Panoramic view of the CASTNET site at Georgia Station, GA (GAS153)

# 2022 CASTNET Annual Network Plan

Clean Air Markets Division

Office of Atmospheric Programs

US Environmental Protection Agency

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## 1. Network Overview

The Clean Air Status and Trends Network (CASTNET) is a long-term monitoring network designed to report trends in regional measurements of air pollutants including ozone ($O_3$), oxidized and reduced forms of nitrogen, and sulfur. CASTNET is managed collaboratively by the US Environmental Protection Agency – Clean Air Markets Division (EPA), the National Park Service – Air Resources Division (NPS), and the Bureau of Land Management – Wyoming State Office (BLM-WSO). In addition to EPA, NPS, and BLM-WSO, numerous other participants provide network support including tribes, other federal agencies, states, private landowners, and universities. The EPA contractor, Wood Environment & Infrastructure Solutions, Inc. (Wood), operates the EPA-sponsored sites while the NPS and BLM-WSO contractor, Air Resource Specialists, Inc. (ARS), operates the remaining sites. A table detailing the management structure of CASTNET operations is provided in Figure 1. A summary of the entire CASTNET monitoring program is available online.[1]

| US Government | US Government Contractors |
|---|---|
| **EPA – Clean Air Markets Division**<br>• **Project Officer**<br>• **QA Manager**<br>• **Technical Monitors**<br>• **Administrative Contracting Officer**<br>• **Contract Property Coordinator** | **Wood**<br>• **Project Manager**<br>  ○ Field Operations Manager<br>  ○ Laboratory Operations Manager<br>  ○ Data Management, Analysis, Interpretation, and Reporting Manager<br>  ○ Property Control Manager<br>• **QA Supervisor**<br>  ○ QA Manager |
| **NPS – Air Resources Division**<br>• **Contracting Officer's Representative (COR)**<br>• **QA Coordinator** | **ARS**<br>• **Program Manager**<br>  ○ Network Operations Manager<br>  ○ Data Management Manager<br>• **QA Officer** |
| **BLM – Wyoming State Office**<br>• **Program Manager** | |

**Figure 1. CASTNET Project Organization**

Eighty-three CASTNET sites measure weekly concentrations of sulfur dioxide ($SO_2$), sulfate ($SO_4^{2-}$), nitrate ($NO_3^-$), nitric acid ($HNO_3$), ammonium ($NH_4^+$), chloride ($Cl^-$) and base cations using a 3-stage filter pack (see Figure 2). Each site also reports hourly 9-meter temperature data to calculate local condition flow volumes. Eighty-one CASTNET sites collect ambient $O_3$ concentrations, reported as hourly averages, using a dual cell, ultraviolet photometric analyzer. Eighty of the eighty-one CASTNET $O_3$ monitoring analyzers meet the ambient monitoring and quality assurance requirements of Title 40, Code of Federal Regulations (CFR) Part 58 Appendices A, C, D and E. The ozone analyzer at Duke Forest, NC (DUK008) does not meet the siting criteria requirements from Appendix E of Part 58 because it has an inlet above the forest canopy at a height of 48 meters. Monitoring objectives, site types, detailed siting criteria, and other relevant parameters for each monitoring site may be found in Appendix A of this plan.

In addition to weekly filter pack and hourly temperature and $O_3$ measurements, forty-three CASTNET sites report hourly meteorological parameters. CASTNET also measures trace-level NO/NOy, $SO_2$, and CO at select sites. CASTNET $O_3$ and trace-level gas monitors report hourly measurements throughout the entire year. Ozone analyzers are challenged nightly with known concentrations delivered from the on-site transfer standard and trace gas analyzers are challenged every other night for fast-response troubleshooting.

[1] CASTNET monitoring program https://www3.epa.gov/castnet/docs/CASTNET-Factsheet-2021.pdf

To monitor consistency between the agencies, EPA operates a co-located site (ROM206) at the NPS CASTNET site located in Rocky Mountain National Park, Colorado (ROM406). Also, EPA operates a pair of co-located $O_3$ monitors (MCK131 and MCK231) in Mackville, KY with the co-located site identified as MCK231. Data from ROM206 and MCK231 are routinely analyzed to assess precision of the measurements and to identify biases that may arise. The CASTNET quality assurance (QA) program is independent of the program management. The QA program routinely assesses compliance with the CASTNET Quality Assurance Project Plan (QAPP)[2] through internal monitoring, including audits and on-site system checks. Additionally, network QA is assessed through an independent audit program managed by EPA. Annual Performance Evaluation (PE) audits at most CASTNET sites are performed by Environmental Engineering & Measurement Services, Inc. (EE&MS). The remaining sites not audited by EE&MS receive PE audits by state, local, or tribal agencies to fulfill the annual PE audit requirement. EE&MS also assesses compliance with the CASTNET QAPP through a Field Systems Audit (FSA) at every CASTNET site every other year following protocols listed in the EPA QA Handbook.[3] The FSA is a complementary component to the facility technical systems audit (TSA) performed by another independent auditor at both the EPA and NPS/BLM-WSO contractors' operations centers every third year.

Both the EPA-sponsored and NPS-sponsored $O_3$ monitoring programs began before 1990. While the NPS-sponsored $O_3$ monitoring program was designed to meet $O_3$ monitoring regulations from the beginning, the EPA-sponsored $O_3$ monitoring program was not. All EPA-sponsored $O_3$ monitors were upgraded by 2011 to comply with the requirements in 40 CFR Part 58. EPA replaced the existing $O_3$ analyzers with a pair of Thermo Scientific™ Model 49i analyzers, where one analyzer has an onboard $O_3$-generator for use as an on-site transfer standard. The upgrade of the EPA-sponsored $O_3$ analyzers resulted in an improved ability to evaluate the quality of the ambient data.

The EPA uses CASTNET $O_3$ and trace-level gas data to calculate design values for all sites where data completeness requirements are met. The CASTNET program follows QA/QC procedures and schedules to meet the regulatory requirements detailed in Appendix B of this plan. This document includes an overview of the CASTNET regulatory $O_3$ and trace-level gas monitoring program, a description of the internal and external QA programs, any planned changes to the network, and a description of each monitoring site. The procedures in this Network Plan originate from the requirements found in 40 CFR Part 58.10, but are adapted to a federally operated national monitoring network.

[2] CASTNET Quality Assurance Project Plan v9.4
https://www3.epa.gov/castnet/docs/CASTNET_QAPP_v9-4_Main_Body.pdf

[3] Quality Assurance Handbook for Air Pollution Measurement Systems Volume II, January 2017
https://www3.epa.gov/ttn/amtic/files/ambient/pm25/qa/Final%20Handbook%20Document%201_17.pdf

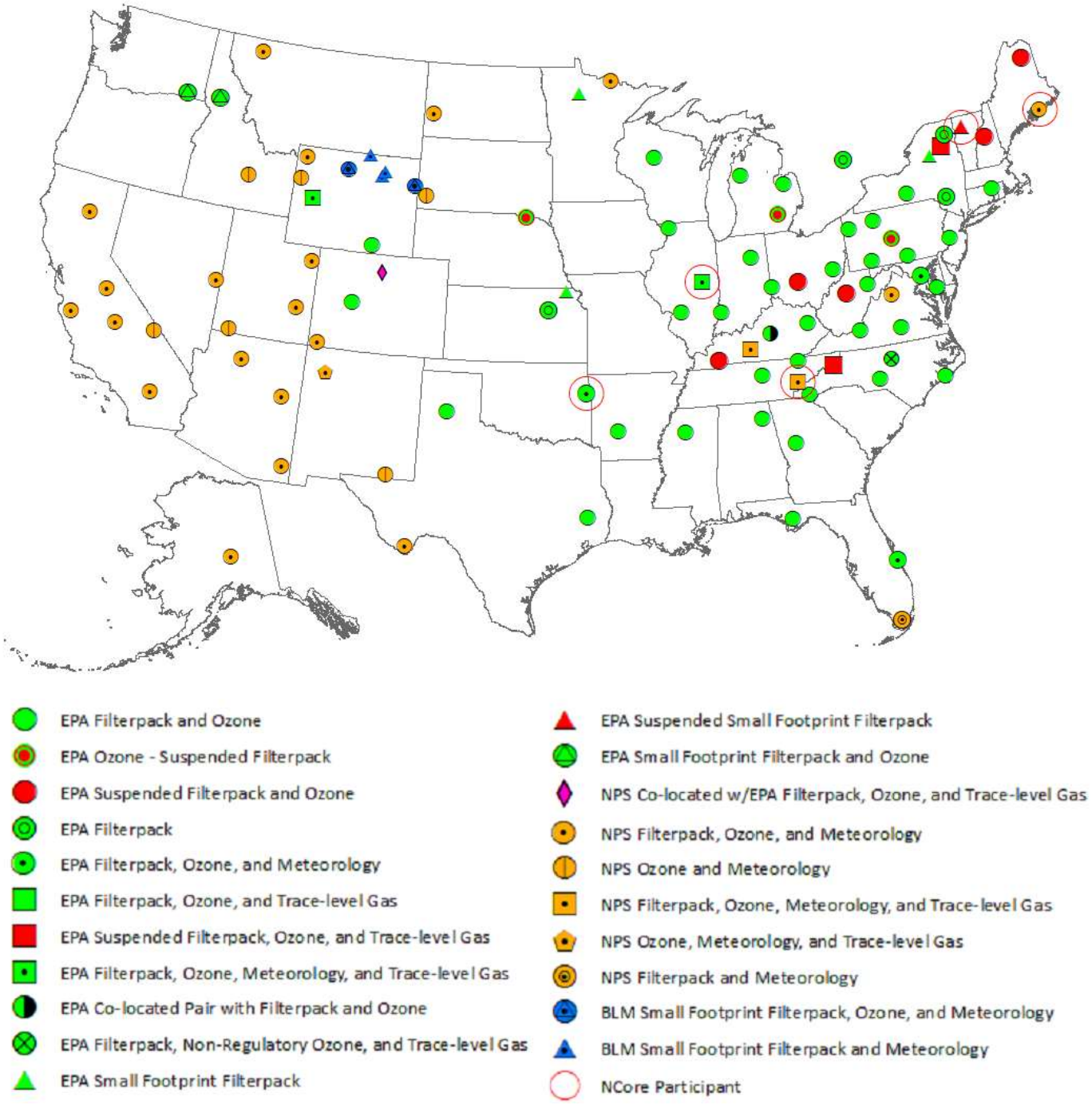


**Figure 2. Active CASTNET sites in 2022** Green shapes represent EPA-sponsored sites. Red shapes indicate EPA-sponsored sites that are suspended all or partial monitoring activities. Orange shapes represent NPS-sponsored sites. The purple diamond represents a co-located pair of NPS-sponsored ozone and filterpack monitoring and EPA-sponsored ozone, filterpack, and trace-level gas monitoring. Blue shapes represent BLM-Wyoming State Office-sponsored sites. National Core network (NCore) sites are identified with a large red circle. For a list of which sites are in each category see Appendix J of this plan. A list of sites with suspended monitoring is included in Appendix K of this plan.

## 2. Ozone and Trace-level Gas Data

CASTNET monitors measure ambient $O_3$ concentrations for the entire year, which extends beyond the required $O_3$ season for many states. CASTNET submits ambient concentrations in near real time to AIRNow[4] and reports hourly data and nightly QC results to the CASTNET website daily for sites where EPA, NPS, or BLM-WSO is the primary quality assurance organization. NPS also displays $O_3$ and meteorological data on the Gaseous Pollutant and Meteorological Data website[5] and the BLM-WSO distributes $O_3$ data through the Wyoming Air Resource Monitoring System (WARMS) website.[6] Wood and ARS submit the $O_3$ and trace-level gas concentrations to EPA's Air Quality System (AQS) database on a monthly basis and daily 1-point precision results on a quarterly basis. EPA submits $O_3$ data from two co-located monitors (ROM206 and MCK231) to AQS, but these data are identified as 'NAAQS Excluded' because these data are solely used for QA purposes and are not used to calculate design values.

CASTNET also measures ambient trace-level gas concentrations including $SO_2$ and CO at Bondville, IL as required by the NCore program for the entire year. CASTNET reports ambient trace-level gas concentrations to the CASTNET website daily.[7] Wood and ARS submit the hourly and 5-minute ($SO_2$ only) trace-level gas concentrations to the AQS database on a monthly basis and daily 1-point precision check results on a quarterly basis. The trace-level gas measurements reported by EPA are certified for comparison against the respective NAAQS, while NPS does not certify their trace-level gas measurements.

CASTNET uses the measurement quality objectives and criteria gas validation templates described in the EPA QA Handbook Validation Template[8] (reproduced in Appendix B of this plan) to ensure that the highest quality data are being submitted to the AQS. These tables describe operational and systematic criteria for $O_3$ and trace-level gas data validation, including requirements for frequency of measurements or audits, calibration schedules, and acceptance criteria for QC checks. One-minute data collected for ambient $O_3$ and trace-level gas measurements are used for data validation purposes and are stored indefinitely.

In addition to the QC checks required for meeting the measurement quality objectives and validation templates, semi-annual ($O_3$) and quarterly ($SO_2$ and CO) system checks are performed at each CASTNET site. Using National Institute of Standards and Technology (NIST) terminology, we define levels as degrees of separation from a NIST standard reference photometer (Level 1). During these checks, a field operations technician challenges the on-site analyzer and re-verifies the on-site transfer standard, calibrates the on-site analyzer to the traveling transfer standard (Level 2) as needed, and verifies the data logger and the shelter temperature probe using NIST-traceable standards. All on-site $O_3$ transfer standards at CASTNET sites are NIST-traceable at Level 3. A flow chart diagram of the data certification process for the EPA contractor, Wood, is illustrated in Appendix D of this plan.

Following guidance in 40 CFR Part 58.15, CASTNET federal managers from EPA, NPS, and BLM-WSO submit their annual data certification letter, including the AQS Data Certification Report (AMP600), to the EPA Office of Air Quality Planning and Standards (OAQPS) and applicable EPA Regional Offices by May 1 of each year. Consistent with 40 CFR Part 58.10 (a)(1), each analyzer included in Appendix G of this plan meets the siting and operational criteria required in appendices A, C, D, and E of 40 CFR Part 58 as identified for each year, except DUK008, as noted.

## 3. Exceptional Events

Exceptional events are unusual or naturally occurring events that can affect air quality, but are not reasonably controllable using techniques that state, local, or tribal (S/L/T) air agencies may implement in order to attain and maintain the National Ambient Air Quality Standards. Exceptional events include wildfires, stratospheric ozone intrusions, and volcanic and seismic activities. Following guidance in 40 CFR Part 50.14(a)(1), a state may request that EPA exclude data that exceed the NAAQS and have been

[4] AIRNow https://www.airnow.gov

[5] NPS Gaseous Pollutant and Meteorological Data website http://ard-request.air-resource.com/

[6] BLM-WSO WARMS website http://www.blmwarms.net/

[7] CASTNET website https://www.epa.gov/castnet/

[8] EPA QA Handbook Appendix D Validation Templates, March 2017 https://www3.epa.gov/ttn/amtic/files/ambient/pm25/qa/APP_D%20validation%20template%20version%2003_2017_for%20AMTIC%20Rev_1.pdf

impacted by an exceptional event. As noted in the preamble to the 2016 Exceptional Events Rule (81 FR 68216, 10/3/2016),[9] "as the single actor responsible for administering air quality planning and management activities within its jurisdictional boundaries, the state, exclusive of tribal lands, is ultimately responsible for submitting exceptional event demonstrations for exceedances that occur at all regulatory monitoring sites within the boundary of the state."

CASTNET federal partners will work with S/L/T air agencies to include a flag in AQS for ambient data potentially influenced by an exceptional event, as requested by an S/L/T air agency that has jurisdiction over the area where a CASTNET site is located, and assist in preparing a demonstration (i.e., providing relevant information) if requested. The initial data flag is denoted as informational-use only and flagged data will continue to be used for NAAQS attainment purposes until the EPA Regional Administrator provides approval for an exceptional event demonstration.

State agencies will be responsible for working with the EPA region to submit exceptional event demonstrations, which may include data from CASTNET sites. CASTNET managers do not have the authorization to determine the sufficiency of an exceptional event demonstration or whether CASTNET monitoring data should be excluded from the NAAQS calculation. S/L/T agencies should follow the regulations described in the revision to 40 CFR Parts 50 and 51, Treatment of Data Influenced by Exceptional Events (81 FR 68216, 10/3/2016), to prepare and submit exceptional event demonstrations.

To request that CASTNET managers apply initial data flags to CASTNET $O_3$ data potentially impacted by an exceptional event, an S/L/T agency should email the following information to Timothy Sharac (sharac.timothy@epa.gov) for EPA-sponsored sites, Barkley Sive (barkley_sive@nps.gov) for NPS-sponsored sites, or Ryan McCammon (rmccammon@blm.gov) for BLM-sponsored sites:

- date/time range of incident,
- type of exceptional event, and
- CASTNET site(s)

Initial data flags will be applied within 30 days after CASTNET managers receive a request from an S/L/T agency. Exceptional event types and their associated AQS qualifier codes are listed on the AQS Code List webpage.[10]

## 4. Network Audit Requirements

The network audit requirements for 40 CFR Part 58 compliance are summarized in Appendix B of this plan. CASTNET managers include the PE and FSA schedules with each Annual Network Plan to ensure EPA Regional Offices have the opportunity to make travel arrangements if they choose to attend the audit. The EPA Regional Office contacts are listed in Appendix E of this plan.

## 5. Quality Control Checks

Automated zero/precision/span (ZPS) quality control checks are performed nightly on all CASTNET ozone analyzers as shown in Table 1. EPA-sponsored ozone analyzers also receive additional weekly QC checks at 30, 90, and 150 ppb on Sundays to verify analyzer accuracy spanning typical ambient ozone concentrations. Additional checks may be initiated remotely to troubleshoot potential issues that may arise. The criteria for the automated ZPS QC checks are included in Appendix B of this plan. Zero, precision, and span QC results are posted to the CASTNET website daily for EPA-sponsored CASTNET sites.

[9] Federal Register Volume 81, No. 191 October 3, 2016
https://www.epa.gov/sites/production/files/2016-09/documents/exceptional_events_rule_revisions_2060-as02_final.pdf

[10] AQS Code List webpage https://www.epa.gov/aqs/aqs-code-list

## Table 1 Quality Control Checks

| | Frequency | $O_3$ (ppb) | $SO_2$ (ppb) | CO (ppb) |
|---|---|---|---|---|
| **Zero** | Daily | 0 | 0* | 0* |
| **Precision** | Daily | 60 | 25* | 250* |
| **Span** | Daily | 225** | 90* | 1800* |
| **Additional point #1** | Weekly | 30*** | 5*** | 80*** |
| **Additional point #2** | Weekly | 90*** | 40*** | 300*** |
| **Additional point #3** | Weekly | 150*** | 60*** | 800*** |

*Table 1 Notes:* *$SO_2$ and CO checks are performed every other night
**NPS and BLM-WSO perform $O_3$ span checks at 200 ppb
***EPA-sponsored CASTNET sites

### 6. Performance Evaluations (PE)

In accordance with EPA's QA Handbook and 40 CFR Parts 53 and 58, an independent auditor performs an annual PE audit and submits these results to AQS on a quarterly basis. Verification of the $O_3$ and trace-level gas analyzers during the field systems audit (FSA) requires that the zero/span be within ±2% of the full scale of the best fit linear line. The auditor selects target concentration values among the ten audit levels, as described in Appendix A to 40 CFR Part 58.[11] The evaluation is made by challenging the analyzer with audit gas standards of known concentration from a minimum of three audit levels that represent routine concentrations at the monitoring site (see Table 2 for acceptable audit ranges). Results for audit levels 1 and 2 must be less than ±1.5 ppb or less than ±15.1%, whichever is less restrictive, to meet the acceptance criteria for $O_3$, $SO_2$, and $NO_2$, while levels 1 and 2 must be less than ±0.031 ppm or less than ±15.1%, whichever is less restrictive, to meet the acceptance criteria for CO. Results from levels 3-10 must be less than ±15.1% to meet the acceptance criteria.

