2023 – 2nd Quarter Report

Support for Conducting Systems & Performance Audits of Clean Air Status and Trends Network (CASTNET) Sites and National Atmospheric Deposition Program (NADP) Monitoring Stations - II

EPA Contract No. EP-W-18-005

Prepared for:

U. S. Environmental Protection Agency

Prepared by:

environmental engineering
& measurement services, inc.

4577E NW 6th St Ext.
Gainesville, FL 32609

Report Submitted
July 2023

Table of Contents

1.0 CASTNET Quarterly Report.....1

1.1 Introduction.....1
1.2 Project Objectives.....2
1.3 CASTNET Sites Visited Second Quarter 2023.....4
1.4 Audit Results.....5

2.0 NADP Quarterly Report.....6

2.1 Introduction.....6
2.2 Project Objectives.....6
2.3 NADP Sites Visited Second Quarter 2023.....7
2.4 Survey Results.....8

List of Appendices

Appendix A CASNTET Audit Report Forms

Appendix B CASTNET Site Spot Report Forms

List of Tables

Table 1. Performance Audit Challenge and Acceptance Criteria..... 2
Table 2. CASTNET Site Audit Visits..... 4
Table 3. NADP Site Survey Visits..... 7

List of Acronyms and Abbreviations

% diff	percent difference
A/D	analog to digital converter
ARS	Air Resource Specialists, Inc.
ASTM	American Society for Testing and Materials
BLM	Bureau of Land Management
BLM-WSO	Bureau of Land Management – Wyoming State Office
CAL	Central Analytical Laboratory
CASTNET	Clean Air Status and Trends Network
CMAQ	Community Multiscale Air Quality
DAS	data acquisition system
deg	degree
DVM	digital voltmeter
ECCC	Environment and Climate Change Canada
EEMS	Environmental, Engineering & Measurement Services, Inc.
EPA	U.S. Environmental Protection Agency
ESC	Environmental Systems Corporation
FSA	Field Systems Audit
FSAD	Field Site Audit Database
GPS	geographical positioning system
HAL	Mercury Analytical Laboratory
LADCO	Lake Michigan Air Directors Consortium
lpm	liters per minute
ME DEP	Maine Department of Environmental Protection
MD DNR	Maryland Department of Natural Resources
MLM	Multilayer Model
MN PCA	Minnesota Pollution Control Agency
m/s	meters per second
mv	millivolt
NESCAUM	Northeast States for Coordinated Air Use Management
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NYDEC	New York Department of Conservation
NYSERDA	New York State Energy Research and Development Authority
OH EPA	Ohio Environmental Protection Agency
PE	Performance Evaluation
QAPP	Quality Assurance Project Plan
SCDHEC	South Carolina Department of Health and Environmental Control
SFWMD	South Florida Water Management District
SOP	standard operating procedure
TDEP	Total Deposition
TEI	Thermo Environmental Instruments
USDA-FS	United States Department of Agriculture – Forest Service
USFS	United States Forest Service

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USNO	United States Naval Observatory
VDC	volts direct current
WDEQ	Wyoming Department of Environmental Quality
WDNR	Wisconsin Department of Natural Resources
WRR	World Radiation Reference
WSLH	Wisconsin State Laboratory of Hygiene

1.0 CASTNET Quarterly Report

1.1 Introduction

The Clean Air Status and Trends Network (CASTNET) is a national air monitoring program established in 1988 by the US EPA. Nearly all CASTNET sites measures weekly concentrations of acidic gases and particles to provide accountability for EPA's emission reduction programs. Most sites measure ground-level ozone as well as supplemental measurements such as meteorology and/or other trace gas concentrations.

Ambient concentrations are used to estimate deposition rates of the various pollutants with the objective of determining relationships between emissions, air quality, deposition, and ecological effects. In conjunction with other national monitoring networks, CASTNET data are used to determine the effectiveness of national emissions control programs and to assess temporal trends and spatial deposition patterns in atmospheric pollutants. CASTNET data are also used for long-range transport model evaluations and critical loads research.

Historically, CASTNET pollutant flux measurements have been reported as the aggregate product of weekly measured concentrations and model-estimated deposition velocities. The Multi-layer Model (MLM) was used to derive deposition velocity estimates from on-site meteorological parameters, land use types, and site characteristics. In 2011, EPA discontinued meteorological measurements at most EPA-sponsored CASTNET sites.

Currently, CASTNET pollutant flux estimates are calculated as the aggregate product of weekly measured chemical concentrations and gridded model-estimated deposition velocities. Total deposition is assessed using the NADP's Total Deposition Hybrid Method (TDEP; EPA, 2015c; Schwede and Lear, 2014), which combines data from established ambient monitoring networks and chemical-transport models. To estimate dry deposition, ambient measurement data from CASTNET and other networks were merged with dry deposition rates and flux output from the Community Multiscale Air Quality (CMAQ) modeling system.

Since 2011 nearly all CASTNET ozone monitors have adhered to the requirements for State or Local Air Monitoring Stations (SLAMS) as specified by the EPA in 40 CFR Part 58. As such, the ozone data collected must meet the requirements in 40 CFR Part 58 Appendix A, which defines the quality assurance (QA) requirements for gaseous pollutant ambient air monitoring. The audits performed by EEMS under this contract fulfilled the requirement for annual performance evaluation audits of pollutant monitors in the network. The QA requirements can be found at:
https://www.epa.gov/amtic/regulations-guidance-and-monitoring-plans

Currently 81 CASTNET sites at 79 distinct locations measure ground-level ozone concentrations. Annual performance evaluation (PE), ozone audit data are submitted to the Air Quality System (AQS) database.

As of July 2023, the network is comprised of 87 active rural sampling sites across the United States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Bureau of Land Management – Wyoming State Office (BLM-WSO) and several independent partners. WSP (formally Wood Environment and Infrastructure Solutions) is responsible for operating the EPA sponsored sites, and Air Resource Specialists, Inc. (ARS) is responsible for operating the NPS and BLM-WSO sponsored sites

1.2 Project Objectives

The objectives of this project are to establish an independent and unbiased program of performance and systems audits for all CASTNET sampling sites. Ongoing Quality Assurance (QA) programs are an essential part of any long-term monitoring network.

Performance audits verify that all reported variables are consistent with the accuracy goals as defined in the CASTNET Quality Assurance Project Plan (QAPP). The parameter specific accuracy goals are presented in Table 1.

Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	Accuracy	2 introductions of known amounts of water	≤ ±10.0% of input amount
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	≤ ±10.0% RH
Solar Radiation	Accuracy	Compared to WRR traceable standard	≤ ±10.0% of daytime average
Surface Wetness	Response	Distilled water spray mist	Positive response
Surface Wetness	Sensitivity	1% decade resistance	N/A
Temperature	Accuracy	Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)	≤ ± 0.5° C
Temperature Difference	Accuracy	Comparison to station temperature sensor	≤ ± 0.50° C

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Shelter Temperature	Accuracy	Comparison to station temperature sensor	≤ ± 2.0° C
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	≤ ±5° from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	≤ ±5° mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	≤ ±0.5 mps below 5.0 mps input; ≤ ±5.0% of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	≤ ± 5.0% of designated rate
Ozone	Slope	Linear regression of multi-point test gas concentration as measured with a certified transfer standard	0.9000 ≤ m ≤ 1.1000
Ozone	Intercept		-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient		0.9950 ≤ r
Ozone	Percent Difference	Comparison with Level 2 standard concentration	≤ ±15.1% of test gas concentration and ≤ ± 0.0015 ppm actual difference
DAS	Accuracy	Comparison with certified standard	≤ ± 0.003 VDC

Performance audits are conducted using standards that are traceable to the National Institute of Standards and Technology (NIST), or another authoritative organization, at least annually.

Field site systems audits (FSA) are intended to provide a qualitative appraisal of the total measurement system. Site planning, organization, and operation are evaluated to ensure that good Quality Assurance/Quality Control (QA/QC) practices are being applied. At a minimum the following audit issues were addressed at each site systems audit:

- Site locations and configurations match those provided in the CASTNET QAPP.
- Meteorological instruments are in good physical and operational condition and are sited to meet EPA ambient monitoring guidelines (EPA-600/4-82-060).
- Sites are accessible, orderly, and if applicable, compliant with OSHA safety standards.
- Sampling lines are free of leaks, kinks, visible contamination, weathering, and moisture.
- Site shelters provide adequate temperature control.

- All ambient air quality instruments are functional, being operated in the appropriate range, and the zero-air supply desiccant is unsaturated.
- All instruments are in current calibration.
- Site documentation (maintenance schedules, on-site SOPs, etc.) is current and log book records are complete.
- All maintenance and on-site SOPs are performed on schedule.
- Corrective actions are documented and appropriate for required maintenance/repair activity.
- Site operators demonstrate an adequate knowledge and ability to perform required site activities, including documentation and maintenance activities.

1.3 CASTNET Sites Visited Second Quarter 2023

This report consists of the systems and performance, and other audit results from the CASTNET sites visited during the second quarter (April through June) of 2023. The site locations, sponsor, visit dates, and parameters audited, are included in Table 2.

Table 2. CASTNET Site Audit Visits

Site ID	Date	FSA	O3 PE	NOy	FLOW	Sponsor
PRK134	4/2/2023	1	1		1	EPA
GAS153	4/25/2023		1			EPA
BWR139	5/11/2023	1	1		1	EPA
PND165	5/15/2023			1		BLM-WSO
GRT434	5/16/2023		1			NPS
YEL408	5/16/2023	1	1		1	NPS
WSP144	5/17/2023	1	1		1	EPA
CRM435	5/18/2023		1			NPS
NEC602	5/24/2023	1	1		1	BLM-WSO
ARE128	6/12/2023		1			EPA
KEF112	6/13/2023		1			EPA
MKG113	6/14/2023		1			EPA
LRL117	6/15/2023		1			EPA
SEK430	6/20/2023	1	1		1	NPS
ZIO433	6/25/2023	1	1			NPS
ACA416	6/30/2023	1			1	NPS

1.4 Audit Results

The observations and results of the systems, performance, and Ozone PE audits are included in Appendix A, *CASTNET Audit Report Forms* by site, arranged by audit date. Photographs of site conditions are included within each system report where necessary. Copies of the spot reports that were sent following the audit of each site are included as Appendix B, *CASTNET Site Spot Report Forms*.

Results of the PE audits of the gaseous pollutant monitors other than ozone, were submitted immediately following the PE and are not included in this report. All TTP PE results of gaseous pollutant monitors are uploaded to AQS and are available there. All audit data and reports are available from the EPA CASTNET website: https://java.epa.gov/castnet/reportPage.do

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates two precipitation chemistry networks and two atmospheric concentration networks. The National Trends Network (NTN) has been measuring acidic precipitation since 1978. The network currently has more than 250 sites. The precipitation event-based Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992, and as of July 2019 is no longer in operation. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from approximately 90 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

The NADP and other long-term monitoring networks provide critical information to the EPA regarding evaluating the effectiveness of emission reduction control programs from the power industry. The networks of the NADP are sponsored by several federal, state, and local agencies as well as private organizations.

The NADP Program Office (PO) operates and administers the two precipitation chemistry networks (NTN and MDN), two atmospheric concentration networks (AMNet and AMoN), and two analytical laboratories (CAL and HAL), from the Wisconsin State Lab of Hygiene (WSLH) at the University of Wisconsin in Madison. The labs have been combined and renamed as the NADP Analytical Laboratory (NAL). The network equipment depot (NED) is also located at the WSLH.

2.2 Project Objectives

The objective of this project is to perform independent and unbiased evaluations of the sites and their operation. These evaluations provide quality assurance pertaining to siting, sample collection and handling, equipment operation and maintenance, record keeping and field laboratory procedures.

More specifically, the surveys determine and report findings based on an established methodology consisting of completing a site questionnaire, testing the equipment and documenting with photographs the location, siting criteria, existing equipment, and any issues encountered that require such documentation.

2.3 NADP Sites Visited Second Quarter 2023

This report presents the NADP sites surveyed during the first quarter (April through June) of 2023. The station locations, sponsors, network. and dates of the surveys are presented in Table 3.

