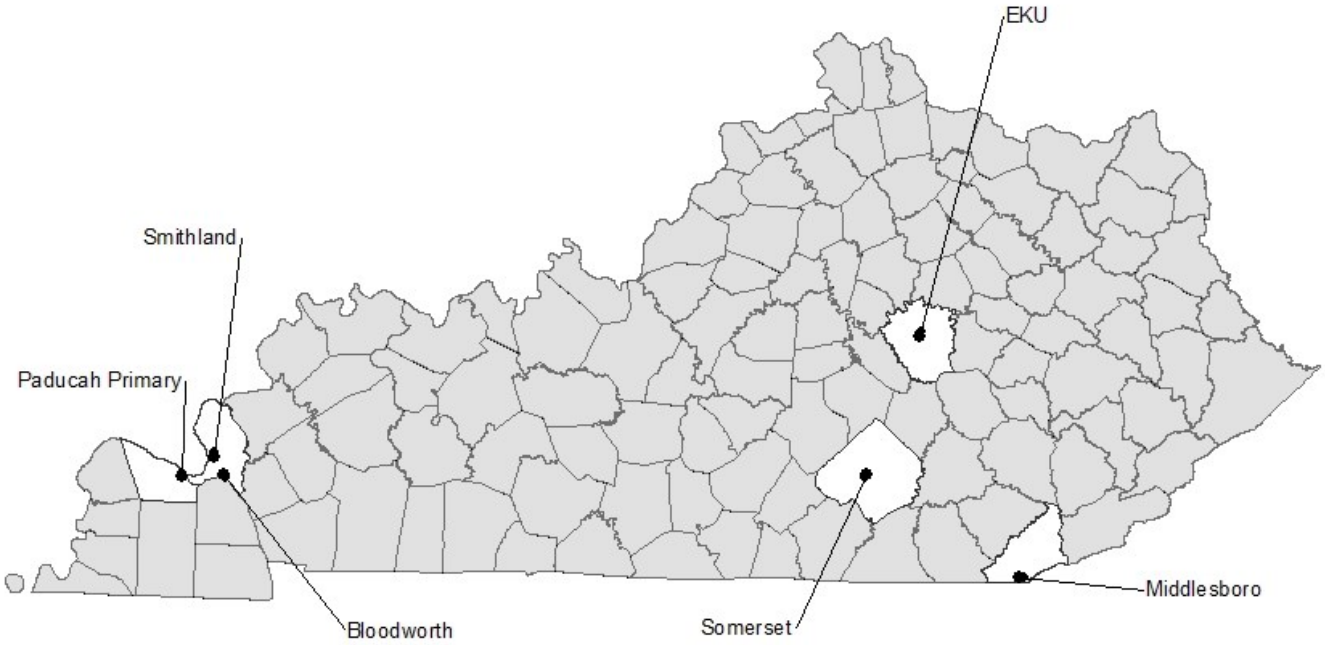
# Micropolitan Statistical Areas




| 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. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-013-0002 Bell | 1420 Dorchester Ave. Middlesboro | 1 | | | | | | | | 1 | | | | | | | | 1 |
| 21-139-0003 Livingston | 706 State Drive Smithland | | | | | | | | | 1 | | | | | | | 1 | |
| 21-139-0004 Livingston | 763 Bloodworth Road Smithland | | | 1[m] | | | | | | | | 1 | | | | | | 1 |
| 21-145-1024 McCracken | 2901 Powell Street Paducah | 1 | 1[Si] | 1 | | 1[Pei] | 1[ei] | | | 1[ei] | | | | | | | | |
| 21-151-0005 Madison | Van Hoose Drive Richmond | | | | | | | | | | 2[C] | | | | | | | |
| 21-199-0003 Pulaski | 305 Clifty Street Somerset | 1 | | | | | | | | 1 | | | | | | | | |
| **Totals** | **6** | **4** | **1** | **2** | | **1** | **1** | | | **4** | **2** | **1** | | | | | **1** | **2** |

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

P=PWEI SO2 monitoring required in CBSA.

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

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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:** 36.60843, -83.73694 (NAD 83)
**Date Established:** February 14, 1992
**Inspection Date:** December 28, 2016
**Inspection By:** Jennifer F. 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 Middlesboro Airport in Middlesboro, Kentucky. The sample inlets are 92 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 C, D, E and G.

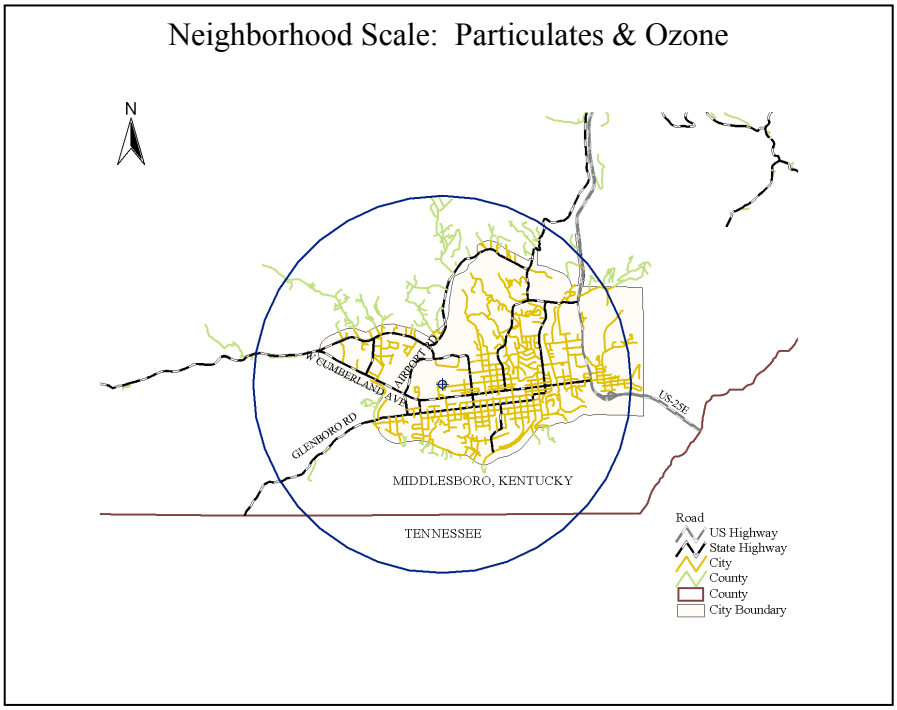
**Monitoring Objective:**
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to provide information on the transport of ozone into the region.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 4.1 | SPM | UV photometry | Continuously<br>March 1 – October 31 |
| FRM $PM_{2.5}$ | 4.6 | SPM | Gravimetric | 24-hours every sixth day |
| Meteorological | 5.7 | 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:**
The site represents population exposure on a neighborhood scale for particulates and ozone.



**CSA/MSA:** Paducah-Mayfield, KY-IL CSA; Paducah, KY-IL Micropolitan Statistical Area
**401 KAR 50:020 Air Quality Region:** Paducah-Cairo Interstate (072)
**Site Name:** Smithland
**AQS Site ID:** 21-139-0003
**Location:** Livingston County Road Dept., 730 State Drive, Smithland, KY 42081
**County:** Livingston
**GPS Coordinates:** 37.155392, -88.394024 (NAD 83)
**Date Established:** April 1, 1988
**Inspection Date:** December 7, 2016
**Inspection By:** Ashley Bedel
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.

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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 139 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 C, D, E and G.

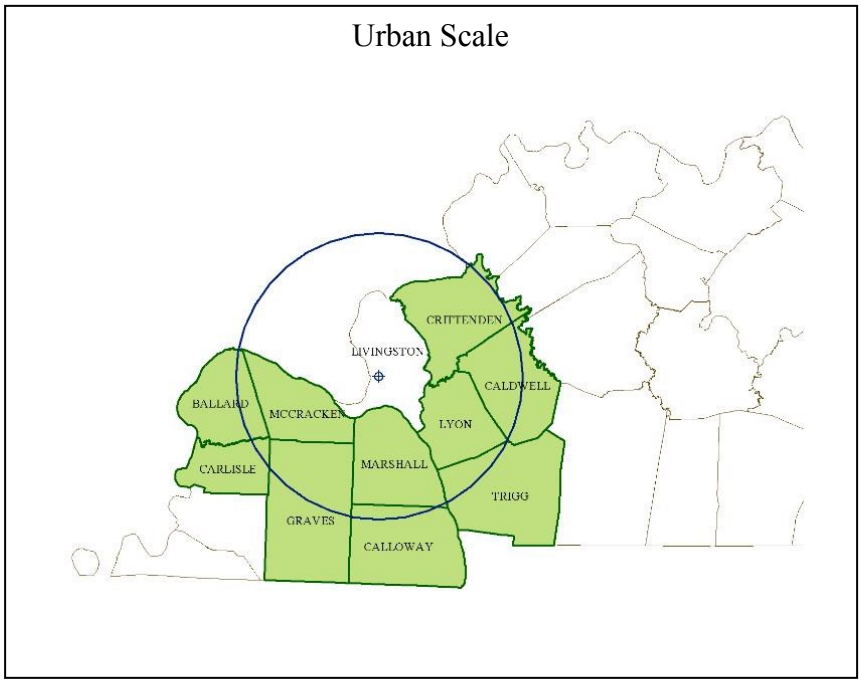
**Monitoring Objective:**
The monitoring objective is to determine compliance with National Ambient Air Quality Standards.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.3 | SLAMS | UV photometry | Continuously |
| Radiation | 2.0 | 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:** Bloodworth
**AQS Site ID:** 21-139-0004
**Location:** 763 Bloodworth Road, Smithland, KY 42081
**County:** Livingston
**GPS Coordinates:** 37.07151, -88.33389 (NAD 83)
**Date Established:** September 15, 1986
**Inspection Date:** December 7, 2016
**Inspection By:** Ashley Bedel
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.

---

The monitoring site is a stationary equipment shelter located at the residence of 763 Bloodworth Road in Livingston County, Kentucky. The sample inlets are 8 meters from the nearest road, which is an access road for a residence. Upon inspection, the inlet and sampler were found to be in good condition.

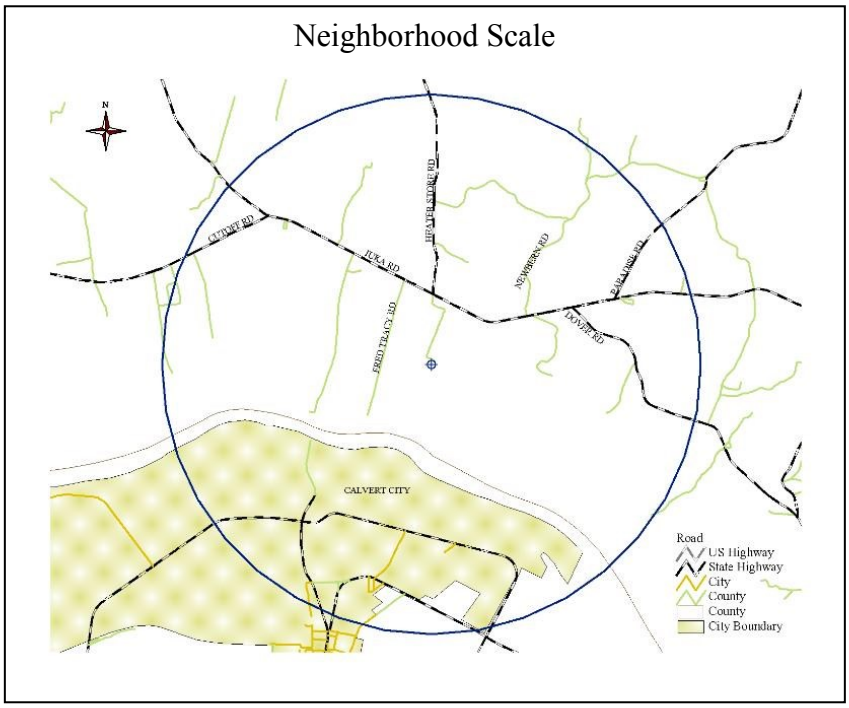
**Monitoring Objective:**
The monitoring objective is to determine compliance with National Ambient Air Quality Standards for $PM_{10}$ and to detect and quantify air toxics in ambient air.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| Volatile Organic Compounds | 4.6 | SPM-Other | EPA method TO-15 | 24-hours every sixth day |
| FRM $PM_{10}$ | 4.5 | SPM | 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 $PM_{10}$ |
| Meteorological | 7.5 | 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:**
The site represents source impacts on a neighborhood 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
**AQS Site ID:** 21-145-1024
**Location:** Jackson Purchase RECC, 2901 Powell Street, Paducah, KY 42003
**County:** McCracken
**GPS Coordinates:** 37.05822, -88.57251 (NAD 83)
**Date Established:** August 15, 1980
**Inspection Date:** December 7, 2016
**Inspection By:** Jennifer F. 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. While the site meets most of the requirements established by 40 CFR 58, Appendices C, D, E and G, the sample inlets are only 9 meters from the nearest road, which is closer than the distances allowed by 40 CFR 58, Appendix E. Due to the small traffic count of the street and the unlikely influence of vehicle-exhaust on data, KDAQ has received EPA-approval for a waiver from the minimum allowable road-distances for all monitors at the site.

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

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Nitrogen Dioxide ($NO_2$, NO, $NO_x$) | 3.7 | SLAMS<br>EPISODE<br>AQI | Chemiluminescence | Continuously |
| AEM Sulfur Dioxide | 3.7 | SLAMS<br>AQI<br>EPISODE | UV fluorescence | Continuously |
| AEM Ozone | 3.7 | SLAMS<br>AQI<br>EPISODE | UV photometry | Continuously<br>March 1 – October 31 |

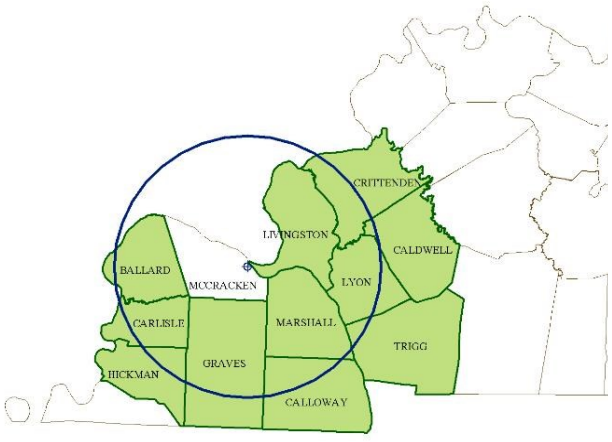
| | | | | |
|---|---|---|---|---|
| $PM_{2.5}$ Continuous | 4.8 | SPM<br>AQI | Broadband Spectroscopy | Continuously |
| FRM $PM_{2.5}$ | 4.7 | SLAMS | Gravimetric | 24-hours every third day |
| FEM $PM_{10}$ | 4.6 | SLAMS | Gravimetric | 24-hours every sixth day |

**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 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:** EKU
**AQS Site ID:** 21-151-0005
**Location:** Eastern Kentucky University, Van Hoose Drive, Richmond, KY 40475
**County:** Madison
**GPS Coordinates:** 37.73635, -84.29169 (NAD 83)
**Date Established:** March 10, 2012
**Inspection Date:** June 30, 2016
**Inspection By:** Jennifer F. Miller & Ashley Bedel
**Site Approval Status:** Site and monitors meet all design criteria for the monitoring network.

---

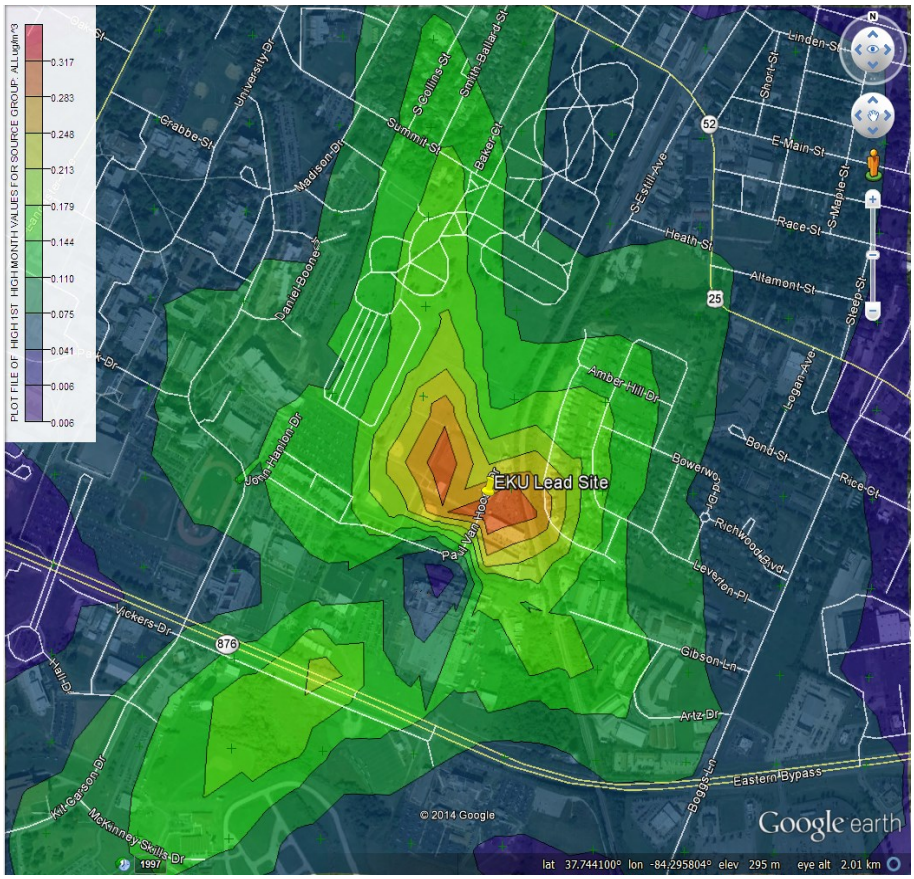
The site is located behind the Gentry Facilities Services building and is adjacent to Eastern Kentucky University's athletic fields. The sample inlets are 2.9 meters from the nearest road. Upon inspection, the sample inlet and monitor were found to be in good condition. The site meets the requirements 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 | 2.3 | SLAMS | High volume air sampler. Analysis via ICP-MS. | 24-hours every sixth day |
| Collocated FRM Lead | 2.3 | 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:** 37.09798, -84.61152 (NAD 83)
**Date Established:** February 14, 1992
**Inspection Date:** December 28, 2016
**Inspection By:** Jennifer F. 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 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 C, D, and E.

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

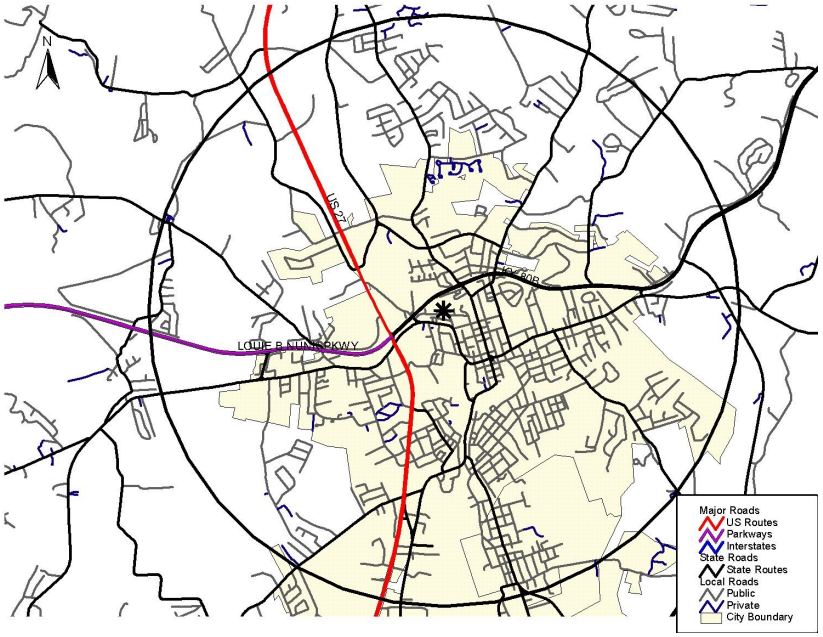
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 4.4 | SPM | UV photometry | Continuously<br>March 1 – October 31 |
| FRM $PM_{2.5}$ | 4.6 | SPM | Gravimetric | 24-hours every third day |

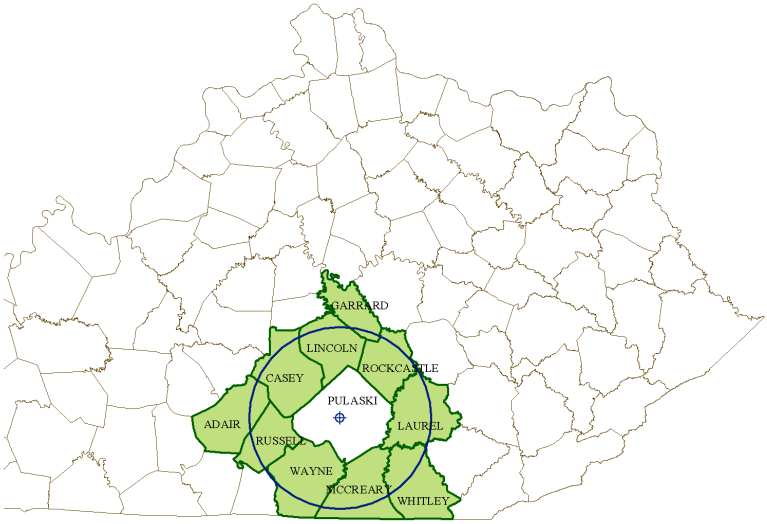
**Quality Assurance Status:**
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**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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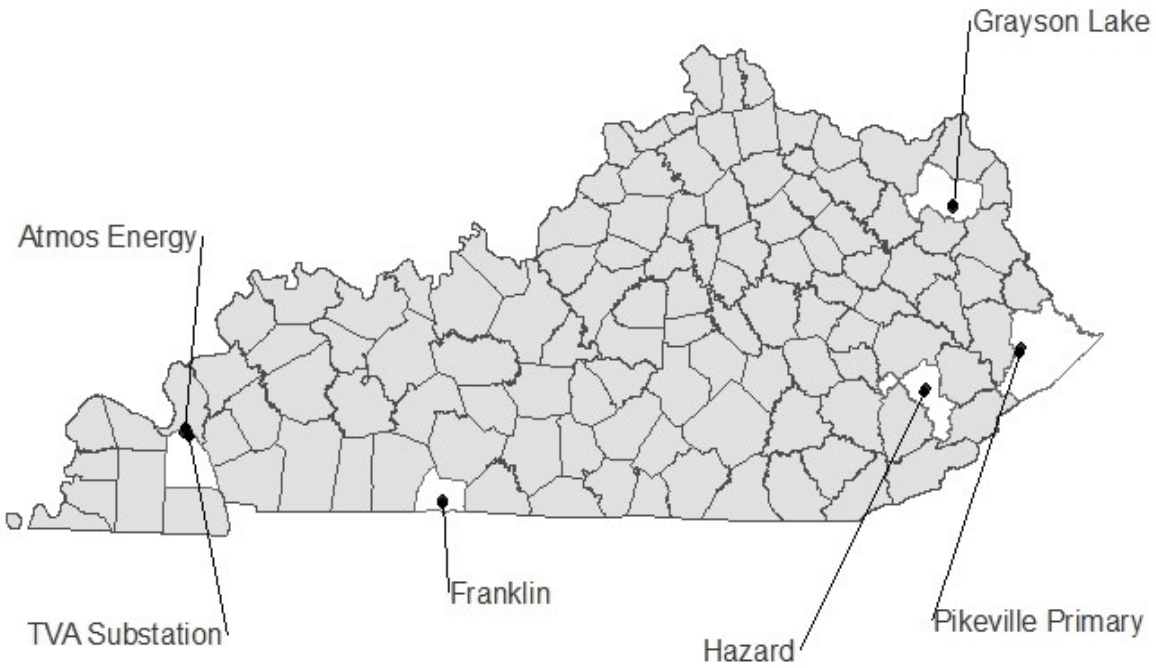
# Not in a Metropolitan or Micropolitan Statistical Area




| 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. | RadNet | Met |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-043-0500 Carter | 1486 Camp Webb Road Grayson | $1^{X}$ | | $2^{Cm}$ | | | | | | 1 | | $2^{D}$ | $2^{D}$ | 1 | | | | 1 |
| 21-157-0014 Marshall | Industrial Parkway Calvert City | | | | | | | | | | | $2^{C}$ | | | | | | |
| 21-193-0003 Perry | 354 Perry Park Road Hazard | 1 | $1^{t}$ | | | | | | | $1^{e}$ | | | | | | | | 1 |
| 21-195-0002 Pike | 109 Loraine Street Pikeville | 1 | $1^{ti}$ | | | | | | | $1^{i}$ | | | | | | | | |
| 21-213-0004 Simpson | 573 Harding Road Franklin | | | | | | | | | 1 | | | | | | | | 1 |
| **Totals** | **5** | **3** | **2** | **2** | | | | | | **4** | | **4** | **2** | **1** | | | | **3** |

