
2023 Ambient Air Monitoring Annual Network Plan and SO₂ Data Requirement Rule Annual Report

June 13, 2023



West Virginia Department of Environmental Protection
Division of Air Quality
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304-926-0499

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 (SO₂ 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:

- Per the provisions of §58.11(e), DAQ requests exclusion of FEM PM_{2.5} data for NAAQS determination at all sites with FRM PM_{2.5} data; requests EPA discontinue the practice of substituting FEM data on non-FRM days; requests EPA correct historical data using this practice; and requests EPA update historical and current design value calculations accordingly.
 - See Appendix B for additional details and documentation regarding the request for exclusion of FEM data for NAAQS determination for following two (2) sites:

NCore (54-039-0020) – DAQ requests the continuous FEM PM_{2.5} BAM, at the NCore site in Charleston be designated as special purpose and be excluded from NAAQS determinations. We continue to report to AirNow, as required for NCore sites; however, EPA's own 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 PM_{2.5} Continuous Monitor Compatibility Assessment Tool for 2020-2022 data can be found in Appendix B. While the data comparability has improved over the last couple of years, the continuous FEM data is higher than the on-site Federal Reference Method (FRM). The on-site FRM data should be used for NAAQS determination without data substitution.

Moundsville (54-051-1002) – While there are two (2) complete years of FEM data, DAQ requests that the continuous FEM PM_{2.5} T640x remains a special purpose monitor, and data be excluded from NAAQS determinations. The on-site FRM data should be used for NAAQS determination without data substitution. The results from EPA's FRM-FEM PM_{2.5} Continuous Monitor Compatibility Assessment Tool for 2021-2022 can be found in Appendix B.

- A new Teledyne API T640x continuous PM_{2.5} monitor was installed at **Huntington/Prindle Field (54-011-0007)** in July 2022 and is undergoing a shakedown period. We are investigating a recurring bad status flag with the vendor. This is a known issue that the vendor has been unable to resolve.

- As approved in advance by EPA Region 3, the air monitoring shelter at **Sam Black Church (54-025-0003)** was moved within the DOH Garage perimeter on October 12, 2022 to allow them to construct a new salt shed. The new location for the shelter has easier access for operators.
- During EPA’s Technical Systems Audit in July 2020, an observation was made that analyzers and calibration equipment should exhaust outside of all shelters. To address this observation, as of March 2023, analyzers and calibrators vent outside of all shelters.
- The project to purchase and install upgraded dataloggers at all sites across the state to include graphing capability was completed as of April 2023.

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} FRM monitoring network or the criteria pollutant monitoring network/stations during the next 12 months except those discussed within this document. With the exception of the Follansbee site, 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://www.epa.gov/amtic/monitoring-regulations>.

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 <https://dep.wv.gov/daq/air-monitoring/Pages/default.aspx>

SO₂ Data Requirement Rule (DRR)

On August 10, 2015, EPA finalized requirements for air agencies to monitor or model ambient sulfur dioxide (SO₂) levels in areas with large sources of SO₂ emissions to help implement the 1-hour SO₂ National Air Ambient Quality Standard (NAAQS). The rule establishes that, at a minimum, air agencies must characterize air quality around sources which emit 2,000 tons per year (tpy) or more of actual SO₂ emissions. An air agency may avoid the requirement for air quality characterization near a source by adopting enforceable emission limits which ensure that the source will not emit more than 2,000 tpy maximum potential to emit of SO₂. The rule requires agencies to use either modeling of actual source emissions or appropriately sited ambient air quality monitors to assess local SO₂ concentrations.