Table 3. NADP Site Survey Visits

Site ID	Date	NTN	MDN	AMoN	Site Sponsor	Site Name
WI35	4/2/2023			1	Wood - EPA	Perkinstown
BC24	4/3/2023	1			Prince Rupert Port Authority	Port Edward
IL78	4/4/2023	1			USGS	Monmouth
BC23	4/4/2023	1			Rio Tinto	Lakelse Lake
BC22	4/4/2023	1			Rio Tinto	Haul Road Station
KS97	4/5/2023	1		1	Wood - EPA	Kickapoo Tribe-Powhattan
AB14	4/6/2023		1		Intrinsik Corp	Genesee
GA41	4/25/2023			1	Wood - EPA	Georgia Station
MN01	5/8/2023	1			Minnesota Pollution Control Agency	Cedar Creek
MD15	5/8/2023	1			NOAA	Smith Island
MN27	5/9/2023	1	1		Minnesota Pollution Control Agency	Lamberton
MD18	5/9/2023	1			Maryland Department of Natural Resources	Assateague Island National Seashore-Woodcock
MD13	5/10/2023	1			University of Maryland	Wye
MD06	5/11/2023			1	Wood - EPA	Blackwater NWR
NJ00	5/12/2023	1			U.S. Fish and Wildlife Service	Edwin B. Forsythe National Wildlife Refuge
NJ39	5/15/2023	1			Wood - EPA	Cattus Island County Park
WY06	5/15/2023			1	Wood - EPA	Pinedale

Site ID	Date	NTN	MDN	AMoN	Site Sponsor	Site Name
WY94	5/15/2023			1	NPS	Grand Tetons National Park
MD08	5/16/2023	1	1	1	Maryland Department of Natural Resources	Piney Reservoir
NJ99	5/17/2023	1		1	Wood - EPA	Washington Crossing
WY08	5/17/2023	1	1		Wyoming Department of Environmental Quality / NPS	Yellowstone National Park-Tower Falls
FL41	6/1/2023	1			USGS	Verna Well Field
PA00	6/12/2023			1	Wood -EPA	Arendtsville
PA29	6/13/2023			1	Wood - EPA	Kane Experimental Forest
PA72	6/13/2023	1			USDA - Forest Service	Milford
PA56	6/14/2023			1	Wood - EPA	M. K. Goddard
PA97	6/15/2023			1	Wood - EPA	Laurel Hil
ME02	6/26/2023	1	1		Maine Department of Environmental Protection	Bridgton
ME08	6/27/2023	1			USGS	Gilead
ME04	6/28/2023	1	1		Penobscot Indian Nation / Wood - EPA	Carrabassett Valley
ME09	6/29/2023	1	1		Maine Department of Environmental Protection	Greenville Station

2.4 Survey Results

Site survey results are entered into a relational database. The database in turn generates Site Spot Reports which are distributed among the interested parties as soon as all the site data has been entered. Database tables with all the data collected and reviewed are then sent to the NADP Program Office and to the U.S. EPA Project Officers.

Other items gathered during the surveys (i.e., photographs, Belfort charts, etc.) are uploaded to the EPA OneDrive account where the NADP PO and the U.S. EPA POs can access them and download them as needed.

Given the volume of data generated, and the fact that data is distributed and/or is available via the internet, no survey results are included in this report.

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PRK134-Eric Hebert-04/02/2023						
1	4/2/2023	Computer	Dell	07021	Inspiron 15	2884848822
2	4/2/2023	DAS	Campbell	000411	CR3000	2509
3	4/2/2023	Elevation	Elevation	None	1	None
4	4/2/2023	Filter pack flow pump	Thomas	04918	107CAB18	060300019989
5	4/2/2023	Flow Rate	Apex	000656	AXMC105LPMDPCV	illegible
6	4/2/2023	Infrastructure	Infrastructure	none	none	none
7	4/2/2023	Modem	Digi	07198	LR54	unknown
8	4/2/2023	Ozone	ThermoElectron Inc	000693	49i A1NAA	1030244806
9	4/2/2023	Ozone Standard	ThermoElectron Inc	000373	49i A3NAA	0726124685
10	4/2/2023	Sample Tower	Aluma Tower	000930	B	AT214072-Z-7-2
11	4/2/2023	Shelter Temperature	Campbell	none	107-L	unknown
12	4/2/2023	Siting Criteria	Siting Criteria	None	1	None
13	4/2/2023	Temperature	RM Young	06306	41342VC	12545
14	4/2/2023	Zero air pump	Werther International	06905	C 70/4	000821907

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2509	PRK134	Eric Hebert	04/02/2023	DAS	Primary

Das Date: 4 /2 /2023
Das Time: 10:35:00
Das Day: 92

Audit Date 4 /2 /2023
Audit Time 10:35:00
Audit Day 92

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0006	0.0003	0.0006

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0002	0.0000	V	V	0.0002
7	0.1000	0.0997	0.0994	V	V	-0.0003
7	0.3000	0.2995	0.2991	V	V	-0.0004
7	0.5000	0.5000	0.5006	V	V	0.0006
7	0.7000	0.6993	0.6990	V	V	-0.0003
7	0.9000	0.8990	0.8990	V	V	0.0000
7	1.0000	0.9990	0.9991	V	V	0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	PRK134	Eric Hebert	04/02/2023	Flow Rate	000656

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/23/2023	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
0.00%	0.00%			**Cal Factor Full Scale**	0.97
				Rotometer Reading:	1.55

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	test pt 1	1.500	1.500	1.54	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.502	1.500	1.55	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.502	1.500	1.55	0.000	1.50	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	40 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244806	PRK134	Eric Hebert	04/02/2023	Ozone	000693

Slope:	0.99343	**Slope:**	0.00000
Intercept	-0.84444	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00066	**Intercept**	0.29985
Cert Date	11/1/2022	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.39	0.08	-0.71	ppb		-0.79
primary	2	14.88	14.52	13.63	ppb		-0.89
primary	3	37.13	36.69	35.39	ppb	-3.61	
primary	4	67.68	67.14	65.97	ppb	-1.76	
primary	5	110.37	109.67	108.10	ppb	-1.44	

Sensor Component	Condition	Status
Audit Pressure	713.2 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further t	True	pass
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.000	pass
Span	1.008	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	100.0 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	692.1 mmHg	pass
Cell A Tmp.	31.8 C	pass
Cell B Freq.	99.7 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	691.5 mmHg	pass
Nafion dryer installed	False	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12545	PRK134	Eric Hebert	04/02/2023	Temperature	06306

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00945	**Intercept**	0.16485
Cert Date	2/17/2023	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.19	0.40		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.23	0.06	0.000	0.2	C	0.14
primary	Temp Mid Range	17.76	17.43	0.000	17.4	C	-0.03
primary	Temp Mid Range	33.05	32.58	0.000	33.0	C	0.4

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	PRK134	Eric Hebert	04/02/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.28	0.54		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00945	Intercept	0.16485
Cert Date	2/17/2023	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.93	23.54	0.000	23.5	C	-0.02
primary	Temp Mid Range	25.27	24.87	0.000	24.3	C	-0.54

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition	20 m	Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
PRK134	Eric Hebert	04/02/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-11)	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Glass bottle and filter	pass
Power Cables	Good	pass
Shelter Temp Control	Functioning	pass
Rotometer	Installed	pass
Sample Tower	Good	pass
Shelter Condition	Good	pass
Shelter Door	Fair	pass
Shelter Roof	Good	pass
Shelter Floor	Fair	pass
Shelter walls	Good	pass
Excessive mold present	Good	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

Clover and Barley have been planted for hay within 20m of the site starting in 2008.

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PRK134	**Technician**	Eric Hebert	**Site Visit Date**	04/02/2023

Site Sponsor (agency)	EPA	**USGS Map**	Perkinstown
Operating Group	Private	**Map Scale**	
AQS #	55-119-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, PM2.5	**QAPP Latitude**	45.2066
Deposition Measurement	dry, wet	**QAPP Longitude**	-90.5972
Land Use	woodland - mixed	**QAPP Elevation Meters**	472
Terrain	gently rolling	**QAPP Declination**	1.6
Conforms to MLM	Yes	**QAPP Declination Date**	2/22/2006
Site Telephone		**Audit Latitude**	45.206525
Site Address 1	W 10776 CTH M	**Audit Longitude**	-90.597209
Site Address 2		**Audit Elevation**	462
County	Taylor	**Audit Declination**	-1.3
City, State	Medford, WI		
Zip Code	54451		
Time Zone	Central		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

	Present		
Fire Extinguisher	☑	new in 2015	
First Aid Kit	☑		
Safety Glasses	☑		
Safety Hard Hat	☑		
Climbing Belt	☐		
Security Fence	☐		
Secure Shelter	☑		
Stable Entry Steps	☑		

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2116-11)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is clean, neat, and well organized.				
Site OK	☑	**Notes**					

Driving Directions

From Medford continue north on 13 approximately 4.5 miles and turn left (west) onto county route M. Continue approximately 13 miles. Before reaching Perkinstown, and just after crossing a small creek and two sharp curves, the site will be visible behind the landowners house on the right.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	04/02/2023

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	Mounted to sample tower
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	04/02/2023

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	04/02/2023

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID PRK134 **Technician** Eric Hebert **Site Visit Date** 04/02/2023

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐

11 Tower comments?

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	04/02/2023

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☑	☐	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☑	☐	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☑	☐	☐	Shelter air conditioner	☑	☐	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	May 2019	☑
HASP	☑	May 2019	☑
Field Ops Manual	☑	May 2019	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	04/02/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	N/A	☑
Visual Inspections	☑	N/A	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	N/A	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	As needed	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	As needed	☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	Logbook, call-in

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	04/02/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID PRK134 **Technician** Eric Hebert **Site Visit Date** 04/02/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	2884848822	07021
DAS	Campbell	CR3000	2509	000411
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300019989	04918
Flow Rate	Apex	AXMC105LPMDPC	illegible	000656
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07198
Ozone	ThermoElectron Inc	49i A1NAA	1030244806	000693
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124685	000373
Sample Tower	Aluma Tower	B	AT214072-Z-7-2	000930
Shelter Temperature	Campbell	107-L	unknown	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	12545	06306
Zero air pump	Werther International	C 70/4	000821907	06905

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GAS153-Eric Hebert-04/25/2023						
1	4/25/2023	DAS	Campbell	000635	CR3000	4934
2	4/25/2023	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
3	4/25/2023	Ozone Standard	ThermoElectron Inc	000215	49i A3NAA	0622717856
4	4/25/2023	Zero air pump	Werther International	06865	C 70/4	000814277

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244793	GAS153	Eric Hebert	04/25/2023	Ozone	000700

Slope:	0.99137	Slope:	0.00000
Intercept	-0.49234	Intercept	0.00000
CorrCoff	0.99999	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	0.99730	Intercept	0.29920
Cert Date	4/25/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Diff	A Max % Di
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.53	0.23	0.06	ppb		-0.17
primary	2	14.88	14.61	13.81	ppb		-0.8
primary	3	34.15	33.93	32.98	ppb	-2.84	
primary	4	67.85	67.72	66.53	ppb	-1.77	
primary	5	117.27	117.27	115.90	ppb	-1.18	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	714.7 mmHg	Status	pass
Sensor Component	26.6 degree unobstructed rule	Condition	True	Status	pass
Sensor Component	Tree dewline >10m or below inlet	Condition	True	Status	pass
Sensor Component	ADT 1000-10000 vehicles further	Condition	True	Status	pass
Sensor Component	ADT <1000 vehicles further than	Condition	True	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Moderately clean	Status	pass
Sensor Component	Offset	Condition	-0.70	Status	pass
Sensor Component	Span	Condition	1.032	Status	pass
Sensor Component	Zero Voltage	Condition	N/A	Status	pass
Sensor Component	Fullscale Voltage	Condition	N/A	Status	pass
Sensor Component	Cell A Freq.	Condition	93.9 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	2.2 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.71 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	713.9 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	36.2 C	Status	pass
Sensor Component	Cell B Freq.	Condition	90.5 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.7 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.72 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	713.3 mmHg	Status	pass
Sensor Component	Nafion dryer installed	Condition	True	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BWR139-Martin Valvur-05/11/2023						
1	5/11/2023	Computer	Dell	07009	Inspiron 15	Unknown
2	5/11/2023	DAS	Campbell	000431	CR3000	2536
3	5/11/2023	Elevation	Elevation	None	1	None
4	5/11/2023	Flow Rate	Apex	000662	AXMC105LPMDPCV	illegible
5	5/11/2023	Infrastructure	Infrastructure	none	none	none
6	5/11/2023	Modem	Digi	07186	LR54	Illegible
7	5/11/2023	Ozone	ThermoElectron Inc	000729	49i A1NAA	1105347323
8	5/11/2023	Ozone Standard	ThermoElectron Inc	000697	49i A3NAA	1030244814
9	5/11/2023	Sample Tower	Aluma Tower	missing	B	none
10	5/11/2023	Shelter Temperature	Campbell	none	107-L	none
11	5/11/2023	Siting Criteria	Siting Criteria	None	1	None
12	5/11/2023	Temperature	RM Young	04315	41342	4012
13	5/11/2023	Zero air pump	Werther International	06877	C 70/4	000815258
14	5/11/2023	Zero air pump	Thomas	04985	107CA18	040400022190