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

D = Duplicate
C = Collocated
t = Continuous TEOM Monitor
m = PM10 Filter Analyzed for Metals
i = AQI Reported
X = Regional Background PM2.5 Monitor

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**CSA/MSA:** Not in a MSA - Rural
**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:** 38.23887, -82.98810 (NAD 83)
**Date Established:** May 13, 1983
**Inspection Date:** October 13, 2016
**Inspection By:** Jennifer F. Miller
**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 98 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:**

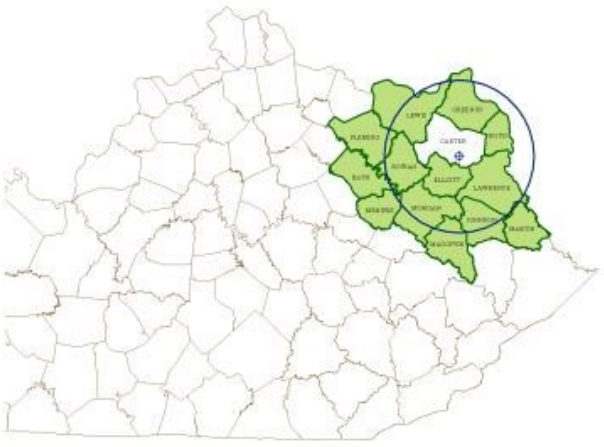
| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.7 | SPM | UV photometry | Continuously<br><br>March 1 – October 31 |
| FRM $PM_{10}$ | 2.2 | SLAMS | Gravimetric | 24-hours every sixth day |
| - Metals $PM_{10}$ | | NATTS SPM-Other | Determined from the $PM_{10}$ samples using EPA method IO 3.5 | Same as $PM_{10}$ |
| Collocated $PM_{10}$ | 2.2 | SLAMS | Gravimetric | 24-hours every twelfth day |
| - Collocated metals $PM_{10}$ | | NATTS SPM-Other | Determined from the $PM_{10}$ samples using EPA method IO 3.5 | 24-hours; six samples per year |

| | | | | |
|---|---|---|---|---|
| FRM $PM_{2.5}$ | 2.3 | SLAMS | Gravimetric | 24-hours every third day |
| Volatile Organic Compounds | 3.8 | NATTS SPM-Other | EPA method TO-15. | 24-hours every sixth day |
| - Duplicate Volatile Organic Compounds | | NATTS SPM-Other | EPA method TO-15. Collected via same sampling system as primary VOCs. | 24-hours; six samples per year |
| Polycyclic Aromatic Hydrocarbons | 2.1 | NATTS SPM-Other | EPA method TO-13A | 24-hours every sixth day |
| Carbonyls | 4.1 | 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 | 12.2 | Other | AQM grade instruments for wind speed, wind direction, relative humidity, and temperature | Continuously |

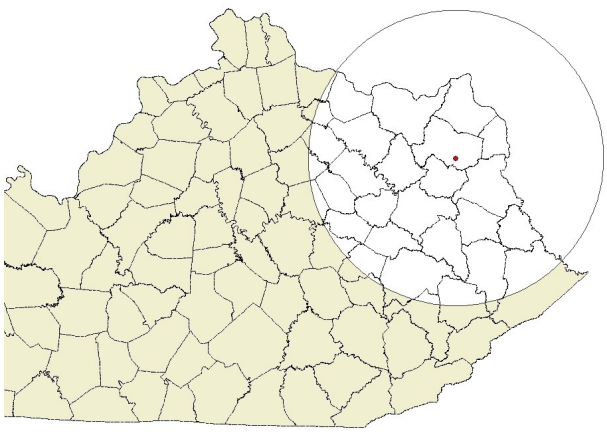
**Quality Assurance Status:**
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**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:** Not in a MSA - Rural
**401 KAR 50:020 Air Quality Control Region:** Paducah – Cairo Interstate (072)
**Site Name:** TVA Substation
**AQS Site ID:** 21-157-0014
**Location:** Plant Cutoff Road & Industrial Parkway, Calvert City, KY 42029
**County:** Marshall
**GPS Coordinates:** 37.04520, -88.33087 (NAD 83)
**Date Established:** January 1, 2005
**Inspection Date:** December 7, 2016
**Inspection By:** Ashley Bedel
**Site Approval Status**: Site and monitors meet all design criteria for the monitoring network.

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The monitoring site is located off Ballpark Road in Calvert City, Kentucky. The inlets are approximately 230 meters from the nearest road. Upon inspection, the sample inlets and monitors were found to be in good condition.

Due to expansion of the fenced-compound of the TVA electrical substation, the samplers were relocated in June 2013. The new location is approximately 20 meters northwest from the original location and is still along the fence-line of the compound.

**Monitoring Objective:**
The monitoring objectives are to detect and quantify air toxic pollutants.

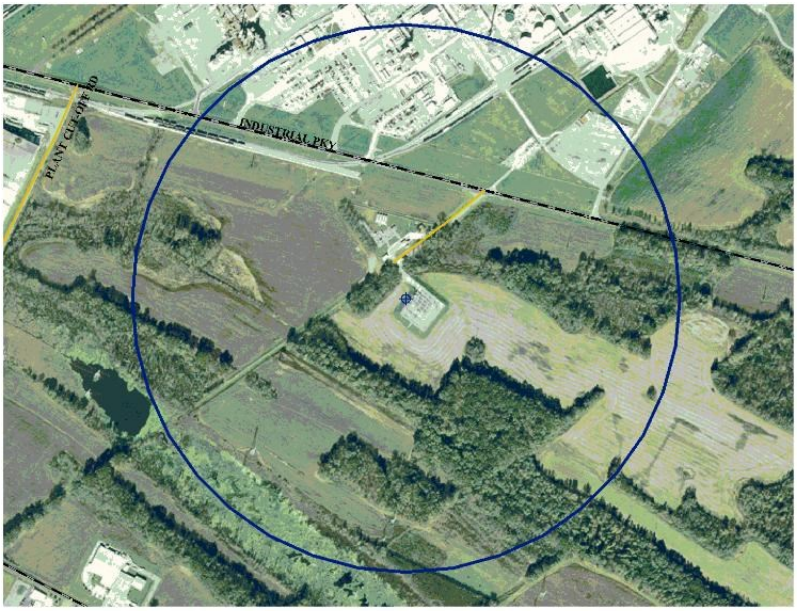
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| Volatile Organic Compounds | 2.1 | SPM-Other | EPA method TO-15 | 24-hours every sixth day |
| Collocated Volatile Organic Compounds | 2.0 | SPM-Other | EPA method TO-15 | 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 oriented exposure on a middle scale.

Middle 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:** 37.28329, -83.20932 (NAD 83)
**Date Established:** April 1, 2000
**Inspection Date:** November 16, 2016
**Inspection By:** Ashley Bedel
**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 33 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 C, D, E and G.

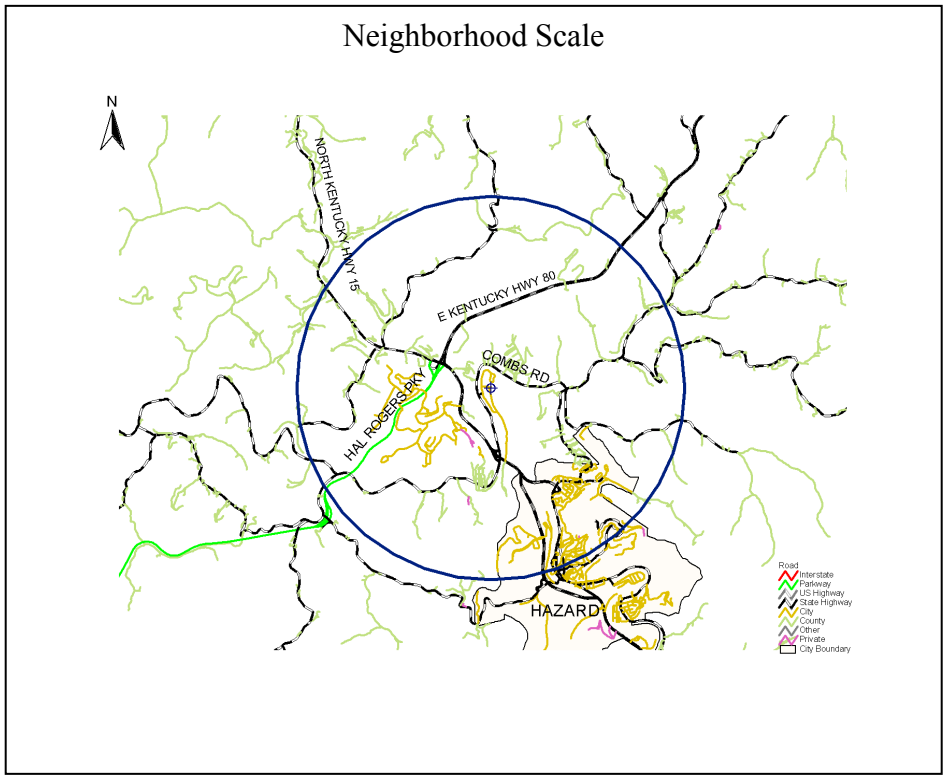
**Monitoring Objective:**
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards and to detect elevated pollutant levels for activation of emergency control procedures for ozone.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 4.6 | SPM<br>EPISODE | UV photometry | Continuously<br>March 1 – October 31 |
| FRM $PM_{2.5}$ | 3.2 | SPM | Gravimetric | 24-hours every sixth day |
| $PM_{2.5}$ TEOM | 5.3 | SPM | Tapered element oscillating microbalance, gravimetric | Continuously |
| Meteorological | 13.0 | Other | AQM grade instruments for wind speed, wind direction, relative 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:**
The site represents population exposure on a neighborhood 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:** 37.48260, -82.53532 (NAD 83)
**Date Established:** May 1, 1994
**Inspection Date:** November 17, 2016
**Inspection By:** Ashley Bedel
**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 88 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.

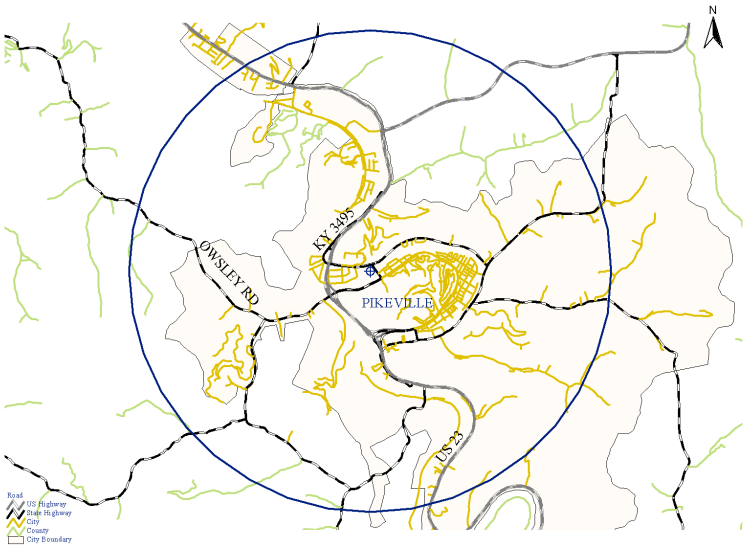
**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 3.7 | SPM<br>AQI | UV photometry | Continuously<br>March 1 – October 31 |
| FRM $PM_{2.5}$ | 4.7 | SLAMS | Gravimetric | 24-hours every third day |
| $PM_{2.5}$ TEOM | 4.7 | SPM<br>AQI | Tapered elemental oscillating microbalance, gravimetric | Continuously |

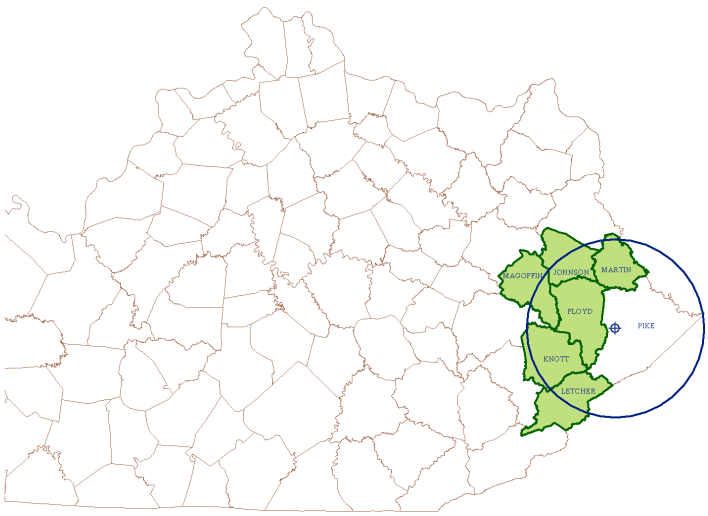
**Quality Assurance Status:**
All Quality Assurance procedures have been implemented in accordance with 40 CFR 58, Appendix A.

**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



**CSA/MSA:** Not in a MSA - Rural
**401 KAR 50:020 Air Quality Control Region:** South Central Kentucky Intrastate (105)
**Site Name:** Franklin
**AQS Site ID:** 21-213-0004
**Location:** KYTC Maintenance Facility, 573 Harding Road (KY1008), Franklin, KY 42134
**County:** Simpson
**GPS Coordinates:** 36.708607, -86.566284 (NAD 83)
**Date Established:** June 19, 1991
**Inspection Date:** October 26, 2016
**Inspection By:** Ashley Bedel
**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 39 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, E and G.

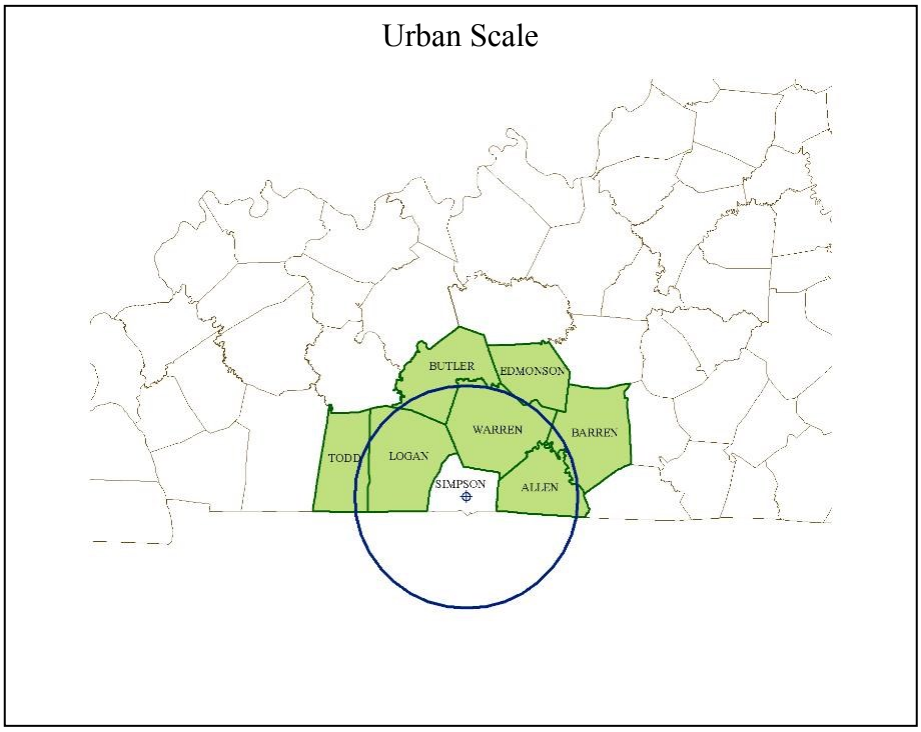
**Monitoring Objective:**
The monitoring objectives are to determine compliance with National Ambient Air Quality Standards; to measure ozone levels upwind of Bowling Green; and to provide data on interstate ozone transport.

**Monitors:**

| Monitor Type | Inlet Height (meters) | Designation | Analysis Method | Frequency of Sampling |
|---|---|---|---|---|
| AEM Ozone | 4.3 | SPM | UV photometry | Continuously<br>March 1 – October 31 |
| Meteorological | 7.5 | Other | AQM grade instruments for wind speed, wind direction, relative 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:**
The site represents population exposure on an urban scale.



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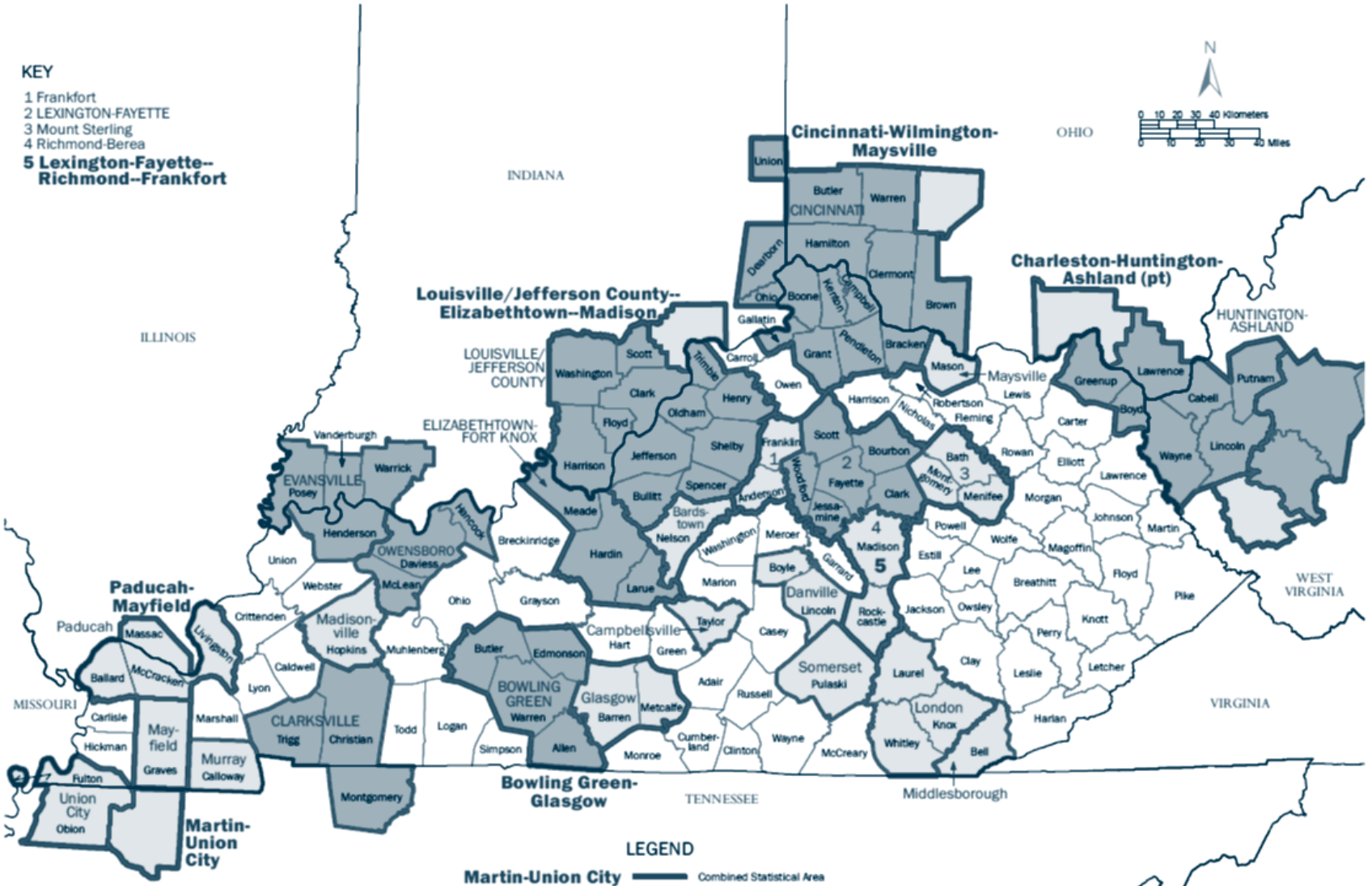
# APPENDIX A

## KENTUCKY CORE-BASED STATISTICAL AREAS AND COUNTIES MAP

# Kentucky - Core Based Statistical Areas (CBSAs) and Counties



# 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 | $O_3$ | $NO_x$/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/NO/NO2 | 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

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Division of Air Pollution Control
William R. Snodgrass TN Tower
312 Rosa L. Parks Ave., 15th Floor
Nashville, Tennessee 37243



July 1, 2014

Sean Alteri, Director
Kentucky Division for Air Quality
Kentucky Department for Environmental Protection
200 Fair Oaks Lane
Frankfort, KY 40601

Dear Mr. Alteri:

The United States Environmental Protection Agency (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 to 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, including continuous PM 2.5 as it applies to MSA areas where the population is sufficient to warrant monitoring for that pollutant. Tennessee and Kentucky share the Clarksville, TN-KY MSA, which is comprised of Trigg and Christian counties in Kentucky and Montgomery county in Tennessee. The US Census Bureau lists this area as containing a population in excess of 260,000.

| CBSA Code | Geographic area | Legal/statistical Area description | July 1, 2013 Estimate | 2010 Census |
|---|---|---|---|---|
| 17300 | Clarksville, TN-KY | Metropolitan Statistical Area | 272,579 | 260,625 |

The Tennessee Division of Air Pollution Control (TDAPC) currently operates one (1) PM 2.5 FRM monitor and one (1) continuous PM 2.5 monitor in this area. The TDAPC believes the operation of the existing PM 2.5 monitors; (FRM and continuous), are sufficient to properly characterize the particulate air quality in the entire Clarksville, TN-KY MSA and comply with the requirements for both population and concentration based monitoring identified in the revised monitoring regulations as found at 40 CFR58,AppD. The TDAPC would like to invite the

Kentucky Division for Air Quality to participate in Tennessee's annual ambient air monitoring network review. Tennessee commits to sharing with Kentucky any and all quality assured ambient air monitoring data collected in the Tennessee portion of the Clarksville, TN-KY MSA. Tennessee also will notify Kentucky in advance of the intent to relocate or shutdown any of the PM 2.5 monitors referenced above so that adequate monitoring arrangements can be made to meet the entire MSA monitoring requirements for PM 2.5.

Sincerely,

Barry R. Stephens, PE
Director, Air Pollution Control Division

BRS/lb
Cc: Heather McTeer-Toney, US EPA Region IV

Steven L. Beshear
Governor

Leonard K. Peters
Secretary

**Energy and Environment Cabinet**
**Department for Environmental Protection**
Division for Air Quality
200 Fair Oaks Lane, 1st Floor
Frankfort, Kentucky 40601-1403
Web site: air.ky.gov

May 15, 2015

Mr. Barry R. Stephens, PE
Director
Tennessee Division of Air Pollution Control
312 Rosa L. Parks Avenue, 15th Floor
Nashville, TN 37243

Dear Mr. Stephens:

In a letter from your office dated July 1, 2014, the Tennessee Division of Air Pollution Control (TDAPC) agreed to operate a continuous $PM_{2.5}$ monitor and an intermittent FRM $PM_{2.5}$ sampler, 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 (Division) appreciates TDAPC's cooperation and looks forward to participating in TDAPC's annual air monitoring network review.

