Panoramic view of the CASTNET site at Abington, CT (ABT147)

2019 CASTNET Annual Network Plan

Clean Air Markets Division

Office of Atmospheric Programs

US Environmental Protection Agency

July 1, 2019

Table of Contents

List of Tables

List of Figures

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 acidic pollutants and ambient ozone (O_3) concentrations. 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 land owners, 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
• **Project Officer**
• **QA Manager**
• **Technical Monitors**
• **Administrative Contracting Officer**
• **Contract Property Coordinator**
	Wood
	• **Project Manager**
	  ○ Field Operations Manager
	  ○ Laboratory Operations Manager
	  ○ Data Management, Analysis, Interpretation, and Reporting Manager
	  ○ Property Control Manager
	• **QA Supervisor**
	  ○ QA Manager

NPS – Air Resources Division
• **Contracting Officer's Representative (COR)**
• **QA Coordinator**
	ARS
	• **Program Manager**
	  ○ Network Operations Manager
	  ○ Data Management Manager
	• **QA Officer**

BLM – Wyoming State Office
• **Program Manager**
	ARS
	• **Program Manager**
	  ○ Network Operations Manager
	  ○ Data Management Manager
	• **QA Officer**

Figure 1. CASTNET Project Organization

Ninety-four 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-three CASTNET sites collect ambient O_3 concentrations, reported as hourly averages, using a UV photometric analyzer. Eighty-two of the eighty-three CASTNET O_3 monitoring sites 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 height of 44 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, thirty-eight 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 gas monitors report hourly measurements throughout the entire year and utilize nightly one-point quality control (QC) checks for fast-response troubleshooting.

To monitor consistency between the agencies, EPA operates a collocated site (ROM206) at the NPS CASTNET site located in Rocky Mountain National Park, Colorado (ROM406). Also, EPA operates a pair of collocated O_3 monitors (MCK131 and MCK231)

[1] CASTNET monitoring program https://www3.epa.gov/castnet/docs/CASTNET-Factsheet-2018.pdf

in Mackville, KY with the collocated 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.

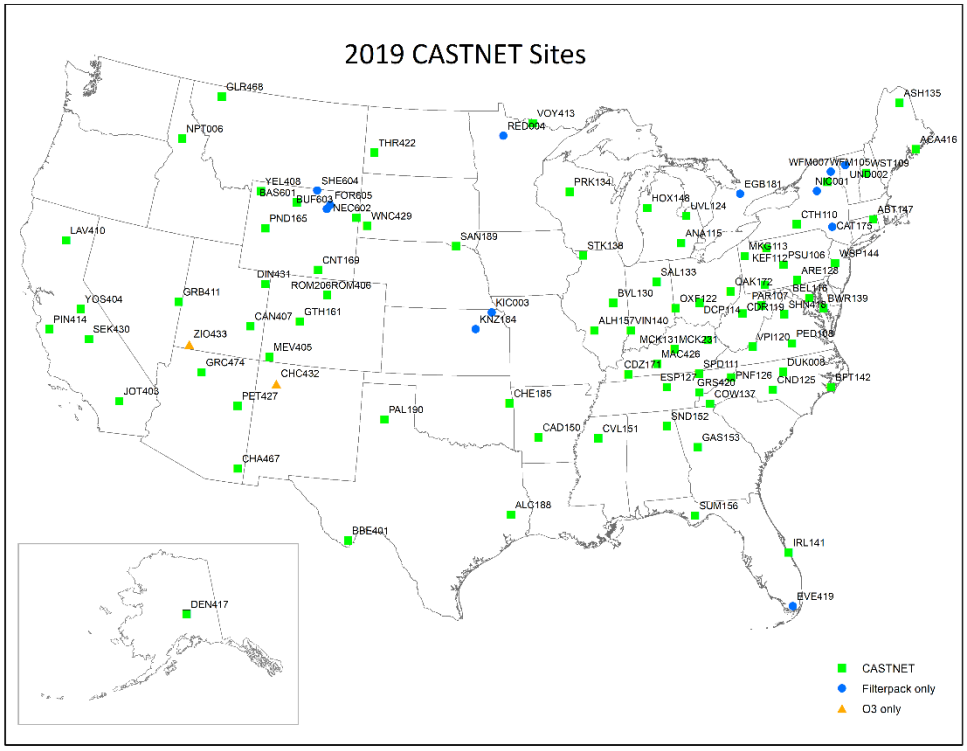


Figure 2. Active CASTNET sites in 2019 Green squares represent sites that have a 3-stage filter pack and measure ambient O_3 concentrations. Blue circles represent sites with a 3-stage filter pack, but do not measure O_3 or trace gas concentrations. Orange triangles represent sites that only measure O_3 concentrations.

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 monitors, where one analyzer has an onboard O_3-generator for use as an on-site transfer standard. The upgrade at the EPA-sponsored sites improved the overall quality of data, the reliability of the analyzers, and the comparability of the data with other regulatory monitoring networks (e.g., State and Local Air Monitoring Sites (SLAMS), National Core network (NCore)).

[2] CASTNET Quality Assurance Project Plan v9.1
https://www3.epa.gov/castnet/docs/QAPP_v9-1_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

The EPA uses CASTNET O_3 and trace 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 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. Ozone and Trace 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 hourly O_3 and trace 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 collocated 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 gas concentrations including SO_2 and CO at Bondville, IL and Mammoth Cave, KY as required by the NCore program for the entire year. CASTNET reports ambient trace gas concentrations to the CASTNET website daily.[7] Wood and ARS submit the hourly and 5-minute (SO_2 only) trace gas concentrations to the AQS database on a monthly basis and daily 1-point precision check results on a quarterly basis.

CASTNET uses the measurement quality objectives and 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 gas data validation, including requirements for frequency of measurements or audits, calibration schedules, and acceptance criteria for QC checks.

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), all of the monitors included in Appendix G of this plan meet the siting and operational criteria required in appendices A, C, D, and E of 40 CFR Part 58 as identified for each year.

