2021 Ambient Air Monitoring Annual Network Plan and SO_2 Data Requirement Rule Annual Report

June 7, 2021

West Virginia Department of Environmental Protection
Division of Air Quality
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Promoting a healthy environment.

Executive Summary

The Annual Network Plan (ANP) provides information on each site within the West Virginia Department of Environmental Protection Division of Air Quality's (DAQ's) ambient air quality network. The requirement for this ANP was established by the United States Environmental Protection Agency (EPA) in 40 CFR Part 58.

Appendix A to this document provides DAQ's Sulfur Dioxide Data Requirements Rule (SO_2 DRR) Annual Report, including an emissions assessment, pursuant to the requirements of 40 CFR 51, Subpart BB, at §51.1205(b).

A public inspection and comment period is open for 30 days from the date this document is posted on our website.

A summary of air monitoring network changes and updates since the previous approval includes:

- **NCore** – As part of this plan, DAQ requests the special purpose continuous FEM $PM_{2.5}$, BAM, at the NCore site in Charleston be excluded from NAAQS determinations. We will continue to report to AQI, as required for NCore sites; however, EPA's comparison tool indicates that the data should not be used to replace or fill-in for FRM data. An annotated print-out of the results from EPA's FRM-FEM PM2.5 Continuous Monitor Compatibility Assessment Tool for 2018-2020 data can be found in Appendix B.

- **Chester -** This discretionary PM_{10} metals toxics sampler at the Chester site in Hancock County operated through the end of first quarter 2020. No pollutants are currently monitored at this site.

- **Fairmont** – This $PM_{2.5}$ site operates on the roof of a health care facility. Operations were temporarily suspended due to COVID-19 exposure concerns for certain periods during 2020 and early 2021. This site resumed its normal $PM_{2.5}$ sampling schedule on April 1, 2021.

- **Moundsville** – A continuous $PM_{2.5}$ T640X monitor was installed on June 27, 2019 at Moundsville as a special purpose monitor. DAQ will report quality-assured data from January 1, 2021 to AQS; DAQ began reporting daily to AQI from April 21, 2021. Since two complete years of data are not yet available, DAQ notes that this remains a special purpose continuous FEM $PM_{2.5}$ monitor, and the data is to be excluded from NAAQS determinations.

- **Summit Circle** – As part of an extensive upgrade to this site, including electrical lines, fencing and decking, and a new shelter, operations were suspended on September 16, 2019. Monitoring for $PM_{2.5}$ and SO_2 resumed on January 16, 2020; for Ozone on March 1, 2020; and for PM_{10} on June 8, 2020.

- **Multiple Sites** – EPA conducted a Technical Systems Audit from July 20-24, 2020. As a result, any stainless steel or Kynar fittings that were in use in sample trains, or calibration/audit lines for SO_2, NO_2 and O_3 were replaced with fittings that meet the criteria described in 40 CFR 58, Appendix E. This was resolved by February 2021.

Purpose

The Annual Network Plan (ANP) provides information on each site within the West Virginia Department of Environmental Protection Division of Air Quality's (DAQ's) ambient air quality network. If necessary, the ANP includes documentation of any changes to the state's $PM_{2.5}$ monitoring that would affect the location of a violating $PM_{2.5}$ monitor. It should be noted that there are no $PM_{2.5}$ monitors in West Virginia that currently violate either the 24-hour or annual National Ambient Air Quality Standard. Except for circumstances not anticipated during this review period, such as inadequate federal or state funding, leasing issues, site maintenance issues, personnel resource issues or equipment failures no other *intentional* changes are expected to be made to the $PM_{2.5}$ monitoring network or the criteria pollutant monitoring network/stations during the next 12 months except those discussed within this document. All monitoring sites are leased and those leases are subject to periodic renewals which can affect the DAQ's ability to retain a monitoring site location. The proposed changes are listed in the specific air monitoring site section.

In the pages that follow, each individual monitoring site and corresponding photograph, is listed by county along with the Air Quality Subsystem (AQS) site ID number, site location information, the Metropolitan Statistical Area (MSA) that is represented by the site, a statement as to whether it meets the requirements of Part 58, sampling and analytical method for each parameter, proposed site changes, and any other general comments regarding the site. Other pertinent information such as latitude/longitude, site purpose, the monitor's objective/site type and representative scale is also listed for each site.

Background

On October 17, 2006, the US Environmental Protection Agency (EPA) published final amendments to 40 CFR Part 53 and 58 "Revisions to Ambient Air Monitoring Regulations; Final Rule". This rule became effective on December 18, 2006.

Under Part 58, Subpart B-Monitoring Network, § 58.10 Annual Monitoring Network Plan and Periodic Assessments (a)(1): " Beginning July 1, 2007, the State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA. "

On March 28, 2016 (effective April 27, 2016) EPA finalized revisions to 40CFR Part 58 "Revision to Ambient Monitoring Quality Assurance and Other Requirements; Final Rule".

Under Part 58 §58.10 (a)(1) "Annual monitoring network plan and periodic network assessment" EPA amended the 2006 language to clarify the handling of any public comment received on the plan: "The annual monitoring network plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA *and the submitted plan shall include and address, as appropriate, any received comments* (emphasis added).

To review the September 2006 and April 2016 Monitoring Regulations please visit https://www3.epa.gov/ttn/amtic/monregs.html.

Additional information and to view data publicly available from the AQS data system can be found at www.epa.gov/airdata/ . A copy of the latest DAQ annual air monitoring report can be found at www.dep.wv.gov/daq/air-monitoring/.