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2536	BWR139	Martin Valvur	05/11/2023	DAS	Primary

Das Date: 5 /11/2023
Das Time: 09:10:00
Das Day: 131

Audit Date 5 /11/2023
Audit Time 09:10:00
Audit Day 131

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0001	0.0000	0.0001

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	-0.0002	V	V	-0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4995	0.4995	V	V	0.0000
7	0.7000	0.6994	0.6994	V	V	0.0000
7	0.9000	0.8992	0.8992	V	V	0.0000
7	1.0000	0.9991	0.9991	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	BWR139	Martin Valvur	05/11/2023	Flow Rate	000662

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/23/2023	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Diff**	**A Max % Di**	**Cal Factor Zero**	0
0.45%	0.67%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	test pt 1	1.490	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.490	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
primary	test pt 3	1.500	1.500	1.51	0.000	1.50	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347323	BWR139	Martin Valvur	05/11/2023	Ozone	000729

Slope:	0.99917	Slope:	0.00000
Intercept	-0.51299	Intercept	0.00000
CorrCoff	0.99997	CorrCoff	0.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Diff	A Max % Di
0.0%	0.0%		

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	0.99730	Intercept	0.29920
Cert Date	4/25/2023	CorrCoff	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.42	0.12	-0.06	ppb		-0.18
primary	2	17.50	17.24	16.78	ppb		-0.46
primary	3	35.94	35.73	34.86	ppb	-2.46	
primary	4	67.76	67.63	66.66	ppb	-1.44	
primary	5	114.69	114.68	114.40	ppb	-0.24	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	771 mmHg	Status	pass
Sensor Component	26.6 degree unobstructed rule	Condition	True	Status	pass
Sensor Component	Tree dewline >10m or below inlet	Condition	True	Status	pass
Sensor Component	ADT 1000-10000 vehicles further	Condition	True	Status	pass
Sensor Component	ADT <1000 vehicles further than	Condition	True	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Moderately clean	Status	pass
Sensor Component	Offset	Condition	-0.4	Status	pass
Sensor Component	Span	Condition	1.023	Status	pass
Sensor Component	Zero Voltage	Condition	N/A	Status	pass
Sensor Component	Fullscale Voltage	Condition	N/A	Status	pass
Sensor Component	Cell A Freq.	Condition	94.4 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.71 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	727.1 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	33.7 C	Status	pass
Sensor Component	Cell B Freq.	Condition	91.9 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	1.0 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.70 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	726.3 mmHg	Status	pass
Sensor Component	Nafion dryer installed	Condition	True	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4012	BWR139	Martin Valvur	05/11/2023	Temperature	04315

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.01172	**Intercept**	0.08161
Cert Date	2/17/2023	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.14	0.32		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.20	0.12	0.000	0.4	C	0.32
primary	Temp Mid Range	24.30	23.94	0.000	23.9	C	-0.03
primary	Temp High Range	47.40	46.77	0.000	46.7	C	-0.07

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	BWR139	Martin Valvur	05/11/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.94	2.21		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.01172	Intercept	0.08161
Cert Date	2/17/2023	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.40	24.04	0.000	26.3	C	2.21
primary	Temp Mid Range	25.00	24.63	0.000	26.5	C	1.89
primary	Temp Mid Range	25.20	24.83	0.000	26.5	C	1.71

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition	10 m	Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
BWR139	Martin Valvur	05/11/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Glass bottle and filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was not available during the audit visit. Data are reported from site documentation.

2 **Parameter:** SiteOpsProcedures

The ozone sample train is leak checked every two weeks following the inlet filter change.

3 **Parameter:** SitingCriteriaCom

Very light agriculture activities near site, not harvested, just to provide food for wildlife.

4 **Parameter:** ShelterCleanNotes

The shelter has been repaired since the previous site audit visit.

5 **Parameter:** PollAnalyzerCom

Ozone sample train has inline dryer.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BWR139	**Technician**	Martin Valvur	**Site Visit Date**	05/11/2023

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	BNWR/private	**Map Scale**	
AQS #	24-019-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	woodlands - mixed, wetlands	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	38.444971
Site Address 1	Blackwater Nat Wildlife Refuge	**Audit Longitude**	-76.111274
Site Address 2	2145 Key Wallace Dr.	**Audit Elevation**	1
County	Dorchester	**Audit Declination**	-11.2
City, State	Cambridge, MD		
Zip Code	21613	**Fire Extinguisher** ☐	
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter has been repaired since the previous site audit visit.				
Site OK	☑	**Notes**					

Driving Directions

From I95 take route 50 east to Cambridge, MD. At mile marker 81 turn right on Woods Rd. Continue approximately 1 mile to the stop sign, turn right onto SR 16 west. Continue approximately 1.7 miles, past the school, and turn left onto Egypt Road. Continue approximately 7.1 miles to the stop sign. Turn right onto Key Wallace Drive towards the visitors center. Continue approximately 0.8 mile to the gate on the left. The site will be visible.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	BWR139	Technician	Martin Valvur	Site Visit Date	05/11/2023

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	BWR139	Technician	Martin Valvur	Site Visit Date	05/11/2023

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	Moderately clean
4	Are the aspirated motors working?	☑	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	BWR139	Technician	Martin Valvur	Site Visit Date	05/11/2023

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Ozone sample train has inline dryer.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID BWR139 **Technician** Martin Valvur **Site Visit Date** 05/11/2023

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Temperature only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?	Met tower removed	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	BWR139	Technician	Martin Valvur	Site Visit Date	05/11/2023

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☑	☐	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☐	☑	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☑	☐
Solar radiation translator	☐	☐	☑	UPS	☐	☑	☐
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☐	☑	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☑	☐	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑		☑
HASP	☑	March 2015	☐
Field Ops Manual	☑	March 2015	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	BWR139	Technician	Martin Valvur	Site Visit Date	05/11/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	N/A	☑
Visual Inspections	☑	N/A	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	N/A	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☐	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, logbook, call-in

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The ozone sample train is leak checked every two weeks following the inlet filter change.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	BWR139	Technician	Martin Valvur	Site Visit Date	05/11/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator was not available during the audit visit. Data are reported from site documentation.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID BWR139 **Technician** Martin Valvur **Site Visit Date** 05/11/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07009
DAS	Campbell	CR3000	2536	000431
Elevation	Elevation	1	None	None
Flow Rate	Apex	AXMC105LPMDPC	illegible	000662
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07186
Ozone	ThermoElectron Inc	49i A1NAA	1105347323	000729
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244814	000697
Sample Tower	Aluma Tower	B	none	missing
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4012	04315
Zero air pump	Thomas	107CA18	040400022190	04985
Zero air pump	Werther International	C 70/4	000815258	06877

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRT434-Tim Mendenhall-05/16/2023						
1	5/16/2023	DAS	Environmental Sys Corp	none	8832	A3743K
2	5/16/2023	Ozone	ThermoElectron Inc	none	49i A3NAA	903334536
3	5/16/2023	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1023943899
4	5/16/2023	Zero air pump	Werther International	none	PC70/4	585590

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	903334536	GRT434	Tim Mendenhall	05/16/2023	Ozone	none

Slope:	1.04853	**Slope:**	0.00000
Intercept	0.07176	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00426	**Intercept**	0.20413
Cert Date	10/31/2022	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.02	-0.21	-0.03	ppb		0.18
primary	2	15.01	14.66	15.39	ppb		0.73
primary	3	35.13	34.58	36.26	ppb	4.74	
primary	4	65.40	64.56	67.71	ppb	4.76	
primary	5	114.40	113.08	118.70	ppb	4.85	

Sensor Component	Condition	Status
Audit Pressure	604 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further t	True	pass
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.000	pass
Span	1.000	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	104 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	Not tested	pass
Cell A Pressure	588.9 mmHg	pass
Cell A Tmp.	33.3 C	pass
Cell B Freq.	80.1 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	Not tested	pass
Cell B Pressure	588.0 mmHg	pass
Nafion dryer installed	False	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
YEL408-Tim Mendenhall-05/16/2023						
1	5/16/2023	DAS	Environmental Sys Corp	None	8832	A4888K
2	5/16/2023	Elevation	Elevation	None	1	None
3	5/16/2023	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Illgeible
4	5/16/2023	Infrastructure	Infrastructure	none	none	none
5	5/16/2023	Met tower	Climatronics	01362	14 inch taper	illegible
6	5/16/2023	Ozone	ThermoElectron Inc	none	49i A3NAA	1172090002
7	5/16/2023	Ozone Standard	ThermoElectron Inc	none	49i A1NAB	0926938297
8	5/16/2023	Sample Tower	Aluma Tower	illegible	B	none
9	5/16/2023	Shelter Temperature	ARS	none	none	none
10	5/16/2023	Siting Criteria	Siting Criteria	None	1	None
11	5/16/2023	Temperature2meter	RM Young	none	41342VC	029239
12	5/16/2023	Zero air pump	Werther International	none	PC 70/4	000836215

DAS Data Form

DAS Time Max Error: 2

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A4888K	YEL408	Tim Mendenhall	05/16/2023	DAS	Primary

Das Date: 5 /16/2023
Das Time: 14:04:00
Das Day: 136

Audit Date 5 /16/2023
Audit Time 14:06:00
Audit Day 136

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0004	0.0009	0.0004	0.0009

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
16	0.0000	-0.0002	-0.0004	V	V	-0.0002
16	0.1000	0.0999	0.0996	V	V	-0.0003
16	0.3000	0.2999	0.2998	V	V	-0.0001
16	0.5000	0.4996	0.4993	V	V	-0.0003
16	0.7000	0.7000	0.7002	V	V	0.0002
16	0.9000	0.8999	0.8994	V	V	-0.0005
16	1.0000	0.9999	1.0008	V	V	0.0009

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	Illgeible	YEL408	Tim Mendenhall	05/16/2023	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	152253	**Tfer Desc.**	BIOS 220-H
Tfer ID	15225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	5/2/2022	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
0.90%	1.01%			**Cal Factor Full Scale**	0
				Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.02	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.03	0.000	0.00	l/m	l/m	
primary	test pt 1	2.979	2.980	2.97	0.000	3.00	l/m	l/m	0.67%
primary	test pt 2	2.972	2.970	2.98	0.000	3.00	l/m	l/m	1.01%
primary	test pt 3	2.970	2.970	2.98	0.000	3.00	l/m	l/m	1.01%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.6 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1172090002	YEL408	Tim Mendenhall	05/16/2023	Ozone	none

Slope:	0.97086	Slope:	0.00000
Intercept	0.29844	Intercept	0.00000
CorrCoff:	1.00000	CorrCoff:	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	49CPS-70008-364	Tfer Desc.	Ozone primary stan
Tfer ID	01110		
Slope	1.00426	Intercept	0.20413
Cert Date	10/31/2022	CorrCoff	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Dif	A Avg %Diff	A Max % Dif
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.06	-0.14	0.17	ppb		0.31
primary	2	17.80	17.42	17.23	ppb		-0.19
primary	3	37.94	37.36	36.50	ppb	-2.33	
primary	4	67.92	67.05	65.45	ppb	-2.42	
primary	5	115.78	114.45	111.40	ppb	-2.7	

Sensor Component	Condition	Status
Audit Pressure	576 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further t	True	pass
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	Not tested	pass
Span	Not tested	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	116.4 kHz	pass
Cell A Noise	1.4 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	556.1 mmHg	pass
Cell A Tmp.	33.1 C	pass
Cell B Freq.	70.1 kHz	pass
Cell B Noise	2.2 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	556.4 mmHg	pass
Nafion dryer installed	False	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	029239	YEL408	Tim Mendenhall	05/16/2023	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00002	Intercept	-0.00336
Cert Date	1/23/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.31	0.4		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.10	0.10	0.000	-0.12	C	-0.22
primary	Temp Mid Range	13.40	13.40	0.000	13.80	C	0.4
primary	Temp High Rang	40.00	40.00	0.000	40.30	C	0.3

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	YEL408	Tim Mendenhall	05/16/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.30	0.30		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00002	Intercept	-0.00336
Cert Date	1/23/2023	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.40	27.40	0.000	27.7	C	0.3
primary	Temp Mid Range	28.10	28.10	0.000	28.4	C	0.3
primary	Temp Mid Range	25.50	25.50	0.000	25.8	C	0.3

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
YEL408	Tim Mendenhall	05/16/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2880-1)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was not able to be present during the site audit visit. Audit data are based on site documentation.