---

[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

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 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 flag ambient data potentially influenced by an exceptional event, as requested by a 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, a 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 a 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) scans are performed nightly while three additional QC checks are verified during weekly (on Sundays) multi-point checks at EPA-sponsored sites as shown in Table 1. Additional checks may be run manually to troubleshoot potential issues that may arise. The criteria for the automated ZPS scans 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 (ppm)
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 Note: *NPS and BLM-WSO perform O_3 span checks at 200 ppb **EPA-sponsored CASTNET sites

CASTNET O_3 monitors are the only regulatory O_3 monitors for 17 distinct CBSAs, therefore the single point precision check was set to 60 ppb because this is the average fourth highest 8-hour daily maximum value for CASTNET O_3 monitors. As required by 40 CFR Part 58 Appendix A, results from the single point precision checks are reported to AQS quarterly.

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 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 Part 58.[11] The evaluation is made by challenging the monitor 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). 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 ±0.03 ppm or less than ±15.1%, whichever is less restrictive, to meet the acceptance criteria for CO. 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	<±0.03 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**	<±0.03 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 a FSA which includes an audit of flow, meteorological sensors, and related parameters

[11] 40 CFR Part 58 Appendix A – Quality Assurance Requirements for Monitors used in Evaluations of National Ambient Air Quality Standards. http://www.ecfr.gov/cgi-bin/text-idx?SID=43a82c5c9a954280524a1abf6a3328ca&mc=true&node=ap40.6.58_161.a&rgn=div9

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]

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	PE	September
1	ME	230039991	1	ASH135	Ashland	FSA + PE	September	PE	September
1	NH	330099991	1	WST109	Woodstock	FSA + PE	October	PE	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
2	NY	360319991	1	HWF187	Huntington Wildlife Forest	FSA + PE	September	PE	September
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	540219991	1	CDR119	Cedar Creek	PE	October	FSA + PE	November
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	212219991	1	CDZ171	Cadiz	PE	March	FSA + PE	March
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 Collocated	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	370119991	1	PNF126	Cranberry	FSA + PE	March	PE	March
4	NC	37XXXXXXX	X	DUK008	Orange	PE	November	FSA + PE	October

[12] CASTNET third-party audit document https://www.epa.gov/sites/production/files/2015-07/documents/third_party_audits.pdf

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	390479991	1	DCP114	Deer Creek	PE	April	FSA + PE	April
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	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	080699991	1	ROM206	Rocky Mtn NP QA Collocated	PE	June	FSA + PE	June
8	CO	080690007	1	ROM406	Rocky Mtn NP Primary	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	PE	September	FSA + PE	July
8	SD	460330132	3	WNC429	Wind Cave NP	PE	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	560391011	1	YEL408	Yellowstone NP	PE	June	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	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

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 FSA every other year at each CASTNET site to complement the requirements of the Technical Systems Audit (TSA) (required every three years) to ensure network-wide consistency among all sites within CASTNET. The purpose of these audits is to provide an independent assessment of the site, the performance of site 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 the 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 QAPP. During the 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 the 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 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.

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

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

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

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 and 2017. The facility TSA consists of an assessment of the staff, facilities, data and document control, and the quality control programs. 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 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 1	Distribute Network Plan to OAQPS, OAQPS list-serve, EPA Regional Offices, NACAA, AAPCA and post for public review on the CASTNET webpage
June 1	Deadline for public comments to Network Plan
June 25	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[18] and OAQPS' AMTIC Network Plan webpage.[19] There is no public comment review and response to this document. The next assessment is due July 1, 2020, 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 June 2019, the following network modifications have occurred or are planned:

- NPS added Death Valley National Park, CA (DEV412) to CASTNET on May 1, 2019 and this site will be added to the Network Plan in 2020.
- NPS discontinued real-time data retrievals from three National Parks where the respective State air agency is the primary quality assurance organization including Acadia National Park, ME (ACA416), Theodore Roosevelt National Park, ND (THR422), and Wind Cave National Park, SD (WNC429). Ozone data are now only reported by the State air agency.
- NPS plans to upgrade the ozone analyzers from the Thermo Fisher Scientific 49C model to the Thermo Fisher Scientific 49iQ model at the following sites:
    - Big Bend National Park, TX (BBE401)
    - Denali National Park, AK (DEN417)
    - Great Basin National Park, NV (GRB411)
    - Mesa Verde National Park, CO (MEV405)
    - Pinnacles National Park, CA (PIN414)
    - Sequoia National Park – Ash Mountain, CA (SEK430)
    - Yosemite National Park – Turtleback Dome, CA (YOS404)
- EPA lowered a weekly multi-point ozone QC check (level 5) from 40 to 30 ppb.
- EPA discontinued all monitoring at the Ameriflux site at Howland, ME (HOW191). This site was designated as non-regulatory.
- EPA will add a non-regulatory ozone monitor above the forest canopy at Duke Forest, NC (DUK008). Siting criteria for this site is in Appendix A. Data will not be reported to AQS.

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 83)

CASTNET O_3 and trace 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

Parameters required by Part 58.10b, but not available include:

- Traffic count (AADT)

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 Roadway	> 100 meters
CBSA Name	Fort Payne, AL Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	5/11/2018

Appendix A. Detailed Site Information (Page 3 of 83)

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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-JUN-87
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/10/2018

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 Roadway	> 100 meters
CBSA Name	Sierra Vista-Douglas, AZ Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	5/11/2018

Appendix A. Detailed Site Information (Page 5 of 83)

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 Roadway	> 100 meters
CBSA Name	Flagstaff, AZ Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	4/17/2018

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 Roadway	> 100 meters
CBSA Name	Show Low, AZ Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	4/16/2018

Appendix A. Detailed Site Information (Page 7 of 83)

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 Roadway	> 100 meters
CBSA Name	Arkadelphia, AR Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	6/16/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	9/13/2018

Appendix A. Detailed Site Information (Page 9 of 83)

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 Roadway	> 100 meters
CBSA Name	San Jose-Sunnyvale-Santa Clara, CA Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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-APR-87
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/27/2018

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 Roadway	> 100 meters
CBSA Name	Riverside-San Bernardino-Ontario, CA Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest Concentration
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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	4/5/2018

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 Roadway	25 meters
CBSA Name	Redding, CA Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	5 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	3/13/2018

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 Roadway	40 meters
CBSA Name	Visalia-Porterville, CA Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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-99
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	9/12/2018

Appendix A. Detailed Site Information (Page 13 of 83)

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/23/2018

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 Roadway	> 100 meters
CBSA Name	Fort Collins-Loveland, CO Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	> 20 meters
Distance Between Collocated	7.5 m
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	7/11/2018