SO_2 Data Requirement Rule (DRR)

On August 10, 2015, EPA finalized requirements for air agencies to monitor or model ambient sulfur dioxide (SO_2) levels in areas with large sources of SO_2 emissions to help implement the 1-hour SO_2 National Air Ambient Quality Standard (NAAQS). The rule establishes that, at a minimum, air agencies must characterize air quality around sources that emit 2,000 tons per year (tpy) or more of actual SO_2 emissions. An air agency may avoid the requirement for air quality characterization near a source by adopting enforceable emission limits that ensure that the source will not emit more than 2,000 tpy maximum potential to emit of SO_2. The rule requires agencies to use either modeling of actual source emissions or appropriately sited ambient air quality monitors to assess local SO_2 concentrations.

As stated in previous ANPs, there are no West Virginia sources subject to the DRR rule that have elected to conduct ambient air monitoring for SO_2. However, there are two (2) SO_2 DRR monitoring sites located within our borders that are neither operated nor overseen by DAQ.

A summary of these sites is below; additional details may be found in the specific West Virginia counties sections of this report. DAQ is not responsible for the operation, maintenance, data collection/reporting or quality assurance activities at these sites.

One of these SO_2 monitoring sites is located in Mineral County, West Virginia near the Maryland border. The Maryland Department of the Environment (MDE) is the Primary Quality Assurance Organization (PQAO). The Verso Paper Corporation Luke Mill, an SO_2 source in Maryland, began conducting SO_2 monitoring in January 2017 at three sites – two in western Maryland and one in West Virginia. The paper mill shut down operations in May 2019. On May 7, 2020 Verso Luke Mill surrendered all air quality operating permits and EPA Region 3 subsequently approved termination of the SO_2 monitoring requirements. Monitoring ended on June 8, 2020 and the equipment was removed. No further monitoring at this location is planned.

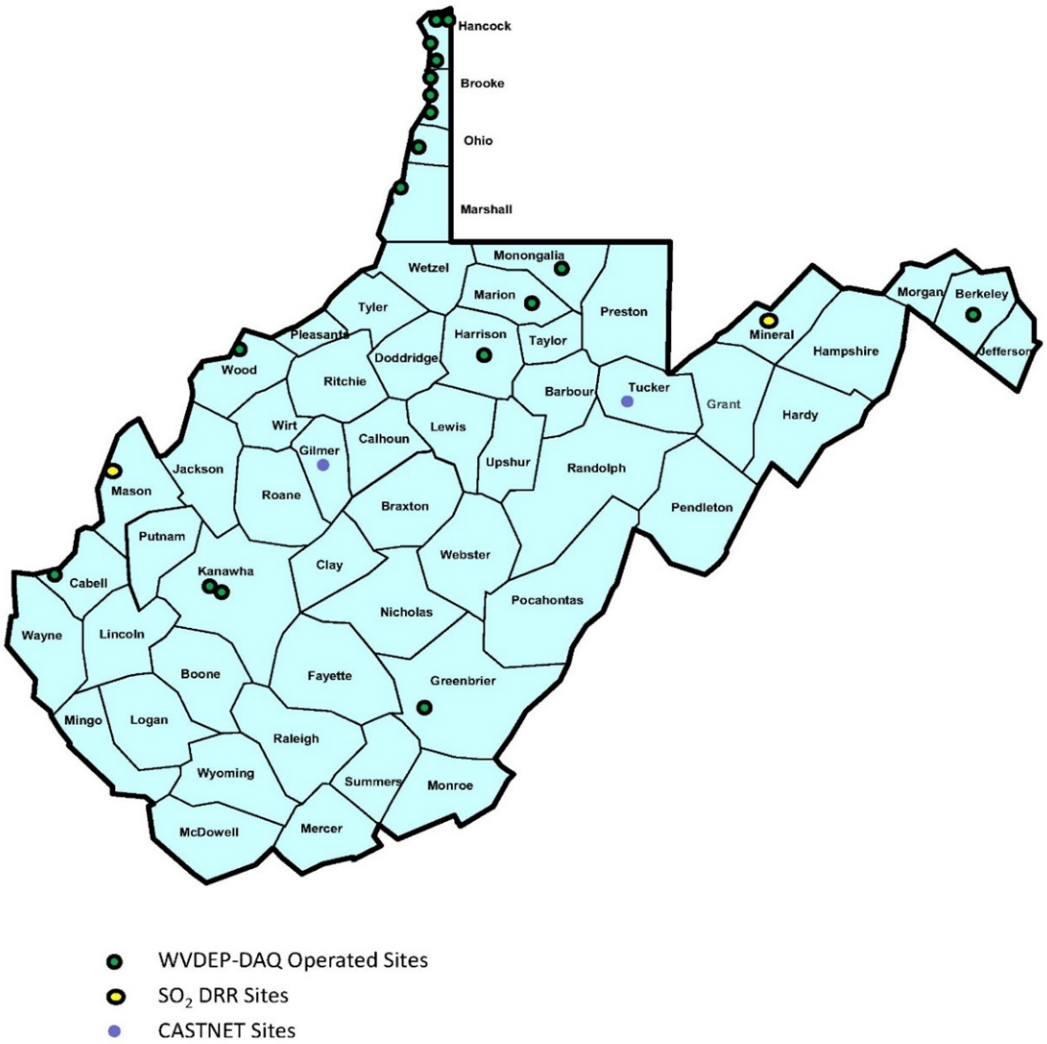
The second SO_2 DRR monitoring site is located in Mason County, West Virginia near the Ohio border. There are also two SO_2 DRR sources in Ohio: American Electric Power's James M. Gavin and the Ohio Valley Electric Corporation Kyger Creek power plants. Both facilities are electric generating utilities that are located within two miles of each other along the Ohio River in Gallia County. These facilities began conducting SO_2 air monitoring under the SO_2 DRR beginning in 2017 and one of those monitoring sites is in Lakin, West Virginia. The Ohio Environmental Protection Agency (OEPA) is the PQAO.