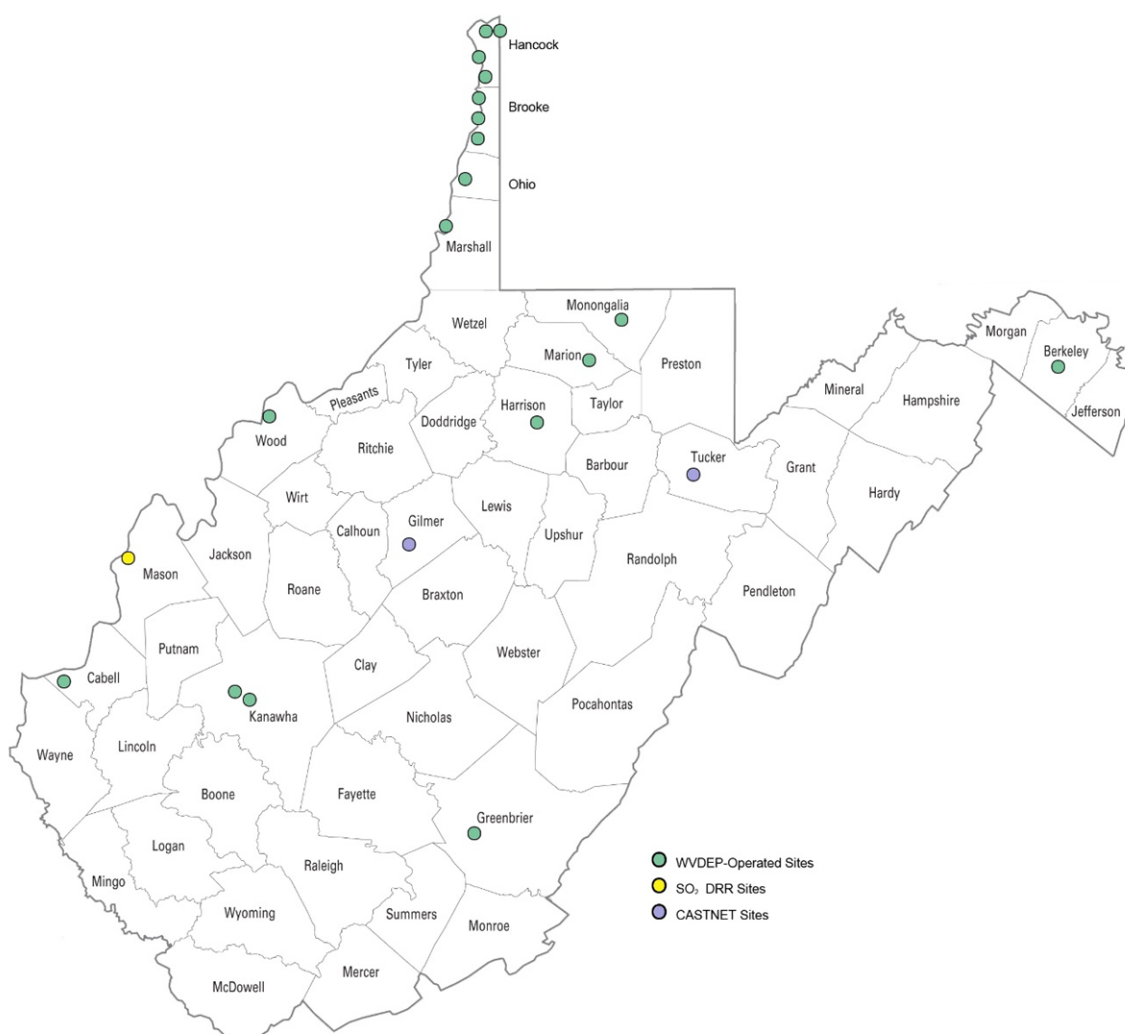
As stated in previous ANPs, there are no West Virginia sources subject to the DRR rule which elected to conduct ambient air monitoring for SO₂. However, there is currently one DRR ambient SO₂ monitoring site in Mason County, West Virginia, near the Ohio border. Two sources in Ohio – the Gavin Power, LLC James M. Gavin power plant and the Ohio Valley Electric Corporation Kyger Creek power plant – began conducting air monitoring under the SO₂ DRR in 2017. One of these monitoring sites is located in Lakin, West Virginia. Both facilities are electric generating utilities and are located within two miles of each other along the Ohio River in Gallia County, Ohio. The Ohio Environmental Protection Agency (OEPA) is the Primary Quality Assurance Organization (PQAO). DAQ is not responsible for the operation, maintenance, data collection, reporting or quality assurance activities at this site. Additional details may be found in the specific West Virginia counties sections of this report.

Appendix A to this document provides DAQ's SO₂ 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 2022 as well as proposed changes for 2023. The map below shows all known air quality monitoring sites in West Virginia using FRM/FEM monitors. DAQ has 18 sites across the state and operates 17 sites currently. Though shown on the map, DAQ is neither the operator nor the Primary Quality Assurance Organization for the one (1) SO₂ DRR monitoring site or for the two (2) Clean Air Status and Trends Network (CASTNET) sites. EPA suspended operations at a number of CASTNET locations throughout the country in May 2022 due to budget constraints, including at the Cedar Creek State Park site in Gilmer County, WV (<https://www.epa.gov/castnet>).

Air Monitoring Sites in West Virginia



The table below provides summary information on all of DAQ's air monitoring sites. DAQ has 18 sites across the state and operates 17 sites currently.