AQS ID	08-069-0007
CASTNET ID	ROM206
Site Name	Rocky Mtn NP Collocated
GPS Coordinates	40.278129, -105.545635
Street Address	Rocky Mountain National Park, Estes Park, CO 80517
County	Larimer
Distance to Roadway	> 100 meters
CBSA Name	Fort Collins-Loveland, CO Metropolitan Statistical Area
Pollutant	Ozone, 3
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	> 20 meters
Distance Between Collocated	7.5 m
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	7/11/2018

Appendix A. Detailed Site Information (Page 16 of 83)

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest Concentration
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-MAY-93
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	9/19/2018

Appendix A. Detailed Site Information (Page 17 of 83)

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 Roadway	> 100 meters
CBSA Name	Willimantic, CT Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/8/2018

Appendix A. Detailed Site Information (Page 18 of 83)

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 Roadway	> 100 meters
CBSA Name	Sebastian-Vero Beach, FL Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	4/10/2018

Appendix A. Detailed Site Information (Page 19 of 83)

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	4/12/2018

Appendix A. Detailed Site Information (Page 20 of 83)

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 Roadway	> 100 meters
CBSA Name	Atlanta-Sandy Springs-Marietta, GA Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon$^{(R)}$
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	5/10/2018

Appendix A. Detailed Site Information (Page 21 of 83)

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 Roadway	
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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	27-SEP-16
Sampling Frequency	Continuous
Sampling Season	01/01 – 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon®
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	7/3/2018

Appendix A. Detailed Site Information (Page 22 of 83)

AQS ID	17-019-1001
CASTNET ID	BVL130
Site Name	Bondville
GPS Coordinates	40.051981, -88.372495
Street Address	Twp Rd 500 E., Champaign, IL
County	Champaign
Distance to Roadway	> 100 meters
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 Objective	Highest Concentration
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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/11/2018 (44201); 11/11/2018 (42101, 42401)

Appendix A. Detailed Site Information (Page 23 of 83)

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/25/2018

Appendix A. Detailed Site Information (Page 24 of 83)

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 Roadway	> 100 meters
CBSA Name	St. Louis, MO-IL Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon$^{(R)}$
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/20/2018

Appendix A. Detailed Site Information (Page 25 of 83)

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 Roadway	> 100 meters
CBSA Name	Vincennes, IN Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/19/2018

Appendix A. Detailed Site Information (Page 26 of 83)

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 Roadway	> 100 meters
CBSA Name	Wabash, IN Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/27/2018

Appendix A. Detailed Site Information (Page 27 of 83)

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 Roadway	> 100 meters
CBSA Name	Bowling Green, KY 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 Objective	Highest Concentration
Monitor Type	EPA
Instruments	Thermo 49i; Thermo 43i-TLE; Thermo 43i-TLE; Thermo 48i-TLE;
Method Code	047; 560; 560; 554
FRM or FEM	FEM; FEM; FEM; FRM
Collecting Agency	National Park Service
Reporting Agency	National Park Service
Start Date	01-AUG-97; 01-JUN-12; 01-JUN-12; 01-JAN-12
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/13/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/2/2018

Appendix A. Detailed Site Information (Page 29 of 83)

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 Roadway	> 100 meters
CBSA Name	Clarksville, TN-KY Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest Concentration & 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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	6/23/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1/2
Parameter Code	44201
NAAQS Monitoring Objective	Highest Concentration/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
Distance to Trees	> 20 meters
Distance Between Collocated	0 m
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N/Y
Frequency for 1 Pt QC	Daily
Last PE Date	8/3/2018; 8/3/2018

Appendix A. Detailed Site Information (Page 31 of 83)

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/4/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Regional Transport & Upwind Background
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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/3/2018

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 Roadway	> 100 meters
CBSA Name	Cambridge, MD Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/16/2018

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 Roadway	> 100 meters
CBSA Name	Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area
Pollutants	Ozone
Parameter Code, POC	44201, 1
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/17/2018

Appendix A. Detailed Site Information (Page 35 of 83)

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	9/12/2018

Appendix A. Detailed Site Information (Page 36 of 83)

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 Roadway	> 100 meters
CBSA Name	Ann Arbor, MI Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon$^{(R)}$
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	9/10/2018

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 Roadway	> 100 meters
CBSA Name	Cadillac, MI Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	9/13/2018

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 Roadway	> 100 meters
CBSA Name	Duluth, MN-WI Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	5 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/23/2018

Appendix A. Detailed Site Information (Page 39 of 83)

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	6/15/2018

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 Roadway	> 100 meters
CBSA Name	Kalispell, MT Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	7/6/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/26/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest Concentration
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-SEP-93
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	3/26/2018

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 Roadway	50 meters
CBSA Name	Lebanon, NH-VT Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/8/2018

Appendix A. Detailed Site Information (Page 44 of 83)

AQS ID	34-021-9991
CASTNET ID	WSP144
Site Name	Wash. Crossing
GPS Coordinates	40.312303, -74.872663
Street Address	Washington Crossing State Park, Titusville, NJ 08560
County	Mercer
Distance to Roadway	> 100 meters
CBSA Name	Trenton-Ewing, NJ Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon$^{(R)}$
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	12/1/2018

Appendix A. Detailed Site Information (Page 45 of 83)

AQS ID	35-045-0020
CASTNET ID	CHC432
Site Name	Chaco Culture National Historical Park
GPS Coordinates	36.035000, -107.904167
Street Address	
County	San Juan
Distance to Roadway	
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	General/Background and Highest Concentration
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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon®
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/6/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	9/30/2018

Appendix A. Detailed Site Information (Page 47 of 83)

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 Roadway	> 100 meters
CBSA Name	Ithaca, NY Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	9/25/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/15/2018

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 Roadway	> 100 meters
CBSA Name	Morehead City, NC Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/27/2017

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	12/7/2018

Appendix A. Detailed Site Information (Page 51 of 83)

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	12/5/2018

AQS ID	37-XXX-XXXX
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 Roadway	> 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
Distance to Trees	Inlet is 10 m above tree canopy
Distance Between Collocated	N/A
Wind Obstruction	None – Inlet is 10 m above tree canopy
Probe Material	Teflon$^{(R)}$
Changes w/in 18 months	Y, new site
Frequency for 1 Pt QC	Daily
Last PE Date	NULL

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 Roadway	> 100 meters
CBSA Name	Dickinson, ND Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon$^{(R)}$
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	6/28/2018

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 Roadway	> 100 meters
CBSA Name	Cincinnati-Middletown, OH-KY-IN Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon$^{(R)}$
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	10/28/2018