Appendix A to this document provides DAQ's SO_2 DRR Annual Report, including an emissions assessment, pursuant to the requirements of 40 CFR 51, Subpart BB, at §51.1205(b).

Overview

This ANP covers operations during 2020 as well as proposed changes for 2021. The map below shows all known air quality monitoring sites in West Virginia using FRM/FEM monitors. DAQ operated 18 sites across the state in 2020, and plans to operate 17 sites in 2021. Though shown on the map, DAQ is neither the operator nor the Primary Quality Assurance Organization for the two (2) SO_2 DRR monitoring sites or for the two (2) CASTNET sites. The SO_2 DRR site in Mineral County was discontinued in 2020.

Air Monitoring Sites in West Virginia



The table below provides summary information on all of DAQ's air monitoring sites that operated in 2020. While the Chester site operated until March 2020, it is not planned to be operated in 2021; there will be 17 sites operating monitors statewide in 2021.

West Virginia Division of Air Quality - Monitoring Network

As of 5/4/2021

		Pollutants Monitored												
County/Location	**AQS ID**	**AIR TOXIC**	**PM10 LO-VOL**	**PM10 TEOM**	**PM2.5 FRM**	**PM2.5 Cont.**	**PM2.5 SPEC**	**CO**	**SO2**	**O3**	**NOx**	**MET**	**AQS Latitude**	**AQS Longitude**
Berkeley														
Martinsburg/Ball Field	540030003				X					X			39.448001	-77.964130
Brooke														
Follansbee/Mahan Lane	540090005				X				X				40.340933	-80.596533
McKims Ridge	540090007								X				40.389660	-80.586240
Weirton/Marland Heights	540090011			X	X				X				40.394583	-80.612017
Cabell														
Huntington/Prindle Field	540110007				X					X			38.410242	-82.432436
Greenbrier														
Sam Black Church/DOH Garage	540250003									X			37.908533	-80.632633
Hancock														
New Cumberland/Tunanidas	540290007								X				40.460138	-80.576567
Chester	540200008												40.615720	-80.560000
Weirton/Summit Circle	540290009			X	X				X	X			40.427372	-80.592318
Law renceville	540290015								X				40.618353	-80.540618
Harrison														
Clarksburg/Washington Irving JHS	540330003				X								39.278117	-80.342250
Kanawha														
Charleston NCore	540390020	X	X *		X	X	X	X	X	X	X	X	38.346258	-81.621161
South Charleston Library	540391005				X								38.366183	-81.693727
Marion														
Fairmont/Marion Health Care Hospital	540490006				X								39.481483	-80.134667
Marshall														
Moundsville/Nat'l Guard Armory	540511002				X	X	X		X				39.915961	-80.733858
Monongalia														
Morgantow n Airport	540610003				X				X	X			39.649367	-79.920897
Ohio														
Warw ood	540690010	X			X					X			40.114760	-80.700972
Wood														
Vienna/Neale School	541071002				X				X	X			39.323553	-81.552367
Total Sites	**18**	**2**	**1**	**2**	**13**	**2**	**2**	**1**	**10**	**8**	**1**	**1**		

** PM10 LO-VOL = Toxic Metals Analysis Only Manual 3 day sampler (Charleston NCore)

** TEOM = Continuous Particulate samplers

** PM2.5 = Manual 3 day samplers

** FRM = Federal Reference Method

** SPEC = Speciated

** MET = Meteorology

Berkeley County

Site: Martinsburg Ball Field
Location: Martinsburg Ball Field, Martinsburg, Berkeley County, WV
AQS ID: 54-003-0003
MSA: Hagerstown-Martinsburg, MD-WV
Latitude: 39.448001
Longitude: -77.96413

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Current site established in 1999 to provide air quality monitoring in Berkeley County and the Eastern Panhandle of WV.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential Lo-Volume sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted: 4/1/2020 and 10/13/2020

Gaseous:
Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 4/1/2020
EPA through the probe audit conducted 10/26/2020

Brooke County

Site: Mahan Lane
Location: Mahan Lane, Follansbee, Brooke County, WV
AQS ID: 54-009-0005
MSA: Steubenville-Weirton OH-WV
Latitude: 40.340933
Longitude: -80.596533

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. The site was established in 1983 to provide air quality monitoring in an industrialized area of Brooke County. DAQ had some historical leasing issues with this site and currently operates without a lease in place. This site underwent an extensive upgrade in 2019.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential Lo-Volume sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State audit conducted 4/1/2020 and 10/5/2020

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State accuracy audit conducted 9/10/2020

Site: McKims Ridge
Location: McKims Ridge Road, Brooke County, WV
AQS ID: 54-009-0007
MSA: Steubenville-Weirton OH-WV
Latitude: 40.38966
Longitude: -80.58624

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1997 as part of a dispersion model evaluation study and to provide additional air quality monitoring in Brooke and Hancock Counties in West Virginia.