West Virginia Division of Air Quality - Monitoring Network

As of 5/4/2023

| County/Location | AQS ID | Pollutants Monitored | | | | | | | | | | | AQS Latitude | AQS Longitude |
|---------------------------------------|-----------|----------------------|----------|------------|-----------|-------------|------------|----------|-----------|----------|----------|----------|--------------|---------------|
| | | AIR TOXICS | PM10-2.5 | PM10 T640X | PM2.5 FRM | PM2.5 Cont. | PM2.5 SPEC | CO | SO2 | O3 | NOx | MET | | |
| Berkeley | | | | | | | | | | | | | | |
| Martinsburg/Ball Field (MT) | 540030003 | | | | X | | | | | X | | | 39.448001 | -77.964130 |
| Brooke | | | | | | | | | | | | | | |
| Follansbee/Mahan Lane (F1) | 540090005 | | | | X | | | | X | | | | 40.340933 | -80.596533 |
| McKims Ridge (W7) | 540090007 | | | | | | | | X | | | | 40.389660 | -80.586240 |
| Weirton/Marland Heights (W5) | 540090011 | | | X | X | | | | X | | | | 40.394583 | -80.612017 |
| Cabell | | | | | | | | | | | | | | |
| Huntington/Prindle Field (H3) | 540110007 | | | | X | X | | | | X | | | 38.410242 | -82.432436 |
| Greenbrier | | | | | | | | | | | | | | |
| Sam Black Church/DOH Garage (SB) | 540250003 | | | | | | | | | X | | | 37.908533 | -80.632633 |
| Hancock | | | | | | | | | | | | | | |
| Chester (CH) * | 540290008 | | | | | | | | | | | | 40.615720 | -80.560000 |
| New Cumberland/Tunanidas (W2) | 540290007 | | | | | | | | X | | | | 40.460138 | -80.576567 |
| Weirton/Summit Circle (W3) | 540290009 | | | X | X | | | | X | X | | | 40.427372 | -80.592318 |
| Lawrenceville (LV) | 540290015 | | | | | | | | X | | | | 40.618353 | -80.540618 |
| Harrison | | | | | | | | | | | | | | |
| Clarksburg/Washington Irving JHS (CL) | 540330003 | | | | X | | | | | | | | 39.278117 | -80.342250 |
| Kanawha | | | | | | | | | | | | | | |
| Charleston NCore (C6) | 540390020 | X | X | | X | X | X | X | X | X | X | X | 38.346258 | -81.621161 |
| South Charleston Library (SC) | 540391005 | | | | X | | | | | | | | 38.366183 | -81.693727 |
| Marion | | | | | | | | | | | | | | |
| Fairmont/Marion Health Care Hosp (FT) | 540490006 | | | | X | | | | | | | | 39.481483 | -80.134667 |
| Marshall | | | | | | | | | | | | | | |
| Moundsville/Nat'l Guard Armory (MV) | 540511002 | | | | X | X | X | | X | | | | 39.915961 | -80.733858 |
| Monongalia | | | | | | | | | | | | | | |
| Morgantown Airport (MA) | 540610003 | | | | X | | | | X | X | | | 39.649367 | -79.920897 |
| Ohio | | | | | | | | | | | | | | |
| Warwood (WD) | 540690010 | X | | | X | | | | | X | | | 40.114760 | -80.700972 |
| Wood | | | | | | | | | | | | | | |
| Vienna/Neale School (V1) | 541071002 | | | | X | | | | X | X | | | 39.323553 | -81.552367 |
| Total Sites | 18 | 2 | 1 | 2 | 13 | 3 | 2 | 1 | 10 | 8 | 1 | 1 | | |

** PM10-2.5 = Manual 3 day sampler (Charleston NCore)

** T640X = Continuous Particulate samplers

** PM2.5 = Manual 3 day samplers

** FRM = Federal Reference Method

** SPEC = Speciated

** MET = Meteorology

* Chester - Not in Operation

Berkeley County

Site: Martinsburg Ball Field

Location: Martinsburg Ball Field, Charlotte Prather Park, Martinsburg, Berkeley County, WV 25401

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: 4/12/2022 and 10/12/2022

EPA performance evaluation audit conducted 8/09/2022

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 7/14/2022

Brooke County

Site: Mahan Lane

Location: Mahan Lane, Follansbee, Brooke County, WV 26037

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 4/25/2022 and 10/28/2022

Gaseous:

Sulfur Dioxide – UV fluorescent continuous gas monitor

Representative siting scale: Neighborhood

Monitoring objective/site type: Population oriented

State accuracy audit conducted 8/9/2022

Site: McKims Ridge

Location: McKims Ridge Road, Colliers, Brooke County, WV 26035

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:

Gaseous:

Sulfur Dioxide – UV fluorescent continuous gas monitor

Representative siting scale: Neighborhood

Monitoring objective/site type: Population oriented

State accuracy audit conducted 8/9/2022

EPA through the probe audit conducted 7/28/2022

Site: Marland Heights

Location: Marland Heights, Weirton, Brooke County, WV 26062

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.

The aging Tapered Element Oscillating Micro-Balance (TEOM) Series 1405 continuous PM₁₀ monitor was discontinued on 10/6/2021 and replaced with a Teledyne API T640x continuous PM₁₀ monitor.