The Division currently operates one (1) intermittent FRM $PM_{2.5}$ sampler and one (1) continuous ozone monitor at the Hopkinsville site (21-047-0006) in Christian County. 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 the most current population estimates from the US Census Bureau, as well as 2012-2014 ozone design values.

| Geographic Area | Area Description | 2014 USCB Population Estimate | 2014 Three-Year Ozone DV (ppm) |
|---|---|---|---|
| Christian County, KY | County | 74,250 | 0.067 |
| Trigg County, KY | County | 14,142 | 0.069 (CASTNET) |
| Montgomery County, TN | County | 189,961 | N/A |
| **Clarksville, TN-KY** | **MSA** | **278,353** | **0.069** |

To satisfy the regulatory requirement, the Division agrees to operate one ozone monitor at the Hopkinsville site. Also, the Division agrees to notify TDAPC in the event that shutdown or relocation of the ozone monitor is necessary.

Despite the fact that 2012-2014 design values show that no FRM $PM_{2.5}$ samplers are required in the Clarksville MSA, the Division will continue to operate the $PM_{2.5}$ sampler at

Hopkinsville. The Division also agrees to notify TDAPC in the event that the Hopkinsville FRM $PM_{2.5}$ sampler must be shutdown or relocated, as it is the design value monitor for the MSA.

The Division commits to sharing with TDAPC any and all quality-assured ambient monitoring data collected in the Kentucky portion of the Clarksville, TN-KY MSA. The Division also welcomes TDAPC participation in Kentucky's annual network review process. If you have any questions or concerns, please contact me at 502-564-3999.

Sincerely,

Sean Alteri,
Director

SA/jfm
c: -Heather McTeer Toney, USEPA Region IV
-Daniel Garver, USEPA Region IV

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# APPENDIX E

# LMAPCD
# AMBIENT AIR MONITORING
# NETWORK 2017

**Appendix E - Part A**
**LMAPCD Proposed Network Changes**

AIR POLLUTION CONTROL DISTRICT

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

May, 2017

## Table of Contents

## LMAPCD Proposed Network Changes – Overview

The Louisville Metro Air Pollution Control District (LMAPCD) is proposing several changes to the ambient monitoring network. Several of these changes are quite significant and involve either shutting down existing sites or establishing new sites. The most significant changes are summarized below. Greater detail about all proposed changes are provided in subsequent sections of this document.

- Close down Bates Elementary site and transfer Ozone and PM2.5 SPM monitors to a new site at Carrithers Middle School. It is anticipated that the construction of the new site at Carrithers Middle School and transfer of equipment from Bates to Carrithers would be complete by 9/1/2017. The justification and approval request for this site move was submitted to EPA prior to submittal of the 2017 network plan in an effort to expedite the network modification. The justification and approval request was available for public comment from 4/18/17 to 5/19/17.
- Close down Southwick Community Center site (pending EPA approval) and transfer PM and Meteorological monitors to the existing, but modified, Firearms Training Center site. Transfer of PM and meteorological equipment from Southwick to Firearms training will occur by 1/1/18, pending approval by EPA.
- Add a continuous Toxics monitor at the Firearms Training site and install a new shelter to house the proposed increase in instrumentation. Pending EPA approval of the Southwick site closure, the PM and meteorological instrumentation will be transferred from Southwick to Firearms Training. The construction of the new shelter is anticipated to be complete by 9/1/17. The toxics instrumentation will be installed shortly after completion of new shelter, with the instrumentation operational by 1/1/18.
- In cooperation with Kosmos Cement Company, establish a new site in the southwestern part of Jefferson County to monitor SO2 concentrations. It is proposed that this site be named 'Kosmosdale', the name of the neighborhood near where the site would be established. This site is being established to provide additional characterization of ambient air quality in the vicinity of the Jefferson County SO2 Nonattainment area located in the southwestern portion of Jefferson County. The site will be operated as a SLAMS Monitor and is intended to represent maximum concentrations of SO2 in the area. Kosmos Cement Company will be responsible for construction and purchase of instrumentation, with APCD staff being responsible for operation of instrumentation and collection, validation and certification of the data. An SO2 analyzer and an anemometer to measure wind speed and wind direction will operate at this site. It is anticipated that the Kosmosdale site will be fully operational by 1/1/18.

A summary of these site changes are provided in Figure 1.

## LMAPCD Proposed Network Changes (Continued)

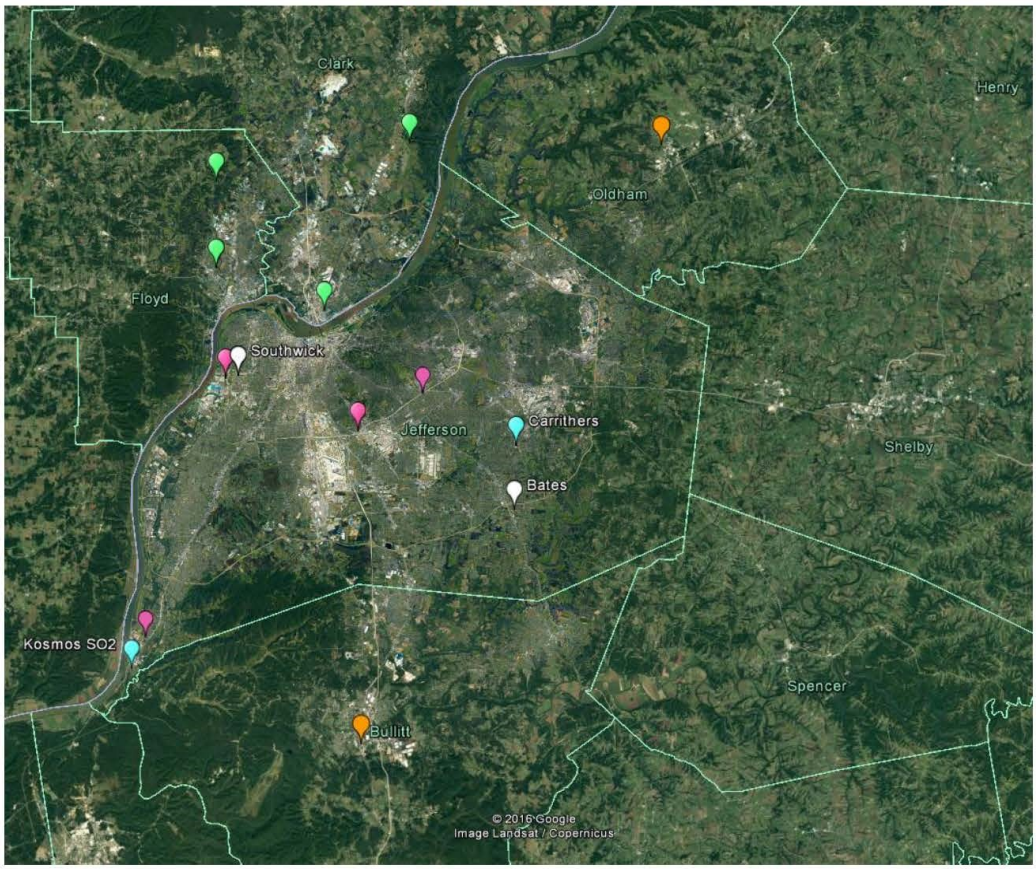


Figure 1 - Overview of proposed changes to LMAPCD's ambient monitoring network. Orange markers are KYDAQ sites. Green markers are IDEM sites. Pink markers are existing APCD sites. White markers are existing APCD sites that are proposed to be retired. Blue markers are proposed new LMAPCD sites.

In addition to the proposed site changes, APCD is also proposing to make the following modifications at existing sites.

Cannons Lane

- Terminate PbPM10 sampling – APCD submitted a request to EPA Region 4 on 12/30/2016 to discontinue PbPM10 sampling at the Cannons Lane NCore site. Per 40 CFR Part 58, PbPM10 sampling is no longer required at NCore sites. EPA Region 4 approved this request on 1/31/2017. Effective 1/1/2017, APCD is no longer monitoring for PbPM10.
- Terminate PM10 FRM sampling – The PM10 FRM sampler is no longer needed as PbPM10 sampling was terminated in January, 2017, per approval from EPA Region 4. The PMcoarse requirement at the Cannons Lane NCore station is being met with the PM10 / PM2.5 BAM pair

that is currently operating. It is anticipated that the discontinuation of the PM10 FRM would occur by 12/31/17.

Watson Lane

- Terminate PM2.5 FRM sampling – The PM2.5 FRM is not required due to the operation of the PM2.5 continuous BAM that has been in place for some time. Removal of the PM2.5 FRM sampler at Watson Lane will save APCD time, effort, and money as the FRM route will no longer require a weekly 60 minute round-trip drive to the Watson Lane site. The operation of a continuous PM2.5 FEM BAM will continue to provide PM2.5 data that are available to the public on an hourly basis. It is anticipated that the discontinuation of the PM2.5 FRM at Watson Lane would occur by 12/31/17.

Firearms Training

- Modification of Shelter – A new shelter will be installed at the Firearms Training site. This is being done due to the proposed expansion of instrumentation at this site, in addition to the fact that the existing shelter is not in good condition.
- Addition of Toxics Sampling – A continuous auto GC analyzer capable of measuring 17 toxics / VOC compounds will be installed. The analyzer will be installed upon completion of the new shelter.
- Addition of Continuous PM – Several continuous PM monitors will be installed upon completion of the new shelter.
    - PM2.5 BAM – A PM2.5 BAM will be installed as soon as practical upon completion of the new shelter. Quick installation will help aide in the evaluation of PM2.5 data comparability between the Southwick and Firearms Training sites to verify comparability before shutting down the Southwick site.
    - PM10 BAM – A PM10 BAM will be installed. Either a new instrument will be installed shortly after shelter completion or the Southwick PM10 BAM will be transferred to Firearms Training.
    - API T640 – The new API T640 will be installed at Firearms Training as a Special Purpose Monitor (SPM) to assess the functionality of this instrument. With collocated continuous PM and filter-based PM, this site would allow for a comparability analysis to be performed helping inform whether the API T640 may be used on a broader basis across the network in the future.
- Addition of Filter-based PM2.5 – Filter-based PM2.5 samplers will be installed. This will likely be the new collocated PM2.5 FRM site to replace the Southwick primary and collocated FRM samplers.
- Addition of meteorological sensors – Either new meteorological instruments will be installed after shelter completion or the existing equipment at Southwick will be transferred to Firearms Training.

## Southwick Closure & PM2.5 Evaluation

The LMAPCD is proposing to shut down the Southwick Community Center site and transfer all particulate and meteorology equipment to the Firearms Training site located 0.62 miles to the west / southwest. The Southwick site is the only remaining rooftop site in APCD's ambient monitoring network, and safety has been a concern for some time. In 2015, APCD put forth considerable effort to modify the Southwick site to re-locate all instrumentation from the rooftop to a ground shelter on the same grounds. However, an agreement could not be reached to allow for a shelter to be placed in the vicinity. Due to continued safety concerns, and an impending roof resurfacing project, APCD is proposing to shut down the Southwick Community Center site and transfer all PM and meteorological equipment to a newly modified Firearms Training site.

The Southwick Community Center site was established in 1983 and PM data are available in EPA's AQS database since 1998. The nearly 20 year record of PM data at this site allows for an assessment of trends in PM without influence of site modifications that could impact trends. Length of record for trends assessment is an important consideration when evaluating the usefulness of a site. An evaluation of historic trends in PM2.5 data is presented in Figure 2 and Figure 3. As can be seen, the Southwick PM2.5 data have shown some of the higher PM2.5 concentrations in the Louisville / Jefferson County MSA. This relationship is also shown in Table 1. Using the most recent three years of data (2014-2016), the Southwick site is tied for the second highest PM2.5 design value in the Louisville / Jefferson County MSA. While the Southwick site is officially listed as tied for the second highest PM2.5 design value in the MSA, it should be noted that due to differences in instrumentation, data comparability analyses indicate that the Southwick site would actually be third highest in the network[1].

[1] The Durrett Lane design value is comprised of FRM data only, while all other LMAPCD PM2.5 sites use both FRM and continuous PM2.5 data to calculate the design value. When only including FRM data, the Southwick 3-yr average is 9.6 µg/m3 compared to Durrett Lane's 10.4 µg/m3.

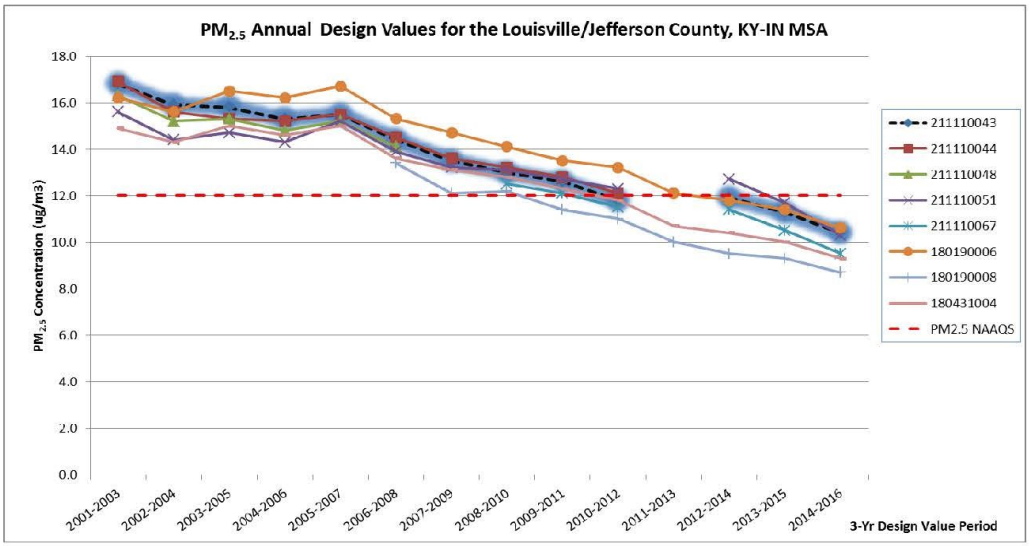


Figure 2 - Trends in PM2.5 Annual Design Values for the period 2001 - 2016. Southwick data represented by black, dashed line with blue shading.

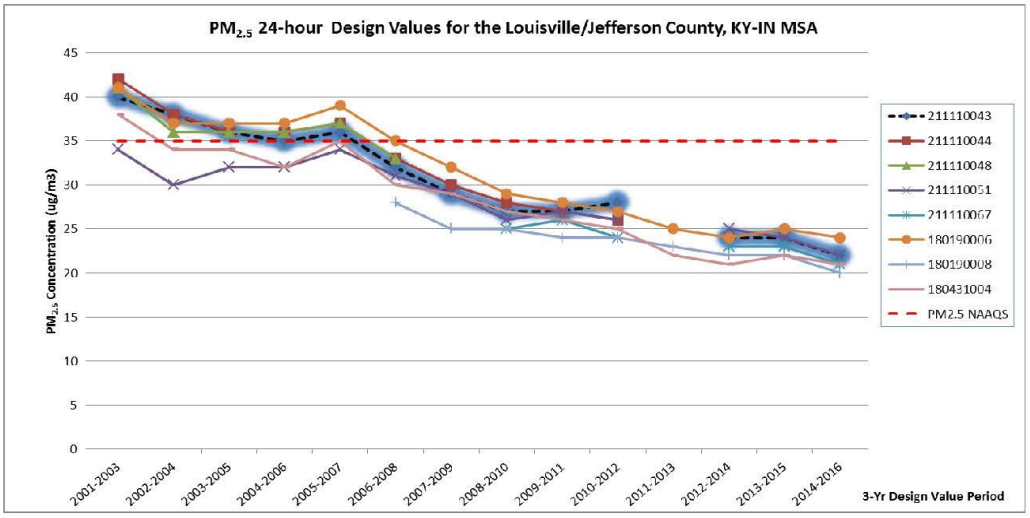


Figure 3 - Trends in PM2.5 24-hour Design Values for the period 2001 - 2016. Southwick data represented by black, dashed line with blue shading.

| Site Name | AQS Site ID | Annual Design Value (µg/m3) | 24-hr Design Value (µg/m3) |
|---|---|---|---|
| **Southwick** | 21-111-0043 | 10.4 | 22 |
| **Watson Lane** | 21-111-0051 | 10.3 | 22 |
| **Cannons Lane** | 21-111-0067 | 9.5 | 21 |
| **Durrett Lane**[1] | 21-111-0075 | 10.4 | 22 |
| **Jeffersonville / Walnut St** | 18-019-0006 | 10.6 | 24 |
| **Charlestown State Park** | 18-019-0008 | 8.7 | 20 |
| **Green Valley Elementary** | 18-043-1004 | 9.3 | 21 |

Table 1 - 2016 Design Values for all Louisville / Jefferson County MSA PM2.5 sites.

### Siting Evaluation

LMAPCD staff have determined that the relocation of the Southwick PM monitors to the Firearms Training site will not result in any relaxation of the PM2.5 monitoring network in Jefferson County, or the MSA. Given the close proximity of the two sites, LMAPCD believes the Firearms Training site will provide very comparable PM2.5 concentrations to the Southwick site. With Firearms Training being located closer to some of the industrial sources in the area, the PM2.5 concentrations may be slightly higher. Figure 4 shows a zoomed in view of the area surrounding the Southwick and Firearms Training sites. Figure 5 shows a wind rose for the Southwick Community Center site based on data collected from that site for the period 2015 – 2016. As can be seen from the wind rose, there are two frequency maximums; one from the south / southwest, and the other from the west / northwest. These predominant wind patterns are also shown in Figure 4. Based on the location of the industrial area and the predominant wind directions, similar pollutants would be expected to impact the Southwick and Firearms Training sites.

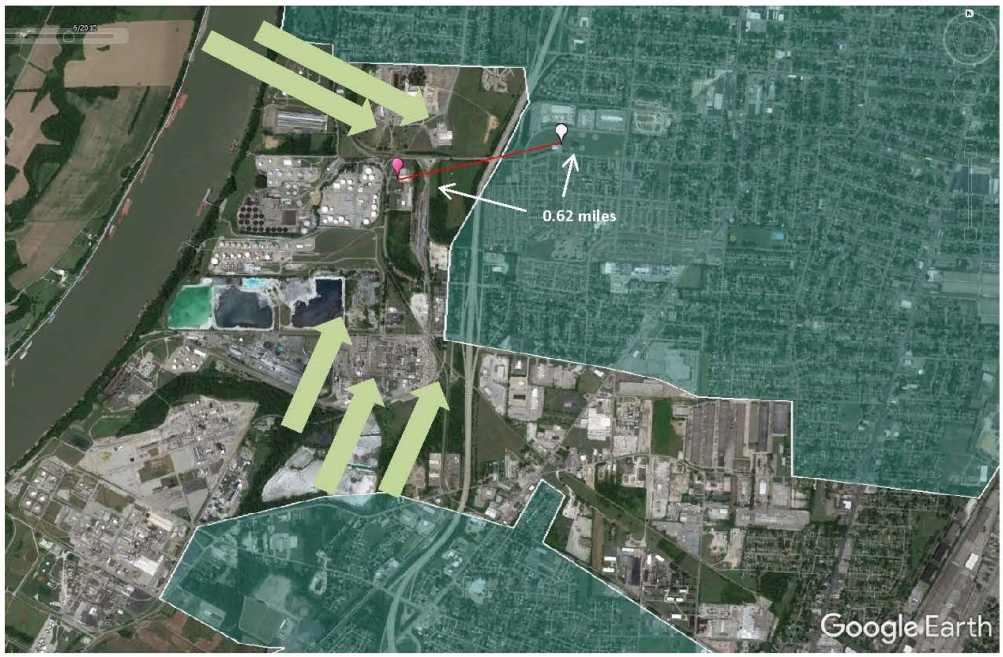


Figure 4 - Zoomed in view of the area in and around the Southwick (white) and Firearms Training (pink) sites. Shaded areas represent primarily residential areas. Large arrows show predominant wind flow.

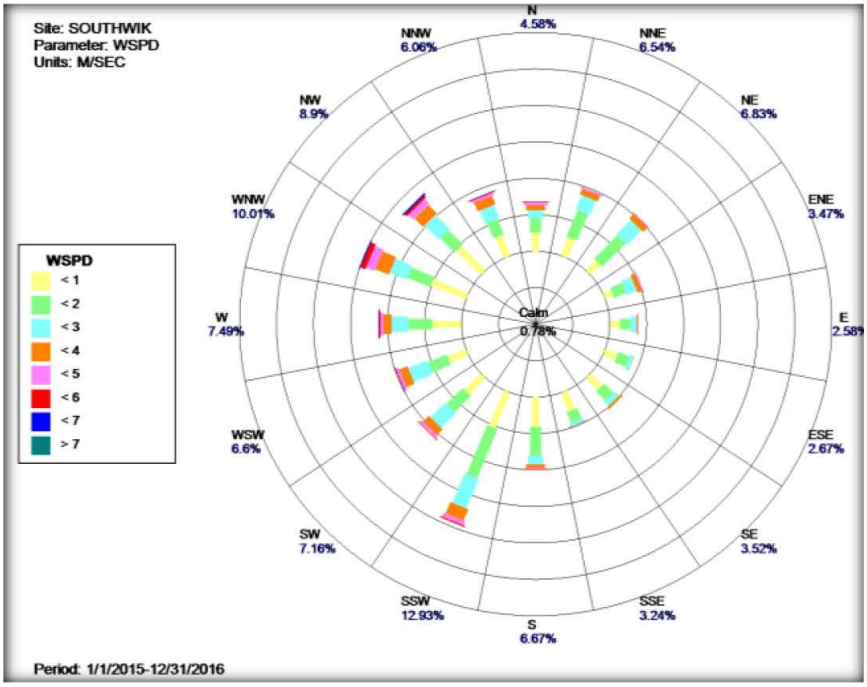


Figure 5 - Wind rose for the Southwick Community Center site. Prevailing winds are out of the south / southwest, with a secondary frequency maxima from the west / northwesterly direction.

## Southwick & Firearms Training PM2.5 Data Comparability

Historical records were reviewed and it was found that there was an approximate three month period in 2001 when PM2.5 data were collected at both Southwick and Firearms Training sites. This is the only period on record that had coincident PM2.5 data collection at the two sites. While the monitoring occurred nearly 15 years ago, and while not a lengthy record, the data do provide an opportunity to compare PM2.5 concentrations from the two sites. Figure 6 and Table 2 provide summaries of these data. As can be seen, the PM2.5 concentrations from the two sites compare very well. These data provide further evidence that the pollutant concentrations at the two sites are very similar, with the Firearms Training site showing very slightly higher concentrations. While the magnitude of the concentrations have likely decreased substantially (as evidenced by Figure 2 and Figure 3), the co-variability of the concentrations at the two sites have likely not changed. To verify however, APCD does plan to install PM2.5 monitors at the Firearms Training site before removing the PM2.5 monitors at Southwick to verify that a similar relationship still applies today.