Parameters monitored, sampling method, scale, and purpose:

<u>Gaseous:</u>
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State accuracy audit conducted 9/10/2020

Site: Marland Heights
Location: Marland Heights, Weirton, Brooke County, WV
AQS ID: 54-009-0011
MSA: Steubenville-Weirton, OH-WV
Latitude: 40.394583
Longitude: -80.612017

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1992 to provide air quality monitoring in an industrial area of Brooke and Hancock Counties in West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
Tapered Element Oscillating Micro-Balance (TEOM) Series 1405 continuous PM_{10} monitor.
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State flow rate audit conducted 6/8/2020 and 12/9/2020

$PM_{2.5}$ sequential Lo-Volume sampler, Federal Reference Method, samples once every three days. A collocated $PM_{2.5}$ monitor samples every 12th day. Samples analyzed by gravimetric analysis.
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State audit conducted 4/1/2020 and 10/5/2020

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State accuracy audit conducted 3/25/2020

Cabell County

Site: Huntington/ Prindle Field
Location: 1313 14th Street, Huntington, Cabell County, WV
AQS-ID: 54-011-0007
MSA: Huntington-Ashland, WV-KY-OH Metro Area
Latitude: 38.410242
Longitude: -82.432436

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. This site began operation in January 2019. This site replaces the Marshall University, Huntington site, and started reporting data in 2019.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential Lo-Volume sampler, Federal Reference Method, samples once every three days. A collocated sequential $PM_{2.5}$ monitor samples every 12th day. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/13/2020 and 10/1/2020
Co-located state audit conducted 4/13/2020 and 10/4/2020
EPA performance evaluation audit conducted 10/15/2020

Gaseous:
Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 6/7/2020
EPA through the probe audit conducted 10/14/2020

Greenbrier County

Site: Sam Black Church
Location: 235 Gray Gables Rd, Crawley WV 25913, Department of Highway Garage, Greenbrier County, WV
AQS ID: 54-025-0003
MSA: NA
Latitude: 37.908533
Longitude: -80.632633

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Current site established in 1999 to continue historical background ozone air quality monitoring that started in 1984 in Greenbrier County, a rural area of West Virginia. A new shelter was installed, along with upgraded power in early 2019.

Parameters monitored, sampling method, scale, and purpose:

Gaseous:
Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 7/2/2020

Hancock County

Site: New Cumberland
Location: RD#1, Carothers Road, New Cumberland, Hancock County, WV
AQS ID: 54-029-0007
MSA: Steubenville-Weirton, OH-WV
Latitude 40.460138
Longitude -80.576567

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1990 as part of a multi-state SO_2 study (PA-WV-OH) and to provide air quality monitoring in Hancock County, WV.

Parameters monitored, sampling method, scale, and purpose:

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 3/25/2020

Site: Chester
Location: Allison Elementary School, 647 Railroad Street, Chester, Hancock County, WV
AQS ID: 54-029-0008
MSA: Steubenville-Weirton, OH-WV
Latitude: 40.615720
Longitude: -80.560000

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. The site at Chester was established on 5/15/1991 to provide air quality monitoring in northern Hancock County, WV. The last data reported to AQS was the SO_2 hourly and 5-minute data through 12/31/2017.

The discretionary special purpose monitoring for the collection of PM_{10} samples for metals analysis was conducted at this site starting in 2009 (TSP metals, and later PM_{10} metals) to support EPA's multi-state investigation into manganese emissions from SH Bell in Liverpool, OH. After a period of overlap, monitoring was switched from TSP metals to PM10 metals monitoring in 2016. PM_{10} samples were collected over a 24-hour period on a once every 6-day schedule.

Implemented change: This discretionary PM_{10} metals toxics site operated throughout 2019, and discontinued operations at the end of the first quarter of 2020. No pollutants are currently monitored at this site.

Site: Summit Circle
Location: Summit Circle, Weirton, Hancock County, WV
AQS ID: 54-029-0009
MSA: Steubenville-Weirton, OH-WV
Latitude: 40.427372
Longitude: -80.592318

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1992 provide air quality monitoring in an industrial area of Hancock County, West Virginia.

Implemented changes: As part of an extensive upgrade to this the site, including electrical lines, fencing and decking, and a new shelter, operations were suspended on September 16, 2019. Monitoring for $PM_{2.5}$ and SO_2 resumed on January 16, 2020; for Ozone on March 1, 2020; and for PM_{10} on June 8, 2020.

Parameters monitored, sampling method, scale, and purpose:

<u>Particulates:</u>
Tapered Element Oscillating Micro-Balance (TEOM) Series 1400AB/1400a continuous PM_{10} monitor.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 6/29/2020 and 12/9/2020

$PM_{2.5}$ sequential sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 4/1/2020 and 10/5/2020
Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State accuracy audit conducted 6/23/2020

Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 6/23/2020

Site: Lawrenceville
Location: Community Park and Tyrone Road, Lawrenceville, Hancock County, WV
AQS ID: 54-029-0015
MSA: Steubenville-Weirton, OH-WV
Latitude: 40.618353
Longitude: -80.540618

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1995 in response to the 1992 installation of Waste Technology Industries (WTI), now known as Heritage Thermal Services, and to provide air monitoring in upper Hancock County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 11/24/2020

Harrison County

Site: Clarksburg
Location: Washington Irving Junior High School, Clarksburg, Harrison County, WV
AQS ID: 54-033-0003
MSA: NA
Latitude: 39.278117
Longitude: -80.342250

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1997 to monitor $PM_{2.5}$ in Harrison County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential Lo-Volume sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/2/2020 and 10/14/2020
EPA performance evaluation audit conducted 12/17/2020

Kanawha County

Site: NCore
Location: 1436 Dixie St., Charleston, Kanawha County, WV
AQS ID: 54-039-0020
MSA: Charleston, WV
Latitude: 38.346258
Longitude: -81.621161

Comment: Site complies with Appendix A, C, D, E of Part 58. Site required to be established by EPA as part of the national NCore multi-pollutant monitoring network. This site started reporting data in 2016.