2 **Parameter:** DasComments

The shelter heat and air conditioner run simultaneously.

3 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the system is leak tested every two weeks.

4 **Parameter:** SitingCriteriaCom

The site is located at the edge of a tree line. Trees as tall as 8 meters are near the sample inlet. Trees taller than 10 meters are 15 meters from the inlet.

5 **Parameter:** ShelterCleanNotes

The shelter is organized and well maintained.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	YEL408	**Technician**	Tim Mendenhall	**Site Visit Date**	05/16/2023

Site Sponsor (agency)	NPS	**USGS Map**	Lake
Operating Group	NPS	**Map Scale**	
AQS #	56-039-1011	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	44.5597
Deposition Measurement	dry	**QAPP Longitude**	-110.4006
Land Use	woodland - evergreen	**QAPP Elevation Meters**	2400
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(307) 242-2410	**Audit Latitude**	44.565356
Site Address 1	Lake Ranger Station	**Audit Longitude**	-110.400338
Site Address 2	route 14	**Audit Elevation**	2430
County	Teton	**Audit Declination**	11.9
City, State	Yellowstone National Park, WY		**Present**
Zip Code	82190	**Fire Extinguisher**	☑ New in 2017
Time Zone	Mountain	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☑
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Steps**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2880-1)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is organized and well maintained.				
Site OK	☑	**Notes**					

Driving Directions From Jackson take route 191 / 89 north to Yellowstone National Park. At Thumb Junction take 14 east around Yellowstone Lake. Turn left just past the Lake Area (and hotel) into the park residence and office compound. Continue through the compound past the housing area. The site is up the hill through the gate to the water supply tank for the compound.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	YEL408	Technician	Tim Mendenhall	Site Visit Date	05/16/2023

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	YEL408	Technician	Tim Mendenhall	Site Visit Date	05/16/2023

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	
2	Are all the meteorological sensors operational online, and reporting data?	☑	
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	YEL408	Technician	Tim Mendenhall	Site Visit Date	05/16/2023

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☐	10 to 15 meters from trees

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 9 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID YEL408 **Technician** Tim Mendenhall **Site Visit Date** 05/16/2023

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☐	Shelter not grounded
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?		

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The shelter heat and air conditioner run simultaneously.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	YEL408	Technician	Tim Mendenhall	Site Visit Date	05/16/2023

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☑	☐	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☐	☑	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☑	☐
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☐	☑	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☑	☐	☐
Filter pack MFC power supply	☐	☑	☐				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	July 2016	☑
HASP	☑	July 2016	☑
Field Ops Manual	☑	July 2016	☑
Calibration Reports	☑		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	YEL408	Technician	Tim Mendenhall	Site Visit Date	05/16/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained by ARS on site
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	N/A	☑
Visual Inspections	☑	N/A	☑
Translator Zero/Span Tests (climatronics)	☑	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	N/A	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Monthly and semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑		☐
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☐		☐
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	Dataview

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The ozone inlet filter is replaced and the system is leak tested every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	YEL408	Technician	Tim Mendenhall	Site Visit Date	05/16/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	Dataview, SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☐	
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☐		☐
Sample Line Check for Dirt/Water	☐		☐

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator was not able to be present during the site audit visit. Audit data are based on site documentation.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID YEL408 **Technician** Tim Mendenhall **Site Visit Date** 05/16/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8832	A4888K	None
Elevation	Elevation	1	None	None
Flow Rate	Alicat	MC-10SLPM-D-PCV	Illgeible	none
Infrastructure	Infrastructure	none	none	none
Met tower	Climatronics	14 inch taper	illegible	01362
Ozone	ThermoElectron Inc	49i A3NAA	1172090002	none
Ozone Standard	ThermoElectron Inc	49i A1NAB	0926938297	none
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	029239	none
Zero air pump	Werther International	PC 70/4	000836215	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
WSP144-Martin Valvur-05/17/2023						
1	5/17/2023	Computer	Dell	07016	Inspiron 15	DK2MC12
2	5/17/2023	DAS	Campbell	000430	CR3000	2525
3	5/17/2023	Elevation	Elevation	None	1	None
4	5/17/2023	Filter pack flow pump	Thomas	06021	107CAB18B	060400022648
5	5/17/2023	Flow Rate	Apex	000872	AXMC105LPMDPCV	illegible
6	5/17/2023	Infrastructure	Infrastructure	none	none	none
7	5/17/2023	Modem	Digi	07196	LR54	unknown
8	5/17/2023	Ozone	ThermoElectron Inc	000745	49i A1NAA	1105347310
9	5/17/2023	Ozone Standard	ThermoElectron Inc	000464	49i A3NAA	0622717858
10	5/17/2023	Sample Tower	Aluma Tower	000126	B	none
11	5/17/2023	Shelter Temperature	Campbell	none	107-L	none
12	5/17/2023	Siting Criteria	Siting Criteria	None	1	None
13	5/17/2023	Temperature	RM Young	06387	41342VC	13960
14	5/17/2023	Zero air pump	Werther International	06880	C 70/4	000814273

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2525	WSP144	Martin Valvur	05/17/2023	DAS	Primary

Das Date: 5 /17/2023
Das Time: 11:43:00
Das Day: 137

Audit Date 5 /17/2023
Audit Time 11:43:00
Audit Day 137

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4995	0.4995	V	V	0.0000
7	0.7000	0.6994	0.6994	V	V	0.0000
7	0.9000	0.8992	0.8992	V	V	0.0000
7	1.0000	0.9991	0.9991	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	WSP144	Martin Valvur	05/17/2023	Flow Rate	000872

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/23/2023	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Diff**	**A Max % Di**	**Cal Factor Zero**	0.01
0.89%	1.33%			**Cal Factor Full Scale**	1.01
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.490	1.490	1.46	0.000	1.48	l/m	l/m	-0.67%
primary	test pt 2	1.490	1.490	1.47	0.000	1.48	l/m	l/m	-0.67%
primary	test pt 3	1.500	1.500	1.46	0.000	1.48	l/m	l/m	-1.33%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	225 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347310	WSP144	Martin Valvur	05/17/2023	Ozone	000745

Slope:	0.99788	Slope:	0.00000
Intercept	-0.03847	Intercept	0.00000
CorrCoff	1.00000	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	0.99730	Intercept	0.29920
Cert Date	4/25/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Diff	A Max % Di
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.39	0.09	0.18	ppb		0.09
primary	2	17.34	17.08	16.96	ppb		-0.12
primary	3	35.04	34.83	34.65	ppb	-0.52	
primary	4	66.81	66.68	66.40	ppb	-0.42	
primary	5	116.00	116.00	115.80	ppb	-0.17	

Sensor Component	Condition	Status
Audit Pressure	758.5 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further	True	pass
ADT <1000 vehicles further than	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.000	pass
Span	1.028	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	90.3 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	731.8 mmHg	pass
Cell A Tmp.	34.3 C	pass
Cell B Freq.	99.7 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	731.2 mmHg	pass
Nafion dryer installed	False	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	13960	WSP144	Martin Valvur	05/17/2023	Temperature	06387

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.01172	**Intercept**	0.08161
Cert Date	2/17/2023	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.16	0.21		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary		0.30	0.22	0.000	0.1	C	-0.17
primary		24.00	23.64	0.000	23.5	C	-0.1
primary		48.40	47.76	0.000	48.0	C	0.21

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	WSP144	Martin Valvur	05/17/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.27	0.57		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.01172	Intercept	0.08161
Cert Date	2/17/2023	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.90	24.53	0.000	24.6	C	0.07
primary	Temp Mid Range	25.10	24.73	0.000	24.9	C	0.17
primary	Temp Mid Range	25.00	24.63	0.000	25.2	C	0.57

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition	20 km	Status	Fail
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Infrastructure Data For

Site ID	WSP144	Technician	Martin Valvur	Site Visit Date	05/17/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Glass bottle and filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	WSP144	**Technician**	Martin Valvur	**Site Visit Date**	05/17/2023

Site Sponsor (agency)	EPA	**USGS Map**	Pennington
Operating Group	NJDEP / WCRC	**Map Scale**	
AQS #	34-021-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, PM2.5, PM10	**QAPP Longitude**	
Land Use	woodland, urban agriculture	**QAPP Elevation Meters**	
Terrain	rolling	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	40.312303
Site Address 1	WCRC-FA	**Audit Longitude**	-74.872663
Site Address 2	Church Rd.	**Audit Elevation**	59
County	Mercer	**Audit Declination**	-12.5
City, State	Titusville, NJ		
Zip Code	08560	**Fire Extinguisher** ☑	dated 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☑	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of wear.				
Site OK	☑	**Notes**					

Driving Directions

From Philadelphia take I-95 north. Cross the Delaware River into New Jersey and take the first exit, route 29 north, just over the bridge. Continue approximately 4 miles through the traffic light at the intersection of 546 and through the park. Turn right onto Church road at the traffic light. Continue approximately 0.5 miles to the gate for the WCRC-FA on the right. The combination to the lock is 1903. Continue through the gate up the gravel road to the top of the hill and turn right along the edge of the field. Follow the gravel road to the site in the chain-link fenced area.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	WSP144	Technician	Martin Valvur	Site Visit Date	05/17/2023

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	WSP144	Technician	Martin Valvur	Site Visit Date	05/17/2023

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	WSP144	Technician	Martin Valvur	Site Visit Date	05/17/2023

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID WSP144 **Technician** Martin Valvur **Site Visit Date** 05/17/2023

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Temperature only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?	Met tower removed	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	WSP144	Technician	Martin Valvur	Site Visit Date	05/17/2023

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☑	☐	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☑	☐	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☑	☐
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☐	☑	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☑	☐	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2011	☑
HASP	☑	Oct 2011	☑
Field Ops Manual	☑		☑
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	WSP144	Technician	Martin Valvur	Site Visit Date	05/17/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	trained by previous operator
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	N/A	☑
Visual Inspections	☑	N/A	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	N/A	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, logbook, call-in

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	WSP144	Technician	Martin Valvur	Site Visit Date	05/17/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☑	Weekly	☑
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID WSP144 **Technician** Martin Valvur **Site Visit Date** 05/17/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	DK2MC12	07016
DAS	Campbell	CR3000	2525	000430
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	060400022648	06021
Flow Rate	Apex	AXMC105LPMDPC	illegible	000872
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07196
Ozone	ThermoElectron Inc	49i A1NAA	1105347310	000745
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717858	000464
Sample Tower	Aluma Tower	B	none	000126
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	13960	06387
Zero air pump	Werther International	C 70/4	000814273	06880