## Table 2 Audit Levels for Performance Evaluations [11]

| Audit Level | $O_3$ Concentration Range, ppm | $SO_2$ Concentration Range, ppm | $NO_2$ Concentration Range, ppm | $O_3$, $SO_2$, and $NO_2$ Acceptance Criteria | CO Concentration Range, ppm | CO Acceptance Criteria |
|---|---|---|---|---|---|---|
| **1** | 0.004 – 0.0059 | **0.003 – 0.0029** | **0.003 – 0.0029** | < ±1.5 ppb or < ±15.1%, whichever is greater | 0.020 – 0.059 | <±0.031 ppm or <±15.1%, whichever is greater |
| **2** | **0.006 – 0.019** | **0.0030 – 0.0049** | **0.0030 – 0.0049** | <±1.5 ppb or <±15.1%, whichever is greater | **0.060 – 0.199** | <±0.031 ppm or <±15.1%, whichever is greater |
| **3** | **0.020 – 0.039** | 0.0050 – 0.0079 | 0.0050 – 0.0079 | <±15.1% | **0.200 – 0.899** | <±15.1% |
| **4** | **0.040 – 0.069** | **0.0080 – 0.0199** | **0.0080 – 0.0199** | <±15.1% | **0.900 – 2.999** | <±15.1% |
| **5** | 0.070 – 0.089 | **0.0200 – 0.0499** | **0.0200 – 0.0499** | <±15.1% | **3.000 – 7.999** | <±15.1% |
| **6** | **0.090 – 0.119** | 0.0500 – 0.0999 | 0.0500 – 0.0999 | <±15.1% | 8.000 – 15.999 | <±15.1% |
| **7** | 0.120 – 0.139 | 0.1000 – 0.1499 | 0.1000 – 0.2999 | <±15.1% | 16.000 – 30.999 | <±15.1% |
| **8** | 0.140 – 0.169 | 0.1500 – 0.2599 | 0.3000 – 0.4999 | <±15.1% | 31.000 – 39.999 | <±15.1% |
| **9** | 0.170 – 0.189 | 0.2600 – 0.7999 | 0.5000 – 0.7999 | <±15.1% | 40.000 – 49.999 | <±15.1% |
| **10** | 0.190 - 0.259 | 0.8000 – 1.000 | 0.8000 – 1.000 | <±15.1% | 50.000 – 60.000 | <±15.1% |

*Table 2 Note:* 40 CFR Part 58 Appendix A – Quality Assurance Requirements for Monitors used in Evaluations of National Ambient Air Quality Standards.[11] The target audit levels used for PE audits for CASTNET $O_3$, $SO_2$, and CO measurements are highlighted in bold font.

The proposed PE and FSA audit schedule for CASTNET sites is shown in Table 3 below. The independent auditor uses equipment that is NIST-certified (verified twice per year) to audit CASTNET monitoring equipment. The independent auditor performs a PE audit at each site annually and performs an FSA which includes an audit of flow, meteorological sensors, and related parameters every other year. States may perform a PE audit if they coordinate with the sponsoring agency, site supervisor, and independent auditor as explained in the third-party CASTNET audit document.[12]

[11] 40 CFR Part 58 Appendix A – Quality Assurance Requirements for Monitors used in Evaluations of National Ambient Air Quality Standards. https://www.ecfr.gov/cgi-bin/retrieveECFR?n=40y6.0.1.1.6
[12] CASTNET third-party audit document https://www.epa.gov/sites/production/files/2015-07/documents/third_party_audits.pdf

## Table 3 Proposed PE and FSA Schedule

| EPA Rgn | State | AQS ID | POC | SITE ID | Site Name | Audit Type Even Years | Audit Month Even Years | Audit Type Odd Years | Audit Month Odd Years |
|---|---|---|---|---|---|---|---|---|---|
| 1 | CT | 090159991 | 1 | ABT147 | Abington | FSA + PE | October | PE | September |
| 1 | ME | 230090103 | 1 | ACA416 | Acadia NP | FSA + PE | October | Performed by ME-DEP | September |
| 2 | NJ | 340219991 | 1 | WSP144 | Wash. Crossing | PE | October | FSA + PE | October |
| 2 | NY | 361099991 | 1 | CTH110 | Connecticut Hill | FSA + PE | September | PE | November |
| 3 | MD | 240339991 | 1 | BEL116 | Beltsville | FSA + PE | November | PE | October |
| 3 | MD | 240199991 | 1 | BWR139 | Blackwater NWR | PE | November | FSA + PE | October |
| 3 | PA | 420019991 | 1 | ARE128 | Arendtsville | FSA + PE | November | PE | October |
| 3 | PA | 420479991 | 1 | KEF112 | Kane Exp. Forest | FSA + PE | October | PE | November |
| 3 | PA | 421119991 | 1 | LRL117 | Laurel Hill | PE | October | FSA + PE | November |
| 3 | PA | 420859991 | 1 | MKG113 | M.K. Goddard | FSA + PE | October | PE | November |
| 3 | PA | 420279991 | 1 | PSU106 | Penn State | FSA + PE | November | PE | October |
| 3 | WV | 540939991 | 1 | PAR107 | Parsons | PE | October | FSA + PE | November |
| 3 | VA | 511479991 | 1 | PED108 | Prince Edward | PE | September | FSA + PE | September |
| 3 | VA | 510719991 | 1 | VPI120 | Horton Station | PE | September | FSA + PE | September |
| 3 | VA | 511130003 | 1 | SHN418 | Shenandoah NP - Big Meadows | PE | November | FSA + PE | November |
| 4 | AL | 010499991 | 1 | SND152 | Sand Mountain | FSA + PE | February | PE | February |
| 4 | FL | 120619991 | 1 | IRL141 | Indian River Lagoon | FSA | February | PE | February |
| 4 | FL | 120779991 | 1 | SUM156 | Sumatra | FSA | February | PE | February |
| 4 | GA | 132319991 | 1 | GAS153 | Georgia Station | FSA | February | PE | February |
| 4 | KY | 211759991 | 1 | CKT136 | Crockett | PE | April | FSA + PE | March |
| 4 | KY | 212299991 | 1 | MCK131 | Mackville | PE | March | FSA + PE | March |
| 4 | KY | 212299991 | 2 | MCK231 | Mackville Co-located | PE | March | FSA + PE | March |
| 4 | KY | 210610501 | 1 | MAC426 | Mammoth Cave NP | PE | March | FSA + PE | March |
| 4 | MS | 281619991 | 1 | CVL151 | Coffeeville | PE | March | FSA + PE | February |
| 4 | NC | 370319991 | 1 | BFT142 | Beaufort | PE | November | FSA + PE | October |
| 4 | NC | 371239991 | 1 | CND125 | Candor | PE | November | FSA + PE | October |
| 4 | NC | 371139991 | 1 | COW137 | Coweeta | FSA + PE | March | PE | March |
| 4 | NC | N/A | N/A | DUK008 | Orange | PE | November | FSA + PE | October |
| 4 | TN | 470419991 | 1 | ESP127 | Edgar Evins | FSA + PE | April | PE | April |
| 4 | TN | 470259991 | 1 | SPD111 | Speedwell | FSA + PE | March | PE | April |
| 4 | TN | 470090101 | 1 | GRS420 | Great Smoky NP - Look Rock | PE | October | FSA + PE | September |
| 5 | IL | 171199991 | 1 | ALH157 | Alhambra | PE | June | FSA + PE | August |
| 5 | IL | 170191001 | 1 | BVL130 | Bondville | PE | August | FSA + PE | August |
| 5 | IL | 170859991 | 1 | STK138 | Stockton | PE | June | FSA + PE | August |
| 5 | IN | 181699991 | 1 | SAL133 | Salamonie Reservoir | FSA + PE | August | PE | August |
| 5 | IN | 180839991 | 1 | VIN140 | Vincennes | PE | June | FSA + PE | August |
| 5 | MI | 261619991 | 1 | ANA115 | Ann Arbor | FSA + PE | August | PE | August |
| 5 | MI | 261659991 | 1 | HOX148 | Hoxeyville | FSA + PE | August | PE | August |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **5** | MI | 261579991 | 1 | UVL124 | Unionville | FSA + PE | August | PE | August |
| **5** | MN | 271370034 | 1 | VOY413 | Voyageurs NP | PE | August | FSA + PE | August |
| **5** | OH | 390179991 | 1 | OXF122 | Oxford | PE | April | FSA + PE | April |
| **5** | OH | 391219991 | 1 | QAK172 | Quaker City | PE | April | FSA + PE | April |
| **5** | WI | 551199991 | 1 | PRK134 | Perkinstown | PE | August | FSA + PE | August |
| **6** | AR | 050199991 | 1 | CAD150 | Caddo Valley | PE | February | FSA + PE | February |
| **6** | OK | 400019009 | 1 | CHE185 | Cherokee Nation | PE | February | FSA + PE | March |
| **6** | NM | 350450020 | 1 | CHC432 | Chaco NM | PE | April | FSA + PE | April |
| **6** | NM | 350150010 | 1 | CAV436 | Carlsbad Caverns | PE | April | FSA + PE | April |
| **6** | TX | 483739991 | 1 | ALC188 | Alabama-Coushatta | PE | March | FSA + PE | February |
| **6** | TX | 480430101 | 1 | BBE401 | Big Bend NP | PE | March | FSA + PE | March |
| **6** | TX | 483819991 | 1 | PAL190 | Palo Duro | PE | February | FSA + PE | March |
| **7** | NE | 311079991 | 1 | SAN189 | Santee Sioux | PE | July | FSA + PE | June |
| **8** | CO | 080519991 | 1 | GTH161 | Gothic | PE | June | FSA + PE | June |
| **8** | CO | 080830101 | 1 | MEV405 | Mesa Verde NP | FSA + PE | April | PE | April |
| **8** | CO | 080690007 | 1 | ROM406 | Rocky Mtn NP Primary | PE | June | FSA + PE | June |
| **8** | CO | 080690007 | 3 | ROM206 | Rocky Mtn NP QA Co-located | PE | June | FSA + PE | June |
| **8** | MT | 300298001 | 1 | GLR468 | Glacier NP | FSA + PE | June | PE | June |
| **8** | ND | 380070002 | 1 | THR422 | Theodore Roosevelt NP | Performed by ND-DEQ | September | FSA + PE | July |
| **8** | SD | 460330132 | 3 | WNC429 | Wind Cave NP | Performed by SD-DENR | September | FSA + PE | July |
| **8** | UT | 490370101 | 1 | CAN407 | Canyonlands NP | FSA + PE | April | PE | April |
| **8** | UT | 490471002 | 1 | DIN431 | Dinosaur NM | FSA + PE | July | PE | July |
| **8** | UT | 490530130 | 1 | ZIO433 | Zion NP | PE | April | FSA + PE | April |
| **8** | WY | 560030002 | 1 | BAS601 | Basin | PE | June | FSA + PE | June |
| **8** | WY | 560019991 | 1 | CNT169 | Centennial | PE | June | FSA + PE | June |
| **8** | WY | 560450003 | 1 | NEC602 | Newcastle | PE | June | FSA + PE | June |
| **8** | WY | 560359991 | 1 | PND165 | Pinedale | PE | August | FSA + PE | June |
| **8** | WY | 560390008 | 1 | GRT434 | Grand Teton NP | FSA + PE | August | PE | May |
| **8** | WY | 560391011 | 1 | YEL408 | Yellowstone NP | PE | August | FSA + PE | May |
| **9** | AZ | 040038001 | 1 | CHA467 | Chiricahua NM | FSA + PE | April | PE | April |
| **9** | AZ | 040058001 | 1 | GRC474 | Grand Canyon NP | FSA + PE | April | PE | April |
| **9** | AZ | 040170119 | 1 | PET427 | Petrified Forest | FSA + PE | April | PE | April |
| **9** | CA | 060270101 | 1 | DEV412 | Death Valley NP | FSA + PE | April | PE | April |
| **9** | CA | 060719002 | 1 | JOT403 | Joshua Tree NP | FSA + PE | May | PE | April |
| **9** | CA | 060893003 | 1 | LAV410 | Lassen Volcanic NP | PE | May | FSA + PE | May |
| **9** | CA | 060690003 | 1 | PIN414 | Pinnacles NM | PE | May | FSA + PE | April |
| **9** | CA | 061070009 | 1 | SEK430 | Sequoia NP - Ash Mountain | PE | May | FSA + PE | May |
| **9** | CA | 060430003 | 1 | YOS404 | Yosemite NP - Turtleback Dome | PE | May | FSA + PE | May |
| **9** | NV | 320330101 | 1 | GRB411 | Great Basin NP | FSA + PE | May | PE | April |
| **10** | AK | 020680003 | 1 | DEN417 | Denali NP | FSA + PE | July | PE | June |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **10** | ID | 160499991 | 1 | NPT006 | Nez Perce | FSA + PE | October | PE | October |
| **10** | ID | 160230101 | 1 | CRM435 | Craters of the Moon NP | FSA + PE | October | PE | October |
| **10** | WA | 530139991 | 1 | UMA009 | Umatilla | FSA + PE | August | PE | August |

*Table 3 Note:* See Appendix H of this plan for CBSA codes for CASTNET sites where they are available

## 7. Field Systems Audit (FSA)

An independent auditor performs a field systems audit (FSA) every other year at each CASTNET site to complement the requirements of a technical systems audit (TSA) which is required every three years to ensure network-wide consistency among all sites within CASTNET. The purpose of an FSA is to provide an independent assessment of the siting criteria, performance of monitoring equipment, and the proficiency of the site operator. The auditor verifies that filter pack flow, the $O_3$ analyzer, shelter temperature, and the meteorological sensors meet the acceptance criteria listed in Appendix B and the CASTNET QAPP.[13] The auditor also completes a PE audit for $O_3$ in addition to an FSA to verify there are no line losses within the system and documents whether the monitor configuration violates any of the CASTNET siting criteria found in the CASTNET QAPP. During an FSA, the auditor discusses any issues related to equipment, siting criteria, or operator handling with the operator and/or site supervisor. The independent auditor submits audit results to the site supervisor, site operator, site funding agency, and CASTNET contractor following the audit. A summary of audit results is available in a quarterly report and posted to CASTNET's Independent Audit Program webpage.[14]

The independent auditor sends FSA announcement letters to the agency contractor, site operator, and site sponsor describing the purpose of the site visit 2-4 weeks prior to an FSA to ensure all parties involved are prepared. The current proposed schedule is shown in Table 3.

## 8. National Performance Audit Program (NPAP)

The purpose of the NPAP is to assess the proficiency of the monitoring organization. As the primary sponsor for CASTNET, EPA's Clean Air Markets Division coordinates with OAQPS, EPA Regional Offices (listed in Appendix E of this plan), and the Environmental Services Assistance Team (ESAT) to fulfill the NPAP requirements for all CASTNET sites. Each monitoring organization's network is required to complete NPAP audits, with a goal of 20% of the sites each year or 100% within 6 years. Through-the-probe audits are performed during an NPAP audit using a zero air generator to supply the carrier gas to an $O_3$ generator. Audit $O_3$ concentrations are delivered to the through-the-probe dual glass manifold connected to the monitor's inlet probe while venting excess flow to the atmosphere. The $O_3$ generator is referenced back to a Level 2 $O_3$ standard which is in turn referenced to a Level 1 standard reference photometer. The auditor selects 3 or 4 known target concentrations to determine the accuracy of the on-site $O_3$ analyzer. The $O_3$ NPAP audit's percent difference criterion of less than ±1.5 ppb at audit levels 1 and 2 and less than ±10.1% at audit levels 3 through 10 is more rigorous than the criteria used for the annual performance evaluations in Table 2. The NPAP auditor is responsible for submitting the audit results to AQS. NPAP audits are also performed on CO and $SO_2$ analyzers, when present.

## 9. Technical Systems Audit (TSA)

CASTNET uses an independent auditor to conduct the facilities portion of the TSA requirements at the contractor's $O_3$ laboratory once every three years. The purpose of the facility TSA is to provide a qualitative appraisal of the total measurement system. Site planning, organization, documentation, and operation are evaluated to ensure that good QA/QC practices are being applied throughout the monitoring program. An outline of the facility TSA is available in Appendix F. RTI International performed facility TSAs at the Wood laboratory in Newberry, FL in 2012, 2015, and 2018 and at the ARS facility in Fort Collins, CO in 2013, 2017,

[13] CASTNET Documents webpage https://www.epa.gov/castnet/

[14] CASTNET's Independent Audit Program webpage https://www.epa.gov/castnet/independent-audit-program

and 2021. Results, findings, and the responses to the findings can be found on the CASTNET documents webpage[15] under "Technical Systems Audit."

## 10. Annual Monitoring Network Plans and Network Assessment

CASTNET staff prepare an annual CASTNET Network Plan for public review. The Network Plan focuses on the CASTNET $O_3$ and trace-level gas monitoring program and addresses the monitoring requirements of 40 CFR 58.10(b). EPA, NPS, and BLM-WSO consult with OAQPS and applicable EPA Regional Offices ahead of adding or discontinuing $O_3$ monitors in accordance with 40 CFR 58.14 and any changes are included in this Network Plan. CASTNET staff collect additional comments by sending draft copies to the National Association of Clean Air Agencies (NACAA) and the Association of Air Pollution Control Agencies (AAPCA). A draft copy is also distributed through OAQPS' monitoring list-serve. CASTNET staff contact states directly if these states use a CASTNET monitor in place of a state operated $O_3$ monitor (e.g., SLAMS) to ensure their participation in the planning process. CASTNET staff submit a final version of the Network Plan and responses to any comments received on the draft Network Plan to the EPA CASTNET $O_3$ webpage[16] and OAQPS' Ambient Monitoring Technology Information Center (AMTIC) Network Plans webpage.[17] The schedule for these activities is outlined in Table 5. The Division Director or a designee at the EPA's Clean Air Markets Division approves this plan with input from the public by July 1. OAQPS provides comments within 120 days on any plans proposing changes to the $O_3$ network.

### Table 4 Annual Network Plan Schedule

| Date | Network Plan Steps |
|---|---|
| **March 1** | Submit Network Plan to NPS/BLM-WSO for review |
| **May 27** | Distribute Network Plan to OAQPS, OAQPS list-serve, EPA Regional Offices, NACAA, AAPCA and post for public review on the CASTNET webpage |
| **June 28** | Deadline for public comments to Network Plan |
| **June 30** | CASTNET staff complete response to public comments |
| **July 1** | CASTNET staff distribute final version of Network Plan |
| **October 31** | OAQPS/Lead EPA Regional Office review Network Plan and provide approval |

EPA completes a network assessment every 5 years in accordance with 40 CFR 58.10(d). CASTNET staff post the network assessment to the EPA CASTNET $O_3$ webpage[16] and OAQPS' AMTIC Network Plan webpage.[17] There is no public comment review and response to this document. The next assessment is due July 1, 2025, and every 5 years thereafter.

Some states include CASTNET sites in their Network Plan to fulfill their monitoring requirement under 40 CFR Part 58 Appendix D. These states should notify the CASTNET agency sponsor that they will be using the CASTNET site in their plan so that the state may be included in any discussions related to changes at the site.