Proposed change: DAQ requests that the special purpose continuous FEM $PM_{2.5}$ BAM, at the NCore site in Charleston be excluded from NAAQS determinations. We will continue to report to AQI, as required for NCore sites, but EPA's comparison tool indicates that the data should not be used to replace or fill-in for FRM data at this site. An annotated print-out of the results from EPA's FRM-FEM $PM_{2.5}$ Continuous Monitor Compatibility Assessment Tool for 2018-2020 data can be found in Appendix B.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
Met One BAM 1020 continuous $PM_{2.5}$ monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/13/2020 and 10/20/2020

$PM_{2.5}$ sequential sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/14/2020 and 10/28/2020

PM_{10} sequential sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis. Data is used only to calculate and report PM Coarse which equals PM_{10} minus $PM_{2.5}$.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented

Gaseous:
Sulfur Dioxide – UV fluorescent continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 6/17/2020

Ozone – UV absorption continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/30/2020

NO/NO_y – Chemiluminescence continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 12/7/2020

Carbon Monoxide –Gas filter correlation continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 3/19/2020

$PM_{2.5}$ Speciation
Speciation Trends Network (STN) site equipped with Met One Super SASS and URG 3000N Carbon sampler. Both sample on a once every three-day schedule.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State flow rate audit conducted 1/15/2020, 4/22/2020, 7/27/2020 and 10/22/2020

Toxics
TSP metals, certain Volatile Organic Compounds, and Carbonyls
Representative siting scale: Neighborhood
Samples once every 12 days
Monitoring objective/site type: Population oriented

Other
Ultra-Sonic wind sensor
Temperature
Barometric Pressure
Relative Humidity

Site: South Charleston
Location: South Charleston Public Library 312 4th Ave., So. Charleston, Kanawha County, WV
AQS ID: 54-039-1005
MSA: Charleston, WV
Latitude: 38.366183
Longitude: -81.69372717

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1974 to provide air quality monitoring in Kanawha County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

<u>Particulates</u>
$PM_{2.5}$ sequential Low-Volume sampler, Federal Reference Method. Samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/14/2020 and 10/28/2020

Marion County

Site: Fairmont
Location: 401 Guffey Street, Manchin Health Care Center, Fairmont, Marion County, WV
AQS ID: 54-049-0006
MSA: NA
Latitude: 39.481483
Longitude: -80.134667

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 2000 to monitor $PM_{2.5}$ in Marion County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential sampler, Federal Reference Method, samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 7/27/2020, 10/14/2020 and 11/19/2020

Implemented temporary change: This $PM_{2.5}$ site operates on the roof of a health care facility. Operations were temporarily suspended due to COVID-19 exposure concerns for certain periods during 2020 and early 2021. This site resumed normal $PM_{2.5}$ sampling on April 1, 2021.

Marshall County

Site: Moundsville
Location: Moundsville National Guard Armory, Moundsville, Marshall County, WV
AQS ID: 54-051-1002
MSA: Wheeling, WV-OH
Latitude: 39.915961
Longitude: -80.733858

Comment: Site complies with Appendix A, C, D, E of Part. This site is suitable for NAAQS comparisons except for the $PM_{2.5}$ continuous special purpose monitor. Site established in 1983 to provide air quality monitoring in Marshall County, West Virginia.

Implemented change: A continuous $PM_{2.5}$ T640X monitor was installed on June 27, 2019 at Moundsville as a special purpose monitor. DAQ will report quality-assured data from January 1, 2021 to AQS; DAQ began reporting daily to AQI from April 21, 2021. Since two complete years of data are not yet available, DAQ notes that this remains a special purpose continuous FEM $PM_{2.5}$ T-640X be excluded from NAAQS determinations.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential sampler, Federal Reference Method. Samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/2/2020 and 10/5/2020

$PM_{2.5}$ Teledyne API T640X continuous $PM_{2.5}$ monitor, Federal Equivalent Method.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented

$PM_{2.5}$ Speciation
Chemical Speciation Network site. Met One Super SASS and URG 3000N Carbon sampler. Both sample on a once every six-day schedule
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State flow rate audit conducted 3/27/2020, 5/18/2020, 9/8/2020, 10/9/2020 and 10/13/2020

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 11/4/2020

Mason County

Site: Lakin
Location: HWY 62, Lakin, WV
AQS ID: 54-053-0001
CBSA: Point Pleasant WV-OH
Latitude: 38.956476
Longitude: -82.088693

Comment: American Electric Powers' (AEP) James M. Gavin and Ohio Valley Electrical Corporation (OVEC) Kyger Creek electric generating facilities located in Gallia County, Ohio have elected to conduct air monitoring under the SO_2 Data Requirements Rule. One of the SO_2 air monitoring sites is in Lakin, Mason County, West Virginia and is included herein for reference. The site is operated by Shell Engineering on behalf of AEP and OVEC. The Ohio Environmental Protection Agency is the responsible Primary Quality Assurance Organization. The DAQ does not have any role in the sites operation, data reporting or quality assurance.

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Source-oriented

Mineral County

Site: Bean Site
Location: Old WV 46, Keyser
AQS ID: 54-057-8883
CBSA: Cumberland, MD
Latitude: 39.4452
Longitude: -79.0691

The Verso Luke Mill, located in Alleghany County, MD elected to perform air monitoring under the SO_2 DRR. One of the SO_2 air monitoring sites operated in Mineral County, West Virginia.

The Maryland Department of the Environment is the responsible Primary Quality Assurance Organization. The DAQ does not have any role in the site operation, data reporting or quality assurance.

Comment: The paper mill shut down operations in May 2019. On May 7, 2020 Verso Luke Mill surrendered all air quality operating permits and EPA Region 3 subsequently approved termination of the SO_2 monitoring requirements. Monitoring ended on June 8, 2020 and the equipment was removed. No further monitoring at this location is planned.