Parameters monitored, sampling method, scale, and purpose:

Particulates:

Teledyne API T640x continuous PM₁₀ monitor, Federal Equivalent Method

Representative siting scale: Neighborhood

Monitoring objective/site type: Population oriented

State flow rate audit conducted 4/20/2022 and 10/28/2022

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 4/25/2022 and 10/28/2022

EPA performance evaluation audit conducted 7/28/2022

Gaseous:

Sulfur Dioxide – UV fluorescent continuous gas monitor

Representative siting scale: Neighborhood

Monitoring objective/site type: Population oriented

State accuracy audit conducted 2/23/2022

EPA through the probe audit conducted 7/27/2022

Cabell County

Site: Huntington/ Prindle Field

Location: 1313 14th Street, Huntington, Cabell County, WV 25701

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 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 4/27/2022 and 10/27/2022

Co-located state audit conducted 4/27/2022 and 10/27/2022

Teledyne API T640x continuous PM_{2.5} monitor, Federal Equivalent Method

Representative siting scale: Urban

Monitoring objective/site type: Population oriented

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 9/13/2022

Greenbrier County

Site: Sam Black Church

Location: 235 Gray Gables Rd, Crawley, Department of Highway Garage, Greenbrier County, WV 24913

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. The shelter was moved within the perimeter of the DOH facility on October 12, 2022 to make way for a new salt shed. It was moved next to an old shelter that has been surplussed to DOH for storage.

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 5/16/2022

EPA through the probe audit conducted 6/9/2022

Hancock County

Site: New Cumberland

Location: RD#1 Carothers Road, New Cumberland, Hancock County, WV 26047

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 SO₂ 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 2/23/2022

EPA through the probe audit conducted 7/26/2022

Site: Chester

Location: A.T. Allison Elementary School, 647 Railroad Street, Chester, Hancock County, WV 26034

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 SO₂ hourly and 5-minute data through 12/31/2017.

Discretionary special purpose monitoring for the collection of PM₁₀ samples for metals analysis was conducted at this site starting in 2009 (TSP metals, and later PM₁₀ 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. PM₁₀ samples were collected over a 24-hour period on a once every 6-day schedule.

This discretionary PM₁₀ 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. The shelter has become unusable (see photos) and is in the process of being removed.

Site: Summit Circle

Location: Summit Circle, Weirton, Hancock County, WV 26062

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 to provide air quality monitoring in an industrial area of Hancock County, West Virginia.

As part of an extensive upgrade to this the site, including electrical lines, fencing and decking, and a new shelter, operations were suspended in September 2019, and resumed by early-mid 2020. The aging Tapered Element Oscillating Micro-Balance (TEOM) Series 1400AB/1400a continuous PM₁₀ monitor was discontinued on 8/11/2021 and replaced with a Teledyne API T640x continuous PM₁₀ monitor.

Parameters monitored, sampling method, scale, and purpose:

Particulates:

Teledyne API T640x continuous PM₁₀ monitor, Federal Equivalent Method

Representative siting scale: Urban

Monitoring objective/site type: Population oriented

State accuracy audit conducted 4/20/2022 and 10/28/2022

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 4/25/2022 and 10/28/2022
EPA performance evaluation audit conducted 7/28/2022

Gaseous:

Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State accuracy audit conducted 5/5/2022

Ozone – UV absorption continuous gas monitor operated during ozone season Mar – Oct
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 5/5/2022

Site: Lawrenceville

Location: Lawrenceville Park and Tyrone Road, Lawrenceville, Hancock County, WV 26034
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 12/06/2022

Harrison County

Site: Clarksburg

Location: Washington Irving Middle School, Clarksburg, Harrison County, WV 26301

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 4/13/2022 and 10/13/2022

Kanawha County

Site: NCore

Location: 1436 Dixie St., Charleston, Kanawha County, WV 25301

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: As part of this plan, DAQ continues to request the continuous FEM PM_{2.5}, BAM, at the NCore site in Charleston be excluded from NAAQS determinations. We will continue to report to AirNow, as required for NCore sites; however, EPA's own comparison tool indicates that the data should not be used to replace or fill-in for FRM data. Results from EPA's FRM-FEM PM_{2.5} Continuous Monitor Compatibility Assessment Tool for 2020-2022 data can be found in Appendix B. The continuous data continues to read higher than the Federal Reference Method (FRM).

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 4/28/2022 and 10/25/2022

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 4/28/2022 and 10/25/2022
EPA performance evaluation audit conducted 9/29/2022

PM₁₀ 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 PM₁₀ 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 6/13/2022

Ozone – UV absorption continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 9/30/2022

NO/NO_y – Chemiluminescence continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted – Audit gas cylinder expired

Carbon Monoxide –Gas filter correlation continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 3/30/2022

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 2/23/2022, 5/31/2022, 9/28/2022 and 12/29/2022

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., South Charleston, Kanawha County, WV 25303

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:

Particulates

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 4/28/2022 and 10/25/2022

EPA performance evaluation audit conducted 9/29/2022

Marion County

Site: Fairmont

Location: 401 Guffey Street, Manchin Health Care Center, Fairmont, Marion County, WV 26554

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 4/13/2022 and 10/13/2022

EPA performance evaluation audit conducted 10/20/2022

Marshall County

Site: Moundsville

Location: Moundsville National Guard Armory, Moundsville, Marshall County, WV 26041

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 in 2019; DAQ began reporting quality-assured data from January 1, 2021 to AQS; DAQ began reporting daily to AIRNow on April 21, 2021. While there are two (2) complete years of FEM data, DAQ requests that the continuous FEM PM_{2.5} T640x remains a special purpose monitor, and data be excluded from NAAQS determinations. The on-site FRM data should be used for NAAQS determination without data substitution. The results from EPA's FRM-FEM PM_{2.5} Continuous Monitor Compatibility Assessment Tool for 2021-2022 can be found in Appendix B

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 4/25/2022 and 10/28/2022

EPA performance evaluation audit conducted 10/20/2022

PM_{2.5} Teledyne API T640X continuous PM_{2.5} monitor, Federal Equivalent Method.

Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/19/2022 and 10/5/2022

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 3/1/2022, 5/2/2022, 8/5/2022 and 10/05/2022

Gaseous:

Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 12/09/2022

Mason County

Site: Lakin

Location: HWY 62, Lakin, WV
AQS ID: 54-053-0001
CBSA: Point Pleasant WV-OH
Latitude: 38.95649
Longitude: -82.08866

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 SO₂ Data Requirements Rule. One of the SO₂ 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 operation, data reporting, or quality assurance of this site.

Gaseous:

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

Monongalia County

Site: Morgantown

Location: Morgantown Municipal Airport, Morgantown, Monongalia County, WV 26505

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 4/13/2022 and 10/13/2022

Gaseous:

Sulfur Dioxide – UV fluorescent continuous gas monitor

Representative siting scale: Urban

Monitoring objective/site type: Population oriented

State accuracy audit conducted 8/30/2022

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 7/12/2022

Ohio County

Site: Warwood/Wheeling

Location: Warwood Water Treatment Plant, Wheeling, Ohio County, WV 26003

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 4/25/2022 and 10/28/2022

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 8/3/2022

Toxics

TSP metals, certain Volatile Organic Compounds, and Carbonyls.

Representative siting scale: Neighborhood

Samples once every 12 days

Monitoring objective/site type: Population oriented

Wood County

Site: Vienna

Location: Neale Elementary School, Vienna, Wood County, WV 26105

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 4/13/2022 and 10/13/2022

EPA performance evaluation audit conducted 10/20/2022

Gaseous:

Sulfur Dioxide – UV fluorescent continuous gas monitor

Representative siting scale: Urban

Monitoring objective/site type: Population oriented

State accuracy audit conducted 8/5/2022

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 9/12/2022

Appendix A - SO₂ 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)¹. This rule, referred to as the Data Requirements Rule (DRR), includes provisions in 40 CFR 51.1205(b) requiring an air agency to submit a report to the EPA documenting SO₂ emissions for areas where modeling of actual SO₂ emissions served as the basis for designating the area attainment for the 2010 1-hour SO₂ 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)² revising the SO₂ NAAQS and established a new 1-hour SO₂ 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, the EPA published (78 FR 47191)³, a final rule designating 29 areas, in 16 states, including two areas in West Virginia (Steubenville, OH-WV and Marshall, WV), as nonattainment for the 2010 1-hour SO₂ NAAQS. In that rulemaking, the EPA stated the agency 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 agency 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 the agency had failed to perform a nondiscretionary duty under the CAA by not issuing 1-hour SO₂ 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 SO₂ 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 SO₂ 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.

¹ <https://www.govinfo.gov/content/pkg/FR-2015-08-21/pdf/2015-20367.pdf>

² <https://www.govinfo.gov/content/pkg/FR-2010-06-22/pdf/2010-13947.pdf>

³ <https://www.govinfo.gov/content/pkg/FR-2013-08-05/pdf/2013-18835.pdf>

On August 21, 2015, the consent decree was finalized, and the EPA published the DRR (80 FR 51051)⁴. The primary purpose of the DRR is to require air agencies to characterize maximum 1-hour SO₂ concentrations around sources emitting 2,000 tons per year (tpy) or more of SO₂. Implementation of the DRR requires states to use either modeling or ambient monitoring to assess SO₂ concentrations or to establish federally enforceable emission limits to bound a source's emissions to less than 2,000 tpy.

The initial implementation step of the DRR required states to identify by January 15, 2016 sources not located in a nonattainment area which had actual annual SO₂ 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 source modeling. 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 the EPA to take actions before the DRR was finalized.

Effective August 12, 2020, the EPA redesignated the West Virginia portion of the Steubenville, OH-WV area to attainment for the 2010 SO₂ NAAQS (85 FR 41925)⁵. Further, effective November 25, 2020, the EPA redesignated the Marshall, WV area to attainment (85 FR 67661)⁶.

Emissions Assessment

Applicable SO₂ emission sources, defined as having actual annual SO₂ emissions of 2,000 tons or more, were modeled by the Division of Air Quality (DAQ) as the basis for designating the area as attainment with the 2010 1-hour SO₂ NAAQS. The applicable sources modeled were all electrical generating units (EGU). Because emissions were modeled based on actual emissions instead of allowable emissions, §51.1205(b) requires an annual report to be submitted to EPA documenting the annual SO₂ 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 SO₂ NAAQS.