[15] CASTNET Documents webpage https://www.epa.gov/castnet/

[16] CASTNET $O_3$ webpage https://www.epa.gov/castnet/castnet-ozone-monitoring

[17] OAQPS' AMTIC Network Plans webpage https://www.epa.gov/amtic/state-and-local-monitoring-plans

## 11. Network Modification

As of May 2022, the following network modifications have occurred or are planned:

- The United States Environmental Protection Agency (EPA) has suspended operations of air quality and atmospheric deposition monitoring at 11 Clean Air Status and Trends Network (CASTNET) sites. The Agency has taken this action in response to current fiscal constraints. EPA will continue to operate 51 rural CASTNET sites under the current FY 22 budget. The decision to suspend sampling rather than decommission sites allows the Agency to continue operations in these locations if circumstances change.

  EPA's Office of Atmospheric Programs (OAP) will undertake a scientific review of long-term rural air quality and atmospheric deposition monitoring assets to inform options for CASTNET under the current resource constraints while meeting EPA mission objectives, as well as evaluate new and emerging issues that could be addressed by the CASTNET environmental monitoring program.

  The list of sites where sampling has been suspended as of May 10, 2022 can be found in Appendix K of this plan.

- With support from EPA Region 9 and the La Posta Band of Diegueno Mission Indians of the La Posta Indian Reservation, California (La Posta) EPA will install a new small-footprint CASTNET site with a regulatory ozone monitor in eastern San Diego county. The site will be operated by the La Posta tribe and will likely start operating around 10/1/2022.

## 12. Data Reporting and Certification

CASTNET staff submit applicable ambient and quality assurance data to AQS within 90 days after the end of each quarterly reporting period. CASTNET complies with the annual air monitoring certification requirements in accordance with 40 CFR 58.15-16. EPA, NPS, and BLM-WSO certify CASTNET ambient $O_3$, $SO_2$, and CO data and quality assurance results by May 1 for the prior calendar year for their respective CASTNET sites and submit the data to OAQPS for review.

Appendix A. Detailed Site Information (Page 1 of 88)

CASTNET $O_3$ and trace-level gas monitors meet the siting criteria as specified within 40 CFR Part 58 Appendices D and E. Following guidance from 40 CFR Part 58.10b, the following detailed information required for each CASTNET monitor is listed in the following pages ordered by AQS ID.

The following parameters are the same at all CASTNET sites:

- Current sampling frequency is continuous
- Sampling season is 01/01 – 12/31
- Frequency of one-point QC check is daily
- Sample residence time for all analyzers is less than 20 seconds, except for the Duke Forest, NC non-regulatory ozone analyzer which has a sample inlet height of 48 meters above ground.

Appendix A. Detailed Site Information (Page 2 of 88)

| | |
|---|---|
| AQS ID | 01-049-9991 |
| CASTNET ID | SND152 |
| Site Name | Sand Mountain |
| GPS Coordinates | 34.289001, -85.970065 |
| Street Address | Sand Mountain Alabama Agricultural Experiment Station, Crossville, AL 35962 |
| County | DeKalb |
| Distance to Roads & ADT | 170 meters; estimated < 1000 ADT |
| CBSA Name | Fort Payne, AL Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 250 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/29/2021 |

Appendix A. Detailed Site Information (Page 3 of 88)

| | |
|---|---|
| AQS ID | 02-068-0003 |
| CASTNET ID | DEN417 |
| Site Name | Denali NP |
| GPS Coordinates | 63.7232, -148.9676 |
| Street Address | Denali National Park |
| County | Denali |
| Distance to Roads & ADT | 130 meters; 1897 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-JUN-87 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 78 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/12/2021 |

| | |
|---|---|
| AQS ID | 04-003-8001 |
| CASTNET ID | CHA467 |
| Site Name | Chiricahua NM |
| GPS Coordinates | 32.009405, -109.389058 |
| Street Address | Chiricahua National Monument |
| County | Cochise |
| Distance to Roads & ADT | 150 meters; 196 ADT |
| CBSA Name | Sierra Vista-Douglas, AZ Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Reporting Agency | National Park Service |
| Start Date | 01-JUL-89 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 109 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/1/2021 |

Appendix A. Detailed Site Information (Page 5 of 88)

| | |
|---|---|
| AQS ID | 04-005-8001 |
| CASTNET ID | GRC474 |
| Site Name | Grand Canyon NP |
| GPS Coordinates | 36.058642, -112.183575 |
| Street Address | Grand Canyon National Park, W Rim Drive |
| County | Coconino |
| Distance to Roads & ADT | 200 meters; estimated < 1000 ADT |
| CBSA Name | Flagstaff, AZ Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Reporting Agency | National Park Service |
| Start Date | 01-JUL-89 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 213 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 9/29/2021 |

| | |
|---|---|
| AQS ID | 04-017-0119 |
| CASTNET ID | PET427 |
| Site Name | Petrified Forest |
| GPS Coordinates | 34.822508, -109.892485 |
| Street Address | Petrified Forest NP, Near Old SW Entrance on Old Route 180 |
| County | Navajo |
| Distance to Roads & ADT | 2168 meters; estimated < 1000 ADT |
| CBSA Name | Show Low, AZ Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Reporting Agency | National Park Service |
| Start Date | 01-OCT-02 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 224 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 9/28/2021 |

| | |
|---|---|
| AQS ID | 05-019-9991 |
| CASTNET ID | CAD150 |
| Site Name | Caddo Valley |
| GPS Coordinates | 34.179278, -93.098755 |
| Street Address | Lower Lake Recreation Area, Caddo Valley, AR 71923 |
| County | Clark |
| Distance to Roads & ADT | 125 meters; 380 ADT |
| CBSA Name | Arkadelphia, AR Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Fail; also tree line within 30 meters of inlet |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 146 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 4/15/2021 |

| | |
|---|---|
| AQS ID | 06-027-0101 |
| CASTNET ID | DEV412 |
| Site Name | Death Valley NP - Park Village |
| GPS Coordinates | 36.50887, -116.847798 |
| Street Address | Death Valley NM, Death Valley, CA |
| County | Inyo |
| Distance to Roads & ADT | 600 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49c |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Reporting Agency | National Park Service |
| Start Date | 10-DEC-93 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 150 |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/26/2021 |

| | |
|---|---|
| AQS ID | 06-043-0003 |
| CASTNET ID | YOS404 |
| Site Name | Yosemite NP - Turtleback Dome |
| GPS Coordinates | 37.713251, -119.706196 |
| Street Address | Turtleback Dome, Yosemite National Park |
| County | Mariposa |
| Distance to Roads & ADT | 250 meters; 2750 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49C |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Reporting Agency | National Park Service |
| Start Date | 01-SEP-90 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 24 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/6/2021 |

| | |
|---|---|
| AQS ID | 06-069-0003 |
| CASTNET ID | PIN414 |
| Site Name | Pinnacles NM |
| GPS Coordinates | 36.483235, -121.156876 |
| Street Address | NE Entrance, Pinnacles NM |
| County | San Benito |
| Distance to Roads & ADT | 85 meters; 400 ADT & 85 meters; 4,182 ADT [Fail] |
| CBSA Name | San Jose-Sunnyvale-Santa Clara, CA Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-APR-87 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 23 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 9/13/2021 |

Appendix A. Detailed Site Information (Page 11 of 88)

| | |
|---|---|
| AQS ID | 06-071-9002 |
| CASTNET ID | JOT403 |
| Site Name | Joshua Tree NP |
| GPS Coordinates | 34.069569, -116.388933 |
| Street Address | Joshua Tree National Monument |
| County | San Bernardino |
| Distance to Roads & ADT | 420 meters; estimated < 1000 ADT |
| CBSA Name | Riverside-San Bernardino-Ontario, CA Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-OCT-93 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 208 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 4/8/2021 |

| | |
|---|---|
| AQS ID | 06-089-3003 |
| CASTNET ID | LAV410 |
| Site Name | Lassen Volcanic NP |
| GPS Coordinates | 40.539991, -121.576462 |
| Street Address | Manzanita Lake, Lassen Volcanic NP |
| County | Shasta |
| Distance to Roads & ADT | 90 meters; 1,750 ADT |
| CBSA Name | Redding, CA Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49c |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-NOV-87 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Passes, while tree at 10 meters from inlet |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 219 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 11/4/2021 |

Appendix A. Detailed Site Information (Page 13 of 88)

| | |
|---|---|
| AQS ID | 06-107-0009 |
| CASTNET ID | SEK430 |
| Site Name | Sequoia NP - Ash Mountain |
| GPS Coordinates | 36.489469, -118.829153 |
| Street Address | Sequoia & Kings Canyon NP |
| County | Tulare |
| Distance to Roads & ADT | 110 meters; 2,350 ADT |
| CBSA Name | Visalia-Porterville, CA Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Reporting Agency | National Park Service |
| Start Date | 01-JUL-99 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Fail; tree at 5 meters from inlet |
| Distance Between Co-located | N/A |
| Wind Obstruction | One tree at 5 meters from inlet |
| Predominant ozone season wind direction | 21 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 5/21/2021 |

| | |
|---|---|
| AQS ID | 08-051-9991 |
| CASTNET ID | GTH161 |
| Site Name | Gothic |
| GPS Coordinates | 38.95627, -106.98587 |
| Street Address | Gunnison National Forest, Crested Butte, CO 81224 |
| County | Gunnison |
| Distance to Roads & ADT | 190 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 353 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 6/1/2021 |

| | |
|---|---|
| AQS ID | 08-069-0007 |
| CASTNET ID | ROM406 |
| Site Name | Rocky Mtn NP |
| GPS Coordinates | 40.278129, -105.545635 |
| Street Address | Rocky Mountain National Park, Estes Park, CO 80517 |
| County | Larimer |
| Distance to Roads & ADT | 70 meters; estimated < 1000 ADT |
| CBSA Name | Fort Collins-Loveland, CO Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-AUG-87 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | 7.5 m |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 294 |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 9/23/2021 |

| | |
|---|---|
| AQS ID | 08-069-0007 |
| CASTNET ID | ROM206 |
| Site Name | Rocky Mtn NP Co-located |
| GPS Coordinates | 40.278129, -105.545635 |
| Street Address | Rocky Mountain National Park, Estes Park, CO 80517 |
| County | Larimer |
| Distance to Roads & ADT | 70 meters; estimated < 1000 ADT |
| CBSA Name | Fort Collins-Loveland, CO Metropolitan Statistical Area |
| Pollutant | Ozone, 3 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Relate Impacts, General/Background, and Quality Assurance |
| Monitor Type | EPA, NON-REGULATORY |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | 7.5 m |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 300 |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 9/23/2021 |

| | |
|---|---|
| AQS ID | 08-083-0101 |
| CASTNET ID | MEV405 |
| Site Name | Mesa Verde NP |
| GPS Coordinates | 37.198398, -108.490462 |
| Street Address | Mesa Verde National Park, Colorado |
| County | Montezuma |
| Distance to Roads & ADT | 145 meters; estimated less than 100 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-MAY-93 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 321 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 4/21/2021 |

| | |
|---|---|
| AQS ID | 09-015-9991 |
| CASTNET ID | ABT147 |
| Site Name | Abington |
| GPS Coordinates | 41.84046, -72.010368 |
| Street Address | 80 Ayers Rd, Abington, CT 06230 |
| County | Windham |
| Distance to Roads & ADT | 575 meters; 1,900 ADT |
| CBSA Name | Willimantic, CT Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 298 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/24/2021 |

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| | |
|---|---|
| AQS ID | 12-061-9991 |
| CASTNET ID | IRL141 |
| Site Name | Indian River Lagoon |
| GPS Coordinates | 27.849215, -80.455595 |
| Street Address | Sebastian Inlet State Recreation Area, Vero Beach, FL 32963 |
| County | Indian River |
| Distance to Roads & ADT | 300 meters; estimated < 1000 ADT |
| CBSA Name | Sebastian-Vero Beach, FL Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 101 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 3/5/2021 |

Appendix A. Detailed Site Information (Page 20 of 88)

| | |
|---|---|
| AQS ID | 12-077-9991 |
| CASTNET ID | SUM156 |
| Site Name | Sumatra |
| GPS Coordinates | 30.110226, -84.99038 |
| Street Address | Apalachicola National Forest, Bristol, FL 32321 |
| County | Liberty |
| Distance to Roads & ADT | 295 meters; 550 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Fail |
| Distance Between Co-located | N/A |
| Wind Obstruction | Tree at 17 meters from inlet |
| Predominant ozone season wind direction | 171 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 3/4/2021 |

| | |
|---|---|
| AQS ID | 13-231-9991 |
| CASTNET ID | GAS153 |
| Site Name | Georgia Station |
| GPS Coordinates | 33.181173, -84.410054 |
| Street Address | Georgia Station Georgia Agricultural Experiment Station, Williamson, GA 30292 |
| County | Pike |
| Distance to Roads & ADT | 700 meters; 220 ADT |
| CBSA Name | Atlanta-Sandy Springs-Marietta, GA Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 234 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 4/15/2021 |

| | |
|---|---|
| AQS ID | 16-023-01011 |
| CASTNET ID | CRM435 |
| Site Name | Craters of the Moon NM and Preserve |
| GPS Coordinates | 43.4606, -113.5622 |
| Street Address | Craters of the Moon National Monument, Idaho |
| County | Idaho |
| Distance to Roads & ADT | 52 meters; 1,200 ADT [fail] |
| CBSA Name | Idaho Falls, ID |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-OCT-1992 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 – 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 230 degrees |
| Probe Material | Teflon® |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/3/2021 |

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| | |
|---|---|
| AQS ID | 16-049-9991 |
| CASTNET ID | NPT006 |
| Site Name | Nez Perce Tribe |
| GPS Coordinates | 46.2756, -116.0216 |
| Street Address | Woodland Road Kamiah, ID 83536 |
| County | Idaho |
| Distance to Roads & ADT | 250 meters; 80 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and General/Background |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 27-SEP-16 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 – 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | Obstruction within a 26.6 degree cone around inlet |
| Predominant ozone season wind direction | N/A |
| Probe Material | Teflon® |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/10/2021 |

| | |
|---|---|
| AQS ID | 17-019-1001 |
| CASTNET ID | BVL130 |
| Site Name | Bondville |
| GPS Coordinates | 40.05202, -88.372481 |
| Street Address | Twp Rd 500 E., Champaign, IL |
| County | Champaign |
| Distance to Roads & ADT | 280 meters; 200 ADT |
| CBSA Name | Champaign-Urbana, IL Metropolitan Statistical Area |
| Pollutants | Ozone; hourly $SO_2$; 5-min $SO_2$; CO |
| Parameter Codes, POC | 44201, 1; 42401, 2; 42401, 3; 42101, 1 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instruments | Thermo 49i; TAPI T100U; TAPI T100U; TAPI T300U |
| Method Code | 047; 600; 600; 593 |
| FRM or FEM | FEM; FEM; FEM; FRM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11; 01-SEP-12; 01-SEP-12; 01-SEP-12 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 223 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/13/2021 (44201, 42101, 42401) |

| | |
|---|---|
| AQS ID | 17-085-9991 |
| CASTNET ID | STK138 |
| Site Name | Stockton |
| GPS Coordinates | 42.287216, -89.99995 |
| Street Address | 10952 E. Parker Rd, Stockton, IL 61085 |
| County | Jo Daviess |
| Distance to Roads & ADT | 745 meters; 50 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 36 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/16/2021 |

| | |
|---|---|
| AQS ID | 17-119-9991 |
| CASTNET ID | ALH157 |
| Site Name | Alhambra |
| GPS Coordinates | 38.869001, -89.622815 |
| Street Address | 5403 State Road 160, Highland, IL 62249 |
| County | Madison |
| Distance to Roads & ADT | 405 meters; 150 ADT |
| CBSA Name | St. Louis, MO-IL Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 213 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/21/2021 |

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| | |
|---|---|
| AQS ID | 18-083-9991 |
| CASTNET ID | VIN140 |
| Site Name | Vincennes |
| GPS Coordinates | 38.740792, -87.484923 |
| Street Address | Southwest Purdue Agricultural Center, Vincennes, IN 47591 |
| County | Knox |
| Distance to Roads & ADT | 365 meters; 8,832 ADT |
| CBSA Name | Vincennes, IN Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objectives | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 260 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/12/2021 |

| | |
|---|---|
| AQS ID | 18-169-9991 |
| CASTNET ID | SAL133 |
| Site Name | Salamonie Reservoir |
| GPS Coordinates | 40.816038, -85.661407 |
| Street Address | Hamilton Rd, Lagro, IN 46941 |
| County | Wabash |
| Distance to Roads & ADT | 415 meters; 525 ADT |
| CBSA Name | Wabash, IN Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 256 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 5/15/2021 |

| | |
|---|---|
| AQS ID | 21-061-0501 |
| CASTNET ID | MAC426 |
| Site Name | Mammoth Cave NP |
| GPS Coordinates | 37.131794, -86.142953 |
| Street Address | Mammoth Cave NP - Alfred Cook Road |
| County | Edmonson |
| Distance to Roads & ADT | 505 meters; 1,049 ADT |
| CBSA Name | Bowling Green, KY Metropolitan Statistical Area |
| Pollutants | Ozone |
| Parameter Codes, POC | 44201, 1 |
| NAAQS Monitoring Objective | Welfare Related Impacts, Regional Transport, and Maximum Ozone Concentration |
| Monitor Type | EPA |
| Instruments | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Reporting Agency | National Park Service |
| Start Date | 01-AUG-97 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 228 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/11/2021 |

| | |
|---|---|
| AQS ID | 21-175-9991 |
| CASTNET ID | CKT136 |
| Site Name | Crockett |
| GPS Coordinates | 37.92146, -83.066295 |
| Street Address | State Highway 437, West Liberty, KY 41472 |
| County | Morgan |
| Distance to Roads & ADT | 440 meters; 448 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 227 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/13/2021 |

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| | |
|---|---|
| AQS ID | 21-221-9991 |
| CASTNET ID | CDZ171 |
| Site Name | Cadiz |
| GPS Coordinates | 36.784053, -87.85015 |
| Street Address | 5720 Old Dover Rd, Cadiz, KY 42211 |
| County | Trigg |
| Distance to Roads & ADT | 525 meters; estimated < 1000 ADT |
| CBSA Name | Clarksville, TN-KY Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts, Regional Transport, and Maximum Ozone Concentration |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-MAR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 213 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | Monitoring Suspended |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/12/2021 |

| | |
|---|---|
| AQS ID | 21-229-9991 |
| CASTNET ID | MCK131/231 |
| Site Name | Mackville |
| GPS Coordinates | 37.704678, -85.048706 |
| Street Address | 542 Wesley-Miller Rd, Harrodsburg, KY 40330 |
| County | Washington |
| Distance to Roads & ADT | 1845 meters; 109 ADT |
| Pollutant | Ozone, 1 & 2 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport; Quality Assurance |
| Monitor Type | EPA; EPA, NON-REGULATORY |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-MAR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | 1 m |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 220 meters |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/22/2021; 10/22/2021 |