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Source-oriented

Monongalia County

Site: Morgantown
Location: Morgantown Airport, Morgantown, Monongalia County, WV
AQS ID: 54-061-0003
MSA: NA
Latitude: 39.649367
Longitude: -79.920897

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1983 to provide air quality monitoring in Monongalia County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential sampler, Federal Reference Method. Samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/2/2020 and 10/14/2020

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 9/15/2020

Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 3/31/2020 and 9/14/2020

Ohio County

Site: Wheeling
Location: Warwood Water Treatment Plant, Wheeling, Ohio County, WV
AQS ID: 54-069-0010
MSA: Wheeling, WV-OH
Latitude: 40.11476
Longitude: -80.700972

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Current site established in 2005 to continue to provide air quality monitoring in Ohio County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential sampler, Federal Reference Method, samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/2/2020 and 10/5/2020

Gaseous:
Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 9/9/2020

Toxics
TSP metals, certain Volatile Organic Compounds, and Carbonyls.
Representative siting scale: Neighborhood
Samples once every 12 days for VOCs and Carbonyls, and once every 6 days for Metals
Monitoring objective/site type: Population oriented

Wood County

Site: Vienna
Location: Neale Elementary School, Wood County, WV
AQS ID: 54-107-1002
MSA: Parkersburg-Marietta, WV-OH
Latitude: 39.323553
Longitude: -81.552367

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1975 to provide air quality monitoring in Wood County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential sampler, Federal Reference Method. Samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/14/2020, 4/23/2020 and 10/1/2020

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 6/23/2020

Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 8/12/2020
EPA through the probe audit conducted 10/15/2020

Appendix A – SO_2 Data Requirement Rule Annual Report

Introduction

On August 21, 2015, the U.S. Environmental Protection Agency (EPA) published the *Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO2) Primary National Ambient Air Quality Standard (NAAQS)* (80 FR 51051). This rule, referred to as the Data Requirements Rule (DRR), includes provisions in 40 CFR 51.1205(b) requiring and air agency to submit a report to the EPA documenting SO_2 emissions for areas where modeling of actual SO2 emissions served as the basis for designating the area attainment for the 2010 1-hour SO_2 NAAQS. The report must include an assessment of the cause of any emission increases from the previous year and a recommendation regarding whether additional modeling is needed. These annual reports are due by July 1 after the effective date of an area's initial designation.

Regulatory History

On June 2, 2010, the EPA signed a final rule (75 FR 35519) revising the SO_2 NAAQS. The EPA established a new 1-hour SO_2 primary NAAQS of 75 parts per billion (ppb), based on the three-year average of the annual 99th percentile of daily 1-hour maximum concentrations. Whenever the EPA revises a NAAQS, the Clean Air Act (CAA) requires the EPA to designate areas as "attainment" (meeting), "nonattainment" (not meeting), or "unclassifiable" (insufficient data). Within one year of a NAAQS revision, each state must submit their designation recommendations. The CAA requires the EPA to complete the designations process within three years of a NAAQS revision.

On August 5, 2013, EPA published (78 FR 47191) a final rule designating 29 areas, in 16 states including West Virginia, as nonattainment for the 2010 1-hour SO_2 NAAQS. In that rulemaking, the EPA stated they would address the designation of all other areas in separate future actions. At that time, the EPA was still developing its strategy for completing the designations process. The EPA anticipated using a hybrid approach, allowing the use of either modeling or monitoring data for designations purposes, but the EPA anticipated the need to issue additional rulemaking and guidance documents prior to finalizing additional designations. Shortly thereafter, three lawsuits were filed against the EPA in different U.S. District Courts, alleging that the EPA had failed to perform a nondiscretionary duty under the CAA by not issuing 1-hour SO_2 designations for all portions of the country within three years of NAAQS promulgation. To resolve the legal challenges, a consent decree was entered in federal court on March 2, 2015.

This consent decree established the criteria and deadlines for the EPA to complete a second, third, and fourth round of designations for the 2010 1-hour SO_2 NAAQS. The second round mostly affected only those areas that contained a source meeting certain emissions-related criterion established in the consent decree. Such areas were required to be designated no later July 2, 2016. The third round affected all undesignated areas that had not installed and begun operating a new SO_2 monitoring network by January 1, 2017. The deadline for the third round was December 31, 2017. Most areas in the U.S. were designated in this round. In the fourth and final round, the remaining undesignated areas were to be designated by December 31, 2020.

On August 21, 2015, the consent decree was finalized, and the EPA published the DRR in 80 FR 51051. The DRR's primary purpose is to require air agencies to characterize maximum 1-hour SO_2 concentrations around sources emitting 2,000 tons per year (tpy) or more. Implementation of the DRR requires states to use either modeling or ambient monitoring to assess SO_2

concentrations or to establish federally enforceable emission limits that limit a source's emissions to less than 2,000 tpy.

The DRR's initial implementation step required states to identify, by January 15, 2016, sources not located in a nonattainment area that had actual annual SO_2 emissions of at least 2,000 tons or were deemed by the air agency as requiring further air quality characterization.

The DRR established January 13, 2017 as the deadline for states to submit the results of those sources modeled. This date also served as the compliance deadline for any new federally enforceable emission limits used to satisfy the DRR. While these deadlines, and those associated with the monitoring option, allow the third and fourth rounds of designations to be informed by data that must be submitted pursuant to the DRR, meeting the second round's July 2, 2016, designation deadline required states and EPA to take actions before the DRR was finalized.

Emissions Assessment

Applicable SO_2 emission sources, defined as having actual annual SO_2 emissions of 2,000 tons or more, where modeled by the DAQ as the basis for designating the area as attainment with the 2010 1-hour SO_2 NAAQS. The applicable sources modeled were all electrical generating units (EGU). Since emissions were modeled based on actual emissions instead of allowable emissions, §51.1205(b) requires the submittal to the EPA an annual report documenting the annual SO_2 emissions from each applicable source and providing an assessment of any emission increases from the previous year. Additionally, §51.1205(b)(1) requires an agency's recommendation regarding whether additional modeling characterizing an area's air quality is needed to determine whether the area meets or does not meet the 2010 1-hr SO_2 NAAQS.