The DRR requires an assessment of SO₂ emissions increases from the previous year. This report includes certified ambient SO₂ air quality monitoring data for 2022, therefore DAQ is assessing actual SO₂ emissions from the previous year, 2021, that may have impacted the 2022 monitoring data. Assessing only the SO₂ increase from a previous year limits the analysis to a two-year period and does not allow for an accurate assessment to determine the need for additional modeling. A comparison of actual annual SO₂ emissions from each applicable source during the initial modeling period, which demonstrated attainment with the 2010 NAAQS, to the previous year actual emissions allows for a better and more meaningful assessment. Therefore, DAQ has made our assessment based upon the initial modeling years as compared to the previous year. Table 1 below shows the three-year initial modeling period for each applicable source and the results of that modeling as a maximum percentage of the 2010 1-hour SO₂ NAAQS.

⁴ <https://www.govinfo.gov/content/pkg/FR-2015-08-21/pdf/2015-20367.pdf>

⁵ <https://www.govinfo.gov/content/pkg/FR-2020-07-13/pdf/2020-13452.pdf>

⁶ <https://www.govinfo.gov/content/pkg/FR-2020-10-26/pdf/2020-21757.pdf>

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% |

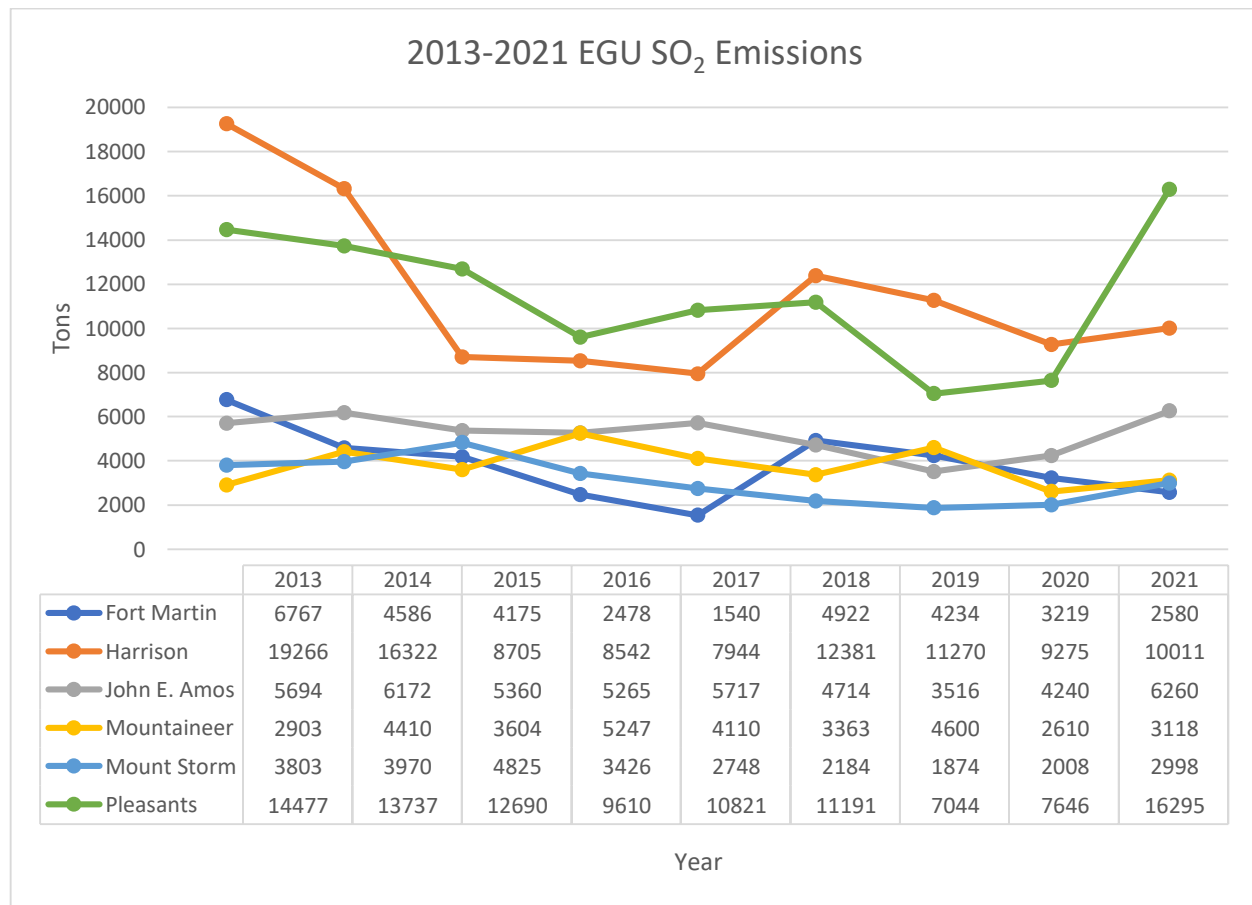
Figure 1 shows the actual annual SO₂ emissions for each modeled EGU from 2013 through 2021. These emissions were taken from the EPA Clean Air Markets Program Data (CAMPD) database⁷. As the chart illustrates, SO₂ emissions from each EGU have been largely stable or decreasing over the assessment period. As was the case for most facets of the supply and demand network, the global pandemic of 2020 caused some disruptions in the energy sector. Electricity demand and generation were certainly affected. Though most EGUs experienced a slight increase in SO₂ production, Pleasants Power saw a large increase. From 2020 and into 2021, Pleasants Power operated for more hours than in previous years and therefore produced more SO₂. The increase in operational hours in 2021 over 2020 was common among coal EGUs throughout the country, as frequent spiking and generally rising average natural gas prices⁸ throughout 2021 allowed coal units to be more cost competitive with natural gas units in markets where lowest cost generation assets are dispatched first. The U. S. Energy Information Administration (EIA) reports coal electricity generation in the United States increased from 773 billion kilowatt-hours (kWh) in 2020 to 899 billion kWh in 2021, while natural gas generation decreased from 1,624 billion kWh to 1,575 billion kWh over the same time period⁹. Although the 2022 data has not been certified at the time of this report, SO₂ values did drop significantly to be more in line with pre-COVID values and less than the highest modeled year.