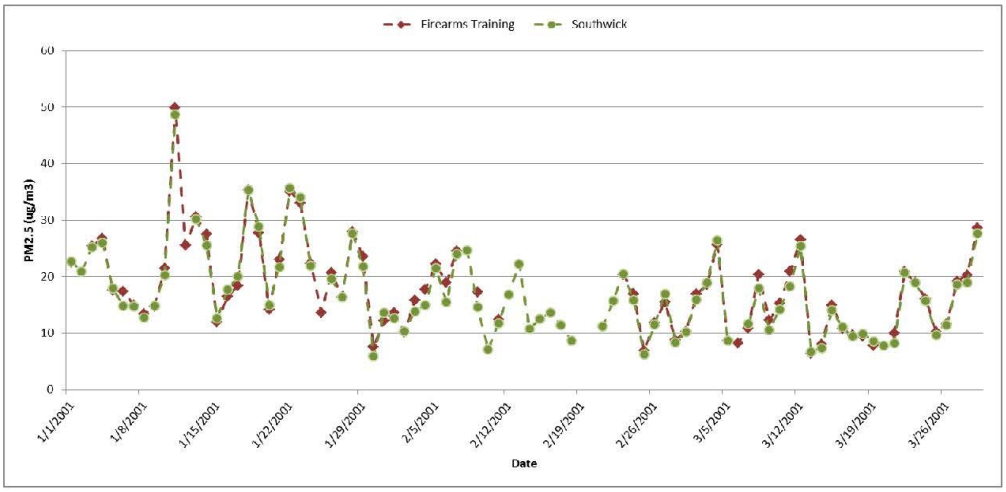


Figure 6 – Daily PM2.5 concentrations at Southwick and Firearms Training for the period 1/1/2001 - 3/29/2001.

| | Firearms Training | Southwick |
|---|---|---|
| **Average** | 18.2 µg/m3 | 17.7 µg/m3 |
| **Maximum** | 49.9 µg/m3 | 48.7 µg/m3 |
| **Minimum** | 6.4 µg/m3 | 5.9 µg/m3 |
| **Median** | 17.2 µg/m3 | 15.9 µg/m3 |
| **Count** | 70 | 70 |

Table 2 - PM2.5 summary statistics for the period 1/1/2001 - 3/29/2001

## Firearms Training Site Modification

As discussed above, it is proposed that the Firearms Training site will undergo a significant modification to allow for the addition of several air quality instruments. Currently, the only monitor located at Firearms Training is an SO2 analyzer. Due to the condition of the current shelter, coupled with the expansion of air quality instrumentation at the site, a new shelter will be installed at the Firearms Training site. The shelter will be larger than the current shelter so that it can house the new equipment. As discussed above, pending EPA approval of the Southwick site closure, the PM and meteorological instrumentation from Southwick will be transferred to the Firearms Training site. The table below provides a summary of the instrumentation that is proposed to be located at Firearms Training.

| Parameter / Pollutant | Instrumentation | Anticipated Installation Date | Anticipated Operational Date |
|---|---|---|---|
| SO2 | API T100 | Current | Current |
| PM10 Continuous | BAM 1020 | 12/2017 | 1/1/2018 |
| PM25 Continuous | BAM 1020 | 9/2017 | 9/2017 |
| PM25 Continuous (SPM) | API T640 | 9/2017 | 1/1/2018 |
| PM2.5 FRM Prim | Thermo 2025i | 12/2017 | 1/1/2018 |
| PM2.5 FRM Coll | Thermo 2025i or 2025b | 12/2017 | 1/1/2018 |
| Temp / RH | RM Young 41372VC | 9/2017 | 1/1/2018 |
| Wind Speed & Dir | RM Young Ultrasonic 8500 | 9/2017 | 1/1/2018 |
| Barometric Pressure | RM Young BP 61302V | 12/2017 | 1/1/2018 |
| Toxics Cont (C2-C6) | Chromatotec Auto GC866 | 9/2017 | 1/1/2018 |
| Toxics Cont (C6-C12) | Chromatotec Auto GC866 | 9/2017 | 1/1/2018 |

Table 3 - Proposed instrumentation at Firearms Training site

### Firearms Training Siting Evaluation

Prior annual siting evaluations have identified some minor concerns relating to the proximity of trees to the site. To alleviate these concerns, LMAPCD had previously re-arranged the SO2 probe inlet at Firearms Training to maximize the distance from probe to tree canopy drip lines. Due to the proposed increase in instrumentation at this site, further consideration should be given to the potential impact of siting requirements on multiple probes / inlets. As such, a detailed site evaluation was performed to assess the probe and monitoring path siting criteria laid out 40 CFR Part 58 Appendix E. An illustration of this site evaluation is presented in Figure 7. The greatest area of concern regarding siting of the Firearms Training site is obstructions (trees) located to the south of the site. While the building to the east is approximately 15 meters away, the trees to the south are approximately 6 and 10 meters away. The measurements taken were conservative as the edge of the concrete foundation was used as a starting point. This was done since a larger shelter will be installed. The siting evaluation shows that distance from probes to tree canopy drip lines may still be a concern when adding additional instrumentation. With several PM instruments likely being installed on the roof of the shelter, the required minimum separation of 1 meter between all samplers requires that the instruments be spread out on the rooftop, potentially utilizing all corners of the shelter. LMACPD is aware of this potential issue, and will find a resolution to ensure that the locations of probes / inlets will be at least 10 meters from tree canopy drip lines.

Spacing from nearest roadways was also evaluated as part of the siting evaluation. The nearest roadway (Algonquin Parkway) is located approximately 48 meters to the west / southwest. The traffic counts for this roadway have ranged from 3,000 – 5,000 over the last few years. Based on these traffic counts, the distance from roadways is well within specifications for neighborhood scale sites / monitors.

While there are some siting challenges facing the Firearms Training site when considering additional instrumentation, LMAPCD is confident that a resolution can be found by either adequately spacing the instrumentation at the site or by modifying the landscaping around the site.


Figure 7 - Aerial view of the Firearms Training site (blue circle). Distances from obstructions or roadways are provided.

## Kosmosdale Site

Through various efforts to characterize ambient air quality concentrations in and around the Jefferson County SO2 Nonattainment area over the last several years, it has been determined that additional ambient monitoring may be needed to more accurately characterize the ambient air quality. While the Watson Lane site has historically been the site that represents maximum SO2 concentrations in the area, more recent modeling has revealed another potential maximum SO2 concentration location to the south of the existing nonattainment area. As such, LMAPCD has entered an Agreed Board Order with Kosmos Cement Company to establish a site to monitor ambient SO2 concentrations. The site location was selected based on air quality dispersion modeling. The details of that modeling can be found in the LMAPCD document titled *'Preliminary SO2 Monitor Siting Evaluation for Kosmos Cement Company Monitoring Plan'*. An overview of that document focusing on the siting location of the new site is included in this document. Figure 8 provides an illustration of the location of the new site, relative to the other significant features in the area. Figure 9 provides a zoomed in view of the proposed site location. The proposed site location is outside of the fence line of the facility, but located on land that is owned by Kosmos Cement Company. Kosmos Cement has agreed to provide the funding for the site and instrumentation, while APCD will operate the instruments and be fully responsible for collecting, validating, and certifying the data collected at the site. The site will include a continuous SO2 analyzer

and meteorological equipment. The site will be a SLAMS site with the purpose of determining compliance with the SO2 NAAQS. The siting of the instruments / probes, and the operation of the instrumentation will meet all monitoring and quality assurance requirements prescribed in 40 CFR Part 58.

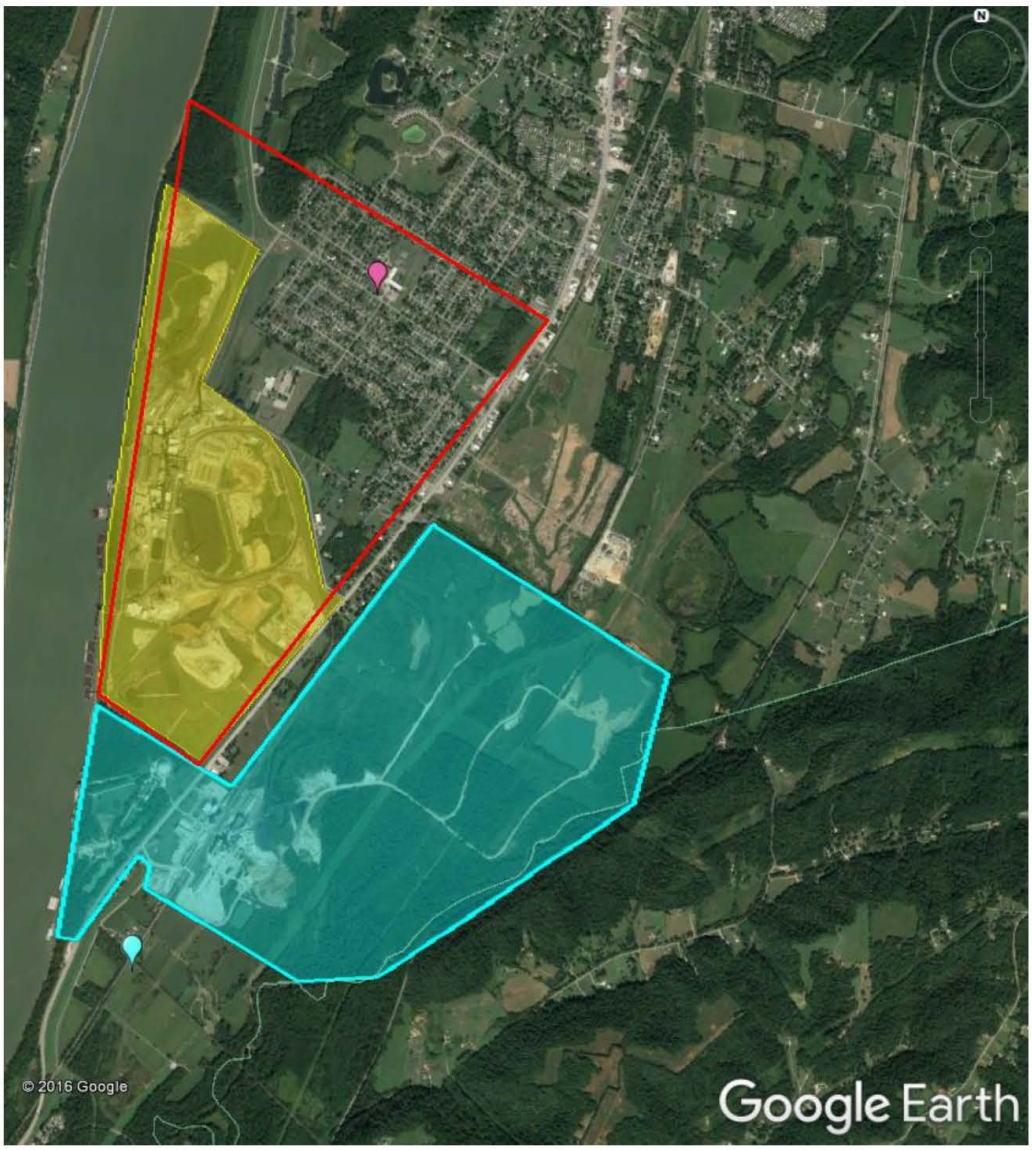


Figure 8 - Aerial image of southwestern Jefferson County showing the Watson Lane site (pink marker), the LG&E Mill Creek facility (yellow shaded area), the Kosmos Cement Company facility (blue shaded area), the Southwest Jefferson County Nonattainment Area (red outline), and the newly proposed ambient monitoring site (blue marker).


Figure 9 - Zoomed in view of the approximate area where the new APCD site may be located.

As can be seen in Figure 9, the area where the proposed site would likely be established is comprised of primarily open farm land, with some forested areas interspersed. The point specified by the blue marker in Figure 9 represents an area that contained the highest modeled SO2 concentrations. While this area may be most limited due to nearby obstructions, this area was focused on for siting evaluation as it may represent a worst case scenario. The distance to nearby trees (blue and yellow lines segments) and the nearby railroad (red line segment) appear to be the most restricting items. Despite those obstructions, it can be seen that the distance from those obstructions are still greater than the minimum distances prescribed in Appendix E of 40 CFR Part 58. Furthermore, the nearest roadway, Dixie

Highway, has an Average Daily Traffic count[2] ranging from 20,700 to 24,400, but is approximately 300 meters from the potential site location. Again, this is well within specifications of the siting requirements in Appendix E. While additional logistics and details remain, the area in question will be suitable for an ambient air quality monitoring station. Using the location of the blue marker in Figure 9, the new site information for the Kosmosdale site can be found in Table 4. If the information needs to be modified after final logistics and details are determined, the information will be updated.

| | |
|---|---|
| **CSA/MSA:** | Louisville / Jefferson County, KY-IN |
| **Site Name:** | Kosmosdale |
| **AQS Site ID:** | 21-111-0065 (proposed) |
| **Address:** | 15501R Dixie Hwy, Louisville, KY 40272 |
| **County:** | Jefferson County |
| **GPS Coordinates:** | 38° 01' 46.61" N; 85° 54' 41.22" W |
| **Elevation** | 438 ft (133.5 meters) |
| **Date Established:** | 1/1/2018 (proposed) |

Table 4 - Site information for new Kosmosdale ambient air monitoring station.

## Closure of Bates Elementary Site & Establishment of Carrithers Middle School Site

Due to Jefferson County Public School (JCPS) plans for significant modification to the Bates Elementary property, the area will no longer be suitable for ambient air quality monitoring. LMAPCD has prepared documentation requesting EPA approval for terminating the Bates Elementary site and transferring equipment to a new site at Carrithers Middle School. This documentation was made available for public comment from 4/18/17 to 5/19/17. The new site information for Carrithers Middle School can be found in Table 5. Aerial images of the new site and the spatial relation between Bates Elementary and Carrithers Middle School can be seen in Figure 10 and Figure 11. Details of the proposed transfer of equipment from Bates Elementary to Carrithers Middle School can be found in the document titled *'Proposed Relocation of the Bates Elementary School Ambient Monitoring Site'*. Based on the siting evaluation, LMAPCD has determined that Carrithers Middle School will be a suitable location for transfer of the Bates Ozone and PM2.5 SPM instrumentation.

| | |
|---|---|
| **CSA/MSA:** | Louisville / Jefferson County, KY-IN |
| **Site Name:** | Carrithers Middle School |
| **AQS Site ID:** | 21-111-0080 (proposed) |
| **Address:** | 4320 Billtown Rd, Louisville, KY 40299 |
| **County:** | Jefferson County |
| **GPS Coordinates:** | 38° 10' 57.04" N; 85° 34' 27.76" W |
| **Elevation** | 713 ft (217.3 meters) |
| **Date Established:** | 9/1/2017 (proposed) |

Table 5 - Site information for proposed ambient air quality site at Carrithers Middle School

[2] Source: Kentuckiana Regional Planning and Development Agency - http://www.kipda.org/Transportation/TrafficCounts/

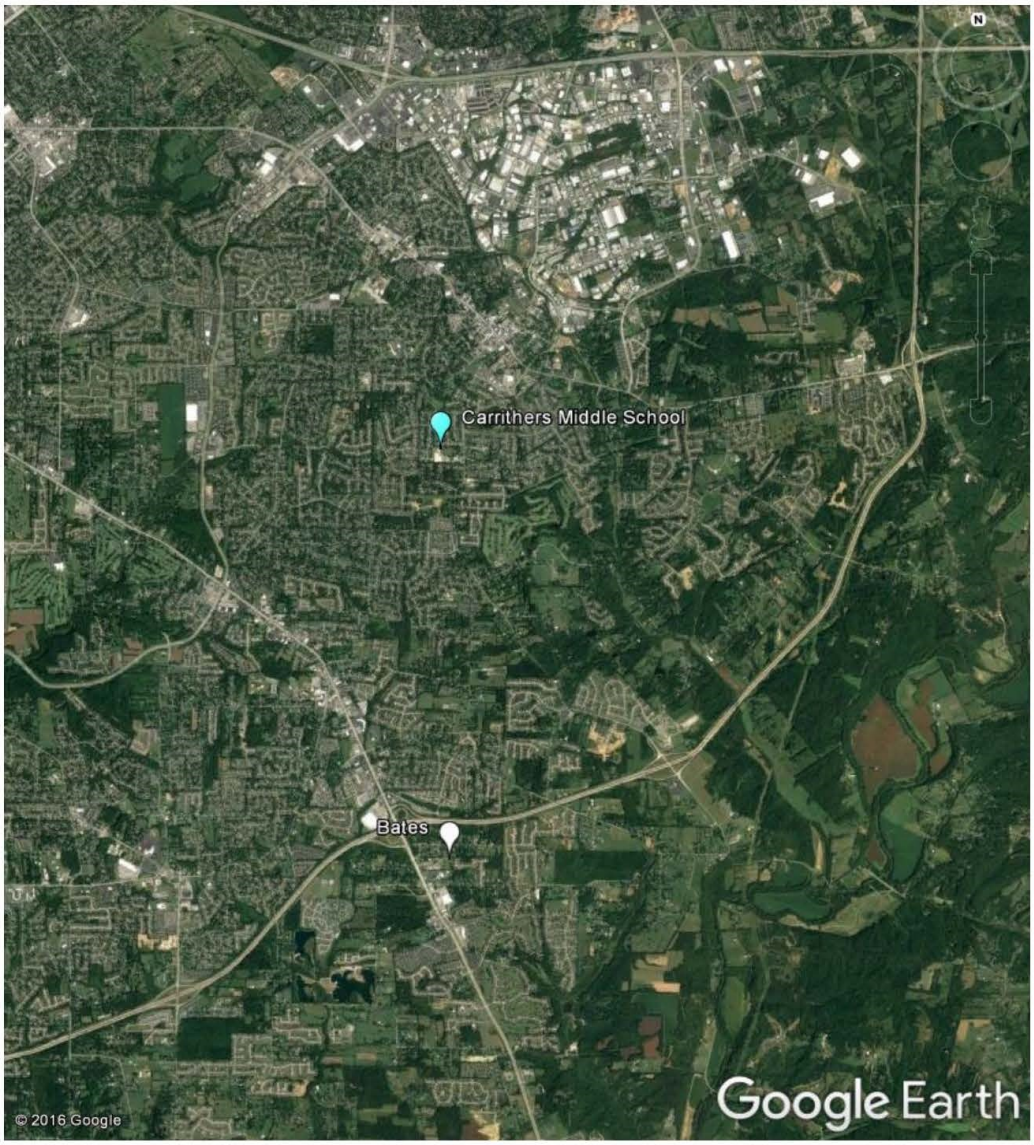


Figure 10 - Location of Carrithers Middle School in relation to Bates Elementary. Carrithers is located approximately 3 miles to the north of Bates.

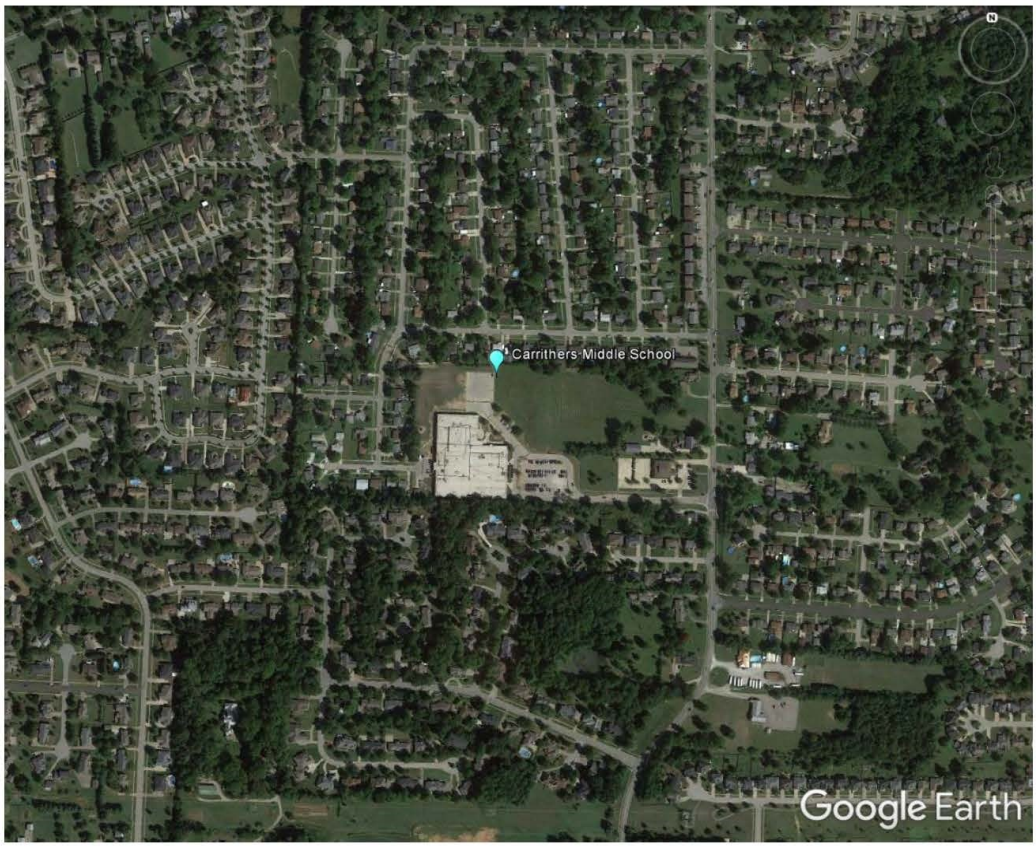


Figure 11 - Zoomed in view of proposed ambient air quality site at Carrithers Middle School.

## Photochemical Assessment Monitoring Stations

Per EPA monitoring requirements, APCD will be required to operate Photochemical Assessment Monitoring Station (PAMS) instrumentation at the Cannons Lane NCore site by 6/1/2019. APCD has volunteered to be a second round 'early adopter' of the PAMS program, therefore, it is likely that instrumentation may become operational earlier than the 6/1/2019 deadline. The exact schedule for instrumentation deployment is not known at this time, but will be updated in the 2018 Network Plan. A summary of the upcoming changes are presented for informational purposes.

- Installation of a continuous Auto GC analyzer for measuring VOCs and other ozone precursor compounds
- Installation of a ceilometer to measure some meteorological parameters such as mixing heights
- Installation of a second pyranometer to measure Ultra Violet radiation. APCD already monitors for total solar radiation.

- Installation of a barometric pressure sensor to measure atmospheric pressure
- Installation of instrumentation to measure carbonyls (method TBD).
- Installation of a direct NO2 monitor. The direct NO2 monitor will likely replace the existing NOx analyzer.

APCD staff is in the process of determining whether the required PAMS instrumentation will necessitate an upgrade to the Cannons Lane NCore site / shelter.

## LMAPCD Ambient Monitoring Network Change Summary

Table 6 provides a summary of all of the proposed changes to APCD's ambient monitoring network. The items shaded in green represent an addition to the network, while the items shaded in red represent a removal from the network.

| Site Name | AQS ID | Pollutant | Make / Model | Action | Effective Date | Comment |
|---|---|---|---|---|---|---|
| Bates Elementary | 21-111-0027 | Ozone | API T400 | Transfer / Terminate | 9/1/17 | Transfer to Carrithers Middle School |
| Bates Elementary | 21-111-0027 | PM2.5 SPM | MetOne BAM 1020 w/ SCC | Transfer / Terminate | 9/1/17 | Transfer to Carrithers Middle School |
| Carrithers Middle School | 21-111-xxxx | Ozone | API T400 | New Site / Transfer | 9/1/17 | Instrument transferred from Bates Elementary |
| Carrithers Middle School | 21-111-xxxx | PM2.5 SPM | MetOne BAM 1020 w/ SCC | New Site / Transfer | 9/1/17 | Instrument transferred from Bates Elementary |
| Cannons Lane | 21-111-0067 | PM10 FRM | Thermo 2025i | Terminate | 1/1/2018 | |
| Cannons Lane | 21-111-0067 | PbPM10 | Thermo 2025i | Terminate | 1/1/2017 | EPA approval 1/31/2017 |
| Cannons Lane | 21-111-0067 | PMcoarse FRM | Thermo 2025i | Terminate | 1/1/2018 | |
| Southwick | 21-111-0043 | PM10 Cont | MetOne BAM 1020 | Transfer / Terminate | 1/1/2018 | Transfer to Firearms Training |
| Southwick | 21-111-0043 | PM2.5 Cont | MetOne BAM 1020 | Transfer / Terminate | 1/1/2018 | Transfer to Firearms Training |
| Southwick | 21-111-0043 | PM2.5 FRM Prim | Thermo 2025b | Transfer / Terminate | 1/1/2018 | Transfer to Firearms Training |
| Southwick | 21-111-0043 | PM2.5 FRM Collocated | Thermo 2025b | Transfer / Terminate | 1/1/2018 | Transfer to Firearms Training |
| Southwick | 21-111-0043 | Meteorological | Various | Transfer / Terminate | 1/1/2018 | Transfer to Firearms Training |
| Firearms Training | 21-111-1041 | PM10 Cont | MetOne BAM 1020 | Transfer / New Site | 1/1/2018 | Transfer from Southwick |
| Firearms Training | 21-111-1041 | PM2.5 Cont | MetOne BAM 1020 | Transfer / New Site | 1/1/2018 | Transfer from Southwick |
| Firearms Training | 21-111-1041 | PM2.5 FRM Prim | Thermo 2025b | Transfer / New Site | 1/1/2018 | Transfer from Southwick |
| Firearms Training | 21-111-1041 | PM2.5 FRM Collocated | Thermo 2025b | Transfer / New Site | 1/1/2018 | Transfer from Southwick |
| Firearms Training | 21-111-1041 | Meteorology | Various | Transfer / New Site | 1/1/2018 | Transfer from Southwick |
| Firearms Training | 21-111-1041 | Toxics | Chromatotec Auto GC866 | New Instrument | 1/1/2018 | New Instrument |
| Watson Lane | 21-111-0051 | PM2.5 FRM | Thermo 2025b | Terminate | 1/1/2018 | |
| Kosmosdale | 21-111-xxxx | SO2 | API T400 | New Site / Instrument | 1/1/2018 | |
| Kosmosdale | 21-111-xxxx | Meteorology | Various | New Site / Instrument | 1/1/2018 | |

Table 6 - Summary of all proposed instrumentation changes to the LMAPCD ambient monitoring network.