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CRM435-Tim Mendenhall-05/18/2023						
1	5/18/2023	DAS	Environmental Sys Corp	none	8816	3504
2	5/18/2023	Ozone	ThermoElectron Inc	none	49i A3NCA	1201477662
3	5/18/2023	Ozone Standard	ThermoElectron Inc	90605	49C	49C-62025-333
4	5/18/2023	Zero air pump	Werther International	none	C 70/4	000847661

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1201477662	CRM435	Tim Mendenhall	05/18/2023	Ozone	none

Slope:	0.98376	**Slope:**	0.00000
Intercept	0.12098	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00426	**Intercept**	0.20413
Cert Date	10/31/2022	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.13	-0.07	-0.04	ppb		0.03
primary	2	15.54	15.18	15.13	ppb		-0.05
primary	3	34.88	34.33	33.98	ppb	-1.02	
primary	4	65.08	64.24	63.24	ppb	-1.57	
primary	5	113.30	111.99	110.30	ppb	-1.52	

Sensor Component	Condition	Status
Audit Pressure	618.5 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further t	False	Fail
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.4	pass
Span	0.998	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	112.2 kHz	pass
Cell A Noise	4.1 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	603.7 mmHg	pass
Cell A Tmp.	Not tested	pass
Cell B Freq.	65.3 kHz	pass
Cell B Noise	1.6 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	604.0 mmHg	pass
Nafion dryer installed	False	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
NEC602-Tim Mendenhall-05/24/2023						
1	5/24/2023	DAS	Campbell	none	CR1000	47758
2	5/24/2023	elevation	Elevation	none	none	none
3	5/24/2023	Filter pack flow pump	Thomas	none	107CAB18	051400047325
4	5/24/2023	Flow Rate	Omega	none	FMA6518ST-RS232	394013
5	5/24/2023	Infrastructure	Infrastructure	none	none	none
6	5/24/2023	MFC power supply	Sceptre	none	FMA65PWC	295106-8
7	5/24/2023	Ozone	ThermoElectron Inc	none	49i A1NAA	1214552974
8	5/24/2023	Ozone Standard	ThermoElectron Inc	L0534683	49i E3CAA	1214552972
9	5/24/2023	Sample Tower	Unknown	none	Unknown	None
10	5/24/2023	Shelter Temperature	ARS	none	Thermocouple	none
11	5/24/2023	siting criteria	Siting Criteria	none	none	None
12	5/24/2023	Temperature2meter	Campbell	none	unknown	missing
13	5/24/2023	Zero air pump	Thomas	none	107CAB18	082000067914

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Omega	394013	NEC602	Tim Mendenhall	05/24/2023	Flow Rate	none

Mfg	Sceptre	
SN/Owner ID	295106-8	none
Parameter:	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	152253	**Tfer Desc.**	BIOS 220-H
Tfer ID	15225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	5/2/2022	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
2.74%	3.09%			

Cal Factor Zero	0
Cal Factor Full Scale	0
Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.18	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.22	0.000	0.00	l/m	l/m	
primary	test pt 1	2.910	2.910	0.00	0.000	3.00	l/m	l/m	3.09%
primary	test pt 2	2.920	2.920	0.00	0.000	2.99	l/m	l/m	2.40%
primary	test pt 3	2.920	2.920	0.00	0.000	3.00	l/m	l/m	2.74%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Rotometer Condition	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-0.75 cm	**Status**	Fail
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1214552974	NEC602	Tim Mendenhall	05/24/2023	Ozone	none

Slope:	0.98158	**Slope:**	0.00000
Intercept	-0.42016	**Intercept**	0.00000
CorrCoff:	0.99994	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00426	**Intercept**	0.20413
Cert Date	10/31/2022	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.12	-0.08	0.13	ppb		0.21
primary	2	14.36	14.01	13.16	ppb		-0.85
primary	3	34.26	33.72	32.22	ppb	-4.55	
primary	4	63.45	62.63	60.69	ppb	-3.15	
primary	5	112.42	111.12	109.02	ppb	-1.91	

Sensor Component	Condition	Status
Audit Pressure	641 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further t	True	pass
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.1	pass
Span	1.041	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	93.5 kHz	pass
Cell A Noise	8.2 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	627.4 mmHg	pass
Cell A Tmp.	33.4 C	pass
Cell B Freq.	81.9 kHz	pass
Cell B Noise	8.4 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	628.0 mmHg	pass
Nafion dryer installed	False	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	missing	NEC602	Tim Mendenhall	05/24/2023	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00002	Intercept	-0.00336
Cert Date	1/23/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.11	0.13		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.28	0.28	0.000	0.15	C	-0.13
primary	Temp Mid Range	19.52	19.52	0.000	19.64	C	0.12
primary	Temp High Rang	37.58	37.58	0.000	37.67	C	0.09

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	NEC602	Tim Mendenhall	05/24/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.18	0.30		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00002	Intercept	-0.00336
Cert Date	1/23/2023	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.26	24.26	0.000	24.4	C	0.1
primary	Temp Mid Range	25.02	25.02	0.000	24.9	C	-0.13
primary	Temp Mid Range	24.43	24.43	0.000	24.7	C	0.3

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition	< 10 km	Status	Fail
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition	2 km	Status	Fail
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition	< 10 km	Status	Fail
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
NEC602	Tim Mendenhall	05/24/2023

Shelter Make	Shelter Model	Shelter Size
Shelter One	AR 263648	24 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Other	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Not installed	Status	Fail
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	1/4 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator does not use gloves to handle the filter pack. Sample line leak checks are not being performed. The sample is changed on Wednesdays and not Tuesdays as described in the QAPP.

2 **Parameter:** DasComments

The dry deposition tower is visibly bent.

3 **Parameter:** SiteOpsProcedures

The site operator is new and has not yet received formal training from ARS. The site operator would benefit from training. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

4 **Parameter:** DocumentationCo

The site operator is new and site documentation (QAPP and SOP) have not been provided.

5 **Parameter:** SitingCriteriaCom

The site is located approximately 2 km northeast of Newcastle WY which has a population of approximately 3500. There is an oil refinery in Newcastle. A heavily traveled road is approximately 100m west of the site.

6 **Parameter:** ShelterCleanNotes

The shelter houses the ozone, DAS, and MFC only.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	NEC602	**Technician**	Tim Mendenhall	**Site Visit Date**	05/24/2023

Site Sponsor (agency)	BLM-WSO	**USGS Map**	
Operating Group	BLM	**Map Scale**	
AQS #	560450003	**Map Date**	
Meteorological Type	Met One		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry and wet	**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	43.8731
Site Address 1		**Audit Longitude**	-104.192009
Site Address 2		**Audit Elevation**	1469
County	Weston	**Audit Declination**	8.2
City, State	Newcastle, WY		**Present**
Zip Code	82701	**Fire Extinguisher**	☐
Time Zone	Mountain	**First Aid Kit**	☐
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Steps**	☑

Shelter Working Room	☐	**Make**	Shelter One	**Model**	AR 263648	**Shelter Size**	24 cuft
Shelter Clean	☐	**Notes**	The shelter houses the ozone, DAS, and MFC only.				
Site OK	☐	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	NEC602	Technician	Tim Mendenhall	Site Visit Date	05/24/2023

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	NEC602	Technician	Tim Mendenhall	Site Visit Date	05/24/2023

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	NEC602	Technician	Tim Mendenhall	Site Visit Date	05/24/2023

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 10 meters
4	Describe dry dep sample tube.		1/4 Nylon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☐	Not present

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID NEC602 **Technician** Tim Mendenhall **Site Visit Date** 05/24/2023

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☐	Not present
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?	sample tower bent	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The dry deposition tower is visibly bent.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	NEC602	Technician	Tim Mendenhall	Site Visit Date	05/24/2023

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☑	☐	Data logger	☐	☑	☐
Wind direction sensor	☐	☑	☐	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☑	☐	Computer	☐	☐	☑
Solar radiation sensor	☐	☑	☐	Modem	☐	☐	☑
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☐	☑
Tipping bucket rain gauge	☐	☑	☐	Lightning protection device	☐	☐	☑
Ozone analyzer	☐	☑	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☐	☑	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☐	Not present	☐
SSRF	☑		☑
Site Ops Manual	☐	Not present	☐
HASP	☐	Not present	☐
Field Ops Manual	☐	Not present	☐
Calibration Reports	☐	Not present	☐
Ozone z/s/p Control Charts	☐	Not present	☐
Preventive maintenance schedule	☐	Not present	☐

1	Is the station log properly completed during every site visit?	☐	No logbook
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator is new and site documentation (QAPP and SOP) have not been provided.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	NEC602	Technician	Tim Mendenhall	Site Visit Date	05/24/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	no formal training received
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☐	visits on Wednesday
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☐	leak check not performed
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☐	would benefit from training

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☐	Not performed	☐
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☐	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☐
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☐		☐
In-line Filter Replacement (at inlet)	☑	Every 2 months	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☐	Unknown

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator is new and has not yet received formal training from ARS. The site operator would benefit from training. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID NEC602 **Technician** Tim Mendenhall **Site Visit Date** 05/24/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☐	Filter changed mid-day on Wednesday
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☐	
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☐	Not performed	☐
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☐	Not present	☐
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator does not use gloves to handle the filter pack. Sample line leak checks are not being performed. The sample is changed on Wednesdays and not Tuesdays as described in the QAPP.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID NEC602 **Technician** Tim Mendenhall **Site Visit Date** 05/24/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	47758	none
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18	051400047325	none
Flow Rate	Omega	FMA6518ST-RS232	394013	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Sceptre	FMA65PWC	295106-8	none
Ozone	ThermoElectron Inc	49i A1NAA	1214552974	none
Ozone Standard	ThermoElectron Inc	49i E3CAA	1214552972	L0534683
Sample Tower	Unknown	Unknown	None	none
Shelter Temperature	ARS	Thermocouple	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	unknown	missing	none
Zero air pump	Thomas	107CAB18	082000067914	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ARE128-Tim Mendenhall-06/12/2023						
1	6/12/2023	DAS	Campbell	000400	CR3000	2524
2	6/12/2023	Ozone	ThermoElectron Inc	000618	49i A1NAA	1009241789
3	6/12/2023	Ozone Standard	ThermoElectron Inc	000433	49i A3NAA	CM08200009
4	6/12/2023	Zero air pump	Werther International	06866	PC70/4	000815262

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241789	ARE128	Tim Mendenhall	06/12/2023	Ozone	000618

Slope:	1.00558	Slope:	0.00000
Intercept	-0.58735	Intercept	0.00000
CorrCoff	0.99994	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	0.99730	Intercept	0.29920
Cert Date	4/25/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Diff	A Max % Di
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.30	0.00	-0.94	ppb		-0.94
primary	2	14.55	14.28	13.50	ppb		-0.78
primary	3	33.17	32.95	33.32	ppb	1.12	
primary	4	63.92	63.78	63.67	ppb	-0.17	
primary	5	108.77	108.75	108.50	ppb	-0.23	

Sensor Component	Condition	Status
Audit Pressure	737.7 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further	True	pass
ADT <1000 vehicles further than	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Moderately clean	pass
Offset	-0.30	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	86.2 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	706.3 mmHg	pass
Cell A Tmp.	37.0 C	pass
Cell B Freq.	89.6 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	707.2 mmHg	pass
Nafion dryer installed	False	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
KEF112-Tim Mendenhall-06/13/2023						
1	6/13/2023	DAS	Campbell	000414	CR3000	2537
2	6/13/2023	Ozone	ThermoElectron Inc	000682	49i A1NAA	1030244796
3	6/13/2023	Ozone Standard	ThermoElectron Inc	000432	49i A3NAA	CM08200008
4	6/13/2023	Zero air pump	Werther International	06932	C 70/4	000829174

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244796	KEF112	Tim Mendenhall	06/13/2023	Ozone	000682