⁷ <https://campd.epa.gov/>

⁸ <https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm>

⁹ <https://www.eia.gov/energyexplained/electricity/electricity-in-the-us.php>

Figure 1: 2013-2021 EGU SO₂ Emissions in tons



From Figure 1, the highest actual SO₂ emissions from the initial three-year modeling period can be compared to the actual 2021 emissions for each source. **Table 2** shows this comparison and demonstrates that actual 2021 SO₂ emissions were generally less than those of the highest modeled year. There were two exceptions: John Amos and Pleasants Power. A discussion of these increases follows in the Conclusions below.

Table 2: Highest Modeled Year SO₂ Emissions vs. 2021 SO₂ Emissions

| EGU Modeled | Highest Modeled Year | Highest Modeled Year Emissions (tons) | 2021 Emissions (tons) | Change from Highest Modeled Year to 2021 (tons) |
|-----------------|----------------------|---------------------------------------|-----------------------|---|
| Fort Martin | 2013 | 6,767 | 2,580 | -4,187 |
| Harrison | 2013 | 19,266 | 10,011 | -9,255 |
| John Amos | 2014 | 6,172 | 6,260 | +88 |
| Mountaineer | 2014 | 4,410 | 3,118 | -1,292 |
| Mount Storm | 2015 | 4,825 | 2,998 | -1,827 |
| Pleasants Power | 2013 | 14,477 | 16,295 | +1,818 |

Conclusions

As shown in Table 1, emissions initially modeled for each source were substantially less than the SO₂ 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 2021 actual SO₂ emissions were less than the emissions for the highest modeled year for all EGUs, except for Pleasants Power and John Amos. Pleasants Power appears to have been disproportionately affected by generation swings attributable to COVID electricity demand decrease and subsequent demand increase as well as natural gas price volatility. SO₂ emissions from the John Amos facility increased from the highest modeled year by 88 tons, which represents less than 1.5%. This slight increase for 2021 is also attributable to the same reasons as the Pleasants Power increase. If the 2022 actual SO₂ 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 for all EGU, including Pleasants Power and John Amos. With consideration of, and despite recent, unprecedented global events, emissions from these facilities remain below or consistent with the modeled years and demonstrate an overall stable trend. Therefore, as required in §51.1205(b), and based on this assessment, the air quality areas represented by the modeled sources continue to meet the 2010 1-hour SO₂ NAAQS and DAQ recommends no additional modeling is needed to characterize air quality in these areas.

Appendix B – DAQ requests exclusion of FEM PM_{2.5} data for NAAQS determination at all sites with FRM PM_{2.5} data per §58.11(e)

Per §58.11(e), DAQ requests exclusion of FEM PM_{2.5} data for NAAQS determination at all sites with FRM PM_{2.5} data; requests EPA discontinue the practice of substituting FEM data on non-FRM days; requests EPA correct historical data using this practice; and requests EPA update historical and current design value calculations accordingly.

