



## **2016-2017 Ohio Air Monitoring Network Plan for the Gavin/Kyger Sulfur Dioxide Monitoring Network**

**Division of Air Pollution Control  
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# Ohio 2016-2017 Air Monitoring Network for the Gavin/Kyger Sulfur Dioxide Monitoring Network

## Requirements and Guidance

Under US EPA's Data Requirements Rule (DRR) to address the 2010 1-hour sulfur dioxide (SO<sub>2</sub>) national ambient air quality standard (NAAQS) (40 CFR Part 51, Subpart BB), Ohio is required to characterize concentrations of SO<sub>2</sub> across the state through either ambient air quality monitoring or air quality modeling analysis where sources of SO<sub>2</sub> emissions have annual actual SO<sub>2</sub> emissions of 2,000 tons or more. These monitoring and modeling data may be used in future determinations of attainment status. Ohio EPA is electing to use ambient air quality monitoring to characterize air quality around two sources that meet this criteria: the AEP General James M. Gavin power plant and the OVEC Kyger Creek power plant (herein in referred to as Gavin/Kyger).

To assist states in developing ambient air quality monitoring networks that satisfy the requirements of the DRR, US EPA issued draft guidance entitled "SO<sub>2</sub> NAAQS Designations Source-Oriented Monitoring Technical Assistance Document" (December 2013) (herein referred to as Modeling TAD). American Electric Power (AEP), Ohio Valley Electric Corporation (OVEC), Shell Engineering, and Ohio EPA have worked jointly to develop a monitoring network that meets the requirements of the Modeling TAD and US EPA's DRR. In addition, US EPA Region V staff were consulted routinely throughout the process.

In addition, Ohio EPA follows the federal general guidance and meets all the requirements for air monitoring according to 40 CFR Part 58, Appendix A, C, D and E.<sup>1</sup>

As required by 40 CFR 58.10, Ohio EPA is providing this revised annual monitoring network plan to address the Gavin/Kyger monitoring network for public review and comment. Ohio EPA will submit this plan with any comments received to the US EPA Region V Regional Administrator. There will be a 30-day comment period for the public to make comments on the plan and those comments will also be submitted to Region V.

## Gavin/Kyger Network Changes

This revised plan for Ohio's Air Monitoring Network for 2016-2017 is to make changes as required to fulfill the requirements of US EPA's DRR for ambient air monitoring around the Gavin/Kyger source area. The objective of monitoring in this area is to monitor maximum concentrations from these sources.

A fundamental consideration for all air monitoring projects and sites is that funding resources be available to operate and maintain the sites and equipment, to provide sample analyses and for data collection and reporting. OVEC will be funding all necessary equipment for three new monitors in the network (Hill, Cheshire School, and Lakin (WV) sites). In addition, for

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<sup>1</sup> This includes the requirement for collecting and reporting the high 5-minute value for each hour.

those three monitors, OVEC will be contracting with Shell Engineering to manage the monitors and ensure acceptable, quality controlled data is supplied to Ohio EPA in order to determine compliance with the 2010 SO<sub>2</sub> NAAQS. Ohio EPA will be responsible for reporting the data to the Air Quality System (AQS) and performing an annual performance evaluation. OVEC/Shell will also perform an annual performance evaluation. Details of the roles between OVEC/Shell and Ohio EPA will be documented in the Gavin/Kyger Quality Assurance Project Plan (QAPP) developed specifically for these three sites.

A fourth monitor is being relocated from an existing Ohio EPA site (Pomeroy monitor 39-105-0003, due to building issues) to a new site that has been determined better suited for its original monitoring purpose which was source-oriented monitoring of the Gavin power plant. This site will be operated solely by Ohio EPA and the QAPP for this monitor will fall under Ohio EPA's existing statewide sulfur dioxide monitoring QAPP.