Slope:	0.96624	Slope:	0.00000
Intercept	0.83467	Intercept	0.00000
CorrCoff	0.99998	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	0.99730	Intercept	0.29920
Cert Date	4/25/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Diff	A Max % Di
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.43	0.13	0.54	ppb		0.41
primary	2	14.89	14.62	15.16	ppb		0.54
primary	3	34.70	34.49	34.54	ppb	0.14	
primary	4	66.52	66.39	64.94	ppb	-2.21	
primary	5	113.42	113.41	110.30	ppb	-2.78	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	707.7 mmHg	Status	pass
Sensor Component	26.6 degree unobstructed rule	Condition	True	Status	pass
Sensor Component	Tree dewline >10m or below inlet	Condition	True	Status	pass
Sensor Component	ADT 1000-10000 vehicles further	Condition	True	Status	pass
Sensor Component	ADT <1000 vehicles further than	Condition	True	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Offset	Condition	0.30	Status	pass
Sensor Component	Span	Condition	1.010	Status	pass
Sensor Component	Zero Voltage	Condition	N/A	Status	pass
Sensor Component	Fullscale Voltage	Condition	N/A	Status	pass
Sensor Component	Cell A Freq.	Condition	89.2 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.9 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.58 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	660.0 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	38.4 C	Status	pass
Sensor Component	Cell B Freq.	Condition	101.7 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.70 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	660.6 mmHg	Status	pass
Sensor Component	Nafion dryer installed	Condition	True	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MKG113-Tim Mendenhall-06/14/2023					
1 6/14/2023	DAS	Campbell	000404	CR3000	2521
2 6/14/2023	Ozone	ThermoElectron Inc	000741	49i A1NAA	1105347316
3 6/14/2023	Ozone Standard	ThermoElectron Inc	000370	49i A3NAA	0726124689
4 6/14/2023	Zero air pump	Werther International	06899	C 70/4	000821902

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347316	MKG113	Tim Mendenhall	06/14/2023	Ozone	000741

Slope:	0.98805	Slope:	0.00000
Intercept	-1.05740	Intercept	0.00000
CorrCoff	0.99999	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	0.99730	Intercept	0.29920
Cert Date	4/25/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Diff	A Max % Di
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.41	0.11	-0.74	ppb		-0.85
primary	2	14.62	14.35	13.03	ppb		-1.32
primary	3	33.68	33.46	31.82	ppb	-5.02	
primary	4	64.87	64.73	62.89	ppb	-2.88	
primary	5	107.69	107.67	105.40	ppb	-2.13	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	732.9 mmHg	Status	pass
Sensor Component	26.6 degree unobstructed rule	Condition	True	Status	pass
Sensor Component	Tree dewline >10m or below inlet	Condition	True	Status	pass
Sensor Component	ADT 1000-10000 vehicles further	Condition	True	Status	pass
Sensor Component	ADT <1000 vehicles further than	Condition	True	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Offset	Condition	-0.10	Status	pass
Sensor Component	Span	Condition	1.004	Status	pass
Sensor Component	Zero Voltage	Condition	N/A	Status	pass
Sensor Component	Fullscale Voltage	Condition	N/A	Status	pass
Sensor Component	Cell A Freq.	Condition	85.6 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	3.1 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.69 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	684.7 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	36.2 C	Status	pass
Sensor Component	Cell B Freq.	Condition	99.3 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	2.2 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.74 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	685.3 mmHg	Status	pass
Sensor Component	Nafion dryer installed	Condition	True	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
LRL117-Tim Mendenhall-06/15/2023						
1	6/15/2023	DAS	Campbell	000344	CR300	2123
2	6/15/2023	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808
3	6/15/2023	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020
4	6/15/2023	Zero air pump	Werther International	06904	C 70/4	000821901

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244808	LRL117	Tim Mendenhall	06/15/2023	Ozone	000701

Slope:	0.98793	Slope:	0.00000
Intercept	-0.64757	Intercept	0.00000
CorrCoff	0.99999	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	0.99730	Intercept	0.29920
Cert Date	4/25/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Diff	A Max % Di
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.49	0.19	-0.47	ppb		-0.66
primary	2	14.54	14.27	13.54	ppb		-0.73
primary	3	33.55	33.33	32.08	ppb	-3.82	
primary	4	64.34	64.20	62.95	ppb	-1.97	
primary	5	109.44	109.42	107.40	ppb	-1.86	

Sensor Component	Condition	Status
Audit Pressure	716 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further	True	pass
ADT <1000 vehicles further than	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.10	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	93.1 kHz	pass
Cell A Noise	4.7 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	684.4 mmHg	pass
Cell A Tmp.	35.5 C	pass
Cell B Freq.	90.3 kHz	pass
Cell B Noise	2.2 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	685.0 mmHg	pass
Nafion dryer installed	False	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SEK430-Martin Valvur-06/20/2023						
1	6/20/2023	Computer	Hewlett Packard	none	ProBook	illegible
2	6/20/2023	DAS	Environmental Sys Corp	90649	8816	2562
3	6/20/2023	Elevation	Elevation	None	1	None
4	6/20/2023	Filter pack flow pump	Thomas	none	107CAB18	120000014367
5	6/20/2023	flow rate	Tylan	03384	FC280AV	AW9403014
6	6/20/2023	Infrastructure	Infrastructure	none	none	none
7	6/20/2023	Met tower	Aluma Tower	none	B	none
8	6/20/2023	MFC power supply	Tylan	03679	RO-32	FP9403015
9	6/20/2023	Ozone	ThermoElectron Inc	none	49i A3NCA	1200666538
10	6/20/2023	Ozone Standard	ThermoElectron Inc	90752	49C	49C-74532-376
11	6/20/2023	Shelter Temperature	ARS	none	none	none
12	6/20/2023	Shield (2 meter)	RM Young	none	Aspirated 43408	none
13	6/20/2023	Siting Criteria	Siting Criteria	None	1	None
14	6/20/2023	Temperature Translator	RM Young	00819	41406-X	063143
15	6/20/2023	Temperature2meter	RM Young	none	41342	8472
16	6/20/2023	Zero air pump	Altec	none	CDA/0	092000484

DAS Data Form

DAS Time Max Error: 1.92

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2562	SEK430	Martin Valvur	06/20/2023	DAS	Primary

Das Date: 6 /20/2023
Das Time: 07:06:55
Das Day: 171

Audit Date 6 /20/2023
Audit Time 07:05:00
Audit Day 171

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0002	0.0001	0.0002

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0002	0.0000	V	V	0.0002
7	0.1000	0.1000	0.0999	V	V	-0.0001
7	0.3000	0.2997	0.2999	V	V	0.0002
7	0.5000	0.4998	0.4999	V	V	0.0001
7	0.7000	0.6998	0.6996	V	V	-0.0002
7	0.9000	0.9002	0.9000	V	V	-0.0002
7	1.0000	1.0003	1.0003	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403014	SEK430	Martin Valvur	06/20/2023	flow rate	03384

Mfg	Tylan	
SN/Owner ID	FP9403015	03679
Parameter:	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	152253	**Tfer Desc.**	BIOS 220-H
Tfer ID	15225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	5/2/2022	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
1.01%	1.36%			

Cal Factor Zero	0.036
Cal Factor Full Scale	5.522
Rotometer Reading:	3.3

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.02	0.0000	0.06	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.0000	0.07	l/m	l/m	
primary	test pt 1	2.950	2.950	2.49	0.0000	2.99	l/m	l/m	1.36%
primary	test pt 2	2.960	2.960	2.49	0.0000	2.99	l/m	l/m	1.01%
primary	test pt 3	2.970	2.970	2.50	0.0000	2.99	l/m	l/m	0.67%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	fail
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-1.0 cm	**Status**	fail
Sensor Component	Filter Azimuth	**Condition**	260 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1200666538	SEK430	Martin Valvur	06/20/2023	Ozone	none

Slope:	0.99127	**Slope:**	0.00000
Intercept	-0.50049	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00426	**Intercept**	0.20413
Cert Date	10/31/2022	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.05	-0.25	-0.60	ppb		-0.35
primary	2	16.34	15.97	15.18	ppb		-0.79
primary	3	33.95	33.41	32.40	ppb	-3.07	
primary	4	58.43	57.66	56.93	ppb	-1.27	
primary	5	112.93	111.63	110.10	ppb	-1.38	

Sensor Component	Condition	Status
Audit Pressure	721.5 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further t	True	pass
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.40	pass
Span	0.997	pass
Zero Voltage	0.000	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	60.3 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	699.6 mmHg	pass
Cell A Tmp.	28.8 C	pass
Cell B Freq.	114.0 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	699.3 mmHg	pass
Nafion dryer installed	False	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	8472	SEK430	Martin Valvur	06/20/2023	Temperature2meter	none

Mfg	RM Young
SN/Owner ID	063143 00819
Parameter:	Temperature Translator

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00002	Intercept	-0.00336
Cert Date	1/23/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.07	0.19		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.02	0.02	0.0000	0.03	C	0.01
primary	Temp Mid Range	24.62	24.62	0.0000	24.62	C	0
primary	Temp High Rang	47.35	47.35	0.0000	47.54	C	0.19

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	SEK430	Martin Valvur	06/20/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.65	0.76		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00002	Intercept	-0.00336
Cert Date	1/23/2023	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.49	21.49	0.000	22.1	C	0.57
primary	Temp Mid Range	21.27	21.27	0.000	22.0	C	0.76
primary	Temp Mid Range	21.58	21.58	0.000	22.2	C	0.61

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition	40 m	Status	Fail
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
SEK430	Martin Valvur	06/20/2023

Shelter Make	Shelter Model	Shelter Size
Alan pre-fab	s/n 861166 1808	512 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	Good	pass
Met Tower	N/A	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Filter	pass
Power Cables	Good	pass
Shelter Temp Control	Functioning	pass
Rotometer	Installed	pass
Sample Tower	Good	pass
Shelter Condition	Good	pass
Shelter Door	Good	pass
Shelter Roof	Good	pass
Shelter Floor	Good	pass
Shelter walls	Good	pass
Excessive mold present	Good	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	SEK430	Martin Valvur	06/20/2023	Filter Depth	Tylan	1414	☐	☐

The filter attachment plate is mounted too low in the enclosure resulting in the filter being exposed to wind-driven rain and in the standard geometric orientation.

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is a wooded area with spaced trees on three sides and a steep drop in elevation on the west side. Although not strictly conforming to siting criteria it is elevated in a wide valley and representative of the area. Trees are still within 5 meters, however none are higher than the CASTNET sample inlets.

2 **Parameter:** ShelterCleanNotes

The shelter is aging but is in fair condition and kept clean, neat, and well organized.

3 **Parameter:** MetOpMaintCom

The 2 meter temperature sensor signal cable is showing signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SEK430	**Technician**	Martin Valvur	**Site Visit Date**	06/20/2023

Site Sponsor (agency)	NPS	**USGS Map**	Case Mountain
Operating Group	NPS	**Map Scale**	
AQS #	06-107-0009	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, IMPROVE, BAM	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	36.489469
Site Address 1	Southern Sierra Research Center	**Audit Longitude**	-118.829153
Site Address 2	Highway 198	**Audit Elevation**	510
County	Tulare	**Audit Declination**	13.1
City, State	Sequoia National Park, CA		
Zip Code	93262	**Fire Extinguisher** ☑	Inspected June 2022
Time Zone	Pacific	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Shelter Working Room	☑	**Make**	Alan pre-fab	**Model**	s/n 861166 1808	**Shelter Size**	512 cuft
Shelter Clean	☑	**Notes**	The shelter is aging but is in fair condition and kept clean, neat, and well organized.				
Site OK	☑	**Notes**					

Driving Directions From highway 99 take 198 east through Three Rivers. Continue approximately 7 miles to the entrance to Sequoia National Park. Less than one mile past the Fee both, take the first paved road to the right at the Southern Sierra Research Center. The site is on the hill behind the center.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	06/20/2023

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☐	2 meter temperature shield pointing south
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	06/20/2023

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☐	Signs of wear
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The 2 meter temperature sensor signal cable is showing signs of wear.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	06/20/2023

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☐	Trees within 5 meters

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 16 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	06/20/2023

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☐	The shelter ground may not be adequate
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?	The met sensors are mounted on the sample tower.	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	06/20/2023

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☐	☑	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☐	☑	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☑	☐	☐
Filter pack MFC power supply	☐	☑	☐				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	Jan 2006	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	SSRFs are reviewed before sending
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	06/20/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by previous operator
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	N/A	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	As needed	☑
Analyzer Diagnostics Tests	☑	Alarm values only	☐
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	DataView