## Conclusion

The proposed APCD Ambient Monitoring network changes result in no reductions in the number of available criteria pollutant monitors throughout the MSA. Redundancies were eliminated with the removal of some instrumentation. As an example, instead of two PM10 and two PMcoarse monitors at CLAMS, there will now be one of each. Likewise, instead of two PM2.5 instruments at Watson Lane, there will now be one. Two significant 'instrumentation transfers' are being proposed. One involves transferring instrumentation from Bates Elementary to Carrithers Middle School and the other involves transferring instrumentation from Southwick Community Center to Firearms Training. Both of these 'transfers' involve a 'one-to-one' transfer of equipment and result in no net gain or loss of instrumentation.

Two 'enhancements' to the monitoring network are being proposed. The number of SO2 monitors will increase by one with the addition of the Kosmosdale site in southwestern Jefferson County. The other additional enhancement to the LMAPCD network is the installation of a Toxics monitor at Firearms Training. This addition may be the most significant change to the network as LMAPCD staff will now take on the task of operating instrumentation and a group of pollutants / compounds that are not regulatory required.

| Louisville / Jefferson County MSA Monitoring Requirements | | | | | | | |
|---|---|---|---|---|---|---|---|
| | $O_3$ | $PM_{2.5}$ | $PM_{10}$ | $SO_2$ | $NO_2$ | CO | Toxics |
| **# Sites Required by CFR** | 2 | 3 | 2-4 | 1 | 2 | 2 | 0 |
| **# Sites Before proposed Changes** | 7 (3) | 6 (4) | 3 (2) | 4 (3) | 2 (2) | 2 (2) | 0 (0) |
| **# Sites After proposed Changes** | 7 (3) | 6 (4) | 3 (2) | 5 (4) | 2 (2) | 2 (2) | 1 (1) |

Table 7 - Summary of monitoring requirements in Louisville / Jefferson County MSA compared to number of monitors / sites before and after network changes. Numbers in parenthesis represents number of sites that APCD operates (versus total number in MSA).

# Appendix E - Part B
# LMAPCD Preliminary $SO_2$ Siting Evaluation for Kosmos Cement Company



**Contents**

## 1. INTRODUCTION

### *a. Background*

On August 5, 2013, the United States Environmental Protection Agency (U.S. EPA) designated a portion of the southwestern Louisville Metro area roughly bounded by Ethan Allen Way, Dixie Highway, the southern boundary of the Louisville Gas & Electric Company (LG&E) Mill Creek Electric Generating Station (Mill Creek) property, and the Ohio River as nonattainment for the 2010 1-hour Primary $SO_2$ National Ambient Air Quality Standard (NAAQS) of 75 parts per billion (ppb), effective October 4, 2013. *Air Quality Designations for the 2010 Sulfur Dioxide ($SO_2$) Primary National Ambient Air Quality Standard,* 78 Fed. Reg. 47191 at 47200 (August 5, 2013) (codified at 40 CFR 81.318).

Mill Creek is the sole source of $SO_2$ emissions within the nonattainment area described above. LG&E recently completed substantial improvements to the air pollution control equipment at Mill Creek. The Kentucky Division for Air Quality (DAQ) and the Louisville Metro Air Pollution Control District (District) conducted modeling of Mill Creek in accordance with the *Guidance for 1-Hour $SO_2$ Nonattainment Area SIP Submissions* Memorandum from Stephen D. Page, Director, Office of Air Quality Planning and Standards, U.S. EPA to Regional Air Division Directors, Regions 1-10 (April 23, 2014), that, with the improvements, did not predict emissions in excess of the 1-hour $SO_2$ NAAQS. All other sources impacting the nonattainment area were modeled and accounted for in background ambient monitoring data. A 1-Hour $SO_2$ Plan for the Louisville/Jefferson County, Kentucky nonattainment area, which further discusses this modeling, has been proposed to address emissions from Mill Creek and demonstrate that the area will timely attain the 1-hour $SO_2$ NAAQS.

District Regulation 3.01, *Ambient Air Quality Standards*, Section 4 prohibits the emission of any air contaminant at levels or in such a ways as would interfere with the maintenance of an ambient air quality standard. As a result of earlier modeling of the Kosmos Cement Company (Kosmos) by DAQ and the District, which was conducted in accordance with *Guidance for 1-Hour $SO_2$ Nonattainment Area SIP Submissions*, the District has determined it is necessary to conduct ambient air quality monitoring to better characterize the ambient concentrations of $SO_2$ in the vicinity of the facility and determine whether those $SO_2$ emissions violate the $SO_2$ NAAQS outside the nonattainment area. The District has therefore entered into an Agreed Board Order (ABO) with Kosmos, whereby Kosmos is required to provide a siting and operation costs agreement to the District by June 1, 2017, for a monitor to begin operation by January 1, 2018. Costs for the monitor and related equipment are to be paid by Kosmos, and the monitor is to be operated by the District. The ambient air quality monitoring will be in accordance with 40 CFR Part 58 and U.S. EPA's non-binding technical assistance document titled, "$SO_2$ NAAQS Designations Source-Oriented Monitoring Technical Assistance Document," U.S. EPA Office of Air and Radiation Office of Air Quality Planning and Standards Air Quality Assessment

Division, February 2016 (Monitoring TAD) as appropriate and in the professional judgment of the District.

*b. Facility Description & Location*

The Kosmos facility is a cement kiln and associated processes, (including barge unloading and transfer, limestone handling, raw material crushing, limestone storage/reclaim, silos, raw mills, kiln feed system, preheater, kiln bypass system, coal handling, coal mill system, clinker cooler, clinker handling and storage, finishing mills, lime slurry system, gasoline dispensing facility, rail/barge loading, truck loading, and cold solvents cleaner) in far southwestern Louisville Metro/Jefferson County, Kentucky. The facility is located at 15301 Dixie Highway, and is roughly bounded by Dixie Highway and a parallel railroad to the west/northwest, farmland/wooded area and light industry (tire recycling) to the north/northeast, and farmland and wooded area to the east and south/southwest. The LG&E Mill Creek facility is across Dixie Hwy to the north/northwest of the Kosmos facility, as is the nonattainment area described above. A portion of the facility, associated with barge loading/unloading and raw materials storage is located across Dixie Hwy from the primary facility, to the south/southwest of the Mill Creek facility. *See Fig. 1* – Location of Kosmos Cement Company (next page - Kosmos' Property is highlighted in blue, the LG&E Mill Creek facility in yellow, the nonattainment area is outlined in red, and the Watson Lane monitor is at the red marker).


*Figure 1* – Location of Kosmos Cement Company

c. *Approach For Monitoring Siting Evaluation*

This siting evaluation report is presented to provide clarification on the rationale and objective of the new ambient $SO_2$ monitoring station, including the location of the new site, the methodology that was followed to make the location selection, and to confirm that a single monitor fulfills the requirements of 40 CFR Part 58. Guidance in *$SO_2$ NAAQS Designations Source-Oriented Monitoring Technical Assistance Document*, Draft, U.S. EPA, Office of Air-Quality Planning and Standards, Air Quality Assessment Division, February 2016. (Monitoring TAD) was followed to determine the locations of modeled maximum impacts, the frequency of such impacts at individual locations, and the likelihood that a monitor could be established in the vicinity of such resulting impacts within the context of the siting limitations normally associated with such monitor set up.

## 2. Information Gathering & Choice of Approach for Monitoring Siting Evaluation (Monitoring TAD Parts 2 & 3)

### *a. Information Gathering*

A basic overview of $SO_2$ emissions sources in the area and existing monitoring and modeling is given below. Additional existing information, such as meteorological data which was used in the modeling to determine monitor site location, is described below in section 3.

#### i. $SO_2$ Emissions Sources

There are two significant sources of $SO_2$ emissions in the vicinity of the contemplated monitoring area, as described above. Both are briefly described below, as well as in the introduction, and below as part of the modeling methodology in Section 3.d..

***Louisville Gas & Electric Mill Creek Generating Station***

The Mill Creek Generating Station (Mill Creek) is an Electric Generating Unit (EGU) owned by Louisville Gas & Electric, a Kentucky Corporation, and generating electric energy for local and remote distribution. Coal is the primary fuel source at Mill Creek's four primary emissions units.

Mill Creek consists of four emissions units emitting through three stacks. Primary control for $SO_2$ is by Flue Gas Desulfurization (FGD). Continuous Emissions Monitoring (CEM) data is collected for these four units, and has been extensively analyzed in conjunction with the recent reissuance of the Title V permit for Mill Creek (145-97-TV (R3); proposed to U.S. EPA February 21, 2017; issued April 5, 2017) and recent draft Attainment Plan for the nonattainment area described in the introduction (prehearing draft submitted to U.S. EPA on March 17, 2017; U.S. EPA comments received April 18, 2017; final submittal pending as of May 3, 2017). Analysis of the CEM data was submitted to U.S. EPA as a part of both submittals. Long term emissions trends were also analyzed as part of the Emissions Inventory submitted in the Draft Attainment Plan. Emissions profiles, metrics, and controls for the four primary units were also characterized as part of the modeled Attainment Demonstration submitted in the Draft Attainment Plan.

***Kosmos Cement Company***

Kosmos Cement Company is a Kentucky Partnership owned jointly by Cemex, Inc. (a Mexican multinational corporation) and Lone Star Industries, Inc. (a foreign corporation owned by Buzzi Unicem, USA), but fully operated by Cemex. The facility itself is a Title V permitted (156-97-TV) cement kiln, with 21 emissions units, only one of which emits $SO_2$. The preheater and kiln are operated jointly as "Unit 7/13". The emissions from this combined unit are not subject to any add-on controls. CEMs data is also collected at the Kosmos facility.

ii. Existing Air Quality Data

There is a SLAMS monitor operated by the District at Watson Lane Elementary, approximately 2 miles north of the Kosmos facility. However, it has been determined based on analysis of wind patterns and relative emissions rates that this monitoring location primarily shows the influence of emissions from the Mill Creek facility, leaving Kosmos' emissions under-studied. A copy of the $SO_2$ hourly average exceedance wind rose plot is shown below in Figure 2.[1]


*Figure 2* – $SO_2$ hourly average exceedance wind rose plot for the Watson Lane $SO_2$ monitor

iii. Existing Modeling

Earlier modeling of the Kosmos facility conducted by DAQ and the District in accordance with *Guidance for 1-Hour $SO_2$ Nonattainment Area SIP Submissions*, showed a need to better characterize the ambient concentrations of $SO_2$ in the vicinity of the facility and determine whether those $SO_2$ emissions violate the $SO_2$ NAAQS outside the nonattainment area. However, because the focus of this modeling was on the nonattainment area, additional modeling in

[1] A more detailed explanation of this determination can be found in the December 20, 2011 Updated boundary recommendations for $SO_2$ nonattainment areas in Kentucky, letter signed by Leonard K. Peters, Secretary, Kentucky Energy and Environment Cabinet; and the Final Technical Support Document, July 2013, Kentucky First Round of Nonattainment Area Designations for the 2010 $SO_2$ Primary NAAQS, prepared by the Region 4 U.S.EPA. Copies of both documents can be found in the docket for the Air Quality Designations and Classifications for the 2010 $SO_2$ Standards, Docket ID: EPA-HQ-OAR-2012-0233.

accordance with the Monitoring and Modeling TADs was necessary to identify the areas of maximum concentration *outside* of the nonattainment area. [2]

*b. Approach For Monitoring Siting Evaluation*

To identify the best locations for a monitor, the Monitoring TAD suggests three alternative approaches:

1. Modeling to inform monitor placement;
2. Using exploratory monitoring for monitor placement; or
3. Monitor siting based on existing data.

The U.S. EPA has stated that dispersion modeling alone provides sufficient information to site a monitor, and is particularly adept for determining location of expected maximum concentration. In accordance with the first approach, the District has determined that modeling is sufficient to site the monitor. As to the second and third approaches, the District does not have sufficient information from previous monitoring in the area to perform focused exploratory monitoring, nor the resources to deploy a large number of samplers to conduct a saturation study. Further, the monitoring TAD states that representative exploratory monitoring throughout the course of a year is preferential, a timeline not contemplated by the ABO with Kosmos.

Dispersion modeling was conducted following the guidance of the Monitoring TAD, which generally follows the Modeling TAD with exceptions involving receptor grid set up and density. The methodology and results of the air dispersion modeling defining maximum impact areas is presented in Section 4. Modeling Methodology and Results (Modeling TAD Parts 3 Through 8)

*c. Model Selection*

The most recent version of AERMOD, View 9.3, which incorporates EPA AERMOD version 16216r was used. AERMET version 16216, MAKEMET version 16216 and BPIP were also all incorporated. The model was run with default settings, as none of the optional settings were determined to be appropriate for this location.

*d. Modeling Domain*

i. Sources Modeled

The purpose of the monitoring will be to better characterize the ambient concentrations of $SO_2$ in the vicinity of Kosmos and to assess compliance with the $SO_2$ NAAQS outside the nonattainment area. Due to the extremely close proximity of the Kosmos and Mill Creek facilities, and the inability to separate emissions from the two out in background (as described below, part 3.f.), both facilities were explicitly modeled. There are no other nearby $SO_2$ sources.

[2] $SO_2$ NAAQS Designations Modeling Technical Assistance Document, U.S. EPA Office of Air and Radiation Office of Air Quality Planning and Standards Air Quality Assessment Division, August 2016.

ii. Receptor Grid

Receptors were initially placed in a rectangular area 3900 x 5550 meters around the Kosmos facility, excluding only the primary Kosmos facility itself, where initial modeling had shown the highest concentration gradients. See part 4. below for further description of how receptors were placed in iterative modeling runs.

*e. Emissions Inputs*

i. Years Modeled

The most recent years available at the time of modeling for the Attainment Plan, 2013-2015, were kept for meteorological inputs, for the sake of consistency. Facility permitted potential emissions were modeled, as described in the next section.

ii. Actual v. Normalized Emissions

Because the purpose of the modeling is not to determine attainment directly, but to determine the placement of a monitor, it was decided that the more conservative approach of modeling allowable emissions was more appropriate. Furthermore, as noted in the Modeling TAD, use of allowable or PTE emissions may be found to be simpler.

Because emissions for both facilities are permitted on a 30 day rolling average basis, a backward adjustment factor was applied to each facility's emissions, essentially by applying the inverse of the methodology laid out in the "Guidance for 1-Hour $SO_2$ Nonattainment Area SIP Submissions," Stephen D. Page, Director, U.S. EPA Office of Air Quality Planning and Standards, April 2014 (Nonattainment Guidance). In the case of Kosmos' single $SO_2$ emissions point, which has no add-on controls, it was determined based on that guidance that an adjustment factor of 0.79 would be appropriate.[3] Their permitted allowable emissions rate of 122 lb/hr on a 30-day rolling basis was conservatively adjusted upward as if that adjustment factor had been applied to a critical emissions rate, to arrive at the hourly rate modeled. In the case of Mill Creek, a critical emissions rate was determined and an adjustment rate applied as part of the SIP Attainment Demonstration and permitting action described above. Therefore, the original higher hourly critical emissions values for each emissions point were used in this modeling.

*f. Source Characterization*

i. Emissions Points, Source Configurations and Source Types

As described above, Kosmos has a single $SO_2$ emissions point for the kiln and preheater, the characteristics of which are described in the table below.

[3] This is the typical value for sources with no control equipment from Appendix D. of the Nonattainment Guidance.

*Table 1* – Kosmos Cement Company Emissions Point

| Stack ID | X Coordinate ($m^a$) | Y Coordinate ($m^a$) | Stack Height (ft) | Stack Diameter (ft) | Exit Velocity (ft/s) | Exit Temperature ($F^o$) | Emission Rate (lb/hr) |
|---|---|---|---|---|---|---|---|
| K945 | 595929.00 | 4210245.58 | 75 | 10.5 | 96.323 | 300.0 | 154.43 |

Mill Creek has four primary emissions units, however emissions from Units 1 & 2 pass through a single stack, and the facility therefore only has three actual primary emissions points, described in the next table.

*Table 2* – Louisville Gas & Electric Mill Creek Generating Station Emissions Points

| Stack ID | X Coordinate ($m^a$) | Y Coordinate ($m^a$) | Stack Height (ft) | Stack Diameter (ft) | Exit Velocity (ft/s) | Exit Temperature ($F^o$) | Emission Rate (lb/hr) |
|---|---|---|---|---|---|---|---|
| S33 | 595779.00 | 4212441.00 | 468.77 | 28.0 | 55.971 | 129.77 | 1789.32 |
| S4 | 595638.00 | 4212124.00 | 468.77 | 19.6 | 74.508 | 120.98 | 1219.15 |
| S34 | 595624.00 | 4211967.00 | 468.77 | 25.0 | 55.742 | 126.5 | 1457.25 |

Other units with $SO_2$ emissions at Mill Creek include the following: two (2) 800 HP emergency generators, PTE for $SO_2$ is 1.56 tpy each, 3.12 tpy total; two (2) 183 HP fire pumps, PTE for $SO_2$ is 0.34 tpy each, 0.68 tpy total; two (2) natural gas fired heaters at gypsum pelletizing plant, PTE for $SO_2$ is 0.06 tpy each, 0.12 tpy total. The total PTE for these units is 3.92 tons, or 0.0003 percent the $SO_2$ emissions of Units 1 through 4, and were not therefore explicitly modeled.

ii. Urban/Rural Determination

The surrounding area, over 10 miles from the central urban area of Louisville, was determined to be rural. As seen in the aerial image below, aside from the facilities modeled, the area is almost exclusively farmland, forested, or small single-family residences.


*Figure 3* – Land Use in area.

iii. Deposition Parameters

*g. Meteorological Data (Meteorological Inputs & Surface Characteristics)*

According to the AERMOD Implementation Modeling Guidelines, the meteorological stations should be representative of the facility. The National Weather Service (NWS) meteorological station chosen, Louisville Standiford Field (station no. 93821), depended on the meteorological tower location, topography, land use, and surface characteristics in reference to the LG&E facility. The surface roughness values of the meteorological surface station were processed by AERSURFACE version 13016. In AERSURFACE, the default 1 km radius was chosen, temporal resolution was set to "monthly", and twelve 30° averaged sectors were chosen.

Meteorology for three years of 2013 – 2015 was used.

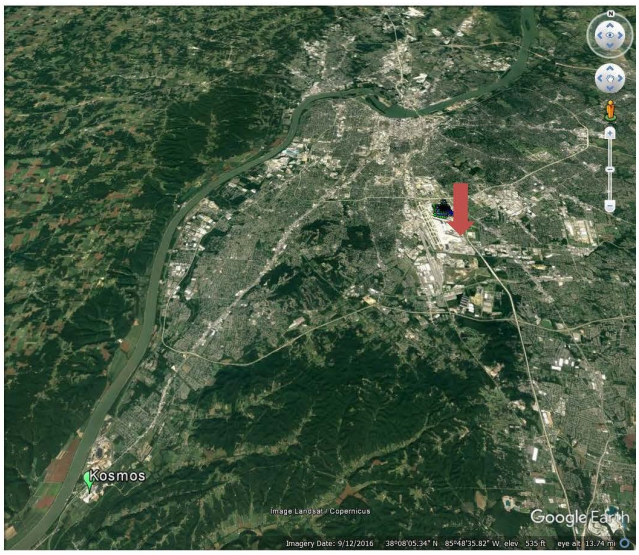


*Figure 4* – location of NWS station used for meteorological input

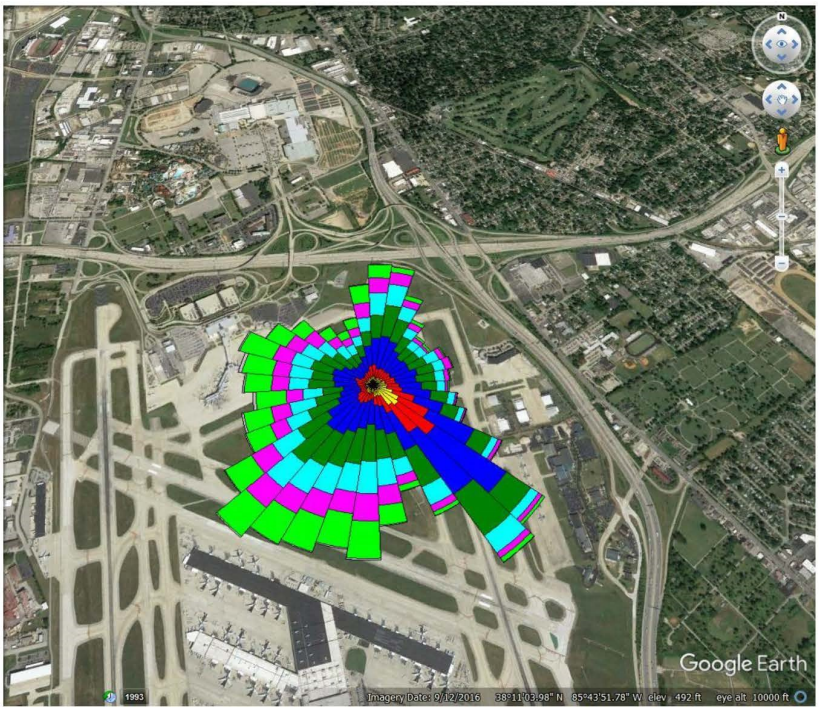


*Figure 5* – Wind rose for NWS station used for meteorological input.

*h. Background Concentration*

For background concentrations of $SO_2$, 2015 data from the Green Valley station in Indiana (Monitor ID: 18-043-1004, Address: 2230 Green Valley Rd/Green Valley Elementary School, New Albany, IN) was used with a 33 degree downwind sector removed in order to best represent ambient concentrations of $SO_2$ and avoid double counting emissions from the model sources (Kosmos and LGE/Mill Creek).

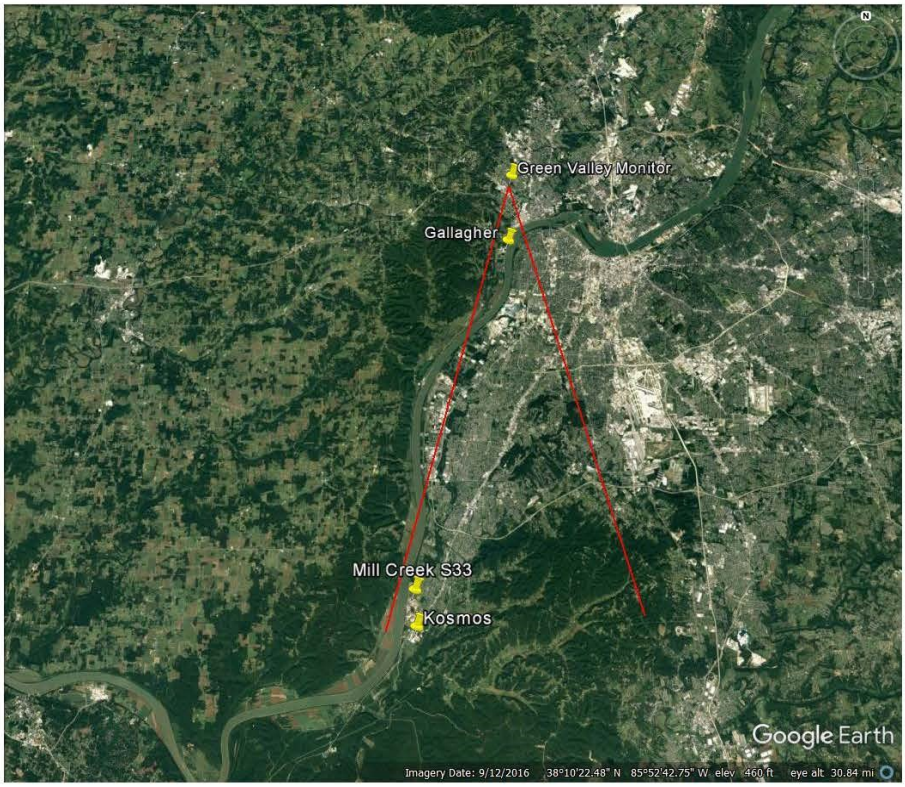


*Figure* 6 – 30° Downwind Sector from Green Valley Monitor

## 3. Source-oriented $SO_2$ Monitor Site Selection (Monitoring TAD Part 4)

The procedure outlined in Appendix A to the Monitoring TAD was followed to determine the areas of maximum concentration which would be most suitable for monitor placement.