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| | |
|---|---|
| AQS ID | 23-003-9991 |
| CASTNET ID | ASH135 |
| Site Name | Ashland |
| GPS Coordinates | 46.603832, -68.413227 |
| Street Address | 45 Radar Rd, Ashland, ME 04732 |
| County | Aroostook |
| Distance to Roads & ADT | 105 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 282 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | Monitoring Suspended |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 9/29/2021 |

| | |
|---|---|
| AQS ID | 23-009-0103 |
| CASTNET ID | ACA416 |
| Site Name | Acadia NP |
| GPS Coordinates | 44.377086, -68.2608 |
| Street Address | McFarland Hill-Air Pollutant Research Site |
| County | Hancock |
| Distance to Roads & ADT | 174 meters; 4,340 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | SLAMS & NON-EPA FEDERAL |
| Instrument | Thermo 49c |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | Maine - Dept of Environmental Protection |
| Spatial Scale | Regional Scale |
| Reporting Agency | Maine - Dept of Environmental Protection |
| Start Date | 09-FEB-98 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 213 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 1/25/2022 |

| | |
|---|---|
| AQS ID | 24-019-9991 |
| CASTNET ID | BWR139 |
| Site Name | Blackwater NWR |
| GPS Coordinates | 38.444971, -76.111274 |
| Street Address | Blackwater National Wildlife Refuge, Cambridge, MD 21613 |
| County | Dorchester |
| Distance to Roads & ADT | 245 meters; 263 ADT |
| CBSA Name | Cambridge, MD Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 209 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 3/16/2021 |

| | |
|---|---|
| AQS ID | 24-033-9991 |
| CASTNET ID | BEL116 |
| Site Name | Beltsville |
| GPS Coordinates | 39.028177, -76.817127 |
| Street Address | Powder Mill Rd, Laurel, MD 20708 |
| County | Prince George's |
| Distance to Roads & ADT | 365 meters; estimated < 1000 ADT |
| CBSA Name | Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area |
| Pollutants | Ozone |
| Parameter Code, POC | 44201, 1 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 284 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 3/18/2021 |

| | |
|---|---|
| AQS ID | 26-157-9991 |
| CASTNET ID | UVL124 |
| Site Name | Unionville |
| GPS Coordinates | 43.613572, -83.359869 |
| Street Address | 1821 E. Dickerson Rd, Unionville, MI 48767 |
| County | Tuscola |
| Distance to Roads & ADT | 205 meters; 1,171 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 240 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/11/2021 |

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| | |
|---|---|
| AQS ID | 26-161-9991 |
| CASTNET ID | ANA115 |
| Site Name | Ann Arbor |
| GPS Coordinates | 42.416636, -83.90218 |
| Street Address | 10070 Strawberry Lake Rd, Dexter, MI 48130 |
| County | Washtenaw |
| Distance to Roads & ADT | 330 meters; 4,879 ADT |
| CBSA Name | Ann Arbor, MI Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 237 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | Filterpack measurements suspended |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/18/2021 |

| | |
|---|---|
| AQS ID | 26-165-9991 |
| CASTNET ID | HOX148 |
| Site Name | Hoxeyville |
| GPS Coordinates | 44.18089, -85.73898 |
| Street Address | 10637 S 9 Rd, Cadillac, MI 49601 |
| County | Wexford |
| Distance to Roads & ADT | 55 meters; estimated < 1000 ADT |
| CBSA Name | Cadillac, MI Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 330 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/16/2021 |

| | |
|---|---|
| AQS ID | 27-137-0034 |
| CASTNET ID | VOY413 |
| Site Name | Voyageurs NP |
| GPS Coordinates | 48.412518, -92.829225 |
| Street Address | Voyageurs National Park |
| County | St. Louis |
| Distance to Roads & ADT | 1,400 meters; 337 ADT |
| CBSA Name | Duluth, MN-WI Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49c |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Reporting Agency | National Park Service |
| Start Date | 01-JUL-96 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Fail; tree at 5 meters |
| Distance Between Co-located | N/A |
| Wind Obstruction | Tree at 5 meters |
| Predominant ozone season wind direction | 232 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/26/2021 |

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| | |
|---|---|
| AQS ID | 28-161-9991 |
| CASTNET ID | CVL151 |
| Site Name | Coffeeville |
| GPS Coordinates | 34.002747, -89.799183 |
| Street Address | Jamie L. Whitten Plant Materials Center, Coffeeville, MS 38922 |
| County | Yalobusha |
| Distance to Roads & ADT | 70 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Fail |
| Distance Between Co-located | N/A |
| Wind Obstruction | Tree at 17 meters from inlet |
| Predominant ozone season wind direction | 180 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 2/28/2022 |

| | |
|---|---|
| AQS ID | 30-029-8001 |
| CASTNET ID | GLR468 |
| Site Name | Glacier NP |
| GPS Coordinates | 48.510301, -113.996807 |
| Street Address | Glacier National Park |
| County | Flathead |
| Distance to Roads & ADT | 50 meters; estimated < 1000 ADT |
| CBSA Name | Kalispell, MT Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Reporting Agency | National Park Service |
| Start Date | 01-APR-89 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | Tree at 30 meters from inlet |
| Predominant ozone season wind direction | 244 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/5/2021 |

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| | |
|---|---|
| AQS ID | 31-107-9991 |
| CASTNET ID | SAN189 |
| Site Name | Santee Sioux |
| GPS Coordinates | 42.829154, -97.854128 |
| Street Address | State Spur 54d, Niobrara, NE 68760 |
| County | Knox |
| Distance to Roads & ADT | 100 meters; 760 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 173 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | Filterpack measurements suspended |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/20/2021 |

| | |
|---|---|
| AQS ID | 32-033-0101 |
| CASTNET ID | GRB411 |
| Site Name | Great Basin NP |
| GPS Coordinates | 39.005121, -114.215932 |
| Street Address | Great Basin National Park |
| County | White Pine |
| Distance to Roads & ADT | 150 meters; 490 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-SEP-93 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 219 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/23/2021 |

| | |
|---|---|
| AQS ID | 33-009-9991 |
| CASTNET ID | WST109 |
| Site Name | Woodstock |
| GPS Coordinates | 43.944519, -71.700787 |
| Street Address | Hubbard Brook Experimental Forest, North Woodstock, NH 03262 |
| County | Grafton |
| Distance to Roads & ADT | 45 meters; 93 ADT |
| CBSA Name | Lebanon, NH-VT Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 295 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | Monitoring Suspended |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 9/30/2021 |

| | |
|---|---|
| AQS ID | 34-021-9991 |
| CASTNET ID | WSP144 |
| Site Name | Washington Crossing |
| GPS Coordinates | 40.312303, -74.872663 |
| Street Address | Washington Crossing State Park, Titusville, NJ 08560 |
| County | Mercer |
| Distance to Roads & ADT | 260 meters; 766 ADT |
| CBSA Name | Trenton-Ewing, NJ Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 331 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 6/12/2021 |

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| | |
|---|---|
| AQS ID | 35-015-0010 |
| CASTNET ID | CAV436 |
| Site Name | Carlsbad Caverns National Park |
| GPS Coordinates | 32.1783, -104.4406 |
| Street Address | N/A |
| County | Eddy |
| Distance to Roads & ADT | 110 meters; 463 ADT |
| CBSA Name | Carlsbad-Artesia, NM Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | N/A |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 – 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | N/A |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | N/A |
| Probe Material | Teflon® |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 3/5/2022 |

| | |
|---|---|
| AQS ID | 35-045-0020 |
| CASTNET ID | CHC432 |
| Site Name | Chaco Culture National Historical Park |
| GPS Coordinates | 36.03448, -107.904275 |
| Street Address | Chaco Culture National Historical Park - Radio Repeater |
| County | San Juan |
| Distance to Roads & ADT | 690 meters; 100 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 23-FEB-2017 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 – 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 266 degrees |
| Probe Material | Teflon® |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 4/20/2021 |

| | |
|---|---|
| AQS ID | 36-031-9991 |
| CASTNET ID | HWF187 |
| Site Name | Huntington Wildlife Forest |
| GPS Coordinates | 43.973044, -74.223317 |
| Street Address | Huntington Wildlife Forest, Newcomb, NY 12852 |
| County | Essex |
| Distance to Roads & ADT | 300 meters; 1,624 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Fail |
| Distance Between Co-located | N/A |
| Wind Obstruction | Tree at 20 meters from inlet |
| Predominant ozone season wind direction | 180 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | Monitoring Suspended |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 7/8/2021 |

| | |
|---|---|
| AQS ID | 36-109-9991 |
| CASTNET ID | CTH110 |
| Site Name | Connecticut Hill |
| GPS Coordinates | 42.400875, -76.653516 |
| Street Address | Connecticut Hill Wildlife Management Area, Newfield, NY 14867 |
| County | Tompkins |
| Distance to Roads & ADT | 75 meters; 680 ADT |
| CBSA Name | Ithaca, NY Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 331 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 5/10/2021 |

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| | |
|---|---|
| AQS ID | 37-011-9991 |
| CASTNET ID | PNF126 |
| Site Name | Cranberry |
| GPS Coordinates | 36.105435, -82.045015 |
| Street Address | Pisgah National Forest, Newland, NC 28657 |
| County | Avery |
| Distance to Roads & ADT | 370 meters; 870 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 72 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | Monitoring Suspended |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 12/7/2021 |

| | |
|---|---|
| AQS ID | 37-031-9991 |
| CASTNET ID | BFT142 |
| Site Name | Beaufort |
| GPS Coordinates | 34.884668, -76.620666 |
| Street Address | Open Grounds Farm, Beaufort, NC 28516 |
| County | Carteret |
| Distance to Roads & ADT | 450 meters; 1,200 ADT |
| CBSA Name | Morehead City, NC Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 236 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 12/15/2021 |

| | |
|---|---|
| AQS ID | 37-113-9991 |
| CASTNET ID | COW137 |
| Site Name | Coweeta |
| GPS Coordinates | 35.060527, -83.43034 |
| Street Address | USDA Southern Research Station, Coweeta Hydrologic Laboratory, Otto, NC 28763 |
| County | Macon |
| Distance to Roads & ADT | 110 meters; 390 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 184 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 11/17/2021 |

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| | |
|---|---|
| AQS ID | 37-123-9991 |
| CASTNET ID | CND125 |
| Site Name | Candor |
| GPS Coordinates | 35.26333, -79.83754 |
| Street Address | 136 Perry Dr, Candor, NC 27229 |
| County | Montgomery |
| Distance to Roads & ADT | 235 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 151 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 12/14/2021 |

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| | |
|---|---|
| AQS ID | N/A |
| CASTNET ID | DUK008 |
| Site Name | Duke Forest |
| GPS Coordinates | 35.9745, -79.099 |
| Street Address | 600 Eubanks Rd, Chapel Hill, NC 27516 |
| County | Orange |
| Distance to Roads & ADT | > 100 meters |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | NAAQS-EXCLUDED |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-19 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 44 meters |
| Tree Dewline > 10m or below inlet | Inlet is 10 m above tree canopy |
| Distance Between Co-located | N/A |
| Wind Obstruction | None – Inlet is 10 m above tree canopy |
| Predominant ozone season wind direction | N/A |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | N/A |

| | |
|---|---|
| AQS ID | 38-007-0002 |
| CASTNET ID | THR422 |
| Site Name | Theodore Roosevelt NP |
| GPS Coordinates | 46.894844, -103.377719 |
| Street Address | 13881 I94 East |
| County | Billings |
| Distance to Roads & ADT | 410 meters; 995 ADT |
| CBSA Name | Dickinson, ND Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | SLAMS |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | North Dakota - Dept of Health |
| Spatial Scale | Regional Scale |
| Reporting Agency | North Dakota - Dept of Health |
| Start Date | 27-JUL-98 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 12.2 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 240 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 9/27/2021 |

| | |
|---|---|
| AQS ID | 39-017-9991 |
| CASTNET ID | OXF122 |
| Site Name | Oxford |
| GPS Coordinates | 39.531115, -84.723547 |
| Street Address | Ecology Research Center, Miami University, Oxford, Ohio 45056 |
| County | Butler |
| Distance to Roads & ADT | 185 meters; 928 ADT |
| CBSA Name | Cincinnati-Middletown, OH-KY-IN Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 257 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/19/2021 |

| | |
|---|---|
| AQS ID | 39-047-9991 |
| CASTNET ID | DCP114 |
| Site Name | Deer Creek |
| GPS Coordinates | 39.635888, -83.260563 |
| Street Address | Deer Creek State Park, Mt Sterling, OH 43143 |
| County | Fayette |
| Distance to Roads & ADT | 75 meters; estimated < 1000 ADT |
| CBSA Name | Washington Court House, OH Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 223 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | Monitoring Suspended |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 5/14/2021 |

| | |
|---|---|
| AQS ID | 39-121-9991 |
| CASTNET ID | QAK172 |
| Site Name | Quaker City |
| GPS Coordinates | 39.942714, -81.337914 |
| Street Address | 58163 St. Johns Rd, Quaker City, OH 43773 |
| County | Noble |
| Distance to Roads & ADT | 150 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 203 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 11/30/2021 |

| | |
|---|---|
| AQS ID | 40-001-9009 |
| CASTNET ID | CHE185 |
| Site Name | Cherokee Nation |
| GPS Coordinates | 35.750786, -94.669789 |
| Street Address | South Highway 59, Rr1, 1795 Dahlonegah Park Road, Stilwell, Oklahoma |
| County | Adair |
| Distance to Roads & ADT | 230 meters; 280 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | TRIBAL & EPA |
| Instrument | Teledyne ML9811 |
| Method Code | 091 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUL-02 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 156 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 9/21/2021 |

| | |
|---|---|
| AQS ID | 42-001-9991 |
| CASTNET ID | ARE128 |
| Site Name | Arendtsville |
| GPS Coordinates | 39.923241, -77.307863 |
| Street Address | 747 Winding Rd, Biglerville, PA 17307 |
| County | Adams |
| Distance to Roads & ADT | 300 meters; 3,435 ADT |
| CBSA Name | Gettysburg, PA Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 301 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/24/2021 |

Appendix A. Detailed Site Information (Page 62 of 88)

| | |
|---|---|
| AQS ID | 42-027-9991 |
| CASTNET ID | PSU106 |
| Site Name | Penn State |
| GPS Coordinates | 40.720902, -77.931759 |
| Street Address | 1366 Tadpole Rd, Pennsylvania Furnace, PA 16865 |
| County | Centre |
| Distance to Roads & ADT | 330 meters; 1,757 ADT |
| CBSA Name | State College, PA Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 250 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | Filterpack measurements suspended |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 9/15/2021 |

| | |
|---|---|
| AQS ID | 42-047-9991 |
| CASTNET ID | KEF112 |
| Site Name | Kane Exp. Forest |
| GPS Coordinates | 41.598119, -78.767866 |
| Street Address | Kane Experimental Forest, Allegheny National Forest, Wilcox, PA 15870 |
| County | Elk |
| Distance to Roads & ADT | 160 meters; estimated < 1000 ADT |
| CBSA Name | St. Mary's, PA Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Fail; tree at 10 meters from inlet |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 259 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 6/18/2021 |

| | |
|---|---|
| AQS ID | 42-085-9991 |
| CASTNET ID | MKG113 |
| Site Name | M.K. Goddard |
| GPS Coordinates | 41.426847, -80.145247 |
| Street Address | Maurice K Goddard State Park, Sandy Lake, PA 16145 |
| County | Mercer |
| Distance to Roads & ADT | 110 meters; 572 ADT |
| CBSA Name | Youngstown-Warren-Boardman, OH-PA Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 297 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 11/29/2021 |

| | |
|---|---|
| AQS ID | 42-111-9991 |
| CASTNET ID | LRL117 |
| Site Name | Laurel Hill |
| GPS Coordinates | 39.988309, -79.251573 |
| Street Address | Laurel Hill State Park, Rockwood, PA 15557 |
| County | Somerset |
| Distance to Roads & ADT | 160 meters; estimated < 1000 ADT |
| CBSA Name | Somerset, PA Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 266 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/21/2021 |

| | |
|---|---|
| AQS ID | 46-033-0132 |
| CASTNET ID | WNC429 |
| Site Name | Wind Cave NP |
| GPS Coordinates | 43.557639, -103.483856 |
| Street Address | Wind Cave National Park, South Dakota |
| County | Custer |
| Distance to Roads & ADT | 320 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 3 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | SLAMS |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | South Dakota - Dept of Environment and Natural Resources |
| Spatial Scale | Regional Scale |
| Reporting Agency | South Dakota - Dept of Environment and Natural Resources |
| Start Date | 01-JAN-05 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 3.35 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 337 degrees |
| Probe Material | Glass |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 11/16/2021 |

| | |
|---|---|
| AQS ID | 47-009-0101 |
| CASTNET ID | GRS420 |
| Site Name | Great Smoky NP - Look Rock |
| GPS Coordinates | 35.633482, -83.941606 |
| Street Address | Great Smoky Mountains NP Look Rock |
| County | Blount |
| Distance to Roads & ADT | 230 meters; 580 ADT |
| CBSA Name | Knoxville, TN Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | SLAMS & NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-JUL-88 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 287 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 12/8/2021 |

| | |
|---|---|
| AQS ID | 47-025-9991 |
| CASTNET ID | SPD111 |
| Site Name | Speedwell |
| GPS Coordinates | 36.46983, -83.826511 |
| Street Address | 718 Russell Hill Rd, Speedwell, TN 37870 |
| County | Claiborne |
| Distance to Roads & ADT | 270 meters; 510 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-MAR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 255 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 5/5/2021 |

| | |
|---|---|
| AQS ID | 47-041-9991 |
| CASTNET ID | ESP127 |
| Site Name | Edgar Evins |
| GPS Coordinates | 36.03893, -85.73305 |
| Street Address | Edgar Evins State Park, Smithville, TN 37166 |
| County | DeKalb |
| Distance to Roads & ADT | 65 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-MAR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 255 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 10/16/2021 |

| | |
|---|---|
| AQS ID | 48-043-0101 |
| CASTNET ID | BBE401 |
| Site Name | Big Bend NP |
| GPS Coordinates | 29.302651, -103.177813 |
| Street Address | Big Bend National Park, Texas |
| County | Brewster |
| Distance to Roads & ADT | 770 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-OCT-90 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 198 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 3/3/2022 |

| | |
|---|---|
| AQS ID | 48-373-9991 |
| CASTNET ID | ALC188 |
| Site Name | Alabama-Coushatta |
| GPS Coordinates | 30.701577, -94.674011 |
| Street Address | 361 Tombigbee Rd, Livingston, TX 77351 |
| County | Polk |
| Distance to Roads & ADT | 84 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 151 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 3/1/2022 |

| | |
|---|---|
| AQS ID | 48-381-9991 |
| CASTNET ID | PAL190 |
| Site Name | Palo Duro |
| GPS Coordinates | 34.88061, -101.664703 |
| Street Address | Palo Duro Canyon State Park, Canyon, TX 79015 |
| County | Randall |
| Distance to Roads & ADT | 3,660 meters; estimated < 1000 ADT |
| CBSA Name | Amarillo, TX Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 203 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 3/6/2022 |

| | |
|---|---|
| AQS ID | 49-037-0101 |
| CASTNET ID | CAN407 |
| Site Name | Canyonlands NP |
| GPS Coordinates | 38.458323, -109.82126 |
| Street Address | Canyonlands National Park, Utah |
| County | San Juan |
| Distance to Roads & ADT | 85 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-SEP-92 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 232 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 4/22/2021 |

| | |
|---|---|
| AQS ID | 49-047-1002 |
| CASTNET ID | DIN431 |
| Site Name | Dinosaur National Monument |
| GPS Coordinates | 40.4373, -109.3046 |
| Street Address | Dinosaur National Monument |
| County | Uintah |
| Distance to Roads & ADT | 240 meters; 930 ADT |
| CBSA Name | Vernal, UT Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Reporting Agency | National Park Service |
| Start Date | 01-JAN-12 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 241 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 4/23/2021 |

| | |
|---|---|
| AQS ID | 49-053-0130 |
| CASTNET ID | ZIO433 |
| Site Name | Zion National Park, Dalton's Wash |
| GPS Coordinates | 37.1983, -113.1506 |
| Street Address | Zion National Park, UT |
| County | Washington |
| Distance to Roads & ADT | 335 meters; 6,113 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49C |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 12-JAN-2004 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 – 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 88 degrees |
| Probe Material | Teflon® |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 5/17/2021 |

| | |
|---|---|
| AQS ID | 51-071-9992 |
| CASTNET ID | VPI120 |
| Site Name | Blue Grass Trail |
| GPS Coordinates | 37.3232, -80.4572 |
| Street Address | 1567 Blue Grass Trail, Newport, VA 24136 |
| County | Giles |
| Distance to Roads & ADT | > 100 meters |
| CBSA Name | Blacksburg-Christiansburg-Radford, VA Metropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | N/A |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 6/14/2021 |