Appendix A. Detailed Site Information (Page 55 of 83)

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 Roadway	> 100 meters
CBSA Name	Washington Court House, OH Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/14/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	12/4/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Regional Transport & General/Background
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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	6/17/2018

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 Roadway	> 100 meters
CBSA Name	Gettysburg, PA Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon$^{(R)}$
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/18/2018

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 Roadway	> 100 meters
CBSA Name	State College, PA Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/22/2018

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 Roadway	> 100 meters
CBSA Name	St. Mary's, PA Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon$^{(R)}$
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/21/2018

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 Roadway	60 meters
CBSA Name	Youngstown-Warren-Boardman, OH-PA Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/20/2018

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 Roadway	> 100 meters
CBSA Name	Somerset, PA Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/10/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 3
Parameter Code	44201
NAAQS Monitoring Objective	Regional Transport & 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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Glass
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	7/16/2018

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 Roadway	> 100 meters
CBSA Name	Knoxville, TN Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	General/Background
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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/14/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	5/13/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	5/12/2018

Appendix A. Detailed Site Information (Page 67 of 83)

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest Concentration
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-OCT-90
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	4/23/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	4/26/2018

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 Roadway	> 100 meters
CBSA Name	Amarillo, TX Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	3/9/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest Concentration
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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	4/3/2018

AQS ID	49-047-1002
CASTNET ID	DIN431
Site Name	Dinosaur NM
GPS Coordinates	40.4373, -109.3046
Street Address	Dinosaur National Monument
County	Uintah
Distance to Roadway	> 100 meters
CBSA Name	Vernal, UT Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	5/17/2018

AQS ID	49-053-0130
CASTNET ID	ZIO433
Site Name	Zion National Park, Dalton's Wash
GPS Coordinates	37.1983, -113.1506
Street Address	
County	Washington
Distance to Roadway	>100 m
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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	12-JAN-2004
Sampling Frequency	Continuous
Sampling Season	01/01 – 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon®
Changes w/in 18 months	Y
Frequency for 1 Pt QC	Daily
Last PE Date	4/6/2018

AQS ID	51-071-9991
CASTNET ID	VPI120
Site Name	Horton Station
GPS Coordinates	37.329832, -80.55751
Street Address	1856 Horton Ln, Newport, VA 24128
County	Giles
Distance to Roadway	> 100 meters
CBSA Name	Blacksburg-Christiansburg-Radford, VA Metropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	7/31/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	General/Background
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
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	11/19/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JAN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	7/30/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	25 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/1/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/1/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-APR-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	9/17/2018

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 Roadway	> 100 meters
CBSA Name	Laramie, WY Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/01 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	8/30/2018

AQS ID	56-003-0002
CASTNET ID	BAS601
Site Name	Basin
GPS Coordinates	44.28, -108.0411
Street Address	Basin (WARMS Station)
County	Big Horn
Distance to Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	General/Background
Monitor Type	NON-EPA FEDERAL
Instrument	Thermo 49i
Method Code	047
FRM or FEM	FEM
Collecting Agency	Bureau of Land Management - Wyoming office
Spatial Scale	Regional Scale
Reporting Agency	Bureau of Land Management – Wyoming office
Start Date	28-NOV-12
Sampling Frequency	Continuous
Sampling Season	01/01 – 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon®
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	6/4/2018

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 Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	Highest 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-JUN-11
Sampling Frequency	Continuous
Sampling Season	01/–1 - 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon®(R)
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	7/23/2018

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 Roadway	> 100 meters
CBSA Name	Jackson, WY-ID Micropolitan Statistical Area
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	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-JUL-96
Sampling Frequency	Continuous
Sampling Season	01/01 – 12/31
Probe Height	10 meters
Distance to Trees	15 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon®
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	7/5/2018

AQS ID	56-045-0003
CASTNET ID	NEC602
Site Name	Newcastle
GPS Coordinates	43.873, -104.1919
Street Address	Newcastle, Warms Station
County	Weston
Distance to Roadway	> 100 meters
Pollutant	Ozone, 1
Parameter Code	44201
NAAQS Monitoring Objective	General/Background
Monitor Type	NON-EPA FEDERAL
Instrument	Thermo 49i
Method Code	047
FRM or FEM	FEM
Collecting Agency	Bureau of Land Management - Wyoming office
Spatial Scale	Regional Scale
Reporting Agency	Bureau of Land Management – Wyoming office
Start Date	14-NOV-12
Sampling Frequency	Continuous
Sampling Season	01/01 – 12/31
Probe Height	10 meters
Distance to Trees	> 20 meters
Distance Between Collocated	N/A
Wind Obstruction	360 degrees
Probe Material	Teflon®
Changes w/in 18 months	N
Frequency for 1 Pt QC	Daily
Last PE Date	6/7/2018

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 2) NA 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 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) < ± 5.1 ppb (>24hr-14 day) Span drift < ± 7.1 %	1 and 2) QA Handbook Volume 2 Sec. 12.3 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 (hourly values)	20.0 to 30.0° C. (Hourly avg) or per manufacturers specifications if designated to a wider temperature range	1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 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 within period of monitor operation,***	Percent difference of audit levels 3-10 < ±15.1% Audit levels 1&2 < ± 1.5 ppb difference or <± 15.1%	1 and 2) 40 CFR Part 58 App A Sec. 3.1.2 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 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 Every 182 day and 2/ calendar year if manual zero/span performed biweekly 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 2) Recommendation 3) 40 CFR Part 50 App D Sec 4.5.5.6 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 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 2 and 3) Transfer Standard Guidance EPA-454/B-10-001 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 2) Recommendation, part of reverification 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% 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 RSD of six slopes ≤3.7% 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)*** ***≤ 0.001 ppm (lower range)***	1) 40 CFR Part 53.23 (b) (definition & procedure) 2) Recommendation- info can be obtained from LDL 3) 40 CFR Part 53.20 Table B-1
Lower detectable limit	Every 365 days and 1/calendar year	***≤ 0.005 ppm (standard range)*** ***≤ 0.002 ppm (lower range)***	1) 40 CFR Part 53.23 (b) (definition & procedure) 2) Recommendation 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 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 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) 2) Recommendation 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) 2) Recommendation 3) 40 CFR Part 58 App E, Sec. Sec. 9 (a) 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 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 2) Recommendation 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 and intercept < 3 ppb	1, 2 and 3) Transfer Standard Guidance EPA-454/B-10-001 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 2) 40 CFR Part 58 App A Sec. 4 (b) 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 2) 40 CFR Part 58 App A Sec. 4 (b) 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 2) NA 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 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) < ± 0.61 ppm (>24hr-14 day) Span drift < ± 10.1 %	1 and 2) QA Handbook Volume 2 Sec. 12.3 3) Recommendation
OPERATIONAL CRITERIA-CO	**OPERATIONAL CRITERIA-CO**	**OPERATIONAL CRITERIA-CO**	**OPERATIONAL CRITERIA-CO**
Shelter Temperature range	Daily (hourly values)	20.0 to 30.0° C. (Hourly avg) or per manufacturers specifications if designated to a wider temperature range	1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 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% Audit levels 1&2 < ± 0.031 ppm difference or < ±15.1%	1 and 2) 40 CFR Part 58 App A Sec. 3.1.2 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 3) NPAP QAPP/SOP
Verification/Calibration	Upon receipt/adjustment/repair/ installation/moving Every 182 day and 2/ calendar year if manual zero/span performed biweekly 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 and 3) Recommendation See details about CO2 sensitive instruments Multi-point calibration (0 and 4 upscale points) Slope criteria is a recommendation