First, an overview of potential monitor sites was developed within the area using Normalized Design Value (NDV) analysis. An initial AERMOD run was used to get 4$^{th}$ highest maximum plot values (***01H4GALL.PLT***), keeping in mind the absolute concentration values are not critical, as they will be normalized to obtain a relative concentration data set for evaluation.

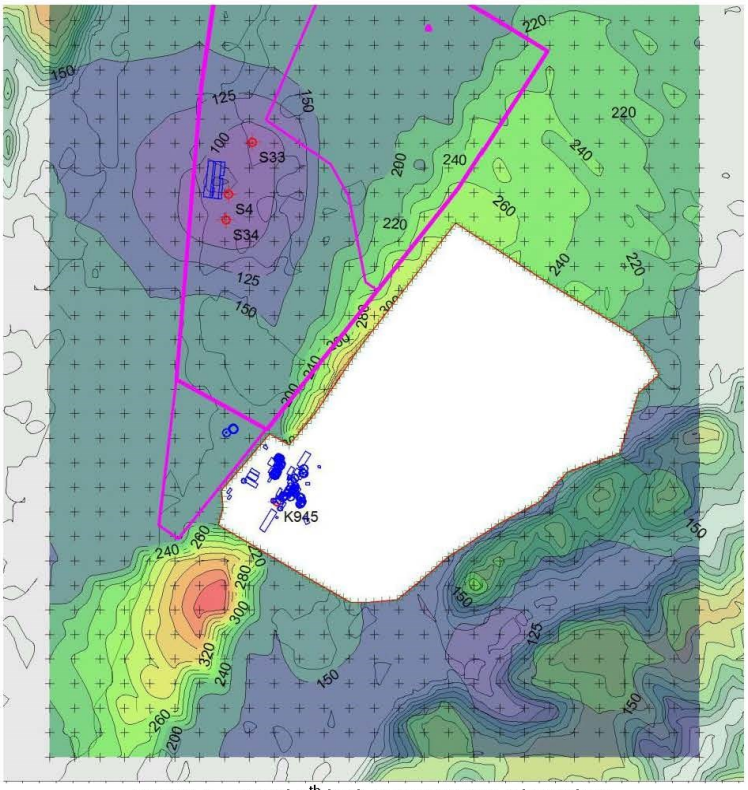


*Figure 7* – initial 4th highest maximum plot values

Modelers then normalized values for receptors by making a copy of the initial run, then extracting values from the ***01H4GALL.PLT*** text file into an MSAccess database. X and Y coordinates were combined for receptors for each receptor to create receptor ID's. The maximum value was then determined and, all values were divided by it to normalize all concentration values (NDVs) to fall within the range of 0.0 to 1.0. Next, NDVs for each receptor were exported from the MSAccess database, and NDV data was formatted to replace concentration values in a new file, which was used to replace the previous plot file. The new plot with the normalized isopleth map is shown below. All concentrations are in the range of 0 to 1.0. This map was used to identify areas for more detailed analysis.

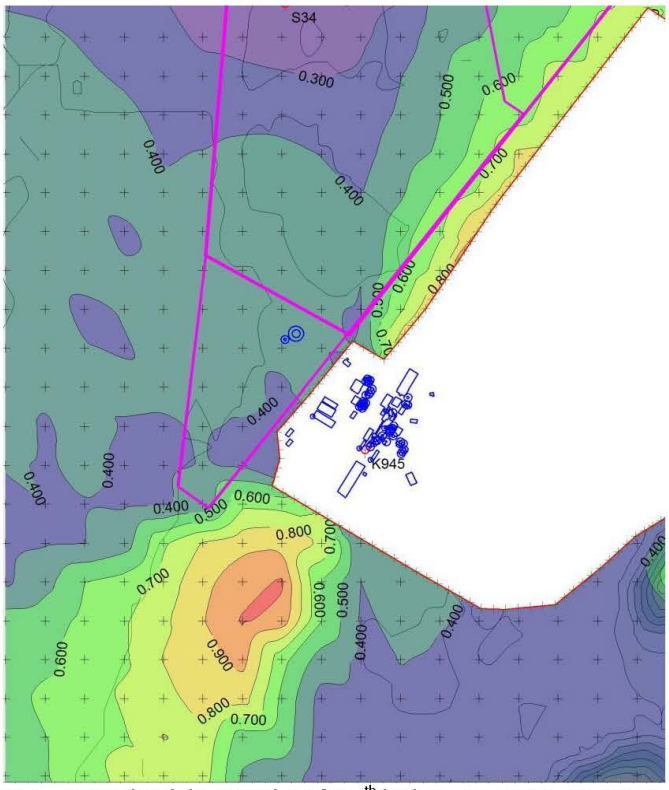


*Figure 8* – Normalized design values for 4th highest maximum concentrations

A ranked receptor list was developed to identify maximum concentration locations, using the NDV method (absolute concentrations were not critical as they are only used to obtain relative NDV concentrations). An AERMOD run was set up with denser receptor grids in two key areas identified by the NDV overview already completed using; 31 and 25 meter spacing respectively. Source characterization parameters were set to the same values used in the previous (overview) run. AERMOD was run with the *MAXDAILY* option to obtain values for ranking. The *MAXDAILY* data was then processed to obtain the 99th percentile number (equivalent to the 4th highest values for a 365 day period). Next, modelers then extracted all receptor records of daily maximums with concentration values greater or equal to this value, then divided all values by the identified maximum concentration to normalize all extracted values to be within the range of 0.0 to 1.0. Then the receptor records were ranked from highest to lowest concentrations, 1 being the highest concentration. Receptors in the 99th percentile *MAXDAILY data* were then ranked using records extracted in the previous step (with associated X/Y receptor IDs) by count of being the daily maximum (*maxdaily* is a list of the daily maximum concentration receptors, which were counted by receptor). The receptors were then ranked highest to lowest with the highest count being 1.

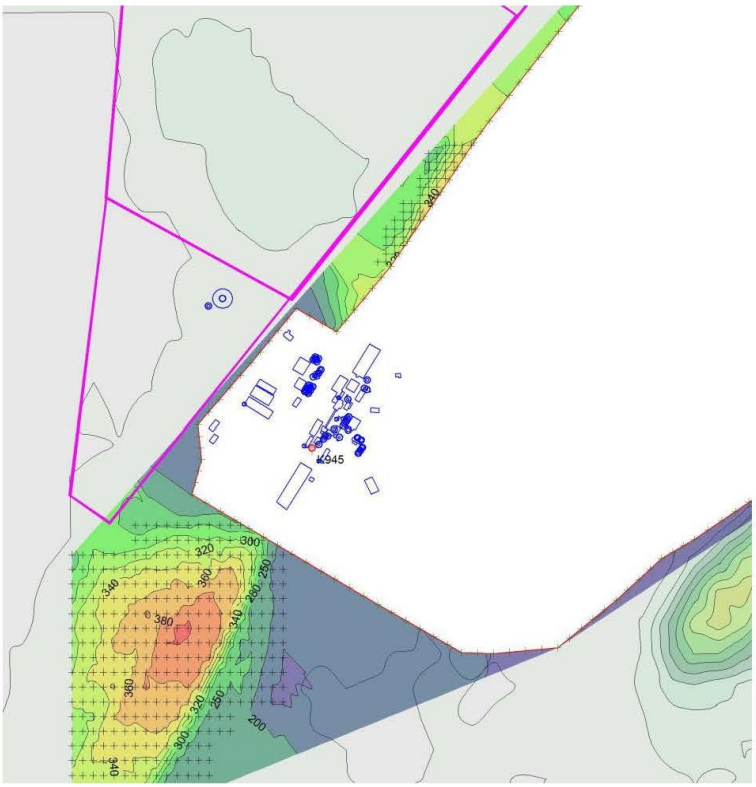


*Figure 9* - AERMOD run with denser receptor grids in two key areas

To complete the ranking of receptors, the two rankings were summed for each receptor. The receptors were then sorted using the summed ranking numbers in ascending order. The summed ranks were then normalized to 1 to 25 to obtain the top 25 candidate receptors for a monitor site. The top 25 receptor rankings were then finally normalized again to 1.0 produce relative values in the range of 0.0 to 1.0 for mapping purposes. A new AERMOD run was set up, copied from the previous run. The *earlier* file receptor concentration data was replaced with the newly developed top 25 receptor coordinates and their ranked/normalized values (0.0…1.0) as concentrations in the existing plot file, ***01H4GALL.PLT***. AERMOD was opened but not run, in order to view the new plot file map (4th highest maximum concentrations). The normalized isopleth map then was used to identify the best potential maximum concentration receptor site(s), which had the highest normalized value(s) (closest or equal to 1.0). Isopleth contour values were set to best identify the highest value receptors.

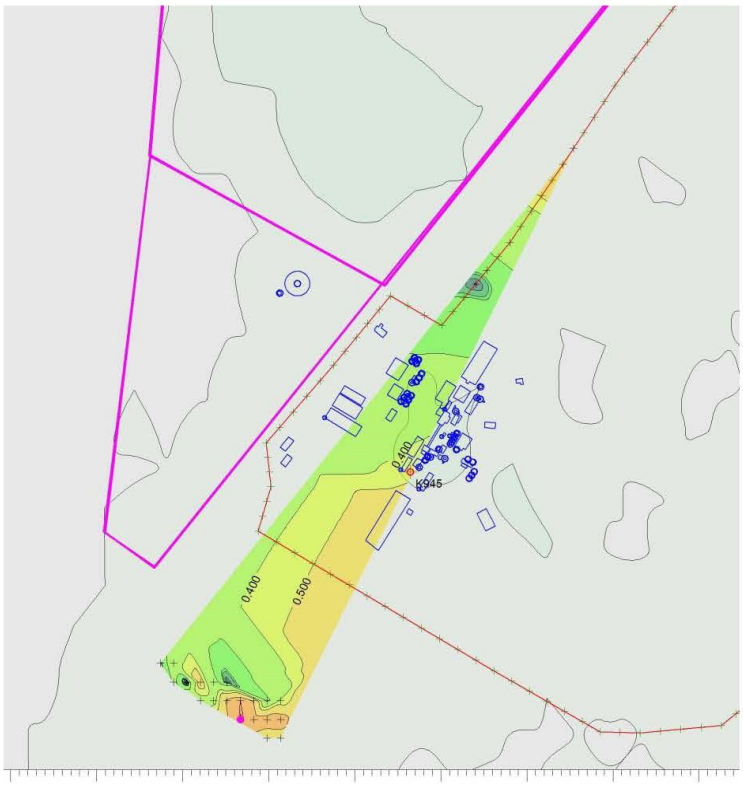


*Figure 10* – top-ranked receptor site

The best receptor site (and area) was determined to be at X=595533.97000, Y=4209660.92000, located within a land parcel owned by Kosmos south of the main plant.

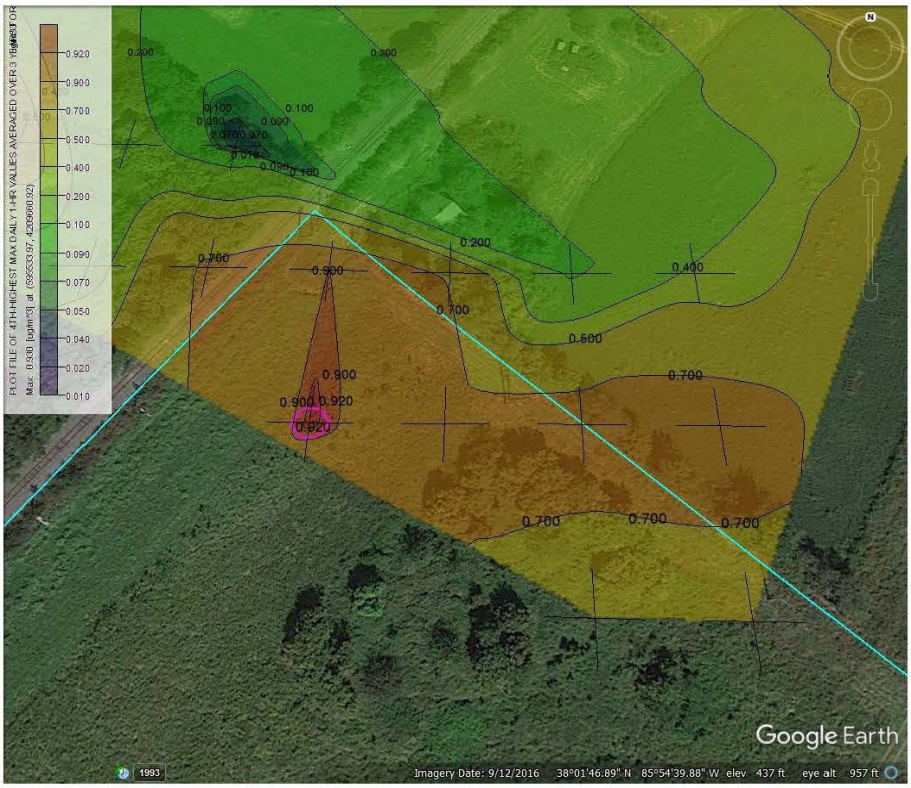


*Figure 11* – satellite view of top receptor site, within Kosmos' property

| Louisville Air Pollution Control District Ambient Monitoring Group Instrument & Equipment Inventory - May, 2017 | | | | | | |
|---|---|---|---|---|---|---|
| Location | Instrument Type | Manufacturer | Model | Serial Number | Condition | Status |
| Bates | PM | Met One | BAM | T18984 | Good | In Use |
| Bates | O3 | API | T400 | 316 | Good | In Use |
| Bates | Calibrator | API | T703 | 255 | Good | In Use |
| Bates | Datalogger | ESC | 8832 | 4411 | Fair | In Use |
| Bates | Wind | RM Young | 05103VM-42 | 47808 | Fair | In Use |
| Bates | Temp | RM Young | 41342VF | 41376A | Fair | In Use |
| Bates | Shelter | Mobile Structures | Na | TSAQT06 | Poor | In Use |
| Cannons Lane | PM | Thermo | 2025i | 20607 | Good | In Use |
| Cannons Lane | PM | Thermo | 2025i | 20614 | Good | In Use |
| Cannons Lane | CSN | URG | 3000N | 3N-B251 | Fair | In Use |
| Cannons Lane | CSN | URG | 3000N | 3N-B933 | Fair | In Use |
| Cannons Lane | Noy | Thermo | 42i-Y | 0814428-734 | Fair | In Use |
| Cannons Lane | SO2 | Thermo | 43i-TLE | 814428-732 | Fair | In Use |
| Cannons Lane | CO | Thermo | 48i-TLE | 0814429-062 | Fair | In Use |
| Cannons Lane | Zero Air | API | T701H | 773 | Fair | In Use |
| Cannons Lane | PM | Met One | BAM | K19863 | Fair | In Use |
| Cannons Lane | PM | Met One | BAM | T18981 | Good | In Use |
| Cannons Lane | Analyzer | Met One | SASS | 6079 | Fair | In Use |
| Cannons Lane | NO2 | API | T200 | 341 | Fair | In Use |
| Cannons Lane | O3 | API | T400 | 1467 | Good | In Use |
| Cannons Lane | Calibrator | API | T700U | 107 | Good | In Use |
| Cannons Lane | CSN | Met One | SASS | 3567 | Fair | In Use |
| Cannons Lane | CSN | Met One | Super SASS | 1046 | Good | In Use |
| Cannons Lane | Rain | Met One | 370 | U10772 | Good | In Use |
| Cannons Lane | Ultrasonic Anemometer | RM Young | 8500 | UB00002568 | Fair | In Use |
| Cannons Lane | Datalogger | ESC | 8832 | 4410 | Fair | In Use |
| Cannons Lane | Temp/Humidity | RM Young | 41382 | TS-14425 | Fair | In Use |
| Cannons Lane | Aspirated Rad Shield | RM Young | 43502 | n/a | Fair | In Use |
| Cannons Lane | Anemometer | RM Young | 85000 | UB-1309 | Fair | In Use |
| Cannons Lane | Radnet | GA-ESI RTS | LPU-02 EPA | 153/10 | Fair | In Use |
| Cannons Lane | TEOM Shelter | EKTO Mfg. | 432-SP | 3200-7 | Fair | In Use |

## LMAPCD Equipment Inventory (Continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| Cannons Lane | TEOM Shelter | EKTO Mfg. | 432-SP | 3535-6 | Fair | In Use |
| Cannons Lane | Shelter | Modular Connections | MCP-296 | MC2519 | Good | In Use |
| Cannons Lane | Meteorological Tower | Aluma Tower | T-35H | AP-29071-U-4 | Good | In Use |
| Cannons Lane | Pyranometer | Met One | 394 | 33927 | Fair | In Use |
| Firearms Training | SO2 | API | T100 | 1322 | Good | In Use |
| Firearms Training | Calibrator | API | T700 | 289 | Good | In Use |
| Firearms Training | Zero Air | API | T701M | 647 | Good | In Use |
| Firearms Training | Datalogger | ESC | 8832 | 4294 | Fair | In Use |
| Firearms Training | Shelter | EKTO Mfg. | 8812 | 3876-1 | Fair | In Use |
| Near Road | PM | Thermo | 2025i | 20608 | Good | In Use |
| Near Road | Zero Air | API | T701M | 839 | Good | In Use |
| Near Road | NO2 | API | T200UP | 085 | Good | In Use |
| Near Road | CO | API | T300U | 155 | Fair | In Use |
| Near Road | Calibrator | API | T700U | 106 | Good | In Use |
| Near Road | Wind | RM Young | 8500 | 4675 | Fair | In Use |
| Near Road | Datalogger | ESC | 8832 | 4293 | Fair | In Use |
| Near Road | Shelter | CAS | | | Good | In Use |
| Near Road | Wind | RM Young | 05305V | 128356 | Fair | In Use |
| Near Road | Meteorological Tower | Aluma Tower | | | Good | In Use |
| Southwick | PM | R&P | 2025B | 21665 | Fair | In Use |
| Southwick | PM | Met One | BAM | N2946 | Fair | In Use |
| Southwick | PM | Met One | BAM | T18983 | Good | In Use |
| Southwick | Sonic Anemoneter | RM Young | 8500 | UB3773 | Fair | In Use |
| Southwick | Relative Humidity | RM Young | 41372VC | Y490092 | Fair | In Use |
| Southwick | TEOM Shelter | EKTO Mfg. | 432-SP | 3408-6 | Fair | In Use |
| Southwick | TEOM Shelter | EKTO Mfg. | 432-SP | 3408-7 | Fair | In Use |
| Southwick | Barometric Pressure | RM Young | 61302V | BPA1240 | Fair | In Use |
| Southwick | Meteorological Tower | Aluma Tower | n/a | n/a | Fair | In Use |
| Southwick | Rain Gauge .01 | Met One | n/a | E5009 | Fair | In Use |
| Watson Lane | PM | R&P | 2025B | 21656 | Fair | In Use |
| Watson Lane | PM | Met One | BAM | N3593 | Fair | In Use |
| Watson Lane | PM | Met One | BAM | T18977 | Good | In Use |
| Watson Lane | SO2 | API | T100 | 1321 | Good | In Use |
| Watson Lane | O3 | API | T400 | 1468 | Good | In Use |

# LMAPCD Equipment Inventory
# (Continued)

| Watson Lane | Calibrator | API | T700 | 1619 | Good | In Use |
|---|---|---|---|---|---|---|
| Watson Lane | Zero Air | API | T701M | 648 | Good | In Use |
| Watson Lane | Datalogger | ESC | 8832 | 4291 | Fair | In Use |
| Watson Lane | Shelter | EKTO Mfg. | 8812 | 3728-1 | Fair | In Use |
| APCD Shop | Pyranometer | Met One | 394 | 34257 | Fair | Not In Use |
| APCD Shop | Rain Gauge | RM Young | 52202 | TB03206 | Poor | Not In Use |
| APCD Shop | Met Station | Met One | Portable | E5678 | Fair | Not In Use |
| APCD Shop | Pyranometer | Met One | Solar PSP | 34257F3 | Fair | Not In Use |
| APCD Shop | Calibrator | Thermo | 146C | 70386-365 | Poor | Not In Use |
| APCD Shop | Calibrator | Thermo | 146i | 0814428-735 | Fair | Not In Use |
| APCD Shop | PM | R&P | 2025B | 240590204 | Fair | Backup / Spare |
| APCD Shop | PM | R&P | 2025B | 21666 | Fair | Backup / Spare |
| APCD Shop | PM | Thermo | 2025i | 20612 | Good | Backup / Spare |
| APCD Shop | CSN | URG | 3000N | 1045 | Fair | Backup / Spare |
| APCD Shop | NO2 | Thermo | 42C | 070415-365 | Poor | Not In Use |
| APCD Shop | NO2 | Thermo | 42C | 70979-367 | Poor | Not In Use |
| APCD Shop | SO2 | Thermo | 43C | 518612-095 | Poor | Not In Use |
| APCD Shop | SO2 | Thermo | 43C | 436610-205 | Poor | Not In Use |
| APCD Shop | SO2 | Thermo | 43C | 69873-364 | Poor | Not In Use |
| APCD Shop | O3 | Thermo | 49C | 417007-061 | Poor | Not In Use |
| APCD Shop | O3 | Thermo | 49C | 74462-376 | Poor | Not In Use |
| APCD Shop | O3 Standard | Thermo | 49C | 70020-364 | Good | In Use |
| APCD Shop | O3 | Thermo | 49C | 64282-342 | Poor | Not In Use |
| APCD Shop | O3 | Thermo | 49i | 617817-230 | Fair | Not In Use |
| APCD Shop | O3 Standard | Thermo | 49iPS | 617817-229 | Good | In Use |
| APCD Shop | O3 | Thermo | 49C | 413906-381 | Poor | Not In Use |
| APCD Shop | Calibrator | Ecotech | 6100 | 4012 | Poor | Not In Use |
| APCD Shop | Calibrator | API | T700E | 1038 | Good | Backup / Spare |
| APCD Shop | PM | Met One | BAM | H1710 | Fair | Backup / Spare |
| APCD Shop | PM | Met One | BAM | K19862 | Fair | Backup / Spare |
| APCD Shop | PM | Met One | BAM | N3596 | Fair | Backup / Spare |
| APCD Shop | Standard | Bios | BiosDryCal | 105393 | Fair | In Use |
| APCD Shop | Standard | Mesa Lab | DeltaCal | 465 | Fair | In Use |
| APCD Shop | Standard | Mesa Lab | DeltaCal | 466 | Fair | In Use |