| | |
|---|---|
| AQS ID | 51-113-0003 |
| CASTNET ID | SHN418 |
| Site Name | Shenandoah NP - Big Meadows |
| GPS Coordinates | 38.5231, -78.43471 |
| Street Address | Shenandoah NP Big Meadows |
| County | Madison |
| Distance to Roads & ADT | 125 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | SLAMS & NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-JUL-85 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 284 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 6/15/2021 |

| | |
|---|---|
| AQS ID | 51-147-9991 |
| CASTNET ID | PED108 |
| Site Name | Prince Edward |
| GPS Coordinates | 37.165222, -78.307067 |
| Street Address | Prince Edward-Gallion State Forest, Burkeville, VA 23922 |
| County | Prince Edward |
| Distance to Roads & ADT | 130 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JAN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 230 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 11/10/2021 |

| | |
|---|---|
| AQS ID | 53-013-9991 |
| CASTNET ID | UMA009 |
| Site Name | Umatilla |
| GPS Coordinates | 46.2026, -117.9539 |
| Street Address | Dayton, WA |
| County | Columbia |
| Distance to Roads & ADT | 160 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 05-NOV-2020 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | N/A |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/9/2021 |

| | |
|---|---|
| AQS ID | 54-021-9991 |
| CASTNET ID | CDR119 |
| Site Name | Cedar Creek |
| GPS Coordinates | 38.879503, -80.847677 |
| Street Address | Cedar Creek State Park, Cedarville, WV 26611 |
| County | Gilmer |
| Distance to Roads & ADT | 35 meters; 500 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 348 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | Monitoring Suspended |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 11/11/2021 |

| | |
|---|---|
| AQS ID | 54-093-9991 |
| CASTNET ID | PAR107 |
| Site Name | Parsons |
| GPS Coordinates | 39.090434, -79.661742 |
| Street Address | USDA Northern Research Station, Monongahela National Forest, Parsons, WV 26287 |
| County | Tucker |
| Distance to Roads & ADT | 355 meters; 4,097 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 311 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 11/12/2021 |

| | |
|---|---|
| AQS ID | 55-119-9991 |
| CASTNET ID | PRK134 |
| Site Name | Perkinstown |
| GPS Coordinates | 45.206525, -90.597209 |
| Street Address | W 10746 County Highway M, Medford, WI 54451 |
| County | Taylor |
| Distance to Roads & ADT | 160 meters; 450 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and Regional Transport |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-APR-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 177 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 8/22/2021 |

| | |
|---|---|
| AQS ID | 56-001-9991 |
| CASTNET ID | CNT169 |
| Site Name | Centennial |
| GPS Coordinates | 41.364531, -106.24002 |
| Street Address | Roosevelt National Forest, Centennial, WY 82055 |
| County | Albany |
| Distance to Roads & ADT | 200 meters; estimated < 1000 ADT |
| CBSA Name | Laramie, WY Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 269 degrees |
| Probe Material | Teflon(R) |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 7/27/2021 |

| | |
|---|---|
| AQS ID | 56-003-0002 |
| CASTNET ID | BAS601 |
| Site Name | Basin |
| GPS Coordinates | 44.279947,-108.041 |
| Street Address | Basin (WARMS Station) |
| County | Big Horn |
| Distance to Roads & ADT | 120 meters; 1,780 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | Bureau of Land Management - Wyoming State Office |
| Spatial Scale | Regional Scale |
| Reporting Agency | Bureau of Land Management – Wyoming State Office |
| Start Date | 28-NOV-12 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 – 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | Fail |
| Predominant ozone season wind direction | N/A |
| Probe Material | Teflon® |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 5/7/2021 |

Appendix A. Detailed Site Information (Page 85 of 88)

| | |
|---|---|
| AQS ID | 56-035-9991 |
| CASTNET ID | PND165 |
| Site Name | Pinedale |
| GPS Coordinates | 42.929031, -109.787796 |
| Street Address | Skyline Dr, Pinedale, WY 82941 |
| County | Sublette |
| Distance to Roads & ADT | 230 meters; estimated < 1000 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | EPA |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | EPA/CAMD |
| Spatial Scale | Regional Scale |
| Reporting Agency | EPA/CAMD |
| Start Date | 01-JUN-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/–1 - 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 320 degrees |
| Probe Material | Teflon® |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 5/4/2021 |

Appendix A. Detailed Site Information (Page 86 of 88)

| | |
|---|---|
| AQS ID | 56-039-0008 |
| CASTNET ID | GRT434 |
| Site Name | Grand Teton NP |
| GPS Coordinates | 43.6708,-110.5995 |
| Street Address | Grand Teton NP - Science School |
| County | Teton |
| Distance to Roads & ADT | 145 meters; estimated < 1000 ADT |
| CBSA Name | Jackson, WY-ID Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 22-AUG-11 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 – 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | 193 degrees |
| Probe Material | Teflon® |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 5/5/2021 |

Appendix A. Detailed Site Information (Page 87 of 88)

| | |
|---|---|
| AQS ID | 56-039-1011 |
| CASTNET ID | YEL408 |
| Site Name | Yellowstone NP |
| GPS Coordinates | 44.565356, -110.400338 |
| Street Address | Yellowstone National Park |
| County | Teton |
| Distance to Roads & ADT | 320 meters; estimated < 1000 ADT |
| CBSA Name | Jackson, WY-ID Micropolitan Statistical Area |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | National Park Service |
| Spatial Scale | Regional Scale |
| Reporting Agency | National Park Service |
| Start Date | 01-JUL-96 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 – 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Fail |
| Distance Between Co-located | N/A |
| Wind Obstruction | Fail; tree at 15 meters from inlet |
| Predominant ozone season wind direction | 220 degrees |
| Probe Material | Teflon® |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 5/6/2021 |

Appendix A. Detailed Site Information (Page 88 of 88)

| | |
|---|---|
| AQS ID | 56-045-0003 |
| CASTNET ID | NEC602 |
| Site Name | Newcastle |
| GPS Coordinates | 43.8731, -104.192009 |
| Street Address | Newcastle, Warms Station |
| County | Weston |
| Distance to Roads & ADT | 140 meters; 1,240 ADT |
| Pollutant | Ozone, 1 |
| Parameter Code | 44201 |
| NAAQS Monitoring Objective | Welfare Related Impacts and General/Background |
| Monitor Type | NON-EPA FEDERAL |
| Instrument | Thermo 49i |
| Method Code | 047 |
| FRM or FEM | FEM |
| Collecting Agency | Bureau of Land Management - Wyoming State Office |
| Spatial Scale | Regional Scale |
| Reporting Agency | Bureau of Land Management – Wyoming State Office |
| Start Date | 14-NOV-12 |
| Sampling Frequency | Continuous |
| Sampling Season | 01/01 – 12/31 |
| Probe Height | 10 meters |
| Tree Dewline > 10m or below inlet | Pass |
| Distance Between Co-located | N/A |
| Wind Obstruction | No obstructions around inlet |
| Predominant ozone season wind direction | N/A |
| Probe Material | Teflon® |
| Changes w/in 18 months | N |
| Frequency for 1 Pt QC | Daily |
| Last PE Date | 4/6/2021 |

Appendix B. Quality Assurance Validation Template[1]

## Ozone Validation Template

| 1) Requirement ($O_3$) | 2) Frequency | 3) Acceptance Criteria | Information /Action |
|---|---|---|---|
| **CRITICAL CRITERIA - $O_3$** | **CRITICAL CRITERIA - $O_3$** | **CRITICAL CRITERIA - $O_3$** | **CRITICAL CRITERIA - $O_3$** |
| ***Monitor*** | NA | ***Meets requirements listed in FRM/FEM designation*** | 1) 40 CFR Part 58 App C Sec. 2.1<br>2) NA<br>3) 40 CFR Part 53 & FRM/FEM method list |
| ***One Point QC Check Single analyzer*** | ***Every 14 days*** | < ±7.1% (percent difference) or < ±1.5 ppb difference whichever is greater | 1 and 2) 40 CFR Part 58 App A Sec. 3.1<br>3) Recommendation based on DQO in 40 CFR Part 58 App A Sec. 2.3.1.2. QC Check Conc range 0.005 - 0.08 ppm and 05/05/2016 Technical Note on AMTIC |
| Zero/span check | Every 14 days | Zero drift < ± 3.1 ppb (24 hr)<br>< ± 5.1 ppb (>24hr-14 day)<br>Span drift < ± 7.1 % | 1 and 2) QA Handbook Volume 2 Sec. 12.3<br>3) Recommendation and related to DQO |
| **OPERATIONAL CRITERIA - $O_3$** | **OPERATIONAL CRITERIA - $O_3$** | **OPERATIONAL CRITERIA - $O_3$** | **OPERATIONAL CRITERIA - $O_3$** |
| Shelter Temperature Range | Daily<br>(hourly values) | 20.0 to 30.0° C. (Hourly avg)<br>or<br>per manufacturers specifications if designated to a wider temperature range | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2<br><br>Generally, the 20-30.0° C range will apply but the most restrictive operable range of the instruments in the shelter may also be used as guidance. FRM/FEM list found on AMTIC provides temp. range for given instrument.<br>FRM/FEM monitor testing is required at 20-30° C range per 40 CFR Part 53.32 |
| Shelter Temperature Control | Daily (hourly values) | < 2.1° C SD over 24 hours | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 |
| Shelter Temperature Device Check | Every 182 days and 2/ calendar year | <± 2.1° C of standard | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 |
| ***Annual Performance Evaluation Single analyzer*** | ***Every site every 365 days and 1/ calendar year within period of monitor operation,*** | Percent difference of audit levels 3-10 < ±15.1%<br>Audit levels 1&2 < ± 1.5 ppb difference or <± 15.1% | 1 and 2) 40 CFR Part 58 App A Sec. 3.1.2<br>3) Recommendation- 3 audit concentrations not including zero. AMTIC guidance 2/17/2011 AMTIC Technical Memo |
| ***Federal Audits (NPAP)*** | ***20% of sites audited in calendar year*** | Audit levels 1&2 < ± 1.5 ppb difference all other levels percent difference < ± 10.1% | 1 and 2) 40 CFR Part 58 App A Sec. 3.1.3<br>3) NPAP QAPP/SOP |

| 1) Requirement ($O_3$) | 2) Frequency | 3) Acceptance Criteria | Information /Action |
|---|---|---|---|
| **Verification/Calibration** | Upon receipt/adjustment/repair/ installation/moving and repair and recalibration of standard of higher level<br>Every 182 day and 2/ calendar year if manual zero/span performed biweekly<br>Every 365 day and 1/ calendar year if continuous zero/span performed daily | All points < ± 2.1 % or < ±1.5 ppb difference of best-fit straight line whichever is greater and Slope 1 ± .05 | 1) 40 CFR Part 50 App D<br>2) Recommendation<br>3) 40 CFR Part 50 App D Sec 4.5.5.6<br>Multi-point calibration (0 and 4 upscale points) Slope criteria is a recommendation |
| ***Zero Air/Zero Air Check*** | Every 365 days and 1/calendar year | Concentrations below LDL | 1) 40 CFR Part 50 App D Sec. 4.1<br>2 and 3) Recommendation |
| **Ozone Level 2 Standard** | **Ozone Level 2 Standard** | **Ozone Level 2 Standard** | **Ozone Level 2 Standard** |
| ***Certification/recertification to Standard Reference Photometer (Level 1)*** | Every 365 days and 1/calendar year | single point difference < ± 3.1% | 1) 40 CFR Part 50 App D Sec. 5.4<br>2 and 3) Transfer Standard Guidance EPA-454/B-10-001<br><br>Level 2 standard (formerly called primary standard) usually transported to EPA Regions SRP for comparison |
| ***Level 2 and Greater Transfer Standard Precision*** | Every 365 days and 1/calendar year | ***Standard Deviation less than 0.005 ppm or 3.0% whichever is greater*** | 1) 40 CFR Part 50 Appendix D Sec. 3.1<br>2) Recommendation, part of reverification<br>3) 40 CFR Part 50 Appendix D Sec. 3.1 |
| (if recertified via a transfer standard) | Every 365 days and 1/calendar year | Regression slopes = 1.00 ± 0.03 and two intercepts are 0 ± 3 ppb | 1, 2 and 3) Transfer Standard Guidance EPA-545/B-10-001 |
| **$O_3$ Transfer standard (Level 3 and greater)** | **$O_3$ Transfer standard (Level 3 and greater)** | **$O_3$ Transfer standard (Level 3 and greater)** | **$O_3$ Transfer standard (Level 3 and greater)** |
| Qualification | Upon receipt of transfer standard | < ±4.1% or < ±4 ppb (whichever greater) | 1, 2 and 3) Transfer Standard Guidance EPA-545/B-10-001 |
| Certification | After qualification and upon receipt/adjustment/repair | RSD of six slopes ≤ 3.7%<br>Std. Dev. of 6 intercepts ≤ 1.5 | 1, 2 and 3) Transfer Standard Guidance EPA-545/B-10-001 1 |
| Recertification to higher level standard | Beginning and end of O3 season or every 182 days and 2/calendar year whichever less | New slope = ± 0.05 of previous and<br>RSD of six slopes ≤3.7%<br>Std. Dev. of 6 intercepts ≤ 1.5 | 1, 2 and 3) Transfer Standard Guidance EPA-545/B-10-001 recertification test that then gets added to most recent 5 tests. It does not meet acceptability certification fails |
| **Detection (FEM/FRMs)** Noise and Lower Detectable Limits (LDL) are part of the FEM/FRM requirements. It is recommended that monitoring organizations perform the LDL test to minimally confirm and establish the LDL of their monitor. Performing the LDL test will provide the noise information. | | | |
| ***Noise*** | Every 365 days and 1/ calendar year | ***≤ 0.0025 ppm (standard range)***<br>***≤ 0.001 ppm (lower range)*** | 1) 40 CFR Part 53.23 (b) (definition & procedure)<br>2) Recommendation- info can be obtained from LDL<br>3) 40 CFR Part 53.20 Table B-1 |
| ***Lower detectable limit*** | Every 365 days and 1/calendar year | ***≤ 0.005 ppm (standard range)***<br>***≤ 0.002 ppm (lower range)*** | 1) 40 CFR Part 53.23 (b) (definition & procedure)<br>2) Recommendation<br>3) 40 CFR Part 53.20 Table B-1 |
| **1) Requirement ($O_3$)** | **2) Frequency** | **3) Acceptance Criteria** | **Information /Action** |

| SYSTEMATIC CRITERIA - $O_3$ | SYSTEMATIC CRITERIA - $O_3$ | SYSTEMATIC CRITERIA - $O_3$ | SYSTEMATIC CRITERIA - $O_3$ |
|---|---|---|---|
| ***Standard Reporting Units*** | ***All data*** | ***ppm (final units in AQS)*** | 1, 2 and 3) 40 CFR Part 50 App U Sec. 3(a) |
| ***Rounding convention for design value calculation*** | ***All routine concentration data*** | ***3 places after decimal with digits to right truncated*** | 1, 2 and 3) 40 CFR Part 50 App U Sec. 3(a) The rounding convention is for averaging values for comparison to NAAQS not for reporting individual hourly values. |
| ***Completeness (seasonal)*** | ***3-Year Comparison*** | ***≥ 90% (avg) daily max available in ozone season with min of 75% in any one year.*** | 1,2,3) 40 CFR Part 50 App U Sec 4(b) |
| | ***8- hour average*** | ***≥ if at least 6 of the hourly concentrations for the 8-hour period are available*** | 1) 40 CFR Part 50 App U<br>2 and 3) 40 CFR Part 50 App U Sec. 3(b) |
| | ***Valid Daily Max*** | ***≥ if valid 8-hour averages are available for at least 13 of the 17 consecutive 8-hour periods starting from 7:00 a.m. to 11:00 p.m*** | 1) 40 CFR Part 50 App U<br>2,3) 40 CFR Part 50 App U Sec. 3(d) |
| ***Sample Residence Time Verification*** | Every 365 days and 1/calendar year | ***≤ 20 Seconds*** | 1) 40 CFR Part 58 App E, Sec. 9 (c)<br>2) Recommendation<br>3) 40 CFR Part 58 App E, Sec. 9 (c) |
| ***Sample Probe, Inlet, Sampling train*** | ***All sites*** | ***Borosilicate glass (e.g., Pyrex®) or Teflon®*** | 1) 40 CFR Part 58 App E, Sec. Sec. 9 (a)<br>2) Recommendation<br>3) 40 CFR Part 58 App E, Sec. Sec. 9 (a)<br>FEP and PFA have been accepted as an equivalent material to Teflon. Replacement or cleaning is suggested as 1/year and more frequent if pollutant load or<br>contamination dictate |
| ***Siting*** | Every 365 days and 1/calendar year | ***Meets siting criteria or waiver documented*** | 1) 40 CFR Part 58 App E, Sec. 2-6<br>2) Recommendation<br>3) 40 CFR Part 58 App E, Sec. 2-6 |
| EPA Standard Ozone Reference Photometer (SRP) Recertification (Level 1) | Every 365 days and 1/calendar year | Regression slope = 1.00 ± 0.01<br>and intercept < 3 ppb | 1, 2 and 3) Transfer Standard Guidance EPA-454/B-10-001<br>This is usually at a Regional Office and is compared against the traveling SRP |
| ***Precision (using 1-point QC checks)*** | ***Calculated annually and as appropriate for design value estimates*** | **90% CL CV < 7.1%** | 1) 40 CFR Part 58 App A 2.3.1.2 & 3.1.1<br>2) 40 CFR Part 58 App A Sec. 4 (b)<br>3) 40 CFR Part 58 App A Sec. 4.1.2 |
| **Bias (using 1-point QC checks)** | ***Calculated annually and as appropriate for design value estimates*** | **95% CL < ± 7.1%** | 1) 40 CFR Part 58 App A 2.3.1.2 & 3.1.1<br>2) 40 CFR Part 58 App A Sec. 4 (b)<br>3) 40 CFR Part 58 App A Sec. 4.1.3 |