1) Requirement (CO)	2) Frequency	3) Acceptance Criteria	Information /Action
Gaseous Standards	All gas cylinders	**NIST Traceable** (e.g., EPA Protocol Gas)	1) 40 CFR Part 50 Appendix C Sec. 4.3.1 2) NA Green Book 3) 40 CFR Part 50 Appendix C Sec. 4.3.1 See details about CO2 sensitive instruments 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	***< 0.1 ppm CO***	1) 40 CFR Part 50 App C Sec. 4.3.2 2) Recommendation 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)*** ***≤ 0.1 ppm (lower range)***	1) 40 CFR Part 53.23 (b) (definition & procedure) 2) Recommendation- info can be obtained from LDL 3) 40 CFR Part 53.20 Table B-1
Lower detectable level	Every 365 days and 1/ calendar year	***≤ 0.4 ppm (standard range)*** ***≤ 0.2 ppm (lower range)***	1) 40 CFR Part 53.23 (c) (definition & procedure) 2) Recommendation 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) 40 CFR Part 50.8(a-2) 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 2) Recommendation 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) 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 2) 40 CFR Part 58 App A Sec. 4 (b) 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 2) NA 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 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) < ± 5.1 ppb (>24hr-14 day) Span drift < + 10.1 %	1 and 2) QA Handbook Volume 2 Sec. 12.3 3) Recommendation and related to DQO
Converter Efficiency	During multi-point calibrations, span and audit Every 14 days	***(≥96%)*** 96% – 104.1%	1) 40 CFR Part 50 App F Sec. 1.5.10 and 2.4.10 2) Recommendation 3) 40 CFR Part 50 App F Sec. 1.5.10 and 2.4.10 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 (hourly values)	20.0 to 30.0° C. (Hourly avg) or per manufacturers specifications if designated to a wider temperature range	1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 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

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% Audit levels 1&2 < ± 1.5 ppb difference or < ±15.1%	1) 40 CFR Part 58 App A Sec. 3.1.2 2) 40 CFR Part 58 App A Sec. 3.1.2 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 3) NPAP QAPP/SOP
Verification/Calibration	Upon receipt/adjustment/repair/ installation/moving Every 182 day and 2/ calendar year if manual zero/span performed biweekly Every 365 day and 1/ calendar year if continuous zero/span performed daily	Instrument residence time ≤ 2 min Dynamic parameter ≥ 2.75 ppm-min 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 Multi-point calibration (0 and 4 upscale points) Slope criteria is a recommendation
Gaseous Standards	All gas cylinders	**NIST Traceable** (e.g., EPA Protocol Gas) 50-100 ppm of NO in Nitrogen with < 1 ppm NO_2	1) 40 CFR Part 50 App F Sec. 1.3.1 2) NA Green Book 3) 40 CFR Part 50 App F Sec. 1.3.1. A technical memo may change the concentration requirement. 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 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) 2) Recommendation- info can be obtained from LDL 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) 2) Recommendation 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) 2) 40 CFR Part 50 App S Sec. 3.1(a) 3) 40 CFR Part 50 App S Sec. 3.1(b)
	1-hour standard	***1) 3consecutive calendars years of complete data 2) 4 quarters complete in each year 3) ≥75% sampling days in quarter 4) ≥ 75% of hours in a day***	1) 40 CFR Part 50 App S Sec. 3.2(b) 2) 40 CFR Part 50 App S Sec. 3.2(a) 3) 40 CFR Part 50 App S Sec. 3.2(b) 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) 2) Recommendation 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 2) Recommendation 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 2) 40 CFR Part 58 App A Sec. 4 (b) 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 2) 40 CFR Part 58 App A Sec. 4 (b) 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 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 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) < ± 5.1 ppb (>24hr-14 day) Span drift < ± 10.1 %	1 and 2) QA Handbook Volume 2 Sec. 12.3 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 (hourly values)	20.0 to 30.0° C. (Hourly avg) or per manufacturers specifications if designated to a wider temperature range	1, 2 and 3) QA Handbook Volume 2 Sec. 7.2.2 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% Audit levels 1&2 < ± 1.5 ppb difference or < ±15.1%	1 and 2) 40 CFR Part 58 App A Sec. 3.1.2 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 3) NPAP QAPP/SOP
Verification/Calibration	Upon receipt/adjustment/repair/ installation/moving Every 182 day and 2/ calendar year if manual zero/span performed biweekly 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 A-1 Sec. 4 2 and 3) Recommendation Multi-point calibration (0 and 4 upscale 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 2) NA Green Book 3) 40 CFR Part 50 App F Sec. 1.3.1 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 < 0.1 ppm aromatic hydrocarbons	1) 40 CFR Part 50 App A-1 Sec. 4.1.6.2 2) Recommendation 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 2) Recommendation 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)*** ***≤ 0.0005 ppm (lower range)***	1) 40 CFR Part 53.23 (b) (definition & procedure) 2) Recommendation- info can be obtained from LDL 3) 40 CFR Part 53.20 Table B-1
Lower detectable level	Every 365 days and 1/ calendar year	***≤ 0.002 ppm (standard range)*** ***≤ 0.001 ppm (lower range)***	1) 40 CFR Part 53.23 (c) (definition & procedure) 2) Recommendation 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 ***Day- 75% hourly Conc*** ***Quarter- 75% complete days Years- 4 complete quarters*** ***5-min value reported only for valid hours***	1, 2 and 3) 40 CFR Part 50 App T Sec. 3 (b), (c) More details in CFR on acceptable completeness. 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) 2) Recommendation 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

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 2) Recommendation 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 2) 40 CFR Part 58 App A Sec. 4 (b) 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 2) 40 CFR Part 58 App A Sec. 4 (b) 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.