All four monitors will be a part of Ohio's State or Local Air Monitoring Stations (SLAMS) Network and Ohio EPA will be playing a significant role in the quality assurance and quality control of the entire Gavin/Kyger monitoring network. In accordance with 40 CFR 58.11(a)(1), all parties shall follow the applicable quality assurance criteria contained in 40 CFR Part 58, Appendix A when operating this SLAMS network.

The four monitors will be located in the Point Pleasant Micropolitan Statistical Area under the care of OVEC/Shell Engineering, Ohio EPA's Central Office and Ohio's EPA's Southeast District Office (SEDO). Three of the monitors are located in Gallia County, Ohio and a fourth monitor is located in Mason County, West Virginia. Ohio EPA and West Virginia Department of Environmental Quality are in agreement with Ohio EPA being the primary quality agency for all four monitors and they will fall within Ohio EPA's Central Primary Quality Assurance Organization (PQAO, 1453).

## Gavin/Kyger Siting Design

Initial monitor siting was conducted using the most up-to-date version of AERMOD, version 15181. To evaluate potential monitor locations, two distinct modeling analyses were conducted. The first analysis examined the location of the highest hourly and 3-year design value modeled using actual 2012 to 2014 emissions from the Gavin and Kyger Creek Power Plants. Modeling was conducted using several sets of meteorological data, years 2012 to 2014:

- Default Huntington (HTS)
- Huntington with LOWWIND2 option
- Huntington with LOWWIND3 option
- Charles Yeager Airport data

Contour plots of the modeled impacts from each meteorological data set were created and superimposed to identify potential monitor sites. Contour plots of maximum one-hour impacts are presented Figures 1-5 in Appendix A. Contour plots of maximum three-year design values are shown in Figures 6-10 of Appendix A. The results of this analysis demonstrate that the area north of Cheshire, Ohio and Lakin, West Virginia as well as the hilly terrain to the south of Kyger Creek Power Plant were consistently impacted under all meteorological conditions modeled.

A second modeling analysis was conducted following the Modeling TAD. In this analysis, Ohio EPA modeled normalized actual emissions. Receptors were assigned a rank based on the modeled 3-year design value. A subset of receptors from this dataset, representing the highest 620 maximum design values, was again modeled using the MAXDAILY output option. From these data, a second rank, based on the number of maximum daily values recorded at each monitor was assigned. Lastly, receptors were assigned an overall rank according to both the design value and frequency ranks. As with the previous analysis, the highest overall receptors were located in the area north of Cheshire and in the hilly terrain to the south of Kyger Creek Power Plant. Details of this analysis are presented in Figures 11 and 12 of Appendix A.

OVEC/Shell also performed a field visit to determine the suitability of locations for the three monitors that will be operated and maintained by OVEC/Shell based upon the results outlined above. This field visit focused on areas that demonstrated, via the modeling analysis presented in Appendix A, as representing areas of both high modeled impacts and frequent occurrences of maximum daily impacts. Additional practical concerns, such as the availability of power and accessibility were also considered during the initial field visit. Initial sites were selected and those details are also included in Figures 17-21 of Appendix A. Subsequently, Ohio EPA performed a site visit to determine the suitability of relocating the Pomeroy monitor to the Guiding Hands location. The site was determined suitable and Ohio EPA is currently working with the building owners to secure an agreement to use the property.

In addition to the above work, on October 17, 2016, Ohio EPA staff performed a siting evaluation of the three monitors that will be sited and maintained by OVEC/Shell. Absent establishment of exact monitoring probe locations, the suitability of each site was conservatively assessed for worst-case scenarios referenced in Table E-4 of Appendix E to 40 CFR Part 58.

This evaluation can be found in Appendix B. Note, this evaluation identified the need for tree removal at the Hill site for the meteorology tower. OVEC/Shell are working on addressing this. A final site evaluation of these three sites, and the Ohio EPA Guiding Hands site, will be conducted by Ohio EPA prior to beginning official operation by January 1, 2017.

Appendix C contains a map of the Gavin/Kyger monitoring network and Appendix D contains a template of the monitoring site description details for each of the four sites individually.