## CO Validation Template

| 1) Requirement (CO) | 2) Frequency | 3) Acceptance Criteria | Information /Action |
|---|---|---|---|
| **CRITICAL CRITERIA-CO** | **CRITICAL CRITERIA-CO** | **CRITICAL CRITERIA-CO** | **CRITICAL CRITERIA-CO** |
| ***Sampler/Monitor*** | NA | ***Meets requirements listed in FRM/FEM designation*** | 1) 40 CFR Part 58 App C Sec. 2.1<br>2) NA<br>3) 40 CFR Part 53 & FRM/FEM method list |
| ***One Point QC Check Single analyzer*** | ***Every 14 days*** | < ±10.1% (percent difference) | 1 and 2) 40 CFR Part 58 App A Sec. 3.1.1<br>3) Recommendation based on DQO in 40 CFR Part 58 App A Sec. 2.3.1. QC Check Conc range 0.5 – 5 ppm |
| Zero/span check | Every 14 days | Zero drift < ± 0.41 ppm (24 hr)<br>< ± 0.61 ppm (>24hr-14 day)<br>Span drift < ± 10.1 % | 1 and 2) QA Handbook Volume 2 Sec. 12.3<br>3) Recommendation |
| **OPERATIONAL CRITERIA-CO** | **OPERATIONAL CRITERIA-CO** | **OPERATIONAL CRITERIA-CO** | **OPERATIONAL CRITERIA-CO** |
| Shelter Temperature range | Daily<br>(hourly values) | 20.0 to 30.0° C. (Hourly avg)<br>or<br>per manufacturers specifications if designated to a wider temperature range | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2<br><br>Generally, the 20-30.0 ° C range will apply but the most restrictive operable range of the instruments in the shelter may also be used as guidance. FRM/FEM list found on AMTIC provides temp. range for given instrument. FRM/FEM monitor testing is required at 20-30 ° C range per 40 CFR Part 53.32 |
| Shelter Temperature Control | Daily (hourly values) | < 2.1° C SD over 24 hours | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 |
| Shelter Temperature Device Check | Every 182 days and 2/ calendar year | < ± 2.1° C of standard | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 |
| ***Annual Performance Evaluation Single Analyzer*** | ***Every site every 365 days and 1/ calendar year*** | Percent difference of audit levels 3-10 < ±15.1%<br>Audit levels 1&2 < ± 0.031 ppm difference or < ±15.1% | 1 and 2) 40 CFR Part 58 App A Sec. 3.1.2<br>3) Recommendation- 3 audit concentrations not including zero. AMTIC Technical Memo |
| ***Federal Audits (NPAP)*** | ***20% of sites audited in a calendar year*** | Audit levels 1&2 < ± 0.031 ppm difference all other levels percent difference < ± 15.1% | 1 and 2) 40 CFR Part 58 App A Sec. 3.1.3<br>3) NPAP QAPP/SOP |
| ***Verification/Calibration*** | Upon receipt/adjustment/repair/ installation/moving<br>Every 182 day and 2/ calendar year if manual zero/span performed biweekly<br>Every 365 days and 1/ calendar year if continuous zero/span performed daily | All points < ± 2.1 % or < ± 0.03 ppm difference of best-fit straight line. whichever is greater and Slope 1 ± .05 | 1) 40 CFR Part 50 Appendix C Sec. 4 2<br>and 3) Recommendation<br><br>See details about CO2 sensitive instruments Multi-point calibration (0 and 4 upscale points)<br><br>Slope criteria is a recommendation |
| | | | |

| 1) Requirement (CO) | 2) Frequency | 3) Acceptance Criteria | Information /Action |
|---|---|---|---|
| ***Gaseous Standards*** | All gas cylinders | **NIST Traceable**<br>(e.g., EPA Protocol Gas) | 1) 40 CFR Part 50 Appendix C Sec. 4.3.1<br>2) NA Green Book<br>3) 40 CFR Part 50 Appendix C Sec. 4.3.1 See details about CO2 sensitive instruments<br>Gas producer used must participate in EPA Ambient Air Protocol Gas Verification Program<br>40 CFR Part 58 App A Sec. 2.6.1 |
| ***Zero Air/Zero Air Check*** | Every 365 days and 1/ calendar year | ***< 0.1 ppm CO*** | 1) 40 CFR Part 50 App C Sec. 4.3.2<br>2) Recommendation<br>3) 40 CFR Part 50 App C Sec. 4.3.2 |
| Gas Dilution Systems | Every 365 days and 1/ calendar year or after failure of 1 point QC check or performance evaluation | Accuracy < ± 2.1 % | 1, 2 and 3) Recommendation based on SO2 requirement in 40 CFR Part 50 App A-1 Sec. 4.1.2 |
| **Detection (FEM/FRMs)** Noise and Lower Detectable Limits (LDL) are part of the FEM/FRM requirements. It is recommended that monitoring organizations perform the LDL test to minimally confirm and establish the LDL of their monitor. Performing the LDL test will provide the noise information. | | | |
| ***Noise*** | Every 365 days and 1/ calendar year | ***≤ 0.2 ppm (standard range)***<br>***≤ 0.1 ppm (lower range)*** | 1) 40 CFR Part 53.23 (b) (definition & procedure)<br>2) Recommendation- info can be obtained from LDL<br>3) 40 CFR Part 53.20 Table B-1 |
| ***Lower detectable level*** | Every 365 days and 1/ calendar year | ***≤ 0.4 ppm (standard range)***<br>***≤ 0.2 ppm (lower range)*** | 1) 40 CFR Part 53.23 (c) (definition & procedure)<br>2) Recommendation<br>3) 40 CFR Part 53.20 Table B-1 |
| **SYSTEMATIC CRITERIA-CO** | **SYSTEMATIC CRITERIA-CO** | **SYSTEMATIC CRITERIA-CO** | **SYSTEMATIC CRITERIA-CO** |
| ***Standard Reporting Units*** | ***All data*** | ***ppm (final units in AQS)*** | 1, 2 and 3) 40 CFR Part 50.8 (a) |
| ***Rounding convention for design value calculation*** | ***All routine concentration data*** | ***1 decimal place*** | 1, 2 and 3) 40 CFR Part 50.8 (d) The rounding convention is for averaging values for comparison to NAAQS not for reporting individual hourly values. |
| ***Completeness*** | ***8-hour standard*** | ***75% of hourly averages for the 8-hour period*** | 1) 40 CFR Part 50.8(c) 2)<br>40 CFR Part 50.8(a-2)<br>3) 40 CFR Part 50.8(c) |
| Sample Residence Time Verification | Every 365 days and 1/ calendar year | ≤ 20 Seconds | 1, 2, and 3) Recommendation. CO not a reactive gas but suggest following same methods other gaseous criteria pollutants. |
| Sample Probe, Inlet, Sampling train | All Sites | Borosilicate glass (e.g., Pyrex®) or Teflon® | 1, 2, and 3) Recommendation. CO not a reactive gas but suggest following same methods other gaseous criteria pollutants. FEP and PFA have been accepted as a equivalent material to Teflon. Replacement/cleaning is suggested as 1/year and more frequent if pollutant load dictate. |
| **Siting** | Every 365 days and 1/ calendar year | ***Meets siting criteria or waiver documented*** | 1) 40 CFR Part 58 App E, Sec. 2-6<br>2) Recommendation<br>3) 40 CFR Part 58 App E, Sec. 2-6 |
| ***Precision (using 1-point QC*** | ***Calculated annually and as*** | ***90% CL CV < 10.1%*** | 1) 40 CFR part 58 App A Sec. 3.1.1 |

| 1) Requirement (CO) | 2) Frequency | 3) Acceptance Criteria | Information /Action |
|---|---|---|---|
| ***checks)*** | ***appropriate for design value estimates*** | | 2) 40 CFR Part 58 App A Sec. 4 (b)<br>3) 40 CFR Part 58 App A Sec. 4.1.2 |
| ***Bias (using 1-point QC checks)*** | ***Calculated annually and as appropriate for design value estimates*** | ***95% CL < ± 10.1%*** | 1) 40 CFR Part 58 App A Sec. 3.1.1<br>2) 40 CFR Part 58 App A Sec. 4 (b)<br>3) 40 CFR Part 58 App A Sec. 4.1.3 |

## $NO_2$, NOx, NO Validation Template

| 1) Requirement ($NO_2$) | 2) Frequency | 3) Acceptance Criteria | Information /Action |
|---|---|---|---|
| **CRITICAL CRITERIA- $NO_2$** | **CRITICAL CRITERIA- $NO_2$** | **CRITICAL CRITERIA- $NO_2$** | **CRITICAL CRITERIA- $NO_2$** |
| ***Sampler/Monitor*** | ***NA*** | ***Meets requirements listed in FRM/FEM designation*** | 1) 40 CFR Part 58 App C Sec. 2.1<br>2) NA<br>3) 40 CFR Part 53 & FRM/FEM method list |
| ***One Point QC Check Single analyzer*** | ***Every 14 days*** | < ±15.1% (percent difference) or < ± 1.5 ppb difference whichever is greater | 1 and 2) 40 CFR Part 58 App A Sec. 3.1.1<br>3) Recommendation based on DQO in 40 CFR Part 58 App A Sec. 2.3.1.5 QC Check Conc range 0.005 - 0.08 ppm and 05/05/2016 Technical Note on AMTIC |
| Zero/span check | Every 14 days | Zero drift < ± 3.1 ppb (24 hr)<br>< ± 5.1 ppb (>24hr-14 day)<br>Span drift < + 10.1 % | 1 and 2) QA Handbook Volume 2 Sec. 12.3<br>3) Recommendation and related to DQO |
| ***Converter Efficiency*** | During multi-point calibrations, span and audit<br>Every 14 days | ***(≥96%)***<br>96% – 104.1% | 1) 40 CFR Part 50 App F Sec. 1.5.10 and 2.4.10<br>2) Recommendation<br>3) 40 CFR Part 50 App F Sec. 1.5.10 and 2.4.10<br>Regulation states ≥ 96%, 96 – 104.1% is a recommendation. |
| **OPERATIONAL CRITERIA- $NO_2$** | **OPERATIONAL CRITERIA- $NO_2$** | **OPERATIONAL CRITERIA- $NO_2$** | **OPERATIONAL CRITERIA- $NO_2$** |
| Shelter Temperature Range | Daily<br>(hourly values) | 20.0 to 30.0° C. (Hourly avg)<br>or<br>per manufacturers specifications if designated to a wider temperature range | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2<br><br>Generally, the 20-30.0 °C range will apply but the most restrictive operable range of the instruments in the shelter may also be used as guidance. FRM/FEM list found on AMTIC provides temp. range for given instrument. FRM/FEM monitor testing is required at<br>20-30 °C range per 40 CFR Part 53.32 |
| **1) Requirement ($NO_2$)** | **2) Frequency** | **3) Acceptance Criteria** | **Information /Action** |

| | | | |
|---|---|---|---|
| Shelter Temperature Control | Daily (hourly values) | < 2.1° C SD over 24 hours | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 |
| Shelter Temperature Device Check | Every 182 days and 2/calendar year | < ± 2.1° C of standard | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 |
| ***Annual Performance Evaluation Single Analyzer*** | ***Every site every 365 days and 1/ calendar year*** | Percent difference of audit levels 3-10 < ±15.1%<br>Audit levels 1&2 < ± 1.5 ppb difference or < ±15.1% | 1) 40 CFR Part 58 App A Sec. 3.1.2<br>2) 40 CFR Part 58 App A Sec. 3.1.2<br>3) Recommendation - 3 audit concentrations not including zero. AMTIC Technical Memo |
| ***Federal Audits (NPAP)*** | 20% of sites audited in calendar year | Audit levels 1&2 < ± 1.5 ppb difference all other levels percent difference < ± 15.1% | 1 & 2) 40 CFR Part 58 App A Sec. 3.1.3<br>3) NPAP QAPP/SOP |
| ***Verification/Calibration*** | Upon receipt/adjustment/repair/ installation/moving<br>Every 182 day and 2/ calendar year if manual zero/span performed biweekly<br>Every 365 day and 1/ calendar year if continuous zero/span performed daily | Instrument residence time ≤ 2 min<br>Dynamic parameter ≥ 2.75 ppm-min<br>All points <± 2.1 % or ≤ ± 1.5 ppb difference of best-fit straight line whichever is greater and Slope 1 ± .05 | 1) 40 CFR Part 50 App F 2 and 3) Recommendation<br><br>Multi-point calibration (0 and 4 upscale points) Slope criteria is a recommendation |
| ***Gaseous Standards*** | All gas cylinders | **NIST Traceable**<br>(e.g., EPA Protocol Gas)<br>50-100 ppm of NO in Nitrogen with < 1 ppm $NO_2$ | 1) 40 CFR Part 50 App F Sec. 1.3.1<br>2) NA Green Book<br>3) 40 CFR Part 50 App F Sec. 1.3.1. A technical memo may change the concentration requirement.<br><br>Gas producer used must participate in EPA Ambient Air Protocol Gas Verification Program 40 CFR Part 58 App A Sec. 2.6.1 |
| ***Zero Air/ Zero Air Check*** | Every 365 days and 1/ calendar year | Concentrations below LDL | 1) 40 CFR Part 50 App F Sec. 1.3.2<br>2 and 3) Recommendation |
| Gas Dilution Systems | Every 365 days and 1/ calendar year or after failure of 1 point QC check or performance evaluation | Accuracy < ± 2.1 % | 1, 2 and 3) Recommendation based on SO2 requirement in 40 CFR Part 50 App A-1 Sec. 4.1.2 |
| **Detection (FEM/FRMs)** Noise and Lower Detectable Limits (LDL) are part of the FEM/FRM requirements. It is recommended that monitoring organizations perform the LDL test to minimally confirm and establish the LDL of their monitor. Performing the LDL test will provide the noise information. | | | |
| ***Noise*** | Every 365 days and 1/ calendar year | ***≤ 0.005 ppm*** | 1) 40 CFR Part 53.23 (b) (definition & procedure)<br>2) Recommendation- info can be obtained from LDL<br>3) 40 CFR Part 53.20 Table B-1 |
| **1) Requirement ($NO_2$)** | **2) Frequency** | **3) Acceptance Criteria** | 4) **Information /Action** |

| | | | |
|---|---|---|---|
| ***Lower detectable level*** | Every 365 days and 1/ calendar year | ***≤ 0.01 ppm*** | 1) 40 CFR Part 53.23 (c) (definition & procedure)<br>2) Recommendation<br>3) 40 CFR Part 53.20 Table B-1 |
| **SYSTEMATIC CRITERIA- $NO_2$** | **SYSTEMATIC CRITERIA- $NO_2$** | **SYSTEMATIC CRITERIA- $NO_2$** | **SYSTEMATIC CRITERIA- $NO_2$** |
| ***Standard Reporting Units*** | ***All data*** | ***ppb (final units in AQS)*** | 1, 2 and 3) 40 CFR Part 50 App S Sec. 2 (c) |
| ***Rounding convention for data reported to AQ S*** | ***All routine concentration data*** | ***1 place after decimal with digits to right truncated*** | 1, 2 and 3) 40 CFR Part 50 App S Sec. 4.2 (a) The rounding convention is for averaging values for comparison to NAAQS not for reporting individual hourly values. |
| ***Completeness*** | ***Annual Standard*** | ***≥ 75% hours in year*** | 1) 40 CFR Part 50 App S Sec. 3.1(b)<br>2) 40 CFR Part 50 App S Sec. 3.1(a)<br>3) 40 CFR Part 50 App S Sec. 3.1(b) |
| | ***1-hour standard*** | ***1) 3consecutive calendars years of complete data<br>2) 4 quarters complete in each year<br>3) ≥75% sampling days in quarter<br>4) ≥ 75% of hours in a day*** | 1) 40 CFR Part 50 App S Sec. 3.2(b)<br>2) 40 CFR Part 50 App S Sec. 3.2(a)<br>3) 40 CFR Part 50 App S Sec. 3.2(b)<br><br>More details in 40 CFR Part 50 App S |
| ***Sample Residence Time Verification*** | Every 365 days and 1/ calendar year | ***≤ 20 Seconds*** | 1) 40 CFR Part 58 App E, Sec. 9 (c)<br>2) Recommendation<br>3) 40 CFR Part 58 App E, Sec. 9 (c) |
| ***Sample Probe, Inlet, Sampling train*** | ***All sites*** | ***Borosilicate glass (e.g., Pyrex®) or Teflon®*** | 1, 2 and 3) 40 CFR Part 58 App E Sec. 9 (a) FEP and PFA have been accepted as equivalent material to Teflon. Replacement or cleaning is suggested as 1/year and more frequent if pollutant load or contamination dictate |
| ***Siting*** | Every 365 days and 1/ calendar year | ***Meets siting criteria or waiver documented*** | 1) 40 CFR Part 58 App E, Secs 2-6<br>2) Recommendation<br>3) 40 CFR Part 58 App E, Sec. 2-6 |
| ***Precision (using 1-point QC checks)*** | ***Calculated annually and as appropriate for design value estimates*** | ***90% CL CV < 15.1%*** | 1) 40 CFR Part 58 App A Sec. 2.3.1.5 & 3.1.1<br>2) 40 CFR Part 58 App A Sec. 4 (b)<br>3) 40 CFR Part 58 App A Sec. 4.1.2 |
| ***Bias (using 1-point QC checks)*** | ***Calculated annually and as appropriate for design value estimates*** | ***95% CL < ± 15.1%*** | 1) 40 CFR Part 58 App A Sec. 2.3.1.5 & 3.1.1<br>2) 40 CFR Part 58 App A Sec. 4 (b)<br>3) 40 CFR Part 58 App A Sec. 4.1.3 |

## $SO_2$ Validation Template

| 1) Requirement ($SO_2$) | 2) Frequency | 3) Acceptance Criteria | Information /Action |
|---|---|---|---|
| **CRITICAL CRITERIA- $SO_2$** | **CRITICAL CRITERIA- $SO_2$** | **CRITICAL CRITERIA- $SO_2$** | **CRITICAL CRITERIA- $SO_2$** |
| ***Sampler/Monitor*** | NA | ***Meets requirements listed in FRM/FEM designation*** | 1) 40 CFR Part 58 App C Sec. 2.1 2) NA<br>3) 40 CFR Part 53 & FRM/FEM method list |
| ***One Point QC Check Single analyzer*** | ***Every 14 days*** | < ±10.1% (percent difference) or < ± 1.5 ppb difference whichever is greater | 1 and 2) 40 CFR Part 58 App A Sec. 3.1.1<br>3) Recommendation based on DQO in 40 CFR Part 58 App A Sec. 2.3.1.2 QC Check Conc range 0.005 - 0.08 ppm and 05/05/2016 Technical Note on AMTIC |
| Zero/span check | Every 14 days | Zero drift < ± 3.1 ppb (24 hr)<br>< ± 5.1 ppb (>24hr-14 day)<br>Span drift < ± 10.1 % | 1 and 2) QA Handbook Volume 2 Sec. 12.3<br>3) Recommendation and related to DQO |
| **OPERATIONAL CRITERIA- $SO_2$** | **OPERATIONAL CRITERIA- $SO_2$** | **OPERATIONAL CRITERIA- $SO_2$** | **OPERATIONAL CRITERIA- $SO_2$** |
| Shelter Temperature Range | Daily<br>(hourly values) | 20.0 to 30.0° C. (Hourly avg)<br>or<br>per manufacturers specifications if designated to a wider temperature range | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2<br><br>Generally, the 20-30.0 ° C range will apply but the most restrictive operable range of the instruments in the shelter may also be used as guidance. FRM/FEM list found on AMTIC provides temp. range for given instrument. FRM/FEM monitor testing is required at 20-30 ° C range per 40 CFR Part 53.32 |
| Shelter Temperature Control | Daily (hourly values) | < 2.1° C SD over 24 hours | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 |
| Shelter Temperature Device Check | every 180 days and 2/calendar year | < ± 2.1° C of standard | 1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 |
| ***Annual Performance Evaluation Single Analyzer*** | ***Every site every 365 days and 1/ calendar year*** | Percent difference of audit levels 3-10 < ±15.1%<br>Audit levels 1&2 < ± 1.5 ppb difference or < ±15.1% | 1 and 2) 40 CFR Part 58 App A Sec. 3.1.2<br>3) Recommendation - 3 audit concentrations not including zero. AMTIC Technical Memo |
| ***Federal Audits (NPAP)*** | 20% of sites audited in calendar year | Audit levels 1&2 < ± 1.5 ppb difference all other levels percent difference < ± 15.1% | 1&2) 40 CFR Part 58 App A Sec. 3.1.3<br>3) NPAP QAPP/SOP |
| ***Verification/Calibration*** | Upon receipt/adjustment/repair/ installation/moving<br>Every 182 day and 2/ calendar year if manual zero/span performed biweekly Every 365 day and 1/ calendar year if<br>continuous zero/span performed daily | All points < ± 2.1 % or < ± 1.5 ppb difference of best-fit straight line whichever is greater and Slope 1 ± .05 | 1) 40 CFR Part 50 App A-1 Sec. 4 2<br>and 3) Recommendation<br><br>Multi-point calibration (0 and 4 upscale<br><br>points) Slope criteria is a recommendation |