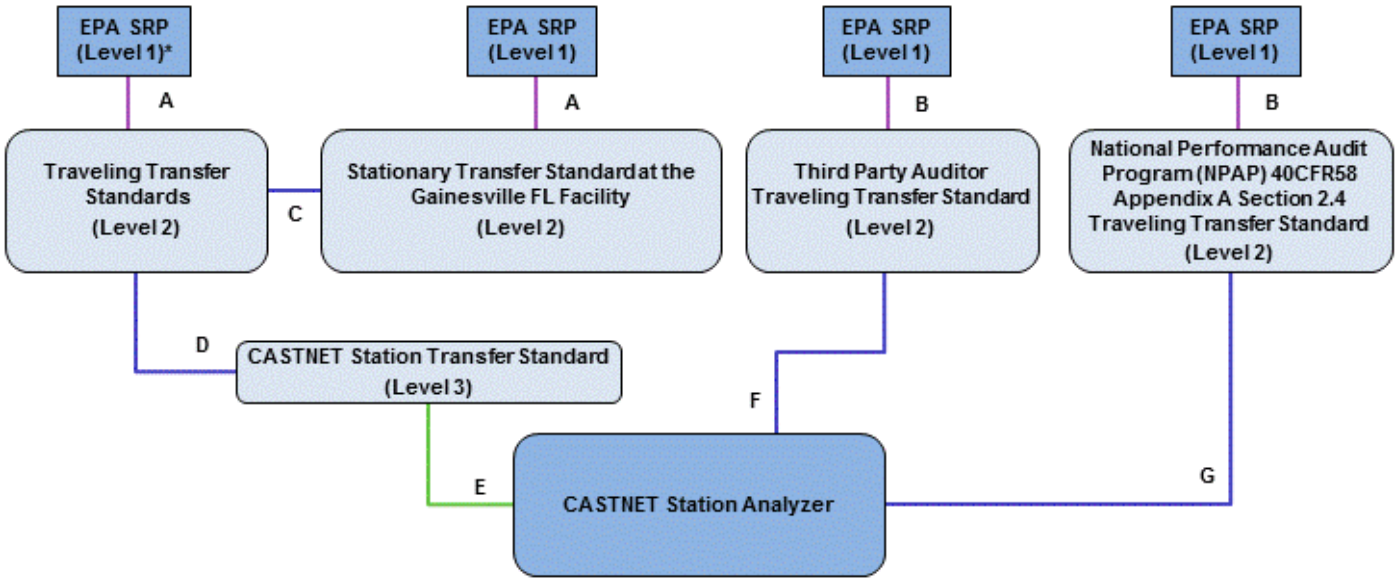
Appendix C. Ozone Season by State[1,2]

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.

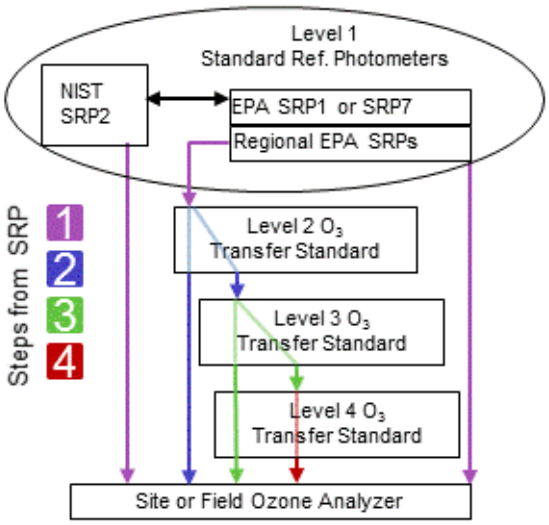
Appendix D. CASTNET QAPP Ozone Certification Flowchart



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	Judge, Robert	617-918-8387	judge.robert@epa.gov
Region 2	Ruvo, Richard A. Mustafa, Mustafa	212-637-4014 732-906-6881	ruvo.richard@epa.gov mustafa.mustafa@epa.gov
Region 3	Hyden, Loretta	215-814-2113	hyden.loretta@epa.gov
Region 4	Rinck, Todd Garver, Daniel	404-562-9062 404-562-9839	rinck.todd@epa.gov garver.daniel@epa.gov
Region 5	Hamilton, Scott	312-353-4775	hamilton.scott@epa.gov
Region 6	Sather, Mark	214-665-8353	sather.mark@epa.gov
Region 7	Davis, Michael Grooms, Leland	913-551-5042 913-551-5010	davis.michael@epa.gov grooms.leland@epa.gov
Region 8	Payton, Richard Rickard, Joshua	303-312-6439 303-312-6460	payton.richard@epa.gov rickard.joshua@epa.gov
Region 9	Biland, Larry	415-947-4132	biland.larry@epa.gov
Region 10	Hall, Christopher	206-553-0521	hall.christopher@epa.gov