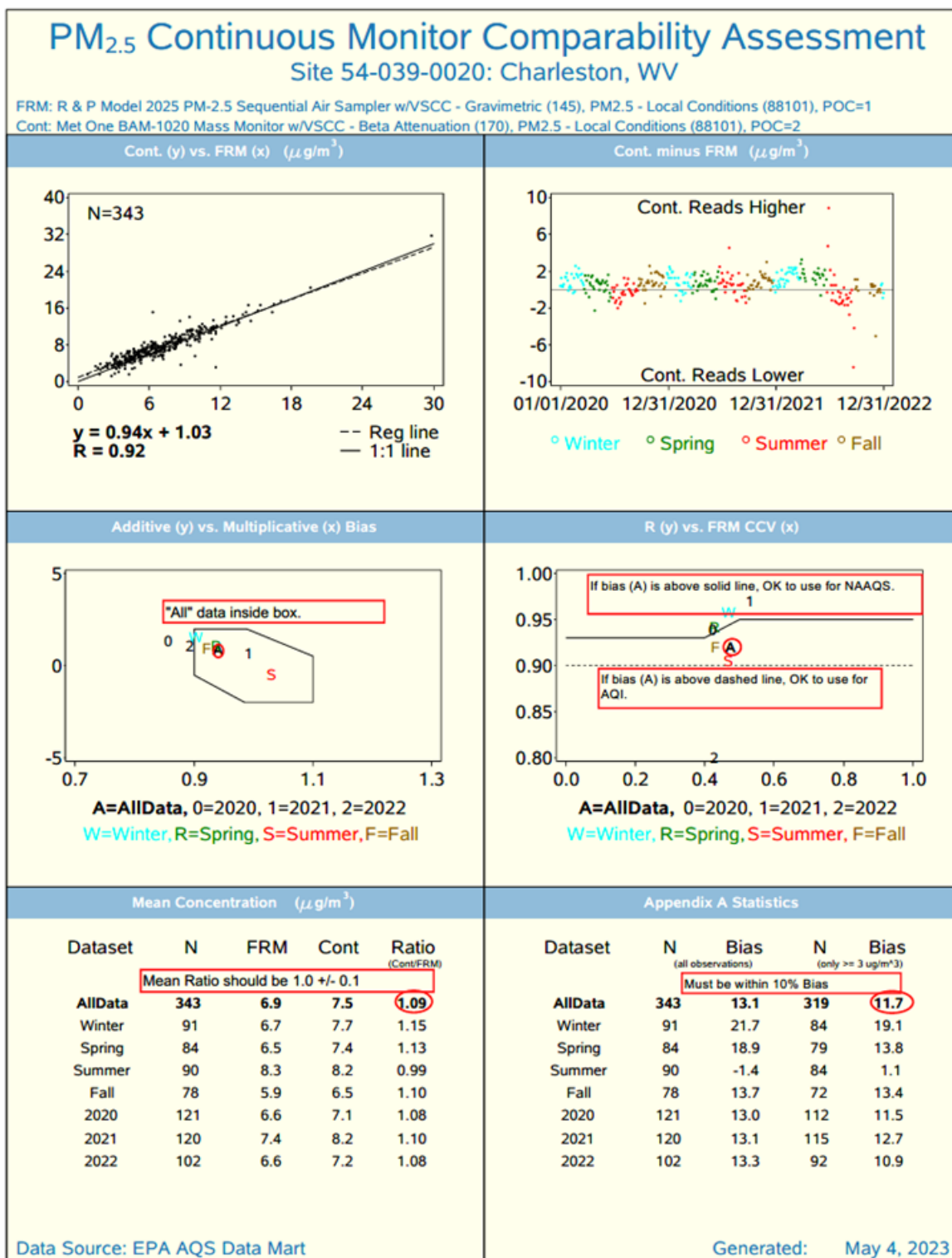
NCore (54-039-0020) – DAQ requests the continuous FEM PM_{2.5} BAM, at the NCore site in Charleston be designated as special purpose and be excluded from NAAQS determinations. We continue to report to AirNow, as required for NCore sites; however, EPA's own comparison tool indicates that the data should not be used to replace or fill-in for FRM data. While the data comparability has improved over the last couple of years, the continuous FEM data is higher than the on-site Federal Reference Method (FRM). The on-site FRM data should be used for NAAQS determination without data substitution.

As is apparent in the Charleston NCore FRM-FEM PM_{2.5} Continuous Monitor Compatibility Assessment Tool 2020-2022 results table in this Appendix, the FEM data at NCore should be excluded: the R(y) vs. FRM CCV(x) fails the test to use for NAAQS, and the Appendix A Statistics test fails the 10% Bias test (it is at 11.7%).

Moundsville (54-051-1002) – While there are two (2) complete years of FEM data, DAQ requests that the continuous FEM PM_{2.5} T640x remains a special purpose monitor, and data be excluded from NAAQS determinations. The on-site FRM data should be used for NAAQS determination without data substitution.

As is apparent in the Moundsville FRM-FEM PM_{2.5} Continuous Monitor Compatibility Assessment Tool 2021-2022 results table in this Appendix, the FEM data at NCore should be excluded: the Additive (y) vs. Multiplicative (x) Bias test fails since the data do not fall within the polygon box; the R(y) vs. FRM CCV(x) fails the test to use for NAAQS; the Mean Concentration test fails at 1.35% (it should be 1.0 +/- 0.1); and the Appendix A Statistics test fails at 37.0% Bias (Bias must be within 10%).

Charleston NCore FRM-FEM PM2.5 Continuous Monitor Compatibility Assessment Tool 2020-2022



Moundsville FRM-FEM PM2.5 Continuous Monitor Compatibility Assessment Tool 2021-2022