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	06/20/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	Flow and observation sections only
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	As needed	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID SEK430 **Technician** Martin Valvur **Site Visit Date** 06/20/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	illegible	none
DAS	Environmental Sys Corp	8816	2562	90649
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	120000014367	none
flow rate	Tylan	FC280AV	AW9403014	03384
Infrastructure	Infrastructure	none	none	none
Met tower	Aluma Tower	B	none	none
MFC power supply	Tylan	RO-32	FP9403015	03679
Ozone	ThermoElectron Inc	49i A3NCA	1200666538	none
Ozone Standard	ThermoElectron Inc	49C	49C-74532-376	90752
Shelter Temperature	ARS	none	none	none
Shield (2 meter)	RM Young	Aspirated 43408	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature Translator	RM Young	41406-X	063143	00819
Temperature2meter	RM Young	41342	8472	none
Zero air pump	Altec	CDA/0	092000484	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ZIO433-Martin Valvur-06/25/2023						
1	6/25/2023	Computer	Hewlett Packard	none	6560 b	5CB22906V0
2	6/25/2023	DAS	Environmental Sys Corp	none	8816	4296
3	6/25/2023	Modem	Sierra wireless	none	GX450	illegible
4	6/25/2023	Ozone	ThermoElectron Inc	90568	49C	49C-59348-322
5	6/25/2023	Ozone Standard	ThermoElectron Inc	90728	49C	49C-70528-366
6	6/25/2023	Shelter Temperature	ARS	none	unknown	none
7	6/25/2023	Temperature2meter	RM Young	none	41432VC	15103
8	6/25/2023	Zero air pump	Werther International	none	PC 70/4	000706556

DAS Data Form

DAS Time Max Error: 1.97

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	4296	ZIO433	Martin Valvur	06/25/2023	DAS	Primary

Das Date: 6 /25/2023
Das Time: 06:44:58
Das Day: 176

Audit Date 6 /25/2023
Audit Time 06:43:00
Audit Day 176

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0004	0.0002	0.0004

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
16	0.0000	-0.0005	-0.0003	V	V	0.0002
16	0.1000	0.1001	0.1002	V	V	0.0001
16	0.3000	0.2997	0.2998	V	V	0.0001
16	0.5000	0.5005	0.5005	V	V	0.0000
16	0.7000	0.7014	0.7015	V	V	0.0001
16	0.9000	0.8998	0.8994	V	V	-0.0004
16	1.0000	1.0007	1.0009	V	V	0.0002

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59348-322	ZIO433	Martin Valvur	06/25/2023	Ozone	90568

Slope:	1.00427	**Slope:**	0.00000
Intercept	-1.29029	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00426	**Intercept**	0.20413
Cert Date	10/31/2022	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.06	-0.14	-1.26	ppb		-1.12
primary	2	15.83	15.47	14.15	ppb		-1.32
primary	3	36.01	35.45	34.25	ppb	-3.44	
primary	4	66.52	65.67	64.55	ppb	-1.72	
primary	5	114.53	113.21	112.50	ppb	-0.63	

Sensor Component	Condition	Status
Audit Pressure	663 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further t	True	pass
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	1.10	pass
Span	1.030	pass
Zero Voltage	-0.0016	pass
Fullscale Voltage	0.9985	pass
Cell A Freq.	88.6 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	697.1 mmHg	pass
Cell A Tmp.	35.3 C	pass
Cell B Freq.	87.8 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	697.0 mmHg	pass
Nafion dryer installed	False	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	15103	ZIO433	Martin Valvur	06/25/2023	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00002	Intercept	-0.00336
Cert Date	1/23/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.25	0.3		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.23	0.23	0.0000	0.46	C	0.23
primary	Temp Mid Range	23.63	23.63	0.0000	23.93	C	0.3
primary	Temp High Rang	48.61	48.61	0.0000	48.83	C	0.22

Sensor Component	Shield	Condition	Moderately clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	ZIO433	Martin Valvur	06/25/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.89	2.15		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00002	Intercept	-0.00336
Cert Date	1/23/2023	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.74	23.74	0.000	23.4	C	-0.3
primary	Temp Mid Range	23.19	23.19	0.000	23.4	C	0.21
primary	Temp Mid Range	23.40	23.40	0.000	25.6	C	2.15

Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

2 **Parameter:** MetOpMaintCom

The inside of the temperature shield is dirty.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ZIO433	**Technician**	Martin Valvur	**Site Visit Date**	06/25/2023

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #	49-053-0130	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	37.198299
Site Address 1		**Audit Longitude**	-113.15072
Site Address 2		**Audit Elevation**	1266
County	Washington	**Audit Declination**	11.2
City, State	Virgin, UT		
Zip Code	84779		
Time Zone	Mountain		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

	Present	
Fire Extinguisher	☑	Inspected March 2022
First Aid Kit	☑	
Safety Glasses	☐	
Safety Hard Hat	☐	
Climbing Belt	☐	
Security Fence	☑	
Secure Shelter	☑	
Stable Entry Steps	☑	

Shelter Working Room ☐ **Make** **Model** **Shelter Size**

Shelter Clean ☐ **Notes**

Site OK ☐ **Notes**

Driving Directions From Hurricane UT drive north on state route 9 toward Springdale and Zion NP. Turn right at the Maverick station on the north side of La Verkin, continuing on route 9. Continue through Virgin. Once through Virgin take the second left onto the unpaved road named Dalton Wash. Take the right fork at the orchard on Dalton Wash road. Continue approximately 1/4 mile past the locked gate and then turn right. Continue approximately 1 mile to the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ZIO433	Technician	Martin Valvur	Site Visit Date	06/25/2023

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	ZIO433	Technician	Martin Valvur	Site Visit Date	06/25/2023

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☐	dirty
4	Are the aspirated motors working?	☑	
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The inside of the temperature shield is dirty.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ZIO433	Technician	Martin Valvur	Site Visit Date	06/25/2023

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		N/A
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	No
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	ZIO433	Technician	Martin Valvur	Site Visit Date	06/25/2023

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☐	No
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☐
11	Tower comments?		

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ZIO433	Technician	Martin Valvur	Site Visit Date	06/25/2023

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☐	☑	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☐	☑
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☐	☑	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☐	☑	Shelter air conditioner	☐	☑	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☐	N/A	☑
Site Ops Manual	☑		☑
HASP	☐	Not present	☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	N/A
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	N/A
4	Are ozone z/s/p control charts properly completed and current?	☑	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	ZIO433	Technician	Martin Valvur	Site Visit Date	06/25/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	trained onsite by ARS
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	trained by site operator
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	N/A
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☑	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	N/A	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☐		☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	ZIO433	Technician	Martin Valvur	Site Visit Date	06/25/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	N/A
2	Are the Site Status Report Forms being completed and filed correctly?	☑	N/A
3	Are data downloads and backups being performed as scheduled?	☑	No longer required
4	Are general observations being made and recorded? How?	☑	Dataview
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	N/A
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	N/A
8	Are filters protected from contamination during handling and shipping? How?	☑	N/A
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	N/A	☐
Flow System Leak Checks	☑	N/A	☐
Filter Pack Inspection	☑	N/A	☐
Flow Rate Setting Checks	☑	N/A	☐
Visual Check of Flow Rate Rotometer	☑	N/A	☐
In-line Filter Inspection/Replacement	☑	N/A	☐
Sample Line Check for Dirt/Water	☑	N/A	☐

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Dry deposition samples are not collected at this CASTNET site.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID ZIO433 **Technician** Martin Valvur **Site Visit Date** 06/25/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906V0	none
DAS	Environmental Sys Corp	8816	4296	none
Modem	Sierra wireless	GX450	illegible	none
Ozone	ThermoElectron Inc	49C	49C-59348-322	90568
Ozone Standard	ThermoElectron Inc	49C	49C-70528-366	90728
Shelter Temperature	ARS	unknown	none	none
Temperature2meter	RM Young	41432VC	15103	none
Zero air pump	Werther International	PC 70/4	000706556	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ACA416-Eric Hebert-06/30/2023						
1	6/30/2023	Computer	Hewlett Packard	none	8460p	CNU20941M6
2	6/30/2023	DAS	Environmental Sys Corp	none	8832	A3506K
3	6/30/2023	Elevation	Elevation	None	1	None
4	6/30/2023	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Illgeible
5	6/30/2023	Infrastructure	Infrastructure	none	none	none
6	6/30/2023	Met tower	Climatronics	none	unknown	illegible
7	6/30/2023	Ozone	ThermoElectron Inc	90744	49C	49C-74536-376
8	6/30/2023	Ozone Standard	T-API	none	T-703V	71
9	6/30/2023	Sample Tower	Aluma Tower	none	B	AT-71103-7I-3
10	6/30/2023	Shelter Temperature	Agilaire	none	Unknown	None
11	6/30/2023	Shield (2 meter)	Climatronics	none	100325	illegible
12	6/30/2023	Siting Criteria	Siting Criteria	None	1	None
13	6/30/2023	Temperature2meter	Climatronics	none	100093	missing
14	6/30/2023	Zero air pump	ThermoElectron Inc	none	111	111-30215-237

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	Illgeible	ACA416	Eric Hebert	06/30/2023	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/23/2023	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.008
2.01%	2.01%			**Cal Factor Full Scale**	5.1
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	0.0000	0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.0000	0.04	l/m	l/m	
primary	test pt 1	1.490	1.490	1.50	0.0000	1.52	l/m	l/m	2.01%
primary	test pt 2	1.492	1.490	1.50	0.0000	1.52	l/m	l/m	2.01%
primary	test pt 3	1.493	1.490	1.50	0.0000	1.52	l/m	l/m	2.01%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	135 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	ACA416	Eric Hebert	06/30/2023	Temperature2meter	none

Mfg	Extech	Parameter	Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.01172	Intercept	0.08161
Cert Date	2/17/2023	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.1	0.25		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.18	0.10	0.0000	0.35	C	0.25
primary	Temp Mid Range	28.40	27.99	0.0000	27.99	C	0
primary	Temp High Rang	49.69	49.03	0.0000	49.07	C	0.04

Sensor Component	Shield	Condition	Moderately clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Agilaire	None	ACA416	Eric Hebert	06/30/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.27	1.27		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.01172	Intercept	0.08161
Cert Date	2/17/2023	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.78	22.44	0.000	23.7	C	1.27

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
ACA416	Eric Hebert	06/30/2023

Shelter Make	Shelter Model	Shelter Size
Custom	Unknown	Unknown

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

2 **Parameter:** SiteOpsProcedures

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

3 **Parameter:** ShelterCleanNotes

The shelter is new, clean and well organized.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ACA416	**Technician**	Eric Hebert	**Site Visit Date**	06/30/2023

Site Sponsor (agency)	NPS	**USGS Map**	Salsbury Cove
Operating Group	NPS/MEDEP	**Map Scale**	
AQS #	23-009-0103	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, SO2, NOx, NOy, PM, VOC	**QAPP Latitude**	44.3770
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-68.2610
Land Use	Costal, woodland - mixed	**QAPP Elevation Meters**	158
Terrain	rolling	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(432) 288-9322	**Audit Latitude**	44.377086
Site Address 1	Route 233	**Audit Longitude**	-68.2608
Site Address 2		**Audit Elevation**	153
County	Hancock	**Audit Declination**	-16.4
City, State	Bar Harbor, ME		
Zip Code	04609	**Fire Extinguisher** (Present) ☑	Inspected Aug 2017
Time Zone	Eastern	**First Aid Kit** ☐	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Shelter Working Room	☑	**Make**	Custom	**Model**	Unknown	**Shelter Size**	Unknown
Shelter Clean	☑	**Notes**	The shelter is new, clean and well organized.				
Site OK	☑	**Notes**					

Driving Directions From Bangor go east on 1A to Ellsworth. From Ellsworth take route 3 east to Bar Harbor. At the west edge of town, take Eagle Lake Rd (route 233) west toward Acadia National Park. The site is through a gate, at the end of a gravel road, across from the Park Headquarters.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	06/30/2023

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	06/30/2023

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	06/30/2023

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		3/8 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 06/30/2023

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?		