Appendix F. Outline for TSA Report

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 Gas Monitors

EPA RGN	ST	AQS ID	POC	PARAM	SITE_ID	AGY	PQAO[1]	NOTES	'11[2]	'12	'13	'14	'15	'16	'17	'18	'19
1	CT	090159991	1	O3	ABT147	EPA	EPA		Y	Y	Y	Y	Y	Y	Y	Y	Y
1	ME	230039991	1	O3	ASH135	EPA	EPA		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
1	ME	230199991	1	O3	HOW132	EPA	EPA	Discontinued 10/2012	Y	Y							
1	NH	330099991	1	O3	WST109	EPA	EPA		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
2	NY	360319991	1	O3	HWF187	EPA	EPA		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
3	MD	240199991	1	O3	BWR139	EPA	EPA		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
3	PA	420019991	1	O3	ARE128	EPA	EPA		Y	Y	Y	Y	Y	Y	Y	Y	Y
3	PA	420279991	1	O3	PSU106	EPA	EPA		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
3	PA	420859991	1	O3	MKG113	EPA	EPA		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
3	VA	510719991	1	O3	VPI120	EPA	EPA		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
3	VA	511479991	1	O3	PED108	EPA	EPA		Y	Y	Y	Y	Y	Y	Y	Y	Y
3	WV	540219991	1	O3	CDR119	EPA	EPA		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
4	AL	010499991	1	O3	SND152	EPA	EPA		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
4	FL	120779991	1	O3	SUM156	EPA	EPA		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
4	KY	210610501	1	O3	MAC426	NPS	NPS		Y	Y	Y	Y	Y	Y	Y	Y	Y
4	KY	210610501	1	CO	MAC426	NPS	NPS									Y	Y
4	KY	210610501	1	SO_2 1Hr	MAC426	NPS	NPS									Y	Y
4	KY	210610501	5	SO_2 5Min	MAC426	NPS	NPS									Y	Y
4	KY	211759991	1	O3	CKT136	EPA	EPA		Y	Y	Y	Y	Y	Y	Y	Y	Y
4	KY	212219991	1	O3	CDZ171	EPA	EPA		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
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
4	NC	370119991	1	O3	PNF126	EPA	EPA		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
4	NC	371139991	1	O3	COW137	EPA	EPA		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
4	NC	37XXXXXXX	X	O3	DUK008	EPA	EPA	NAAQS-EXCLUDED									
4	TN	470090101	1	O3	GRS420	NPS	NPS		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
4	TN	470419991	1	O3	ESP127	EPA	EPA		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
5	IL	170191001	2	SO_2 1Hr	BVL130	EPA	EPA				Y	Y	Y	Y	Y	Y	Y
5	IL	170191001	3	SO_2 5Min	BVL130	EPA	EPA				Y	Y	Y	Y	Y	Y	Y
5	IL	170191001	1	CO	BVL130	EPA	EPA				Y	Y	Y	Y	Y	Y	Y
5	IL	170859991	1	O3	STK138	EPA	EPA		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
5	IN	180839991	1	O3	VIN140	EPA	EPA		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
5	MI	261579991	1	O3	UVL124	EPA	EPA		Y	Y	Y	Y	Y	Y	Y	Y	Y
5	MI	261619991	1	O3	ANA115	EPA	EPA		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
5	MN	271370034	1	O3	VOY413	NPS	NPS		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
5	OH	390479991	1	O3	DCP114	EPA	EPA		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
5	WI	551199991	1	O3	PRK134	EPA	EPA		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
6	OK	400019009	1	O3	CHE185	EPA	CN		Y	Y	Y	Y	Y	Y	Y	Y	Y
6	NM	350450020	1	O3	CHC432	NPS	NPS	New site, 2017							Y	Y	Y
6	TX	480430101	1	O3	BBE401	NPS	NPS		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
6	TX	483819991	1	O3	PAL190	EPA	EPA			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		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
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
8	CO	080830101	1	O3	MEV405	NPS	NPS		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
8	ND	380070002	1	O3	THR422	NPS	ND		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
8	UT	490370101	1	O3	CAN407	NPS	NPS		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
8	WY	560030002	1	O3	BAS601	BLM	BLM				Y	Y	Y	Y	Y	Y	Y
8	WY	560359991	1	O3	PND165	EPA	EPA		Y	Y	Y	Y	Y	Y	Y	Y	Y
8	WY	560391011	1	O3	YEL408	NPS	NPS		Y	Y	Y	Y	Y	Y	Y	Y	Y

8	WY	560450003	1	O3	NEC602	BLM	BLM				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
8	UT	490530130	1	O3	ZIO433	NPS	NPS	Existing NPS site, included w/CASTNET in 2018								Y	Y
9	AZ	040038001	1	O3	CHA467	NPS	NPS		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
9	AZ	040170119	1	O3	PET427	NPS	NPS		Y	Y	Y	Y	Y	Y	Y	Y	Y
9	CA	060430003	1	O3	YOS404	NPS	NPS		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
9	CA	060719002	1	O3	JOT403	NPS	NPS		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
9	CA	061070009	1	O3	SEK430	NPS	NPS		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
10	AK	020680003	1	O3	DEN417	NPS	NPS		Y	Y	Y	Y	Y	Y	Y	Y	Y
10	WA	530531010	1	O3	MOR409	NPS	NPS	Discontinued 11/2013	Y	Y	Y						
10	ID	160499991	1	O3	NPT006	EPA	EPA	New site, 9/2016							Y	Y	Y
								Network Ozone Sites[4]	**77**	**79**	**78**	**78**	**77**	**77**	**79**	**80**	**80**
								Network SO_2 Sites			**2**	**2**	**2**	**2**	**1**	**2**	**2**
								Network CO Sites			**1**	**1**	**1**	**1**	**1**	**2**	**2**

[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 Total Sites does not include the three NAAQS-excluded monitors used for quality assurance purposes (ROM206, MCK231, and DUK008)