| 1) Requirement ($SO_2$) | 2) Frequency | 3) Acceptance Criteria | Information /Action |
|---|---|---|---|
| ***Gaseous Standards*** | ***All gas cylinders*** | ***NIST Traceable (e.g., EPA Protocol Gas)*** | 1) 40 CFR Part 50 App A-1 Sec. 4.1.6.1<br>2) NA Green Book<br>3) 40 CFR Part 50 App F Sec. 1.3.1<br>Producers must participate in Ambient Air Protocol Gas Verification Program 40 CFR Part 58 App A Sec. 2.6.1 |
| ***Zero Air/ Zero Air Check*** | Every 365 days and 1/ calendar year | Concentrations below LDL<br>< 0.1 ppm aromatic hydrocarbons | 1) 40 CFR Part 50 App A-1 Sec. 4.1.6.2<br>2) Recommendation<br>3) Recommendation and 40 CFR Part 50 App A-1 Sec. 4.1.6.2 |
| ***Gas Dilution Systems*** | Every 365 days and 1/ calendar year or after failure of 1point QC check or performance evaluation | ***Accuracy < ± 2.1 %*** | 1) 40 CFR Part 50 App A-1Sec. 4.1.2<br>2) Recommendation<br>3) 40 CFR Part 50 App A-1 Sec. 4.1.2 |
| **Detection (FEM/FRMs)** Noise and Lower Detectable Limits (LDL) are part of the FEM/FRM requirements. It is recommended that monitoring organizations perform the LDL test to minimally confirm and establish the LDL of their monitor. Performing the LDL test will provide the noise information. | | | |
| ***Noise*** | Every 365 days and 1/ calendar year | ***≤ 0.001 ppm (standard range)***<br>***≤ 0.0005 ppm (lower range)*** | 1) 40 CFR Part 53.23 (b) (definition & procedure)<br>2) Recommendation- info can be obtained from LDL<br>3) 40 CFR Part 53.20 Table B-1 |
| ***Lower detectable level*** | Every 365 days and 1/ calendar year | ***≤ 0.002 ppm (standard range)***<br>***≤ 0.001 ppm (lower range)*** | 1) 40 CFR Part 53.23 (c) (definition & procedure)<br>2) Recommendation<br>3) 40 CFR Part 53.20 Table B-1 |
| **SYSTEMATIC CRITERIA- $SO_2$** | **SYSTEMATIC CRITERIA- $SO_2$** | **SYSTEMATIC CRITERIA- $SO_2$** | **SYSTEMATIC CRITERIA- $SO_2$** |
| ***Standard Reporting Units*** | ***All data*** | ***ppb (final units in AQS)*** | 1, 2 and 3) 40 CFR Part 50 App T Sec. 2 (c) |
| ***Rounding convention for design value calculation*** | ***All routine concentration data*** | ***1 place after decimal with digits to right truncated*** | 1, 2 and 3) 40 CFR Part 50 App T Sec. 2 (c) The rounding convention is for averaging values for comparison to NAAQS not for reporting individual hourly values. |
| ***Completeness*** | ***1 hour standard*** | Hour – 75% of hour<br>***Day- 75% hourly Conc***<br>***Quarter- 75% complete days Years- 4 complete quarters***<br>***5-min value reported only for valid hours*** | 1, 2 and 3) 40 CFR Part 50 App T Sec. 3 (b), (c)<br>More details in CFR on acceptable completeness.<br>5-min values or 5-min max value (40 CFR part 58.16(g)) only reported for the valid portion of the hour reported. If the hour is incomplete no 5-min or 5-min max reported. |
| ***Sample Residence Time Verification*** | Every 365 days and 1/ calendar year | ***≤ 20 Seconds*** | 1) 40 CFR Part 58 App E, Sec. 9 (c)<br>2) Recommendation<br>3) 40 CFR Part 58 App E, Sec. 9 (c) |
| ***Sample Probe, Inlet, Sampling train*** | ***All sites*** | ***Borosilicate glass (e.g., Pyrex®) or Teflon®*** | 1, 2 and 3) 40 CFR Part 58 App E Sec. 9 (a)<br>FEP and PFA have been accepted as equivalent material to Teflon. Replacement or cleaning is suggested as 1/year and more frequent if pollutant load or contamination dictate |

| 1) Requirement ($SO_2$) | 2) Frequency | 3) Acceptance Criteria | Information /Action |
|---|---|---|---|
| ***Siting*** | Every 365 days and 1/ calendar year | ***Meets siting criteria or waiver documented*** | 1) 40 CFR Part 58 App E, Sec. 2-6<br>2) Recommendation<br>3) 40 CFR Part 58 App E, Sec. 2-6 |
| ***Precision (using 1-point QC checks)*** | ***Calculated annually and as appropriate for design value estimates*** | ***90% CL CV < 10.1%*** | 1) 40 CFR Part 58 App A Sec. 2.3.1.6 & 3.1.1<br>2) 40 CFR Part 58 App A Sec. 4(b)<br>3) 40 CFR Part 58 App A Sec. 4.1.2 |
| ***Bias (using 1-point QC checks)*** | ***Calculated annually and as appropriate for design value estimates*** | ***95% CL < ± 10.1%*** | 1) 40 CFR Part 58 App A Sec. 2.3.1.6 & 3.1.1<br>2) 40 CFR Part 58 App A Sec. 4(b)<br>3) 40 CFR Part 58 App A Sec. 4.1.3 |

[1] Table reproduced from OAQPS' *QA Handbook Appendix D Validation Templates. Ambient Air Quality Monitoring Program EPA-454/B-17-001 March, 2017. Appendix D.* https://www3.epa.gov/ttn/amtic/files/ambient/pm25/qa/APP_D%20validation%20template%20version%2003_2017_for%20AMTIC%20Rev_1.pdf

[2] Match numbered details within the 4) Information/Action column with columns (1) Requirement (pollutant), (2) Frequency, and (3) Acceptance Criteria.

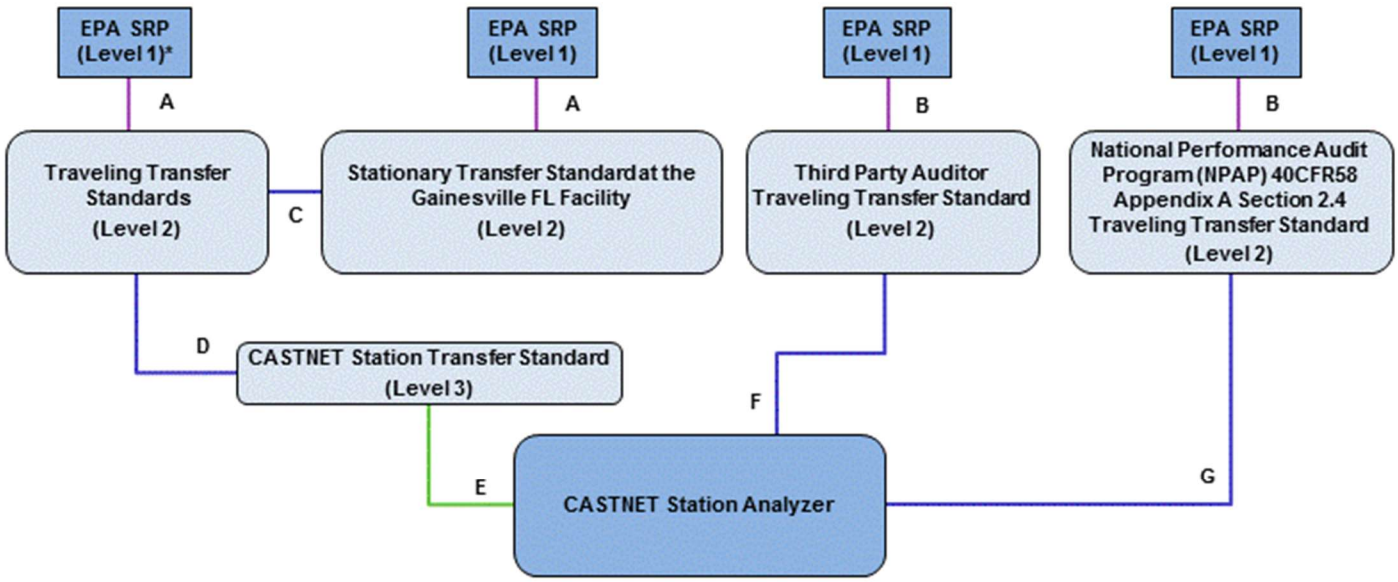
Appendix C. Ozone Season by State[1,2]

| State | Begin Month | End Month |
|---|---|---|
| **Alabama** | March | October |
| **Alaska** | April | October |
| **Arizona** | January | December |
| **Arkansas** | March | November |
| **California** | January | December |
| **Colorado** | January | December |
| **Connecticut** | March | September |
| **Delaware** | March | October |
| **District of Columbia** | March | October |
| **Florida** | January | December |
| **Georgia** | March | October |
| **Hawaii** | January | December |
| **Idaho** | April | September |
| **Illinois** | March | October |
| **Indiana** | March | October |
| **Iowa** | March | October |
| **Kansas** | March | October |
| **Kentucky** | March | October |
| **Louisiana (Northern) AQCR 019, 022** | March | October |
| **Louisiana (Southern) AQCR 106** | January | December |
| **Maine** | April | September |
| **Maryland** | March | October |
| **Massachusetts** | March | September |
| **Michigan** | March | October |
| **Minnesota** | March | October |
| **Mississippi** | March | October |
| **Missouri** | March | October |
| **Montana** | April | September |
| **Nebraska** | March | October |
| **Nevada** | January | December |
| **New Hampshire** | March | September |
| **New Jersey** | March | October |
| **New Mexico** | January | December |
| **New York** | March | October |
| **North Carolina** | March | October |
| **North Dakota** | March | September |
| **Ohio** | March | October |
| **Oklahoma** | March | November |
| **Oregon** | May | September |
| **Pennsylvania** | March | October |
| **Puerto Rico** | January | December |
| **Rhode Island** | March | September |
| **South Carolina** | March | October |
| **South Dakota** | March | October |
| **Tennessee** | March | October |
| **Texas (Northern) AQCR 022, 210, 211, 212, 215, 217, 218** | March | November |
| **Texas (Southern) AQCR 106, 153, 213, 214, 216** | January | December |
| **Utah** | January | December |
| **Vermont** | April | September |
| **Virginia** | March | October |
| **Washington** | May | September |
| **West Virginia** | March | October |

| | | |
|---|---|---|
| **Wisconsin** | March | October 15 |
| **Wyoming** | January | September |
| **American Samoa** | January | December |
| **Guam** | January | December |
| **Virgin Islands** | January | December |

[1] Ozone season by State from Appendix D to 40 CFR Part 58, Table D-3.
[2] Air Quality Control Region (AQCR) as delineated in 40 CFR Part 81, Subpart B.

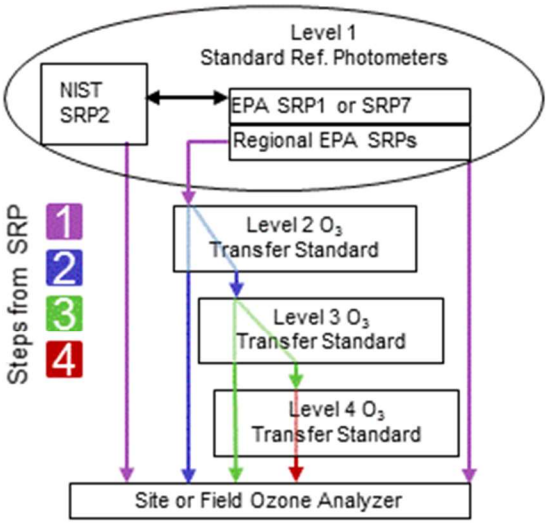
Appendix D. CASTNET QAPP Ozone Certification Flowchart




**Legend**

A = Annual Reverification
B = Quarterly Reverification
C = Audited ~1/6 weeks
D = Reverification 1/6 months
E = Zero, Span and single Point QC check daily
F = Audited Annually
G = Audited 1/5 years

***Traceability**



Appendix E. EPA Regional Office Contacts Information

| EPA Region | Name | Phone | Email |
|---|---|---|---|
| **Region 1** | Cuzzupe, Mary Jane<br>Murphy, Alysha | 617-918-8383<br>617-918-8381 | cuzzupe.maryjane@epa.gov<br>murphy.alysha@epa.gov |
| **Region 2** | Ruvo, Richard A.<br>Gavin, Lau | 212-637-4014<br>212-637-3708 | ruvo.richard@epa.gov<br>gavin.lau@epa.gov |
| **Region 3** | Hyden, Loretta | 215-814-2113 | hyden.loretta@epa.gov |
| **Region 4** | Rinck, Todd<br>Garver, Daniel | 404-562-9062<br>404-562-9839 | rinck.todd@epa.gov<br>garver.daniel@epa.gov |
| **Region 5** | Hamilton, Scott<br>Compher, Michael | 312-353-4775<br>312-886-5745 | hamilton.scott@epa.gov<br>compher.michael@epa.gov |
| **Region 6** | Apodaca, Suzanne | 214-665-6556 | apodaca.suzanne@epa.gov |
| **Region 7** | Davis, Michael<br>Grooms, Leland | 913-551-5042<br>913-551-5010 | davis.michael@epa.gov<br>grooms.leland@epa.gov |
| **Region 8** | Rickard, Joshua | 303-312-6460 | rickard.joshua@epa.gov |
| **Region 9** | Biland, Larry | 415-947-4132 | biland.larry@epa.gov |
| **Region 10** | Waldo, Sarah<br>Wallace, Will | 206-553-1504<br>206-553-2495 | waldo.sarah@epa.gov<br>wallace.will@epa.gov |

Appendix F. Outline for TSA Report

Please refer to *Conducting Technical Systems Audits of Ambient Air Monitoring Programs document # EPA-454/B-17-004 November 2017*

1. Executive Summary
2. Introduction
3. General Program and Quality Management (Audit of EPA contractor's office and NPS contractor's office)
    a. Complete General/Quality Management Forms
    b. Findings, Discussions, Recommendations
4. Network Management
    a. Complete Network Management, Field Support, Instrument Certification/Testing, Standards and Calibrations, and Instrument Repair Forms
    b. Table listing the site locations, number of monitors at each location, type of monitor (SLAMS, SPM, etc.), what is measured
    c. Findings, Discussions, Recommendations
5. Field Operations
    a. Complete Field Overview Forms
    b. Table that list site name, AQS ID, and pollutants monitored
    c. Findings, Discussions, Recommendations
6. Laboratory Operations
    a. Complete Laboratory Operations Forms
    b. Findings, Discussions, Recommendations
7. Data and Data Management
    a. Complete Data and Data Management Forms
    b. Findings, Discussions, Recommendations
8. Quality Control and Quality Assurance

Appendix G. Current list of 40 CFR Part 58 Compliant CASTNET Ozone and Trace-level Gas Monitors

| EPA REG | ST | AQS ID | POC | PARAM | SITE_ID | AGY | PQAO [1] | NOTES | 2011 [2] | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CT | 090159991 | 1 | O3 | ABT147 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 1 | ME | 230039991 | 1 | O3 | ASH135 | EPA | EPA | **Suspended All May 2022** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | |
| 1 | ME | 230090103 | 1 | O3 | ACA416 | NPS | ME | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 1 | ME | 230199991 | 1 | O3 | HOW132 | EPA | EPA | Discontinued 10/2012 | Y | Y | | | | | | | | | |
| 1 | NH | 330099991 | 1 | O3 | WST109 | EPA | EPA | **Suspended All May 2022** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | |
| 2 | NJ | 340219991 | 1 | O3 | WSP144 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 2 | NY | 360319991 | 1 | O3 | HWF187 | EPA | EPA | **Suspended All May 2022** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | |
| 2 | NY | 361099991 | 1 | O3 | CTH110 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | MD | 240199991 | 1 | O3 | BWR139 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | MD | 240339991 | 1 | $SO_2$ 1Hr | BEL116 | EPA | EPA | Discontinued 4/2017 | | | Y | Y | Y | Y | | | | | |
| 3 | MD | 240339991 | 2 | $SO_2$ 5Min | BEL116 | EPA | EPA | Discontinued 4/2017 | | | Y | Y | Y | Y | | | | | |
| 3 | MD | 240339991 | 1 | O3 | BEL116 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | PA | 420019991 | 1 | O3 | ARE128 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | PA | 420279991 | 1 | O3 | PSU106 | EPA | EPA | **Suspended Filterpack May 2022** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | PA | 420479991 | 1 | O3 | KEF112 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | PA | 420859991 | 1 | O3 | MKG113 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | PA | 421119991 | 1 | O3 | LRL117 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | VA | 510719992 | 1 | O3 | VPI120 | EPA | EPA | Changed AQS ID in August 2020 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | VA | 511130003 | 1 | O3 | SHN418 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | VA | 511479991 | 1 | O3 | PED108 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 3 | WV | 540219991 | 1 | O3 | CDR119 | EPA | EPA | **Suspended All May 2022** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | |
| 3 | WV | 540939991 | 1 | O3 | PAR107 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | AL | 010499991 | 1 | O3 | SND152 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | FL | 120619991 | 1 | O3 | IRL141 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | FL | 120779991 | 1 | O3 | SUM156 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | GA | 132319991 | 1 | O3 | GAS153 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | KY | 210610501 | 1 | O3 | MAC426 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | KY | 210610501 | 1 | CO | MAC426 | NPS | NPS | Data are not certified | | | | | | | | Y | Y | | |
| 4 | KY | 210610501 | 1 | $SO_2$ 1Hr | MAC426 | NPS | NPS | Data are not certified | | | | | | | | Y | Y | | |
| 4 | KY | 210610501 | 5 | $SO_2$ 5Min | MAC426 | NPS | NPS | Data are not certified | | | | | | | | Y | Y | | |
| 4 | KY | 211759991 | 1 | O3 | CKT136 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | KY | 212219991 | 1 | O3 | CDZ171 | EPA | EPA | **Suspended All May 2022** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | |
| 4 | KY | 212299991 | 1 | O3 | MCK131 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | KY | 212299991 | 2 | O3 | MCK231 | EPA | EPA | QA only beginning 1/1/2015 [3] | Y | Y | Y | Y | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | MS | 281619991 | 1 | O3 | CVL151 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | NC | 370119991 | 1 | O3 | PNF126 | EPA | EPA | **Suspended All May 2022** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | |
| 4 | NC | 370319991 | 1 | O3 | BFT142 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | NC | 371139991 | 1 | O3 | COW137 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | NC | 371239991 | 1 | O3 | CND125 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | NC | N/A | NA | O3 | DUK008 | EPA | EPA | NAAQS-EXCLUDED | | | | | | | | | | | | |
| 4 | TN | 470090101 | 1 | O3 | GRS420 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | TN | 470259991 | 1 | O3 | SPD111 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 4 | TN | 470419991 | 1 | O3 | ESP127 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | IL | 170191001 | 1 | O3 | BVL130 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | IL | 170191001 | 2 | $SO_2$ 1Hr | BVL130 | EPA | EPA | | | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | IL | 170191001 | 3 | $SO_2$ 5Min | BVL130 | EPA | EPA | | | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | IL | 170191001 | 1 | CO | BVL130 | EPA | EPA | | | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | IL | 170859991 | 1 | O3 | STK138 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | IL | 171199991 | 1 | O3 | ALH157 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | IN | 180839991 | 1 | O3 | VIN140 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | IN | 181699991 | 1 | O3 | SAL133 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | MI | 261579991 | 1 | O3 | UVL124 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | MI | 261619991 | 1 | O3 | ANA115 | EPA | EPA | **Suspended Filterpack May 2022** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | MI | 261659991 | 1 | O3 | HOX148 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | MN | 271370034 | 1 | O3 | VOY413 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | OH | 390179991 | 1 | O3 | OXF122 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | OH | 390479991 | 1 | O3 | DCP114 | EPA | EPA | **Suspended All May 2022** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | |
| 5 | OH | 391219991 | 1 | O3 | QAK172 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 5 | WI | 551199991 | 1 | O3 | PRK134 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 6 | AR | 050199991 | 1 | O3 | CAD150 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 6 | OK | 400019009 | 1 | O3 | CHE185 | EPA | CN | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 6 | NM | 350150010 | 1 | O3 | CAV436 | NPS | NPS | Existing NPS site, included w/CASTNET on 3/5/2021 | | | | | | | | | | | | Y |
| 6 | NM | 350450020 | 1 | O3 | CHC432 | NPS | NPS | New site, 2017 | | | | | | | Y | Y | Y | Y | Y | |
| 6 | TX | 480430101 | 1 | O3 | BBE401 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 6 | TX | 483739991 | 1 | O3 | ALC188 | EPA | EPA | | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 6 | TX | 483819991 | 1 | O3 | PAL190 | EPA | EPA | | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 7 | KS | 201619991 | 1 | O3 | KNZ184 | EPA | EPA | Discontinued 4/2013 | Y | Y | | | | | | | | | | |
| 7 | NE | 311079991 | 1 | O3 | SAN189 | EPA | EPA | **Suspended Filterpack May 2022** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | CO | 080519991 | 1 | O3 | GTH161 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | CO | 080690007 | 3 | O3 | ROM206 | EPA | EPA | QA only beginning 10/2012 | Y | Y | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | CO | 080690007 | 1 | O3 | ROM406 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | CO | 080830101 | 1 | O3 | MEV405 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | MT | 300298001 | 1 | O3 | GLR468 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | ND | 380070002 | 1 | O3 | THR422 | NPS | ND | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | SD | 460330132 | 3 | O3 | WNC429 | NPS | SD | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | UT | 490370101 | 1 | O3 | CAN407 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | WY | 560019991 | 1 | O3 | CNT169 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | WY | 560030002 | 1 | O3 | BAS601 | BLM | BLM | | | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | WY | 560359991 | 1 | O3 | PND165 | EPA | EPA | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | WY | 560390008 | 1 | O3 | GRT434 | NPS | NPS | Existing NPS site, included w/CASTNET on 7/1/2019 | | | | | | | | | Y | Y | Y | Y |
| 8 | WY | 560391011 | 1 | O3 | YEL408 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | WY | 560450003 | 1 | O3 | NEC602 | BLM | BLM | | | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | UT | 490471002 | 1 | O3 | DIN431 | NPS | NPS | New site 1/2014 | | | | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 8 | UT | 490530130 | 1 | O3 | ZIO433 | NPS | NPS | Existing NPS site, included w/CASTNET on 1/1/2018 | | | | | | | | Y | Y | Y | Y | Y |
| 9 | AZ | 040038001 | 1 | O3 | CHA467 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 9 | AZ | 040058001 | 1 | O3 | GRC474 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 9 | AZ | 040170119 | 1 | O3 | PET427 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 9 | CA | 060270101 | 1 | O3 | DEV412 | NPS | NPS | Existing NPS site, included w/CASTNET on 5/1/2019 | | | | | | | | | Y | Y | Y | Y |
| 9 | CA | 060430003 | 1 | O3 | YOS404 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 9 | CA | 060690003 | 1 | O3 | PIN414 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 9 | CA | 060719002 | 1 | O3 | JOT403 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 9 | CA | 060893003 | 1 | O3 | LAV410 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 9 | CA | 061070009 | 1 | O3 | SEK430 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 9 | NV | 320330101 | 1 | O3 | GRB411 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 10 | AK | 020680003 | 1 | O3 | DEN417 | NPS | NPS | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 10 | WA | 530531010 | 1 | O3 | MOR409 | NPS | NPS | Discontinued 11/2013 | Y | Y | Y | | | | | | | | | |
| 10 | WA | 530139991 | 1 | O3 | UMA009 | EPA | EPA | New site 11/2020 | | | | | | | | | | | | Y |
| 10 | ID | 160230101 | 1 | O3 | CRM435 | NPS | NPS | Existing NPS site, included w/CASTNET on 11/1/2019 | | | | | | | | | Y | Y | Y | Y |
| 10 | ID | 160499991 | 1 | O3 | NPT006 | EPA | EPA | Site started on 9/2016 | | | | | | | Y | Y | Y | Y | Y | Y |
| | | | | | | | | **Network Ozone Sites[4]** | **77** | **79** | **78** | **78** | **77** | **77** | **79** | **80** | **83** | **84** | **78** |
| | | | | | | | | **Network $SO_2$ Sites** | | | **2** | **2** | **2** | **2** | **1** | **2** | **2** | **1** | **1** |
| | | | | | | | | **Network CO Sites** | | | **1** | **1** | **1** | **1** | **1** | **2** | **2** | **1** | **1** |