# LMAPCD Equipment Inventory
# (Continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| APCD Shop | Standard | Fluke | Molbox | 2213 | Good | In Use |
| APCD Shop | Zero Air | API | T701M | 604 | Good | In Use |
| APCD Shop | Zero Air | API | T701M | 835 | Poor | Not In Use |
| APCD Shop | Standard | Vaisala | J0871073 | J0871073 | Fair | In Use |
| APCD Shop | Zero Air | Rocker | Pump | C031 | Fair | Not In Use |
| APCD Shop | Zero Air | Rocker | Pump | B002 | Fair | Not In Use |
| APCD Shop | Zero Air | Rocker | Pump | H005 | Fair | Not In Use |
| APCD Shop | CSN | Met One | SASS | 3565 | Fair | Not In Use |
| APCD Shop | CSN | Met One | SASS | 6080 | Fair | Not In Use |
| APCD Shop | Standard | Chinook | SLP | M41005 | Fair | In Use |
| APCD Shop | Standard | Chinook | SLP | M41006 | Fair | In Use |
| APCD Shop | Standard | Chinook | SLP | M41007 | Fair | In Use |
| APCD Shop | Standard | Chinook | SLP | M70204 | Fair | In Use |
| APCD Shop | SO2 | API | T100U | 081 | Fair | Backup / Spare |
| APCD Shop | O3 | API | T400 | 315 | Good | Backup / Spare |
| APCD Shop | Calibrator | API | T700 | 1620 | Good | Backup / Spare |
| APCD Shop | Calibrator | API | T700U | 174 | Good | In Use |
| APCD Shop | Calibrator | API | T700 | 290 | Good | Backup / Spare |
| APCD Shop | Calibrator | API | T750 | 054 | Good | Backup / Spare |
| APCD Shop | Zero Air | API | T751 | 62 | Good | In Use |
| APCD Shop | CO | Thermo | 48C | 417007-060 | Poor | Not In Use |
| APCD Shop | CO | Thermo | 48C | 67474-356 | Poor | Not In Use |
| APCD Shop | Datalogger | ESC | 8832 | 4691K | Fair | In Use |
| APCD Shop | Calibrator | Thermo | 146C | 0417007-062 | Poor | Not In Use |
| APCD Shop | Calibrator | Thermo | 146C | 382 | Poor | Not In Use |
| APCD Shop | TEOM | R&P | 1400ab | 24059 | Poor | Not In Use |
| APCD Shop | CO | Thermo | 48C | 68840-361 | Poor | Not In Use |
| APCD Shop | Zero Air | Rocker | Pump | B001 | Fair | Not In Use |
| APCD Shop | Standard | Vaisala | 10013 | 10013 | Fair | Not In Use |
| APCD Shop | Analyzer | Echotech | Serinus | 40-10-51 | Poor | Not In Use |
| APCD Shop | Datalogger | ESC | 8832 | 2713K | Fair | Backup / Spare |
| APCD Shop | Datalogger | ESC | 8816 | 5058 | Poor | Not In Use |
| APCD Shop | Zero Air | API | T701M | 837 | Poor | Not In Use |
| APCD Shop | Zero Air | API | T701M | 801 | Good | Backup / Spare |

# LMAPCD Equipment Inventory
# (Continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| APCD Shop | Zero Air | API | T701M | 802 | Good | Backup / Spare |
| APCD Shop | NO2 | API | T500U | 169 | Good | Backup / Spare |
| APCD Shop | CO | API | T300U | 281 | Good | Backup / Spare |
| APCD Shop | PM | API | T640 | 151 | Good | Backup / Spare |
| APCD Shop | Anemometer | Met One | 50.5 | B-1031 | Fair | Not In Use |
| APCD Shop | Anemometer | Met One | 50.5 | Y3338 | Fair | Not In Use |
| APCD Shop | Datalogger | ESC | 8816 | 1917 | Fair | Not In Use |
| APCD Shop | Datalogger | ESC | 8832 | A1014 | Fair | Not In Use |
| APCD Shop | TEOM | R&P | 1400AB | 230750005 | Poor | Not In Use |
| APCD Shop | Temp. | RM Young | 41342VF | TS05123 | Fair | Not In Use |
| APCD Shop | Temp/RH | RM Young | 41372V | 21011 | Fair | Not In Use |
| APCD Shop | Anemometer | RM Young | 5305AQ | VW101749 | Fair | Not In Use |
| APCD Shop | Air Toxics Sampler | TECO | Miran Saphire | 79545411 | Fair | Not In Use |
| APCD Shop | WS Calibrator | RM Young | n/a | n/a | Fair | Not In Use |
| APCD Shop | Laboratory Refrigerator | Thermo | REL1204A | 155472601160526 | Good | In Use |
| APCD Warehouse @ CL | Air Toxics FTIR | IMACC | M-ZSE12-180 | M0015 | Fair | Not In Use |
| APCD Warehouse @ CL | Air Toxics UV | IMACC | n/a | n/a | Fair | Not In Use |
| APCD Warehouse @ CL | TEOM | R&P | 1400a | 23075 | Poor | Not In Use |
| APCD Warehouse @ CL | TEOM | R&P | 1400a | 23746 | Poor | Not In Use |
| APCD Warehouse @ CL | TEOM | R&P | 1400a | 23748 | Poor | Not In Use |
| APCD Warehouse @ CL | O3 | Thermo | 49C | 47646-280 | Poor | Not In Use |
| APCD Warehouse @ CL | CO | Thermo | 48i-TLE | 617817-228 | Fair | Not In Use |
| APCD Warehouse @ CL | TEOM | R&P | 1400ab | 24097 | Poor | Not In Use |
| APCD Warehouse @ CL | TEOM | R&P | 1400ab | 24926 | Poor | Not In Use |
| APCD Warehouse @ CL | TEOM | R&P | 1400a | 24601 | Poor | Not In Use |
| APCD Warehouse @ CL | PM | R&P | 2025B | 22560 | Fair | Not In Use |
| APCD Warehouse @ CL | PM | R&P | 2025B | 21310 | Fair | Not In Use |
| APCD Warehouse @ CL | TEOM | R&P | 1400ab | 24885 | Poor | Not In Use |
| APCD Warehouse @ CL | O3 | Thermo | 49C | 43374-269 | Poor | Not In Use |
| APCD Warehouse @ CL | CO | Thermo | 48C | 351 | Poor | Not In Use |
| APCD Warehouse @ CL | Shelter | EKTO Mfg. | 81012 | 4234-1 | Fair | Not In Use |
| APCD Warehouse @ CL | Analyzer | Environics | 300 | 1586 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 1971 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 1972 | Fair | Not In Use |

# LMAPCD Equipment Inventory
# (Continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 1973 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 2423 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 2764 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 3303 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 3304 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 3305 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 3306 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 3307 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 3308 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 3801 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 4422 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 4423 | Fair | Not In Use |
| APCD Warehouse @ CL | Datalogger | ESC | 8816 | 4424 | Fair | Not In Use |
| APCD Warehouse @ CL | TEOM Shelter | EKTO Mfg. | 432-SP | 3278-10 | Fair | Not In Use |
| APCD Warehouse @ CL | TEOM Shelter | EKTO Mfg. | 432-SP | 3278-9 | Fair | Not In Use |
| APCD Warehouse @ CL | Meteorological Tower | Rohn | n/a | n/a | Good | Not In Use |

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# APPENDIX F

## KDAQ & LMAPCD
## INTENDED USE OF CONTINUOUS $PM_{2.5}$ FEMS

## Appendix F
## KDAQ & LMAPCD 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 $PM_{2.5}$ NAAQS, as long as these monitors were specified as special-purpose monitors (SPMs). Data from these monitors was 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 was 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.

During the upcoming monitoring year, KDAQ plans to install FEM Teledyne-API model T640 $PM_{2.5}$ mass monitors at the Ashland Primary site (21-019-0017) in Boyd County and the Jackson Purchase RECC sites (21-145-1024) in McCracken County. These monitors will be tested for comparability against on-site manual intermittent FRM $PM_{2.5}$ samplers over the course of approximately two years.

The monitor designations for Teledyne-API T640 continuous $PM_{2.5}$ FEMs that will be operated by KDAQ are summarized in the chart below:

| Ashland Primary (21-019-0017) & Jackson Purchase RECC (21-145-1024) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Scenario** | **Parameter Name** | **Parameter Code** | **Pollution Occurrence Code (POC)** | **Monitor Type** | **Primary Monitor (Collocation)** | **Used for substitutions of missing primary data?** | **Used for NAAQS Comparisons?** | **Eligible for AQI?** |
| PM2.5 Continuous FEM is being tested and is less than 24 old; FRM is retained as the Primary monitor. | PM2.5 Local Conditions | 88101 | 3 | SPM & Non-Regulatory | FRM | No | No | Yes |

LMAPCD will operate three Met-One BAM 1020 continuous $PM_{2.5}$ FEMs, located at the Watson Lane (21-111-0051), Cannons Lane (21-111-0067), and Firearms Training (21-111-1041) sites. The EPA has determined that the data from the continuous $PM_{2.5}$ FEMs located at these three sites are comparable to the data collected by collocated FRMs; as such, those monitors are also designated as SLAMs monitors and are eligible for NAAQS comparisons.

A fourth BAM, located at Carrithers Middle School (21-111-0080), is not configured as a FEM. Data from non-FEM continuous $PM_{2.5}$ monitors are not used for NAAQS comparisons and are only eligible for reporting of the AQI; as such, non-FEM monitors are not included in this statement.

The monitor designations for Met-One BAM 1020 continuous $PM_{2.5}$ FEMs operated by LMAPCD are summarized in the chart below:

| Cannons Lane (21-111-0067), Watson Lane (21-111-0051), Firearms Training (21-111-1041) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Scenario** | **Parameter Name** | **Parameter Code** | **Pollution Occurrence Code (POC)** | **Monitor Type** | **Primary Monitor (Collocation)** | **Used for substitutions of missing primary data?** | **Used for NAAQS Comparisons?** | **Eligible for AQI?** |
| $PM_{2.5}$ Continuous FEM is eligible for NAAQS comparisons. | PM2.5 Local Conditions | 88101 | 3 | SLAMS | FRM | Yes | Yes | Yes |

LMAPCD also plans to install a FEM Teledyne-API T640 mass monitor at the Firearms Training site (21-111-1041). This monitor will be tested for comparability against other on-site particulate monitors. The monitor designation for the Teledyne-API T640 continuous $PM_{2.5}$ FEM that will be operated by LMAPCD is summarized in the chart below:

| Firearms Training (21-111-1041) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Scenario** | **Parameter Name** | **Parameter Code** | **Pollution Occurrence Code (POC)** | **Monitor Type** | **Primary Monitor (Collocation)** | **Used for substitutions of missing primary data?** | **Used for NAAQS Comparisons?** | **Eligible for AQI?** |
| PM2.5 Continuous FEM is being tested and is less than 24 old; FRM is retained as the Primary monitor. | PM2.5 Local Conditions | 88101 | 3 | SPM & Non-Regulatory | FRM | No | No | Yes |

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# APPENDIX G

# NEAR-ROAD MONITORING

# Appendix G
## Part A - 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 were required to establish $NO_2$ near-road monitoring stations based upon core based statistical area (CBSA) populations and traffic metrics.

Specifically, the final rule originally 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 necessitated:

- 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.

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 were or are required in Kentucky.

| CBSA Name (500,000 or more people) | 2015 CBSA Population Estimate* | Highest Road Segment 2-Way AADT for CBSA** | Number of Monitors Required in CBSA |
|---|---|---|---|
| Cincinnati-Middletown, OH-KY-IN | 2,128,603 | 193,399 | 1 |
| Louisville-Jefferson County, KY-IN | 1,251,351 | 166,432 | 1 |

*Source: US Census Bureau, 2015 Population Estimates (Last accessed: April 5, 2016)

**Source: KYTC Traffic Database. http://datamart.business.transportation.ky.gov/EDSB_SOLUTIONS/CTS/. Last accessed: June 2015

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.

The phased approach originally included a third phase, which would have required $NO_2$ near-road sites in CBSAs with populations of 500,000-1,000,000 to be established by January 1, 2017. However, on December 22, 2016, the EPA removed this requirement, as data collected in larger CBSAs indicated that air quality levels in the near-road environment are well below the level of the NAAQS.

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# APPENDIX H

## KENTUCKY $SO_2$ PWEI VALUES

# Appendix H
## Kentucky $SO_2$ PWEI Values

40 CFR 58, Appendix D, requires that a minimum number of $SO_2$ monitors be operated based upon a Population Weighted Emissions Index (PWEI) values. This index, which is calculated for each Core Based Statistical Area (CBSA), 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 may, at their discretion, require additional monitors beyond the minimum required by PWEI calculations. However, 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 | 2015 PWEI* (million persons-tons per year) | Number of $SO_2$ Monitors Required in MSA | Number of Kentucky $SO_2$ Monitors Present in MSA | Total Number of $SO_2$ Monitors Present in MSA | Monitoring Requirement Fulfilled? |
|---|---|---|---|---|---|
| Cincinnati, OH-KY-IN | 380,617 | 2 | 1 | 6** | Y*** |
| Evansville, IN-KY | 7,771 | 1 | 1 | 1 | Y |
| Huntington-Ashland, WV-KY-OH | 4,553 | 1 | 2 | 2 | Y |
| Lexington-Fayette, KY | 3,522 | 1 | 2 | 2 | Y |
| Louisville-Jefferson County, KY-IN | 60,030 | 1 | 3**** | 3 | Y*** |
| Paducah, KY-IL | 5,514 | 1 | 1 | 1 | Y |

* 2015 PWEI calculated from 2013 USCB Population Estimates and 2011 NEI.
** Additional monitors operated by SWOAQA in Ohio.
*** Monitoring requirement partially fulfilled via MOA.
**** Monitors operated by the Louisville Metro Air Pollution Control District

# APPENDIX I

## EPA CASTNET STATIONS IN KENTUCKY

# Appendix I
## 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 J

# KDAQ EQUIPMENT INVENTORY

# Appendix J
# KDAQ Equipment Inventory

| Location | Item | Description | Condition | Comments |
|---|---|---|---|---|
| 21st & Greenup | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| 21st & Greenup | PM2.5 Sampler | Partisol Plus 2025 Sequential | Fair | In Use |
| Baskett | Calibrator | Teledyne-API 700 E | Fair | In Use |
| Baskett | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Baskett | PM10 Sampler | Partisol 2000 | Good | In Use |
| Baskett | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | In Use |
| Baskett | PM2.5 Sampler | Partisol Plus 2025i Sequential | Good | In Use |
| Baskett | Zero Air Unit | Teledyne-API 701E Zero Air | Good | In Use |
| Bloodworth | Air Toxics- VOCs | Xontech 911a | Good | In Use |
| Bloodworth | PM10 Sampler | Partisol 2000 | Good | In Use |
| Buckner | Datalogger | ESC Model 8832 | Good | In Use |
| Buckner | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Buckner | Photometer | Teledyne-API 703E | Good | In Use |
| Buckner | Zero Air Unit | Teledyne-API 701 Zero Air | Fair | In Use |
| East Bend | Datalogger | ESC Model 8832 | Good | In Use |
| East Bend | Meteorological- Probe | 41372VC RH/Temp | Fair | In Use |
| East Bend | O3 Monitor | Teledyne-API T400 | Good | In Use |
| East Bend | Photometer | Teledyne-API 703E | Good | In Use |
| East Bend | Zero Air Unit | Teledyne-API 701 Zero Air | Fair | In Use |
| EKU | Lead Sampler- TSP | Tisch Model TE-5170DV-BL TSP | Good | In Use |
| EKU | Lead Sampler- TSP | Tisch Model TE-5170DV-BL TSP | Good | In Use |
| E-town | Datalogger | ESC Model 8832 | Good | In Use |
| E-town | O3 Monitor | Teledyne-API T400 | Good | In Use |
| E-town | Photometer | Teledyne-API 703E | Good | In Use |
| E-town | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | In Use |
| E-town | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| E-town | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| E-town | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| FIVCO | Air Toxics- VOCs/Carbonyls | ATEC 2200 | Fair | In Use |
| FIVCO | Calibrator | Teledyne-API T700 | Good | In Use |
| FIVCO | Datalogger | ESC Model 8832 | Good | In Use |
| FIVCO | Meteorological- Probe | 41372VC RH/Temp | Fair | In Use |
| FIVCO | NOx Monitor | Teledyne-API 200E | Good | In Use |
| FIVCO | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | In Use |
| FIVCO | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| FIVCO | SO2 Monitor | Teledyne-API T100 | Good | In Use |
| FIVCO | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| Franklin | Datalogger | ESC Model 8832 | Fair | In Use |
| Franklin | Meteorological- Probe | 41372VC RH/Temp | Fair | In Use |
| Franklin | Photometer | Teledyne-API 703E | Good | In Use |
| Franklin | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| Grayson Lake | Air Toxics- PAHs | PUF Air Sampler, Brushless | Good | In Use |
| Grayson Lake | Air Toxics- VOCs/Carbonyls | ATEC 2200-2, Dual Channel | Good | In Use |
| Grayson Lake | Datalogger | ESC Model 8832 | Good | In Use |
| Grayson Lake | Meteorological- Pressure | Barometric Pressure 61202V | Fair | In Use |
| Grayson Lake | Meteorological- Probe | 41372VC RH/Temp | Fair | In Use |
| Grayson Lake | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Grayson Lake | Photometer | Teledyne-API 703E | Good | In Use |
| Grayson Lake | PM10 Sampler | Partisol 2000 | Good | In Use |
| Grayson Lake | PM10 Sampler | Partisol 2000 | Good | In Use |
| Grayson Lake | PM2.5 Sampler | Partisol Plus 2025i Sequential | Good | In Use |
| Grayson Lake | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |

# KDAQ Equipment Inventory (Continued)

| Location | Item | Description | Condition | Comments |
|---|---|---|---|---|
| Hazard | Datalogger | ESC Model 8832 | Fair | In Use |
| Hazard | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Hazard | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | In Use |
| Hopkinsville | Datalogger | ESC Model 8832 | Fair | In Use |
| Hopkinsville | Photometer | Teledyne-API 703E | Good | In Use |
| Hopkinsville | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| Hopkinsville | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| JPRECC | Calibrator | Teledyne-API 700 E | Good | In Use |
| JPRECC | Datalogger | ESC Model 8832 | Good | In Use |
| JPRECC | NOx Monitor | Teledyne-API 200E | Good | In Use |
| JPRECC | O3 Monitor | Teledyne-API 400E | Fair | Backup/Spare |
| JPRECC | O3 Monitor | Teledyne-API T400 | Good | In Use |
| JPRECC | PM10 Sampler | Partisol 2000 | Good | In Use |
| JPRECC | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | In Use |
| JPRECC | PM2.5 Sampler | Partisol Plus 2025 Sequential | Fair | In Use |
| JPRECC | SO2 Monitor | Teledyne-API T100 | Good | In Use |
| Lewisport | Datalogger | ESC Model 8832 | Fair | In Use |
| Lewisport | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Lewisport | Photometer | Teledyne-API 703E | Good | In Use |
| Lewisport | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| Lexington Primary | Calibrator | Teledyne-API 700 E | Good | In Use |
| Lexington Primary | Datalogger | ESC Model 8832 | Good | In Use |
| Lexington Primary | NOx Monitor | Teledyne-API 200E | Good | In Use |
| Lexington Primary | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Lexington Primary | PM10 Sampler | Partisol 2000 | Good | In Use |
| Lexington Primary | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | In Use |
| Lexington Primary | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| Lexington Primary | SO2 Monitor | Teledyne-API T100 | Good | In Use |
| Lexington Primary | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| Lexington Primary | Zero Air Unit | Teledyne-API 701E Zero Air | Good | In Use |
| Mayfield Elementary | Lead Sampler- TSP | Tisch Model TE-5170DV-BL TSP | Good | In Use |
| Mayfield Elementary | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| Middlesboro | Datalogger | ESC Model 8832 | Good | In Use |
| Middlesboro | Meteorological- Probe | 41372VC RH/Temp | Fair | In Use |
| Middlesboro | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Middlesboro | Photometer | Teledyne-API 703E | Good | In Use |
| Middlesboro | PM2.5 Sampler | Partisol Plus 2025i Sequential | Good | In Use |
| Middlesboro | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| Nicholasville | Calibrator | Teledyne-API 700 E | Fair | In Use |
| Nicholasville | Meteorological- Probe | Humidity and Temperature | Fair | In Use |
| Nicholasville | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Nicholasville | SO2 Monitor | Teledyne-API T100 | Good | In Use |
| Nicholasville | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| NKU | Calibrator | Teledyne-API T700 | Good | In Use |
| NKU | Datalogger | ESC Model 8832 | Good | In Use |
| NKU | NOx Monitor | Teledyne-API 200E | Good | In Use |
| NKU | O3 Monitor | Teledyne-API T400 | Good | In Use |
| NKU | PM2.5 Continuous | Thermo Scientific TEOM 1405 | New | In Use |
| NKU | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| NKU | SO2 Monitor | Teledyne-API T104 | Good | In Use |
| NKU | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |

# KDAQ Equipment Inventory (Continued)

| Location | Item | Description | Condition | Comments |
|---|---|---|---|---|
| Owensboro Primary | Calibrator | Teledyne-API T700 | Good | In Use |
| Owensboro Primary | Datalogger | ESC Model 8832 | Good | In Use |
| Owensboro Primary | NOx Monitor | Teledyne-API 200E | Good | In Use |
| Owensboro Primary | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Owensboro Primary | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | In Use |
| Owensboro Primary | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| Owensboro Primary | PM2.5 Sampler | Partisol Plus 2025i Sequential | Good | In Use |
| Owensboro Primary | SO2 Monitor | Teledyne-API T101 | Good | In Use |
| Owensboro Primary | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| Paducah Regional Office | O3 Monitor | Teledyne-API T400 | Good | Backup/Spare |
| Pikeville | Datalogger | ESC Model 8832 | Fair | In Use |
| Pikeville | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Pikeville | Photometer | Teledyne-API 703E | Good | In Use |
| Pikeville | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | In Use |
| Pikeville | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| Pikeville | Zero Air Unit | Teledyne-API 701E Zero Air | Good | In Use |
| Pikeville | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| Sebree | Datalogger | ESC Model 8832 | Good | In Use |
| Sebree | SO2 Monitor | Teledyne-API T100 | Good | In Use |
| Sebree | Zero Air Unit | Teledyne-API 701 Zero Air | Fair | In Use |
| Sebree | Calibrator | Teledyne-API 700 E | Good | In Use |
| Sent to Manufacturer | Zero Air Unit | Teledyne-API 701 Zero Air | Poor | Under Repair |
| Shepherdsville | Datalogger | ESC Model 8832 | Fair | In Use |
| Shepherdsville | Photometer | Teledyne-API 703E | Good | In Use |
| Shepherdsville | Zero Air Unit | Teledyne-API 701 Zero Air | Fair | In Use |
| Smithland | Datalogger | ESC Model 8832 | Good | In Use |
| Smithland | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Smithland | Photometer | Teledyne-API 703E | Good | In Use |
| Smithland | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| Smiths Grove | Datalogger | ESC Model 8832 | Fair | In Use |
| Smiths Grove | O3 Monitor | Teledyne-API T400 | Good | Backup/Spare |
| Smiths Grove | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Smiths Grove | Photometer | Teledyne-API 703E | Good | In Use |
| Smiths Grove | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | In Use |
| Smiths Grove | PM2.5 Sampler | Partisol Plus 2025i Sequential | Good | In Use |
| Smiths Grove | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | In Use |
| Smiths Grove | Zero Air Unit | Teledyne-API 701 Zero Air | Fair | In Use |
| Somerset | Datalogger | ESC Model 8832 | Fair | In Use |
| Somerset | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Somerset | Photometer | Teledyne-API 703E | Good | In Use |
| Somerset | PM2.5 Sampler | Partisol Plus 2025i Sequential | Good | In Use |
| Somerset | Zero Air Unit | Teledyne-API 701 Zero Air | Good | In Use |
| TSB- Technical Support Shop | Air Toxics- VOCs | Xontech 911a | Good | Spare |
| TSB- Technical Support Shop | Air Toxics- VOCs/Carbonyls | ATEC 2200 | Fair | Spare |
| TSB- Technical Support Shop | Air Toxics- VOCs/Carbonyls | ATEC 2200-2, Dual Channel | Good | Spare |
| TSB- Technical Support Shop | Air Toxics- VOCs/Carbonyls | ATEC 2200-2, Dual Channel | Good | Spare |
| TSB- Technical Support Shop | Air Toxics- VOCs/Carbonyls | ATEC 2200-2, Dual Channel | Fair | Spare |
| TSB- Technical Support Shop | Air Toxics- VOCs/Carbonyls | ATEC 2200-2, Dual Channel | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API 700 E | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API 700 E | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API 700 E | Good | Spare |