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	06/30/2023

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☑	☐	Data logger	☑	☐	☐
Wind direction sensor	☐	☑	☐	Data logger	☐	☐	☑
Temperature sensor	☑	☐	☐	Strip chart recorder	☑	☐	☐
Relative humidity sensor	☐	☑	☐	Computer	☐	☑	☐
Solar radiation sensor	☑	☐	☐	Modem	☐	☑	☐
Surface wetness sensor	☐	☑	☐	Printer	☐	☑	☐
Wind sensor translator	☐	☑	☐	Zero air pump	☐	☑	☐
Temperature translator	☑	☐	☐	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☑	☐	Surge protector	☐	☑	☐
Solar radiation translator	☑	☐	☐	UPS	☐	☑	☐
Tipping bucket rain gauge	☑	☐	☐	Lightning protection device	☐	☑	☐
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☐	☑	☐
Filter pack MFC power supply	☐	☑	☐				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑	June 2000	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☑		☑

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	06/30/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained on-site by ARS during site installation
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	Operator procedures are very good for filter replacement
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually by MEDEP	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☑	N/A	☐
Manual Rain Gauge Test	☑	Monthly	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	Not performed	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Monthly	☑
Automatic Zero/Span Tests	☑	Weekly	☑
Manual Zero/Span Tests	☑	Weekly	☑
Automatic Precision Level Tests	☑	Weekly	☑
Manual Precision Level Test	☑	Weekly	☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	Results are recorded weekly on a checklist

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	06/30/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings, 90%
2	Are the Site Status Report Forms being completed and filed correctly?	☑	Flow and general observation sections only
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐	Not performed	☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	As needed	☑
Sample Line Check for Dirt/Water	☐	Not performed	☐

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 06/30/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8460p	CNU20941M6	none
DAS	Environmental Sys Corp	8832	A3506K	none
Elevation	Elevation	1	None	None
Flow Rate	Alicat	MC-10SLPM-D-PCV	Illgeible	none
Infrastructure	Infrastructure	none	none	none
Met tower	Climatronics	unknown	illegible	none
Ozone	ThermoElectron Inc	49C	49C-74536-376	90744
Ozone Standard	T-API	T-703V	71	none
Sample Tower	Aluma Tower	B	AT-71103-7I-3	none
Shelter Temperature	Agilaire	Unknown	None	none
Shield (2 meter)	Climatronics	100325	illegible	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	Climatronics	100093	missing	none
Zero air pump	ThermoElectron Inc	111	111-30215-237	none

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 7/16/2023 14:07:19

SiteVisitDate	Site	Technician
06/30/2023	ACA416	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.10	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.25	c	**P**
3	Flow Rate average % difference	P	10	5	4	2.01	%	**P**
4	Flow Rate max % difference	P	10	5	4	2.01	%	**P**
5	Shelter Temperature average error	P	5	2	5	1.27	c	**P**
6	Shelter Temperature max error	P	5	2	5	1.27	c	**P**

SiteVisitDate	Site	Technician
06/30/2023	ACA416	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

2 **Parameter:** SiteOpsProcedures

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

3 **Parameter:** ShelterCleanNotes

The shelter is new, clean and well organized.

EEMS Spot Report

Data Compiled: 6/22/2023 10:47:31

SiteVisitDate	Site	Technician
06/12/2023	ARE128	Tim Mendenhall

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00558	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.58735	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99994	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.7	%	**P**
5	Ozone Absolute Difference g2	P	7	1.5	1	-0.78	ppb	**P**

EEMS Spot Report

Data Compiled: 5/25/2023 12:39:48

SiteVisitDate	Site	Technician
05/11/2023	BWR139	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	21	0.14	c	**P**
2	Temperature max error	P	4	0.5	21	0.32	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99917	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.51299	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.18	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.46	ppb	**P**
9	Flow Rate average % difference	P	10	5	3	0.45	%	**P**
10	Flow Rate max % difference	P	10	5	3	0.67	%	**P**
11	DAS Voltage average error	P	7	0.003	91	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	24	1.94	c	**P**
13	Shelter Temperature max error	P	5	2	24	2.21	c	**Fail**

SiteVisitDate	Site	Technician
05/11/2023	BWR139	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was not available during the audit visit. Data are reported from site documentation.

2 **Parameter:** SiteOpsProcedures

The ozone sample train is leak checked every two weeks following the inlet filter change.

3 **Parameter:** SitingCriteriaCom

Very light agriculture activities near site, not harvested, just to provide food for wildlife.

4 **Parameter:** ShelterCleanNotes

The shelter has been repaired since the previous site audit visit.

5 **Parameter:** PollAnalyzerCom

Ozone sample train has inline dryer.

EEMS Spot Report

Data Compiled: 5/28/2023 11:16:39

SiteVisitDate	Site	Technician
05/18/2023	CRM435	Tim Mendenhall

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98376	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.12098	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.03	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.05	ppb	**P**

EEMS Spot Report

Data Compiled: 5/25/2023 16:01:54

SiteVisitDate	Site	Technician
04/25/2023	GAS153	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99137	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.49234	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.17	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.8	ppb	**P**

EEMS Spot Report

Data Compiled: 5/28/2023 11:00:31

SiteVisitDate	Site	Technician
05/16/2023	GRT434	Tim Mendenhall

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.04853	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.07176	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.18	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.73	ppb	**P**

EEMS Spot Report

Data Compiled: 6/22/2023 10:55:49

SiteVisitDate	Site	Technician
06/13/2023	KEF112	Tim Mendenhall

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.96624	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.83467	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.2	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.41	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.54	ppb	**P**

EEMS Spot Report

Data Compiled: 6/22/2023 11:13:37

SiteVisitDate	Site	Technician
06/15/2023	LRL117	Tim Mendenhall

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98793	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.64757	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.2	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.66	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.73	ppb	**P**

EEMS Spot Report

Data Compiled: 6/22/2023 11:04:40

SiteVisitDate	Site	Technician
06/14/2023	MKG113	Tim Mendenhall

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98805	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.0574	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.85	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.32	ppb	**P**

EEMS Spot Report

Data Compiled: 6/9/2023 10:31:20

SiteVisitDate	Site	Technician
05/24/2023	NEC602	Tim Mendenhall

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.11	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.13	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98158	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.42016	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99994	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.21	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.85	ppb	**P**
9	Flow Rate average % difference	P	10	5	3	2.74	%	**P**
10	Flow Rate max % difference	P	10	5	3	3.09	%	**P**
11	Shelter Temperature average error	P	5	2	18	0.18	c	**P**
12	Shelter Temperature max error	P	5	2	18	0.30	c	**P**

SiteVisitDate	Site	Technician
05/24/2023	NEC602	Tim Mendenhall

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator does not use gloves to handle the filter pack. Sample line leak checks are not being performed. The sample is changed on Wednesdays and not Tuesdays as described in the QAPP.

2 **Parameter:** DasComments

The dry deposition tower is visibly bent.

3 **Parameter:** SiteOpsProcedures

The site operator is new and has not yet received formal training from ARS. The site operator would benefit from training. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

4 **Parameter:** DocumentationCo

The site operator is new and site documentation (QAPP and SOP) have not been provided.

5 **Parameter:** SitingCriteriaCom

The site is located approximately 2 km northeast of Newcastle WY which has a population of approximately 3500. There is an oil refinery in Newcastle. A heavily traveled road is approximately 100m west of the site.

6 **Parameter:** ShelterCleanNotes

The shelter houses the ozone, DAS, and MFC only.

EEMS Spot Report

Data Compiled: 4/11/2023 08:58:43

SiteVisitDate	Site	Technician
04/02/2023	PRK134	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	18	0.19	c	**P**
2	Temperature max error	P	4	0.5	18	0.40	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99343	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.84444	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.2	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.79	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.89	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	0.00	%	**P**
10	Flow Rate max % difference	P	10	5	8	0.00	%	**P**
11	DAS Voltage average error	P	7	0.003	91	0.0003	V	**P**
12	Shelter Temperature average error	P	5	2	16	0.28	c	**P**
13	Shelter Temperature max error	P	5	2	16	0.54	c	**P**

SiteVisitDate	Site	Technician
04/02/2023	PRK134	Eric Hebert

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

Clover and Barley have been planted for hay within 20m of the site starting in 2008.

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized.

EEMS Spot Report

Data Compiled: 7/16/2023 13:13:38

SiteVisitDate	Site	Technician
06/20/2023	SEK430	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.07	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.19	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99127	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.50049	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.35	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.79	ppb	**P**
9	Flow Rate average % difference	P	10	5	14	1.01	%	**P**
10	Flow Rate max % difference	P	10	5	14	1.36	%	**P**
11	DAS Voltage average error	P	7	0.003	70	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	24	0.65	c	**P**
13	Shelter Temperature max error	P	5	2	24	0.76	c	**P**

SiteVisitDate	Site	Technician
06/20/2023	SEK430	Martin Valvur

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Filter Depth **CommentCode:** 71

The filter attachment plate is mounted too low in the enclosure resulting in the filter being exposed to wind-driven rain and in the standard geometric orientation.

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is a wooded area with spaced trees on three sides and a steep drop in elevation on the west side. Although not strictly conforming to siting criteria it is elevated in a wide valley and representative of the area. Trees are still within 5 meters, however none are higher than the CASTNET sample inlets.

2 **Parameter:** ShelterCleanNotes

The shelter is aging but is in fair condition and kept clean, neat, and well organized.

3 **Parameter:** MetOpMaintCom

The 2 meter temperature sensor signal cable is showing signs of wear.

EEMS Spot Report

Data Compiled: 5/25/2023 13:19:40

SiteVisitDate	Site	Technician
05/17/2023	WSP144	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	18	0.16	c	**P**
2	Temperature max error	P	4	0.5	18	0.21	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99788	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.03847	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.09	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.12	ppb	**P**
9	Flow Rate average % difference	P	10	5	3	0.89	%	**P**
10	Flow Rate max % difference	P	10	5	3	1.33	%	**P**
11	DAS Voltage average error	P	7	0.003	98	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	24	0.27	c	**P**
13	Shelter Temperature max error	P	5	2	24	0.57	c	**P**

SiteVisitDate	Site	Technician
05/17/2023	WSP144	Martin Valvur

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of wear.

EEMS Spot Report

Data Compiled: 6/9/2023 09:46:19

SiteVisitDate	Site	Technician
05/16/2023	YEL408	Tim Mendenhall

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.31	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.40	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97086	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.29844	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.1	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.31	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.19	ppb	**P**
9	Flow Rate average % difference	P	10	5	4	0.90	%	**P**
10	Flow Rate max % difference	P	10	5	4	1.01	%	**P**
11	DAS Voltage average error	P	16	0.003	42	0.0004	V	**P**
12	Shelter Temperature average error	P	5	2	27	0.30	c	**P**
13	Shelter Temperature max error	P	5	2	27	0.30	c	**P**

SiteVisitDate	Site	Technician
05/16/2023	YEL408	Tim Mendenhall

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was not able to be present during the site audit visit. Audit data are based on site documentation.

2 **Parameter:** DasComments

The shelter heat and air conditioner run simultaneously.

3 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the system is leak tested every two weeks.

4 **Parameter:** SitingCriteriaCom

The site is located at the edge of a tree line. Trees as tall as 8 meters are near the sample inlet. Trees taller than 10 meters are 15 meters from the inlet.

5 **Parameter:** ShelterCleanNotes

The shelter is organized and well maintained.

EEMS Spot Report

Data Compiled: 7/16/2023 13:34:19

SiteVisitDate	Site	Technician
06/25/2023	ZIO433	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.25	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.30	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00427	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.29029	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.6	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-1.12	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.32	ppb	**P**
9	DAS Voltage average error	P	16	0.003	35	0.0002	V	**P**
10	Shelter Temperature average error	P	5	2	9	0.89	c	**P**
11	Shelter Temperature max error	P	5	2	9	2.15	c	**Fail**

SiteVisitDate	Site	Technician
06/25/2023	ZIO433	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

2 **Parameter:** MetOpMaintCom

The inside of the temperature shield is dirty.