These sites are currently in their final phases of implementation and installation/relocation, therefore, minor changes may be necessary to certain elements of this plan or the attached documents (e.g, final lat/long coordinates, AQS numbers, etc.). Ohio EPA commits to updating this monitoring plan, and associated documents, during the next monitoring plan submittal cycle due July 1, 2017.

## 2016-2017 Ohio Gavin/Kyger Air Monitoring Network Summary Table

AQS ID # Air Agency	County/ Address	Latitude	Longitude	Parameter/ Method	Analysis	Schedule	Monitoring Objective	Spatial Scale	Method Code/ Comments
<b>SEDO</b>									
	<b>Meigs Co.</b>								
39-105-0003	117 Memorial Dr., Pomeroy	39.03849	-82.0459	Sulfur dioxide	Pulsed Fluorescence	Continuous	Source-oriented	Neighborhood	(060) Thermo 43C
	Site discontinued in 2016 and relocated beginning 1/1/17.								
	<b>Gallia Co.</b>								
	Guiding Hands (relocated 39-105-0003)								(060) Thermo 43C. This equipment was at Pomeroy, and is moving to the new Guiding Hands site. This site will be operated by OEPA
39-053-xxxx		38.949911	-82.110097	Sulfur dioxide	Pulsed Fluorescence	Continuous	Source-oriented	Neighborhood	
39-053-xxxx	Hill (new)	38.894970	-82.148930	Sulfur dioxide	Pulsed Fluorescence	Continuous	Source-oriented	Neighborhood	See footnote <sup>1</sup>
39-053-xxxx	Cheshire School (new)	38.950192	-82.121453	Sulfur dioxide	Pulsed Fluorescence	Continuous	Source-oriented	Neighborhood	See footnote <sup>1</sup>
	<b>Mason Co., WV</b>								
54-053-xxxx	Lakin (new)	38.957680	-82.089510	Sulfur dioxide	Pulsed Fluorescence	Continuous	Source-oriented	Neighborhood	See footnote <sup>1</sup>

### Footnotes:

Shell Engineering and Associates, Inc. is using the following equipment which will be operated by OVEC/Shell:

SO2 Analyzers -	Thermo Model 43i
Gas Calibrators -	Thermo Model 146i
Zero Air Generators -	API Model 701
Cellular Modem s	Sierra Wireless Model RV50 w/ AT&T service
Data Loggers -	Campbell Scientific Model CR1000
Wind Speed/Direction Sensors -	RM Young Model 05305 AQ
Vertical Wind Speed Sensor-	Climatronics Model 102236
Ambient Temperature Sensors -	Climatronics Model 100093
Solar Radiation Sensor -	Kipp and Zonen Model CMP3
Room Temperature Sensors -	Campbell Scientific Model Therm 107

### Notes/Explanations:

AQS is the Air Quality System maintained by US EPA for air quality data. In the AQS ID# the first 2 digits refer to the state. 39 is Ohio. The next 3 digits are the county within Ohio. The last 4 digits designate a specific site within the county.

All sulfur dioxide sites are comparable to the NAAQS.

Monitoring instruments used for comparing to the National Ambient Air Quality Standards are designated as Federal Reference Methods (FRM) or Equivalent Methods.

U.V. fluorescence indicates ultra-violet fluorescence, a method of detection for sulfur dioxide concentrations.

SIP is State Implementation Plan that details how the state will implement controls that will bring the area into attainment status for a particular National Ambient Air Quality Standard.

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## Public Comments

In response to posting the Gavin/Kyger network plan on the Ohio EPA website, we received \_\_\_\_ comment from \_\_\_\_\_.

<Summarize comments/response>

## Contact Information: Public Comments or Questions

For questions about the Gavin/Kyger Air Monitoring Network please contact:  
Jennifer Van Vlerah at 614-644-3696

Comments about this Gavin/Kyger Air Monitoring Network Plan may be emailed to:  
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