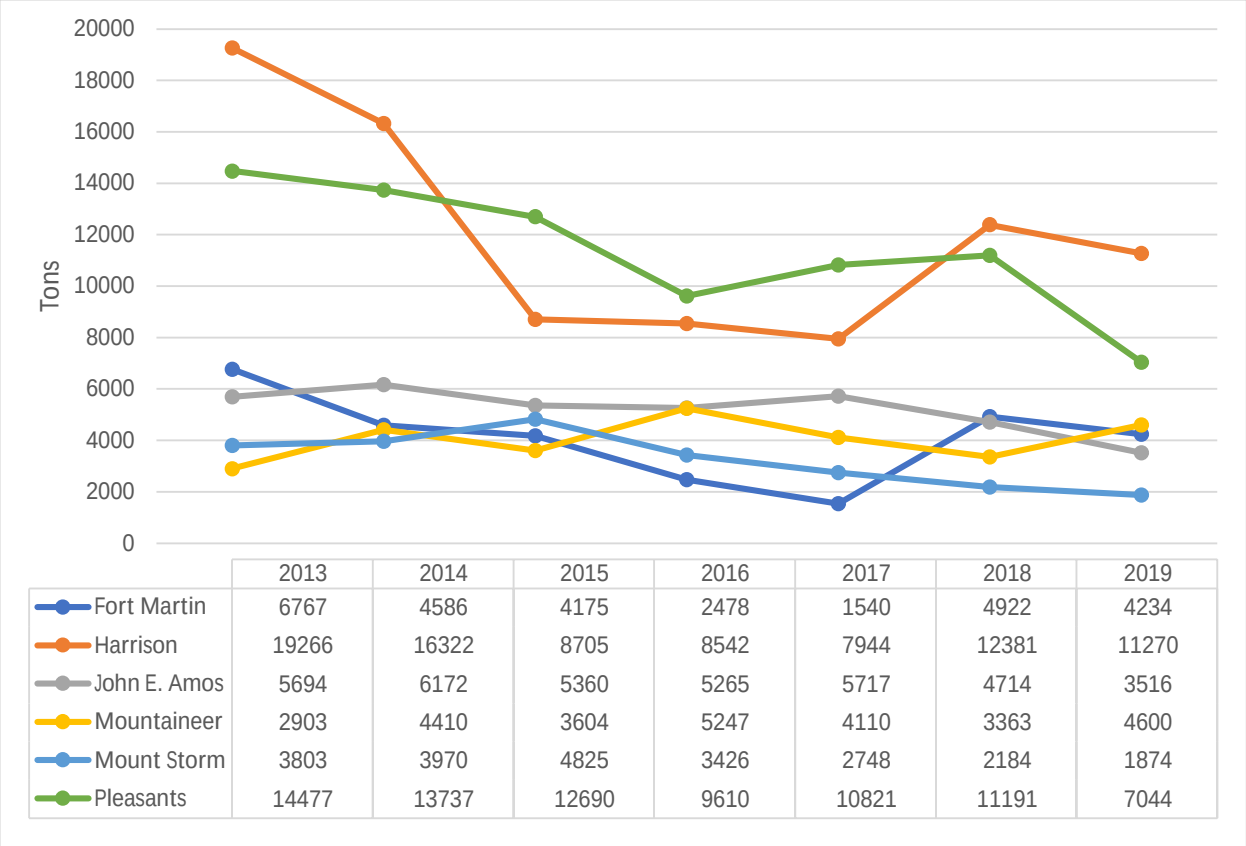
The DRR requires an assessment of SO_2 emissions increases from the previous year. This report includes certified ambient SO_2 air quality monitoring data for 2020, therefore the DAQ is assessing actual SO_2 emissions from previous year (2019) that may have impacted the 2020 monitoring data. Assessing only the previous year's SO_2 increase effectively limits the assessment to a two-year period and does not allow for an accurate assessment to determine the need for additional modeling. A comparison of each applicable source's actual annual SO_2 emissions during the initial modeling period, which demonstrated attainment with the 2010 NAAQS, to the previous year's actual emissions allows for a better and more meaningful assessment. Therefore, the DAQ has made our assessment based the initial modeling years to the previous year. Table 1 below shows each source's three-year initial modeling period and the results of that modeling as a maximum percentage of the 2010 1-hour SO_2 NAAQS.

Table 1: EGU Modeled Year and Percent of NAAQS

EGU Modeled	Years Modeled (actual emissions)	Maximum Percent of NAAQs Modeled
Fort Martin	2013-2015	64%
Harrison	2012-2014	52.8%
John Amos	2013-2015	< 50%
Mountaineer	2012-2014	< 50%
Mount Storm	2013-2015	< 50%
Pleasants Power	2013-2015	77.7%

Figure 1 shows the actual annual SO_2 emissions for each EGU modeled from 2013 through 2019. These emissions were taken from the EPA's Clean Air Markets Division (CAMD) database. As the chart illustrates, SO_2 emissions from each EGU has been largely stable or decreasing over the assessment period.

Figure 1: 2013-2019 EGU SO2 Emissions



From Figure 1, the source's highest actual SO_2 emissions from the initial three-year modeling period can be compared to the source's actual 2019 emissions. Table 2 shows this comparison and demonstrates that in all cases the 2019 SO_2 emissions were less than the highest modeled year's emissions.