Appendix H. CBSA Code and Title for CASTNET Sites

EPA RGN	AQS ID	POC	CASTNET ID	STATE	COUNTY	O_3 DV PPB[1]	CBSA[2]	POP.[3]
1	090159991	1	ABT147	CT	Windham	70	Worcester, MA-CT	930,473
1	230039991	1	ASH135	ME	Aroostook	52		
1	230090103	1	ACA416	ME	Hancock	64		
1	230199991	1	HOW132	ME	Penobscot	NA	Bangor, ME	153,414
1	330099991	1	WST109	NH	Grafton	54	Claremont-Lebanon, NH-VT	217,634
2	340219991	1	WSP144	NJ	Mercer	73	Trenton, NJ	371537
2	360319991	1	HWF187	NY	Essex	57		
2	361099991	1	CTH110	NY	Tompkins	62	Ithaca, NY	104,691
3	240199991	1	BWR139	MD	Dorchester	65	Cambridge, MD	32,578
3	240339991	1	BEL116	MD	Prince George's	69	Washington-Arlington-Alexandria, DC-VA-MD-WV	6,033,737
3	420019991	1	ARE128	PA	Adams	66	Gettysburg, PA	101,714
3	420279991	1	PSU106	PA	Centre	65	State College, PA	158,742
3	420479991	1	KEF112	PA	Elk	66	St. Mary's, PA	
3	420859991	1	MKG113	PA	Mercer	66	Youngstown-Warren-Boardman, OH-PA	553,263
3	421119991	1	LRL117	PA	Somerset	NA	Somerset, PA	76,218
3	510719991	1	VPI120	VA	Giles	62	Blacksburg-Christiansburg-Radford, VA	181,605
3	511130003	1	SHN418	VA	Madison	63		
3	511479991	1	PED108	VA	Prince Edward	58		
3	540219991	1	CDR119	WV	Gilmer	57		
3	540939991	1	PAR107	WV	Tucker	62		
4	010499991	1	SND152	AL	DeKalb	62	Fort Payne, AL	
4	120619991	1	IRL141	FL	Indian River	NA	Sebastian-Vero Beach, FL	144,755
4	120779991	1	SUM156	FL	Liberty	56		
4	132319991	1	GAS153	GA	Pike	67	Atlanta-Sandy Springs-Marietta, GA	5,614,323
4	210610501	1	MAC426	KY	Edmonson	64	Bowling Green, KY	165,732
4	211759991	1	CKT136	KY	Morgan	64		
4	212219991	1	CDZ171	KY	Trigg	61	Clarksville, TN-KY	278,353
4	212299991	1	MCK131	KY	Washington	64		
4	212299991	2	MCK231	KY	Washington	NA		
4	281619991	1	CVL151	MS	Yalobusha	55		
4	370119991	1	PNF126	NC	Avery	NA		
4	370319991	1	BFT142	NC	Carteret	NA	Morehead City, NC	68,811
4	371139991	1	COW137	NC	Macon	61		
4	371239991	1	CND125	NC	Montgomery	NA		
4	470090101	1	GRS420	TN	Blount	67	Knoxville, TN	857,585
4	470259991	1	SPD111	TN	Claiborne	62		
4	470419991	1	ESP127	TN	DeKalb	61		
5	170191001	1	BVL130	IL	Champaign	66	Champaign-Urbana, IL	237,252
5	170859991	1	STK138	IL	Jo Daviess	64		
5	171199991	1	ALH157	IL	Madison	67	St. Louis, MO-IL	2,806,207
5	180839991	1	VIN140	IN	Knox	66	Vincennes, IN	37,938
5	181699991	1	SAL133	IN	Wabash	68	Wabash, IN	32,252
5	261579991	1	UVL124	MI	Tuscola	65		
5	261619991	1	ANA115	MI	Washtenaw	69	Ann Arbor, MI	356,874

5	261659991	1	HOX148	MI	Wexford	66	Cadillac, MI	47,923
5	271370034	1	VOY413	MN	St. Louis	54	Duluth, MN-WI	280,218
5	390179991	1	OXF122	OH	Butler	69	Cincinnati-Middletown, OH-KY-IN	2,149,449
5	390479991	1	DCP114	OH	Fayette	67	Washington Court House, OH	28,800
5	391219991	1	QAK172	OH	Noble	65		
5	551199991	1	PRK134	WI	Taylor	60		
6	050199991	1	CAD150	AR	Clark	57	Arkadelphia, AR	22,576
6	350450020	1	CHC432	NM	San Juan	NA	Farmington, NM	123,785
6	400019009	1	CHE185	OK	Adair	59		
6	480430101	1	BBE401	TX	Brewster	62		
6	483739991	1	ALC188	TX	Polk	60		
6	483819991	1	PAL190	TX	Randall	65	Amarillo, TX	259,885
7	311079991	1	SAN189	NE	Knox	64		
8	080519991	1	GTH161	CO	Gunnison	65		
8	080690007	1	ROM406	CO	Larimer	68	Fort Collins-Loveland, CO	324,122
8	080690007	3	ROM206	CO	Larimer	NA	Fort Collins-Loveland, CO	324,122
8	080830101	1	MEV405	CO	Montezuma	66		
8	300298001	1	GLR468	MT	Flathead	53	Kalispell, MT	94,924
8	380070002	1	THR422	ND	Billings	60	Dickinson, ND	30,372
8	460330132	3	WNC429	SD	Custer	61	Rapid City, SD	143,638
8	490370101	1	CAN407	UT	San Juan	64		
8	490471002	1	DIN431	UT	Uintah	72	Vernal, UT	36,867
8	490530130	1	ZIO433	UT	Washington	65	St. George, UT	
8	560019991	1	CNT169	WY	Albany	64	Laramie, WY	37,811
8	560030002	1	BAS601	WY	Big Horn	NA		
8	560359991	1	PND165	WY	Sublette	63		
8	560391011	1	YEL408	WY	Teton	61	Jackson, WY-ID	33,271
8	560450003	1	NEC602	WY	Weston	61		
9	040038001	1	CHA467	AZ	Cochise	65	Sierra Vista-Douglas, AZ	127,448
9	040058001	1	GRC474	AZ	Coconino	66	Flagstaff, AZ	137,682
9	040170119	1	PET427	AZ	Navajo	63	Show Low, AZ	108,101
9	060430003	1	YOS404	CA	Mariposa	75		
9	060690003	1	PIN414	CA	San Benito	68	San Jose-Sunnyvale-Santa Clara, CA	1,952,872
9	060719002	1	JOT403	CA	San Bernardino	87	Riverside-San Bernardino-Ontario, CA	4,441,890
9	060893003	1	LAV410	CA	Shasta	64	Redding, CA	179,804
9	061070009	1	SEK430	CA	Tulare	89	Visalia-Porterville, CA	458,198
9	320330101	1	GRB411	NV	White Pine	64		
10	020680003	1	DEN417	AK	Denali	50		
10	530531010	1	MOR409	WA	Pierce	NA	Seattle-Tacoma-Bellevue, WA	3,671,478
10	160499991	1	NPT006	ID	Idaho	NA		

[1] Design values are displayed for the 2015-2017 sampling period when data completeness is sufficient. 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 Gas Monitors

2019 SUMMARY

PQAO[1]	PQAO Name	O_3 Sites	SO_2	CO
1344	Environmental Protection Agency – Clean Air Markets Division	53[2]	1	1
0745	National Park Service – Air Resources Division	23	1	1
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	83	2	2

[1] Principal Quality Assurance Organization (PQAO) as identified within the AQS AMP480 report.
[2] EPA-CAMD's site count of 53 includes three NAAQS Excluded ozone monitors: the EPA-sponsored QA monitor in Rocky Mountain National Park, CO (ROM206), the collocated QA monitor in Mackville, KY (MCK231), and the ozone monitor sited above a forest canopy in Duke Forest, NC (DUK008).