# KDAQ Equipment Inventory (Continued)

| Location | Item | Description | Condition | Comments |
|---|---|---|---|---|
| TSB- Technical Support Shop | Calibrator | Teledyne-API 700 E | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API 700 E | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API 700 E | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API 700 E | Fair | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API 700 E | Fair | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API T700 | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API T700 | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Thermo 49C-PS | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API T700 | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API T700 | Good | Spare |
| TSB- Technical Support Shop | Calibrator | Teledyne-API T700 | Good | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Good | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Good | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Good | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Good | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Fair | Spare |
| TSB- Technical Support Shop | Datalogger | Agilaire Model 8872 | Good | New |
| TSB- Technical Support Shop | Datalogger | Agilaire Model 8872 | Good | New |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Good | Spare |
| TSB- Technical Support Shop | Datalogger | ESC Model 8832 | Good | Spare |
| TSB- Technical Support Shop | Lead Sampler- TSP | Tisch Model TE-5170DV-BL TSP | Good | Spare |
| TSB- Technical Support Shop | Lead Sampler- TSP | Tisch Model TE-5170DV-BL TSP | Good | Spare |
| TSB- Technical Support Shop | Lead Sampler- TSP | Tisch Model TE-5170DV-BL TSP | Good | Spare |
| TSB- Technical Support Shop | Lead Sampler- TSP | Tisch Model TE-5170DV-BL TSP | Good | Spare |
| TSB- Technical Support Shop | Meteorological- Pressure | Barometric Pressure 61202V | Fair | Spare |
| TSB- Technical Support Shop | Meteorological- Probe | Humidity and Temperature 41382VC | Fair | Spare |
| TSB- Technical Support Shop | Meteorological- Solar | Solar Radiation CMP4 | Fair | Spare |
| TSB- Technical Support Shop | NOx Monitor | Teledyne-API 200E | Good | Spare |
| TSB- Technical Support Shop | NOx Monitor | Teledyne-API 200E | Fair | Spare |
| TSB- Technical Support Shop | NOx Monitor | Teledyne-API 200E | Fair | Spare |
| TSB- Technical Support Shop | NOx Monitor | Teledyne-API 200E | Fair | Spare |
| TSB- Technical Support Shop | NOx Monitor | Teledyne-API 200E | Fair | Spare |
| TSB- Technical Support Shop | NOx Monitor | Teledyne-API 200E | Fair | Spare |
| TSB- Technical Support Shop | NOx Monitor | Teledyne-API 200E | Fair | Spare |

# KDAQ Equipment Inventory (Continued)

| Location | Item | Description | Condition | Comments |
|---|---|---|---|---|
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Fair | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Fair | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Fair | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Fair | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Fair | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Fair | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Fair | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Fair | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Fair | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Fair | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API 400E | Poor | Under Repair |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API T400 | Good | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API T400 | Good | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API T400 | Good | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API T400 | Good | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API T400 | Good | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API T400 | Good | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API T400 | Good | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API T400 | Good | Spare |
| TSB- Technical Support Shop | O3 Monitor | Teledyne-API T400 | Good | Spare |
| TSB- Technical Support Shop | Photometer | Teledyne-API 703E | Good | Spare |
| TSB- Technical Support Shop | Photometer | Teledyne-API 703E | Good | Spare |
| TSB- Technical Support Shop | Photometer | Teledyne-API 703E | Good | Spare |
| TSB- Technical Support Shop | Photometer | Teledyne-API 703E | Good | Spare |
| TSB- Technical Support Shop | Photometer | Teledyne-API 703E | Good | Spare |
| TSB- Technical Support Shop | Photometer | Teledyne-API 703E | Good | Spare |
| TSB- Technical Support Shop | Photometer | Teledyne-API 703E | Good | Spare |
| TSB- Technical Support Shop | Photometer | Teledyne-API 703E | Good | Spare |
| TSB- Technical Support Shop | Photometer | Teledyne-API 703E | Good | Spare |
| TSB- Technical Support Shop | PM10 Sampler | Partisol 2000 | Poor | Spare |
| TSB- Technical Support Shop | PM10 Sampler | Partisol 2000 | Poor | Spare |
| TSB- Technical Support Shop | PM10 Sampler | Partisol 2000 | Good | Spare |
| TSB- Technical Support Shop | PM10 Sampler | Partisol 2000 | Good | Spare |
| TSB- Technical Support Shop | PM10 Sampler | Partisol 2000 | Good | Spare |
| TSB- Technical Support Shop | PM10 Sampler | Partisol 2000 | Good | Spare |
| TSB- Technical Support Shop | PM10 Sampler | Partisol 2000 | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Continuous | Thermo Scientific TEOM 1405 | New | Spare |
| TSB- Technical Support Shop | PM2.5 Continuous | Thermo Scientific TEOM 1405 | New | Spare |
| TSB- Technical Support Shop | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Continuous | Thermo Scientific TEOM 1400 | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Continuous | Thermo Scientific TEOM 1400 | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Continuous | Thermo Scientific TEOM 1400 | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Continuous | Thermo Scientific TEOM 1405 | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025i Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |

# KDAQ Equipment Inventory (Continued)

| Location | Item | Description | Condition | Comments |
|---|---|---|---|---|
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025i Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025 Sequential | Good | Spare |
| TSB- Technical Support Shop | PM2.5 Sampler | Partisol Plus 2025i Sequential | Good | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API 100E | Fair | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API 100E | Fair | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API 100E | Fair | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API 100E | Fair | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API 100E | Fair | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API T100 | Good | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API T100 | Good | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API T100 | Good | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API T100 | Good | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API T100 | Good | Spare |
| TSB- Technical Support Shop | SO2 Monitor | Teledyne-API T100 | Good | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701 Zero Air | Good | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701 Zero Air | Good | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701 Zero Air | Good | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701E Zero Air | Good | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701 Zero Air | Good | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701 Zero Air | Good | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701 Zero Air | Fair | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701 Zero Air | Fair | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701 Zero Air | Fair | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701 Zero Air | Fair | Spare |
| TSB- Technical Support Shop | Zero Air Unit | Teledyne-API 701 Zero Air | Fair | Spare |
| TSB-Quality Assurance Shop | Audit Calibrator | Environics 6103 | Fair | In Use |
| TSB-Quality Assurance Shop | Audit Calibrator | Environics 6100 | Fair | In Use |
| TSB-Quality Assurance Shop | Audit Calibrator | Environics 6100 | Fair | In Use |
| TSB-Quality Assurance Shop | Audit Calibrator | Environics 6103 | Fair | In Use |
| TSB-Quality Assurance Shop | Audit Calibrator | Environics Multigas & Ozone Transfer Std | Good | In Use |
| TSB-Quality Assurance Shop | Audit Calibrator | Environics Multigas & Ozone Transfer Std | Good | In Use |
| TSB-Quality Assurance Shop | Audit Calibrator | Environics Multigas & Ozone Transfer Std | Good | In Use |
| TSB-Quality Assurance Shop | Audit Calibrator | Environics Multigas & Ozone Transfer Std | Good | In Use |
| TSB-Quality Assurance Shop | Zero Air Unit | Teledyne-API Model 751H Zero Air | Good | In Use |
| TSB-Quality Assurance Shop | Zero Air Unit | Teledyne-API Model 751H Zero Air | Good | In Use |
| TSB-Quality Assurance Shop | Zero Air Unit | Teledyne-API Model 751H Zero Air | Good | In Use |
| TSB-Quality Assurance Shop | Zero Air Unit | Teledyne-API Model S7000 Zero Air | Fair | In Use |
| TSB-Quality Assurance Shop | Zero Air Unit | Teledyne-API Model S7000 Zero Air | Fair | In Use |
| TSB-Quality Assurance Shop | Zero Air Unit | Teledyne-API Model 751H Zero Air | Good | In Use |
| TVA | Air Toxics- VOCs | Xontech 911a | Good | In Use |
| TVA | Air Toxics- VOCs | Xontech 911a | Good | In Use |
| Worthington | Calibrator | Teledyne-API 700 E | Good | In Use |
| Worthington | Datalogger | ESC Model 8832 | Fair | In Use |
| Worthington | O3 Monitor | Teledyne-API T400 | Good | In Use |
| Worthington | SO2 Monitor | Teledyne-API T100 | Good | In Use |
| Worthington | Zero Air Unit | Teledyne-API 701E Zero Air | Good | In Use |

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# APPENDIX K

# PUBLIC COMMENTS

**KENTUCKY DIVISION FOR AIR QUALITY**
**AMBIENT AIR MONITORING NETWORK**

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

A public comment period on the KENTUCKY DIVISION FOR AIR QUALITY AMBIENT AIR MONITORING NETWORK PLAN 2017 was held from May 19, 2017, through June 18, 2017.

## Comments Received 6/18/2017

The Division received comments from Kosmos Cement Company, via Bingham Greenebaum Doll LLP, Counsel for Kosmos Cement. The comments relate solely to Appendix E- Part B of the Annual Ambient Air Monitoring Network Plan: "LMAPCD Preliminary Siting Evaluation for Kosmos Cement Company." The comments received are directed towards to the network operated by LMAPCD, as such LMAPCD is responsible for providing a response. The comments are included in the following pages of this network plan.

## Response to Comments

**LMAPCD acknowledges receipt of these public comments and will respond separately.**

June 16, 2017

VIA ELECTRONIC MAIL

Jennifer F. Miller
Environmental Control Supervisor
Kentucky Division for Air Quality
300 Sower Blvd, 2nd Floor
Frankfort, KY 40601
Jenniferf.Miller@ky.gov

Rachael Hamilton
District Secretary - Treasurer
Louisville Metro Air Pollution Control District
701 Ormsby Avenue
Louisville, KY 40203
Rachael.Hamilton@louisvilleky.gov

RE: Public Comments Regarding Louisville Metro Air Pollution Control District's Proposed Changes to the 2017 Kentucky Annual Ambient Air Monitoring Network, Published for Public Comment on May 19, 2017

Dear Ms. Miller and Ms. Hamilton:

Please see Kosmos Cement Company's attached public comments regarding the Louisville Metro Air Pollution Control District's ("District's") "Preliminary $SO_2$ Monitoring Siting Evaluation for Kosmos Cement Company Monitoring Plan" ("Preliminary Siting Evaluation") included in the 2017 Kentucky Annual Ambient Air Monitoring Network Plan recently released by the Kentucky Division for Air Quality for public comment. Kosmos is submitting these formal comments to KDAQ and the District before the close of the 2017 KY AAMNP public comment period on June 18, 2017.

We appreciate the Agencies' consideration of our comments.

Sincerely,

Lillian DePrimo
Director, Environmental

6212 Cement Plant Road, Knoxville, TN 37924. USA, (865) 541-5500, (865) 541-5595

Cc: Beverly Banister, Director, Air, Pesticides, and Toxics Management Division, U.S. EPA, Region IV
Keith Talley, Director, LMAPCD
Sean Alteri, Director, Kentucky Division for Air Quality
Scott Smith, Smith Management Group
Kelly Bartley, Bingham Greenebaum Doll LLP

**PUBLIC COMMENTS BY KOSMOS CEMENT COMPANY**
**2017 Kentucky Annual Ambient Air Monitoring Network Plan**
**Published for Public Comment May 19, 2017**

All comments raised herein relate to Appendix E- Part B of the 2017 Kentucky Annual Ambient Air Monitoring Network Plan (2017 KY AAAMNP) published for public comment on May 19, 2017. Appendix E-Part B is titled: "LMAPCD Preliminary $SO_2$ Siting Evaluation for Kosmos Cement Company" (hereinafter "Preliminary Siting Evaluation").

**A. The Preliminary Siting Evaluation should be revised to ensure consistency with the ABO.**

The Agreed Board Order ("ABO") that calls for the monitoring plan contemplated by the Preliminary Siting Evaluation includes certain commitments relating to Kosmos Cement Company ("Kosmos"). Some statements within the Preliminary Siting Evaluation are inconsistent with the ABO. Kosmos requests that the final Siting Evaluation be revised to be consistent with the ABO or alternatively, that the final Siting Evaluation be revised to include a statement providing that any summary of the terms of the ABO is general only and that the ABO governs the terms covered thereunder. Statements inconsistent with the ABO include:

- The AAMNP contains broad statements about costs and financial liabilities for Kosmos. Pursuant to the ABO $SO_2$ Monitoring Plan, Kosmos agreed to pay the costs of establishing the monitoring site and associated equipment not to exceed a specified amount. The statements, as written on Pages 135, 145 and 154 of the 2017 KY AAMNP, could be read to imply that Kosmos will be responsible for an undefined cost associated for construction and purchase of instrumentation, which is not accurate.

- On page 154 of the 2017 AAMNP, the District indicates that the subject monitor will begin operation by January 1, 2018. As provided in the ABO, the monitor will begin operation January 1, 2018 or 6 months from the date the site monitor location is approved by U.S. EPA, whichever is later. This language should be clarified in the final Siting Evaluation.

**B. The Preliminary Siting Evaluation should be revised to clarify the description of the Kosmos Facility.**

Section 1.b. of the Preliminary Siting Evaluation describes the Kosmos Facility as: "cement kiln and associated processes, (including barge unloading and transfer, limestone handling, raw material crushing, limestone storage/reclaim, silos, raw mills, kiln feed system, preheater, kiln bypass system, coal handling, coal mill system, clinker cooler, clinker handling and storage, finishing mills, lime slurry system, gasoline dispensing facility, rail/barge loading, truck loading, and cold solvents cleaner)." Kosmos suggests that it is more appropriate to describe the Kosmos facility as a Portland Cement Manufacturer or Portland Cement Plant; these terms are consistent with source category descriptions used by US EPA which regulates air emissions from the facility under 40 CFR Part 60 Subpart F New Source Performance Standard (NSPS) and 40 CFR Part 63 Subpart LLL National Emission Standard for Hazardous Air Pollutants (NESHAP).

**C. The Final Siting Evaluation should clarify the basis for the siting criteria and the method by which the data generated by the monitor will be evaluated.**

The modeling and other analyses outlined and discussed in the Preliminary Siting Evaluation were conducted only for the purposes supporting the District's proposed siting of the Kosmosdale monitor at a location where the District has determined that maximum impacts from explicitly modeled sources (Kosmos and LG&E Mill Creek) are expected to occur. Source contributions to any future monitored exceedance cannot be determined by the modeling conducted to date and instead require evaluation of actual meteorological conditions and source emission profiles paired in time with an exceedance event(s). Because the regulatory mechanism for the siting and operation of the proposed monitor is not clear (see comment E. below), Kosmos submits that the Final Siting Evaluation should include language clarifying that the analyses undertaken in order place the monitor do not reflect, indicate or otherwise direct a pre-determination of source contributions to any future monitored exceedance. It is Kosmos' understanding that, pursuant to the ABO, if the proposed Kosmosdale Monitor produces a 3-year design value which exceeds the $SO_2$ NAAQS, the District and Kosmos will perform a subsequent analysis (using appropriate statistical and engineering analyses) to determine the source or sources which caused or contributed to monitored violations. Using the procedures outlined in the ABO, any necessary remedial measures leading to compliance with $SO_2$ NAAQS will then be identified and implemented under the time frames identified in the ABO.

In accordance with this comment, Kosmos requests that the Preliminary Siting Evaluation be revised to add the following language within the "Background" section:

> The modeling and other analyses utilized to support the siting of the Kosmosdale monitor as outlined and discussed in this Siting Evaluation were conducted only for the purposes of appropriately placing the monitor at a location where the District has determined that maximum impacts from explicitly modeled sources (Kosmos and LG&E Mill Creek) are expected to occur. Source contributions to any future monitored exceedance (should such occur) will not be determined by the analyses supporting this Siting Evaluation and will be determined instead, at the conclusion of the three year monitoring period, through evaluation of actual meteorological conditions and source emission or other occurrence/event profiles paired in time with an exceedance event(s) using appropriate statistical and engineering analyses. Specifically, if the proposed Kosmosdale Monitor produces a 3-year design value which exceeds the $SO_2$ NAAQS, the District and Kosmos will perform subsequent analyses to determine the source or sources which caused or contributed to monitored violations and, using the procedures outlined in the ABO, determine what, if any, remedial measures by Kosmos are necessary to lead to compliance with the 1-hour $SO_2$ NAAQS.

**D. The District's finding that Kosmos emissions are under-studied is not necessary for the Siting Evaluation and otherwise is not adequately supported.**

i. In Section 2.a.ii. of the Preliminary Siting Evaluation the District concludes that Kosmos' emissions are under-studied based on analysis of wind patterns and relative emission rates from 2009-2011. Kosmos does not believe that such conclusion is necessary to the Siting Evaluation. Kosmos requests that this discussion be deleted from the final Siting Evaluation.

ii. In the alternative, to the extent the District determines that a finding that Kosmos' emissions are under-studied is necessary for approval of the Siting Evaluation (if it is determined that the monitor must be sited in accordance with requirements for 40 CFR Part 58 neighborhood scale monitors for example), no discussion or justification of that analysis is provided in the Preliminary Siting Evaluation or the referenced Final Technical Support Document.[1] Kosmos' review of meteorological data for wind speed and direction combined with source's proximity to the Watson Lane site indicate that Kosmos $SO_2$ emissions are adequately characterized by the Watson Lane Monitor given its stated monitoring objectives, spatial scale (neighborhood), and Area Representativeness.

**E. The Preliminary Siting Evaluation should be revised to clarify siting methodology.**

i. The ABO $SO_2$ Monitoring Plan provides for the monitoring that is the subject of the Siting Evaluation to be conducted in accordance with 40 CFR Part 58 and the Monitoring TAD "as appropriate in the professional judgment of the District." Kosmos submits that, as currently drafted, reliance on the Monitoring TAD, which implements the U.S. EPA's $SO_2$ NAAQS Implementation Data Requirements Rule ("DRR"), has not been adequately justified or otherwise adequately explained in the Preliminary Siting Evaluation given that the DRR is not applicable to Kosmos or the monitoring at issue.[2] If the District is to rely upon the Monitoring TAD to inform the location of the proposed monitor, the Siting Evaluation should be revised to justify reliance on said guidance document given that the DRR is not applicable to the monitoring.

ii. To the extent that reliance on the Monitoring TAD is justified, Kosmos again requests that the Preliminary Siting Evaluation be revised to confirm that the application of said guidance including any modeling conducted in connection with the same, only informs the District's judgment regarding proper placement of the monitor at a location where the maximum impacts are predicted to occur from the explicitly modeled sources (Kosmos and LG&E Mill Creek) and is not included to pre-determine source contributions, including the relative contribution of Kosmos, to any future monitored exceedance. Kosmos reserves its right to object to or otherwise comment on, the use of any modeling or other analyses used to support the siting of the monitor to pre-determine or otherwise support conclusions regarding Kosmos' relative

[1] Final Technical Support Document, July 2013, Kentucky First Round of Nonattainment Area Designations for the 2010 SO2 Primary NAAQS, prepared by the Region 4 U.S. EPA [Docket ID: EPA-HQ-OAR-2012-0233] https://www.regulations.gov/document?D=EPA-HQ-OAR-2012-0233-0308

[2] Conducting new modeling to aid in candidate site identification for an ambient air quality monitor under the DRR is not warranted unless the Kosmos facility was identified as an Applicable Source (as defined in 40 CFR §51.1200) in a submission made pursuant to 40 CFR §51.1202 by January 15, 2016, as required under 40 CFR §51.1203.

contribution to any future monitoring exceedance and reserves all arguments and defenses relating thereto. Such arguments and defenses include but are not limited to:

- Kosmos' previous comments on the modeling conducted by the District to date, and now used to inform siting, have not been addressed. See Kosmos' Public Comments Regarding 1-Hour SO2 Attainment Plan for the Louisville/Jefferson County, Kentucky Nonattainment Area, Published for Public Comment on November 30, 2016 (submitted January 6, 2017). The District must respond to Kosmos' previous specific comments regarding the modeling conducted to date to the extent that modeling, or the inputs for the same, are used to draw or infer any conclusions regarding Kosmos' relative contribution to any future modeled exceedance based on three year design values.

If contrary to Kosmos' understanding, it is the District's intent to expand the DRR guidance or otherwise use the analyses supporting the present Siting Evaluation for anything beyond siting, Kosmos should be provided notice of the same through a revised draft Siting Evaluation, and given an opportunity to provide more detailed comments regarding the basis for its position that the modeling to date does not appropriately inform or support conclusions regarding source contribution of an actual monitored violation.

**F. The Preliminary Siting Evaluation should be updated to include information concerning the applicable Quality Assurance Project Plan for the monitor.**

i. The Preliminary Siting Evaluation does not include a site-specific Quality Assurance Project Plan (QAPP) for the Proposed Kosmosdale Monitor. It is Kosmos' understanding that a site-specific QAPP is necessary to establish procedures for the sampling methodology, measurement quality control, equipment maintenance, instrument selection/procurement, system calibration, data collection/validation, and data quality assessments consistent with the QAPP contained within the $SO_2$ Monitoring Siting Evaluation Under the DRR for BREC and Century Aluminum provided at Appendix H of the 2016 Kentucky Ambient Air Monitoring Network Plana (a DRR monitoring site for which KDAQ is both the operator and auditor). The Preliminary Siting Evaluation should be revised to include a site-specific QAPP with adequate opportunity for comment from Kosmos. Alternatively, the absence of a site-specific QAPP should be justified or otherwise explained in the Siting Evaluation.

ii. To the extent not addressed as part of the above comment at Section F.i., the Preliminary Siting Evaluation should be revised to address the following quality assurance elements:

- The Preliminary Siting Evaluation should be revised to identify the instrument selections, including specification sheets that are being proposed by the District for the monitoring of ambient $SO_2$ concentrations and meteorological data as adequate and appropriate to produce excellent resolution, reliability and optimum data recovery.
- The Preliminary Siting Evaluation should be revised to provide for advance approval from the U.S. EPA to re-locate, de-commission and/or shut down the Kosmosdale air monitoring station in accordance with 40 CFR Part 58 upon collection of thirty-seven months of reportable data from the monitoring station. Kosmos submits that because the regulatory mechanism for the subject monitor is not defined (DRR is not applicable; additional neighborhood area scale monitor not justified under 40 CFR Part 58), and further because the ABO, the mechanism authorizing the monitoring, provides for only a three-year monitoring period for collection of data, advance approval of such action is warranted and appropriate.
- The Siting Evaluation should be revised in order to provide that after construction of the monitoring station but prior to commissioning for reporting of reportable data, a monitor shakedown period of at least thirty (30) days shall be allowed to properly install and warm-up the monitor, perform start-up calibration, and validate calibration. Initial calibration and validation shall be performed in accordance with the Division for Air Quality's Measurement of $SO_2$ (technical support document TS-17-2 Rev No 14, December 2016) to ensure proper operation of the $SO_2$ monitor prior to day one of the 3-year monitoring period.

**G. Kosmos continues to evaluate the potential $SO_2$ monitoring site location and will inform the District as to any identified logistical concerns.**

In the Preliminary Siting Evaluation, the District's stated *best receptor site* for placement of an ambient $SO_2$ monitor is located within a Kosmos-owned parcel at the GPS coordinates 38° 01' 46.6" N/85° 54' 41.3 W (WGS84 Datum). The proposed location is approximately 1,300-ft southwest of Kosmos Cement Plant, 150-ft southeast of the railroad and approximately 1,000-ft east of Dixie Highway (U.S. Route 31W). Upon initial review, Kosmos has not identified environmentally sensitive areas (e.g., floodplain and wetlands) or other logistical concerns that preclude placement of the ambient monitor at the District's desired location. However, Kosmos continues to evaluate the proposed monitor site and potential access routes to the proposed site and is prepared to participate in future discussions with the District regarding an appropriate access route for monitoring personnel which minimizes environmental impacts and adequately addresses personnel safety concerns.

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