Table 2: Highest Modeled Year SO_2 Emissions vs. 2019 SO_2 Emissions

EGU Modeled	Highest Modeled Year	Highest Modeled Year Emissions (tons)	2019 Emissions (tons)	Change from Highest Year to 2019 (tons)
Fort Martin	2013	6,767	4,234	-2533
Harrison	2013	19,266	11,270	-7996
John Amos	2014	6,172	3,516	-2656
Mountaineer	2014	4,410	4,600	190
Mount Storm	2015	4,825	1,874	-2951
Pleasants Power	2013	14,477	7,044	-7433

As shown in Table 1, emissions initially modeled for each source were substantially less than the SO_2 1-hour NAAQS; with one-half of the sources modeled less than 50 percent of the standard. The emission comparison in Table 2 demonstrates that 2019 actual SO_2 emissions were less than the emissions for the highest modeled year for all EGUs but Mountaineer. Despite the small increase, Mountaineer remains at or below 50 percent the NAAQS. If the 2020 actual SO_2 emissions were modeled, the results would be less than those modeled during the three-year initial modeling period and less than the maximum percent of the NAAQS shown in Table 1. Therefore, as required in §51.1205(b) and based on the assessment, the air quality areas represented by the modeled sources continue to meet the 2010 1-hour SO_2 NAAQS and the DAQ recommends no additional modeling is needed to characterize the areas' air quality.

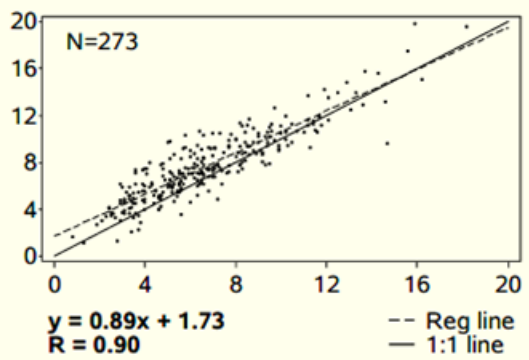
Appendix B – Charleston NCore FRM-FEM EPA $PM_{2.5}$ Continuous Monitor Compatibility Assessment Tool for 2018-2020

$PM_{2.5}$ Continuous Monitor Comparability Assessment

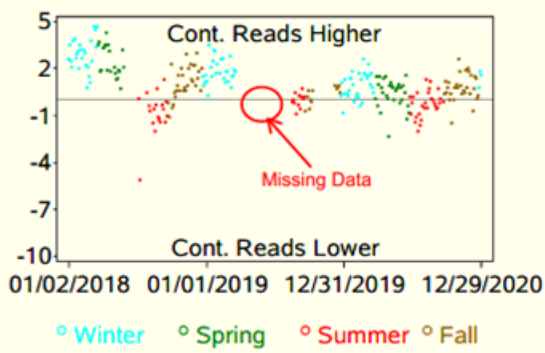
Site 54-039-0020: Charleston, WV

FRM: R & P Model 2025 PM-2.5 Sequential Air Sampler w/VSCC - Gravimetric (145), PM2.5 - Local Conditions (88101), POC=1
Cont: Met One BAM-1020 Mass Monitor w/VSCC - Beta Attenuation (170), PM2.5 - Local Conditions (88101), POC=2

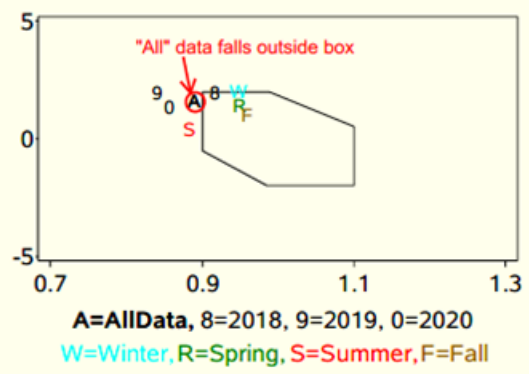
Cont. (y) vs. FRM (x) ($\mu g/m^3$)



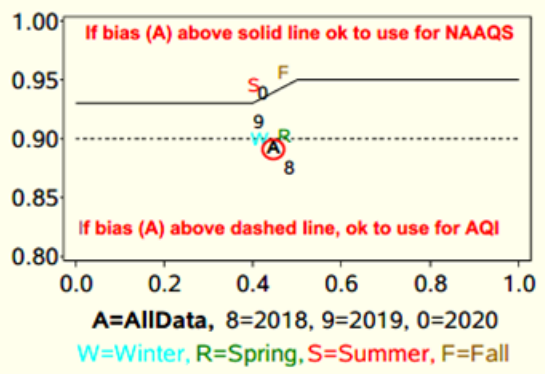
Cont. minus FRM ($\mu g/m^3$)



Additive (y) vs. Multiplicative (x) Bias



R (y) vs. FRM CCV (x)



Mean Concentration ($\mu g/m^3$)

Dataset	N	FRM	Cont	Ratio (Cont/FRM)
		Mean ratio should = 1.0 +/- 0.1		
AllData	**273**	**6.8**	**7.7**	**1.14**
Winter	88	6.2	8.1	1.30
Spring	52	6.5	7.7	1.19
Summer	60	7.7	7.3	0.95
Fall	73	6.8	7.7	1.13
2018	100	6.9	8.5	1.22
2019	52	6.9	7.9	1.15
2020	121	6.6	7.1	1.08

Appendix A Statistics

Dataset	N (all observations)	Bias	N (only >= 3 ug/m^3)	Bias
		Must be within 10% bias		
AllData	**273**	**20.1**	**254**	**19.1**
Winter	88	35.7	81	34.7
Spring	52	26.7	48	21.8
Summer	60	-4.3	56	-2.7
Fall	73	16.6	69	16.7
2018	100	28.3	93	27.6
2019	52	20.8	49	20.3
2020	121	13.0	112	11.5

Data Source: EPA AQS Data Mart

Generated: February 24, 2021