[1] See Appendix I for details on PQAO

[2] Year column indicates monitor may be compared to the NAAQS for that year

[3] Bold font indicates status change to the monitor for the upcoming year
[4] Network ozone site totals do not include the three NAAQS-excluded monitors used for quality assurance or research purposes (ROM206, MCK231, and DUK008)

Appendix H. CBSA Code and Title for CASTNET Sites

| EPA RGN | AQS ID | POC | CASTNET ID | STATE | COUNTY | O3 DV PPB[1] | CBSA[2] | POP.[3] |
|---|---|---|---|---|---|---|---|---|
| 1 | 090159991 | 1 | ABT147 | CT | Windham | 66 | Worcester, MA-CT | 930,473 |
| 1 | 230090103 | 1 | ACA416 | ME | Hancock | 60 | | |
| 6 | 483739991 | 1 | ALC188 | TX | Polk | 59 | | |
| 5 | 171199991 | 1 | ALH157 | IL | Madison | 66 | St. Louis, MO-IL | 2,806,207 |
| 5 | 261619991 | 1 | ANA115 | MI | Washtenaw | 65 | Ann Arbor, MI | 356,874 |
| 3 | 420019991 | 1 | ARE128 | PA | Adams | 61 | Gettysburg, PA | 101,714 |
| 8 | 560030002 | 1 | BAS601 | WY | Big Horn | 59 | | |
| 6 | 480430101 | 1 | BBE401 | TX | Brewster | 63 | | |
| 3 | 240339991 | 1 | BEL116 | MD | Prince George's | 71 | Washington-Arlington-Alexandria, DC-VA-MD-WV | 6,033,737 |
| 4 | 370319991 | 1 | BFT142 | NC | Carteret | NA | Morehead City, NC | 68,811 |
| 5 | 170191001 | 1 | BVL130 | IL | Champaign | 61 | Champaign-Urbana, IL | 237,252 |
| 3 | 240199991 | 1 | BWR139 | MD | Dorchester | 63 | Cambridge, MD | 32,578 |
| 6 | 050199991 | 1 | CAD150 | AR | Clark | 57 | Arkadelphia, AR | 22,576 |
| 8 | 490370101 | 1 | CAN407 | UT | San Juan | 66 | | |
| 6 | 350150010 | 1 | CAV436 | NM | Eddy | NA | Carlsbad-Artesia, NM | 56,395 |
| 9 | 40038001 | 1 | CHA467 | AZ | Cochise | 66 | Sierra Vista-Douglas, AZ | 127,448 |
| 6 | 350450020 | 1 | CHC432 | NM | San Juan | 67 | Farmington, NM | 123,785 |
| 6 | 400019009 | 1 | CHE185 | OK | Adair | NA | | |
| 4 | 211759991 | 1 | CKT136 | KY | Morgan | 58 | | |
| 4 | 371239991 | 1 | CND125 | NC | Montgomery | 56 | | |
| 8 | 560019991 | 1 | CNT169 | WY | Albany | 67 | Laramie, WY | 37,811 |
| 4 | 371139991 | 1 | COW137 | NC | Macon | 57 | | |
| 10 | 160230101 | 1 | CRM435 | ID | Butte | 64 | Seattle-Tacoma-Bellevue, WA | 3,671,478 |
| 2 | 361099991 | 1 | CTH110 | NY | Tompkins | 59 | Ithaca, NY | 104,691 |
| 4 | 281619991 | 1 | CVL151 | MS | Yalobusha | 56 | | |
| 10 | 20680003 | 1 | DEN417 | AK | Denali | 52 | | |
| 9 | 60270101 | 1 | DEV412 | CA | Inyo | NA | | |
| 8 | 490471002 | 1 | DIN431 | UT | Uintah | 66 | Vernal, UT | 36,867 |
| 4 | 470419991 | 1 | ESP127 | TN | DeKalb | 58 | | |
| 4 | 132319991 | 1 | GAS153 | GA | Pike | NA | Atlanta-Sandy Springs-Marietta, GA | 5,614,323 |
| 8 | 300298001 | 1 | GLR468 | MT | Flathead | 53 | Kalispell, MT | 94,924 |
| 9 | 320330101 | 1 | GRB411 | NV | White Pine | 69 | | |
| 9 | 40058001 | 1 | GRC474 | AZ | Coconino | 64 | Flagstaff, AZ | 137,682 |
| 4 | 470090101 | 1 | GRS420 | TN | Blount | 63 | Knoxville, TN | 857,585 |
| 8 | 560390008 | 1 | GRT434 | WY | Teton | 59 | Jackson, WY-ID | 33,271 |
| 8 | 80519991 | 1 | GTH161 | CO | Gunnison | 67 | | |
| 5 | 261659991 | 1 | HOX148 | MI | Wexford | 65 | Cadillac, MI | 47,923 |
| 4 | 120619991 | 1 | IRL141 | FL | Indian River | 60 | Sebastian-Vero Beach, FL | 144,755 |
| 9 | 060719002 | 1 | JOT403 | CA | San Bernardino | 86 | Riverside-San Bernardino-Ontario, CA | 4,441,890 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 | 420479991 | 1 | KEF112 | PA | Elk | 58 | St. Mary's, PA | |
| 9 | 060893003 | 1 | LAV410 | CA | Shasta | 68 | Redding, CA | 179,804 |
| 3 | 421119991 | 1 | LRL117 | PA | Somerset | 59 | Somerset, PA | 76,218 |
| 4 | 210610501 | 1 | MAC426 | KY | Edmonson | 59 | Bowling Green, KY | 165,732 |
| 4 | 212299991 | 1 | MCK131 | KY | Washington | 60 | | |
| 4 | 212299991 | 2 | MCK231 | KY | Washington | NA | | |
| 8 | 080830101 | 1 | MEV405 | CO | Montezuma | 68 | | |
| 3 | 420859991 | 1 | MKG113 | PA | Mercer | 63 | Youngstown-Warren-Boardman, OH-PA | 553,263 |
| 10 | 530531010 | 1 | MOR409 | WA | Pierce | 61 | | |
| 8 | 560450003 | 1 | NEC602 | WY | Weston | 62 | | |
| 10 | 160499991 | 1 | NPT006 | ID | Idaho | 56 | Walla-Walla, WA | 63,829 |
| 5 | 390179991 | 1 | OXF122 | OH | Butler | 66 | Cincinnati-Middletown, OH-KY-IN | 2,149,449 |
| 6 | 483819991 | 1 | PAL190 | TX | Randall | 68 | Amarillo, TX | 259,885 |
| 3 | 540939991 | 1 | PAR107 | WV | Tucker | 56 | | |
| 3 | 511479991 | 1 | PED108 | VA | Prince Edward | 57 | | |
| 9 | 040170119 | 1 | PET427 | AZ | Navajo | 67 | Show Low, AZ | 108,101 |
| 9 | 060690003 | 1 | PIN414 | CA | San Benito | 65 | San Jose-Sunnyvale-Santa Clara, CA | 1,952,872 |
| 8 | 560359991 | 1 | PND165 | WY | Sublette | 66 | | |
| 5 | 551199991 | 1 | PRK134 | WI | Taylor | 60 | | |
| 3 | 420279991 | 1 | PSU106 | PA | Centre | 60 | State College, PA | 158,742 |
| 5 | 391219991 | 1 | QAK172 | OH | Noble | 60 | | |
| 8 | 080690007 | 3 | ROM206 | CO | Larimer | NA | Fort Collins-Loveland, CO | 324,122 |
| 8 | 080690007 | 1 | ROM406 | CO | Larimer | 70 | Fort Collins-Loveland, CO | 324,122 |
| 5 | 181699991 | 1 | SAL133 | IN | Wabash | 69 | Wabash, IN | 32,252 |
| 7 | 311079991 | 1 | SAN189 | NE | Knox | 63 | | |
| 9 | 061070009 | 1 | SEK430 | CA | Tulare | 88 | Visalia-Porterville, CA | 458,198 |
| 3 | 511130003 | 1 | SHN418 | VA | Madison | 57 | | |
| 4 | 010499991 | 1 | SND152 | AL | DeKalb | 61 | Fort Payne, AL | |
| 4 | 470259991 | 1 | SPD111 | TN | Claiborne | 58 | | |
| 5 | 170859991 | 1 | STK138 | IL | Jo Daviess | 63 | | |
| 4 | 120779991 | 1 | SUM156 | FL | Liberty | 57 | | |
| 8 | 380070002 | 1 | THR422 | ND | Billings | 57 | Dickinson, ND | 30,372 |
| 10 | 530139991 | 1 | UMA009 | WA | Columbia | NA | Idaho Falls, ID | |
| 5 | 261579991 | 1 | UVL124 | MI | Tuscola | 64 | | |
| 5 | 180839991 | 1 | VIN140 | IN | Knox | 65 | Vincennes, IN | 37,938 |
| 5 | 271370034 | 1 | VOY413 | MN | St. Louis | 56 | Duluth, MN-WI | 280,218 |
| 3 | 510719991 | 1 | VPI120 | VA | Giles | NA | Blacksburg-Christiansburg-Radford, VA | 181,605 |
| 8 | 460330132 | 3 | WNC429 | SD | Custer | 61 | Rapid City, SD | 143,638 |
| 2 | 340219991 | 1 | WSP144 | NJ | Mercer | 70 | Trenton, NJ | 371537 |
| 8 | 560391011 | 1 | YEL408 | WY | Teton | 63 | Jackson, WY-ID | 33,271 |
| 9 | 060430003 | 1 | YOS404 | CA | Mariposa | 79 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | 490530130 | 1 | ZIO433 | UT | Washington | 66 | St. George, UT | |

[1] Design values are displayed for the 2018-2020 sampling period when data completeness requirements are satisfied. These values originate from OAQPS' Air Trends website: http://epa.gov/airtrends/values.html

[2] CBSA = Core Based Statistical Area - A statistical geographic entity consisting of the county or counties associated with at least one core (urbanized area or urban cluster) of at least 10,000 population, plus adjacent counties having a high degree of social and economic integration with the core as measured through commuting ties with the counties containing the core.

Definitions of statistical areas are from the Office of Management and Budget Federal Register Notice Vol 65, No. 249. December 27, 2000.
https://www.bls.gov/lau/frn249.pdf

[3]POP. = CBSA 2014 Census from OAPQS' AIRSRAQS.CORE_BASED_STATISTICAL_AREAS Census Population Data

Appendix I. Summary of Current CASTNET Ozone and Trace-level Gas Monitors

**2022 SUMMARY**

| PQAO[1] | PQAO Name | $O_3$ Sites | $SO_2$ | CO |
|---|---|---|---|---|
| **1344** | Environmental Protection Agency – Clean Air Markets Division | 48[2] | 1 | 1 |
| **0745** | National Park Service – Air Resources Division | 27 | | |
| **1366** | Bureau of Land Management – Wyoming State Office | 2 | | |
| **905** | Cherokee Nation | 1 | | |
| **0973** | South Dakota – Department of Environment and Natural Resources | 1 | | |
| **0782** | North Dakota – Department of Health | 1 | | |
| **0635** | Maine Department of Environmental Protection – Bureau of Air Quality Control | 1 | | |
| | Total | 80 | 1 | 1 |

[1] Principal Quality Assurance Organization (PQAO) as identified within the AQS AMP480 report.
[2] EPA-CAMD's site count of 48 includes three NAAQS Excluded ozone monitors: the EPA-sponsored QA monitor in Rocky Mountain National Park, CO (ROM206), the co-located QA monitor in Mackville, KY (MCK231), and the ozone monitor sited above a forest canopy in Duke Forest, NC (DUK008).

Appendix J. CASTNET Parameter Key

| CASTNET Parameter | Site List |
|---|---|
| **BLM Small Footprint Filterpack and Meteorology** | BUF603, FOR605, SHE604 |
| **BLM Small Footprint Filterpack, Ozone, and Meteorology** | BAS601, NEC602 |
| **EPA Co-located Pair with Filterpack and Ozone** | MCK131/MCK231 |
| **EPA Filterpack and Ozone** | ABT147, ALC188, ALH157, ARE128, BFT142, BWR139, CAD150, CKT136, CND125, CNT169, COW137, CTH110, CVL151, ESP127, GAS153, GTH161, HOX148, KEF112, LRL117, MKG113, OXF122, PAL190, PAR107, PED108, PRK134, QAK172, SAL133, SND152, SPD111, STK138, SUM156, UVL124, VIN140, VPI120, WSP144 |
| **EPA Ozone - Suspended Filterpack** | ANA115, PSU106, SAN189 |
| **EPA Suspended Filterpack and Ozone** | ASH135, CDR119, CDZ171, DCP114, WST109 |
| **EPA Filterpack** | CAT175, EGB181, KNZ184, WFM105 |
| **EPA Filterpack, Non-Regulatory Ozone, and Trace-level Gas** | DUK008 |
| **EPA Filterpack, Ozone, Meteorology, and Trace-level Gas** | BVL130, PND165* |
| **EPA Filterpack, Ozone, and Meteorology** | BEL116, CHE185, IRL141 |
| **EPA Suspended Filterpack, Ozone, and Trace-level Gas** | HWF187, PNF126 |
| **EPA Small Footprint Ozone and Filterpack** | NPT006 and UMA009 |
| **EPA Small Footprint Filterpack** | KIC003, NIC001, RED004, WFM105 |
| **EPA Suspended Small Footprint** | UND002 |
| **NCore Participant** | ACA416, BVL130, CHE185, GRS420, UND002 |
| **NPS Filterpack and Meteorology** | EVE419 |
| **NPS Filterpack, Ozone, Meteorology, and Trace-level Gas** | GRS420, MAC426 |
| **NPS Filterpack, Ozone, and Meteorology** | ACA416, BBE401, CAN407, CHA467, DEN417, DIN431, GLR468, GRB411, GRC474, JOT403, LAV410, MEV405, PET427, PIN414, SEK430, SHN418, THR422, VOY413, WNC429, YEL408, YOS404 |
| **NPS Ozone and Meteorology** | CAV436, CRM435, DEV412, GRT434, ZIO433 |
| **NPS Ozone, Meteorology, and Trace-level Gas** | CHC432 |
| **NPS/EPA Co-located Pair with EPA Filterpack, Ozone, and Trace-level Gas** | ROM406/ROM206 |

* Meteorological measurements at PND165 are sponsored by BLM-WSO.

Appendix K. EPA-Sponsored CASTNET Suspended Site List

| Site ID | AQS ID | POC | State | EPA Region | Parameters Active | Parameters Suspended |
|---|---|---|---|---|---|---|
| **ASH135** | 230039991 | 1 | ME | 1 | | Ozone and Filterpack |
| **WST109** | 330099991 | 1 | NH | 1 | | Ozone and Filterpack |
| **UND002** | NA | NA | VT | 1 | | Filterpack |
| **HWF187** | 360319991 | 1 | NY | 2 | | Ozone, Trace-Level Gas, and Filterpack |
| **PSU106** | 420279991 | 1 | PA | 3 | Ozone | Filterpack |
| **CDR119** | 540219991 | 1 | WV | 3 | | Ozone and Filterpack |
| **CDZ171** | 212219991 | 1 | KY | 4 | | Ozone and Filterpack |
| **PNF126** | 370119991 | 1 | NC | 4 | | Ozone, Trace-Level Gas, and Filterpack |
| **ANA115** | 261619991 | 1 | MI | 5 | Ozone | Filterpack |
| **DCP114** | 390479991 | 1 | OH | 5 | | Ozone and Filterpack |
| **SAN189** | 311079991 | 1 | NE | 7 | Ozone | Filterpack |